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6 November 2015

Frankie Liang

Ms Carolyn McNally
Secretary
Department of Planning & Environment
GPO Box 39
Sydney NSW 2001

Attention: Brent Devine, Senior Planner, Infrastructure Projects

Dear Ms McNally

RE: WESTCONNEX M4 EAST (SSI 6307) – NOTICE OF PUBLIC EXHIBITION.

We thank you for the opportunity for Strathfield Council to provide comment in respect to the above matter.

Council, at its Meeting on 3 November 2015, resolved (321/15):

> *"1. That the Council endorse the draft submission prepared in response to the M4 East Environmental Impact Statement.*
>
> *2. That Council forward the submission to the Department of Planning & Environment for consideration."*

Please therefore find the enclosed Council's submission for your consideration including:

- Council's Final Submission (as endorsed on 3 November 2015)
- Traffic Review Report prepared by Bitzios Consulting (dated 22 October 2015)
- Air Quality & Contamination Review Report prepared by SLR Consulting (dated 22 October 2015)
- Noise & Vibration Review Report prepared by Wilkinson Murray (dated 21 October 2015)

Whilst Council is supportive of the overall intent of the WestConnex project, Council's submission also highlights a series of concerns with the current M4 East Project Design as further detailed in its submission and consultants' reports:

- The EIS Traffic and Transport assessment fails to adequately assess the impacts on the already congested local roads and the North-South access routes and arterial roads in the Homebush and Strathfield precinct. Therefore, the detailed traffic / transport modelling should be publicly released for Council to ascertain the impact.
- The proposed new M4 west-bound on-ramp would have less impact on the Homebush section of Parramatta Road and the surrounding local road network if it was to be

located in the vicinity of where it currently exists (i.e. the Leicester / Concord Parramatta Road intersection).

- The proposed westbound on-ramp at 15 Parramatta Road / Arnotts Reserve will drastically impact the quality and amenity of the Arnotts Reserve and its important role in the Powells Creek Open Space network. Therefore, Council requests it be relocated from the currently proposed location.
- Council strongly requests that an air filtration system or treatment system be installed to the ventilation stacks so the ventilation stacks do not add to or increase the current level of air pollution in the Homebush precinct.
- All the storeys of existing multi-unit residential buildings, where identified as exceeding the NSW Noise Criteria Guideline, should be provided with additional acoustic treatment and buffering.
- The EIS fails to provide a detailed cost-benefit or economic analysis or any analysis of other alternatives, such as improved public transport systems or widening of existing roads, to ascertain the cost-effectiveness.
- WestConnex Delivery Authority is requested to adequately compensate not only the properties to be acquired but also the impacted nearby properties that are not being acquired.

For further details, please refer to the attached Council's final submission (as endorsed on 3 November 2015).

Should you have any questions regarding this letter, please contact Frankie Liang, Council's Acting Manager Strategic Planning on 9748 9995.

Yours sincerely,

DAVID BACKHOUSE
GENERAL MANAGER

STRATHFIELD COUNCIL SUBMISSION

WESTCONNEX M4 EAST APPLICATION NO SS1 6307 – ENVIRONMENTAL IMPACT STATEMENT (EIS)

Strathfield Council is supportive of the overall intent of the WestConnex project, particularly reducing vehicle travel from Homebush to Haberfield. However, there are a number of critical local impacts as a result of the current Project Design contained in its Environmental Impact Statement that Council has concerns with as detailed herein.

This submission takes into account previous Council resolutions, internal and external technical analysis on issues and community feedback. These issues are identified and outlined as below:

1. Traffic and Transport:

Council engaged Bitzios Consulting to review the EIS in regards to traffic and transport impact. The feedback and comment is summarised as follows:

- In general, the EIS Traffic and Transport assessment scope is limited to key east west roads and intersections immediately adjacent to the M4 and Parramatta Road corridors. It fails to adequately assess impacts on local roads and the North-South access routes and arterial roads.
- The proposal's attractiveness to encourage additional traffic into the corridor is significant and is therefore expected to have traffic impacts in the broader corridor, including to the North-South connecting routes to ramps and interchanges. The EIS has failed to model or identify these impacts.
- The EIS fails to demonstrate the detailed modelling / assessment of the proposed new westbound Homebush on-ramp (at Arnotts Reserve) to assist in identifying its local road impacts on Parramatta Road and the local roads south of the on-ramp.
- The proposed new M4 west-bound on-ramp would have less impact on the local road network if it was to be located to the Leicester / Concord Parramatta Road intersection (where it currently exists).
- Overall, there is insufficient level of detail in the EIS traffic modelling to determine operational period impacts on local roads.
- The existing service level of key intersections (Cantenary Drive / Arthur Street, Centenary Drive / Marlborough Road / existing M4 westbound on-ramp, Parramatta / Leicester Avenue) in and surrounding Strathfield Local Government Area has already been poor. The traffic impact will be exacerbated due to the increase volume of local and regional traffic as a result of M4 capacity increase.
- Most of the north-south routes in or adjacent to the Council LGA (i.e. Concord Road, Underwood Road and Homebush Bay Drive which currently are congested) will be affected by the construction traffic movements (e.g. access to and from the construction compound).
- Mitigation measures include some temporary widening works, and traffic management plan to address loss of on street parking due to these works.

- Subsequent WDA Construction Traffic Management Plans will need to specifically restrict heavy vehicle usage of Bridge Road, the Subway Lane underpass and other local roads south of Parramatta Road.
- Bus priority measures should be considered in more details, in particular considering these routes feed buses through to Homebush and Strathfield Station.

The full Traffic Review report is attached with this Submission (see Appendix 1).

2. Air Quality Impact:

Council engaged SLR Consulting to review the EIS in regard to air quality impact. The feedback and comment is summarised as follows:

- Further justification for use of the specific dispersion model (Section 8.3 of the EIS) in this assessment (given that this is not a well recognised method), and its methodology (e.g. the computation of 'steady state concentration field', meteorology used, wind speed reduction in height etc.) is required by WDA.
- Further clarification of Sensitivity tests (taken into account that the street canyon effects may be significant) is required by WDA.
- Based on the above additional justification and further clarification sought from WDA, it is strongly recommended that a program of validation testing is performed to verify the assumptions presented in the report.
- The EIS fails to provide detailed discussion of impacts at 15 Parramatta Road (Arnotts Reserve open space) and surrounding approved multi-level residential development at 17-35 Parramatta Road, Homebush in its Air Quality Impact Assessment Report. Given the significant impact of the Westbound Homebush On-Ramp (over Arnotts Reserve), Council **requests** a separate detailed analysis at this particular location from WDA.
- Council strongly **requests** that an air filtration system or treatment system be installed to the ventilation stacks so the ventilation stacks do not add to or increase the current level of air quality in the Homebush precinct.

The full Air Quality Review report is attached with this Submission (see Appendix 2).

3. Contamination Impact:

Council engaged SLR Consulting to review the EIS in regard to the contamination impact. The feedback and comment is summarised as follows:

- The EIS fails to provide a detailed plan for waste classification or identification of contamination hotspots in accordance with NSW EPA guidance and its previous request.
- A Site Auditor should be appointed to maintain project continuity and to ensure that appropriate contamination assessment and consequent remediation measures be adopted.
- The investigations of individual properties' site assessments may not meet the NSW contamination management guidelines.
- Clarification is sought from WDA regarding the extent of investigation required and direction to be provided to contractors regarding the Asbestos fragments identified in fill soils in this corridor.
- It is recommended that further waste classification, waste management options, and disposal routes are considered as part of the approval.

The full Contamination Review report is attached with this Submission (see Appendix 2).

4. Noise & Vibration Impact

Council engaged Wilkinson Murray to review the EIS in regard to Noise & Vibration impact. The feedback and comment is summarised as follows:

- Further clarification is required from WDA as to whether the existing multi-level residential buildings, which are already impacted by existing traffic noise, would be provided with additional acoustic treatment and buffering as a result of the proposed development.
- The EIS fails to demonstrate the reasons why it would be "generally not feasible and reasonable to provide at-receiver noise mitigation to multi-level receivers", given precedents in other transport projects (e.g. Lane Cove Tunnel Development).
- All the storeys of existing multi-unit residential buildings, where identified as exceeding the noise criteria, should be provided with additional acoustic treatment and buffering.
- The noise from the proposed Homebush ventilation stacks should not exceed the noise criteria with the relevant numeric controls included in any project approval.
- The EIS fails to demonstrate a commitment to use the construction noise management used by Transport for NSW or to develop such strategy specific for WestConnex – M4 East project.
- The noise mitigation measures should be considered for the approved development at 17-35 Parramatta Road & 5 Powell Street, Homebush adjacent to the M4 East corridor.

The full Noise & Vibration Review report is attached with this Submission (see Appendix 3).

5. Human Health Impact

- There is likely potential for the M4 East Project to impact negatively on human health during and after construction due to:
  - Increase in dust particulates from construction activities and plant equipment
  - Increase in CO_2 emission from increase traffic congestion
  - Increase noise, including vibration from construction activities and idling and moving traffic
  - tunnel ventilation stack not being filtered
  - tunnel ventilation located close to residential areas
    - Increase in CO_2 emission from greater number of vehicles entering, leaving and using the M4 and its adjoining road network.
- With respect to increase in CO_2 emissions, the unfiltered stack are relying on mixing CO_2 from tunnels with clean air and redistributed this to maintain local air quality. This methodology relies on a number of underlining favourable metrological factors such as prevailing winds conditions & low level of air pollution within the Sydney basin to achieve effectiveness use of the ventilation stack in maintain current of communities adjacent and surround the WestConnex M4 East.
- Furthermore the EIS acknowledges that point source pollution from the stack will impact residents in close proximity to the ventilation stacks, but the impact will be minimal.
- Although the WestConnex M4 East will more than likely provide a better road network for Metropolitan Sydney, it may come at a cost to the health and amenity of local residents adjacent and near to WestConnex M4 East and adjoining road networks.

- Therefore Council strongly **requests** that an air filtration / treatment system be installed to the ventilation stacks to ensure the M4 East tunnel project does not decrease existing air quality so as to not negatively impact human health.

6. Impact on Arnotts Reserve

- The proposed westbound on-ramp at 15 Parramatta Road / Arnotts Reserve will drastically impact the quality and amenity of the Arnotts Reserve and its important role in the Powells Creek Open Space network.
- The quality of this critical and valuable open space land would be severely impacted and degraded by the proposed M4 westbound on-ramp. Effectively, this section of the Arnotts Reserve would have the similar amenity of a traffic island.
- The Powells Creek Open Space Corridor has long been identified as a key open space corridor between Sydney Olympic Park, Homebush and Strathfield. This has been included in various planning documents including the Planning NSW (March 2003) Powells Creek Landscape Design Framework Study. In addition, Council is currently managing the remediation of Arnotts Reserve land to enable the full connection of the open space corridor to Parramatta Road. The state government has supported and funded these actions.
- The proposed westbound on-ramp from Parramatta Road will go across and over Arnotts Reserve up to the level of the existing elevated M4 Motorway. As a result, continuous streams of cars and trucks will be accelerating up this gradient creating significant noise, air and visual pollution to the users of this park and adjoining multi-unit residential buildings.
- The reduced and substandard quality of Arnotts Reserve totally contradicts the state government objective for urban intensification and renewal for this section of the Parramatta Road corridor. As open space in this corridor in close proximity to residential areas is extremely limited, the quality and usability of the subject land is paramount.
- The acquisition of this valuable open space also contradicts to the state government targets that led to 4,000-5,000 new dwellings being planned in the corridor under the Strathfield LEP 2012. Whilst it even further contradicts the current draft New Parramatta Road Strategy (by UrbanGrowth) with the massive target of 17,000 dwellings.
- Therefore, Council strongly **requests** that the M4 westbound on-ramp be relocated from the Arnotts Reserve and an alternative location be sought (see Appendix 1 for details).

7. Economic Impact

- The EIS fails to provide a detailed cost-benefit analysis (e.g. measures on the investment value of the M4 East project including estimated changes in travel patterns, changes in travel time savings, value saving of accidents, changes in vehicle operating costs, the cost of construction, operations and maintenance etc.)
- The EIS needs to adopt Cost-Benefit Analysis principles which should be understood as an ongoing, multi-disciplinary, exercise performed throughout the project preparation, along with other technical and environmental consideration.
- The failure of the M4 East EIS to provide an adequate Economic Analysis will result in a lack of understanding by the public as to the true investment value.

- The appropriate Economic Analysis and cost-benefit analysis details, that adequately consider the costs of the project in comparison to the projected benefits, should be prepared and be available to all stakeholders.

- The EIS indicates that the revenue of the M4 East project will not cover the total cost of the project. This means state government will need to provide additional funding to this major road infrastructure at the cost of investing on other essential infrastructure such as hospital and public transport.

- The EIS fails to detail future projected costs and benefits resulting from the Westconnex beyond 2031. The scale of investment justifies an in depth analysis of the long-term cumulative impacts resulting from the investment.

8. Biodiversity Impact

The proposed M4 East project will reduce the amount of important habitat area (i.e. loss of vegetated areas within the existing M4 corridor) which will adversely impact on the existing flora species, loss of tree canopy cover in an area of Sydney where urban renewal is impacting tree canopy opportunities. The following summarises these possible impacts and proposed mitigation measures in further consultation with Council prior to construction:

- *Impacts on fauna species and habitat*
    - The EIS fails to demonstrate whether there will be areas reserved to meet habitat needs of small bird species such as fairy wrens, and lizards, such as blue tongues. Whilst these are not threatened species under the relevant legislation, however they are valuable species and needs to be protected in the unique urban context of Strathfield.

    - Council **requests** that additional nest box hollows be provided in proposed habitat reserve areas for hollow-nesting mammal and bird species such as Kookaburras. Kookaburra breeding pairs have been observed within the construction footprint and this may suggest the pairs are nesting in the area.

    - Prior to construction, Consultation with Council (including on–site meeting) is requested to retrieve habitat trees (hollows) if any, identified during WDA's pre-clearing survey stage.

    - Council offers the opportunity to advise WDA on the establishment of habitat areas where feasible.

- *Impacts on aquatic habitats*
    - Council is concerned of the potential sedimentation impact within Powells Creek (as indicated in the EIS) on the Mason Park wetland, and on Sydney Water's Powells Creek naturalisation project.

    - In the event of the potential release of large sediment loads from M4 East project into Powell Creek, WDA needs to consult Sydney Water regarding the status of Powells Creek naturalisation project planned to start in October 2016.

- *Flora species*

- Prior to construction, Council **requests** the opportunities to retrieve plant propagation material from species that may otherwise be destroyed by the proposed works.

- Post construction, Council shall be consulted regarding proposed landscaping of the corridor.

