



**Planning &
Environment**

WestConnex New M5 Project

Peer Review of Traffic & Transport Assessment

April 2016

SAMSA CONSULTING

TRANSPORT PLANNING & TRAFFIC ENGINEERING

Samsa Consulting Pty Ltd
Transport Planning & Traffic Engineering

ABN: 50 097 299 717

46 Riverside Drive, Sandringham, NSW 2219, AUSTRALIA

Phone: (+61) 414 971 956

E-mail: alansamsa@gmail.com

Skype: alan_samsa

Web: www.samsaconsulting.com

© Samsa Consulting Pty Ltd

This document is and shall remain the property of Samsa Consulting Pty Ltd. The document may only be used for the purposes for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

Contents

1. Introduction	1
1.1 Objectives & Scope of Work	1
1.2 Report Structure	2
2. Project Details	3
2.1 Background	3
2.2 Project Description	3
2.3 Summary of Submissions	5
2.4 Project Amendments	6
3. Review of Traffic & Transport Assessment	7
3.1 Secretary’s Environmental Assessment Requirements (SEARs)	7
3.2 Assessment Methodology and Modelling Tasks	8
3.3 Road Network / Traffic Operations.....	12
3.4 Parking and Access.....	17
3.5 Public Transport Operations	17
3.6 Pedestrian / Cyclist Issues.....	18
3.7 Construction Phase Issues	19
3.8 Miscellaneous Issues	25
4. Conclusions & Recommendations	26
4.1 Conclusions.....	26
4.2 Recommendations.....	28

1. Introduction

The full WestConnex project will link Parramatta to Sydney's central business district (CBD), Sydney Airport, the Port Botany precinct and the M5 in south-west Sydney via a 33 kilometre tolled motorway.

Sydney Motorway Corporation (on behalf of Roads and Maritime Services - RMS) proposes to deliver WestConnex in a series of project stages as follows:

- M4 Widening from Parramatta to Homebush.
- M4 East from Homebush to Haberfield.
- New M5 – King Georges Road at Beverly Hills to St Peters.
- King Georges Road Interchange Upgrade.
- M4–M5 Link: Haberfield to St Peters, including the Southern Gateway and Southern Extension.
- Sydney Gateway.
- Southern extension.

The New M5 is Stage 2 of the WestConnex project. It involves construction of a multi-lane road link, including twin motorway tunnels, between the M5 East Motorway east of King Georges Road, Beverly Hills and St Peters. The project would also include an interchange at St Peters and connections to the existing road network.

This report details a review of the traffic and transport impact assessment for the proposed Project and has been prepared by *Samsa Consulting Pty Ltd*, Transport Planning & Traffic Engineering Consultants, for *NSW Department of Planning & Environment (DP&E)* as part of its project assessment process.

1.1 Objectives & Scope of Work

The DP&E requires independent technical advice with respect to the Project's traffic and transport assessment. This review has been carried out to provide the independent technical advice including:

- Review of relevant documents and information including:
 - Traffic and transport assessment within the Environmental Impact Statement (EIS), SSI Application Report, etc.
 - Submissions received from the public and government agencies including local councils.
 - The Project's Response to Submissions Report including the Preferred Infrastructure Report and/or RMS response, as required.
- Site familiarisation visit of Project area to observe and assess traffic and transport issues generally, determine surrounding road environment, road network conditions, etc.
- Liaison with DP&E staff at Preliminary Review stage, review / response to agency comments and upon completion of review and recommendations.
- Identify additional information or clarification required from the proponent to complete

an adequate assessment of the application and the identification of any gaps including specifically, the adequacy of the assessment with respect to the Project SEARs.

- Prepare a Preliminary Review report with specific consideration of the adequacy of the information provided and whether an assessment of the impacts of the proposal is able to be suitably made.
- Consolidate and finalise Preliminary Review report following DP&E comments / feedback.
- Assess the adequacy and suitability of any mitigation measures proposed and specifically any road network capacity and intersection upgrade measures proposed for parallel routes.
- Develop recommended actions and conditions of approval that could be applied to avoid, minimise, mitigate, and/or manage the residual traffic and transport impacts of the Project.
- Prepare a draft Review Report on the EIS summarising the above and finalise the report following comments / feedback from DP&E.

In undertaking the review, the main document reviewed was AECOM Australia “*WestConnex New M5, Environmental Impact Statement*”, 23 November 2015 (EIS), which incorporated AECOM Australia “*WestConnex The New M5 – Technical Working Paper: Traffic and Transport (Revision H)*”, 19 November 2015 (T&TTWP). Other documents that were referenced / reviewed include the following:

- AECOM Australia “*WestConnex New M5, Submissions and Preferred Infrastructure Report (Final Report)*”, 4 March 2016
- Transport NSW “*Road Network Modelling Assumptions Book (Version 1.4)*”, 4 July 2013
- Secretary's Environmental Assessment Requirements (SEARs), 26 August 2015
- Submissions received from the general community, government agencies (Local Councils) and other organisations.

1.2 Report Structure

The remainder of this report is presented as follows:

Chapter 2 describes the proposed Project.

Chapter 3 provides a review of the traffic and transport assessment undertaken for the project.

Chapter 4 provides conclusions and recommendations.

2. Project Details

2.1 Background

NSW Roads and Maritime Services (RMS) is the project proponent (*Application No.SSI 6788*). The NSW Government has established the Sydney Motorway Corporation (SMC) to manage delivery of the WestConnex projects. SMC has been established as a public subsidiary corporation of RMS.

The New M5 project has been deemed as critical State significant infrastructure (SSI) and the environmental assessment approval process is under *Part 5.1* of the *EP&A Act*.

The M5 Motorway corridor (the M5 East Motorway and the M5 South West Motorway) is the main passenger, commercial and freight corridor between Port Botany, Sydney Airport and south-west Sydney. Traffic demands on the M5 East Motorway currently exceed the design capacity of the roadway, and as a result, create a significant bottleneck to the M5 Motorway corridor with motorists experiencing heavy congestion and unreliable journey times. The New M5 project is needed to provide additional capacity along the M5 Motorway corridor, and would allow for a more robust and reliable transport network.

2.2 Project Description

The project would be located within the Canterbury, Hurstville, Rockdale, Marrickville, City of Sydney and Botany Bay local government areas. The project corridor traverses the suburbs of Narwee, Beverly Hills, Kingsgrove, Bexley North, Earlwood, Bardwell Park, Bardwell Valley, Arncliffe, Turrella, Wollie Creek, Tempe, Sydenham, St Peters, Alexandria and Mascot.

The project would include the following key components:

- Twin motorway tunnels between the existing M5 East Motorway (between King Georges Road and Bexley Road) and St Peters. The western portals along the M5 East Motorway would be located east of King Georges Road, and the eastern portals at St Peters would be located in the vicinity of Princes Highway and Canal Road. Each tunnel would be about nine kilometres in length and would be configured as follows:
 - Between the western portals and Arncliffe, the tunnels would be line marked for two lanes as part of the project, and built with the provision to be widened to three lanes in the future, subject to additional assessment and approval.
 - Between Arncliffe and St Peters, the tunnels would be line marked for four lanes as part of the project, and built with the provision to be widened to five lanes in the future, subject to additional assessment and approval.
- Tunnel stubs to allow for a potential future connection to Stage 3 of the WestConnex program of works (the M4-M5 Link) and a potential future connection to southern Sydney.
- Surface road widening works along the M5 East Motorway between east of King Georges Road and the new tunnel portals.
- A new interchange at St Peters (the St Peters interchange), which would initially

provide road connections from the main alignment tunnels to Campbell Road and Euston Road, St Peters and eventually connect the New M5 and the future M4-M5 Link (WestConnex Stage 3) with:

- Euston Road at the intersection of Campbell Road;
- Gardeners Road at the intersection with Kent Road; and
- Sydney Airport and Port Botany via a new future road known as the ‘Sydney Gateway’.
- Two new road bridges across Alexandria Canal which would connect St Peters interchange with Gardeners Road and Bourke Road, Mascot.
- Closure and remediation of the Alexandria Landfill site, to enable the construction and operation of the new St Peters interchange.
- Local road upgrades at St Peters, Alexandria and Mascot, including:
 - Widening of sections of Euston Road, Campbell Street, Bedwin Road, Campbell Road, Bourke Street and Bourke Road;
 - An extension of Campbell Road to provide a direct connection to Bourke Road, Mascot via a new bridge over the Alexandria Canal;
 - An extension of Gardeners Road to provide a connection to the St Peters interchange via a new bridge over the Alexandria Canal;
 - Modifications to existing intersections and construction of new intersections;
 - Construction of a 370 m pedestrian and cyclist bridge between Campbell Road, St Peters and Mascot; and
 - Grade-separated pedestrian and cyclist bridge across Campbell Road into Sydney Park.
- Ancillary infrastructure and operational facilities for electronic tolling, signage (including electronic signage), ventilation structures and systems, fire and life safety systems, and emergency evacuation and smoke extraction infrastructure.
- Motorway control centre that would include operation and maintenance facilities.
- New service utilities and modifications to existing service utilities.
- Temporary construction facilities and temporary works to facilitate the construction of the project.
- Infrastructure to introduce tolling on the existing M5 East Motorway.
- Surface road upgrade works within the corridor of the M5 South West Motorway and M5 East Motorway.

