Belmore Road Ramps – Review of Environmental Factors

Submissions Report

Roads and Maritime Services | February 2018

NSW GOVERNMENT

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Executive summary

The Belmore Road interchange with the M5 South West Motorway (M5W) currently provides an eastbound exit road ramp and a westbound entry road ramp to the motorway (ie both west-facing road ramps). No east-facing road ramps are currently provided.

The Commonwealth and NSW Governments are proposing to construct east-facing road ramps at the M5W and Belmore Road interchange, to facilitate better access to and egress from the M5W. The proposal objectives aim to improve local network efficiency, and reduce travel times for residents and business in the suburbs of Riverwood, Peakhurst and Lugarno.

A review of environmental factors (REF) was prepared to assess the potential impacts of the proposal on the environment (SMEC 2017).

The REF was publicly displayed for 21 days between Friday 24 November 2017 and Friday 15 December 2017 at five locations. The REF was also placed on the Roads and Maritime website and made available for download. The display locations and website link were advertised in the Canterbury Bankstown Express and Bankstown-Canterbury Torch and on 28 November 2017 and 29 November 2017.

A total of 36 submissions were received in response to the display of the REF. This included one submission from Canterbury Bankstown City Council (CBCC), and 35 submissions from the community. Of the total community submissions, two were in support of the proposal, three opposed the proposal, 29 did not state a preference on the proposal, and one was not relevant to this proposal (ie they were concerned with more general road network improvements).

The CBCC submission stated that Council seeks a revised proposal concept design that addresses the following:

- enhanced street design between M5 and Josephine Street to offset increased traffic volumes and provide attractive active transport options
- further investigations for proposed construction activities that may disturb encapsulated soils at Rotary Park and affect access to Council facilities
- enhanced shared path design that connects to existing infrastructure
- loss of trees should be reduced or appropriately off-set
- construction impacts must be clearly communicated to the community and appropriate mitigation measures offered to residents and businesses that will be worst affected
- improved traffic management at Hannans Road/Belmore Road intersection.

The main issues raised in submissions from community members related to:

- Belmore Road currently has a high volume of traffic and the proposal is expected to worsen traffic flow in the area
- the new road ramps will increase the amount of traffic on Belmore Road, as motorists are attracted to use the new road ramps
- the proposal could increase noise and pollution in the area
- the clearway received a mixed response from the community with some respondent's positive about the potential impact of the clearway and some respondents saying it would have negative traffic impacts. This issue was raised about the existing residential dwellings at Washington Park and the proposed residential development at Riverwood Estate

- respondents raised concerns about the impact of residential development in the area and its potential impact on traffic
- respondents noted that it was currently difficult to access Belmore Road from side streets both north and south of the proposal.

The issues raised during the public display of the REF have been summarised and responded to within this report. The Belmore Road Ramps Review of Environmental Factors (November 2017) has been used as the key source for responses to issues raised by stakeholders.

Since display of the REF a new construction site compound has been identified and proposed. The proposed construction site compound is south of the M5W, behind the Morris Iemma Sporting Complex. Additional assessments were undertaken to determine whether use of this site would lead to any impacts additional to those identified within the REF, and subsequently whether any additional safeguards would be necessary. The proposed use of this site does not fundamentally change the potential project impacts.

All potential environmental impacts have been assessed with appropriate safeguards and management measures identified to avoid, minimise and mitigate impacts. The implementation of the safeguards and management measures identified in the REF and submissions report would appropriately manage and mitigate the potential impacts.

Contents

1. Introduction and background

1.1 The proposal

Roads and Maritime Services (Roads and Maritime) is proposing to construct east-facing entry and exit road ramps, and upgrade the existing west-facing exit road ramp at the M5 South West Motorway (M5W) and Belmore Road interchange. A more detailed description of Belmore Road Ramps proposal is provided in the Belmore Road Ramps Review of Environmental Factors (REF) prepared by Roads and Maritime in November 2017.

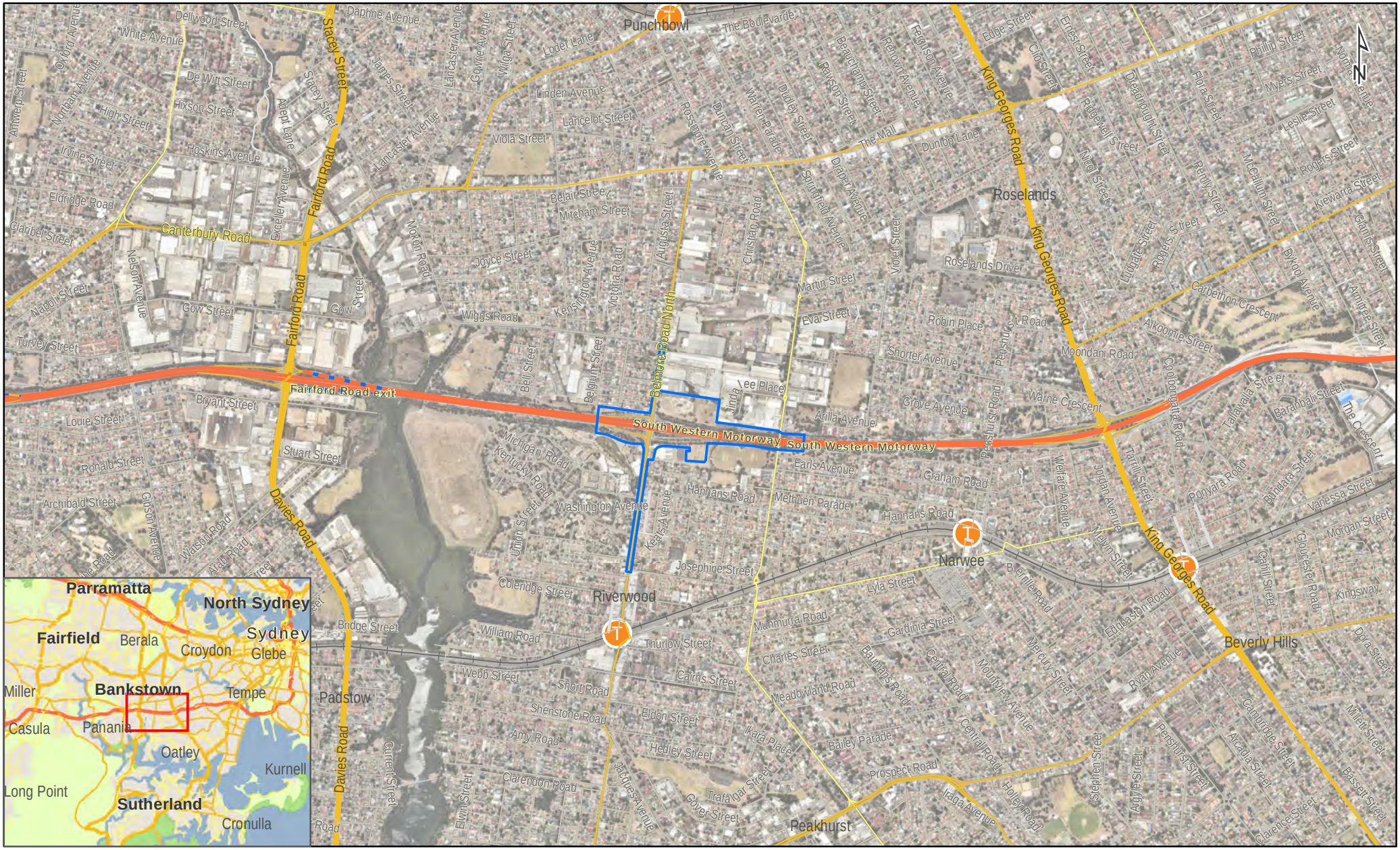
The Belmore Road interchange with the M5W currently provides an eastbound exit road ramp and a westbound entry road ramp to the motorway (ie both west-facing road ramps). No east-facing road ramps are currently provided.

The Commonwealth and NSW Governments are proposing to construct east-facing road ramps at the M5W and Belmore Road interchange, to facilitate better access to and egress from the M5W.

Key features of the proposal include:

- a new eastbound entry road ramp that will connect Belmore Road to the M5W. The initial section of the road ramp will comprise of two lanes for about 150 metres, before forming into one lane for merging onto the M5W
- a new westbound exit road ramp that will connect Belmore Road to the M5W. The road ramp will comprise of one lane for about 150 metres, before splitting into two lanes to allow for one left turn lane and one right turn lane onto Belmore Road
- widening the existing eastbound exit road ramp connecting the M5W to Belmore Road, to allow one left turn lane and two right turn lanes from the road ramp onto Belmore Road
- upgrading of Belmore Road to modify the centre median on the Belmore Road bridge to provide a 120 metre northbound right turn lane and storage for vehicles turning right onto the eastbound entry road ramp that will connect Belmore Road to the M5W
- provision of tolling gantries on each of the new road ramps to facilitate toll collection (by InterLink Roads)
- upgrading of existing and providing new traffic signals at the Belmore Road intersection with the M5W, north of the Belmore Road bridge
- upgrading of existing and providing new traffic signals at the Belmore Road intersection with the M5W, south of the Belmore Road bridge
- construction of a new shared user path through the Rotary Park between Belmore Road and Bonds Road
- connections to the dedicated off-road pedestrian footpath on Belmore Road
- provision of a clearway for Belmore Road southbound between Hannans Road and Josephine Street
- ancillary and supporting infrastructure.

Please refer to ***Figure 1*** for the regional context of the proposal, and ***Figure 2*** showing the key components of the proposal.



Project boundary

Regional context of the proposal **Figure 1**

0 0.25 0.5
km

Location: \\AUSYFSV003\Group\projects\30011940 - Belmore Road Ramps\012 GIS\Maps\REF\Submission\1 Regional context of the proposal.mxd

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100% road design output

Construction boundary

Location of the proposal **Figure 2**

0 50 100

Metres

Location: \\AUSYFSV003\Group\projects\30011940 - Belmore Road Ramps\012 GIS\Maps\REF\Submission\2 Location of the proposal.mxd

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1.2 REF display

Roads and Maritime prepared a review of environmental factors (REF) to assess the environmental impacts of the proposed works. The REF was publicly displayed at five locations for 21 days between Friday 24 November 2017 and Friday 15 December 2017, as detailed in ***Table 1***. It was also placed on the Roads and Maritime website and made available for download. The display locations and website link were advertised in the Canterbury-Bankstown Express and Bankstown-Canterbury Torch on 28 November 2017 and 29 November 2017.

In addition to the above public display, an invitation to comment and a copy of the November 2017 community update was sent directly to several identified stakeholders (**Appendix A**).

A targeted doorknock was carried out on Friday 24 November 2017 for residents along Belmore Road who may be affected by the installation of the proposed clearway between Hannans Road and Josephine Street. Residents were provided information on the proposed clearway, including information on how they could provide feedback during consultation. A 'sorry we missed you' flyer was left at properties where people did not answer the door. All residents received a copy of the November 2017 community update.

Copies of the November 2017 community update were distributed to 4700 properties in the Riverwood area. The distribution of the community updates was completed on 25 November 2017.

Table 1 REF display locations

Location	Address
Morris Iemma Indoor Sports Centre	150 Belmore Road, Riverwood
Bankstown Customer Service Centre	Bankstown Civic Tower 66 – 72 Rickland Road, Bankstown
Campsie Customer Service Centre	137 Beamish Street, Campsie
Riverwood Branch Library	Corner of Belmore Road and Roosevelt Avenue, Riverwood
Roads and Maritime Services	20 – 44 Ennis Road, Milsons Point

1.3 Purpose of the report

This submissions report relates to the review of environmental factors REF prepared for the Belmore Road Ramps proposal and should be read in conjunction with that document. It summarises the issues raised and provides responses to each issue.

Since display of the REF a new construction site compound has been identified and proposed. The proposed construction site compound is south of the M5W, behind the Morris Iemma Sporting Complex. Additional assessments were undertaken to determine whether use of this site would lead to any impacts additional to those identified within the REF, and subsequently whether any additional safeguards would be necessary. The proposed use of this site does not fundamentally change the potential project impacts.

2. Response to issues

Roads and Maritime received 35 community submissions, accepted up until Friday 15 December 2017. Canterbury Bankstown City Council (CBCC) requested an extension and made its submission on 22 December. ***Table 2*** lists the respondents, each respondent's allocated submission number, and where the issues from each submission were addressed in this report.

Table 2 Respondents

Respondent	Submission No.	Section number where issues are addressed
Community member	1	2.2
Community member	2	2.3.1, 2.5.2
Community member	3	2.3.4, 2.9
Community member	4	2.3.2, 2.3.5
Community member	5	2.3.1, 2.4.1, 2.8
Community member	6	2.5.1
Community member	7	2.5.1
Community member	8	2.5.1
Community member	9	2.5.2
Community member	10	2.3.4
Community member	11	2.5.2
Community member	12	2.3.4
Community member	13	2.3.1, 2.3.2, 2.6, 2.8
Community member	14	2.5.1
Community member	15	2.3.4
Community member	16	2.3.1, 2.6
Community member	17	2.3.2, 2.3.4
Community member	18	2.3, 2.3.1, 2.3.2, 2.3.3, 2.4.1, 2.9
Community member	19	2.3.4
Community member	20	2.6
Community member	21	2.3, 2.3.1, 2.4.1
Community member	22	2.3.1, 2.9
Community member	23	2.3.3
Community member	24	2.3.4
Community member	25	2.3.2
Community member	26	2.3.1, 2.3.2
Community member	27	2.3.3
Community member	28	2.3.3

Respondent	Submission No.	Section number where issues are addressed
Community member	29	2.3.3
Community member	30	2.3.1, 2.3.2
Community member	31	2.2
Community member	32	2.3.2, 2.3.3, 2.3.4, 2.4.1, 2.6, 2.9
Community member	33	2.3.1, 2.3.2, 2.3.4, 2.6
Community member	34	2.3.1, 2.3.3, 2.3.5, 2.4.1, 2.4.3, 2.6, .2.7.1, 2.9
Community member	35	2.3.1, 2.3.2, 2.3.4, 2.4.1, 2.9
Canterbury-Bankstown City Council	36	2.2, 2.3.1, 2.3.3, 2.3.4, 2.4.2, 2.4.3, 2.6, 2.7, 2.7.1, 2.8, 2.9

2.1 Overview of issues raised

A total of 36 submissions were received in response to the display of the REF. This included one submission from CBCC and 35 submissions from the community.

Each submission has been examined individually to understand the issues being raised. The issues raised in each submission have been extracted and collated, and corresponding responses 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 Roads and Maritime response to these issues forms the basis of this chapter.

Of the total community submissions, two were in support of the proposal, three opposed the proposal, 30 did not state a preference on the proposal, and one was not relevant to this proposal (ie they were concerned with more general road network improvements).

The CBCC submission stated that Council seeks a revised proposal concept design that addresses the following:

- enhanced street design between the M5W and Josephine Street to offset increased traffic volumes and provide attractive active transport options
- further investigations for proposed construction activities that may disturb encapsulated soils at Rotary Park and affect access to Council facilities
- enhanced shared path design that connects to existing infrastructure
- loss of trees should be reduced or appropriately off-set
- construction impacts must be clearly communicated to the community and appropriate mitigation measures offered to residents and businesses that will be worst affected
- improved traffic management at the Hannans Road/Belmore Road intersection.

The main issues raised by the community included:

- Belmore Road currently has a high volume of traffic and the proposal is expected to worsen traffic flow in the area
- the new road ramps will increase the amount of traffic on Belmore Road, as motorists are attracted to use the new road ramps
- the proposal could increase noise and pollution in the area

- the clearway received a mixed response from the community with some respondent's positive about the potential impact of the clearway and some respondents saying it would have negative traffic impacts
- respondents raised concerns about the impact of residential development in the area and its potential impact on traffic. This issue was raised about the existing residential dwellings at Washington Park and the proposed residential development at Riverwood Precinct
- respondents noted that it was currently difficult to access Belmore Road from side streets both north and south of the proposal.

Two respondents contacted the proposal team more than once and provided feedback verbally and via email.

2.2 Response to Canterbury-Bankstown City Council submissions

The CBCC submission generally supported the proposal to build additional road ramps at the M5W and Belmore Road interchange, as well as the benefits the proposal would bring to residents and businesses in the area. However, CBCC also raised concerns about several aspects of the design, and potential impacts on the community during construction of the proposal.

Details of the concerns raised by CBCC in their submissions (presented in blue italics), and the Roads and Maritime responses to these are provided below.

1. Enhanced street design between M5 South West Motorway and Josephine Street to offset increased traffic volumes and provide attractive active transport options

Substantially increased residential densities are planned for the Riverwood Planned Precinct and Riverwood Estate projects; therefore, pedestrian accessibility is important to encourage more walking to local amenities, which will in turn help reduce traffic congestion. Information provided at project control group meetings for the Riverwood projects is the estate renewal would yield 5,500 dwellings. The Riverwood Centre renewal could yield 2 or 3 times this number of dwellings given the size of the study area for that project.