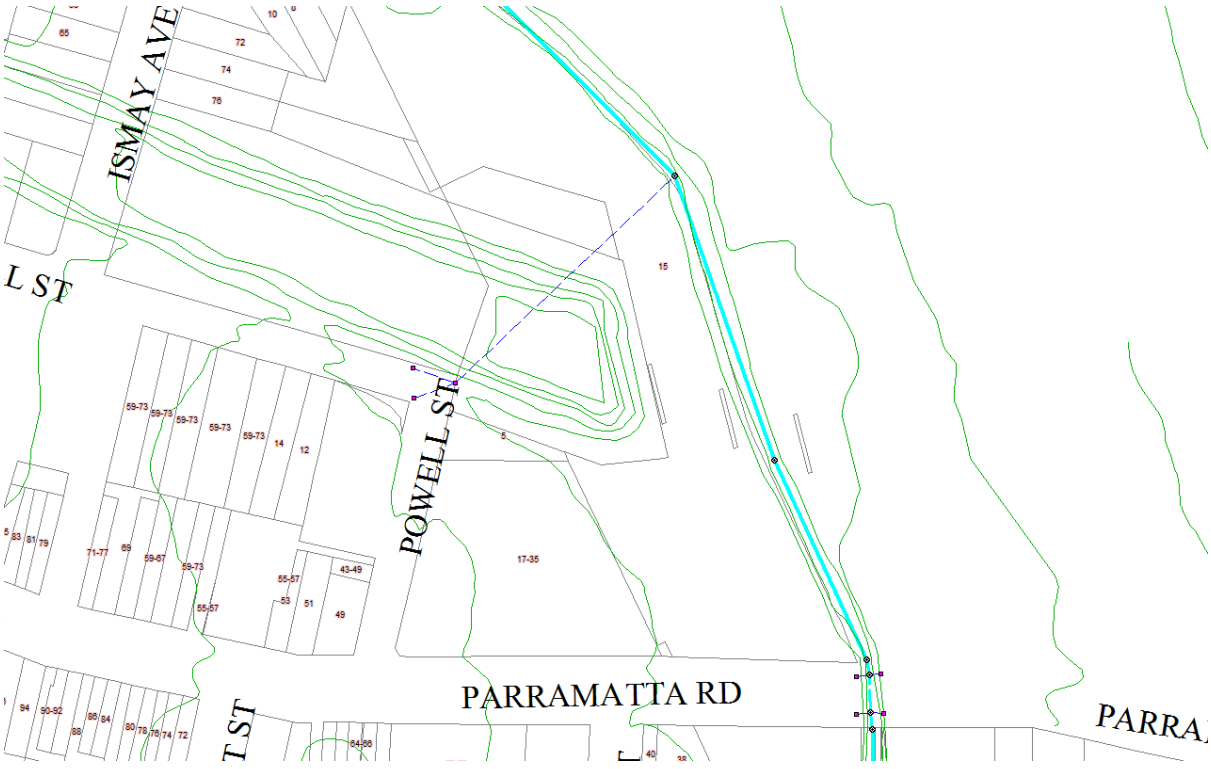
- *Loss of canopy cover*
  - The EIS fails to provide details on the negative effects of the reduced canopy cover on human health, plants, and animals in particular with regard to increased temperatures (also known as the 'Urban Heat Island Effect'), and mitigation measures of the resultant loss of canopy cover.

  - It is recommended an environmental consultant is engaged to measure canopy cover of the project area before and after construction.

9. Flooding Impact

There are a number of conditions relating to the flooding impact of the M4 East project that should be imposed as part of the EIS:

- Filling of land in areas affected by overland flow of stormwater runoff or mainstream flooding is not permitted.
- Redirection of flows including surface runoff from other sub-catchments shall not be permitted unless appropriate counter measures are undertaken.
- Increases in flood levels in any part of the flood affected areas as a result of proposed works is not acceptable.
- The drainage plan below indicates the approximate location of Council's and Sydney Water's drainage assets in the area. Location of Council's drainage pits and pipes must be verified on site.



10. Other issues

- *Alternative to M4 East Project*

The EIS does not provide any analysis of other alternatives, such as improved public transport systems or widening of existing roads, to ascertain whether these alternatives are more cost-effective investments than the existing M4 East project concept design.

- *Road Infrastructure Capacity*

Increasing the capacity in the existing M4 corridor and new tunnel will generate more vehicles on the surrounding regional road network. The additional traffic and attractiveness of using the WestConnex will result in corresponding increase in local traffic and impact on surrounding already congested north-south street network (details as outlined in the item 1. Traffic & Transport).

- *Limitations of key destination*

There are already certain existing limitations (e.g. car-parking provision) on the key destinations (e.g. the city of Sydney and Sydney airports). Increasing capacity and attractiveness of car use along the M4 / Parramatta Road corridor does not match up with the limited carparking capacity at those key destinations. It is also contrary to the NSW Long Term Masterplan's goal to reduce reliance on car-travel.

- *Impact on Properties*

The WestConnex involves the acquisition of many private properties as a result of the project construction and operation.

  - Properties not acquired adjacent to the corridor

    The Environmental Impact of the M4 East project during construction and future operation is likely to be significant to these properties (e.g. in Underwood Road and Ismay Avenue). The EIS fails to measure the likely impact to these residents both financially and socially. It is likely that these properties may be devalued due to their close proximity to the expanded M4 Infrastructure.

  - Properties to be acquired:

    The property owners are forced to be removed out of their home under the *Land Acquisition (Just Term Compensation) Act 1991* by WDA. The loss of community and neighbourhood may be significant for some residents, even though they may be appropriately financially compensated.

- *Efficiency of larger vehicle (public transport)*

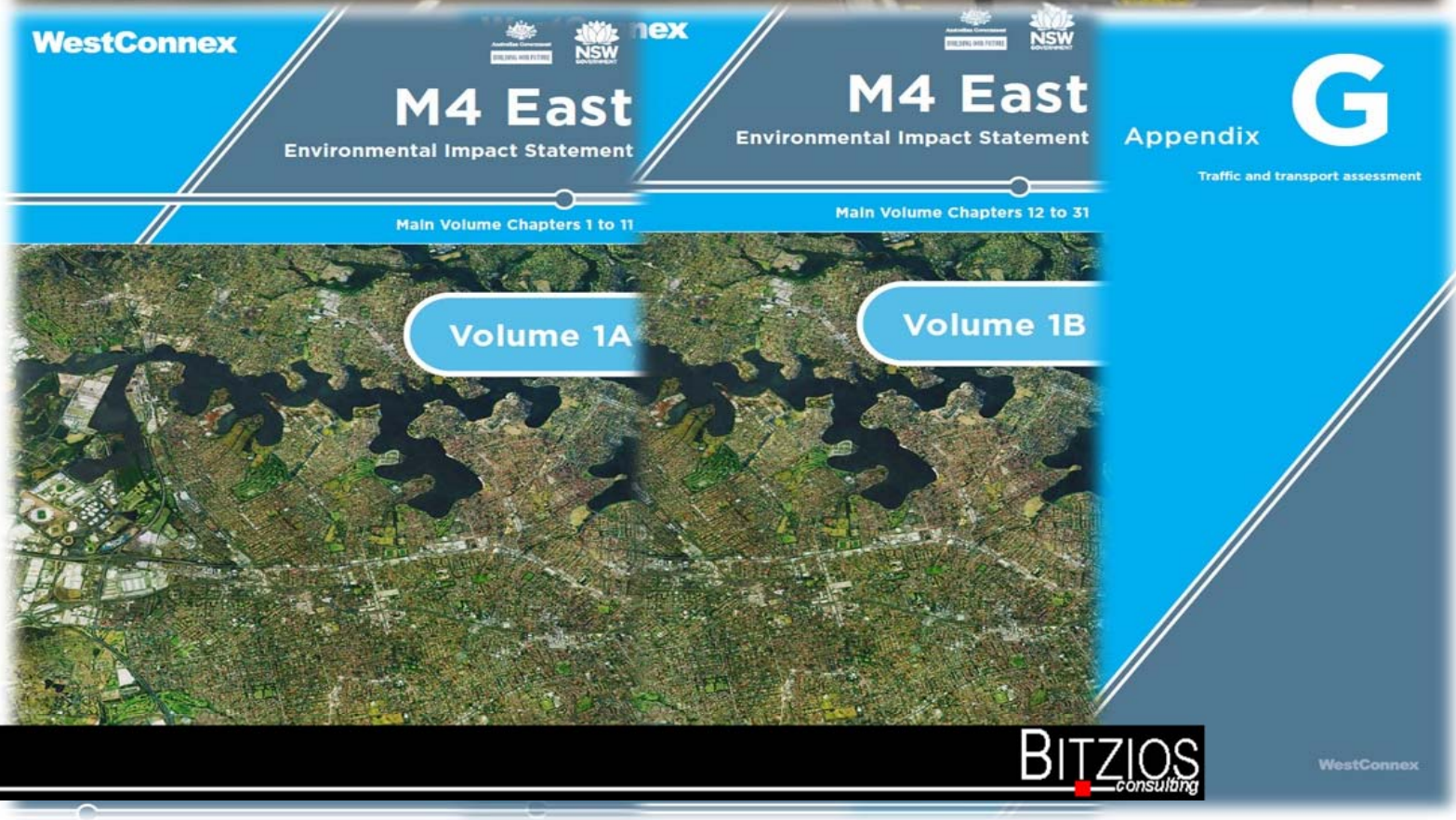
Building the WestConnex (including new M4 East Tunnel) encourages additional smaller vehicles on the road corridor as it increases the road capacity. However, the efficiency of moving people along a transport corridor is improved by the move to larger passenger vehicles such as buses. For example, the joint study on the Aviation Capacity for Sydney recommends that Sydney Airports land bigger planes to maximise its capacity.

SUPPLEMENTARY REVIEW REPORTS

- Appendix 1: Traffic Review Report prepared by Bitzios Consulting (dated 22 October 2015)
- Appendix 2: Air Quality & Contamination Review Report prepared by SLR Consulting (dated 22 October 2015)
- Appendix 3: Noise & Vibration Review Report prepared by Wilkinson Murray (dated 21 October 2015)

WESTCONNEX M4 EAST EIS REVIEW
MARLBOROUGH ROAD TO CONCORD ROAD

FOR
STRATHFIELD COUNCIL



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DOCUMENT CONTROL SHEET

Issue History

Report File Name	Prepared by	Reviewed by	Issued by	Date	Issued to
P2286.001R WestConnex M4 East EIS Review	D. Bitzios	S. Brooke	D. Bitzios	4/10/2015	Strathfield Council
P2286.002R WestConnex M4 East EIS Review	D. Bitzios	S. Brooke	D. Bitzios	22/10/2015	Strathfield Council

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Figures

EXECUTIVE SUMMARY

The EIS for the WestConnex M4 East has recently been released by the WestConnex Delivery Authority (WDA). Strathfield Council is interested in understanding what the implications the project area on its roads and intersections near the project and an assessment has been completed focussing on the following aspects of the project:

- The Homebush Bay Drive Interchange;
- The new westbound on ramp to the M4 near Powells Creek;
- The Concord Road Interchange; and
- Construction period impacts

Homebush Bay Drive Interchange

This interchange has been upgraded to include connections directly to the new M4 east tunnel (east of Homebush Bay Drive), whilst maintaining all existing connections to the (old) M4. Up until the release of the EIS, it was Council's understanding that the heavy southbound to westbound movement at the interchange which is currently made via a signalised right turn movement would be replaced by a "G-turn", effectively taking this movement out of the signals. The benefit of this change would have been an ability to allocate more green time for northbound through movements at the interchange and consequentially allow more of the Arthur Street right turn movements into Centenary Drive to be provided for.

The key advantages and disadvantages of the interchange arrangement for Council are:

Advantages	Disadvantages
▪ Maintains all of the existing M4 connections and in so doing is unlikely to introduce any new impacts into Parramatta Road or adjacent areas	▪ No new G turn for southbound to westbound turns meaning northbound pinch point remains with continuation of the Arthur Street right turn congestion issues ▪ Potentially induces more traffic into the interchange to make use of the M4 east, exacerbating congestion issues on Centenary Drive ▪ No works proposed to increase capacity at the interchange bridge meaning that it will remain a key pinch point in the Centenary Drive – Homebush Bay Drive corridor
Conclusion: All connections maintained and no new impacts for Council, but potential exacerbation of congestion issues on Centenary Drive which ultimately affect Arthur Street right turn capacity.	

New Westbound on Ramp at Powells Creek Reserve

Whilst not specifically stated in the EIS, this new intersection and on ramp has most likely been provided to replace the connection from Leicester Avenue to the M4 westbound that is removed as part of the Concord Road Interchange upgrade. That is, traffic from Leicester Avenue destined for the west would now turn left from Leicester into Parramatta Road then right at the new traffic lights at Powells Creek to enter the M4 westbound. From there they could either exit to the Homebush Bay Drive interchange (as they can do now) or continue on to the WestConnex M4 west. The key advantages and disadvantages of this arrangement for Council are:

Advantages	Disadvantages
▪ Maintains all of the existing M4 connections (i.e. replaces the existing Leicester/Concord westbound ramp)	▪ Significantly increases westbound traffic on Parramatta Road between Leicester and the new Powells Creek on ramp and through the congested George Street intersection. ▪ Potentially induces traffic through Subway Lane and Underwood Road to access the new westbound on ramp given the level of congestion expected at the alternative westbound access point at the Homebush Bay Drive interchange.
Conclusion: The need for the new ramp and intersection is understood however relocating it further east (and east of George Street) would minimise induced traffic through local roads (e.g. Subway Lane-Knight Street) and reduce significant impacts expected at the George Street / Parramatta Road intersection. There may be some design complexities to overcome in this constrained area though to try and relocate the on ramp.	

Concord Road Interchange

This is a major interchange for connections to WestConnex M4 East. Whereas there is currently no direct connection from Concord Road southbound to the M4 westbound, the upgrade includes a new free-flow ramp for this movement which may act to take some pressure off the alterative heavily congested right turn from Homebush Bay Drive into the M4 westbound. The key advantages and disadvantages of this arrangement for Council are:

Advantages	Disadvantages
▪ Maintains all of the existing M4 connections, albeit with the connection from Leicester into the M4 westbound now via a short section of Parramatta Road and the new on ramp. ▪ By providing the Concord Road southbound to M4 westbound ramp, takes some pressure of the Homebush Bay Drive to M4 westbound right turn.	▪ Arrangement removes the existing left turn on ramp from Leicester to the M4 westbound, which is a major movement and locates it further west via Parramatta Road and the new Powells Creek on ramp. ▪ Potentially induces traffic through Mosley Street to access the M4 westbound, rather than filtering through from Leicester to Parramatta Road to the new westbound on ramp.
Conclusion: Overall has some benefits to Council however the relocation of the westbound on ramp to the M4 further west is likely to induce some through traffic through local streets.	

Construction Period Impacts

It is recognised that the construction period impacts are likely to be temporary however three of the four north-south routes available north of Parramatta Road will be impacted by construction traffic access movements. There appear to be no easy solutions to this disruption during construction with the possible exception of providing more capacity at the construction access intersection on Underwood Road at Short Street, through temporary removal of parking lanes to provide additional through traffic lanes to bypass turning construction vehicles.

1. INTRODUCTION

1.1 BACKGROUND

The EIS for the WestConnex M4 East project has recently been released on exhibition by the WestConnex Delivery Authority (WDA). The EIS aims to identify impacts and propose mitigations measures for the M4 East project through its construction and ongoing operational phases. Stage 1b of the project is the stage of most relevance to the consideration of traffic impacts in the Strathfield Council area.

