NSW GOVERNMENT | Transport for NSW

A/ Deputy Director General
Development Assessment & Systems Performance
Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Attention: Chris King

Exhibition of Preferred Project Report supporting Project Application for Rozelle Village/Balmain Leagues Club Development off Victoria Road, Rozelle (MP11_0015)

Dear Mr Wilson,

Thank you for your letter dated 5 November 2012 regarding the abovementioned Preferred Project Report (PPR), which was referred to Transport for NSW (TfNSW) for comment.

TfNSW appreciates the opportunity to provide comment and offers the combined comments of Roads and Maritime Services (RMS) and TfNSW. Detailed comments are provided in **Attachment 1**.

A critical issue for both TfNSW and RMS is the operation of Victoria Road. In this regard the applicant has provided a detailed report as part of the PPR outlining the results of a micro-simulation model to understand the impacts of the proposal. The RMS has commissioned Parsons Brinckerhoff (PB) to undertake an independent audit of the transport modeling submitted.

As illustrated in the attached comments from RMS and the independent audit from PB, the critical issue is that the micro-simulation modeling is not fit for purpose and therefore not able to be used to quantify the impacts of the development on the operation of Victoria Road (including any potential adverse impacts on bus and other vehicle travel times and reliability) within the Rozelle precinct. A copy of the PB audit report is provided in **Attachment 2** for your information.

TfNSW advises that before a project approval is granted, the applicant should be required to address the concerns raised and resubmit the application. TfNSW / RMS is not in a position to support the proposed development in its current form or provide requirements to be incorporated into any project approval until such time that the applicant has satisfactorily addressed the concerns and demonstrated that the proposed development will not have an adverse traffic and transport impact on the road network within the Rozelle Precinct by submitting micro-simulation traffic models that are fit for purpose.

If a project approval is granted, TfNSW further advises that a formal concurrence under

18 Lee Street Chippendale NSW 2008
PO Box K659 Haymarket NSW 1240
T 8202 2200 F 8202 2209
www.transport.nsw.gov.au
ABN 18 804 239 602

the State Environmental Planning Policy (Infrastructure) 2007 is required due to the proximity of the development to the CBD Metro Corridor. In this instance, TfNSW advises that the concurrence is granted subject to the proposed conditions of consent being imposed as outlined in **Attachment 3**.

Should you have any questions regarding this matter, please contact Aleks Tancevski on 8202 2811 or Aleks.Tancevski@transport.nsw.gov.au

Yours sincerely

Steve Enticott 14/2/17
General Manager, Transport Planning
For and on behalf of Sydney Metro
Transport for NSW

Encl.: Attachment 1 – Detailed TfNSW & RMS Comments
Attachment 2 - Parsons Brickerhoff Paramics Model Audit
Attachment 3 - State Environmental Planning Policy (Infrastructure) 2007 Concurrence

CD12/20739

Attachment 1

Detailed TfNSW and RMS Comments

A. Protection of the CBD Metro Rail Corridor

The proposed development, in particular the proposed excavation, is in proximity to the CBD Metro corridor. Under Clause 88(4) of the *State Environmental Planning Policy (Infrastructure) 2007* ("Infrastructure SEPP"), concurrence is required from Transport for NSW (as vested from Sydney Metro) to ensure that the proposed development will not have an adverse impact on the future viability of the corridor.

In issuing such concurrence, TfNSW has considered the likely effects of the proposed development on:

1. The practicability and cost of carrying out development for the purposes of the CBD Metro on the relevant land in the future;
2. The structural integrity or safety of, or ability to operate, the CBD Metro; and
3. The land acquisition costs and the cost of the construction, operation or maintenance of the CBD Metro.

TfNSW has reviewed the relevant documentation and note that the architectural plans do not include structural details or excavation levels of its foundations. As such, TfNSW undertook an assessment to determine whether the running tunnels and the proposed basement structure can co-exist.

The proposed development falls within the Zone of Influence of the Metro running tunnels (as defined by the *'Development Guidelines within the vicinity of Sydney Metro Network Line 1'*, document reference no.CBD-2100-PBACH-R-GN-0159). Encroachment of the proposed building basement excavation within the Zone of Influence is expected to be of a high risk to the potential future Rozelle metro station cavern as a consequence of interpreted geological conditions and vertical separation between the cavern and the extent of the basement. However, without details of the proposed foundation arrangements and loadings of the building basement or accurate information regarding the building footprint, a definitive judgment could not be reached. For instance, the available information to date does not guarantee that piles will not encroach within the protection zone which is not permitted. It is requested that once these details are available, a more detailed engineering assessment is undertaken prior to issue of the Construction Certificate.

Therefore, TfNSW request that as part of any approval for the proposed physical works, the developer and/or landowner with the benefit of the development consent enter into a deed agreement with TfNSW, to ensure that the ability for the future metro to be developed is not comprised. Such deed is required as a condition of consent and is to be executed prior to the issue of the Construction Certificate.