Roads and Maritime acknowledges the CBCC's concerns about the proposed development of the Riverwood Estate State Significant Precinct (SSP) and the impacts this may have on the traffic network in the area. Therefore, pedestrian accessibility is important to encourage active transport use to and from local amenities, which will in turn reduce traffic congestion. Local road network and active transport upgrades would likely be included in the proposed Riverwood Estate SSP design.

The Department of Planning and Environment (DPE) is managing the Riverwood Estate SSP, and are working with the NSW Land and Housing Corporation, the CBCC, Georges River Council and other State agencies including Roads and Maritime during the planning stage of this project. Roads and Maritime discussed the proposal with the DPE during the development of the detailed design. Relevant data on the Riverwood Estate SSP, including projected dwelling and population numbers, were used in the traffic and transport study, social and economic impact assessment, and the REF. Roads and Maritime will provide information to the DPE on issues raised during consultation for the proposal that relate to the Riverwood Estate SSP.

The traffic report notes that a southbound clearway is proposed on Belmore Road between Hannans Road and Josephine Street. This is likely to increase traffic speeds and volume, making it more difficult for pedestrians and vehicles to traverse. This also risks increasing traffic speed and congestion in the Riverwood town centre.

Traffic and transport modelling completed for the proposal indicates that the implementation of the southbound clearway during the evening / night peak period is the most favourable option to minimise congestion on Belmore Road. The clearway is proposed from 4 p.m. to 7 p.m., Monday to Friday, and would improve southbound traffic flow on Belmore Road during the p.m. peak period. Modelling indicates that the proposed clearway provides motorists with additional through capacity in the southbound direction while also providing improved access to and from local roads without significant interruption to the Belmore Road mainline traffic along this section.

The proposed clearway is intended to increase the capacity of Belmore Road, allowing vehicles to pass motorists wanting to turn right onto local roads, as well as allowing possible Belmore Road traffic queues to be contained and not spill back onto the proposed M5W exit road ramp.

Roads and Maritime has noted CBCC's concerns regarding pedestrian access across Belmore Road. However, Belmore Road will remain with a posted speed limit of 50 kilometres per hour.

Council believes there is an opportunity to provide benefits for pedestrians who use this area through enhanced street design between M5 and the Riverwood Centre. This is fundamental given the amount of growth expected in the center from the Riverwood Priority Precinct and Riverwood Estate Renewal projects.

Roads and Maritime note that due to the removal of the two pedestrian refuge islands, pedestrian access between the M5W and the proposed Riverwood Estate SSP would be via the signalised crossing at Hannans Road, or the mid-block crossing to the south of Josephine Street. Roads and Maritime will investigate the signalisation of other intersections within and near the proposal area to determine current and future pedestrian access needs.

Council recommends an extension of the project study area to include the impacts on Belmore Road and surrounds to Josephine Street.

Roads and Maritime advises that the study area will not be extended due to funding and timing considerations. The current budget allocation for the proposal is $30 million. This allocation will be required to complete the design and construction of the proposal as described in the REF. The addition of other upgrades would affect the proposal's design and construction budget and timeframes.

An enhanced street design would include the following features:

a) Widening of footpaths between M5 and Josephine Street on both sides of Belmore Road, including M5 overbridge. Consultation undertaken for the Riverwood Planned Precinct highlights the community desire for improved walking and cycling access to the centre:
   - *i. access and safety of walking, cycling and/or public transport (signage, paths, lighting etc.)*
   - *ii. improve safety along M5 walk from Belmore Road*
   - *iii. improve footpaths and parking.*

Roads and Maritime have investigated the widened of footpaths between the M5W and Josephine Street, including the M5W overbridge, and dedicated cycle facilities on both sides of Belmore Road. However, the inclusion of these components in the design for the proposal would require the removal of existing traffic lanes on the road sections, and widening the Belmore Road bridge.

The proposal, as presented in the REF, would improve active transport connectivity and access for residents and businesses within the study area, by providing a new shared-user path through Rotary Park, as discussed below.

b) Separated cycleway provided on both sides of Belmore Road including the M5 overbridge. Belmore Road is an important north-south active transport link, particularly linking Riverwood Station north to Punchbowl station and Bankstown town centre, via the new high-density

areas such as the Riverwood Planned Precinct and Riverwood Estate. It is vital major works such as this make provision for cyclists with separated cycle lanes.

The proposal would improve the active transport network by providing a shared user path that extends from Belmore Road, through Rotary Park to Bonds Road. The proposed shared user path would provide a safe and efficient route for active transport users within the study area. The proposal retains the existing cyclist and pedestrian path over Belmore Road bridge, and provides tie-in locations to the existing active transport path network to the north and south of the proposal.

During the planning for the shared user path, Roads and Maritime consulted with the CBCC and considered, where necessary, Council's LGA-wide current and future cycle and pedestrian path network planning.

c) *Signalised intersection at Roosevelt Avenue and Washington Avenue. Vehicle, pedestrian and cyclist volumes on Washington Ave and Roosevelt Ave are expected to increase substantially as a result of the redevelopment of Land and Housing Corporation (LAHC) land.*

   Combined with increased traffic on Belmore Road associated with the new M5 ramps, these intersections will require upgrading to manage traffic and pedestrian movement. Signalised crossings at these intersections are also required to offset the proposed removal of two pedestrian refuges either side of the Roosevelt Avenue that will reduce the opportunities for pedestrians to cross safely at this part of Belmore Road. The increased population in the centre will require more connectivity across Belmore Road rather than less to access the town centre as well as existing and future community facilities.

The addition of signalised crossings at the intersections of Roosevelt Avenue and Washington Avenue, and Belmore Road and Roosevelt Avenue would need to be assessed in relation to their impact on traffic flow. A signalised crossing is not required at the intersection of Belmore Road and Washington Avenue due to its proximity to Hannans Road, which has an existing signalised crossing.

Based on investigations undertaken for the proposal, pedestrian movements at the existing pedestrian refuges were low (less than 10 per hour), and Roads and Maritime notes that the library directly across one of the pedestrian refuges is also scheduled to be moved from its current location, which may reduce pedestrian movements in the area.

There are also existing options for pedestrians to cross Belmore Road to the north and south of both Roosevelt Avenue and Washington Avenue, including a signalised crossing at the intersection of Belmore Road and Hannans Road.

However, Roads and Maritime will undertake further assessments and feasibility of movements within this vicinity.

d) *Gateway treatment at Josephine Street. The intersection of Josephine Street with Belmore Road is the gateway to the Riverwood town centre. The projected increased traffic volumes on Belmore Road combined with the planned southbound clearway will increase traffic volume and speed in the approach to the town centre. Therefore, as part of this project an appropriate public domain upgrade is required at this intersection to demark entry into a slower speed, high-pedestrian environment. This should include traffic calming, pedestrian crossings, street trees and town centre signage.*

In relation to the CBCC request for a gateway treatment at Josephine Street, Roads and Maritime acknowledges that there will be an increase in traffic; however traffic speeds will remain signposted as 50km/h. It is also noted that Belmore Road is a local road and therefore it is within CBCC's remit to carry out any desired gateway treatments. RMS ackwodlege Council's concern with overall future anticipated traffic increases in this area, partially due to proposal but more significantly from

the anticipated growth as a result of the planned Riverwood Estate SSP development. As such, RMS will forward the CBCC comments to the DPE for its consideration, as the future development of Riverwood Estate SSP may impact on pedestrian movements in the area.

e) More street trees to combat urban heat and make pedestrian and cycle access to Morris Iemma Indoor Sports Centre and Riverwood Community Centre an attractive alternative. Urban heat is a pressing concern at all levels of government. Any opportunities to provide more street trees as part of a public infrastructure project should be considered. Council recommends that RMS propose a program of street tree planting along this State Road to fill the gaps between the M5 motorway and Josephine Street.

The REF included a landscape and visual amenity assessment and proposed landscaping of construction areas in line with relevant Roads and Maritime guidelines, and landscaping undertaken for recent adjacent road upgrade projects. The over-arching aim of the landscape and urban design plan was to ensure that proposal elements were physically and visually integrated with their surrounding environment. To meet these aims, a set of key urban design objectives were developed.

Landscaping as part of the proposal is limited to the areas associated with the proposed new road ramps and the shared user path through Rotary Park. Construction of the shared user path would include earthworks and landscape modifications to ensure an improved visual and landscape outcome. The northern side of the shared user path through Rotary Park will have landscaped mounding. This helps to separate the recreational area of the park from the shared user path and M5W. The urban design proposal also aims to emphasise the location of the Morris Iemma Sports Centre, express the upgraded M5W and Belmore Road interchange as a gateway to CBCC, and retain the privacy and amenity of residents.

In relation to landscaping along other areas of Belmore Road, Roads and Maritime advises that Belmore Road is a local road that falls within the CBCC LGA. As such, landscaping and tree planting along Belmore Road is the responsibility of CBCC.

f) Underground powerlines as part of any public domain works. Undergrounding lines allows for larger street trees and a more amenable public domain experience.

No overhead powerlines are impacted by the proposal and as such they will remain in their current position. Roads and Maritime will continue to liaise with utility providers to determine the optimal solutions for each project scenario.

2. Further investigation for proposed construction activities that may disturb encapsulated soils at Rotary Park and affect access to Council facilities

The REF proposes to construct a shared cycle/pedestrian path between Belmore Road and Bonds Road. The proposed path traverses the southern part of Rotary Park playground and continues behind the industrial precinct before ending at Bonds Road. The REF also identifies a potential compound site within Rotary Park.

Council is very concerned that the proposed shared path alignment and any compound site at Rotary Park (north of M5) may disturb encapsulated contaminated soil. This risk has not been properly considered. Soil testing sites in the contamination report do not include any locations within Rotary Park.
The risks associated with exposure of users of the park and surrounds to contaminated fill has not been properly considered and necessitates that Council take a precautionary approach and object to the disturbance of any land at Rotary Park until a Stage 2 Contamination Report has been prepared. Alternative compound sites and share path corridor may be required and should be identified in consultation with Council officers. Any alternatives sites adjacent to the M5 corridor should be also assessed for contaminated fill.

The provision of a shared user path through Rotary Park was agreed at meetings held between CBCC and Roads and Maritime. At those meetings, CBCC advised Roads and Maritime that encapsulated soils within Rotary Park should not be disturbed, particularly those at the south-eastern end of Rotary Park, as these soils are known to contain asbestos which CBCC recently had treated. CBCC requested that the alignment of the shared user path as presented to them at those meetings be changed to avoid known contaminated areas. Through subsequent investigations, the shared user path has been realigned to avoid known contaminated areas, and the design modified so that construction of the shared user path would not involve any cut, only fill.

Roads and Maritime held an additional meeting with CBCC staff on Friday 22 December 2017 to discuss use of both the Rotary Park and the field behind the Morris Iemma Indoor Sports Centre as construction site compounds. This resulted in an in-principal agreement that both sites could be used as construction site compounds for the proposal. Use of the Rotary Park site as construction compounds would not involve any earthwork / cutting.

A *Contaminated Land Management Plan* will be developed for the proposal to mitigate potential contamination exposure risks to the public, construction workers, and the environment during construction. The *Contaminated Land Management Plan* would include an *Asbestos Management Sub-plan* to manage ACM surface inspections, sampling, and associated removal works and the issuing of clearance certificates.

Council also seeks assurances from RMS that the community will have unimpeded access to and from Council facilities during construction and operation including to the Morris Iemma Indoor Sports Centre, Rotary Park playground, Riverwood Community Centre and Wetlands Playground.

At meetings held between CBCC and Roads and Maritime, it was proposed that heavy construction vehicle access to Rotary Park would be through the agreed licensed/leased area only, and not via the existing park entrance and car park. This will provide a clear separation of public and heavy construction vehicle access areas. The car park would only be used by light construction vehicles as an alternate access to the construction site compound. No construction vehicles will park within the car park. This will be discussed further in consultation between Roads and Maritime and CBCC.

Regarding access to the proposed construction site compound behind the Morris Iemma Indoor Sporting Centre, it was agreed between CBCC and Roads and Maritime that construction vehicle access would be possible through the existing car park, with appropriate separation and traffic control measures in place. It was also agreed that the northern row of car parking within the complex could be used for construction vehicle access. The shared user path network through the Home of Brothers Park would remain in operation, with only a small section to be diverted during construction, and connectivity maintained.

Both car parks would be reinstated as required, including replacement of existing trees in the park that will be affected by construction activities.

An option has also been discussed between CBCC, the DPE and Roads and Maritime to use the area between the proposed road ramps and the existing driveway for construction vehicle access/egress to the sites. This would allow a complete separation of public and construction vehicles. RMS will investigate these options further and will advise CBCC of their feasible. Proposed access and turning paths are shown in ***Figure 5***.

3. Enhanced shared path design that connects to existing infrastructure

Subject to the above matters raised in item No.3 being resolved Council requests that the shared path be appropriately connected with Council's existing shared paths aligned with, and

south of, the M5 corridor. This will require the share path design to include public domain improvements connecting the shared path to the crossing on Bonds Road to the south. This crossing should be upgraded to for use by pedestrians and cyclists.

The proposed shared user path through Rotary Park will integrate with existing shared user paths to the east and west, and as such improve connectivity and access for residents and businesses within the study area. The proposal retains the existing cyclist and pedestrian path over Belmore Road bridge, and provides tie-in locations to the existing active transport path network to the north and south of the proposal.

Roads and Maritime notes that the proposed shared path is in line with the CBCC cycleway plan for the LGA. The cycleway plan identifies Belmore Road, including the bridge, classified as an "existing shared path". Bonds Road, under the M5W bridge, is noted as a "proposed bicycle lane (on-road)". This indicates that this section of Bonds Road is planned as an "on-road" facility, not shared user path, as stated in the CBCC submission.

4. Loss of trees should be reduced or appropriately off-set

Council acknowledges that "batters, embankments, verges and redundant areas should be planted out, where practicable and appropriate, with indigenous species in accordance with a Revegetation Plan, to be prepared following approval. Council requests that the direction to the contractor is that replanting must occur as part of this project. Council also requests that any revegetation plan include a provision that the removal of plants must be offset at a ratio of 3:1.

Council notes that RMS will remove approximately 150 Acacia pubescens plants. There are only a very few reserves in the LGA where this plant grows. The RMS biodiversity ecological report fails to examine the loss of these plants in proper detail. The contractor should off-set the loss of the 150 Acacia pubescens plants at a ratio of 3:1. This will result in planting of 450 Acacia pubescens plants as a part of the landscape plan. This will ensure a high ratio of plants succeeding to mature growth.

RMS should consider sites outside of the works area to offset their plantings, and provide locally native canopy trees for certain streets through which traffic will increase. This will off-set the increase in local heat (Urban Heat Island Effect) from increased transport movements through the locality.

Council requests a documented and appropriate maintenance regime to ensure plant survival and replacement of any plants that die off.

As outlined in the REF, landscaping will be provided along the interface between the road corridor and surrounding property to maintain the existing landscape character. The landscaping will be as per the approach detailed in the *M5 West Widening: Urban Design and Landscape Plan* (HBO & EMTB, 2012), and relevant Roads and Maritime guidelines. The principles of landscaping plan include:

- planting is proposed to be undertaken at the top of the interchange near Belmore Road. This would consist of feature planting and screen planting where practicable. Planting may also be provided to line existing shared user paths and footpaths to provide screening of existing and modified noise walls
- species selection would be in accordance with Roads and Maritime Landscape Guidelines and would include low-maintenance and drought tolerant native species to reduce maintenance requirements. The species selected would complement the existing Cooks River / Castlereagh Ironbark Forest vegetation community, and species used in the *M5 West Widening: Urban Design and Landscape Plan.*

No trees that are part of the plant community type (PCT) or endangered ecological community (EEC) that were observed on the site would be removed during construction. The viable local population of identified threatened flora, *Acacia pubescens*, includes about 157 individuals recorded in the study area (in 2017), and 143 individuals, located within about 300 metres of the study area (recorded in 2012). The latter are estimated to persist based on review of clearing in recent aerial photographs. This comprises a total of local population of 300 individuals. Much of the local population of *A. pubescens* was planted during the original construction of the M5W.

Of these, about 148 individuals (or 49 per cent) would be removed in the area between Belmore Road and Bonds Road. This would reduce the local population size by about half and fragment the viable local population into two groups separated by more than 300 metres, resulting in the creation of two separate smaller viable local populations.

The biodiversity assessment prepared for the REF determined there was not a significant impact on the viable local population of *A. pubescens* through the removal of 148 individuals, or any significant impact on other biodiversity value within the study area. Based on the results of the biodiversity assessment, and in applying Roads and Maritime guidelines, offsetting is not required, and the 3:1 ratio that CBCC suggests is not a legislative requirement.

Regardless, Roads and Maritime has prepared a landscaping plan which includes the planting of native trees and shrubs. *A. pubescens* is not included on the species list for the landscaping plan as it is not a species approved for Roads and Maritime projects.

Since display of the REF, an additional biodiversity assessment was undertaken to determine any potential biodiversity impacts associated with the proposed additional construction site compound, located behind the Morris Iemma Sporting Complex. No additional threatened species or communities will be impacted by using this site. The results of this assessment are summarised in **Section 3.4** of this report.