Construction activities associated with the project would generally include the following:

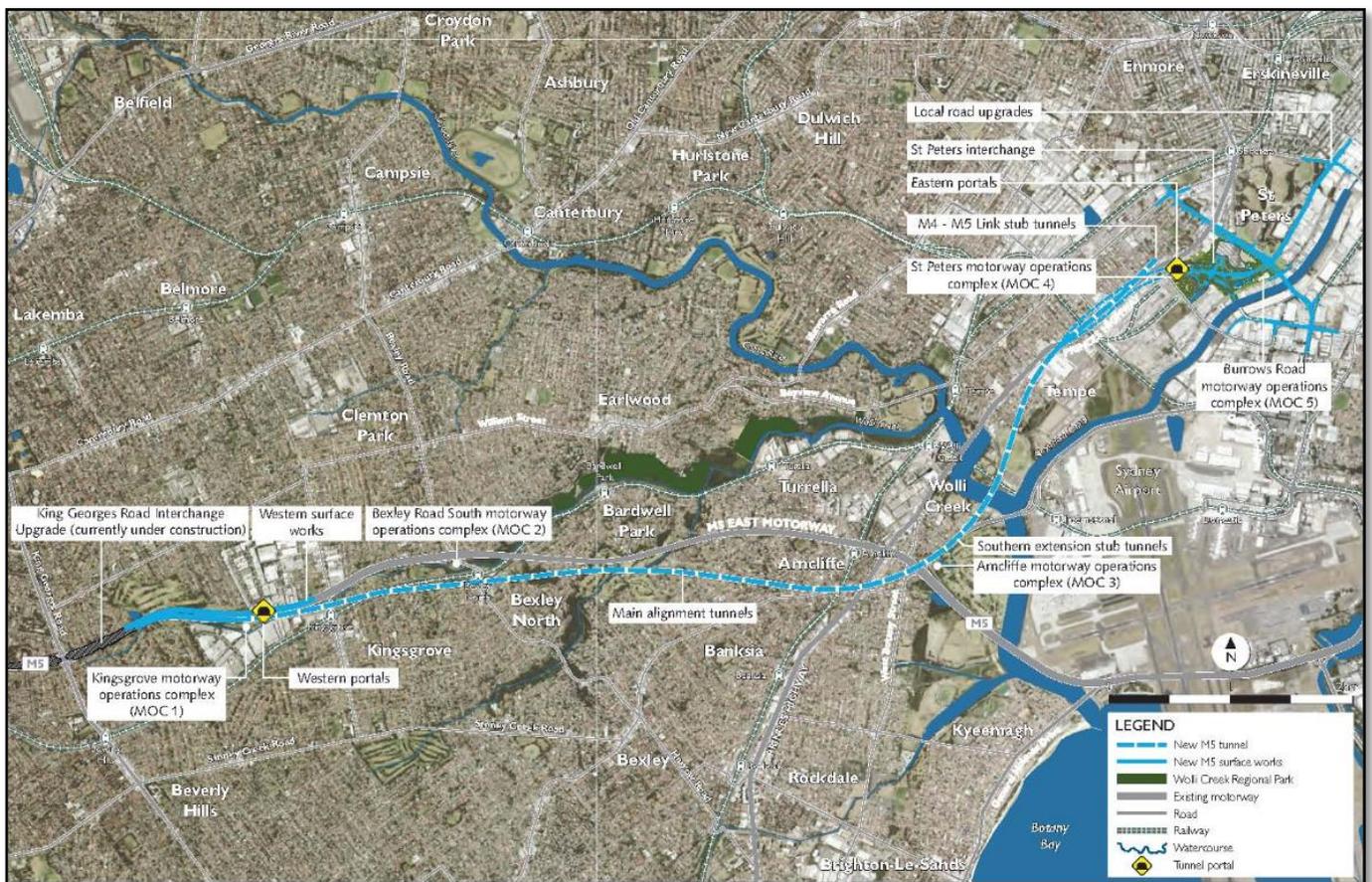
- Commencement of enabling and temporary works, including construction power, water supply, ancillary site establishment, demolition works, property and utility adjustments and public transport modifications (if required).
- Construction of the road tunnels, interchanges, intersections and roadside infrastructure.
- Haulage of spoil generated during tunnelling and excavation activities.
- Fit-out of the road tunnels and support infrastructure, including ventilation and emergency response systems.

- Construction and fit-out of the motorway control centre and ancillary operations buildings.
- Upgrades to surface roads and construction of bridges.
- Implementation of environmental management and pollution control facilities for the project.

The project does not include ongoing motorway maintenance activities during operation. These would be subject to separate assessment and approval as appropriate.

Construction of the New M5 project is anticipated to commence around mid-2016 (subject to planning approval) and is expected to take around three years to complete.

The location of the proposed New M5 project is shown in *Figure 2.1* below.



Source: AECOM Australia "The New M5 – Technical Working Paper: Traffic and Transport (Revision H)", 19 November 2015

Figure 2.1: Proposed Project Location

2.3 Summary of Submissions

A total of 10,162 submissions were received in response to the EIS. This included eight (8) submissions from State Government agencies and seven (7) from local government authorities. Submissions were also received from peak groups and advisory organisations (including NRMA), assorted interest groups (including public transport advocacy and bicycle user groups) and educational facilities.

The most common traffic and transport-related issues raised were as follows:

- Validation and accuracy of traffic modelling including toll avoidance sensitivity / driver behaviour and the potential impacts of increased traffic on parallel un-tolled routes.
- Lack of public transport forecasting in the modelling.
- The effects of the Project on existing road network congestion, eg. Bexley Road / Kingsgrove Avenue, Marsh Street / West Botany Street / M5 East Motorway.
- Road safety / congestion issues related to incident management within tunnels.
- Limited opportunities for public transport and/or multi-modal alternatives including impacts on bus services during operation.
- Limited pedestrian and cycleway improvements and lack of connectivity.
- Project does not address transport (freight) challenges, lacks strategic justification and is of limited benefit.
- Construction related issues including haulage routes / timing, understating construction impacts, CTMP preparation, pedestrian / cycle route diversions, optimisation / minimisation of truck movements, impacts on bus services, construction workforce transportation, provision of adequate off-street (on-site) parking in construction compounds and cumulative construction impacts of multiple development and infrastructure projects being undertaken concurrently.

In general, it is considered that the proponent provided reasonable / appropriate responses and addressed the transport issues identified.

2.4 Project Amendments

Project amendments and further investigation or assessment was undertaken by the proponent during the EIS display period and preparation of the Submissions and Preferred Infrastructure Report (S&PIR). These were undertaken to address commitments made in the EIS and/or address comments received in submissions. The amendments and additional investigations related to traffic and transport included the following:

- Changes to the Euston Road / Sydney Park Road / Huntley Street intersection including removal of the high angle (high speed) left-turn between Sydney Park Road (eastbound) and Euston Road (northbound) and confirmation of the right-turn restriction (buses only allowed) between Euston Road (southbound) and Sydney Park Road (westbound).
- Pedestrian paths would be provided along the southern side of Campbell Road, northern side of Campbell Road (extension), western side of Bourke Road and the eastern side of Euston Road.
- Various clarifications related to local roads and access.
- Confirmation of direct access to compounds C1 and C2 from M5 East Motorway (eastbound).
- Changes / clarifications to construction hours for the C1 and C2 compounds.
- Heavy vehicle access to the C3 compound during site establishment and demobilisation and on rare occasions, for maintenance activities during construction.
- Clarification of Arncliffe construction site and Canal Road construction site access.

3. Review of Traffic & Transport Assessment

3.1 Secretary's Environmental Assessment Requirements (SEARs)

The environmental assessment requirements for the assessment of traffic and transport impacts (SEARs issued by the DP&E) include the following.