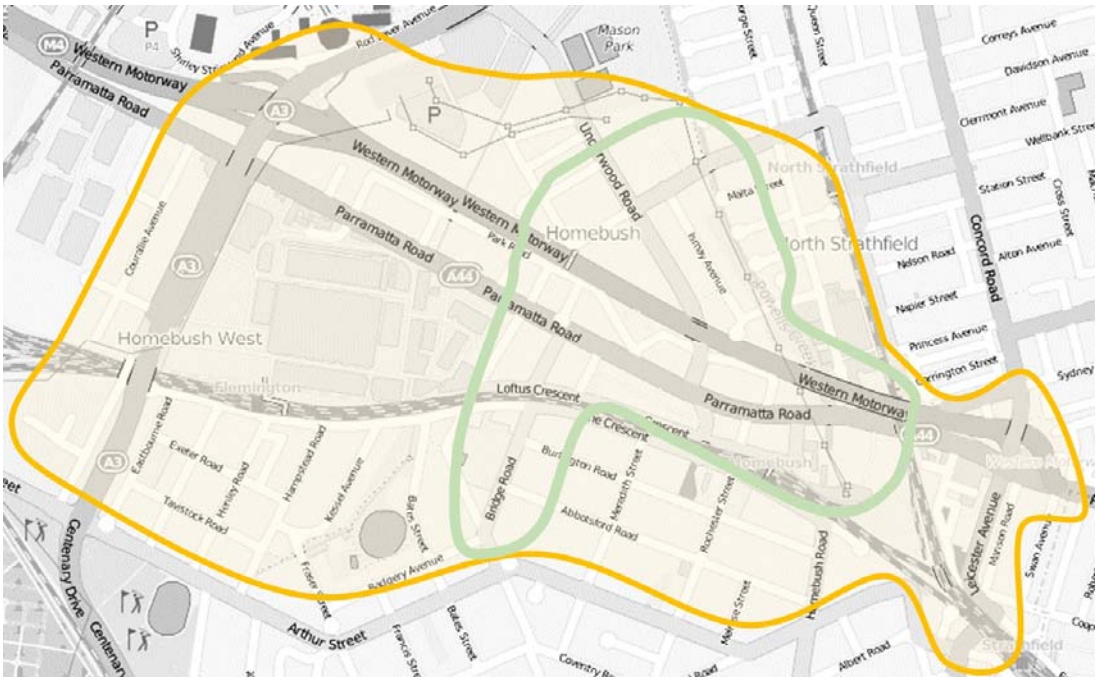
Strathfield Council intends to provide a submission to the WDA in response to the EIS and Bitzios Consulting has been engaged to assess the traffic impacts (in particular) of the M4 East project on a nominated part of Council's road network.

1.2 FOCUS AREAS AND SCOPE

Whilst this review considers the traffic impacts of WestConnex M4 East on the entire Strathfield LGA, it has a particular focus on areas around the Parramatta Road corridor between Marlborough Road and Concord Road, as follows:

- In the area bordered by Parramatta Road, Bridge Road, Loftus Crescent and Station Street; and
- In the area bordered by Parramatta Road, Underwood Road, Pomeroy Street and Ismay Avenue; and
- south of the rail corridor on Subway Lane – The Crescent and Bridge Road

The primary and secondary impact review areas are shown in Figure 1.1.



Source: openstreetmap.org

Figure 1.1: Primary and Secondary Impact Review Areas

The assessment presented in this report focusses on construction and operational period traffic impacts in the impact review areas shown in Figure 1.1 with consideration as well of associated parking, public transport and active transport impacts.

This review comments on the analysis methodologies, coverage and level of detail considered in the EIS and responds with the identification of any deficiencies or limitations based on the available information and local knowledge attained through previous studies and site observations. Where insufficient analysis or assessment has been undertaken to fully describe an impact, this report provides commentary on the likely scale of those impacts and what supplementary assessments should be considered.

2. KEY PROJECT FEATURES

2.1 GENERAL

Through Strathfield, the WestConnex M4 East project includes its western tunnel portal located east of Centenary Drive. To the west of this point the WestConnex Project involves at grade widening only. There are connections to surface roads at (see Figure 2.1):

- Centenary Drive via an all movements interchange;
- near number 15 Parramatta Road via a westbound on ramp; and
- at the junction of Concord Road with Parramatta Road and Leicester Avenue via an all movements interchange.

Source: http://www.westconnex.com.au/explore_the_route/stage_1/m4_east_resources.html

Figure 2.1: Key Features in the Assessment Area

In addition to the above, and as a separate State Government project, Transport for New South Wales (TfNSW) has released a "high level" vision for Parramatta Road which is relevant to the considerations for the WestConnex M4 East through this area. This proposal is titled the "New Parramatta Rd".

2.2 CENTENARY DRIVE INTERCHANGE

The interchange configuration is shown in Figure 2.2 with key features summarised as follows:

- The interchange involves essentially the same connections to the M4 as are currently in place;
- The entry ramp to the eastbound tunnel portal is braided over the extension of the eastbound off ramp which connects to the "old" section of the M4 east of the tunnel portal; and
- There is a westbound off ramp from just west of the westbound tunnel exit which braids over a westbound on ramp coming from the "old" section of the M4 and then connects to Centenary Drive.

Source: http://www.westconnex.com.au/explore_the_route/stage_1/m4_east_resources.html

Figure 2.2: Centenary Drive Interchange

Another key feature of the project in this location is the Motorway Control Centre and Maintenance Facility located on the north-eastern side of the interchange adjacent to the Homebush DFO.

2.3 WESTBOUND ON RAMP FROM PARRAMATTA ROAD

This westbound on ramp is a new connection that is presumably intended to encourage Strathfield residents south of the M4 and employees in the Strathfield area to access the M4 westbound via this location, rather than via a right turn from Arthur Street to Centenary Drive and on to the westbound on ramp at the M4/Centenary Drive interchange. The new westbound on ramp introduces opportunities for the redevelopment areas around the Parramatta Road corridor between Centenary Drive and Powells Creek to access the M4 westbound without having to filter through residential roads like Bridge Road, Subway Lane and The Crescent to access Arthur Street to try and get to the M4 westbound "the long way around".

The on ramp configuration is shown in Figure 2.3. The westbound ramp connects to the "old" section of the M4 which then connects to the WestConnex M4 East via an on ramp east of Centenary Drive. This old section of the M4 also joins the westbound off ramp from WestConnex near Centenary Drive, effectively providing Parramatta Road traffic in Strathfield a more direct connection to Centenary Drive northbound.

The intersection of the new westbound on ramp and Parramatta Road is proposed to be signalised with both right turns and left turns allowed from Parramatta Road to the ramp.

Source: http://www.westconnex.com.au/explore_the_route/stage_1/m4_east_resources.html

Figure 2.3: Parramatta Road Westbound On Ramp

2.4 CONCORD ROAD INTERCHANGE

The interchange configuration is shown in Figure 2.4 with key features summarised as follows:

- This is a major interchange in the project connecting Parramatta Road east, Leicester Avenue, Concord Road, Parramatta Road west and the "old" section of the M4 with WestConnex M4 East;
- It essentially augments the WestConnex M4 East tunnel connections into the connections that currently exist in this area; and
- It shifts the balance of traffic movements at the Parramatta Road/existing M4 intersection with more east-west through lanes required and fewer lanes required for turning left from the "old" M4 to Parramatta Road east or for turning right from Parramatta Road east into the "old" section of the M4.

Source: http://www.westconnex.com.au/explore_the_route/stage_1/m4_east_resources.html

Figure 2.4: Concord Road Interchange Configuration

2.5 PARRAMATTA ROAD CHANGES

Apart from the proposed new westbound on ramp and its associated intersection near number 15 Parramatta Road, there are no changes proposed for Parramatta Road as part of the WestConnex M4 East project.

However, Urban Growth NSW has recently released two studies relevant for consideration in the review of WestConnex M4 East in this area, namely:

- New Parramatta Rd: Draft Parramatta Road Urban Transformation Strategy, Volume 1; and
- New Parramatta Rd: Parramatta Road Precinct Transport Report.

The draft strategy has a vision of "*a high quality multi-use corridor with improved transport choices, better amenity and balanced growth of housing and jobs*" and identifies WestConnex as a *"unique catalyst to transform the corridor*". The draft strategy divides the Parramatta Rod corridor into eight precincts of which the "Homebush" precinct covers the study area.

For Homebush, the draft strategy suggest higher density housing and "main street" uses on Parramatta Road and on George Street with the population increasing by approximately 6,500 persons and jobs increasing by approximately 6,000 in this precinct by 2050. The strategy also envisages the existing dense street network to provide connectivity for all modes of transport.

The Homebush Access and Movement Plan (see Figure 2.5) includes the following key features of relevance to the review of the WestConnex M4 East project's EIS:

- Extending Underwood Road to Loftus Crescent;
- Extending Loftus Lane from Crane Street to Smallwood Avenue;
- Minor upgrades at the Bridge Road and the Underwood intersections with Parramatta Road; and
- Designating the Station Street-Loftus Crescent-Bridge Road route as a "Major Road.

Of particular relevance to traffic considerations associated with the WestConnex M4 East project is that there are no new road connections across either the WestConnex M4 East corridor or the Western Rail Line. The *Transport Report* identified the Western Line as a constraint to the road network. A key road capacity enhancement from the *Transport Report* was the investigation of clearways on Parramatta Road in this area in order to deliver bus priority measures. This was not specifically identified in the WestConnex M4 East EIS.

Source: Draft Parramatta Road Urban Transformation Strategy (Urban Growth NSW)

Figure 2.5: Homebush Access and Movement Plan

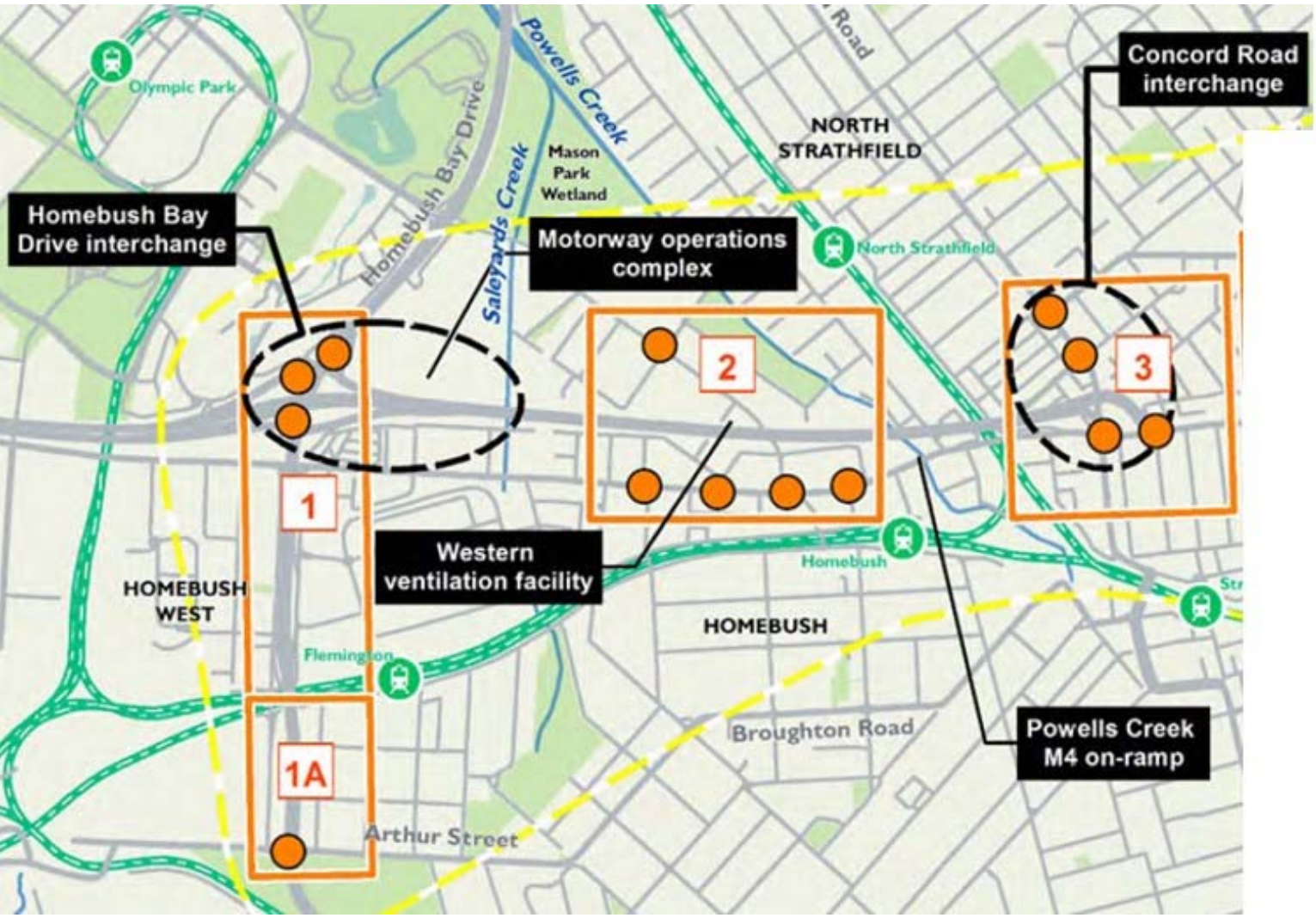
3. TRAFFIC ASSESSMENT COVERAGE AND METHODOLOGIES

3.1 IMPACT ASSESSMENT COVERAGE

Whilst WestConnex M4 East is a major project of significant length and expenditure, its traffic impact areas are relatively localised around its entry and exit points and particularly where these are different to the entry and exit points currently available for the M4 west of its connection into Parramatta Road. Notwithstanding this, the accessibility of the general M4-Parramtta Road corridor increases significantly with the additional capacity provided and this accessibility improvement attracts additional traffic to/from the corridor.

The geographical coverage of the EIS for traffic and transport impacts was limited to 3 "clusters" near the review focus area, namely (see Figure 3.1):

- Cluster 1: At the Centenary Drive interchange (+ the Centenary Drive/Arthur Street intersection)
- Cluster 2: Parramatta Road between Bridge Road and the proposed new westbound on ramp (+ the Pomeroy/Underwood intersection);
- Cluster 3: Around the new Concord Road Interchange.



Source: WestConnex M4 East: Environmental Impact Statement Appendix G: Traffic and Transport Assessment

Figure 3.1: Intersection Analysis Clusters

The geographical coverage of traffic impacts in the review area is limited very closely to the intersections where the WestConnex M4 East project interfaces with the surface road network. This limited coverage is insufficient to fully detail the impacts and benefits of the project; particularly in terms of amenity impacts associated with inducing traffic through local streets to access WestConnex M4 East.

3.2 IMPACT DETERMINATION METHODS

A strategic link-based model (the WRTM) and localised LinSig models in each cluster area have been used as the basis for traffic analysis and impact assessment. These tools are appropriate for assessment of broad traffic pattern changes (through the WRTM) and local intersection effects (through the LinSig modelling).

The modelling of intersections in the impact review area included key intersections on Parramatta Road such as at Bridge Road, Park Road, Underwood Road and Knight Street as well as the Pomeroy Street/Underwood Road intersection. There is no mention in the Traffic and Transport Report as to the means of LinSig model calibration and validation. In any case, Table 6.8 of the report suggests that the four intersections assessed on Parramatta Road are operating at LOS C or better in the AM and PM peak 1 hour with average delays of about 30 seconds or less. Whilst this might me the case for Parramatta Road through traffic, recent site observations suggest that side street traffic in Bridge Road and Underwood Road experiences much longer delays than this with reasonably long queues in these streets as a consequence. Additional local re-development and more induced north-south traffic to access WestConnex M4 East will exacerbate these issues and this has not been identified in the report; presumably due to its "high level" assessment focussed on major roads and intersections.