5. Construction impacts must be clearly communicated to the community and appropriate mitigation measures offered to residents and businesses that will be worst affected.

Engagement with Council and the community must clearly describe the works, impacts and mitigation proposed by RMS. Residents and businesses must be given sufficient time to make arrangements for their staff and contractors about changes to local traffic management.

Council understands that standard construction hours, as set out in the REF, will be applied to this project being:

- *Monday to Friday: 7:00 am to 6:00 pm*
- *Saturday: 8:00 am to 1:00 pm*
- *Sundays and public holidays: no work.*

The REF also states that "due to the importance of maintaining through traffic on the M5 South West Motorway and Belmore Road, particularly during peak hours, out of normal hours' work would be required at times during the construction of the proposal as follows: Monday to Sunday: 8 pm to 6 am; Public holiday: No regular work. Out of normal hours' work would be undertaken to minimise disruptions to motorists, minimise safety risks for workers and the travelling public, minimise disturbance to businesses and tie in with technical or timetabling reasons".

Council must be advised of the timing of Out of Hours Works (OOHW) and the mitigation measures proposed to reduce the impacts on residences and businesses. This matter has not been appropriately described and addressed in the REF. RMS should provide ample and timely notification to residents for OOH with description of mitigation measures proposed.

Roads and Maritime is committed to keeping the community and stakeholders informed about progress of the proposal. As such, an Out of Hours Works (OOHW) procedure will be developed and included in a construction environmental management plan (CEMP).

In addition, a *Community and Stakeholder Engagement Plan* has been developed. The community and stakeholder engagement objectives for the proposal were to:

- provide regular and targeted information to build awareness about the proposal as well as information about the likely impacts and benefits of the proposal
- provide clear direction to the community and stakeholders about whether we are providing information or seeking feedback so expectations are clear at all stages
- ensure community and stakeholder views are continuously fed into the proposals development and used to understand and effectively assess impacts
- collaborate with government agencies and local councils to ensure a whole-of-government approach and consistent key messaging
- keep the local community and other key stakeholders regularly informed of the progress of the proposal
- provide the community and stakeholders with regular and targeted information to build awareness about the proposal
- increase stakeholder understanding of the proposal and its objectives
- ensure that community and stakeholder enquiries about the proposal are managed and resolved effectively
- ensure that proposal information is distributed in an effective and timely manner.

Residents and other stakeholders will be notified about work that could affect them in advance of the work taking place. This includes community consultation regarding the proposed additional construction site compound. Roads and Maritime will provide a minimum of five days notification for all construction activities, including investigation work, for the proposal.

At a meeting held between CBCC and Roads and Maritime, CBCC advised Roads and Maritime that residents behind the Morris Iemma Indoor Sports Centre would be considered sensitive receivers, in relation to noise impacts. Roads and Maritime committed to an additional review, including assessment, to understand the potential impacts associated with the use of part of the Morris Iemma Sports Centre as a site compound. This will include appropriate community consultation with identified sensitive receivers. The results of this assessment are summarised in **Section 3** of the Submissions Report.

6. Improved traffic management at Hannans Road/Belmore Road intersection.

Council requests that RMS investigate options to improve the performance of the intersection of Hannans Road and Belmore Road. Options include an exclusive right turn bay for northbound traffic and an additional through lanes for northbound traffic.

Council acknowledges that the proposed ramps will improve access to the M5 motorway for businesses in industrial precincts in the vicinity of the ramps. However, they will also increase truck movements through the centre. This increases the necessity for appropriate public domain improvements to calm and slow traffic at the entrances to the town centre to increase pedestrian safety.

It is likely that heavy vehicles from the Punchbowl Industrial area would use Hannans Road and Belmore Road to access the M5, therefore this intersection in particular may need upgrading to accommodate truck turn movements. The traffic report states "The performance of the Belmore

Rd intersections with Thurlow Street and Hannans Road is expected to deteriorate in the future, regardless of the project. The traffic models suggest additional upgrades at these intersections may be required.

Traffic modelling included in the REF indicates that the performance of the intersections of Belmore Road, Thurlow Street and Hannans Road was expected to deteriorate in the future, regardless of the introduction of the proposal. The modelling shows that by the year 2021, the proposal does not increase this intersection level of service beyond acceptable guideline limits. In addition, the proposal would only increase the overall intersection delay by 10-15 seconds by the year 2031. Traffic modelling also suggested additional upgrades at these intersections may be required in the future, but these were not included in the proposal. Additional upgrades would require significant modification to the intersection, including private land acquisition to accommodate these.

It is acknowledged that the performance of the Belmore Road and Hannans Road intersection is an existing problem on the local road network and the intersection may be further affected by the proposed Riverwood Estate SSP development. Roads and Maritime liaised with the DPE during the development of the proposal regarding the potential traffic impacts of Riverwood Estate SSP on the surrounding road network. Roads and Maritime will inform DPE of the issues raised during consultation for the project proposal that relate to the Riverwood Estate.

It is noted that in general, Belmore Road would benefit from the proposed southbound clearway between Hannans Road and Josephine Street. This provides drivers additional through capacity in the southbound direction while providing improved access to and from minor local roads without significant interruption to the Belmore Road mainline traffic along this section.

2.3 Responses to community submissions

2.3.1 Support for the proposal

Submission number(s)

1, 31.

Issue description

Submissions in support for the project with respect to it relieving traffic congestion.

Response

The proposed new road ramps at the M5W and Belmore Road interchange at Riverwood are expected to ease congestion and improve travel times on local streets and roads in nearby suburbs. Commuters traveling toward the Sydney Airport and the CBD are expected to benefit from the proposal with easier access to the M5W from Riverwood. The addition of the new east facing road ramps will allow a greater number of vehicles to travel via the M5W to reach Belmore Road and surrounding local streets, rather than having to exit the M5W at either the King Georges Road or Fairford Road interchanges. This will result in a greater number of vehicles remaining on the M5W reducing traffic volumes on local roads between King Georges Road and Fairford Road.

2.3.2 Traffic and transport

2.3.2.1 Expected increase in traffic

Submission number(s)

2, 5, 13, 16, 18, 21, 22, 26, 30, 33, 34, 35, 36

Issue description

Several submissions stated that Belmore Road currently had high traffic volumes and the respondents believed the proposal would increase the volume of traffic on Belmore Road. Respondents raised specific issues, including:

- access to properties on Belmore Road is already difficult, and the proposal will exacerbate this
- the proposal will increase traffic volumes and congestion along Belmore Road and the surrounding road network
- the current configuration of Belmore Road cannot support the predicted increased traffic volumes due to the proposal.

Response

A traffic and transport assessment was undertaken to inform the detailed design and REF for the proposal. The assessment concluded that with the addition of the new east facing road ramps, a greater number of vehicles would travel via the M5W to reach Belmore Road and nearby areas, rather than leaving the M5W at the King Georges Road interchange. This will result in a greater number of vehicles remaining on the M5W, reducing traffic volumes on local roads between King Georges Road and Fairford Road.

The provision of east-facing road ramps allowing direct access to Belmore Road for westbound M5W traffic will increase traffic volumes on Belmore Road. However, the inclusion of a southbound clearway between Hannans Road and Josephine Street during the afternoon peak will benefit traffic volumes on Belmore Road as it provides additional southbound through capacity for traffic for this section of Belmore Road. About half of the properties adjacent to the clearway have rear lane access and therefore access to these properties should not be impacted. Of those properties without rear lane access, street parking will only be unavailable during the clearway times (i,e 4pm to 7pm weekdays). Roads and Maritime will provide sufficient notice to residents regarding the implementation of the southbound clearway on Belmore Road so that affected residents have time to consider alternate parking arrangements.

The traffic and transport study undertaken for the REF notes that:

- on an average existing weekday, two-way traffic recorded on Belmore Road at the M5W overpass is approximately 26,640 vehicles per day
- existing two-way traffic on Friday (the highest volume day) is on average about 7 per cent higher than the weekday average two-way traffic
- existing weekend two-way traffic is 22 per cent lower than weekday two-way traffic. The notable reduction in traffic during the weekend is a result of low business activity in industrial and employment zones in the study area during the weekend
- the performance of Belmore Road intersections with Thurlow Street and Hannans Road is expected to deteriorate in the future, regardless of the proposal
- the network performance results indicate that the proposal leads to a slight overall performance in the network.

2.3.2.2 Traffic management

Submission number(s)

4, 13, 17, 18, 25, 26, 30, 32, 33, 35

Issue description

Several issues relating to traffic management were raised during the REF display:

- access to local streets from Belmore Road is already difficult, and the proposal will exacerbate this
- the right turn into Killara Avenue should be restricted and heavy vehicles should be stopped from making left turns from Belmore Road into Hannans Road
- Hannans Road should be restricted for use by light vehicles only
- Belmore Road is too narrow to cope with increases in traffic volumes
- Belmore Road is congested during the peak at the Washington Road and Hannans Road intersections
- Belmore Road and Hannans Road are not designed to carry the current level of traffic and volumes will increase with the proposal.

Response

Belmore Road provides a link between the M5W and several main arterial roads, such as Canterbury Road and Henry Lawson Drive, thus forming an important connection between key transport corridors and residential and commercial areas. The existing configuration means that local traffic must use local streets and roads to access the eastbound road ramps, causing issues in the local traffic network including congestion and increased travel times.

The objective of the proposal is to allow better access to and egress from the M5W and Belmore Road and surrounding suburbs. The proposed new road ramps at Belmore Road Riverwood, are expected to improve access to the M5W. Commuters traveling toward the Sydney Airport and the CBD are expected to benefit from the proposal with easier access to the motorway from Riverwood. The addition of the new east facing road ramps will allow a greater number of vehicles to travel via the M5W to reach the Belmore Road area, rather than leaving the M5W at King Georges Road. This leads to a greater percentage of vehicles in a high speed (motorway) environment and reduces the traffic volumes on parallel local roads between King Georges Road and Belmore Road.

The implementation of a PM peak clearway is intended to facilitate better traffic flow along Belmore Road during these times. Belmore Road has adequate width for two-way traffic. The clearway should also facilitate better access to and from local streets.

Local roads in the study area fall under the CBCCs jurisdiction, and Roads and Maritime has been liaising with CBCC during the development of the proposal. Roads and Maritime will inform the CBCC of the issues raised relating to local roads during consultation for the proposal. This will allow the CBCC to investigate options to modify the local road network, including turning movements around Belmore Road.

2.3.2.3 Riverwood Estate State Significant Precinct

Submission number(s)

18, 23, 27, 28, 29, 32, 34, 36

Issue description

Several respondents stated that residential development at the SSP would generate traffic in the area, which should be considered by Roads and Maritime during the planning of the Belmore Road Ramps proposal. One respondent stated that development at Washington Park also contributed to congestion in the area.

Response

The DPE is working with the CBCC, Georges River Council and State agencies to plan for the Riverwood Estate. The DPE is also working with the NSW Land and Housing Corporation to plan for the Riverwood Estate State Significant Precinct which currently accommodates around 1,000 social housing dwellings on over 30 hectares of government-owned land.

Roads and Maritime has been liaising with DPE during the development of the proposal about the potential traffic impacts that the redevelopment of Riverwood Estate may present for the surrounding road network. Roads and Maritime will inform DPE of the issues raised during consultation for the proposal that relate to, or may need to be considered during planning for the Riverwood Estate development.

2.3.2.4 Clearway (traffic impacts)

Submission number(s)

3, 10, 12, 15, 17, 19, 24, 32, 33, 35

Issue description

Several submissions were received relating to the effectiveness of the proposed clearway, including:

- the clearway would not be effective because it was only proposed to be on one side of Belmore Road
- the clearway should commence earlier than proposed to coincide with the PM peak-period
- maintaining the right turn into Killara Avenue from Belmore Road during clearway hours will negate its effectiveness.

Response

The traffic and transport assessment undertaken to inform the detailed design and REF determined that traffic on Belmore Road would benefit the southbound clearway proposed between Hannans Road and Josephine Street. The clearway will improve the southbound traffic flow on Belmore Road during the PM peak period. Implementation of the clearway provides additional through capacity in the southbound direction, while providing improved access to and from local minor roads without significant interruption to the Belmore Road mainline traffic along this section. The clearway would be implemented during the afternoon peak, from 4 p.m. to 7 p.m., weekdays.

This proposed clearway is intended to increase the capacity on Belmore Road, allowing vehicles to pass right turners as well as allowing the possible Belmore Road queues to be contained and not spill back into the M5W off-ramps.

Traffic modelling determined the clearway would be most effective on the southbound side of Belmore Road.

Roads and Maritime will monitor and review the effectiveness of the clearway and the operation times may be amended, if necessary.

2.3.2.5 Tolling

Submission number(s)

4, 34

Issue description

Respondents raised issues regarding the tolling of the road ramps, including one respondent who said motorists would drive to King Georges Road to avoid paying the toll, which would negate the purpose of building the road ramps. Another respondent stated that funding for the proposal would go to a privately-owned company and would not go back into the community.

Response

The new east-facing road ramps would be tolled consistent with other entry and egress points on the M5W and in accordance to the commercial deed agreement between Roads and Maritime and M5W operator InterLink. Traffic and transport modelling undertaken to inform the detailed design and REF for the proposal indicates that motorists would use the new road ramps regardless of them being tolled. Roads and Maritime also note that the NSW Government M5 Cashback Scheme allows NSW residents to claim back the value of tolls paid while using a vehicle registered in NSW for private, pensioner or charitable use on the M5W.

In 2026, the M5W will revert to NSW Government ownership so the financial investment in the new east-facing road ramps is an investment in a future Roads and Maritime (Government) asset and in the efficiency of the road network.

2.3.3 Environment

2.3.3.1 Noise and pollution

Submission number(s)

5, 18, 21, 32, 34, 35

Issue description

Respondents raised several issues relating to noise and air pollution relating to the operational phase of the new road ramps and referred to existing air and noise pollution conditions in the area. Some were general concerns about an increase in air pollution. Community members also made specific comments about the noise at specific residences or locations.

Response

There is potential for construction noise related impacts to the local community, particularly for residents and businesses located immediately next to the construction site.

Roads and Maritime would program work, where possible, during standard day working hours; however, additional work would need to be conducted outside these hours, including night work, to minimise traffic disruption to road users.

Residents and businesses will be advised before work commences and where any additional work is due to take place outside of the standard day working hours.

In all cases Roads and Maritime would consult with potentially impacted residents and businesses to implement feasible and reasonable noise mitigation measures to minimise impacts from the proposed work. This would include scheduling work to provide night time respite, use of sound barriers and lower noise generating equipment. Noise impact would be short-term and Roads and

Maritime would notify potentially impacted community members with details of the work, times, noise mitigation measures and contact details prior to the start of the work.

Operational noise modelling results found that noise levels were not generally found to increase significantly because of the proposal, with the increase being less than 2 decibels. The Road Noise Policy (DECCW 2011) describes an increase in noise level of up to 2 dB as representing a minor impact that is considered barely perceptible to the average person.

In relation to air quality, the site air quality index (AQI) level for Liverpool and Earlwood is described as 'good', with all parameters recording 'very good' or 'good' concentrations.

Sensitive receivers relating to air quality include known or likely future locations where people could work or live. The following sensitive receivers have been identified in the proposal area:

- existing residences and businesses along the north of the M5W and to the west of Belmore Road
- future residences that may be constructed consistent with the Riverside Estate
- users of public areas including bushland reserves. The use of the proposal area by pedestrians and cyclists would also be encouraged through the provision of shared user pathways and infrastructure to facilitate active transport movements.

The assessment undertaken as part of the REF determined that the proposal is not likely to result in breaches of the EPAs air quality assessment criteria.

2.3.3.2 Urban design and landscape management

Submission number(s)

34, 36

Issue description

A submission was received regarding the urban design for the proposal and included references to retaining the vegetated character of the M5W and defining the address of the Morris Iemma Sports Centre.

Response

The over-arching aim of the urban design proposal was to ensure that the proposal is physically and visually integrated with its surrounding environment.

This includes providing new shared connections through Rotary Park to contribute to the local shared user path network and integrate the path with earthworks and landscape modifications along Rotary Park to ensure an improved visual and landscape outcome.

To meet these aims, a set of key urban design objectives have been developed. The northern side of the shared user path through Rotary Park will have landscaped mounding. This helps to separate the recreational area of the park from the shared user path.

The urban design proposal also aims to emphasise the location of the Morris Iemma Sports Centre, as well as expressing the interchange as a gateway to the City of Canterbury-Bankstown, as well as retaining the privacy and amenity of residents.

2.3.4 Property (access/amenity)

2.3.4.1 Clearway

Submission number(s)

6, 7, 8, 11, 14

Issue description

Respondents provided feedback in relation to the impact of the clearway on access to their businesses or impact on their customers. Respondents said some parking had been previously removed to allow installation of a bus stop on Belmore Road; however, they did not expect the clearway to impact on their property.