- Details of how the proposal meets the objectives of the overall WestConnex program.
- Details of how the traffic and transport objectives of the proposal, and service and infrastructure responses, take into account adjacent sensitive land uses, future housing and employment growth areas, existing town, employment and industrial centres, approved and proposed infrastructure proposals and broader transport needs (including public transport, cyclist and pedestrian requirements and facilities), including with specific reference to:
 - preferred alignment and design;
 - proposed interchanges and connections to the surrounding road network; and
 - associated road and related transport infrastructure facilities.
- An assessment and modelling of operational traffic and transport impacts on the local and regional road network (in consultation with affected councils) and the Sydney motorway network, including the consideration of planning proposals, major urban renewal and development, the potential cumulative impacts of Stage 3 – M4 South (Haberfield to St Peters), and the impacts of potential shifts of traffic movements to alternative routes outside the proposal area (including as a result of tolls).
- Induced traffic and operational implications for public transport (particularly with respect to strategic bus corridors and bus routes) and future public transport opportunities.
- Impacts on property and business access and on-street parking provision, including permanent and temporary (construction) changes to access and parking, and traffic management measures such as clearways.
- Impacts on cyclists and pedestrian access and safety and consideration of opportunities to integrate cycleway and pedestrian elements with surrounding networks;
- Construction traffic and transport impacts of the proposal (including ancillary facilities) and associated management measures, in particular:
 - impacts to the road network (including safety and level of service, parking, pedestrian and cyclist access, and disruption to public transport services and access to properties);
 - route identification and suitability for heavy vehicles, and scheduling of transport movements, particularly movements outside standard construction hours;
 - number, frequency and size of construction related vehicles (both light and heavy vehicles);

- nature of existing traffic on construction access routes (including consideration of peak traffic times);
- need to close, divert or otherwise reconfigure elements of the road network associated with construction of the proposal; and
- having reference to the cumulative construction impacts of other infrastructure preparing for or commencing construction.

The SEARs for the environmental assessment formed the basis of issues considered in the peer review. Issues identified during the peer review are characterised in the following sections.

Where the proponent has provided relevant responses, these have been included below each identified issue / comment (*in blue italics*). Additional comments on proponent responses are included [*in red and brackets*].

3.2 Assessment Methodology and Modelling Tasks

In general, the assessment has been undertaken quite thoroughly with an appropriate methodology. This is particularly the case for the modelling tasks, which incorporated an independent peer review in the assessment of the model calibration and validation. This provides a high level of confidence in the outputs and is considered to be an excellent approach to ensure rigorous model results.

The modelling adopted a toll choice diversion model known as a distributed value of time (VOT) multiclass equilibrium assignment model, which is considered suitable for the overall WestConnex planning task. This type of model is appropriate for the overall planning task because it considers toll route choice, which is relevant to the Sydney road network and its tolled road network. The modelling adopted a three stage approach – forecasting, rebasing and operational traffic modelling with an exclusive focus on the study area rather the wider Sydney road network.

Traffic demand data contained within this traffic and transport assessment has been taken from the WRTM, following assessment of the model calibration and validation by independent peer reviewers and agreement that the model is suitable for this purpose.

The WRTM toll choice model was constructed to directly model the range of driver behaviour and was adjusted to match the observed patronage on the existing toll facilities. A series of validation checks was undertaken to verify the performance of both the Base Demand and Toll Choice Assignment models within the WRTM.

Traffic modelling assessed the following scenarios:

- Existing traffic conditions (2012).
- Construction (2016 peak).
- 2021 and 2031 with and without the project.
- 2031 with the full WestConnex program of works and a future Southern extension.

The WRTM comprises separate time period sub-models, with average one-hour peak multi-class traffic assignments run for:

- AM period: 7 am to 9 am
- Day-time inter-peak: 9 am to 3 pm

- PM period: 3 pm to 6 pm
- Evening off-peak: 6 pm to 7 am

The modelled traffic volume outputs were also reported at north-south screenlines across the project corridor – eastern and western screenlines. The screenlines are useful in gaining an understanding and comparison of future year volumes and patterns in the project corridor for each modelled scenario, traffic flows along the M5 East mainline and the level of traffic that would potentially transfer to the project from parallel routes along the surrounding road network.

The results of the modelling and the screenlines in particular, indicate limited use of the New M5 Motorway until the full program of WestConnex projects is complete, eg. in 2031 when all WestConnex projects are complete, New M5 Motorway traffic increases by approximately 135% in comparison to the completion of the New M5 Motorway project only. This is further reflected in the limited redistribution of traffic away from parallel routes, eg. Canterbury Road, Stoney Creek Road, Marsh Street and Princes Highway.

In fact, when the New M5 Motorway is open alone, there is some traffic redistribution back onto the parallel road network, most likely due to toll avoidance and most noticeably along Stoney Creek Road. The major benefactor of the full program of WestConnex projects being completed is Princes Highway, which is forecast to have a reduction in traffic of approximately 68% in comparison with the 2031 'without project' scenario.

For the St Peters interchange area, operational road network performance in both the AM and PM peak hours in 2021 with the project improves slightly compared to without the project.

By 2031, under the 'with project' scenario, the traffic demand at St Peters increases substantially (approximately 25%) and is exacerbated by a significant increase in local trip generation. This additional traffic needs to be accommodated without any increase in road space attributed to the full WestConnex project. Modelling suggests that only about 80% of the traffic demand in the 2031 'with project' scenario could be accommodated in the network and that in the absence of the development of the full WestConnex program of works, additional network upgrades would be required to accommodate this traffic demand in the St Peters interchange area.

Once the full WestConnex program of works is complete in 2031, modelling indicates that the interchange area including the surrounding local road network and the associated tunnels all operate well within capacity levels and no congestion or significant queuing is predicted. In the AM peak hour, the network performance improves with the average travel time per vehicle reducing by 11% and average speed per vehicle increasing by 42%. In the PM peak hour, the improvement is more marked, with the average travel time per vehicle reducing by 26% and average speed per vehicle increasing by 74%.

While the assessment methodology and particularly the modelling tasks are considered to be adequate and appropriate for this study assessment, the following comments are provided:

- The 'With Project' scenarios in 2021 and 2031 are considered to be largely irrelevant because the New M5 project is unlikely to go ahead on its own without the M4 East project. This is acknowledged by the study assessment in that an additional scenario incorporating the New M5 project as well as the King Georges Road Interchange Upgrade, the M4 Widening project and the M4 East project was strategically assessed

to determine the potential impacts on traffic volumes and patterns within the study area. The results indicated no significant difference in volumes within the study area resulting from the M4 East project and therefore, no further analysis was undertaken. It is acknowledged that these scenarios were required as part of the SEARs.

Noted.

[Acceptable response – no additional impacts on assessment.]

- It is unclear why a 2012 base year has been used for the M5 East Motorway comparison scenarios but a different 2014 base year has been used for the St Peters interchange comparison scenarios. Clarification / justification of the methodology is required.

To create a calibrated and validated operational model using Paramics, traffic survey data such as detailed counts, journey times, speeds and queue lengths are required. This information was not available for 2012 and therefore new surveys were undertaken in 2014 to collect the information required.

[Acceptable response.]

- In Section 8.1.1 (page 209) of the T&TTWP, it is unclear why there would be a traffic volume reduction along King Georges Road under the 2021 'do minimum' scenario. Please clarify why this reduction would occur.

The traffic volume change effects discussed in Section 8.1 and specifically for 2021 in Section 8.1.1 are relatively minor impacts. The majority of the impacts are around the WestConnex M4 East Widening (Stage 1a) project. The mentioned increase of traffic on the M5 East in 2021 is of the order of 2,500 vehicles per day (vpd) and the decrease of traffic on King Georges Road is of the order of 1,000 vpd. Both are small effects but related. The increase of traffic on M5 South West travelling through to M5 East is likely due to long distance traffic displaced from the M4 Motorway corridor. This traffic in turn uses limited capacity on the M5 East corridor that displaces traffic from King Georges Road that previously used M5 East.

[Acceptable response.]

- In Table 70 (page 210) of the T&TTWP, some discussion / explanation is required to clarify why some traffic volumes reduce in 2031 compared to 2021, eg. traffic volumes in the New M5 tunnel. Is this due to any restrictions on vehicles being able to enter due to downstream congestion, for example?

There is no reduction in 2031 traffic compared to 2021 when light and heavy vehicles are converted into passenger car units (PCUs). Observations are:

- *2031 HCV volumes are generally increasing proportionally more than light vehicle volumes – this is a result of the greater growth in the HCV demand matrices in the M5 Motorway corridor.*
- *Capacity in the existing M5 East Motorway tunnel is limited and the increasing number of trucks tends to displace light vehicles.*
- *All of the effects can be explained when the model's equilibrium assignment methodology is considered.*

[Acceptable response.]