What is missing is a corridor-level model/assessment to determine local route choice effects through residential and commercial areas due to changes in access locations with WestConnex and due to the induced traffic effects, as well as cumulative impacts with local land use intensification (as per the New Parramatta Rd project). The WRTM is too coarse to sensitively model these effects as it does not account for intersection delays in route selection in any case. The LinSig intersection models do not include route choice and are based on user-provided traffic volumes which may have been estimated from WRTM future year estimates.

Given the limitation of the WRTM not considering intersection-based congestion, it is likely that the volume difference plots shown in Section 8 of the EIS Traffic and Transport Assessment Report have over-assigned traffic to major roads (like Parramatta Road) and under-assigned traffic to local roads, like Bridge Road, The Crescent, etc. thereby underestimating the impacts on these roads. A local area mesoscopic model would be needed to more sensitively assess changes in route choice locally due to WestConnex effects.

The screenline analysis undertaken in the Traffic and Transport Report was limited to north-south screenlines and did not consider impacts on north-south movements through residential and commercial areas to access WestConnex. Also, traffic impacts have primarily been described in terms of operational capacity and safety. No meaningful assessment has been undertaken of amenity *or environmental street capacity* impacts.

3.3 MITIGATION METHODS ANALYSIS

The EIS Traffic and Transport Report Section 11.2 identifies a number of network changes that have been included in the design, including the lane allocation of through and turn movements near the Concord Road interchange. The methods appear to have been assessed/modelled although it is not definitive as to whether these measures will be adopted by RMS.

3.4 SUMMARY OF ISSUES

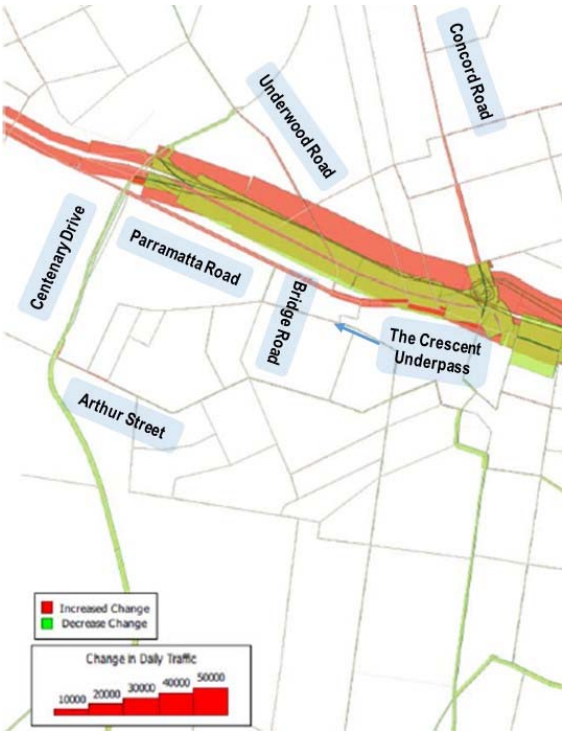
The traffic assessment coverage and methodology issues identified were:

- The coverage and methodology for the traffic impact assessment were insufficient to identify the level of additional traffic in residential streets in the study area. The strategic modelling was too coarse and the intersection modelling too limited to allow for identification of what WestConnex M4 East traffic would be drawn through residential streets in the impact review area. Mesoscopic modelling of the area north of Arthur Street, east of Centenary Avenue, south of Pomeroy Street and west of Concord Road would be needed to more sensitively determine these impacts; and
- The mitigation of the EIS-identified impacts at the George Street/Parramatta Road intersection have not been identified and there will be consequential impacts for local traffic in the impact assessment area, particularly for Parramatta Road intersections such as Underwood Road, Knight Street and Bridge Road.

4. OPERATIONAL PERIOD TRAFFIC IMPACTS

4.1 TRAFFIC PATTERN CHANGES

Chapter 8 of the WestConnex M4 East Traffic and Transport Report included volume difference plots comparing daily traffic volumes under "Do Something" (i.e. with WestConnex) versus "Do Minimum" (i.e. without WestConnex). The 2031 difference plot is shown in Figure 4.1.



Source: WestConnex M4 East: Environmental Impact Statement Appendix G: Traffic and Transport Assessment

Figure 4.1: Impacts of WestConnex on Daily 2031 Traffic

Whilst there is a reasonable increase in Parramatta Road traffic shown in Figure 4.1, there is a (as expected) a major reduction in traffic using the "old" M4 due to the tunnel being in place. The modelling also shows slight reductions in traffic on rods like Centenary Drive, Bridge Road, The Crescent underpass and Leicester Avenue, whilst Concord Road increases in traffic.

The results are counter-intuitive in that there is no additional attractiveness generated to the WestConnex access points compared the current M4. That is, it would be expected that additional traffic would be drawn through Centenary Drive and Leicester Avenue in particular and to a lesser extent through Bridge Road and The Crescent underpass of the Western Line, as the four key crossing points of the rail line in this area.

Also, the additional traffic identified to be using Parramatta Road is not sensitive to the congestion and capacity issues on this road between Centenary Drive and Concord Road and the effects that this would have on re-routing traffic through residential areas. The primary reason for these results in expected to be the use of a link-based strategic transport model (the WRTM) to assess impacts rather than a model that account for intersection delays in route choice (which are the key route choice consideration in the area at peak times). It is therefore expected that if a mesoscopic model was used to assess the traffic changes due to WestConnex, the following traffic pattern changes in the impact review area would have been likely:

- An increase in traffic volumes on Centenary Drive and Leicester Avenue due to the increased attractiveness of the WestConnex M4 corridor;
- A minor increase in traffic volumes on Bridge Road and under the Western Line at The Crescent due to additional traffic on Centenary Drive and Leicester Avenue and the attractiveness of the improved access off Parramatta Road to the WestConnex entry ramps in the area;
- Southbound traffic on George Street being diverted down Pomeroy Street and Underwood Road to access Parramatta Road due to congestion at the intersection of George Street and Parramatta Road

4.2 CAPACITY IMPACTS

4.2.1 George Street/Parramatta Road

The key capacity issue that is unresolved is the over-capacity condition of the Parramatta Road / George Street intersection. It is likely that to preserve the entry capacity of the high volume Concord Road interchange, RMS will favour "flushing" the westbound through traffic movement on Parramatta Road at George Street, to the detriment of the eastbound through movement and to the detriment of the George Street approach. This is likely to have a two-fold effect:

- "encourage" more traffic to use Pomeroy Street – Underwood Road to bypass this bottleneck placing more pressure on the Underwood Road/Parramatta Road intersection; and
- reducing green time for Parramatta Road eastbound movements at George Street (coupled with higher traffic volumes due to the above point) to create excessive queuing in Parramatta Road eastbound and leading to a greater potential for "rat running" on parallel roads such as The Crescent and Loftus Lane.

4.2.2 New connection from Parramatta Road to Centenary Drive Northbound (via ramps)

A key benefit to traffic movements in the area and particularly to the Arthur Street/Centenary Drive intersection is the new intersection of the westbound off ramp to Centenary Drive and Centenary Drive which in effect allows traffic south of Parramatta Road in the impact review area destined to the north, to not have to access Centenary Drive via the congested Arthur Street intersection. Rather, this traffic can use Parramatta Road and the new westbound on ramp to the "old M4" westbound to access the new intersection at Centenary Drive.

This is likely to re-orientate some traffic to Loftus Crescent and Station Street to access the new on ramp. It is also like to re-orientate traffic to the peak direction on Bridge Road. That is, whereas some northbound traffic actually heads south to Arthur Street now before heading north on Centenary Drive, this traffic will more likely now head north on Bridge Road and east along Parramatta Road before using the new westbound on ramp.

4.2.3 Underwood Road/Parramatta Road

Table 9.7 of the Traffic and Transport Report identifies that this intersection will be at LOS D in the 2031 PM peak under "do minimum" with a marginal benefit introduced with WestConnex M4 East ("do something"). This is counter-intuitive in that additional traffic will be using Parramatta Road with increased side street delays and with the expectation of more traffic bypassing the southern end of George Street by using Pomeroy Street and Underwood Road instead. Some upgrades to this intersection would be likely to be needed to manage the delays and queues on the Underwood Road approach.

4.2.4 Bridge Road/Parramatta Road

There are only two "local" crossings of the Western Line in the impact review area via Bridge Road (overpass) or via The Crescent (underpass), with acknowledgement of the existing Leicester Avenue crossing further east and Centenary Drive to the west which accommodate longer distance traffic. With significant redevelopment potential in the area there are potential impacts on both of the local rail line crossings and at the Bridge Road/Parramatta Road signalised intersection, as previously identified in the Parramatta Road Corridor Transport and Mobility Study (Bitzios Consulting, 2014).

This intersection is currently observed to be operating at capacity in peak periods and additional traffic expected on both Parramatta Road and Bridge Road will exacerbate these issues, as will the additional local development access Parramatta Road. There appears to be a difference in Table 9.7 and Table 10.15 in the Traffic and Transport Report in that Table 9.7 identifies a 2031 LOS F for this intersection under "do minimum" whereas Table 10.15 shows this intersection at LOS F and average delays of 224 seconds. Table 10.15 also suggests a slight worsening under "do something" which is expected with more traffic on Parramatta Road but contradicts this with operational improvements expected at the Underwood Road intersection (which would be expected to be similar the Bridge Road intersection issues/performance).

4.2.5 Other Parramatta Road Intersections

It is clear that with more local development in the Parramatta Road catchment between Concord Road and Centenary Drive, there will be increasing demands for turning movements to/from side streets. The *Parramatta Road Corridor Transport and Mobility Study* envisaged that the introduction of WestConnex M4 East would reduce traffic on Parramatta Road and hence allow more priority to be allocated to side street turning movements. This does not appear to be the case. Additional turn pockets and green time for side-street movements at the intersections on this section of Parramatta Road would further "localise" this section of Parramatta Road; which was an intended key local benefit of the WestConnex M4 East project in this area.

Figure 4.2 summarises the potential localised capacity impacts in the impact review area.

Figure 4.2: Likely Capacity Issues in the Impact Review Area

4.3 Local Accessibility and Amenity Impacts

Whilst the WestConnex M4 East Traffic and Transport Report did not specifically identify upgrades for Parramatta Road and associated connecting local roads in Homebush-Strathfield, the New Parramatta Rd Transport Report did. The New Parramatta Rd report identified investigations for:

- Signalising the Subway Lane / Parramatta Road intersection;
- Widening the Bridge Road / Parramatta Road intersection; and
- Bus priority measures along Parramatta Road.

It is clear that bus priority measures along Parramatta Road in the impact review area is in conflict with the traffic capacity needs to cater for the additional traffic drawn to this road by WestConnex M4 East and that measures are needed to actively discourage through traffic usage of Parramatta Road between Concord Road and Centenary Drive to reduce the potential for local accessibility impacts. Measures could include:

- Re-configuring signalised intersections with more turning lanes;
- Reducing through traffic capacity; and
- Providing bus jumps and peak period bus lanes to further constrain through traffic capacity.

It is inevitable that WestConnex M4 East will draw more traffic through Bridge Road and The Crescent rail underpass (contrary to the WRTM results). Unless this additional traffic is carefully managed through providing sufficient accessibility to/from Parramatta Road it is likely that traffic will be further dispersed into Roads such as The Crescent and Loftus Lane which is undesirable given the constrained alignments of these roads.

4.4 SUMMARY OF ISSUES

The new westbound on ramp to the M4 near 15 Parramatta Road will provide benefits to the broader local network by reducing the need to use the Arthur Street / Centenary Drive intersection. However, the ramp is also expected to draw more traffic through the local areas north and south of Parramatta Road, the impacts of which are not determinable at this stage without the benefit of local area (mesoscopic) modelling.

The expected operational period traffic impacts of the WestConnex M4 East project on the impact review are summarised as follows:

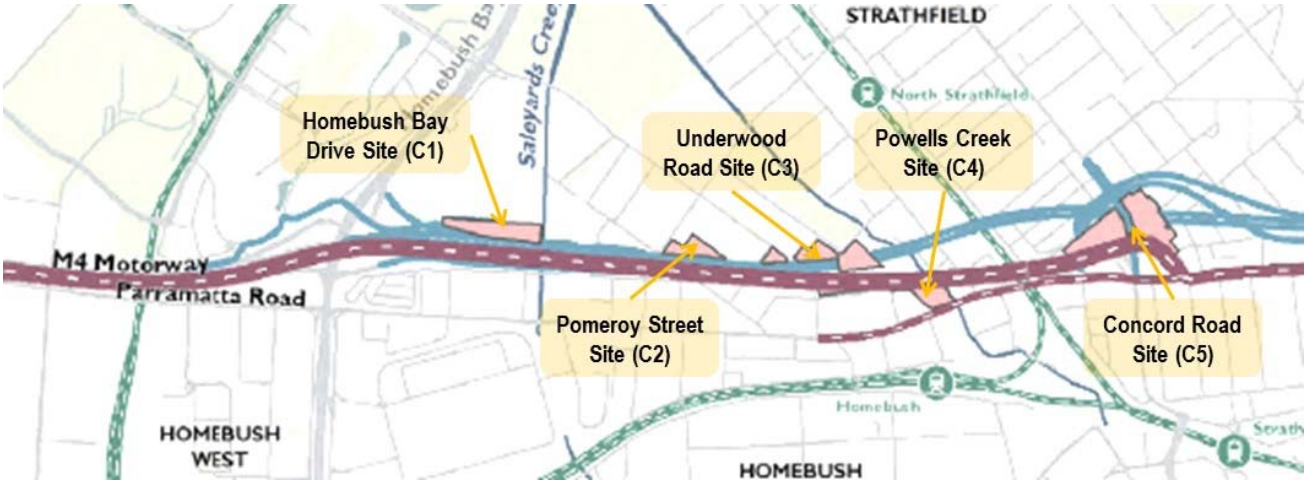
- Increased traffic and congestion on Parramatta Road will affect local accessibility due to additional delays at its intersections for entry to and exit from adjacent areas; and
- The cumulative effects of WestConnex M4 East and local re-development will impact accessibility and amenity with traffic re-routing to access Parramatta Road and the WestConnex ramps. Underwood Road, Pomeroy Street, Bridge Road and The Crescent are the local routes most likely to be impacted to some extent.

5. CONSTRUCTION PERIOD TRAFFIC IMPACTS

5.1 SPATIAL IMPACTS – COMPOUNDS AND SITE ACCESS LOCATIONS

5.1.1 Compound Locations in the Impact Review Area

There are a number of construction compounds located in the impact review area, as shown in Figure 5.1.



Source: WestConnex M4 East: Environmental Impact Statement Appendix G: Traffic and Transport Assessment

Figure 5.1: Compound Areas

The capacity analysis of temporary intersections and local traffic diversions does not appear to have been undertaken, with the impact assessment focussed on the major intersections within each "cluster" as assessed for the operational period analysis. The construction period impacts are different and more localised and would suggest a more localised impact assessment than only considering major road intersections (like along Parramatta Road which has little construction traffic using it in the impact review area).