Response

The proposed clearway would commence just after the bus stop near the intersection of Josephine Street and Belmore Road. The section of road from this point back to the intersection of Belmore Road and Hannans Road is already a no stopping zone due to the bus stop and proximity to Hannans Road intersection. Should businesses be concerned with parking restrictions in this area, they would need to apply to Council for consideration of alternate parking arrangements.

Traffic modelling indicates that traffic on Belmore Road would benefit from a new southbound clearway between Hannans Road and Josephine Street, proposed as part of the works. The clearway is proposed for the afternoon peak between 4 p.m. to 7 p.m., Monday to Friday. The clearway will improve the southbound traffic flow during peak periods on Belmore Road.

2.3.4.2 Driveway

Submission number(s)

2, 9

Issue description

The respondent lives close to the intersection and has difficulty backing onto Belmore Road from the driveway. A respondent stated that their property has three cars and they use the street for parking as there is not enough room for three cars on their driveway. The respondent is concerned the clearway will cause parking problems for their family.

Response

The clearway is proposed for the afternoon peak times only, from 4 p.m. to 7 p.m., Monday to Friday. Existing parking restrictions apply for all other times.

Roads and Maritime undertook doorknocking activities on 24 November 2017 to inform the community about the proposed clearway and collect community feedback. Thirty properties along Belmore Road were doorknocked and Roads and Maritime spoke to 12 residents. Feedback from residents spoken to included 8 neutral comments, two negative comments and two positive comments. The results of the community survey and an assessment of impacts the implementation of the clearway would have on parking concluded that 10 regular carpark users would be most affected. However, no changes to parking on the opposite of Belmore Road, or outside the clearway are proposed.

Roads and Maritime will consult with Council and affected residents regarding the clearway, including timing of its implementation, so that residents have ample time to make alternate arrangements if required.

2.3.5 Active transport

Submission number(s)

13, 16, 20, 32, 33, 34, 36

Issue description

Respondents raised issues relating to the difficultly for pedestrians to cross the road and one respondent suggested installing a pedestrian crossing south of the intersection at Washington Avenue. A respondent was happy with the shared user path to Bonds Road from Rotary Park.

Response

A three-metre-wide shared user path will be constructed on Council land adjacent to the motorway boundary and Rotary Park. This will provide connectivity for cyclists and pedestrians between Belmore Road and Bonds Road. The shared user path will be operational during the same periods that the Rotary Park is open to the public.

Roads and Maritime has been liaising with CBCC during the development of the Belmore Road Ramps proposal. Roads and Maritime will inform Council of the issues raised during consultation for the proposal. This will allow Council to investigate options to modify the road network, including changes to improve access for pedestrians.

Roads and Maritime advise that there are options for pedestrians to cross Belmore Road to the north and south of Roosevelt Avenue. There are signalised crossings at the intersection of Hannans Road. A signalised crossing is therefore not required at Washington Avenue because of its proximity to Hannans Road. Roads and Maritime will however consider further study of pedestrian movements near this area to assess the impact of additional signalised intersections.

2.3.6 Construction impacts

Submission number(s)

34, 36

Issue description

A submission was received relating to access to the Riverwood Community Centre, skate park, wetlands and other publicly used facilities that could be impacted during construction of the proposal. The respondent is concerned about the impact on land and amenity space during construction.

Response

Roads and Maritime recognises that construction activities may have direct or indirect impacts on Rotary Park, Riverwood Skate Park, Morris Iemma Indoor Sports Centre Riverwood Wetlands Playground and Riverwood Community Centre. These impacts were assessed as part of the REF.

Roads and Maritime recognises that construction of the shared user path will require some impact to these publicly used facilities. The nominated construction company will need to use Rotary Park to build the shared user path. Roads and Maritime and the nominated construction company will endeavour to minimise the impact on access to all public facilities during construction. Roads and Maritime will ensure there is ongoing access to all facilities during construction, in consultation with Council and residents. Disruption may include some construction noise and dust as well as changed access arrangements.

2.3.7 Community consultation

Submission number(s)

5, 13, 36

Issue description

During the targeted doorknock on Friday 24 November, one resident said that was the first time they had heard about the proposal. One respondent said that two of the streets on the community update were labelled incorrectly.

Response

Roads and Maritime apologises for the error in mislabelling both Belgium Street and Alverstone Street in the November 2017 community update.

The REF was publicly displayed for 21 days between Friday 24 November 2017 and Friday 15 December 2017, at five locations in the Riverwood area. The REF was placed on the Roads and Maritime proposal website and made available for download and comment. The display locations and website link were advertised in the Canterbury Bankstown Express and Bankstown-Canterbury Torch. Copies of the November 2017 community update were distributed to 4700 properties in the Riverwood area. The distribution of the community updates was completed on 25 November 2017.

A targeted doorknock was carried out on Friday 24 November 2017 to residents along Belmore Road who may be affected by the installation of the proposed clearway between Hannans Road and Josephine Street.

2.3.8 Outside proposal scope

Submission number(s)

3, 18, 22, 32, 34, 35, 36

Issue description

Several submissions were received relating to issues that are outside of the scope of the proposal.

Response

Roads and Maritime will continue to liaise with relevant Local and State Government agencies concerning non-proposal related issues raised by the community during the consultation for Belmore Road Ramps.

3. Additional assessment

During submission of the detailed design and public display of the REF, Roads and Maritime held discussions with CBCC regarding an alternate site compound location. The new location is proposed to the east of the *Morris Iemma Indoor Sports Complex*, within The Home of Brothers Park, which runs between Belmore Road and Bonds Road to the south of the M5W. Additional assessments were undertaken to ensure that all environmental, social and cultural aspects were considered for the potential use of this land as a site compound.

The additional assessments considered the potential impact associated with proposed use of The Home of Brothers Park as a site compound during construction of the Belmore Road Ramps proposal, including those associated with:

- traffic and transport
- noise and vibration
- socio-economic
- Aboriginal, non-Aboriginal heritage, biodiversity and contaminated lands (desktop)
- community consultation.

The additional assessments were prepared in accordance with relevant Roads and Maritime policies and guidelines, and legislative requirements.

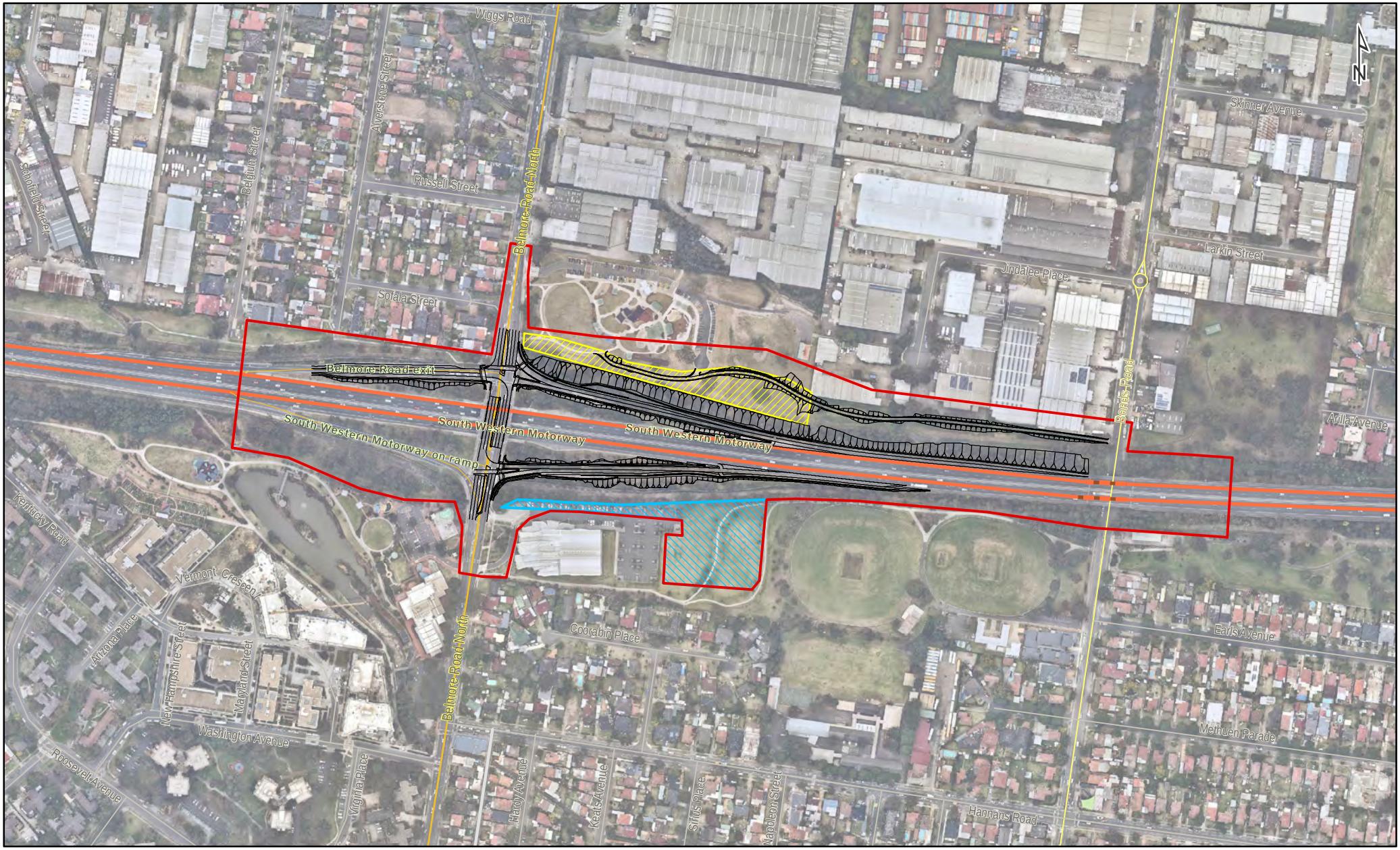
3.1 Description of the proposed changes

Two locations are proposed for site compounds, one located to the south of the M5W within *The Home of Brothers Park* and the other to the north of the M5W within Rotary Park. The latter was considered in the REF, and as such this assessment has only considered impacts associated with the proposed site compound within The Home of Brothers Park.

Access to the site compound within The Home of Brothers Park would be via the existing access to the Morris Iemma Sports Centre. Traffic control will be required to manage the safe access / egress of construction vehicles, as well as the interaction with light vehicles and pedestrians. Further detail concerning specific access arrangements will be detailed in the Traffic Management Plan to be prepared for construction of the proposal.

The site compound on the south side of the M5W would include a site office, staff parking, concrete washout area, laydown hardstand for materials and a refuelling area for plant and equipment. Additional stockpile areas will be required for the temporary storage of materials and would be located within the construction area of each of the proposed road ramps.

The proposed location of the site compound is shown in ***Figure 3***.



100% road design output

Construction boundary

Site compound - indicative

Proposed site compound, no tree clearing allowed

Proposed construction site compounds **Figure 3**

0 50 100

Metres

Location: \\AUSYFSV003\Group\projects\30011940 - Belmore Road Ramps\012 GIS\Maps\REF\Submission\3 Key features of the proposal - cut fill ancillary.mxd

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3.2 Traffic and transport

3.2.1 Purpose

The purpose of the additional traffic and transport assessment was to:

- identify the number of construction vehicles accessing the site compounds daily
- determine the expected routes that will likely be used by construction traffic generated by the project.

3.2.2 Construction related heavy vehicle movements

A review of the Schedule of Rates (SoR) for construction of the project was undertaken, which details all key tasks relating to the project, including estimated quantity of materials associated with individual work items. This was used to determine the number of monthly and daily construction related heavy vehicle movements associated with the proposed works.

The type of heavy vehicles assumed to be involved in construction of the project that would impact on the external road network include dump trucks (30 tonne capacity), flatbed trucks, liquid tankers and concrete mixers. It is assumed that all other plant and equipment including, inter alia, bulldozers, excavators, backhoe, graders, scrapers, rollers, drilling rigs etc. would be transported to site and would have no direct impact on the external road network.

A review of the Project Program was also undertaken to determine when construction tasks would be undertaken, the inter-relationship of tasks and to establish the profile of heavy vehicle movements across the construction program. It is assumed that the construction program will run from March 2018 for a 12 month period, including delay contingencies such as for wet weather.

The project comprises day and night works, however material quantities from which heavy vehicle movements have been calculated are not disaggregated by time of day, therefore all estimates of heavy vehicle movements reflect all tasks associated with the project whether undertaken during the day or at night. It is not expected that night works will form a significant proportion of overall works associated with the project, but will be required for some tasks primarily to minimise disruption to motorists and minimise safety risks.

Figure 4 contains the estimated monthly profile of heavy vehicle movements throughout the construction program. This shows that the peak months for heavy vehicle construction activity would be between May and September. The overall total number of heavy vehicle movements throughout the whole construction program is estimated to be 5100.

The peak number of heavy vehicle movements would occur in August 2018 when a total 1996 heavy vehicle movements would be generated. This equates to a daily peak total of 83 heavy vehicle movements during August that would impact on the external road network.

As referenced in the Belmore Road Ramps Traffic and Transport Assessment report in Appendix F of the REF, two-way average weekday traffic recorded in 2017 on Belmore Road at the M5W overpass comprises some 26,640 vehicles per day of which eight per cent are heavy vehicles. The addition of 83 daily heavy vehicle movements associated with construction of the project would therefore only result in a small increase of in overall traffic on the external road network.

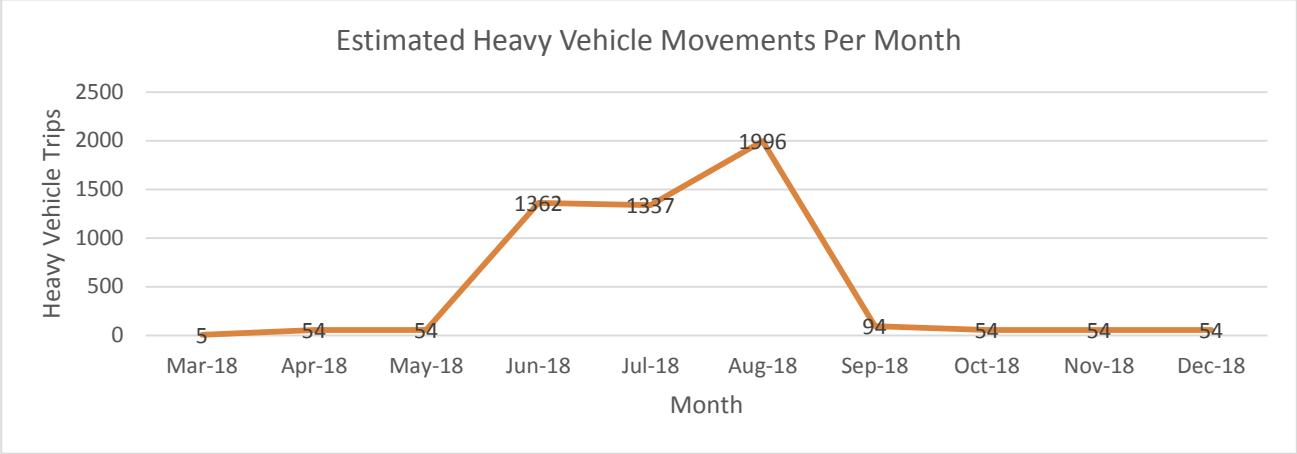


Figure 4 Estimated number of heavy vehicle movements per month

3.2.3 Construction vehicle access routes

Potential delivery routes to the construction site compound for heavy vehicle traffic have been considered. This included a review of the NSW Combined Higher Mass Limits (HML) and Restricted Access Vehicle (RAV) Map published by Roads and Maritime. Designated B-Double routes within the proposed study area relevant to the project include:

- M5W
- A3 King Georges Road
- A6 Fairford Road
- A34 Canterbury Road
- Belmore Road (between M5 Motorway/ Belmore Road interchange and Wiggs Road).

It is assumed that heavy construction vehicle traffic would use the State road network as a priority prior to using local roads near the site. ***Table 3*** shows proposed heavy vehicle delivery routes.

Table 3 Likely heavy vehicle access routes

Direction	Heavy vehicle access route
North	Heavy vehicles travelling to/ from the north via the A6 would join the M5W at the Fairford Road interchange and enter/ exit at the Belmore Road west facing ramps. Heavy vehicles travelling to/ from the north via the A3 would use the A34 Canterbury Road then Belmore Road to site.
South	Heavy vehicles travelling to/ from the south via the A6 would join the M5W at the Fairford Road interchange and enter/ exit at the Belmore Road west facing ramps. Heavy vehicles travelling to/ from the south via the A3 would use the A34 Canterbury Road then Belmore Road to site.
East	Heavy vehicles travelling to/ from the east would use the M5W, A3 King Georges Road, A34 Canterbury Road then Belmore Road to site. This detour is required as there are currently no east facing ramps at Belmore Road.
West	Heavy vehicles travelling to/ from the west would use the M5W and exit/ enter at the Belmore Road west facing ramps.