- In Tables 74 and 75 (page 214) of the T&TTWP, the 2031 AM peak flows have reduced by 6% from 2021 flows, presumably due to the constraints of network capacity and unreleased demand restricting vehicles into the modelled area. However, the 2031 PM peak flows increase to levels greater than the 2021 AM peak flows with the same network capacity. This seems incorrect – why don't the AM peak flows increase to a similar level, ie. approximately 172,000 vpd. Clarification of these results is required.

It is important to note the figures in Tables 74 and 75, which are referenced in the comment, relate to number of vehicle stops and not number of vehicles as stated.

The traffic patterns are different in the PM peak compared to the AM and results in congestion points at different locations in the network. This is illustrated in Figures 64 and 65 (pages 216 and 217), which show the constraint points in the network through the areas of unreleased demand. The constraints in the PM peak in 2021 are considerably less than the 2021 AM peak and both the 2031 peaks, specifically at the southern end of the model on the Princes Highway. When the 2031 PM peak was modelled, the constraints within the network are comparable to the 2021 and 2031 AM peaks, again specifically around the Princes Highway. These factors result in the total number of stops in the 2021 PM peak appearing to be inconsistent with the other scenarios.

[Acceptable response.]

- In Table 77 (page 217) of the T&TTWP, clarification is required of the large discrepancy between AM and PM peak results, ie. there seems to be too small an increase in the morning peak travel direction.

The small increase in the travel times from 2021 to 2031 is due to the network being at capacity along this route in 2021 thereby not allowing any major increase in travel time. This is illustrated in Figures 64 and 65 (pages 216 and 217) which show the constraint points in the network through the areas of unreleased demand, specifically at the southern end of the model on the Princes Highway and the intersection of Princes Highway and Railway Parade. The three minute increase can be attributed to the decrease in LoS at the intersection of Kings Street and Princes Highway.

[Acceptable response.]

- In Tables 79 and 80 (2021 and 2013 'with project' scenarios) of the T&TTWP, clarification / discussion is required as to why traffic volumes along General Holmes Drive would increase due to the project.

The section of General Holmes Drive referenced in the screenline locations is south of the Cooks River and north of Bestic Street. The 'with project' case includes the New M5 tunnel and tolling on both the existing M5 East and new M5 tunnels. As a result, the traffic demands on the existing M5 East tunnel drop significantly. Some of the traffic is diverted to the New M5 tunnel but some is diverted to untolled alternative routes. The traffic increase on General Holmes Drive is some of this traffic avoiding the tolled M5 East. A difference plot shows a clear (albeit small) increase of traffic on General Holmes Drive and Bestic Street.

[Acceptable response.]

- There appears to be an anomaly in the forecast traffic volumes for the 2031 'with project' scenario for eastbound traffic along Stoney Creek Road – refer to *Table 80 (page 227)* of the T&TTWP. Confirmation is required that the average weekday traffic volume of 28,048 is correct and if so, clarification is needed to explain the large increases from the 2021 'with project' and 2031 'without project' scenarios (approximately +46% and +68% respectively).

The figure is incorrect. The eastbound AWT volume should be 20,636, not 28,048. This would be an increase of 7% (not 46%) compared to the 2021 'with project' scenario and an increase of 24% (not 68%) compared to the 2031 'without project' scenario. The eastbound AWT screenline total reduces to 122,727 and the Stoney Creek Road screenline share would be 17% (not 22%), which correlates closely to the 2021 'with project' share of 18%.

[Acceptable response.]

3.3 Road Network / Traffic Operations

In general, the assessment of road network and intersection operations has been undertaken thoroughly. The majority of significant intersections were analysed for existing as well as future scenarios, either with or without the New M5 project infrastructure (in 2021 and 2031) as well as the full WestConnex infrastructure development including the future Southern extension (2031).

Intersection analysis for the operational scenarios reported on average vehicle delay and levels of service while road (mid-block) sections also reported levels of service related to volume / capacity ratios.

The assessment has identified a number of intersections where the operational performance would change significantly under the future traffic demands as modelled. The T&TTWP acknowledges that the assessment has been based on modelled traffic demand and, consequently, the outcome may be affected by the limitations of the modelling process. Moreover, the resolution of the proposed future Sydney Gateway interchange, which is still subject to refinement, would also impact on the operation of the road network in the Mascot area.

Travel times were derived from the modelling outputs as a means of quantifying measures that would directly relate to motorists.

An operational traffic review would be undertaken to confirm the operational traffic impacts of the project on surrounding arterial roads and major intersections approximately 12 months after the commencement of operation of the project. In undertaking the review, the level of service would be assessed at major intersections in the St Peters and Mascot areas, as well as at the M5 East / King Georges Road interchange. Changes in traffic levels on parallel arterial roads, such as Stoney Creek Road, would also form part of the traffic review.

The operational traffic review would be based on actual traffic counts and the methodology used would be similar to that used in the Project assessment. The results and recommendations of the review would assist the development of the RMS network operations and infrastructure provision plans.

The following are additional specific comments on the road network and traffic operations assessment:

- Details of the Project interaction with the King Georges Road interchange upgrade project need to be clarified, especially with respect to the eastbound and westbound bypass ramp arrangements. It is understood that these are required for access to the King Georges Road interchange and prevent unsafe weave manoeuvres for entering / exiting motorway traffic to/from the interchange. These will require a clear directional signage / wayfinding strategy to ensure that motorists are suitably guided and are able to travel in a safe manner.

The New M5 western portals consist of two lanes in each direction, with one lane providing a connection to/from the M5 South West Motorway and the other providing a direct connection to the King Georges Road interchange ramps. The bypass lanes would integrate with the outer lane of the interchange to eliminate the weaving movements for vehicles travelling to/from the M5 East Motorway that use the King Georges Road interchange. Wayfinding and appropriate advance warning (such as VMS) would be used communicate to motorists before these decision points.

[Noted and acceptable response.]

- At the top of page 39 of the T&TTWP (first dot point), the description indicates a right-turn restriction southbound at the Sydney Park Road / Euston Road / Huntley Street intersection. However, the St Peters interchange diagram does not show any right-turn restrictions at the subject intersection – please clarify the intersection arrangements.

The text description is correct. This will be clarified in the Submissions Report as the project does include a right-turn restriction southbound at the Sydney Park Road / Euston Road intersection.

[Noted and amended in PIR.]

- In Table 6 (page 49) of the T&TTWP, why are only two days shown for Site 1: M5 East Motorway, east of King Georges Road, when the other locations (Tables 7 and 8 following) show a whole week (7 days).

This was the only available survey data provided at that location.

[Noted – it is considered that the two survey days (Tuesday and Friday) would be generally indicative of the average weekday.]

- On page 52 of the T&TTWP, Campbell Road is incorrectly described as a regional road. Its status would be similar to Euston Road, which is a collector road. Similarly, Bourke Street is incorrectly described as a local road, when its status would be at least a collector road.

Noted. This will be clarified in the Submissions Report.

[Noted and amendment made in Submissions and PIR – refer to Section 6.4.1 (page 6-17).]

- In Section 8.3.1 (page 212) of the T&TTWP, it is incorrectly stated that there would be the removal of the General Holmes Drive link between Joyce Drive and Botany Road. This is not part of the Sydney Airport Master Plan 2033 and General Holmes Drive and Joyce Drive are to be retained and upgraded to maintain airport access (refer to Section 7.1.2 of the subject master plan document).

The description in Section 7.1.2 of the Sydney Airport Master Plan 2033 is referring to

another section of General Holmes Drive. The subject section of General Holmes Drive (the rail level crossing between Joyce Drive and Botany Road) is to be removed as part of the Roads and Maritime WestConnex Enabling Works for the Airport East Precinct.

[Noted and acceptable response.]

- A number of roads have proposed to have lane widths down to 3.0 m wide. This width is considered to be inappropriate, especially because of the relatively high heavy vehicle volumes in the St Peters area, for example. Austroads advocates a desirable 3.5 m lane width, especially where heavy vehicle volumes are significant.

The requirement of lane width does not only depend on vehicle volumes. It also depends on the design speed of the road (narrow lanes can be used for lower speed roads), and the location of the lane (inside lanes can be narrower than outside lanes). The Austroads Road Design Guide advocates a desirable width of 3.5 metres, but in recognising physical site constraints (such as property boundaries, major utility services and key infrastructures) the Guide allows a minimum width of 3.0 metres. This is particularly relevant in the case of widening existing roads where new works are often dictated by the existing geometry and property boundaries often limit the ability of the design to meet desirable requirements. The proposed lane width at the specific locations are considered to be acceptable and in compliance with the relevant design guides. Similar provisions has been adopted in other urban road upgrade projects with similar design speed and vehicle volumes in Sydney and other parts of New South Wales.