TfNSW's concurrence in accordance with the Infrastructure SEPP for this proposed development is in **Attachment 3.** Transport for NSW issues this concurrence subject to the conditions being included in any such development consent for the proposed development.

For matters relating to the Metro corridor, please contact Michael Gheorghiu on 0419 265 659 or michael.gheorghiu@transport.nsw.gov.au

B. Road Network and Bus Service Operation

1. As you would already be aware, RMS requested the applicant to submit micro-simulation modelling for review in order to quantify the full extent of any increase in vehicular queues, bus and vehicle travel times and level of congestion on the road network as direct result of the proposed development.

   RMS commissioned Parsons Brinckerhoff (PB) to undertake an independent audit of the micro-simulation modelling on behalf of RMS and TfNSW.

   The audit has identified numerous errors with the micro-simulation models which include some significant errors, such as the following:

   - Up to 65% difference between the surveyed and modelled average travel times for the base case models. In this regard, the travel time validation for the base models does not meet industry standard.
   - Through movements on Darling Street and Victoria Road operate during the same signal phase in the AM base case model.
   - 1700 unreleased vehicles on Robert Street approach to Victoria Road in future (development scenario) AM model.
   - 200 vehicles unreleased in Wellington Street at Terry Street intersection in future (development scenario) AM model.
   - Some bus stops are missing or coded incorrectly in the base models.

   As a result of the significance of some of the numerous errors with the submitted micro-simulation models, the models are deemed not fit for purpose in quantifying the traffic and transport impacts of the proposed development. This includes quantifying any increase in bus and vehicle travel times on Victoria Road as a direct result of the proposed development and associated access arrangements.

   As you will appreciate, TfNSW and RMS are not in a position to provide comment on the external traffic and transport impacts of the proposed development, until such time that micro-simulation models are submitted that are deemed fit for purpose.

   For the applicant's information and reference, a copy of the PB audit is provided in the attached.

2. The following concerns are raised with regard to the geometric layout of the proposed modified signalised intersection of Victoria Road and Wellington Street:

   a. The proposed exit ramps to Victoria Road from the proposed loading dock and basement car park are physically separated by pillars and are at different grades leading up to Victoria Road. This is a highly unorthodox road design. Concern is raised that motorists on these exit ramps will not have adequate sight distance to vehicles on adjacent exit ramps when exiting the subject site on a green phase. This restricted sight distance between exiting vehicles may require two separate signal phases for the proposed fourth leg on road safety grounds, which would create significant additional congestion on Victoria Road and would be unacceptable as

Victoria Road is critical east-west arterial corridor.

b. There is a significant deflection within the proposed modified signalised intersection for through movements from Wellington Street into the subject site.
c. Limited sight distance to pedestrians on Victoria Road for motorists exiting the subject site.

The applicant shall submit an independent road safety audit by a certified practitioner for the proposed modified signalised intersection on Victoria Road, which includes auditing the abovementioned safety concerns.

3. To accommodate the future traffic flows generated by the development, the applicant proposes to remove a number of parking spaces along Darling Street, between Victoria Road and Waterloo Street. Whilst RMS does not object to the removal of these on-street parking spaces, the proponent must undertake adequate consultation with any affected local businesses and Council to the satisfaction of DoP&I.

4. The PPR and TMAP do not address the potential change in delays to buses and bus passengers along Darling Street. An analysis needs to be undertaken to determine the impacts.

5. The PPR and TMAP do not take into account any growth in traffic or bus numbers over the life of the completed development. The modelling should consider and report on current and current + 10 years after completion of the development and report on the impact of both traffic and bus volumes, delays and associated costs.

6. The PPR includes the provision of a porte cochere and taxi drop off / pick up facility under the proposed development's podium entrance with access to and from Victoria Road. TfNSW considers that such a facility could potentially impact buses on Victoria Road and therefore requests the facility's impact on traffic and buses on Victoria Road be accessed. It is critical that the queue entering the site does not spill into the through lane and have any impact on buses.

7. Section 3.2 of the PPR states that the bus stop location on Victoria Road (westbound) east of Darling Street has been adjusted to better reflect existing conditions as part of modified modelled scenarios. TfNSW would like clarification as to whether this bus stop would be relocated as part of the proposal as there is no mention of this being undertaken in the TMAP. If so, greater detail on the proposed new location is required to be provided and the applicant must ensure that the bus stop is DDA compliant.

8. The PPR does not provide a suitable location for a bus stop with awning, stop facilities and Passenger Information Display. The proponent should be required to contribute to a suitable passenger facility.

Attachment 2

Parsons Brickerhoff Rozelle Village Paramics Model Audit

Peer review of Rozelle Village Paramics Modelling

Roads and Maritime Services

February 2013

PARSONS BRINCKERHOFF

Parsons Brinckerhoff Australia Pty Limited
ABN 80 078 004 798

Level 27, Ernst & Young Centre
680 George Street
Sydney NSW 2000
GPO Box 5394
Sydney NSW 2001
Australia
Telephone +61 2 9272 5100
Facsimile +61 2 9272 5101
Email sydney@pb.com.au

Certified to ISO 9001, ISO 14001, AS/NZS 4801
A GRI Rating: Sustainability Report 2011

2175001A-PR_3452_RevA

Revision	Details	Date	Amended By

Author: Bill Chen , Meysam Ahmadpour.....