3.2.4 Traffic management plan

As discussed in the REF report, A Traffic Management Plan (TMP) will be prepared and implemented for the proposal. This will be prepared in accordance with the *Roads and Maritime Traffic Control at Work Sites Manual* (RTS, 2010) and *QA Specification G10 Control of Traffic* (Roads and Maritime, 2008).

The TMP will be prepared following appointment of the Principal Contractor when contracts for supply of materials have been awarded and will confirm further detail regarding, inter alia, haulage routes, site specific traffic control measures to manage and regulate traffic movements, details concerning access to construction compounds, including the interaction between light and heavy vehicles and pedestrians, as well as measures to prevent construction vehicles queuing on the public road network.

3.3 Noise and vibration

This noise and vibration assessment should be read in conjunction with the *Belmore Ramps, Riverwood Noise and Vibration Assessment* provided as an appendix to the REF. The noise and vibration technical note is provided in **Appendix E**.

3.3.1 Background environment

The additional compound location is located adjacent NCA 3, one of the nine noise catchments areas identified in the Noise and Vibration Assessment for the REF.

Table 4 Noise monitoring locations

Monitoring Location	Address	Distance to road	Representative area
L3	22 Coorabin Place	150	Representative of receivers in NCA 3, south of the M5 from Coorabin Place to Bonds Road. Located in freefield in backyard approximately 150 m from the carriageway.

3.3.2 Construction noise criteria

Construction noise management levels are given in the *Interim Construction Noise Guideline* (ICNG) (DECCW, 2009) (DECCW, 2009) and are based on measured background noise to minimise the annoyance from construction. Based on the background noise monitoring conducted as part of the REF assessment, the construction noise criteria for receivers adjacent the additional construction compound are reproduced in ***Table 5***.

Table 5 Project specific (external) construction noise management levels

Location	RBL dB(A)			Construction noise management levels			
	Day	Evening	Night	Standard Hours (RBL+10)	Out of hours - day (RBL+5)	Out of hours – evening (RBL+5)	Out of hours - night (RBL+5)
Receivers NCA-1	60	54	43	70	65	59	48
Receivers NCA-2	45	44	38	55	50	49	43
Receivers NCA-3	47	46	41	57	52	51	46
Receivers NCA-8	50	49	42	60	55	54	47
Commercial Premises				70			
Industrial				75			
Active Recreation Areas				65			

3.3.3 Construction hours and duration

Construction is anticipated to start in Q2 2018, with a construction duration of up to 12 months. Working hours are expected to be the standard Monday to Friday between 7 a.m. to 6 p.m. and Saturday 8 a.m. to 1 p.m., excluding public holidays. The construction workforce would be expected to fluctuate, depending on the stage of construction and associated activities.

3.3.4 Construction activities

A summary of the relevant construction scenarios with the potential to generate impact on the nearest receivers is provided in ***Table 6***. Site establishment activities are likely to occur over a period of several weeks, with ongoing access and operation of the site to continue for a period of up to 12 months.

Table 6 Construction scenarios and plant – additional construction site compound

Scenario	Equipment	Overall sound power level, dB(A)
Short-term auxiliary works	Excavators, mulching plant and chipper, cranes, generators, hand tools	115
Ongoing site operation	Vehicular movements, crane	110

Standard mitigation measures will be implemented as discussed in the REF and **Section 5.2**.

3.3.5 Noise modelling

The construction noise modelling methodology and assumptions were consistent with the assessment undertaken for the REF. Additional ancillary facilities are proposed adjacent the Morris Iemma sport complex; this site has been identified in addition to the site specified as part of the REF. The closest sensitive receivers are in NCAs 1b, 2b, 3 and 8 (as per the REF).

Based on typical earthmoving equipment to shape stockpiles, assuming full operation of equipment during these activities, and that site establishment would occur during standard hours, the impacts on the surrounding receivers was determined for the establishment of the ancillary facilities. The results are presented in ***Table 7***.

Table 7 Predicted typical construction noise levels during establishment of the site compound

NCA	Noise management level dB(A)				Construction noise level range, dB(A)
	Standard Hours (RBL+10)	**Out of hours - day (RBL+5)**	**Out of hours - evening (RBL+5)**	**Out of hours - night (RBL+5)**	
1b	70	65	59	48	31-57
2b	55	50	49	43	46-55
3	57	52	51	46	55-68
8	60	55	54	47	29-57

For receivers within approximately 140 metres of the site, noise levels from ancillary site establishment are predicted to exceed noise management levels during operations; however, these values are based on simultaneous operations of all equipment, and are considered highly conservative.

It is considered that noise levels can be minimised by driver training and ensuring that noisy equipment does not operate simultaneously, and that such activity is limited to daytime hours. These activities are predicted to be of short duration, in the order of several weeks. Standard mitigation measures as outlined in the REF will be implemented as necessary.

Ongoing operations from the long-term use of the ancillary facilities were modelled to assess the impacts of vehicular movements and maintenance activities. The impacts on the surrounding receivers are presented in ***Table 8***.

Table 8 Predicted typical construction noise level ranges during operation of the site compound

NCA	Noise management level dB(A)				Construction noise level range, dB(A)
	Standard Hours (RBL +10)	**Out of hours - day (RBL +5)**	**Out of hours – evening (RBL +5)**	**Out of hours – night (RBL +5)**	
1b	70	65	59	48	25-51
2b	55	50	49	43	41-49
3	57	52	51	46	49-62

8	60	55	54	47	24-52

For receivers within approximately 60 m of the site, noise levels from ancillary site operations are predicted to exceed noise management levels during typical hours of changeover; however, these values are based on simultaneous operations of all equipment, and are considered highly conservative. It is likely that mitigation and management measures will be required to manage ongoing impacts for the first row of houses exposed to the ancillary site.

3.3.6 Construction traffic

Proposed construction vehicle fleet and site access are discussed in **Section 3.2**. Construction vehicles that would impact on the external road network are anticipated to include dump trucks (30 tonne capacity), flatbed trucks, liquid tankers and concrete mixers. Access to the site compound on the south side of the M5W would be via the existing access to the Morris Iemma Sports Centre.

The construction traffic volumes for the works would reach peak daily levels of 83 heavy vehicles in August 2018. Adopting these worst-case conditions, and assuming all proposed construction equipment is operational on site simultaneously, construction activities will generate up to 43 additional construction movements per shift (one day and one night shift). All routes and roads during construction will remain open with some kerbside or median lane closures, no alternative routes or detours are proposed.

Consistent with the REF, assuming all proposed construction equipment is operational on site simultaneously, it can be assumed that the construction activities will generate up to 25 additional light vehicle movements per shift.

Based on the existing traffic volumes on project roads (as defined in the REF), worst-case predictions assumed all vehicle movements occurring in one hour during the day or night period. Contributions were predicted during the Roads and Maritime construction noise estimator, as presented in ***Table 9***.

Table 9 Change in noise level from construction traffic on project roads

Project Road	Speed (km/hr)	Change in noise level, dB(A)	
		Day (7 a.m. to 10 p.m.)	Night (10 p.m. to 7 a.m.)
M5W	90	0.1	0.6
Belmore Road	50	0.2	1.2

Construction traffic noise on project roads have been calculated to increase by less than 0.6 decibels on the M5W and less than 1.2 decibels on Belmore Road for daytime and night time periods, resulting in marginal impacts at the nearest receivers, due to the numbers of vehicles already using the affected roads. The construction phase would involve lane closures during parts of the construction activities. A TMP will be developed for the project, outlining traffic management measures would be used to minimise traffic impacts.

3.3.7 Construction vibration

Impacts from vibration can be considered both in terms of effects on building occupants (human comfort) and the effects on the building structure (building damage).

The *Construction Noise and Vibration Guideline* (Roads and Maritime 2016) provides recommended safe working distances for a range of construction activities (refer to the Noise and Vibration Assessment, 2017). No significant sources of vibration are anticipated because of the additional construction compound, and the distances to receivers are such that impacts would not result in structural damage or human annoyance at the nearest receivers.

To reduce the potential risk of impact, it is recommended that construction vibration mitigation measures are considered as part of the construction noise and vibration management plan.

3.3.8 Management and mitigation

The assessment of construction noise impacts from the ancillary compound indicated that receivers closest to the works (ie within approximately 60 m of the site) would be expected to experience noise levels more than the construction noise management levels, and in some cases, would be highly noise affected. It is likely that mitigation and management measures will be required to manage ongoing impacts for the first row of houses exposed to the ancillary site.

For receivers within approximately 140 m of the site, noise levels are predicted to exceed noise management levels during establishment; however, these values are based on simultaneous operations of all equipment during night time periods, and are considered highly conservative.

For receivers within approximately 60m of the site, noise levels are predicted to exceed management levels during operation of the ancillary facility in the evening and night time periods. However, this is based on simultaneous operations of equipment and without mitigation measures in place at the ancillary facility.

It is considered that noise levels can be minimised by driver training and ensuring that noisy equipment does not operate simultaneously, and that such activity is limited to daytime hours. Mitigation and management measures to manage any residual impacts were outlined in the REF, and will be finalised as part of the *Construction Noise and Vibration Management Plan* for the proposal.

Construction traffic noise on project roads have been calculated to increase by less than 0.3 decibels on the M5W and less than 0.7 decibels on Belmore Road for daytime and night time periods, resulting in marginal impacts at the nearest receivers, due to the numbers of vehicles already using the affected roads.

Construction noise should be managed by a detailed *Construction Noise and Vibration Management Plan* to be prepared by the construction contractor prior to commencement of works on site. Standard mitigation measures should be implemented as discussed in the REF.

Where exceedances are still expected to occur after standard mitigation measures have been applied, additional mitigation measures will be implemented. These mitigation measures are presented in the REF.

The guideline states that these mitigation measures are more applicable to short term construction activities, as these measures may become less effective with increasing durations of works. It is considered that due to the nature of these construction activities, the above mitigation measures would still be appropriate and effective.

3.4 Biodiversity

3.4.1 Purpose

A biodiversity assessment was undertaken to identify if any biodiversity impacts are likely to occur because of the proposed access, establishment and use of the additional construction site compound. A site walkover survey was conducted on Friday 2 February 2018. During the site visit, rapid vegetation assessments were undertaken to inform the high-level constraints vegetation mapping of areas within the proposed construction site compound. Opportunistic records of fauna species encountered were also collected during the rapid assessments.

Impacts were considered in accordance with the *Biodiversity Conservation Act 2016* (BC Act) and *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

3.4.2 Previous vegetation mapping

Mapping prepared for the Belmore Road Ramps Biodiversity Assessment (Eco Logical, 2017) ground-truthed the distribution of native vegetation within the study area, and identified an extent of Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion (CRCIF), which is listed as endangered under the BC Act. While this community is listed as Critically Endangered under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act), it was noted by Eco Logical (2017) that the patch of vegetation identified during their assessment did not conform to CRCIF under the EPBC Act as it does not meet the condition thresholds. Although the patch of CRCIF mapped is greater than 0.1 ha, less than 30% of the perennial native understorey cover is made up of native species.

Eco Logical (2017) also visited areas proposed for the access to the additional site compound. Although the vegetation did not conform to any plant community types (PCTs), *Acacia pubescens* (downy wattle) was found to be present.

3.4.3 Native vegetation mapping

3.4.3.1 Construction site compound

An initial random meander through areas adjacent to the YMCA Pathway identified the occurrence of several hybrid tree species and exotic grasses. The tree species identified on site include planted Sydney blue gum (*Eucalyptus saligna x sieberi*) used for landscaping along the YMCA Pathway. The ground layer within Morris Iemma Sporting Complex was sparse and was dominated by the exotic grass species *Cenchrus clandestinus* (Kikuyu Grass). There were limited patches of *Cynodon dactylon* (Couch) and uncommon exotic forbs and graminoids. Beyond *Cynodon dactylon*, no native plant species were noted in the ground layer. There was no evidence of regeneration or soil stored seed of any locally indigenous species. None of the vegetation within this area conforms to any native PCTs.

3.4.3.2 Potential site access area

In the north of the study area, between the Morris Iemma Indoor Sports Centre and the noise wall for the M5W, there is a landscaped woodland that is planted with several native trees. The canopy layer is dominated by *Corymbia citrodora* (Lemon Gum) and *Casuarina glauca* (swamp she-oak). Within the shrub layer *Acacia pubescens* is present as previously recorded by Eco Logical (2017). *Acacia pubescens* is listed as vulnerable under both the BC Act and EPBC Act. The ground layer was largely absent, except for the occasional patch of *Cenchrus clandestinus* and *Cynodon dactylon*. None of the vegetation within this area conforms to any native PCTs.

Access to areas to the north of the noise wall was not possible through the locked gate; however, these areas have already been assessed as part of the Eco Logical (2017) biodiversity assessment and the results of the Eco Logical assessment were used to inform this assessment.

Based on previous mapping, the results of the additional biodiversity assessment, and the design, including proposed access for construction vehicles (***Figure 5***), use of the proposed additional construction site compound would not result in any additional biodiversity impacts to those identified within the REF.

3.4.4 Fauna Habitat

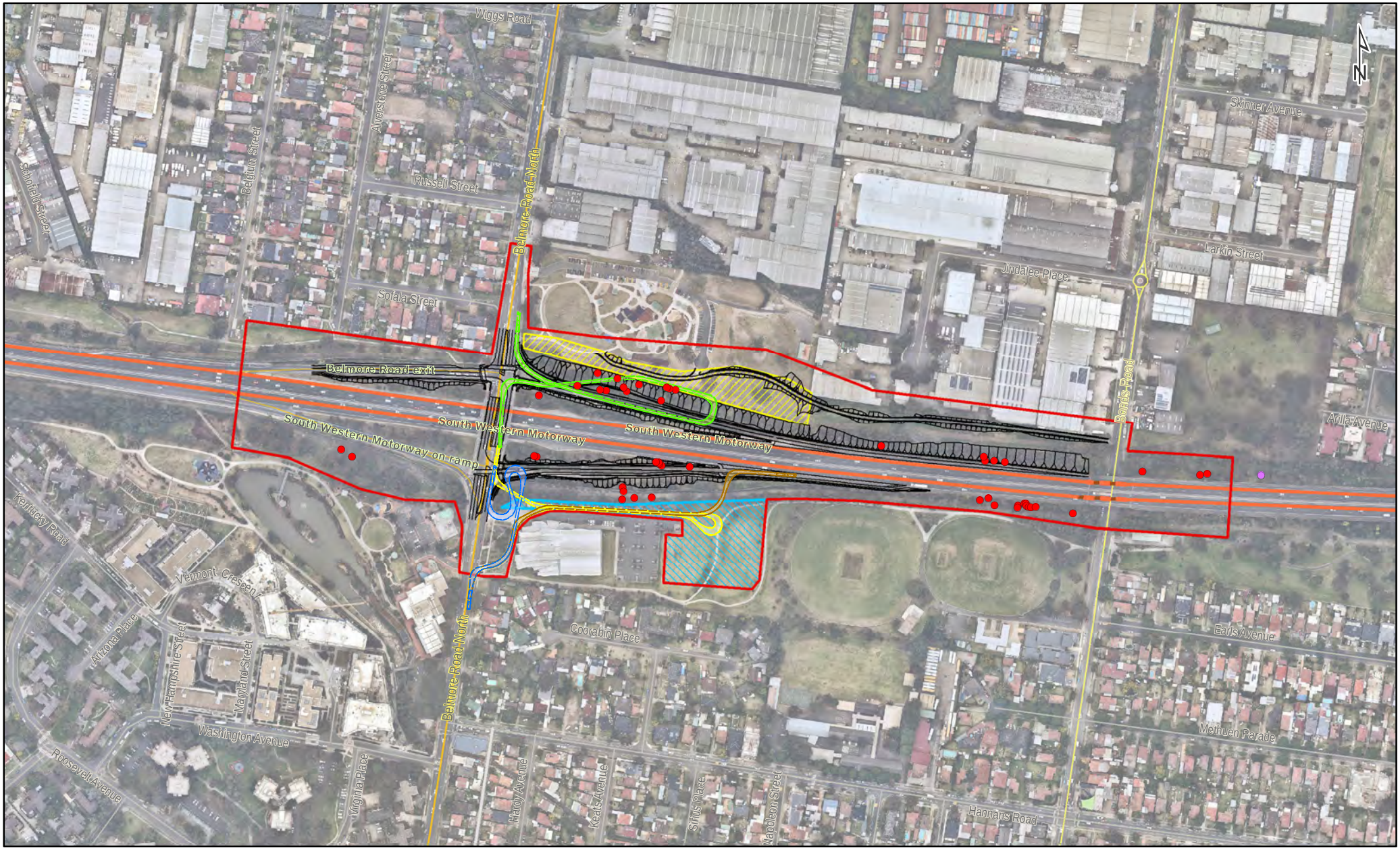
Most the study area has been cleared, with only relatively isolated mature locally native trees, occasionally bare ground, exotic groundcovers and recently constructed hard landscaping associated with paved pathways. These areas are not expected to provide particularly suitable habitat for any fauna species of note beyond marginal foraging habitat. Leaf-litter and fallen timber and logs are absent, and no hollows were observed in any of the trees present.