During the detailed design stage, the lane width provisions would be further developed. The design would be reviewed by Roads and Maritime and verified by an Independent Verifier to ensure that the design meets all relevant Code and Standard requirements. A Road Safety Audit would also be undertaken which assess the safe operation of the road with the given speed environment, road geometry and traffic volumes.

[Acceptable response.]

- There are proposed to be a number of turn restrictions (left-in / left-out) in the St Peters area, eg. eastbound right-turn restrictions into Brown Street, Florence Street, Church Street, Harber Street, Barwon Park Road and Burrows Road. These would require alternative (possibly circuitous) routes with suitable directional / wayfinding signage.
This is noted and appropriate signage would be incorporated into the detailed design. The design has been checked to ensure access can still be gained to all locations. In some cases, the introduction of left-in and left-out has been included to prevent rat running, for example Barwon Park Road would be left-in only to prohibit traffic from Princes Highway using Barwon Park Road (essentially a residential road) as a short cut to Campbell Road. Other restrictions on movements are due to the predicted increase in the number of vehicles using the network resulting in an increase in the number of lanes. It would no longer be safe to turn right into or out of the side roads due to vehicles having to cross the increased number of lanes against a high volume of opposing vehicles.

[Acceptable response.]

- In Figure 5-32 of the EIS, Barwon Park Road is shown as left-in only, ie. one-way northbound entry only. This contradicts the description of the intersection in Table 93 (page 246) of the T&TTWP, which indicates that it would be left-in / left-out.

The diagram is correct – Barwon Park Road would be left-in only. This will be clarified in

the Submissions Report.

[Noted and clarification made in Submissions and PIR – refer to Section 6.2 (page 6-1).]

- In Table 93 (page 246) of the T&TTWP, there is a description of the future Harber Street / Campbell Road intersection, but this is inconsistent with the closure of Harber Street and therefore no access including left-in / left-out for eastbound traffic.

Harber Street currently extends from Holland Street, across Campbell Road, and terminates north of Campbell Road to provide rear property access to residential properties and access to Sydney Park.

As stated in Table 93 of the technical working paper, Harber Street / Campbell Road would be modified to provide left-in, left-out access to maintain access to the residential properties. As stated in Table 93, the section of road south of Campbell Road (being the section between Campbell Road and Holland Street) would be permanently closed.

[Noted and acceptable response.]

- In Figure 5-33 of the EIS, there is no right-turn lane shown for the New M5 northbound ramps to Campbell Road eastbound. This contradicts the description of the intersection in Table 93 (page 246) of the T&TTWP. Significantly, this is considered to be an important movement providing access for New M5 traffic to the Campbell Road extension bridge and through to Gardeners Road.

The figure and the table are both correct. Dedicated turning lanes would be provided, but this does not extend to a right-turn lane from the New M5 northbound ramps to Campbell Road eastbound. This movement will be signed via the Gardeners Road ramps from the portal, which will allow access to the Mascot area while maintaining the Campbell Road bridge as a local traffic route.

[Noted and acceptable response.]

- In Figure 5-35 of the EIS, the Bourke Road / Gardeners Road / Bourke Street intersection shows left-turn, through and two right-turn lanes, which contradicts the description in Table 94 (page 248) of the T&TTWP.

The figure is correct. Description will be clarified in the Submissions Report.

[Noted and amendment made in Submissions and PIR – refer to Table 6.4 (page 6-17).]

- In Figure 5-33 of the EIS, Harber Street is shown to be totally closed, which contradicts the description in Section 10.3.1.5 (page 249) of the T&TTWP, which states that Harber Street would be closed between Holland Street and Campbell Road.

Figure 5-33 of the EIS shows Harber Street being partially closed – being the section of road south of Campbell Road.

Harber Street currently extends from Holland Street, across Campbell Road, and terminates north of Campbell Road to provide rear property access to residential properties and access to Sydney Park.

As stated in Table 93 of the technical working paper, Harber Street / Campbell Road would be modified to provide left-in, left-out access to maintain access to the residential properties. As stated in Table 93, the section of road south of Campbell Road (being the section between Campbell Road and Holland Street) would be permanently closed.

[Noted and acceptable response.]

- On page 252 of the T&TTWP (above Figure 73), the assessment states that “In the absence of the development of the full WestConnex program of works and the future Southern extension, additional network upgrades would be required to accommodate the 2031 ‘with project’ traffic demand in the St Peters interchange area.” However, it is unclear what these upgrades would be and who would be responsible for these. Does the Project rely on the provision of the Stage 3 network (ie. full WestConnex projects) to function adequately?

The full benefit of the WestConnex program of works, which includes Stage 3, is only achieved when all stages of WestConnex have been built. If Stage 3 and the future Southern extension were not built, then by 2031, Stage 2 on its own would not be able to accommodate the growth in traffic in the St Peters interchange area. In the event Stage 3 and the future Southern extension are not built, Roads and Maritime would consider what upgrades would be required to address the specific traffic issues and would implement them as part of a future State wide prioritised capital works program.

[Acceptable response.]

- In Section 10.3.3.3 (page 264) of the T&TTWP, there is limited context for the performance results of the five intersections that would perform poorly in 2031 ‘full WestConnex and Southern extension’ scenario. How do these compare with other scenarios, specifically the 2031 ‘do minimum’ scenario?

These locations are outside of the study area and have only been included as information to indicate further works outside of the scope of the EIS that may be required.

[Noted and acceptable response.]

- Clarification is required as to what PCU factor has been adopted for heavy vehicles, eg. the heavy vehicle PCU factor fluctuates between approximately 2.1 to 2.2 in Tables 69 and 70 (page 210) of the of the T&TTWP.

PCU factors for the different study area locations and times of day assessed were based on averages of the vehicle composition from existing traffic survey data at those locations and those time periods, eg. a PCU factor of 2.17 was used for the M5 East in the AM peak hour (Table 69 of the Technical Working Paper: Traffic and Transport) and 2.11 was used for the M5 East in the PM peak hour (Table 70 of the Technical Working Paper: Traffic and Transport).

[Acceptable response.]

- For the right-turn restriction (buses only allowed) from Euston Road southbound into Sydney Park Road westbound, there is no discussion on potential ‘rat-run’ impacts due to vehicles travelling via alternative routes south to west, eg. via Maddox Street and Mitchell Road.

Section 4.1.3.2 (page 39) of the Technical Working Paper: Traffic and Transport presents a discussion on an intersection treatment at the Sydney Park Road / Mitchell Road intersection, namely banning the right turn from Mitchell Road into Sydney Park Road, to stop the potential ‘rat-running’ due to the right-turn restriction (buses only allowed) from Euston Road southbound into Sydney Park Road. This was included in the modelling.

[Noted and acceptable response.]

3.4 Parking and Access

Generally, the assessment of impacts related to parking and access have been undertaken adequately. While the loss of on and off-street parking has generally been identified in the short-term (during construction) and permanent (during operations) scenarios, there have not been any measures proposed to mitigate these impacts, eg. refer to *Table 110* (page 267) of the T&TTWP for the loss of on-street parking due to road network changes.

Temporary off-street parking opportunities at those properties that are being resumed / acquired as part of the project would be investigated during detailed design. These may be provided for use by residents and/or businesses affected by changes to existing parking conditions during the period of temporary affectation.

[Noted and acceptable response. However, clarification is required of the investigation process including who would be responsible and the timing of the provision of temporary / permanent replacement parking.]

In accordance with New M5 draft condition D55 (vii), the D&C Contractor would prepare a parking strategy as part of the Construction Traffic and Access Management Plan, detailing reductions in on-street parking consequent to construction activities, proposed construction staff parking arrangements and measures to reduce on-street parking impacts including working with the relevant councils to introduce parking restrictions adjacent to work sites and compounds.

[Noted and acceptable response.]

A miscellaneous comment related to parking is as follows:

- In *Table 65* (page 192) of the T&TTWP, the likely construction employee peak does not correlate with (is lower than) the predicted number of construction staff described in *Section 7.1.3.1* (page 96). This may result in an inadequate number of on-site parking spaces and resultant impacts on surrounding off-site parking.

In Table 65, the sum of peak employees equates to 954 employees, while Section 7.1.3.1 states “during peak construction, the project would generate about 1,550 full time positions”. Both figures are correct. The higher figure shows the number of positions created as a result of the project, however not all positions are necessarily filled and engaged concurrently for the full construction period – particularly sub-contracted positions for specialist work. The 954 figure describes the peak number of positions that are working concurrently on the project or peak at one given time.