Traffic diversion impacts on Underwood Road, and particularly any temporary capacity augmentation needs at the Short Street and the Powell Street intersections would seem appropriate to be included in the EIS-assessment.

5.1.2 Homebush Bay Drive Site

This site would introduce minimal impacts with no local road closures and access via the M4 and Homebush Bay Drive.

5.1.3 Pomeroy Street Site

This site does not require any local street closures and with access via the M4 and the adjacent Homebush Bay Drive site, will have minimal impacts on local traffic.

5.1.4 Underwood Road site

This site, in part, straddles Underwood Road and Short Street and traffic signals are proposed to manage entry and exits at a temporary four way intersection. Given the heavy traffic volumes in peak periods in Underwood Road and the as yet unknown demand for movements across Underwood Road between the eastern and western compounds, it may be necessary to develop this intersection with two short through lanes in each direction, to separate construction vehicle turning movements and to minimise queueing back into Parramatta Road. Further localised analysis of this need would be required.

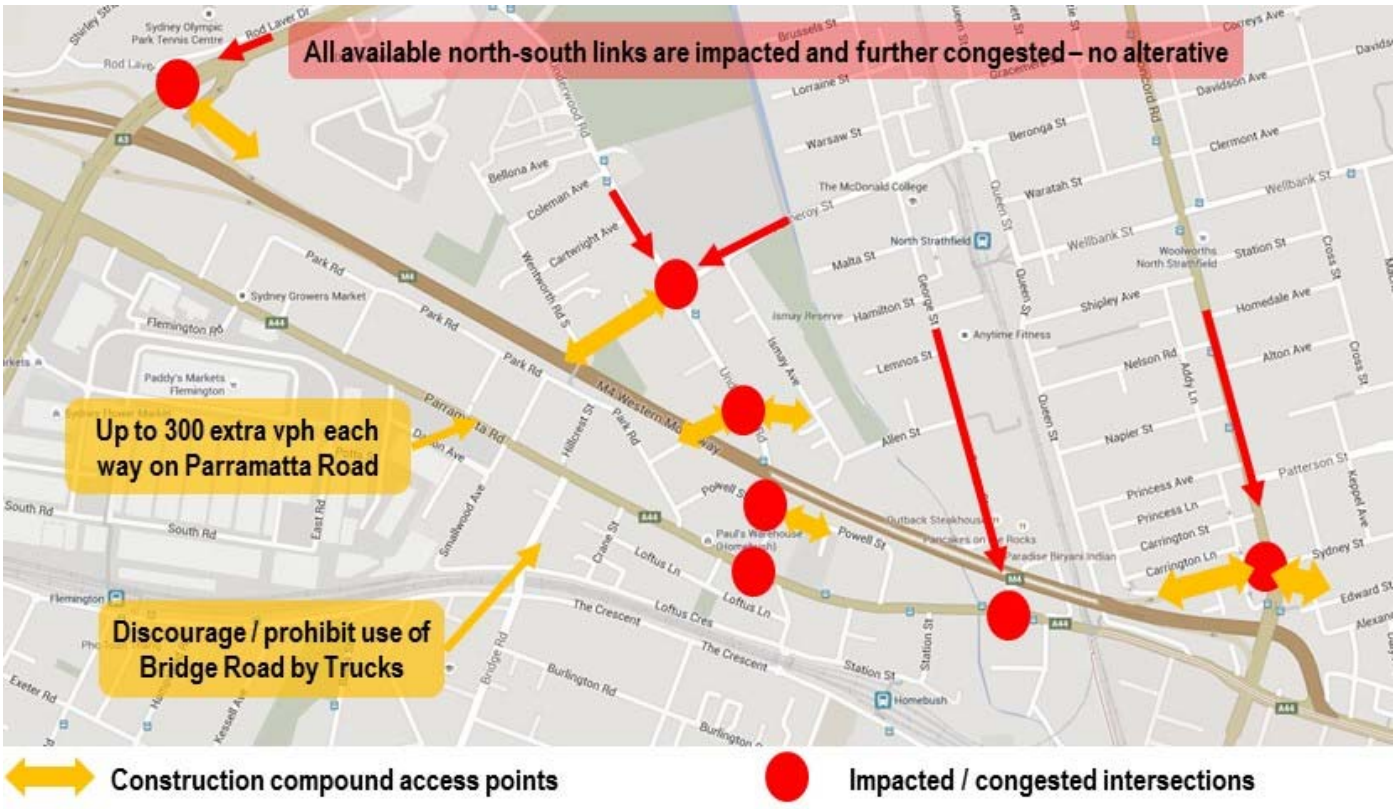
5.1.5 Powells Creek Site

This site is accessed via Underwood Road and Powell Street. With the Underwood Road site access under traffic signal, there is some potential for queues from that intersection queueing back past Powell Street

increasing the importance of achieving a second northbound short lane at the temporary Underwood Road access signal. Furthermore, Underwood Road northbound at Powell Street would benefit from a temporary right turn pocket to store turning construction traffic whilst allowing northbound through traffic to pass (and hence not queue back to Parramatta Road).

Delays to general traffic due to the construction traffic effects at the Short Street and Powell Street intersections may encourage traffic diversions to George Street, although it is recognised that its intersection with Parramatta Road would be similarly congested and hence be a deterrent to this alternative.

Figure 5.2 highlights these potential issues.



Source: Google Maps

Figure 5.2: Construction Access and Capacity Issues

5.1.6 Concord Road Site

This location is a major compound spanning a significant area with a large number of construction vehicles accessing via the proposed access via Sydney Street and its signalised intersection with Concord Road. The key issue with introducing additional delays to through traffic at this location (in additional to construction traffic access of Homebush Bay Drive) is that three out of four potential north-south routes in the area will have some form of construction traffic access delays, with George Street the only unaffected route.

5.2 Construction Traffic and Haul Routes

Section 7.4 of the Traffic and Transport report states that "*traffic volume changes west of Concord Road are limited and show contraction at some mid blocks. This is indicative of current saturation rates which mean the corridor is at capacity and only small fluctuations in volumes are likely in the absence of more attractive alternative options*". This finding is contrary to the results of the LinSig modelling which show LoS of A - C for all three intersections in Parramatta Road within "Cluster 2" and only the George Street/Parramatta Road intersection as LoS F in the PM peak.

It is expected that all four intersections will be operating at LoS F due to residual queueing back from the George Street intersection and excessive side street delays in Underwood Road and Bridge Street on approach to Parramatta Road. This is best evidenced by the 300-400 additional vehicles per hour per

direction in Parramatta Road west of Bridge Street and the heavy construction traffic turning volumes expected into Underwood Road. This suggests that early works (i.e. in the construction phase) could include upgrades to the Underwood Road intersection as well as to the George Street intersection with Parramatta Road.

There are no road closures in the impact review area with the exception of the intersection (bend) at Pomeroy Street and Wentworth Street south. This closure would have a minimal impact on local traffic accessibility in this area.

5.3 SUMMARY OF ISSUES

The underlying traffic capacity issue during construction is the limited north-south road capacity both north and south of Parramatta Road (effectively only two lanes in each direction) between Concord Road and Centenary Drive and no opportunity to "escape" construction period delays. It therefore seems imperative that construction period traffic access be managed to ensure minimal additional delays on Underwood Road traffic through additional temporary infrastructure, which could include additional northbound and southbound lanes on Underwood Road at Short Street and Powell Street to ensure sufficient through traffic capacity on Underwood Road and to minimise delays.

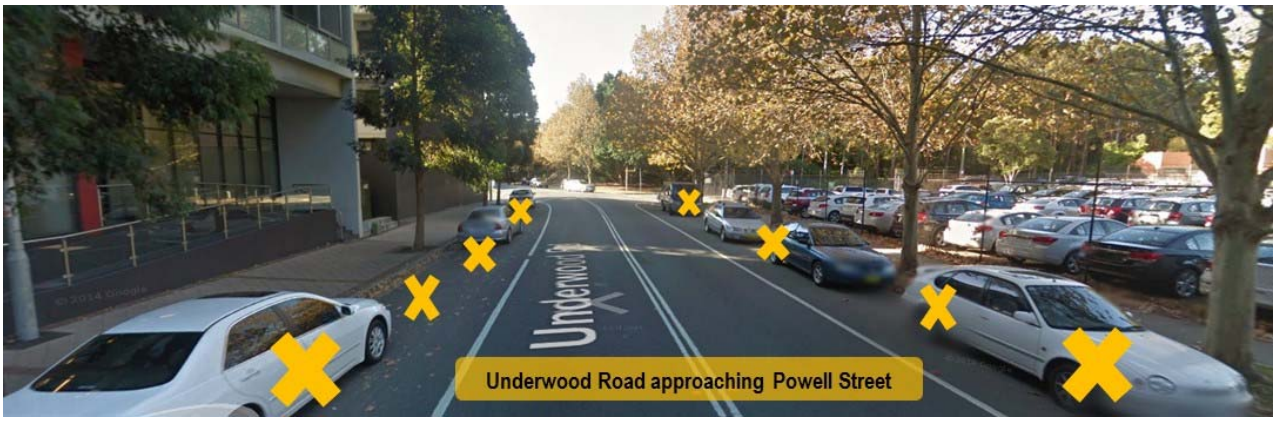
Furthermore, whilst haul routes are mostly limited to Parramatta Road and the M4 corridor, some usage of Underwood Road is likely. The greatest impact on local congestion however will be due to light vehicles with up to approximately 300vph each way added to Parramatta Road west of Underwood Road at peak construction times. This suggests that early upgrades of the Underwood Road, George Street and Bridge Road intersections with Parramatta Road would appear warranted to manage the impacts of this additional traffic from the outset.

Furthermore, strict management measures would need to be put in place to prohibit the use of local streets south of Parramatta Road (such as Bridge Road) by heavy construction traffic.

6. OTHER IMPACTS

6.1 PARKING

During construction, the primary parking impacts will be along Underwood Road from Parramatta Road to Short Street if the additional through lanes recommended at Powell Street are implemented. Figure 6.1 shows that additional area of parking removal that would be required if the additional lanes in Underwood Road were adopted.



Source: Google Maps

Figure 6.1: Additional Potential On-Street Parking Loss During Construction

During operations, parking impacts are likely to be secondary impacts associated with the loss of side-street parking near Parramatta Road to provide additional turn lane storage. Likely streets where on street parking loss are likely in the future include:

- Further south along Bridge Road in front of more residential properties (i.e. extension of turn pockets;
- Underwood Road from Parramatta Road to Powell Street (mix of residential and commercial parking impacted); and
- Knight Street south to Loftus Crescent (mostly residential frontage impacts until redevelopment occurs).

The customers to businesses fronting Parramatta Road use these areas to some extent and removing them (which is likely) further heightens the need for Loftus Lane to be formalised as the "rear access and parking" street in the area.

6.2 PUBLIC TRANSPORT

The construction and operational period impacts on bus stops and additional delays to buses have not been discussed in any detail in the EIS Traffic and Transport report. Potential impacts include:

- The need for temporary relocation or closure of the stop on Underwood Road under the M4 during construction;
- The potential need for removal/relocation of the eastbound stop on Parramatta Road near the new westbound on ramp;
- Construction period delays/disruptions to Underwood Road bus services and timetabling effects for connections at Homebush Station and at Strathfield Station;
- The absence of bus priority measures in the project through the impact review area (as a "missed opportunity"); and
- The likely effect of more traffic on Pomeroy Street and Underwood Road due to congestion issues at George Street /Parramatta Road and hence ongoing delays and reliability impacts for buses using this route.

Whilst the WestConnex M4 East project identifies benefits to overall bus travel times, all of these benefits are generated east of Burwood where bus lanes are being implemented. West of Concord Road and for

services on approach to Homebush Station and Strathfield Station for interchanging, bus delays on Parramatta Road and on Underwood Road are likely.

6.3 ACTIVE TRANSPORT

Most of the active transport benefits are to the east of Concord Road with bus lanes in Parramatta Road providing benefits for cyclists being able to use these lanes as well. Also, Parramatta Road traffic reduces compared to the "do minimum" case to the east of Concord Road however there is a slight increase west of Concord Road which would increase friction with on road cyclists.

In terms of pedestrian movements, it is expected that the mooted redevelopment along Parramatta Road will introduce more pedestrian demands across this corridor for local trips and access to bus stops, thereby further impacting peak period traffic operations due to the long times required for these six lane crossings.

The M4, Parramatta Road and the Western Rail Line will continue to act as barriers to efficient north-south pedestrian and cyclist movement through the area, unlike areas further east where the reduction in Parramatta Road traffic would further encourage pedestrians and cyclist usage.

The Pomeroy Street pedestrian overpass facility is being retained meaning that the same number and location of cross-M4 connections will be in place with the project as before the project.

6.4 SUMMARY OF ISSUES

No parking, public transport or active transport impact mitigation measures have been identified, but should be in the impact review area given the potential importance of these impacts at the local scale.

Active transport impacts associated with the project west of Concord Road are mostly associated with additional traffic drawn into Underwood Road and Parramatta Road which are key active transport routes.

Bus stops on Underwood Road (under the M4) and on Parramatta Road (near the new westbound on ramp) will be impacted as well and require removal or relocation.

Bus travel times will be adversely impacted in the impact review area with due recognition that bus travel times will be improved significantly east of Burwood due to bus lanes on Parramatta Road.

7. CONCLUSIONS

7.1 METHODOLOGY AND IMPACT ASSESSMENT SCOPE ISSUES

The WestConnex M4 East EIS assessed the project's construction period and operational period traffic and transport impacts. The assessments undertaken for traffic were primarily focussed on intersection "clusters" and clusters 1, 2 and 3 were located between Homebush Bay Drive and Concord Road, with cluster 2 of most significance. Cluster 2 included four intersections on Parramatta Road between Bridge Road and Station Street as well as the Underwood Road/Powell Road intersection.

In general, the strategic level modelling and intersection level modelling used in the EIS limited the coverage and the level of detail of the project on local roads in the impact review area. The Traffic and Transport Report focussed primarily on major road (mid-block) and major road intersection capacity impacts with no consideration of local road impacts of side street queueing and delays to major roads (such as Parramatta Road) or amenity impacts due to additional traffic being drawn through residential areas. This level of assessment would require a mesoscopic level of modelling considering say 1km either side of the Parramatta Road corridor.

In addition, the assessment in the Traffic and Transport report focusses on east-west roads and the current and emerging issues in the impact review area are primarily with north-south roads. Given limited rail line and M4 road crossings in the areas both north and south of Parramatta Road, drawing more traffic into Parramatta Road in a north-south direction, whilst increasing traffic on Parramatta Road in an east-west direction has a cumulative effect of additional delays at intersections. No intersection upgrades for intersections on Parramatta Road west of Concord Road have been considered as part of the project and a more detailed assessment is needed to identify what upgrades are required to ensure "no worsening" to side street delays and queues.