Fauna that was encountered during the site visit included:

- Feral Pigeon (*Columba livia*)
- Noisy Miner (*Manorina melanocephala*).

3.4.5 Potential Impacts

Direct impacts to threatened biodiversity due to the proposed additional construction site compound and access roads are not considered likely. Individual *Acacia pubescens* identified in the area between the proposed new exit road ramp and construction site compound will not be removed, and will be protected in accordance with relevant guidelines.



Turn path 1
Turn path 2
Turn path 3
Turn path 4
100% road design output

Construction boundary
Site compound - indicative
Proposed site compound, no tree clearing allowed
Acacia pubescens 2017
Acacia pubescens 2012

Construction site / compound proposed access and recorded threatened species **Figure 5**

0 50 100
Metres

Location: \\AUSYFSV003\Group\projects\30011940 - Belmore Road Ramps\012 GIS\Maps\REF\Submission\5 Recorded threatened species.mxd

Last updated by: FA13847 on 22/02/2018 at 11:17

3.5 Socioeconomic

The Morris Iemma Indoor Sport Centre is located at 150 Belmore Road, Riverwood, adjacent to the southbound carriageway. The centre has a large carpark area which consists of around 140 car spaces, four of which are disabled parking. There are exit and entry driveways facing onto Belmore Road. The Morris Iemma Indoor Sport Centre is bordered by the M5W to the north of the carpark and Belmore Road to the west. The YMCA Pathway is located to the south of the centre and tracks behind the facility to the east, where there is green space as well as Lance Hutchinson Oval.

The northern boundary of the Morris Iemma Indoor Sports Centre is likely to be impacted by the proposal. Parking facilities for the Centre are located along the northern side of the property, and are near the proposed westbound exit on the eastern side of Belmore Road. One of the two entrances to the property is less than 30 metres away from the proposed westbound exit ramp. Direct access to the Centre may be impacted and restricted during some construction activities. The Centre would be impacted by noise and dust during construction activities.

3.6 Aboriginal heritage

No additional Aboriginal Heritage issues were identified regarding use of the Morris Iemma Sporting Complex as a construction site compound.

3.7 Non-Aboriginal heritage

No additional non-Aboriginal Heritage issues were identified regarding use of the Morris Iemma Sporting Complex as a construction site compound.

3.8 Contaminated lands

The area of the proposed additional construction site compound was considered in the contaminated land assessment for the REF. No potential areas of concern were identified within the Morris Iemma Sporting Complex site. However, the safeguards proposed in the REF (and **Section 5.2**) should be implemented during the establishment and use of this site to ensure that any potential contamination issues are managed accordingly.

3.9 Consultation

Roads and Maritime has engaged in ongoing consultation with the CBCC about the proposal, including an on-site meeting on 22 December 2017 to discuss the site compound location.

Targeted community consultation will be undertaken to inform residents of the anticipated impacts associated with the use of the proposed construction site compound.

3.10 Conclusion

Based on the additional assessments detailed above, potential impacts associated with the proposed construction site compound behind the Morris Iemma Indoor Sporting Complex include:

- impacts to sensitive receivers from construction related noise.

For receivers within approximately 140 m of the site, noise levels are predicted to exceed noise management levels during operations; however, these values are based on simultaneous operations of all equipment, and are considered highly conservative. The safeguard and management measures that were proposed in the REF would be applied to minimise these impacts.

Impacts to the listed threatened flora species would be avoided.

4. Environmental management

4.1 Environmental management plans

Safeguards and management measures to minimise adverse environmental impacts, including social impacts, which could potentially arise because of the proposal, were identified and included in the REF. Should the proposal proceed, these safeguards would be incorporated into the detailed design and implemented during the construction and operation of the proposal through a *Construction Environmental Management Plan* (CEMP). The CEMP would provide a framework for establishing how these safeguards and management measures would be implemented and who would be responsible for their implementation.

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

4.2 Summary of safeguard and management measures

Environmental safeguards outlined in this document would be incorporated into the detailed design phase of the proposal and during construction and operation of the proposal, should it proceed. These safeguards would minimise any potential adverse impacts arising from the proposed works on the surrounding environment. The safeguards and management measures are summarised in ***Table 10***. Safeguards additional to those presented in the REF are in **bold**.

Table 10 Summary of safeguards and management measures

ID	Impact	Environmental safeguards	Responsibility	Timing
GEN1	General - minimise environmental impacts during construction	A CEMP will be prepared and submitted for review and endorsement of the Roads and Maritime Environment Manager prior to commencement of the activity. As a minimum, the CEMP will address the following: • any requirements associated with statutory approvals • details of how the project will implement the identified safeguards outlined in the REF • issue-specific environmental management plans • roles and responsibilities • communication requirements • induction and training requirements • procedures for monitoring and evaluating environmental performance, and for corrective action • reporting requirements and record-keeping • procedures for emergency and incident management • procedures for audit and review. • **An OOHW procedure** The endorsed CEMP will be implemented during the undertaking of the activity.	Construction contractor Roads and Maritime	Pre-construction / detailed design
GEN2	General - notification	All businesses, residential properties and other key stakeholders (eg schools, local councils) affected by the activity will be notified at least five days prior to commencement of the activity.	Construction contractor Roads and Maritime	Pre-construction
GEN3	General – environmental awareness	All personnel working on site will receive training to ensure awareness of environment protection requirements to be implemented during the project. This will include up-front site induction and regular "toolbox" style briefings. Site-specific training will be provided to personnel engaged in activities or areas of higher risk. These include: • areas of Aboriginal heritage sensitivity • adjoining residential areas requiring noise management measures	Construction contractor Roads and Maritime	Pre-construction / detailed design
Biodiversity				
B1	General	A *Flora and Fauna Management Plan* will be prepared in accordance with Roads and Maritime's Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects (RTA, 2011) and implemented as part of the CEMP. It will include, but not be limited to: • plans showing areas to be cleared and areas to be protected, including exclusion zones,	Construction contractor(s)	Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
		protected habitats and revegetation areas • requirements set out in the Landscape Guideline (RTA 2008) • pre-clearing survey requirements (if any) • 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 2013)		
B2	Retained native vegetation	Ensure exclusion zones (at the subject site boundary) are established prior to vegetation clearing in accordance with Guide 2 of the Roads and Maritime *Biodiversity Guideline* (RTA 2011). Fencing and signage and will be delineated by a registered surveyor.	Construction contractor(s)	Pre-construction
B3	Retained native vegetation	Measures to further avoid and minimise the construction footprint and native vegetation or habitat removal will be investigated during detailed design and implemented where practicable and feasible.	Construction contractor(s)	Pre-construction
B4	Threatened species	If unexpected threatened flora species are discovered, stop works immediately and follow the Roads and Maritime Unexpected Threatened Species Finds Procedure in the Roads and Maritime Biodiversity Guidelines – Guide 1 (Preclearing process) (RTA, 2011).	Construction contractor(s)	Construction
B5	Rehabilitation	Batters, embankments, verges and redundant areas will be planted out, where practicable and appropriate, with indigenous species in accordance with a Revegetation Plan, to be prepared following approval.	Construction contractor(s)	Construction
B6	Establishment / spread of invasive species and pathogens	Implement a Site Erosion and Sediment Control Plan or Soil Water Management Plan in accordance with the Blue Book (Landcom 2004) during construction.	Construction contractor(s)	Construction
B7	Establishment / spread of invasive species and pathogens	Undertake weed management and control in accordance with the Roads and Maritime Biodiversity Guidelines (RTA 2011) during and post-construction in accordance with a weed management sub-plan.	Construction contractor(s)	Pre-construction Construction
B8	Establishment / spread of invasive species and pathogens	All Roads and Maritime and Contractor vehicles will be subject to cleaning in accordance with Roads and Maritime hygiene policy to reduce the potential for spread of noxious weeds, plant pathogens or animal diseases into retained forested habitats (eg. Vehicle wash-down areas) in accordance with a hygiene management sub-plan.	Construction contractor(s)	Construction

ID	Impact	Environmental safeguards	Responsibility	Timing
Landform, soils and contamination				
SO1	Potential contamination	Where reuse of construction wastes is not possible, all materials will be classified in accordance with the *Waste Classification Guidelines: Part 1 Classifying Wastes* (NSW EPA, 2014) prior to being legally transported and disposed of in accordance with the PoEO Act and the *Protection of the Environment (Waste) Regulation 2005*. Prior to wastes being transported off-site to sites not owned by Roads and Maritime or sites that are not already licensed by the EPA to accept specific wastes, a signed Section 143 Notice will be obtained from the landowner receiving the material. It is an offence under section 143 of the PoEO Act to transport waste to a place that cannot lawfully receive that waste. A Section 143 Notice, once completed and signed, is a declaration from the land owner that wastes of a certain type and quantity may be legally accepted for an approved use on their land.	Construction contractor(s)	Construction
SO2	Potential contamination	A Contaminated Land Management Plan (CLMP) will be developed to mitigate potential contamination exposure risks to construction workers, surface water and groundwater during construction stages. The CLMP will include an *Asbestos Management Plan* component to manage additional sampling, surface inspections, associated removal works and the issuing of clearance certificates. The CLMP will be implemented as part of the project *Construction Environmental Management Plans* (CEMP).	Construction contractor(s)	Pre-construction
SO3	Potential contamination	The adopted site screening level in accordance with NEPM (2013) includes no visible asbestos for surface soil. Given asbestos is present, a thorough ground surface inspection is required in accordance with NEPM (2013) to assess the site. A qualified environmental professional will be present to undertake a thorough surface inspection during the early works stage of construction to implement requirements of the CLMP. For offsite disposal or beneficial re-use of fill material, all ACM fragments will be removed from the surface of the site prior to cut and fill excavation.	Construction contractor(s)	Pre-construction Construction

ID	Impact	Environmental safeguards	Responsibility	Timing
SO4	Potential contamination	Where evidence of buried waste is observed, further testing of representative soil and material fragment samples is recommended to assess the potential for asbestos containing materials (ACM) on the ground surface or in fill material. To verify the presence of asbestos, samples will be tested for asbestos presence/absence. Due to access constraints at the proposal area, sampling undertaken during this current scope of works was limited spatially. Further sampling for waste classification will be required to confirm waste classification, either in-situ prior to excavation or ex-situ following stockpiling. Further investigation and/or management may be required if groundwater or shallow perched water seepages are encountered showing evidence of oily sheen and odours during construction and earthworks activities.	Construction contractor(s)	Pre-construction Construction
SO5	Erosion and sedimentation	A Soil and Water Management Plan (SWMP) will be prepared as part of the CEMP prior to the commencement of construction. The SWMP will address the following: • Roads and Maritime Code of Practice for Water Management • The Blue Book – Managing Urban Stormwater: Soils and Construction, Volumes 1 and 2 • Roads and Maritime Technical Guidelines – Temporary Stormwater Drainage for Road Construction. The SWMP will include: • stockpile Management Plan • identification of catchment and sub-catchment high-risk and sensitive areas • the likely run-off from each road sub-catchment • direction of flow of on-site and off-site water • separation of flow of on-site and off-site water • direction of run-off and drainage points during each stage of construction • dewatering plan which includes process for monitoring flocculating and dewatering water from site (ie sediment basins and sumps).	Construction contractor(s)	Pre-construction
SO6	Erosion and sedimentation	A soil conservationist from the Roads and Maritime Erosion, Sedimentation and Soil Conservation Consultancy Services Register is to be engaged to review the proposed erosion and sedimentation controls and conduct routine inspections of the construction works.	Construction contractor(s)	Pre-construction
SO7	Erosion and sedimentation	All stockpiles will be designed, established, operated and decommissioned in accordance with the Roads and Maritime Stockpile Management Procedures.	Construction contractor(s)	Pre-construction
SO8	Erosion and	Controls will be implemented at construction zone exit points to minimise the tracking of soil and	Construction	Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
	sedimentation	particulates onto pavement surfaces.	contractor(s)	
Traffic and transport				
TT1	Traffic and transport	A Traffic Management Plan (TMP) will be prepared and implemented for the proposal. The TMP will be prepared in accordance with the Roads and Maritime *Traffic Control at Work Sites Manual* (RTA, 2010) and *QA Specification G10 Control of Traffic* (Roads and Maritime, 2008). The TMP will include: • confirmation of haulage routes • measures to maintain access to local roads and properties • site specific traffic control measures (including signage) to manage and regulate traffic movement • measures to maintain pedestrian and cyclist access • requirements and methods to consult and inform the local community of impacts on the local road network • access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads. • a response plan for any construction traffic incident • consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic • monitoring, review and amendment mechanisms.	Construction contractor(s)	Detailed design / Pre-construction
TT2	Construction traffic	Consultation and construction activities will occur with emergency service authorities.	Roads and Maritime	Detailed design
TT3	Construction traffic	A detailed construction staging plan will be developed to maintain existing peak flow capacity	Construction contractor	Pre-construction
TT4	Access to bus services	Access to appropriate bus service locations will be maintained during construction in consultation with bus operators. Any changes will be appropriately communicated to commuters.	Construction contractor(s)	Pre-construction
TT5	**Further studies**	**RMS will investigate signalisation of other intersections in vicinity of the proposal to determine current and future pedestrian access needs.**	**Roads and maritime**	**N/A**
TT6	**Further studies**	**RMS commits to further study pedestrian movements in the vicinity and to complete a traffic study to assess the impact of adding signals to other intersections. This includes investigating options relating to pedestrians and the Riverwood Estate SSP.**	**Roads and Maritime**	**N/A**

ID	Impact	Environmental safeguards	Responsibility	Timing
TT7	**Monitoring**	**Roads and Maritime will monitor and review the effectiveness of the clearway and the operation times may be amended, if necessary.**	**Roads and Maritime**	**Operations**
Noise and vibration				
NV1	Noise and vibration	A Noise and Vibration Management Plan (NVMP) will be prepared and implemented as part of the CEMP. The NVMP will generally follow the approach in the *Interim Construction Noise Guideline* (ICNG) (DECC, 2009) and identify: • all potential significant noise and vibration generating activities associated with the activity • feasible and reasonable mitigation measures to be implemented, considering *Beyond the Pavement: urban design policy, process and principles* (Roads and Maritime, 2014). • a monitoring program to assess performance against relevant noise and vibration criteria • arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures • contingency measures to be implemented in the event of non-compliance with noise and vibration criteria.	Construction contractor(s)	Detailed design / Pre-construction
NV2	Noise and vibration	All sensitive receivers (eg schools, residents) likely to be affected will be notified at least 5 days prior to commencement of any works associated with the activity that may have an adverse noise or vibration impact. The notification will provide details of: • the project • the construction period and construction hours • contact information for project management staff • complaint and incident reporting • how to obtain further information.	Construction contractor(s)	Detailed design / Pre-construction
NV3	Noise and vibration	Where activities using significant sources of vibration occur within proximity to structures and identified receivers: • increase separation distance between vibration source and sensitive receiver where feasible and reasonable • substitution of methods of high vibration emission to lower vibration methods • vibration monitoring as required, as part of vibration impact management • where vibration monitoring is undertaken and criteria exceedances are identified, management measures will be implemented immediately to ensure vibration compliance is achieved.	Construction contractor(s)	Construction

ID	Impact	Environmental safeguards	Responsibility	Timing
Socio-economic				
SE1	Socio-economic	A Communication Plan (CP) will be prepared and implemented as part of the CEMP to help provide timely and accurate information to the community during construction. The CP will 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 will be prepared in accordance with the *Community Involvement and Communications Resource Manual* (RTA, 2008).	Construction contractor(s)	Detailed design / Pre-construction
Urban design and visual amenity				
VA1	Landscape and visual amenity	Revegetation of the modified mound with and adjacent Rotary Park. The existing mound creates a strong visual buffer for park users. Revegetation allowd vegetation to recover and fill in gaps in the vegetated corridor edge and minimise erosion.	Construction contractor(s)	Detailed design
VA2	Landscape and visual amenity	Retain existing noise walls and vegetated buffer as much as practicable. Revegetate areas where modified. The existing noise wall creates a strong visual buffer. Revegetation allows vegetation to recover and fill in gaps in the vegetated corridor edge and minimise erosion.	Design contractor Construction contractor(s)	Detailed design Construction
VA3	Landscape and visual amenity	An urban design contractor will be appointed by Roads and Maritime during the detailed design phase to ensure adequate consideration is given to urban design principles and objectives, and to ensure appropriate mitigation of identified impacts.	Roads and Maritime Design contractor	Detailed design
VA4	Landscape and visual amenity	The footprint for construction works will be kept to a minimum to ensure existing vegetation remains intact wherever possible and to screen nearby sensitive receptors.	Construction contractor(s)	Construction
VA5	Landscape and visual amenity	The work site will be maintained to minimise construction related visual clutter	Construction contractor(s)	Construction
Climate change and greenhouse gases				
GG1	Greenhouse gas emissions	Materials will be delivered as full loads and local suppliers will be used where possible to reduce construction transport emissions	Construction contractor(s)	Construction
GG2	Greenhouse gas emissions	Equipment will be properly maintained to ensure it is operating efficiently	Construction contractor(s)	Construction