[Acceptable response.]

3.5 Public Transport Operations

Generally, the assessment of public transport (bus services) has been undertaken adequately. However, the discussion on opportunities to improve public transport (bus) patronage along the New M5 corridor is minimal, particularly along parallel bus routes, eg. Stoney Creek Road, Canterbury Road. This includes the potential to improve future bus operations (eg. bus lanes and other bus priority measures) through inclusion as part of the model scenarios.

It is acknowledged that the project offers a flexible design which does not preclude bus priority measures being included in the future and the surface road network can be adapted to include measures identified at a future date.

During operations, and also potentially during construction, a number of intersections and road sections have been identified as having a reduction in level of service and/or an increase in traffic leading to longer journey times due to increased congestion.

In *Section 8.2.4 (page 211)* of the T&TTWP, there is no discussion on the impacts (changes) of bus transport along parallel routes (eg. Stoney Creek Road, Canterbury Road, General Holmes Drive) and north-south routes (eg. Kingsgrove Road, Bexley Road) in future scenarios. Similarly, in *Section 10.2.4 (page 242)* of the T&TTWP, there is minimal discussion on the effects on public bus transport along parallel / nearby routes (eg. Stoney Creek Road, General Holmes Drive), which are forecast to experience traffic increases.

As noted in section 8.2.4, there is a planned rapid bus route between Hurstville and Macquarie Park via Burwood (current route M41), with a commitment to deliver bus priority along the corridor, including on Stoney Creek Road and Bexley Road. The forecast increase in traffic volumes along these roads would be reviewed as part of an operational traffic review undertaken on the surrounding arterial roads and major intersections about 12 months after the commencement of operation of the project. Roads and Maritime and Transport for NSW would continue to work together to deliver Sydney's Bus Future, with the surface road network being adapted to include bus priority measures already identified, as well as those identified at a future date.

[Noted and acceptable response.]

3.6 Pedestrian / Cyclist Issues

In general, the assessment of pedestrian and cyclist issues has been adequately assessed especially at and around the St Peters interchange area. The resultant impacts have been assessed to be largely insignificant.

Regionally significant cycleway routes are proposed to be created to provide east-west connectivity across Alexandra Canal connecting the Bourke Road cycleway to St Peters at Unwins Bridge Road. Such infrastructure would increase active transport links for existing and future growing populations in the surrounding areas.

The following miscellaneous comments relating to pedestrian and cyclist travel are provided:

- In *Table 4 (page 44)* of the T&TTWP, the average daily bicycle volumes seem unrealistically low. Please confirm that these are correct and if so, clarify whether there could be any reason for such low volumes, eg. timing of survey.

This was from data sourced from the King Georges Road Interchange Upgrade EIS report. The original survey data supports the low volumes. The counts were done for a week in May 2014. There may have been inclement weather or, as stated in the report, the low volumes could be due to the availability of a parallel off-road shared path and the volume of traffic on the M5 East Motorway.

[Noted – while the bicycle volumes in the assessment report are not considered to be indicative of typical daily volumes, it is acknowledged that bicycle use along the M5 East Motorway carriageways is relatively minor due to the availability of a parallel off-road shared path and the high volumes of traffic on the motorway.]

- At the end of *Section 5.3.4* (page 64 of the T&TTWP), there is no discussion on how Marrickville Council's strategic bicycle plan would connect / interact with the Project's cycleway proposals.

The interactions of the project's cycleway proposals are discussed in Sections 10.2.5 and 10.3.5.

[Noted and acceptable response.]

3.7 Construction Phase Issues

It is considered that the assessment generally covers construction impacts thoroughly. As part of the identification of traffic impacts, a 2016 model was prepared to determine the impact of construction traffic on background traffic levels during the peak construction period.

The locations of site compounds and other construction facilities are generally reasonable with suitable access onto the major road network ensuring heavy vehicle transport routes minimise impacts on local roads in particular. While some local roads (eg. Garema Circuit / Wirega Avenue) are required to be used for heavy vehicle access to work sites, it has been acknowledged that preparation of suitable traffic management plans (TMPs) and traffic control plans (TCPs) to appropriate standards would be undertaken.

The general objectives for traffic management of construction activities are considered to be reasonable and adequate. These have been detailed in suitable form within the assessment and would form the basis in the preparation of a project Construction Environmental Management Plan (CEMP), which would include a Traffic Management and Safety Plan (TMSP) prepared by SMC to the satisfaction of relevant local Councils and RMS.

The construction contractor would take all reasonable measures to ensure that road user delays are kept to an absolute minimum and that access is maintained for all road users. In addition to development of a TMSP, there would be a range of mitigation measures / strategies implemented to manage and control traffic during construction. The most significant of these is to maintain existing peak period road network capacity during construction unless approval is obtained from RMS, TMC or relevant stakeholders.

The following miscellaneous construction-related comments are provided:

- In *Section 7.3* of the T&TTWP, direct access to construction compound C1 to/from M5 East Motorway is not clearly shown in *Figures 33 and 34* (pages 105 / 107) but is shown indicatively as part of construction routes in *Figure 39* (page 123).

Figures 33 and 34 will be updated in the Submissions Report to show the direct access off the M5 East Motorway.

[Noted and shown in Submissions and PIR – refer to *Figure 6-2* (page 6-11).]

- In *Tables 40, 41, 46, 56, 57 and 67* of the T&TTWP, the hourly peaks and daily volumes for construction traffic do not correlate, eg. in some cases daily volumes are greater than the hourly peaks multiplied by 24 (hours in a day), while in other cases, hourly peaks are simply 1/24 of the daily volumes, which is not a peak but just an hourly volume averaged over the day. Moreover, the hourly peak for light vehicles (staff) is too low. Staff traffic should correspond (approximately) to the number of staff at each site arriving and departing during an hour with peaks at shift changeover and start / finish times.

Consequently, intersection and road network operations / performance results in *Tables*

42, 43, 47, 48, 58 and 59 of the T&TTWP may need to be re-assessed based on amended peak hourly and/or daily traffic volumes.

There is a difference in the correlation between the AM peak and PM peak vehicle numbers per hour to the daily vehicle numbers in a number of instances in Tables 40, 41, 46, 56 and 57. On review of the construction activities, it has been confirmed that the AM peak and PM peak values for the sites are correct. This results in a reduction in daily vehicle movements; consequently the values currently in the identified tables are conservative. This conservative assumption flows into Table 67 identified in the gap analysis.

Regarding the staff level comparison to LV traffic, staff traffic movement is outside the peak hour times as travel to and from work for construction projects occurs outside the identified peak traffic periods (arriving / leaving work prior to 7 am and arriving / leaving after 6:30 pm, depending on which shift they are working).

Regarding the updating of results for the modelling identified for Tables 42, 43, 47, 48, 58, and 59; as the correct AM peak and PM peak values were used, there would be no requirement to remodel the intersection and road network operations.

[Acceptable response.]

- The construction vehicle routes to construction compound C3 only allow access to/from the east via the Kingsgrove Road ramps with no routes indicated to/from the west. Similarly, the routes to construction compound C5 only allow access to/from the west via the Bexley Road ramps with no routes indicated to/from the east.

Noted. The impacts have been assessed as per the routing described.

[Acceptable response.]

- In Section 7.3.6.2 (page 131) of the T&TTWP, there is a wider area of intersections (road network) potentially affected that have not been considered by the assessment, eg. Bexley Road / Canterbury Road, Moorefields Road / King Georges Road, etc.

The selected intersections were chosen as those on which the construction traffic would likely have the largest impact. As the impact on these intersections was relatively small, it was likely that the impact would be similar on other intersections; therefore impact assessments on further intersections were not considered necessary.

[Acceptable response.]

- In Table 43 (page 135) of the T&TTWP, there is a wider area of intersections (road network) potentially affected that have not been considered by the assessment, eg. Stoney Creek Road, Canterbury Road, etc.

The selected roads were chosen as those on which the construction traffic would likely have the largest impact. As the impact on these roads was relatively small, it was likely that the impact would be similar on other roads; therefore impact assessments on further roads were not considered necessary.

[Acceptable response.]

- In Section 7.4.1 (page 149) of the T&TTWP, it is assumed that the proposed widening of Marsh Street will be completed prior to start of operations at the Arncliffe construction compound (C7) access. What are the implications for access to the Arncliffe compound if the Marsh Street widening has not been completed?

Traffic controllers would be engaged to maintain access to the Arncliffe compound

should the widening of Marsh Street be delayed.

[Noted and acceptable response – to be covered in the Project TMSP.]