7.2 OPERATIONAL PERIOD IMPACTS

Key operational period traffic impacts that have wither not been identified or have been identified and not sufficiently mitigated in the WestConnex M4 East EIS include:

- Increased traffic volumes and congestion on Parramatta Road west of Concord Road will affect local accessibility particularly considering the redevelopment potential of the area under the New Parramatta Rd proposal;
- Increased delays in Bridge Street and in Underwood Road in particular on approach to Parramatta Road in peak periods that are not adequately reported or addressed in the Traffic and Transport Report. This includes what additional approach lane storage capacity might be required and what consequential impacts to on street parking may result;
- The volume of additional traffic that would be drawn through local areas north and south of Parramatta Road west of Concord Road (in roads such as The Crescent, Station Street, Bridge Road and Underwood Road) which has not been assessed in sufficient detail using a delay-sensitive route choice model such as is commonly used in mesoscopic simulation models; and
- The new Powells Creek on ramp and traffic that will now be attracted from Leicester Avenue, left into Parramatta Road, through the George Street intersection and turning right into the new on ramp which will significantly impact the congested George Street/Parramatta Road intersection. If significant delays are experienced here (as expected) some through traffic for this movement may be tempted instead to use Mosely Street to turn left to access the M4 at its intersection with Parramatta Road, inducing more through traffic into this residential street.
- The over-capacity condition of the George Street/Parramatta Road intersection, with signals most probably managed to minimise Parramatta Road queuing to the detriment of queueing in George Street and the consequential likely diversion of through traffic to the Pomeroy Street-Underwood Road corridor.
- Relocating the new Powells Creek on ramp further east, and east of George Street if possible, would mitigate a number of the expected congestion issues and the likely usage of local streets for accessing the M4 westbound.

It may be that these local impacts, when fully tested in more sensitive and more holistic modelling, may not be significant in the context of "do minimum" delays and queues however in the absence of this detailed analysis, local knowledge and previous assessments in the area would suggest some impacts are likely and some intersection upgrades would be warranted.

No detailed assessment of bus route impacts has been undertaken in the impact review area. Whilst there are bus travel time benefits to the east with bus lanes included in Parramatta Road east of Burwood, no such bus lanes are proposed through Strathfield-Homebush and bus travel times will be affected by additional traffic on Underwood Road and on Parramatta Road with no priority measures in place. The lack of identification of bus priority on Parramatta Road in this area is seen as a missed opportunity.

7.3 CONSTRUCTION PERIOD IMPACTS

The construction program and compound access locations will see three of the four north-south routes in the area north of Parramatta Road impacted by construction vehicle access movements, namely: Concord Road, Underwood Road and Homebush Bay Drive. The only north-south route directly unaffected, George Street, will have significant congestion at its intersection with Parramatta Road. With approximately 300 vph per direction added to Parramatta Road west of Concord Road in peak periods, along with compound site access turning movements, there will inevitably be increased delays during the construction period for local and through traffic using Parramatta Road and Underwood Road in particular. There does not appear to be any easy solution to this issue with the exception of some temporary widening works in Underwood Road at the Powell Street and the Short Street compound site access intersections to separate turning vehicles from through vehicles.

In addition, the construction traffic management plans that are to come should specifically identify measures to restrict heavy vehicle usage of Bridge Road and The Crescent rail underpass for access to/from the south to construction compounds.

8. RECOMMENDED RESPONSE TO WESTCONNEX DELIVERY AUTHORITY

The recommended response to the WestConnex Delivery Authority on the WestConnex M4 EIS (*the project*) specifically related to Traffic impacts issues, is as follows:

- In general, the EIS Traffic and Transport assessment scope is limited to key east-west roads and intersections immediately adjacent to the M4 and Parramatta Road corridors. The project, and its attractiveness for additional traffic is significant and is expected to have impacts in the broader corridor that have not yet been identified, including on north-south connecting routes to ramps and interchanges. These impacts should be determined.
- The mitigation measures identified in the EIS are generally limited to the access points to the project, which is insufficient for a project of this scale. Over-capacity conditions at the George Street/Parramatta Road intersection are identified to be managed through signal operations. Further detail (through modelling) should be provided to quantify exactly what the consequential impacts to Parramatta Road side streets are when managing Parramatta Road queueing through signal phase times.
- Homebush Bay Drive Interchange - All connections maintained and no new impacts for Council, but potential exacerbation of congestion issues on Centenary Drive which ultimately affect Arthur Street right turn capacity.
- New Powells Creek westbound on ramp and intersection with Parramatta Road - The need for the new ramp and intersection is understood however relocating it further east (and east of George Street) would minimise induced traffic through local roads (e.g. Subway Lane-Knight Street) and reduce significant impacts expected at the George Street/Parramatta Road intersection. There may be some design complexities to overcome in this constrained area though to try and relocate the on ramp.
- Concord Road Interchange - Overall has some benefits to Council however the relocation of the westbound on ramp to the M4 further west is likely to induce some through traffic through local streets
- Overall, there is an insufficient level of detail or coverage in the EIS traffic modelling to determine operational period impacts on local roads in terms of:
  - Additional queueing and delays on approaches to Parramatta Road, such as at Bridge Road, Underwood Road and Knight Street;
  - The additional traffic drawn through the limited number of north-south local routes in the area based on intersection delay-affected local route choice rather than link delay-based route choice and due to the stated over-capacity conditions at the George Street/Parramatta Road intersection; and
  - What additional intersection upgrades along Parramatta Road west of Concord Road would be required to mitigate the impacts created by the above.
- Mesoscopic simulation modelling should be undertaken for the impact review area to better understand the impacts of the project and also considering the cumulative impacts of the re-development scale and the traffic and transport strategies in the New Parramatta Rd proposal.
- The construction compound access locations will see three of the four north-south routes in the area north of Parramatta Road impacted by construction vehicle access movements, namely: Concord Road, Underwood Road and Homebush Bay Drive. The only north-south route directly unaffected, George Street, will have significant congestion at its intersection with Parramatta Road. With approximately 300 vph per direction added to Parramatta Road west of Concord Road in peak periods, along with compound site access turning movements, it will be important to design the compound access intersections such that there is no worsening of current delays to background traffic.
- Part of the mitigation to construction period impacts could include some temporary widening works in Underwood Road at the Powell Street and the Short Street compound site access intersections to separate turning vehicles from through vehicles, including management plans to address loss of on street parking due to these works.
- Any subsequent construction traffic management plans for the project should specifically identify measures to restrict heavy vehicle usage of Bridge Road, The Crescent rail underpass and other local roads south of Parramatta Road for access to/from construction compounds.
- Bus priority measures should be considered in more detail for Parramatta Road and for the Underwood Road/Parramatta Road intersection in particular considering these routes feed buses through to Homebush and Strathfield Stations. Any bus priority proposals introduced should then be considered further for their associated traffic impacts and what supplementary intersection upgrades should be undertaken.

REFERENCES

Bitzios Consulting, December 2014, *Parramatta Road Corridor Transport and Mobility Study*

Urban Growth NSW, September 2015, *New Parramatta Rd: Draft Parramatta Road Urban Transformation Strategy, Volume 1*.

Urban Growth NSW, September 2015, *New Parramatta Rd: Parramatta Road Precinct Transport Report*.

WestConnex Delivery Authority, September 2015, *WestConnex M4 East: Environmental Impact Statement.*

WestConnex Delivery Authority, September 2015, *WestConnex M4 East: Environmental Impact Statement Appendix G: Traffic and Transport Assessment*

APPENDIX A

????

WILKINSON MURRAY

21 October 2015

WM Project Number: 15302
Our Ref: SCL15302Ltr10102015

Frankie Liang
Strathfield Council
65 Homebush Road
STRATHFIELD NSW 2135

Dear Frankie

Re: M4 East Environmental Impact Assessment (Noise & Vibration Independent Review)

Wilkinson Murray Pty Ltd has been commissioned to conduct an independent review of the M4 East Environmental Impact Statement (the project), particularly the Technical Paper *"Noise Assessment WestConnex M4 East Project Construction and Operational Road Traffic Noise and Vibration Impact Assessment Report Number 610.13569-R2 4 September 2015"* (the report), prepared by SLR Consulting Australia Pty Ltd (the consultant).

This letter presents an adequacy review of the report. It identifies noted gaps in the assessment and provides recommendations to Strathfield Council.

The review focussed on operational and construction noise and vibration; and was conducted with reference to the following NSW Government Guidelines:

- *Industrial Noise Policy (INP);*
- *Interim Construction Noise Guidelines (ICNG);*
- *Assessing vibration: a technical guideline (AVTG);*
- *Road Noise Policy (RNP);*
- *Noise Criteria Guideline (NCG); and,*
- *Noise Mitigation Guideline (NMG).*

It should be noted that the NCG and NMG are RMS guidelines not whole of Government NSW policies.

The review the noise and vibration assessment report including a critical review of the follow:

- *Existing noise environment;*
- *Noise assessment methodology;*
- *Construction noise impact assessment;*
- *Operational noise impact assessment; and*

- *Noise mitigation and management measures proposed.*
- *Recommend deliverable solutions to mitigate any identified noise and vibration impacts.*

Additionally the specific noise and vibration impact of the proposed on-ramp located at 15 Parramatta Road, Homebush (Lot 2 DP 1002876) on the adjacent residential zoned land, existing residential flat buildings and on the proposed Arnott's Reserve have been reviewed.

OPERATIONAL TRAFFIC NOISE

Operational traffic noise for the project is assessed in Section 8 of the report. The report considers the resulting changes in traffic noise as a result of the project.

A review of the operational road traffic noise impact assessment Report indicates that the general methodology used for the assessment was appropriate and consistent with the RNP, NCG and NMG.

The assessment identifies a total of 392 sensitive receivers (within 301 individual lots) which qualify for consideration of additional noise mitigation as part of the project. The majority of these receivers qualify on the basis of a cumulative noise limit exceedance. The following additional noise mitigation measures have been recommended:

- Low noise pavement for the surface sections of the M4E carriageway and modified sections of the M4 carriageway.
- Seven new or increased height noise barriers of various heights.
- Property treatment at a total of 310 receivers (247 individual lots).

Much of the proposed traffic noise impacts from surface roads from the Westconnex project are within the Strathfield Council area and many of the buildings impacted are multi –level residential buildings. The report states the following commitment with regard to providing or considering property treatments for residential receivers:

"7.4 Receivers considered for property treatments

For individual residential receivers, Roads and Maritime does not consider it reasonable to consider noise mitigation above the ground and first floor. It is generally not feasible and reasonable to provide at-receiver noise mitigation to multi-level residential receivers. Noise levels are assessed and outcomes referred to detail design.

Where residential receivers are identified as exceeding the NCG criteria in multi-storey apartment buildings, a further feasible and reasonable review of architectural treatments should be completed during the detailed design. This would consider requirements adjacent to elevated sections of the project, noting also that some existing sections of the M4 Motorway are elevated."

The extent of the proposed property treatments are unclear as it is not clear if multi –level residential buildings impacted by traffic noise would be considered for property treatments above the ground and first floor. It is understood that property treatments were conducted for all levels of multi-level residential receivers for the Lane Cove Tunnel Development.

Query/ Recommendation:
Wilkinson Murray recommends that Council in their submission to RMS request clarification if multi–level residential buildings impacted by traffic noise would be considered for property treatment and why it would be "generally not feasible and reasonable to provide at-receiver noise mitigation to multi-level residential receivers" when it has been done on other projects. All levels of residential multi-level apartments, where residential receivers are identified as exceeding the NCG criteria should be considered for property treatment consistent with NSW Government Policy and past projects (eg. Lane Cove Tunnel Development).

OPERATIONAL TRAFFIC NOISE

One of the ventilation facilities is located in the Strathfield Council area. A ventilation facility is proposed to be located adjacent to Underwood Road in the Homebush Bay Drive Interchange zone typically referred to as the western ventilation facility.

The western ventilation facility consists of five (four duty and one standby) large diameter axial exhaust fans and associated intake and discharge sound attenuators and motorised isolation dampers, all located above ground level in a vertical configuration. The proposed stack would be 30.5 metres above local ground.

The mechanical plant noise for the project is assessed in Section 9 of the report. A review of the western ventilation facility noise impacts indicates that the general methodology used for the assessment was appropriate and consistent with the INP.

The report has identified noise criteria for the closest residential receiver's around the western ventilation facility of:

- 51dBA $L_{Aeq,\ 15minutes}$;
- 45dBA $L_{Aeq,\ period}$; and
- 61dBA $L_{A1(1minute)}$.

These criteria would appear to be consistent with EPA noise policy and would ensure that noise impacts from the western ventilation facility is controlled.

Query/ Recommendation:
Wilkinson Murray recommends that Council in their submission to RMS request that the following noise criteria be included in any approval if the project where to be approved.
Noise from the western ventilation facility should not exceed:

- 51dBA $L_{Aeq,\ 15minutes}$;
- 45dBA $L_{Aeq,\ period}$; and
- 61dBA $L_{A1(1minute)}$.

at any residential receiver.

CONSTRUCTION NOISE

The construction noise assessment presented noise predictions for:

- Work area establishment;
- Temporary road and intersection modifications;
- Construction ancillary facilities;
- Roads works;
- Tunnelling Site operations;
- Demolition of acquisition properties; and
- Ventilation facility construction.

It is evident from the construction noise assessment in the report that there are significant noise impacts as a result of the *WestConnex M4 East Project* construction works. As the *WestConnex M4 East Project* would be constructed through busy urban areas, works have the potential to disrupt traffic at many intersections throughout the proposal area. To minimise disruption, it is likely that works will be required outside of standard construction hours. The approach taken in the assessment has been to identify noise impacts of representative construction activities.

The construction noise assessment appears to be quite comprehensive with all the assumptions being reasonable. The report has limited detail concerning the construction scheduling and the duration of the noise impact at construction ancillary facilities. The only information presented in the Report is presented below:

Construction activity	Indicative construction timeframe															
	2016				2017				2018				2019			
Construction access excavation (all sites)		■	■	■		■	■	■								
Tunnelling (excavation)			■	■	■	■	■	■								
Tunnel drainage and pavement works						■	■	■	■	■						
Tunnel mechanical and electrical fitout works								■	■	■	■					
Tunnel completion works											■	■	■			
Homebush Bay Drive interchange			■	■	■	■	■	■	■	■						
M4 surface works		■	■	■	■	■	■	■	■	■	■	■				
Western ventilation facility							■	■	■	■	■					
Powells Creek on-ramp		■	■	■	■	■										
Concord Road interchange			■	■	■	■	■	■	■	■	■					
Wattle Street interchange		■	■	■	■	■	■	■	■	■	■	■				
Parramatta Road interchange		■	■	■	■	■	■	■	■	■	■	■				
Eastern ventilation facility		■	■	■	■	■	■	■	■	■	■					
Cintra Park fresh air supply facility				■	■	■	■	■	■	■	■	■				
Cintra Park water treatment facility									■	■		■				
Motorway operations complex						■	■	■								
Mechanical and electrical fitout works							■	■	■	■	■	■				
Site rehabilitation and landscaping						■	■	■	■	■	■	■				

Due to the close vicinity of the proposed works to residents in Strathfield Council area the predicted construction noise levels presented by the EIS indicate high exceedances of the Noise Management Levels (NMLs) by more than 25dB for both daytime and Out of Hours Works (OOHWs) at nearest residences.

It should be noted that Tunnelling site operations are anticipated to be undertaken on a 24/7 basis for all tunnelling sites particularly around Underwood Road. Exceedances of the NMLs by more than 25dB are predicted OOHWs at nearest residences. The noise mitigation proposed for Underwood Road is a 4.5 metre hoarding to the northern boundary and an acoustic shed.