ID	Impact	Environmental safeguards	Responsibility	Timing
GG3	Climate change	Sensitivity analysis will be undertaken during detailed design to determine if there are any future impacts because of climate change	Design contractor	Detailed design
Other				
OT-1	Aboriginal heritage	The *Standard Management Procedure – Unexpected Heritage Items* (Roads and Maritime, 2015) will be followed if an unknown or potential Aboriginal object/s, including skeletal remains, are found during construction. This applies where Roads and Maritime does not have approval to disturb the object's or where a specific safeguard for managing the disturbance (apart from the Procedure) is not in place. Work will only recommence once the requirements of that procedure have been satisfied. Core standard safeguard AH2, Section 4.9 of QA G36 Environment Protection	Construction Contractor	Construction
OT2	Air quality	The management measures will include but not limited to the following: • vehicles transporting waste or other materials that have a potential to produce odours or dust are to be covered during transportation • dust will be suppressed on stockpiles and unsealed or exposed areas using methods such as water trucks, temporary stabilisation methods, soil binders or other appropriate practices • disturbed areas will be minimised in extent and rehabilitated progressively • speed limits will be imposed on unsealed surfaces • stockpiles will be located as far away from residences and other sensitive receivers • plant and equipment will be maintained in accordance with manufacturer's specifications • plant and machinery will be turned off when not in use • no burning of any timbers or other combustible materials will occur on site • visual monitoring of air quality will be undertaken to verify the effectiveness of controls and enable early intervention • work activities will be reprogrammed if management measures are not deemed adequate.	Construction Contractor(s)	Construction
OT3	Non-Aboriginal heritage	The *Standard Management Procedure – Unexpected Heritage Items* (Roads and Maritime, 2015) will be followed if any unexpected heritage items, archaeological remains or potential relics of non-Aboriginal origin are encountered. Work will only recommence once the requirements of that procedure have been satisfied. Core standard safeguard H2, Section 4.10 of QA G36 Environment Protection.	Construction Contractor	Construction
OT4	Water quality	Vehicle wash down and concrete wash out to occur in appropriately bunded location(s)	Construction contractor(s)	Construction

ID	Impact	Environmental safeguards	Responsibility	Timing
OT5	Water quality	A Spill Management Plan will be prepared for the proposal. If a spill or incident occurred, the Roads and Maritime Environmental Incident Classification and management Procedure will be implemented.	Construction contractor(s)	Construction
OT6	Water quality	All fuels, chemicals and liquids to be stored in an impervious bunded area and at least 50 metres from any creek or waterway, and slopes with a gradient above 10 per cent.	Construction contractor(s)	Pre-construction
OT7	Water quality	• refuelling of plant and equipment to occur either off-site, or in an appropriately bunded area and at least 50 metres from any creek or waterway, and slopes with a gradient above 10 per cent • refuelling machinery will have spill prevention mechanisms, refuelling areas will have appropriate containment and emergency spill equipment, refuelling will also be supervised.	Construction contractor(s)	Construction
OT8	Water quality	Consideration would be given to planting drainage swales with suitable plant species to provide nominal water quality treatment.	Construction contractor(s)	Construction
OT9	Construction waste management	A Resource and Waste Management Plan (RWMP) will be prepared, which will include the following (as a minimum): • the type, classification and volume of all materials to be generated and used on site including identification of recyclable and non-recyclable waste in accordance with the *EPA's Waste Classification Guides 2014* • quantity and classification of excavated material generated because of the proposal (Refer *Roads and Maritime Waste Management Fact sheets 1-6, 2012*) • interface strategies for cut and fill on site to ensure re-use where possible • strategies to 'avoid', 'reduce', 'reuse' and 'recycle' materials • classification and disposal strategies for each type of material • destinations for each resource/waste type either for on-site reuse or recycling, offsite reuse or recycling, or disposal at a licensed waste facility • details of how material will be stored and treated on-site • identification of available recycling facilities on and off site • identification of suitable methods and routes to transport waste • procedures and disposal arrangements for unsuitable excavated material or contaminated material • site clean-up for each construction stage.	Construction contractor	Construction
OT10	Resource use	Excavated material will be reused onsite for fill where feasible to reduce demand on resources.	Construction contractor	Construction

ID	Impact	Environmental safeguards	Responsibility	Timing
OT11	Utilities	Prior to the commencement of works: • The location of existing utilities and relocation details will be confirmed following consultation with the affected utility owners. • If the scope or location of proposed utility relocation works falls outside of the assessed proposal scope and footprint, further assessment will be undertaken. Core standard safeguard U1.	Construction contractor	Pre-construction
OT12	Disruption to utility services during construction	Residents are to be informed prior to any interruptions to utility services that may be experienced because of utilities relocations.	Construction contractor	Construction
OT13	Relocation of sensitive utilities	Consultation with utility providers will continue through construction to ensure satisfactory protection of assets is achieved.	Construction contractor	Construction
OT14	Hazards and risk management	A Hazard and Risk Management Plan (HRMP) will be prepared and implemented as part of the CEMP. The HRMP will include, but not be limited to: • details of hazards and risks associated with the activity • measures to be implemented during construction to minimise these risks • record keeping arrangements, including information on the materials present on the site, material safety data sheets, and personnel trained and authorised to use such materials • a monitoring program to assess performance in managing the identified risks • contingency measures to be implemented in the event of unexpected hazards or risks arising, including emergency situations. The HRMP will be prepared in accordance with relevant guidelines and standards, including relevant Safe Work Australia Codes of Practice, and EPA or Office of Environment and Heritage publications.	Construction Contactor(s)	Pre-construction
Consultation and stakeholder engagement				
SE1	**Stakeholder engagement**	**Roads and Maritime will provide information to the Department of Planning and Environment on issues raised during consultation for the proposal that relate to the Riverwood Estate SSP.**	**Roads and Maritime**	**N/A**
SE2	**Stakeholder engagement**	**Roads and Maritime will provide sufficient notice to residents regarding the implementation of the southbound clearway on Belmore Road so that affected residents have time to consider alternate parking arrangements.**	**Roads and Maritime**	**N/A**

4.3 Licensing and approvals

Table 11 provides a list of the licences and approvals required to construct and operate the proposal.

Table 11 Summary of licensing and approvals required

Instrument	Requirement	Timing
Roads Act 1993	A Road Occupancy License will be required from the relevant roads authority by the Contractor for road works and any temporary road closures.	Construction

5. References

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Roads and Maritime (2015) Noise Criteria Guideline. NSW Government, Roads and Maritime Services.

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RTA (2008b) community involvement and communications: a resource manual for staff. NSW Government, Roads and Traffic Authority

RTA (2010) Traffic Control at Worksites. NSW Government, Roads and Traffic Authority.

SMEC (2017a) Belmore Road Ramps: Drainage and Hydrology Design Report. Prepared for Roads and Maritime Services.

SMEC (2017b) Belmore Road Ramps: Utility Services Strategy Report. Prepared for Roads and Maritime Services.

SMEC (2017c) Belmore Road Ramps: Shared Path Biodiversity Constraints. Prepared for Roads and Maritime Services.

SMEC (2017d) Belmore Road Ramps: Contamination Assessment. Prepared for Roads and Maritime Services.

SMEC (2017e) Belmore Road Ramps: Traffic and Transport Assessment. Prepared for Roads and Maritime Services.

TfNSW (2012) NSW Long Term Transport Master Plan. NSW Government, Transport for NSW.

TfNSW (2013) Sydney's cycling Future: Cycling for Everyday Transport. NSW Government, Transport for NSW

Appendix A - Stakeholders invited to comment on REF display

An invitation to comment and a copy of the November 2017 community update was sent directly to the following identified stakeholders:

- Interlink Roads
- Canterbury-Bankstown Council
- Transport Management Centre
- Bicycle NSW
- BusNSW
- Parramatta Business Chamber
- NSW Business Chamber Sydney South West region
- South West Bankstown Chamber of Commerce
- Bankstown Community Resource Group
- Canterbury Community Action Group
- Punchbowl Bus Company
- Bankstown Coaches
- RFNSW
- Gandangara LALC
- Metro LALC
- Georges River Council.

Residents / businesses, through our door knocks and letterbox drops for delivery of notifications in relation to geotechnical and utility investigations.

Appendix B - Community Update – Have Your Say

Australian Government

BUILDING OUR FUTURE

NSW GOVERNMENT

Belmore Road Ramps

Community update – Have your say

Roads and Maritime Services | November 2017

The Australian and NSW Governments are jointly funding this project to build two new east-facing ramps to improve:

- access to the M5 South West Motorway at Belmore Road, Riverwood for local road users accessing Sydney airport and the CBD
- the efficiency of the local network, easing congestion for local residents and businesses.

Review of Environmental Factors

Roads and Maritime has prepared the detailed design and a Review of Environmental Factors (REF) to examine the potential impact of the proposed Belmore Road Ramps.

The REF addresses potential environmental impacts including noise, heritage, biodiversity and amenity as well as impacts during construction, and outlines measures to reduce and manage the potential impacts.

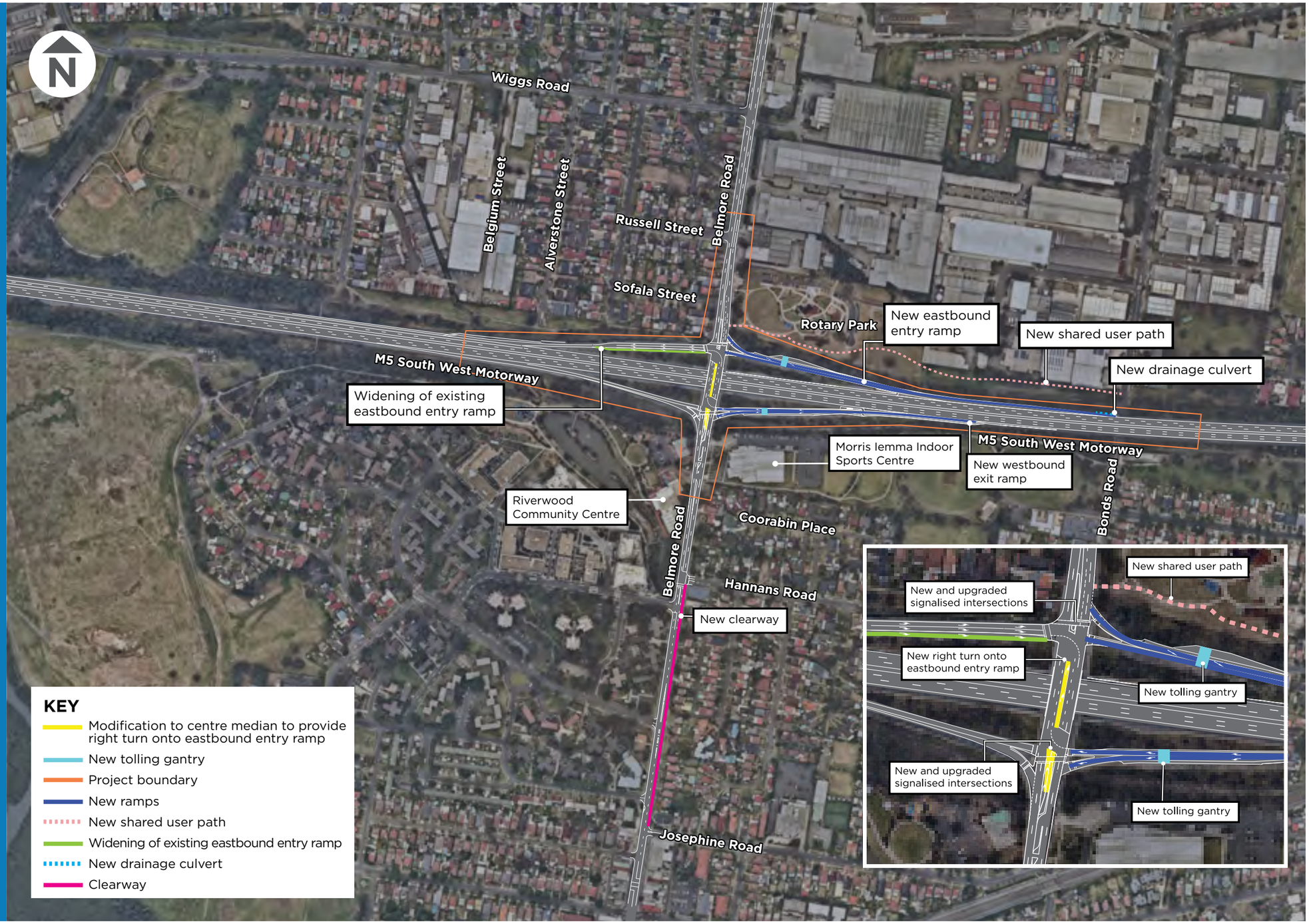
The REF will be on display until **Friday 15 December 2017.** All feedback will be considered and a submissions report published.

Benefits

- Provide better access and faster entry and exit to and from the M5 South West Motorway at Belmore Road, Riverwood
- Ease congestion and reduce travel times
- Improve travel reliability for local road users
- Provide an additional choice of route to the city and to Belmore Road for local Riverwood motorists and businesses
- Extend the existing shared pathway network through Rotary Park, adjacent to the M5 South West Motorway

Key features

- New entry ramp for direct access to the M5 South West Motorway to travel east from Belmore Road towards Sydney Airport and the city
- New exit ramp for motorists travelling west on the M5 South West Motorway to access Belmore Road
- Widening the existing eastbound exit road ramp from the M5 South West Motorway to allow an additional right turn lane onto Belmore Road
- Upgrade of Belmore Road to allow southbound vehicles to turn left onto the new ramp to the M5 South West Motorway
- Modifying the central median on Belmore Road bridge to provide a right turn lane onto the new ramp to the M5 South West Motorway
- New and upgraded traffic signals at the Belmore Road and the M5 South West Motorway interchange
- New shared pathway through Rotary Park, connecting to the existing shared pathway network
- New afternoon peak (4-7pm) clearway on Belmore Road southbound between Hannans Road and Josephine Street



Easing congestion

More time with family and friends

New pathways for active transport

REF display locations

During the display period, the REF is available to view in hard copy at the following locations:

City of Canterbury Bankstown Council

Bankstown Customer Service Centre
Bankstown Civic Tower
66 – 72 Rickard Road, Bankstown

Campsie Customer Service Centre
137 Beamish Street, Campsie

Riverwood Branch Library
Corner Belmore Road and Roosevelt Avenue, Riverwood

Roads and Maritime Services
20 – 44 Ennis Road, Milsons Point

Electronic copies of this community update and the REF are also available on the Roads and Maritime website at
www.rms.nsw.gov.au/belmoreroadramps

Community information drop-in sessions

Roads and Maritime Services will host two community 'drop in' information sessions.

The drop-in sessions will enable the community to meet face-to-face with project team members who will be available to answer questions and receive feedback. A formal presentation will not be given, so please feel free to drop in any time during these sessions.

Tuesday 28 November from 4pm to 7pm

Tuesday 5 December from 4pm to 7pm

Venue: Morris Iemma Indoor Sport Centre

Location: 150 Belmore Road North, Riverwood

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 571 850.**

ISO CERTIFICATION · CO_2 MANUFACTURED CARBON NEUTRAL · FOREST MANAGEMENT · ECO BLEACHING PROCESS · AUSTRALIAN MADE · RECYCLED CONTENT

Next steps

The closing date for feedback on REF and concept design is **Friday 15 December.** All feedback will be considered and a submission report prepared.

Roads and Maritime will finalise the REF and prepare for construction in the first quarter of 2018, subject to project approval.

Have your say

To have your say or if you have any questions and would like more information please contact our project team:

1 800 571 850

belmore.road@rms.nsw.gov.au

www.rms.nsw.gov.au/belmoreroadramps

Belmore Road Ramps,
Roads and Maritime Services
Locked Bag 928, North Sydney NSW 2059

NSW GOVERNMENT

November 2017
RMS 17.621

Appendix C - Newspaper advertisements

Local Newspaper – Public Notice / Advertisement

Have Your Say

Belmore Road Ramps detailed design and Review of Environmental Factors

The Australian and NSW Governments are jointly funding this project to improve access to and from the M5 South West Motorway at Belmore Road, Riverwood, and ease congestion for local Riverwood residents and businesses.

Roads and Maritime Services is seeking community feedback on the detailed design and Review of Environmental Factors until 15 December 2017. Please visit rms.nsw.gov.au/belmoreroadramps for more information and to *Have your say*.

We encourage you to find out more about the project and speak with members of the project team at two community information 'drop in' sessions being held on:

Tuesday 5 December 2017 from 4pm to 7pm

Venue: Morris lemma Indoor Sport Centre

Location: 150 Belmore Road North, Riverwood

For more information about the project, please contact us on 1800 571 850 and belmore.road@rms.nsw.gov.au

Local Newspaper – Public Notice / Advertisement

Have Your Say

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For more information about the project, please contact us on 1800 571 850 and belmore.road@rms.nsw.gov.au

Appendix D - Noise and Vibration Assessment

Mark Davey
Senior Associate Environmental Scientist
SMEC
Mark.Davey@smec.com

9th February 2018

Dear Mark

Belmore Ramps Detailed Design, Noise and Vibration Assessment – Additional Construction Compound

1 Introduction

Roads and Maritime are proposing an additional construction compound for the Belmore Ramps project located in Riverwood.