- In Section 7.4.1 (page 149) of the T&TTWP, parking within the Arncliffe construction compound (C7) is described as 180 parking spaces. However, this appears to be spread between the northern and southern ends of the compound site (refer to Figure 47 on page 151). Moreover, it is unclear why there are approximately 30 parking spaces at the southern end of the site where there appears to be minimal access to site sheds and other facilities.

The 30 spaces shown at the southern end is to accommodate sub-contract staff and overflow parking from the northern parking area.

[Noted and acceptable response.]

- In Figure 48 (page 153) of the T&TTWP, there is no construction vehicle route shown exiting to the north from the Arncliffe construction compound (C7).

Figure 48 will be updated to include this route north on Marsh Street.

[Noted, however Figure 6-3 (page 6-13) in the Submissions and PIR does not show any construction vehicle route exiting to the north to either Marsh Street or Princes Highway. Clarification / further information is required as part of the preparation of the construction TMSP.]

Fig 6-3 in the submissions report is correct. There are two exit options from the construction compound. One is shown in purple and is a left turn onto Marsh St and then heading west on the M5 East. The other option, shown in blue, is to turn left onto Marsh St, turn left onto West Botany St, turn right onto Wickham St and turn left onto Princes Highway.

[Noted, it is maintained that Figure 6-3 (page 6-13) in the Submissions and PIR does not show any construction vehicle routes exiting to the north or east, ie. towards the Eastern Suburbs and Lower North Shore (eg. Maroubra, Botany, Randwick, North Sydney and beyond) or Inner South-Western suburbs (eg. Tempe, St Peters, Alexandria, etc.). It is envisaged that the route would follow the exit route shown in purple but instead of turning west (right) onto the M5 East, vehicles would turn east (left) onto the M5 East and head towards Southern Cross Drive from where they could access the Eastern and Inner South-Western suburbs. Clarification / further information will be required as part of the preparation of the construction TMSP.]

- In Table 47 (page 154) of the T&TTWP, there is a wider area of intersections (road network) potentially affected that have not been considered by the assessment, eg. Princes Highway / West Botany Street.

The selected intersections were chosen as those on which the construction traffic would likely have the largest impact. As the impact on these intersections was relatively small, it was likely that the impact would be similar on other intersections; therefore impact assessments on further intersections were not considered necessary.

[Acceptable response.]

- The intersection / road network performance results for the Marsh Street / M5 East Motorway interchange (Table 47 and 48 of the T&TTWP) do not reflect on-site conditions. Anecdotal evidence / site observations indicate very poor operations (long

queues and severe congestion) for vehicles trying to access the existing M5 East Motorway westbound tunnel off Marsh Street.

It is noted in the text above Table 47 in the T&TTWP that the level of service may not be reflective of actual conditions for intersections that are part of a co-ordinated system of signalised intersections, due to assessing them as standalone intersections. However, the impact of the construction traffic can be measured and reported.

[Acceptable response.]

- In Section 7.5.1 (page 162) of the T&TTWP, there is no description of site access arrangements to/from the construction compound C8 site, eg. left-in / left-out movements off the northern side of Canal Road or some other arrangement?

The Canal Road compound would be serviced by two access points. The first, which would service areas of the compound located closest to the Princes Highway / Canal Road intersection would be a left-in, left-out configuration. The second access point, located further south, would allow for left-in and right-out turning movements via modifications to an existing signalised intersection opposite Cooks River Rail Terminal.

Figure 54 of the Traffic and Transport Technical Paper does depict a right-turn out from the first access point. This would not be provided and will be clarified in the Submissions Report.

[Noted and shown in Submissions and PIR – refer to Figure 6-4 (page 6-15).]

- In Figure 54 (page 175) of the T&TTWP, the western site access for construction compound C8 shows a right-turn exit movement into Canal Road westbound. It is unclear how this right-turn movement would work and there is no indication of any road adjustment works, eg. removal of central median and part of the Canal Road westbound right-turn bay approaching Princes Highway.

Figure 54 of the Traffic and Transport Technical Paper does depict a right-turn out from this access point. This would not be provided and will be clarified in the Submissions Report.

[Noted and shown in Submissions and PIR – refer to Figure 6-4 (page 6-15).]

- In Table 63 (page 186) of the T&TTWP, the temporary loss of on-street / off-street parking during the construction period has been detailed, however there have not been any measures proposed to mitigate these impacts.

Temporary off-street parking opportunities at those properties that are being resumed / acquired as part of the project would be investigated during detailed design. These may be provided for use by residents and/or businesses affected by changes to existing parking conditions during the period of temporary affectation.

[Noted and acceptable response. However, clarification is required of the investigation process including who would be responsible and the timing of the provision of temporary replacement parking.]

In accordance with New M5 draft condition D55 (vii), the D&C Contractor would prepare a parking strategy as part of the Construction Traffic and Access Management Plan, detailing reductions in on-street parking consequent to construction activities, proposed construction staff parking arrangements and measures to reduce on-street parking impacts including working with the relevant councils to introduce parking restrictions adjacent to work sites and compounds.

[Noted and acceptable response.]

- In Table 64 (page 192) of the T&TTWP, the number of parking spaces within the Arncliffe construction compound (C7) is shown as 220, which contradicts the 180 parking spaces described in Section 7.4.1 (page 149) of the T&TTWP.

180 spaces is proposed at this compound. Section 7.4.1 is correct.

[Noted – no amendments made in Submissions and PIR but 180 spaces accepted as correct.]

- Note 3 of Table 64 (page 193) of the T&TTWP: clarification is required as to whether the likely employee peak includes double the number of staff (when shifts overlap) or just the maximum number of staff (one shift replaces the other).

The likely employee peak includes the combined overlap i.e. double the number of staff.

[Noted and acceptable response.]

- The cumulative impacts described at the end of Section 7.8.2 (page 203 of the T&TTWP) indicate that other projects are unlikely to contribute substantially to cumulative traffic impacts in the vicinity of the project during its construction phase. This is debatable, especially for projects near to construction compound sites, eg. Wollie Creek development, which is close to construction compound C7.

Noted – no response required.

[It is debatable that cumulative impacts would be insignificant – these would need to be covered in the Project TMSP once the full extent of nearby projects and their traffic generation is determined / available.]

- There seems to be minimal discussion on the scheduling of construction transport movements, especially with respect to cumulative impacts.

Scheduling of transport movements is largely dictated by the program. The construction activities that generate the majority of the traffic movements are associated with the major construction activities, including tunnelling, which are critical path activities. Offset traffic movements would naturally occur due to:

- *Shift change-over times at sites traditionally occurring outside AM and PM Peak traffic movements.*
- *Delivery of major construction equipment required 'out-of-hours' (OOH).*
- *Specific construction activities occurring during night shift to manage traffic interfaces.*
- *Site deliveries to interface with spoil truck movements.*

It should be noted that focus has been given to other mitigation methods (which are not naturally occurring) to minimise the impact of construction traffic, including:

- *Choice and layout of sites that allow direct connection from tunnel sites to M5 East, which has the capacity to accommodate the additional traffic.*
- *Exploring 24-hour truck haulage where feasible based on M5 East connections (rather than spoil haulage being confined to day time) and therefore spreading the traffic load across 24 hours.*
- *Maximising the entry and exit points to sites to / from arterial roads commonly used by heavy vehicles.*
- *Spoil haulage will be limited and managed during peak hours and special events.*

[Noted and acceptable response. It is envisaged that the task of 'exploring' 24-hour truck haulage would be resolved as part of the preparation of the Project TMSP.]

- In Table 68 (page 207) of the T&TTWP, the 'Road network performance and delays' section should include a measure to maintain peak period traffic capacity throughout the study area network and even though capacity may be reduced during the off-peak periods, the network performance would be no worse than during peak periods.

No part of the road reserve can be occupied without first obtaining a road occupancy licence issued by RMS Transport Management Centre. This licence will come with Conditions of Approval that consider clearway and regulatory restrictions as well as the requirements of Appendix C.4 of the SWTC – Road Occupancy and Site Access Requirements. The purpose of these approval conditions is to ensure the capacity of the network is maintained.

[Noted and acceptable response.]

- If the off-site spoil destinations and haulage routes adopted for assessment (ie. to/from the west and south) were not actually used during construction, the CEMP would need to address possible impacts resulting from trips in other directions, especially if travelling to the east and/or north.

Noted – no response required.

[Noted and acceptable response.]