The construction noise assessment presents typical construction noise mitigation methods and procedures, however a detailed construction noise management strategy is not provided.

Transport NSW has a detailed Construction Strategy (7TP-ST-157/2.0). The purpose of this document is to provide practical and transparent guidance on how to minimise, to the fullest extent practicable, the impacts on the community from airborne noise, ground-borne noise and vibration generated during the construction of major infrastructure projects through the application of all feasible and reasonable mitigation measures.

Query/ Recommendation:
Wilkinson Murray recommends that Council in their submission to RMS require a commitment to use the construction noise management used by Transport NSW for consistency and transparency of managing construction noise and vibration as this could be considered best practice or develop a construction Noise Management Strategy specific for WestConnex.

RAMP LOCATED AT 15 PARRAMATTA ROAD, HOMEBUSH

The proposed ramp located at 15 Parramatta Road, Homebush is located within noise catchment area NCA05 for noise assessment purposes. With regard to noise impacts in NCA05 the report states:

"NCA05 - Receivers south of the M4 adjacent to the new westbound on ramp at the adjacent multi-storey receiver on Powell Street. Indicatively, typical increases of around 3 dBA are predicted. It is noted that receivers are not eligible for consideration of at-property treatments in this catchment as part of the project."

The report has not identified the approved residential development 17-35 Parramatta Road & 5 Powell Street, Homebush Lot 81 in DP 870786 & Lot 3 in DP 1002876. This appears to be a series omission as the development is proposed to comprise 221 residential apartments and was approved in late 2014. Demolition, excavation and construction of the development appears to have started on site. Figure 1 shows the approved residential development 17-35 Parramatta Road & 5 Powell Street, Homebush relative to the proposed M4 ramp.

Figure 1 Proposed M4 Ramp

The proposed residential development was designed such that road traffic noise from Parramatta Road and to a less extent M4 was mitigated in order to satisfy the requirements for habitable rooms under Clause 102 (3) of State Environmental Planning Policy (Infrastructure) 2007. However as the development did not consider the proposed ramp from the M4 it is likely that there would be apartments oriented towards the ramp that would have habitable rooms that would exceed the noise requirement in the State Environmental Planning Policy (Infrastructure) 2007.

Query/ Recommendation:

Wilkinson Murray recommends that Council in their submission to RMS identifies that the Approved development at 17-35 Parramatta Road & 5 Powell Street, Homebush be assessed as part of the submissions report and that consideration of noise mitigation be considered for this area consistent with NSW government policies. The installation of acoustic noise barrier on the western side of the on ramp along the green space area should be considered as a minimum.

CONCLUSION

A review of the Noise Assessment WestConnex M4 East Project Construction and Operational Road Traffic Noise and Vibration Impact Assessment Report was conducted by Wilkinson Murray. The general methodology for the noise and vibration assessment was appropriate. However, some gaps in the assessment have been identified and recommendations for additional information have been presented above.

I trust this information is sufficient. Please contact us if you have any further queries.

Yours faithfully
WILKINSON MURRAY

John Wassermann
Director

22 October 2015

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Strathfield Municipal Council
PO Box 120
STRATHFIELD NSW 2135

Attention: Mr Rashad Danoun

Dear Rashad

SLR Consulting Australia Pty Ltd (SLR) was commissioned by Strathfield Council (Council) to perform a peer review / adequacy assessment of the ground contamination and air quality impact assessment (AQIA) for the WestConnex Stage 1(b) - M4 East which was released for public exhibition on 8 September 2015.

The attached presents a summary of our observations.

Yours sincerely

GARY GRAHAM
Technical Director – Air Quality

COLM MOLLOY
Regional Manager APAC, Land & Water

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1 SCOPE

The proposed scope of works is to review the documentation, review the suitability and robustness of the following specific aspects of the assessment:

- Selection of appropriate contamination and air quality criteria.
- Appropriateness of the conceptual model inputs (areas of concern / emissions inventory).
- Meteorological modelling methodology (suitability / accuracy of modelled meteorology), including:
  - The overall air quality impact as a result of the M4 East project;
  - The specific air quality impact on surrounding community of Homebush area resulting of the proposed locality of ventilation outlet / stacks west of Underwood Road; and
  - The specific air quality impact of the proposed on-ramp located at 15 Parramatta Road, Homebush (Lot 2 DP 1002876) on the adjacent residential zoned land, existing residential flat buildings and on the proposed Arnotts Reserve.
- Assessment of contamination assessment, remedial measures and potential impacts, including:
  - The potential environmental impact from the waste generated of the excavation work in potential contaminated area as a result of the M4 East project on the Strathfield LGA; and
  - The specific environmental impact of the excavation work at and around Arnotts Reserve and the relevant sediment controls / measures.
  - Validity and/or effectiveness of any proposed mitigation measures

2 REVIEWERS

This air quality peer review was performed by **Gary Graham** (SLR) and **Dr Martin Doyle** (SLR).

The contaminated land peer review was performed by **Colm Molloy** (SLR) and **Dr Lange Jorstad** (Geosyntec Consultants).

Gary Graham is a Technical Director with SLR and the Technical Discipline Manager for Air Quality across Australia, New Zealand and Asia with over 20 years' experience in consulting environmental science in Australia, Asia and Europe.

He holds a Bachelor's Degree (with Honours) in Environmental Science (BSc), a Master's Degree (MSc) in Wastes Management, is a Chartered Scientist (CSci), Chartered Environmentalist (CEnv), Chartered Water and Environmental Manager (C.WEM MCIWEM).

He is a project manager with extensive experience in multi-disciplinary consultancy with an emphasis within the air quality, environmental permitting, compliance, environmental planning and waste management sectors.

He has provided technical consultancy advice to an extensive portfolio public and private sector clients, including the World Bank, European Bank for Reconstruction and Development, central government agencies in Europe and Australia, (including Australian DOD, NSW DECCW/EPA, INSW, UK DEFRA and Highways Agency), local government, development agencies, energy, industry, infrastructure, wastewater, and urban renewal sectors.

He routinely provides peer review services on behalf of Councils and frequently provides expert witness and testimony in Australia on odour, dust, air quality, climate change and spray drift issues, and at Public Inquiry in the UK.

Dr Martin Doyle is a Principal Air Quality Scientist with SLR. He has over 15 years' experience in all aspects of air quality and greenhouse gas assessment, from academic research to public and private environmental consultancy.

He holds a Bachelor's Degree (with Honours) in Environmental Science (BSc), completed his doctorate (PhD) in 2004 in the area of air pollution meteorology and was a Senior Research Associate at the University of East Anglia, which has the UK's highest rating for the quality of environmental research undertaken.

He is experienced in all aspects of air quality assessment from air quality monitoring, emissions inventory development and atmospheric dispersion modelling for a wide range of pollutants, including odour.

He has detailed working experience with a range of dispersion models including CALPUFF, AUSPLUME and AERMOD and has been involved in a number of complex modelling assessments for his clients.

Martin is a provisional lead auditor in environmental management systems and has undertaken several desktop and site audits of environmental management plans.

Colm Molloy is a Regional Manager (APAC) with SLR and manages all aspects of our Land & Water service line. This includes contamination, remediation, hydrogeology, earth science, geotechnical engineering and risk assessment. Colm has over 20 years' experience in senior management and executive level roles. Colm is a dynamic people manager, with track record in engaging and motivating teams across disciplines, regions and organizational levels. He is passionate about developing innovative design as the basis of our strong business culture and structure.

Colm is a chartered engineer with wide experience across global infrastructure and resource sectors, with proven experience in business leadership, operational and project management, and business development. A strong track record in growing innovative containment design within Global Engineering consulting organisations, developing and implementing strategic plans, growing technical and management capability to target both new and existing markets, and providing strategic advice to major businesses.

Throughout his career, he has provided leadership in the delivery of major projects and programs, provided governance on leadership teams and boards, and directed and managed teams on a wide range of major water, civil, environmental and transport infrastructure projects. Colm is a recognised leader in the areas of contamination and remediation assessment, waste management, civil and geotechnical engineering and has provided high level technical advice and expert witness on these issues across the region.

Dr Lange Jorstad has Peer Reviewed the ground contamination observations, who is a NSW EPA Accredited Site Auditor pursuant to Part 4 of the Contaminated Land Management Act 1997. Dr. Jorstad is a Senior Hydrogeologist in Geosyntec Consultant's Sydney, Australia operations. Lange has 18 years' experience in environmental consultancy, including three years of postgraduate research in contaminant hydrogeology.

His experience includes management of both contaminated land and hydrogeological investigations, and specialist hydrogeological support for multi-disciplinary projects in Australia, Asia Pacific and the United States. Specialist technical services include groundwater impact assessment to support planning and permitting for extractive and infrastructure developments, development of robust conceptual site models to guide management decisions for contaminated land, and contaminant fate and transport analysis in support of risk based site assessments.

3 AIR QUALITY

3.1 Documents Reviewed

The following document was reviewed as part of this Peer Review:

- Appendix H of the Environmental Impact Statement – M4 East (September 2015) (*Air Quality Impact Assessment*).

3.2 Peer Review

For expediency, the following tables briefly outline the Peer Review of the specified documents. Each observation is allocated a discrete entry and its potential significance is qualified by the following descriptors:

- **High:** the issue has a significant implication on the conclusions that are drawn from the data / assumption.
- **Medium:** the issue has an implication that may alter the conclusions that are drawn from the data / assumption.
- **Low:** the issue needs to be addressed but is considered unlikely to alter the conclusions drawn from the data / assumption.
- **Observation:** the issue has been raised as an observation only.

Please note that the above ranking is not necessarily intended as an assessment of "*error*" but represents the potential implication of the identified uncertainty. In most instances, the uncertainty relates to a lack of adequate justification for the use of data or a stated assumption.

3.2.1 Summary of Findings

There are a total of 6 issues identified as being of "Medium" significance. These principally relate to the selection of the dispersion modelling approach, the use of data as input to that approach, and the selection of data and interpretation of data output from the dispersion modelling.

Table 1 Air Quality - Peer Review Observations

Ref	Document / Reference	Issue / Observation	Comments / Recommendations	Significance
A	SEARS	Requirement to consider any advice from the Advisory Committee on Tunnel Air Quality – advice provided for the NorthConnex (reports) were taken into account. No project specific advice seemingly sought, provided or taken (page 6).	Further clarification is sought	Low
B	SEARS	Modelling required to be performed in accordance with the Approved Methods or a suitably justified and verified alternative method. Modelling conducted in accordance with Approved Methods 'where appropriate'.	Further clarification is sought – see later comments on dispersion modelling	Low
C	Agency Letters	Requirement that air quality modelling scenarios should be canvassed with the Inter-Agency Regulatory Group to obtain in-principle support for the approach. The methodology and findings have been presented to the DPE, EPA and NSW Health – no discussion of the outcomes of those discussions is provided to confirm (or otherwise) that the approach gained in-principle support.	Further clarification is sought	Low
D	Section 8.3 Dispersion Modelling	Model Selection The GRAMM/GRAL dispersion model has been selected for use. It is noted that the GRAL system has not been extensively used in Australia. Its suitability for use within this assessment should be justified in detail and the rationale for selection provided in full. The bullet points on page 99 of the AQIA are generic. The first bullet point "…*can utilise a full year of meteorological data*" is immaterial given that a classified meteorological data set (ie not a full year of meteorological data) has been used within the assessment.	Need further justification for use in this assessment, given that it is not an 'approved method'. Some agreement from NSW EPA would strengthen this case. See comment below on met data use.	Medium
E	Section 8.3 Dispersion Modelling	Model Application The computation of 'steady-state concentration fields' (page 101) for classified meteorological fields has been performed because 'the simulation of an hourly time series of a whole year would be very time consuming'. However, the effects of inversions and/or increasing concentrations of NO2 on a hour to hour basis may not be appropriately represented using a steady state method or using classified meteorological data, where concentrations are assumed to be effectively reset to zero at the beginning of each modelled hour.	Clarification that the dispersion modelling provides for the impacts associated with the potential worst case hour and includes the effects of previous hours of meteorology.	Medium
F	Section 8.3 Dispersion Modelling	The use of Canterbury Racecourse AWS BoM observational data as input to the meteorological model (GRAMM) is noted. The extraction of modelled meteorology at this point and subsequent validation of the meteorological model using these data is questioned however.	Provide clarification that the meteorology used in modelling is an accurate (or representative) reflection of the meteorology likely to be experienced between the	Medium

Ref	Document / Reference	Issue / Observation	Comments / Recommendations	Significance
		The statement "Regression analysis of wind speed showed a very good agreement between predicted and observed values at the Canterbury Racecourse site, but less so at the other sites" (page 104) raises questions as to the validity of the meteorological modelling. The model seems to perform well at the point where observational data is used (as would be expected), but not very well at any other points in the modelling domain.	source and receptor(s).	
G	Section 8.3 Dispersion Modelling	Data at a height of 10 m is understood to have been used in modelling. However, wind speeds at the point of emission (effectively ground level) will be lower. It is not clear whether the model has taken into account wind speed reductions with height.	Clarify whether 10m wind speeds or ground level wind speeds used in modelling.	Medium
H	Section 8.3 Dispersion Modelling	The dispersion model outputs are noted to be associated with a height of 3 m above ground level - 'effectively ground level' (page 109) as the model cannot predict concentrations at ground level. Confirmation that predictions of pollutants at heights multiple times the distance from ground level to the point of emission are appropriate is required.	Further information on how predictions at 3 m are appropriate to reflect ground level concentrations is required.	Medium
I	Section 8.4 Outputs	Dispersion model outputs are presented in a number of ways in the report, including contour plots. Given that a large amount of public concern will be associated with emissions from ventilation outlets, presentation of contour plots specific to these areas, at an appropriate resolution would be useful.	Suggest provision of contour plots around ventilation outlets	Low
J	Section 8.7 Sensitivity Tests	Sensitivity tests were performed using varying ventilation outlet temperature, outlet height and inclusion of buildings near ventilation outlets (Section 8.7). Confirmation that sensitivity tests were not performed using buildings for road emission sources is sought, given that street canyon effects may be important.	Further clarification required	Medium
K	Section 8.6 Summary of key assumptions	Weekday traffic volumes were applied to each day of the year, which is stated to result in overestimates of concentrations at weekends.	Confirmation of the weekday/weekend traffic volumes extracted from the traffic model is required for clarification that the weekday traffic flows do represent 'worst case' for all receptors.	Low

Further to the above Council has requested that SLR provide commentary on the following issues:

- *Specific <u>air quality</u> impact on surrounding community of the Homebush area resulting from the proposed locality of ventilation outlet / stacks west of Underwood Road (e.g. whether this has been mentioned or addressed in the EIS and what measures have been proposed to mitigate any impact and whether these are sufficient.*

Over 10,000 discrete receptor locations were included in the dispersion modelling assessment, with results for 31 "community" receptors being provided in detail within the AQIA. Those closest to the ventilation outlet west of Underwood Road are identified as SR02 and SR08 to SR13 (see Figure 8-16 of the AQIA). Results associated with 'normal' operations for the 2021 scenario have been examined in detail.