Pacific Environment has completed additional works for this scope, including updated noise and vibration impacts associated with the additional construction compound. This assessment has been completed to support the Addendum Review of Environmental Factors (REF) for the Belmore Road Ramps Project.

This addendum letter makes reference to the Traffic Addendum (SMEC, February, 2018) and should be read in conjunction with the *Belmore Ramps, Riverwood Noise and Vibration Assessment* (Pacific Environment, 21 November 2017).

2 Modifications to the Proposal

The proposed modifications include the addition of an ancillary compound area from south-east of the Belmore Ramps overpass over the M5 motorway, within a recreational area located to the east of the Morris Iemma Sporting Complex. The area will contain a site office, staff parking, stockpile area, concrete washout, laydown hardstand for materials and refuelling of plant and equipment. The relocation of this area will impact on receivers in the vicinity.

The location of the additional location is presented in the main text of this report and Figure 3.1. Site access would occur via the existing access to the Morris Iemma Sports Centre.

Pacific Environment Pty Ltd
Office Address
City, State, Postcode

(ASX: PEH) ABN: 86 127 101 642
www.pacific-environment.com
Ph: +61 x xxxx xxxx

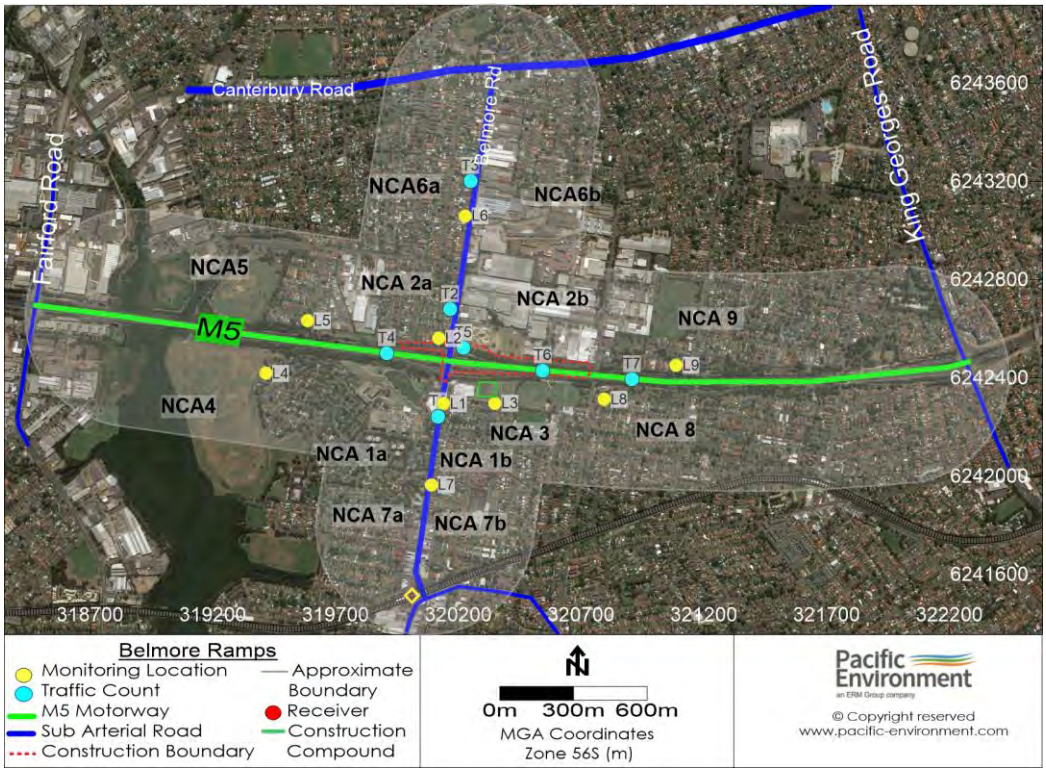

Figure 3.1: Locations of additional site compounds and stockpiles

3 Background Environment

The additional compound location is located adjacent NCA 3, one of the nine noise catchments areas identified in the Noise and Vibration Assessment (Pacific Environment, 2017).

Table 3-1: Noise Monitoring Locations

Monitoring Location	Monitoring Location Address	Distance to Road (m)	Representative Area
L3	22 Coorabin Place	150	Representative of receivers in NCA 3, south of the M5 from Coorabin Place to Bonds Road. Located in freefield in backyard approximately 150 m from the carriageway.

Source: Noise and Vibration Assessment (Pacific Environment, 2017).

4 Construction Noise Criteria

Construction noise management levels are given in the Interim Construction Noise Guideline (ICNG) (DECCW, 2009) (DECCW, 2009) and are based on measured background noise to minimise the annoyance from construction. Construction noise management levels for residential receivers are shown in Table 4-1. The management levels represent the level at which when exceeded, the measures outlined in Table 4-1 would apply.

Table 4-1: Construction Noise Management Levels at Residences

Time of Day	Management Level $L_{Aeq,15min}$	How to Apply
Recommended Standard Hours: Monday to Friday 7.00am to 6.00pm Saturday 8.00am to 1.00pm No work on Sundays or Public Holidays	Noise affected RBL + 10 dB(A)	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured $L_{Aeq,(15min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences 2. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected RBL + 5 dBA	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community.

Source: 1. ICNG (DECCW, 2009)

Based on the background noise monitoring conducted as part of the 2017 assessment, the construction noise criteria for receivers adjacent the additional construction compound are reproduced in Table 4-2.

Table 4-2: Project Specific (External) Construction Noise Management Levels

Location	RBL			Construction Noise Management Level[1,2]			
	Day	Eve	Night	Standard Hours	OOH D	OOH E	OOH N
Receivers – NCA1	60	54	43	70	65	59	48
Receivers – NCA2	45	44	38	55	50	49	43
Receivers – NCA3	47	46	41	57	52	51	46
Receivers – NCA8	50	49	42	60	55	54	47
Commercial Premises				70			
Industrial				75			
Active recreation areas				65			

Location	RBL			Construction Noise Management Level[1,2]			
	Day	Eve	Night	Standard Hours	OOH D	OOH E	OOH N
Passive recreation areas				60			

Notes: 1. Construction noise criteria calculated as $L_{eq,15min}$ = RBL+ 10 dB for standard day and $L_{eq,15min}$ = RBL + 5 dB for OOH day, evening and night.
2. Standard hours: Monday to Friday 7.00am to 6.00pm Saturday 8.00am to 1.00pm. OOH day: Saturday 1.00 pm to 6.00 pm Saturday, 7.00 am to 6.00 pm Sunday. OOH evening: Monday to Sunday 6.00pm to 10.00pm. OOH Night time: Monday to Saturday 10.00pm to 7.00am Sunday & Public Holidays 10.00pm to 8.00am.

5 Noise Modelling

5.1 Construction Hours and Duration

Construction is anticipated to start in Q1 or Q2 2018, with a construction duration of up to 18 months.

Working hours are expected to be the standard Monday to Friday between 7am to 6pm and Saturday 8am to 1pm, excluding public holidays.

The construction workforce would be expected to fluctuate, depending on the stage of construction and associated activities. The peak construction workforce would be about 50 personnel.

During construction, a site compound will be established, with space for a site office, amenities, laydown and storage area for materials. Potential ancillary locations have been identified within the project boundary (Figure 3.1).

5.2 Construction Activities

Table 5-1 presents a summary of the relevant construction scenarios with the potential to generate impact on the nearest receivers. Site establishment activities are likely to occur over a period of several weeks, with ongoing access and operation of the site to continue for a period of up to 18 months.

Table 5-1: Construction Scenarios and Plant – Additional Construction Compound

Scenario	Equipment	Overall Sound Power Level, dB(A)
Short term- Auxiliary works	Excavators, mulching plant and chipper, cranes, generators, hand tools	115
Ongoing site operation	Vehicular movements, crane	110

Standard mitigation measures will be implemented as discussed in the Noise and Vibration Assessment (Pacific Environment 2017).

5.3 Noise Modelling

The construction noise modelling methodology and assumptions are consistent with the 2017 assessment.

Additional ancillary facilities are proposed adjacent the Morris Iemma sport complex; this site has been identified in addition to the sites specified as part of the Noise and Vibration Assessment (2017). The closest sensitive receivers are in NCAs 1b, 2b and 8.

Based on typical earthmoving equipment to shape stockpiles, and assuming full operation of equipment during these activities, the impacts on the surrounding receivers was determined for the establishment of the ancillary facilities. The results are presented in Table 5-2.

Table 5-2: Predicted Typical Construction Noise Level Ranges for Establishment of Stockpiling and Ancillary Facilities – Additional Location

NCA	Noise Management Levels				Construction Noise Level Ranges, dB(A)
	Standard Hours	OOH D	OOH E	OOH N	
1b	70	65	59	48	31 - 57
2b	55	50	49	43	46 - 55
3	57	52	51	46	55 - 68
8	60	55	54	47	29 - 57

Note: 1. Highly noise affected levels indicated in red font.

For receivers within approximately 140 m of the site, noise levels from ancillary site establishment are predicted to exceed noise management levels during operations, however these values are based on simultaneous operations of all equipment, and are considered highly conservative.

It is considered that noise levels can be minimised by driver training and ensuring that noisy equipment does not operate simultaneously, and that such activity is limited to daytime hours. These activities are predicted to be of short duration, in the order of several weeks.

Ongoing operations from the long term use of the ancillary facilities were modelled to assess the impacts of vehicular movements and maintenance activities. The impacts on the surrounding receivers are presented in Table 5-3.

Table 5-3: Predicted Typical Construction Noise Level Ranges for Ongoing usage of Ancillary Facilities – Additional Location

NCA	Noise Management Levels				Construction Noise Level Ranges, dB(A)
	Standard Hours	OOH D	OOH E	OOH N	
1b	70	65	59	48	25 - 51
2b	55	50	49	43	41 - 49
3	57	52	51	46	49 - 62
8	60	55	54	47	24 - 52

For receivers within approximately 60 m of the site, noise levels from ancillary site operations are predicted to exceed noise management levels during typical hours of changeover, however these values are based on simultaneous operations of all equipment, and are considered highly conservative. It is likely that mitigation and management measures will be required to manage ongoing impacts for the first row of houses exposed to the ancillary site.

5.4 Construction Traffic

The Belmore Road Ramps Traffic Addendum (SMEC, February 2018) prepared for the additional compound area describes the proposed construction vehicle fleet and site access. Construction vehicles that would impact on the external road network are anticipated to include dump trucks (30t capacity), flatbed trucks, liquid tankers and concrete mixers. Access to the site compound on the south side of the M5 Motorway would be via the existing access to the Morris Iemma Sports Centre.

The Traffic Addendum (2017) states that the construction traffic volumes for the works would reach peak daily levels of 83 heavy vehicles in August 2018. Adopting these worst case conditions, and assuming all proposed construction equipment is operational on site simultaneously, construction activities will generate up to 43 additional construction movements per shift (one day and one night shift). All routes and roads during construction will remain open with some kerbside or median lane closures, no alternative routes or detours are proposed.

Consistent with the Noise and Vibration Assessment (2017), assuming all proposed construction equipment is operational on site simultaneously, it can be assumed that the construction activities will generate up to 25 additional light vehicle movements per shift.

Based on the existing traffic volumes on project roads (refer to Section 5.2 of the Noise and Vibration Assessment (Pacific Environment, 2017)), worst case predictions were made assuming all vehicle movements occurring in one hour during the day or night period. Contributions were predicted during the Roads and Maritime construction noise estimator, as presented in Table 5-4.

Table 5-4: Change in Noise Level from Construction Traffic on Project Roads – Additional Compound

Project Road	Speed (km/h)	Change in Noise Level, dB(A)	
		Day (7am to 10pm)	Night (10pm to 7am)
M5	90	0.1	0.6
Belmore Road	50	0.2	1.2

Note: 1. Results from Roads and Maritime Construction Noise Estimator.

Construction traffic noise on project roads have been calculated to increase by less than 0.6 dB on the M5 and less than 1.2 dB on Belmore Road for daytime and night time periods, resulting in marginal impacts at the nearest receivers, due to the numbers of vehicles already using the affected roads.

The construction phase would involve lane closures during parts of the construction activities. A traffic management plan (TMP) will be developed for the project, outlining traffic management measures would be used to minimise traffic impacts.

5.5 Construction Vibration

Impacts from vibration can be considered both in terms of effects on building occupants (human comfort) and the effects on the building structure (building damage).

The Construction Noise and Vibration Guideline (Roads and Maritime 2016) provides recommended safe working distances for a range of construction activities (refer to the Noise and Vibration Assessment, 2017). No significant sources of vibration are anticipated as a result of the additional construction compound, and the distances to receivers are such that impacts would not result in structural damage or human annoyance at the nearest receivers.

In order to reduce the potential risk of impact, it is recommended that construction vibration mitigation measures are considered as part of the construction noise and vibration management plan.

6 Management and Mitigation Measures

Construction noise should be managed by a detailed Construction Noise and Vibration Management Plan (CNVMP) to be prepared by the successful construction contractor prior to commencement of works on site. Standard mitigation measures should be implemented as discussed in the Noise and Vibration Assessment (Pacific Environment, 2017).

Where exceedances are still expected to occur after standard mitigation measures have been applied, the implementation of additional mitigation measures. These mitigation measures are presented in Table 6.1. Specific definitions for the terms used are presented in the guideline.

Table 6.1 Triggers for Additional Mitigation Measures – Airborne Noise

Perception	dB(A) above RBL	dB(A) above NML	Additional Mitigation Measures Type [1]	Mitigation Levels [2]
All Hours				
75dBA or greater			N, V, PC, RO	HA
Standard Hours: Mon - Fri (7am – 6pm), Sat (8am – 1pm), Sun/Pub Hol (Nil)				
Noticeable	5 to 10	0	-	NML
Clearly Audible	10 to 20	<10	-	NML
Moderate Intrusive	20 to 30	20 to 30	N/V	NML+10
Highly Intrusive	>30	>20	N/V	NML+20
OOHW Period 1: Mon – Fri (6pm – 10pm), Sat (7am – 8am & 1pm – 10pm), Sun/Pub Hol (8am – 6pm)				
Noticeable	5 to 10	<5	-	NML
Clearly Audible	10 to 20	5 to 15	N, R1, DR	NML+5
Moderate Intrusive	20 to 30	15 to 25	V, N, R1, DR	NML+15
Highly Intrusive	>30	>25	V, IB, N, R1, DR, PC, SN	NML+25
OOHW Period 2: Mon – Fri (10pm – 7am), Sat (10pm – 8am), Sun/Pub Hol (6pm – 7am)				
Noticeable	5 to 10	<5	N	NML
Clearly Audible	10 to 20	5 to 15	V, N, R2, DR	NML+5
Moderate Intrusive	20 to 30	15 to 25	V, IB, N, PC, SN, R2, DR	NML+15
Highly Intrusive	>30	>25	V, IB, N, PC, SN, R2, DR	NML+25

Notes: 1. R1 = Respite Period 1; V = Verification ; PC = Phone calls ; IB = Individual briefings ; SN = Specific notifications ; N = Notification ; R2 = Respite Period 2 ; DR = Duration Respite ; Perception = relates to level above RBL

2. NML = Noise Management Level (see Appendix D)

HA = Highly Affected (> 75 dB(A) - applies to residences only), Source: *Construction Noise and Vibration* Guideline (Roads and Maritime 2016).

The guideline states that these mitigation measures are more applicable to short term construction activities, as these measures may become less effective with increasing durations of works. It is considered that due to the nature of these construction activities, the above mitigation measures would still be appropriate and effective.

7 Summary and Conclusion

Pacific Environment has assessed the impacts of an additional construction compound adjacent the Morris Iemma sport complex, including updated noise and vibration impacts to support the Addendum Review of Environmental Factors (REF) for the Belmore Road Ramps Project.

The assessment of construction noise impacts from the ancillary compound indicated that several residential receivers would be expected to experience noise levels in excess of the construction noise management levels, and in some cases would be highly noise affected, for receivers closest to the works.

For receivers within approximately 140 m of the site, noise levels are predicted to exceed noise management levels during operations, however these values are based on simultaneous operations of all equipment, and are considered highly conservative.

It is considered that noise levels can be minimised by driver training and ensuring that noisy equipment does not operate simultaneously, and that such activity is limited to daytime hours. Mitigation and management measures have been outlined in this report to manage any residual impacts, to be finalised as part of the Construction Noise and Vibration Management Plan for the works.

Construction traffic noise on project roads have been calculated to increase by less than 0.3 dB on the M5 and less than 0.7 dB on Belmore Road for daytime and night time periods, resulting in marginal impacts at the nearest receivers, due to the numbers of vehicles already using the affected roads.

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