- The Marsh Street Ponds construction site requires construction vehicles to access the site via Eve Street. The assessment states that access would be via the West Botany Street / Eve Street intersection (page 2-5 of Appendix C in the Submissions and PIR). However, clarification is required whether this would be restricted to left-in / left-out movements only between West Botany Street and Eve Street – there is currently a right-turn restriction out of Eve Street onto West Botany Street. It is noted that the assessment states that construction vehicles would access the site by turning left off Marsh Street into Eve Street and turning left out of Eve Street into Marsh Street (Section 4.1.1 of the Submissions and PIR). This is incorrect because there is no direct access between Marsh Street and Eve Street.

The access to the site is left from West Botany Street into Eve Street and the exit is left from Eve Street into West Botany Street.

In Section 4.1.1 (page 4-1 of Appendix C in the Submissions and PIR), the reference to Marsh Street should be West Botany Street.

[Noted and acceptable response.]

3.8 Miscellaneous Issues

While the methodology of the assessment was adequate, the wording used throughout the assessment document was at times vague, ambiguous and/or non-committal with respect to what is being proposed, eg. 'would be considered / investigated / explored', 'may include', 'may be used', 'consideration would be given to', etc. It becomes unclear what potential impacts or implications there would be if a particular issue is unresolved / not acted upon / not found to be feasible, etc. Clarification and/or commitments are required to fully understand the Project being proposed.

The following additional miscellaneous comments are provided:

- In *Figure 7 (page 19)* of the T&TTWP, it is assumed that the “%” in parentheses are heavy vehicle percentages.

This is a correct assumption.

[Noted and acceptable response.]

- In *Figure 13 (page 37)* of the T&TTWP, it appears that the Burrows / Campbell intersection is shown along Bourke Road, north of Gardeners Road, where there is no existing intersection.

Assuming the comment is about the Bourke Rd / Campbell Street intersection, this is a new intersection to be built as part of the project, so it is shown in the modelled network extents in Figure 13.

[Noted and acceptable response.]

- In *Section 9.2 (page 222)* of the T&TTWP, the text states “shown as the red dot on Figure 66”. Figure 66 has no red dot shown.

Noted.

[The text provides an adequate description for assessment.]

- In *Section 10.2.1.2 (page 238)* of the T&TTWP, the report states that between the Southern Extension and the St Peters interchange, the number of lanes would expand to four lanes in each direction. This contradicts *Section 1.2* of the T&TTWP (Overview of the project), which indicates there would only be two lanes in each direction with future capability for 3, 4 or 5 lanes (subject to future assessment). Therefore, *Table 87 (page 239)* should only be assessing two lanes rather than four lanes.

The description in Section 1.2 explains that between Arncliffe and St Peters (ie. between the Southern Extension and the St Peters interchange) the tunnels would be built to be five lanes, but marked for two lanes. It then describes the future capability for 3, 4 or 5 lanes (subject to future assessment). For the analysis in Section 10.2.1.2, four lanes were assumed in the concept design. Therefore, there is no contradiction between the assessment and the description.

[Noted and acceptable response.]

4. Conclusions & Recommendations

4.1 Conclusions

The following conclusions are provided in the peer review of the proposed Project's traffic and transport assessment:

- In general, the assessment has been undertaken quite thoroughly with an appropriate methodology. This is particularly the case for the modelling tasks, which incorporated an independent peer review, thus providing a high level of confidence in the outputs and is considered to be an excellent approach to ensure rigorous model results.
- An operational traffic review is proposed to be undertaken to confirm the operational traffic impacts of the project on surrounding arterial roads and major intersections 12 months after the commencement of operation of the project. The review aims to address several operational issues including unsatisfactory intersection and road network performance and bus network operations. As part of the review process, tasks would include monitoring traffic patterns and operations, especially at critical intersections and sections of road network, assessment of operations, and development and implementation of road network mitigation improvements for areas where consequent traffic performance is at unsatisfactory levels once the Project is operating.

It is considered that the timing of the operational traffic review (12 months after operations have started) is considered a weak and reactive approach to the assessment. One of the objectives of the modelling task is to make predictions on future traffic operations, which can then be acted upon to determine appropriate mitigation measures. While a post-operations review is considered prudent and should be undertaken, it should not be in lieu of a suitable assessment during the EIS process. Moreover, it is unclear who would be responsible for the review assessment, who would be responsible for implementation of any actions arising from the review, what timeframe would be agreed to and how any works would be funded. In summary, there are too many unknowns related to the post-operations review process.

- The modelled traffic volume outputs were reported at eastern and western screenlines, which are useful in gaining an understanding and comparison of future year volumes and patterns in the project corridor for each modelled scenario, traffic flows along the M5 East mainline and the level of traffic that would potentially transfer to the project from parallel routes along the surrounding road network
- Generally, the assessment of impacts related to parking and access have been undertaken adequately. While the loss of on and off-street parking has generally been identified for the short-term (during construction) and permanent (during operations) scenarios, there have been limited measures proposed to mitigate these impacts. Replacement parking is to be investigated during detail design, however clarification is required of the investigation process including who would be responsible and the timing of the provision of permanent replacement parking.

- While the assessment of public transport (bus services) has been generally undertaken adequately, the discussion on opportunities to improve public transport (bus) patronage along the New M5 corridor is minimal, particularly along parallel bus routes, eg. Stoney Creek Road, Canterbury Road. This includes the potential to improve future bus operations (eg. bus lanes and other bus priority measures) through inclusion as part of the model scenarios. It is noted that the Project does not preclude bus priority measures being included in the future and the surface road network can be adapted to include measures identified at a later date.
- In general, the assessment of pedestrian and cyclist issues has been adequately assessed (eg. at and around the St Peters interchange area) considering the majority of network changes associated with the project occur underground and at existing intersections. The resultant impacts have been assessed to be largely insignificant.
- The assessment generally covers construction impacts thoroughly with a 2016 model prepared to determine the impact of construction traffic on background traffic levels during the peak construction period. The general objectives for traffic management of construction activities are considered to be reasonable and adequate, have been detailed in suitable form within the assessment and would form the basis in the preparation of a Project Construction Traffic Management and Safety Plan (TMSP). The locations of site compounds and other construction facilities are generally reasonable with suitable access onto the major road network.
- A Traffic Management and Safety Plan (TMSP) would be prepared as part of the Construction Environmental Management Plan (CEMP). The TMSP would include the guidelines, general requirements and principles of traffic management to be implemented during construction and prepared in accordance with relevant guidelines and in consultation with, and to the satisfaction of relevant local councils and RMS. It would aim to minimise delays and disruptions, and identify and respond to any changes in road safety as a result of road network construction works.
- As part of the Submissions and Preferred Infrastructure Report, *Table 8.1 (page 8-2)* provides a summary of environmental management measures including TT01 to TT15 for measures during construction, OpTT01 to OpTT03 for measures during operations and CI01 to CI02 for cumulative impact measures.

4.2 Recommendations

Based on the findings of this review, the following Draft Conditions and actions by the proponent are recommended:

1. Prior to Project construction, the preparation of a construction Traffic Management and Safety Plan (TMSP) would need to be undertaken by the chosen contractor in consultation with, and to the satisfaction of relevant local councils and RMS. The overall Project TMSP should include, but not be limited to, the following:
 - Construction car parking strategy including clarification of the investigation process for replacement parking, eg. who would be responsible and the timing of the provision of parking;
 - Haulage movement work hours / numbers / routes including clarification of the construction vehicle route for vehicles destined to the north and east when exiting from the Arncliffe construction compound;
 - Detailed travel management strategy for construction staff, eg. Green Travel Plan;
 - Maintaining peak period traffic capacity throughout the study area network and even though capacity may be reduced during the off-peak periods, the network performance would be no worse than during peak periods;
 - Maintaining adequate bus operations, especially in and around the St Peters works area;
 - Maintaining pedestrian and cyclist links / routes / connectivity during the construction period;
 - Independent road safety audits on construction-related traffic measures; and
 - Measures to account for any cumulative activities / work zones / other development and infrastructure projects operating simultaneously.

The TMSP would need to be a Condition.

2. Prior to Project implementation, detail the responsibilities for the post-operations review including (as a minimum) who would be responsible for the review assessment, who would be responsible for implementation of any actions arising from the review, what timeframe would be agreed to and how any works would be funded. The post-operations review should be used to monitor traffic patterns and operations, and implement road network mitigation improvements for areas where consequent traffic performance is at unsatisfactory levels after construction of the project. The review should take into account all road transport including bus operations as well as road safety issues related to vulnerable road users such as pedestrians and cyclists.
3. Prior to Project implementation, determine responsibilities for the investigation and funding in the provision of permanent replacement parking including the timing of replacement parking provision.
4. Independent road safety audits are to be undertaken for all stages of further design development. Any issues identified by the audits will need to be closed out to the satisfaction of the relevant authorities including RMS and/or Councils.