Predicted maximum 1 hour and 8 hour concentrations of carbon monoxide (CO) are well below the relevant criterion at all of these receptors with impacts from the ventilation facility predicted to be zero for 1 hour predictions and less than 0.3% for 8 hour predictions. Existing background concentrations are predicted to be the major contributor to 1 hour and 8 hour CO impacts at receptors SR02 and SR08 to SR13.

Annual mean and 1 hour maximum nitrogen dioxide (NO_2) concentrations were predicted to be less than the relevant criteria at receptors SR02 and SR08 to SR13 (and all community receptors assessed). The impacts of emissions from the ventilation outlets on annual mean NO_2 concentrations is hard to quantify from the graphs provided in the AQIA, but is minor. Impacts are shown to be dominated by existing background NO_2 concentrations. The predicted contribution of ventilation stack emissions to the maximum 1 hour NO_2 concentrations was zero with concentrations dominated by existing air quality.

Annual mean and 24 hour maximum PM_{10} concentrations are all predicted to be below the criteria values for all community receptors modelled (including SR02 and SR08 to SR13). The contribution from ventilation outlets is quoted to be "negligible" for predictions of both averaging periods. Existing background concentrations of PM_{10} are shown to be the dominant contributor to cumulative impacts at all receptors.

Exceedances of the annual mean $PM_{2.5}$ concentration are predicted at all community receptors and at receptors SR02 and SR08 to SR13 with concentrations approximately 1 $\mu g/m^3$ above the criterion of 8 $\mu g/m^3$. The quoted contribution from the ventilation outlets was less than 0.03 $\mu g/m^3$. And the contributions from surface roads was predicted to be between 0.5 $\mu g/m^3$ and 1.1 $\mu g/m^3$.

24 hour maximum $PM_{2.5}$.concentrations are all predicted to be below the current criteria values for all community receptors modelled (including SR02 and SR08 to SR13). The contribution from ventilation outlets is quoted to be "negligible" (<0.2 $\mu g/m^3$). Existing background concentrations of $PM_{2.5}$ are shown to be the dominant contributor to cumulative impacts at all receptors.

Concentrations of air toxics assessed within the AQIA were predicted to be below relevant criteria levels.

The results indicate that concentrations of air pollutants modelled as part of the AQIA all meet the required criteria, with the exception of annual mean $PM_{2.5}$. The contribution to predicted impacts resulting from the operation of ventilation outlets is shown to be minimal. Notwithstanding these predictions, the AQIA includes a discussion related to the potential options to reduce emissions from the ventilation outlets (10.2.2 of the AQIA). Page 199 of the AQIA outlines a number of reasons why air treatment is not proposed for the ventilation outlets. Assuming that the predictions presented in the AQIA are accurate (that is, the predicted impacts are negligible at the receptors examined and assuming that dispersion modelling predictions would be unchanged as a result of the queries raised in **Table 1**), and the impacts surrounding the ventilation outlets (a detailed and zoomed in view of impacts around each ventilation stack has been identified as being of interest in **Table 1** ref I), the inclusion of air treatment might be considered to represent an unsustainable solution. However, it would be strongly recommended that a program of validation testing is performed to verify the assumptions presented in the report. Should this validation testing indicate that the assumptions made in the AQIA relating to ventilation emissions are not accurate, additional dispersion modelling should be performed to quantify the predicted impacts of these inaccuracies. Where impacts may be shown to be not acceptable, consideration should be given to treatment of the ventilation emissions.

- *The specific air quality impact of the proposed on-ramp located at 15 Parramatta Road, Homebush (Lot 2 DP 1002876) on the adjacent residential zoned land, existing residential flat buildings and on the proposed Arnotts Reserve (e.g. whether any modelling of this specific air quality impact particularly when the cars are travelling the on-ramp, what mitigation measures are proposed, any suggestion on additional mitigation measures).*

The predicted impacts at the location 15 Parramatta Road are as described above. No detailed discussion of impacts at this location is available from the AQIA. Modelling has been performed at this location (as part of the 10,000 receptors modelled) and results are presented generally as a total Project impact across all receptors within the AQIA.

- *Overall/Summary of recommendations from the EIS review of Air Quality and Contamination (whether they are satisfactory or not and what important control measures to highlight etc.) for Council to include in its submission.*

Recommendations for further assessment and discussion of a number of issues with associated risk have been provided in **Table 1**.

- *Whether installing a filtration system to the ventilation stack is required to produce an acceptable air quality impact.*

The AQIA indicates that impacts due to ventilation stacks are minimal / negligible on the receptors assessed. However, as indicated previously above and in **Table 1** ref I, the AQIA would benefit from inclusion of detailed contour plots of predicted impacts surrounding ventilation outlets.

Based on the information reviewed, and the justification for not including air treatment in the ventilation stacks as provided within the AQIA, SLR would conclude that air treatment is not required to produce a ‘not unacceptable’ air quality impact. It is noted that this is not the same as “no impact”.

4 GROUND CONTAMINATION

4.1 Documents Reviewed

The following documents from the Environmental Impact Statement – M4 East (September 2015) were reviewed as part of this Peer Review:

- Section 11 Human Health
- Section 15 Soil & Water Quality
- Section 16 Contamination
- Section 26 Cumulative Impacts (relevant to environmental)
- Section 28 Environmental Risk Analysis
- Section 29 Summary of Environmental Management measures
- Appendix J – Human health risk assessment
- Appendix O – Soil and water assessment
- Appendix P – Soil and land contamination assessment

4.2 Peer Review

For expediency, the following tables briefly outline the Peer Review of the specified documents. Each observation is allocated a discrete entry and its potential significance is qualified by the following descriptors:

- **High:** the issue has a significant implication on the conclusions that are drawn from the data / assumption.
- **Medium:** the issue has an implication that may alter the conclusions that are drawn from the data / assumption.
- **Low:** the issue needs to be addressed but is considered unlikely to alter the conclusions drawn from the data / assumption.
- **Observation:** the issue has been raised as an observation only.

Please note that the above ranking is not necessarily intended as an assessment of "*error*" but represents the potential implication of the identified uncertainty. In most instances, the uncertainty relates to a lack of adequate justification for the use of data or a stated assumption.

4.2.1 Summary of Findings - Contamination

There are a total of 5 issues identified as being of "Medium" significance and one issue of "High" significance. These principally relate to the selection of the contamination assessment approach to identify issues, the extent of the investigations undertaken, and the proposed mitigation measures. The issue of "High" significance relates to the mitigation of asbestos in soil, which has become an issue of technical complexity and a community concern on other major infrastructure projects.

Table 2 Contamination - Peer Review Observations

Ref	Document / Reference	Issue / Observation	Comments / Recommendations	Significance
A	SEARS	Assessment required identifying potential impacts of the development on acid sulfate soils in accordance with the relevant guidelines and a description of the mitigation measures proposed to minimise potential impacts.	Further clarification is sought	Low
B	SEARS	A contaminated lands assessment in accordance with relevant guidelines.	Further clarification is sought – see later comments on scope of the contamination assessment undertaken	Low
C	Agency Letters	NSW EPA request that EIS include a detailed plan for in situ classification of waste material, including the sampling locations and sampling regime that will be employed to classify the waste, particularly with regards to the identification of contamination hotspots.	Further clarification is sought – EIS indicates further investigations be carried out and provides outline of environmental management that may be employed in the event of contamination being encountered. However this does not provide a detailed plan for waste classification or identification of contamination hotspots in accordance with NSW EPA guidance.	Medium
D	Agency Letters	NSW EPA request the EA should specify whether or not a site auditor, accredited under the CLM Act 1997, has been or will be engaged to issue a site audit statement to certify on the suitability of the current or proposed uses.	The EA states that a Site Auditor has not been appointed to assess suitability of the current or proposed project with respect to contamination. We recommend that a Site Auditor be appointed to maintain project continuity and to ensure that appropriate contamination assessment and consequent remediation measures be proactively adopted within project timelines, rather than a reactive measure during D&C bidding stage.	Medium
E	Volume 2F, Appendix P Section 3.2	The EA comments that detailed site assessments of individual properties were not undertaken as part of this report, WorkCover Dangerous good searches were excluded from the scope and that this is a large scale project, with relatively wide spacing of data along a linear corridor. “The results of the investigations should therefore be viewed as a high level assessment of whether significant, widespread gross contamination is likely to have the potential to pose material constraints to the project”.	This indicates that the investigations undertaken may not meet with the generally accepted contamination management guidelines adopted in NSW (in terms of sampling frequency or in the holistic identification of areas of environmental concern). The high level investigation creates the potential for the investigation to have missed contamination issues beyond the materiality of this high level EA assessment. It is recommended that further	Medium

Ref	Document / Reference	Issue / Observation	Comments / Recommendations	Significance
			investigation be undertaken to address these information gaps before the D&C bidding phase.	
F	Volume 2F, Appendix P Section 7.1.1	Asbestos fragments (bonded and fibres) were identified in fill soils in Section 1 (Homebush Bay Drive to Pomeroy Street) (refer to Figure 4-1). Asbestos (fibres and bonded) has also been identified in Section 3 (Ismay Avenue to Carrington Lane) at Ismay Reserve (as reported by JBS (2013)). The mitigation measures for this surface asbestos contamination are to undertake further investigation to assess the level and extent of the asbestos in the publicly accessible area beside the M4 in Section 1 (Homebush Bay Drive to Pomeroy Street).	Clarification is sought regarding the extent of investigation required and direction to be provided to contractors regarding remediation measures, waste classification / disposal requirements, and environmental management protocols for asbestos in soil.	High
G	Volume 2F, Appendix P Section 7.1.2	Acquisition properties: commercial and residential -properties that are to be acquired may have hazardous building materials including asbestos containing material, and have not yet been assessed or investigated.	Clarification is sought regarding the investigations to assess hazard potential and remediation / mitigation measures required to manage identified risks.	Low
H	Volume 2F, Appendix P Section 7.1.2	Contamination has been assessed at Arnotts Reserve, and the EA comments that remediation will be undertaken by Strathfield Council to render the site suitable for use, prior to development of WestConnex M4 East. It is not clear whether the EA has assessed the specific remediation plan for Arnotts Reserve and concludes that the remediation will be sufficient to render the WestConnex footprint suitable for construction and subsequent use as public infrastructure.	Clarification is sought that the WestConnex design can accommodate the remedial scope and plan for Arnotts Reserve. With reference to issue D, appointing a NSW EPA accredited site auditor to review the remediation action plan would provide greater confidence in the adequacy of the RAP to render the site suitable for its intended land use.	Low
I	Environmental Assessment, Chapter 15 Soil & Water Quality, 15.5.2	Management of soil and water quality during construction and operation will be undertaken by preparing Soil & Water Quality Management Plan in accordance with Blue Book and RTA code of practice. It is not clear that water quality, soil and erosion control measures will specifically reference contamination sources or specific remediation plans (such as at Arnotts Reserve, for example). The nature and timing of remediation and rehabilitation work at Arnotts Reserve undertaken by Council will need to inform the M4East design and construction.	Clarification is sought regarding how the integration of soil and water management will be coordinated with contamination mitigation measures. It is recommended that this integration be synchronised among multiple parties (WDA, NSW EPA, Council, Designers, D&C Teams) during the project development phases (detailed design, tender design, construction, operation).	Low
J	Volume 2D, Appendix J Section 1.4	The Human Health Risk Assessment (HHRA) technical working paper makes assessment of impacts identified in relation to air quality, noise and vibration and social aspects. The HHRA does not evaluate the human health risks due to the construction or operational phase contamination impacts.	It is recommended that the HHRA be further developed to encompass an assessment of ground contamination impacts / risks to identified receptors.	Low

Ref	Document / Reference	Issue / Observation	Comments / Recommendations	Significance
K	Volume 2F, Appendix P Section 7.1.2	The EA comments that further waste classification would be required during the construction phase to direct appropriate soil management and disposal. There is potential for localised areas of soils to be classified as higher category waste (ie other than general solid waste) based on historical use.	It is our experience that significant impacts, delays and remedial planning may be encountered on major infrastructure when construction stage remediation is reactively managed. It is recommended that further waste classification, waste management options and disposal routes are considered as part of the approval and design stage.	Medium
L	Volume 2F, Appendix P Section 7.1.2	Maps indicated the potential for ASS in Section 1 (Homebush Bay Drive to Pomeroy Street), and limited testing within areas of disturbed terrain has indicated latent acidity within the residual clay and weathered bedrock strata in the areas where the ASS mapping has identified potential ASS. No samples exceeded the action criterion for equivalent sulfur or equivalent acidity based on the chromium reducible sulfur results. Based on these results the likelihood of widespread ASS is considered to be low.	It is recommended in areas where potential ASS has been mapped to confirm presence/ absence of ASS, and to obtain a specific liming rate for stockpiles (if required) or further ASS investigations within the disturbed terrain areas of the alignment to confirm their presence or absence. We agree with this approach.	Low
M	Volume 2F, Appendix P Section 7.1.2	An Environmental Management Plan and various contaminant management plans (latent contamination, groundwater, waste management and acid sulfate soils) are to be compiled for the construction phase. The EA does not discuss the need or mechanism for ongoing operational environmental management post-construction.	It is recommended that further assessment of environmental management during the M4 East operational phase is included. This should also include assessment of impacts on Councils	Low

4.2.2 Contamination Peer Review

This Peer Review has been undertaken as part of an overall review of the M4 East WestConnex Environmental Impact Statement Assessment by Strathfield Council. In summary, the EIS addresses the ground contamination and air quality issues in a thorough manner based on the intended scope. We have made comment regarding particular clarifications to provide Council with confidence that the proposed development is protective of human health and the environment where the route traverses Council lands. We believe that the comments and recommendations made herein will provide value to the project in a holistic sense.

5 LIMITATIONS

This report is for the exclusive use of Strathfield Municipal Council. This report may be relied upon by other parties with written consent from SLR.

This report has been prepared based on the scope of services (see below). SLR cannot be held responsible to the Client and/or others for any matters outside the agreed scope of services.

This report has been prepared by SLR with reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with the Client. Information reported herein is based on the interpretation of data collected (data, surveys, analyses, designs, plans and other information), which has been accepted in good faith as being accurate and valid.

It should be noted that many investigations are based upon an assessment of potentially contaminating processes which may have occurred historically on the site. This assessment is based upon historical records associated with the site. Such records may be inaccurate, absent or contradictory. In addition documents may exist which are not readily available for public viewing.

Except where it has been stated in this report, SLR has not verified the accuracy or completeness of the data relied upon. Statements, opinions, facts, information, conclusions and/or recommendations made in this report ("conclusions") are based in whole or part on the data obtained, those conclusions are contingent upon the accuracy and completeness of the data. SLR cannot be held liable should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to SLR leading to incorrect conclusions.

Should the report be reviewed for any reason, the report must be reviewed in its entirety and in conjunction with the associated Scope of Services. It should be understood that where a report has been developed for a specific purpose, for example a due diligence report for a property vendor, it may not be suitable for other purposes such as satisfying the needs of a purchaser or assessing contamination risks for classifying the site. The report should not be applied for any purpose other than that originally specified at the time the report was issued.

Report logs, figures, laboratory data, drawings, etc. are generated for this report by SLR consultants (unless otherwise stated) based on their individual interpretation of the site conditions at the time the site visit was undertaken. Although SLR consultants undergo training to achieve a standard of field reporting, individual interpretation still varies slightly. Information should not under any circumstances be redrawn for inclusion in other documents or separated from this report in any way.