Signed: .....

Reviewer: Graeme Inglis .....

Signed: .....

Approved by: Graeme Inglis .....

Signed: .....

Date: 7 February 2013 .....

Distribution: .....

Please note that when viewed electronically this document may contain pages that have been intentionally left blank. These blank pages may occur because in consideration of the environment and for your convenience. this document has been set up so that it can be printed correctly in double-sided format.

Contents

Page number

1. Audit overview 1

1.1 Purpose 1
1.2 Overview 1
1.3 Conduct of the audit 2
1.4 Recommendations index 2

2. Audit background 3

2.1 Standards 3
2.2 Submitted models 3
2.3 Submitted reports 4

3. Audit schedule 5

3.1 The project 5
3.2 The audit 5
3.3 Model scope 5
3.4 Network 6
3.5 Vehicle and driver data 7
3.6 Base year traffic demand 8
3.7 Assignment 8
3.8 Calibration 8
3.9 Validation 9

4. Base model development review 11

4.1 Model form 11
4.2 Model Parameters and input files 12
4.2.1 Configuration 12
4.2.2 Vehicles 12
4.2.3 Behaviour 13
4.2.4 Categories 13
4.2.5 Acceleration profiles 13

Contents (Continued)

		Page number
4.3	Traffic data and demand development	14
4.3.1	Traffic turn count data	14
4.3.2	Demand matrices	14
4.3.3	Demand profile	14
4.4	Network coding	15
4.5	Road hierarchy	15
4.5.1	Road category coding	15
4.5.2	Link and category cost factors	16
4.6	Lane choice plugin	17
4.7	Next lanes	17
4.8	Restrictions	17
4.9	Closures	17
4.10	Public transport	17
4.11	Traffic signals	18
4.12	Pedestrians	19
4.13	Traffic assignment	19
4.13.1	Driver familiarity	19
4.13.2	Assignment method	19
5.	Calibration and validation review	21
5.1	Calibration review	21
5.1.1	Changes made to Calibrated Base Models	21
5.2	Validation review	22
5.2.1	Travel time validation	22
5.2.2	Bus Travel times	22
5.3	Queue length validation	23
5.3.1	Queuing on Side Roads	23
5.4	Terry Street/Wellington Street	24
6.	Future scenarios model audit	27
6.1	Development traffic development	27
6.1.1	Estimated trip generation	27
6.1.2	Cumulative trip generation	27
6.2	Network coding	28
6.2.1	Signal timings	28
6.2.2	Terry Street/Wellington Street	29
6.2.3	Pedestrian Crossing at Victoria Road/Wellington Street	30
6.2.4	Robert Street/Victoria Street Intersection	30

Contents (Continued)

		Page number
6.3	Travel time results	31
6.3.1	Travel time for general traffic	31
6.3.2	Bus travel time	31
6.4	Intersection performance results	32
6.4.1	Development trips	33
7.	Summary and recommendations	35

Contents (Continued)

List of tables

		Page number
Table 4.1	Configuration file changes	12
Table 4.2	Vehicles file changes	12
Table 4.3	Categories file changes	13
Table 4.4	Heavy vehicle percentages in the models and the report	14
Table 5.1	Network performance between Halcrow WP4 Report and the GTA PPR	21
Table 5.2	Review of validation statistics for total vehicles	22
Table 6.1	Review development trip generation	27
Table 6.2	Signal timings for Base Case and with Rozelle Village Scenarios	29
Table 6.3	Review of validation statistics for total vehicles	32
Table 6.4	Review of validation statistics for total vehicles	33

List of figures

		Page number
Figure 4.1	Model study area	11
Figure 4.2	Inconsistent road category coding	16
Figure 4.3	Signal coding error	18
Figure 5.1	AM peak – Unreleased vehicles on Wellington Street and Evans Street	24
Figure 6.1	Signal timings at Victoria Road/Wellington Street, Base and Proposed	28
Figure 6.2	Signal timings at Victoria Road/Wellington Street	30
Figure 6.3	Coding error at Robert Street	31

1. Audit overview

Parsons Brinckerhoff was commissioned by NSW Roads and Maritime Services (RMS) to undertake an audit of the microsimulation models developed by GTA/Halcrow to assess the proposed Rozelle Village development.

1.1 Purpose

The purpose of this audit is to:

- confirm the quality of the data and its application in the development of the models
- review the modelling process employed in accordance with industry standard modelling practices
- assess the accuracy of the modelling results to ensure that they appropriately inform the decision making process of the project.

1.2 Overview

This audit examines the following aspects of the work:

- the network model
- traffic signal control
- travel demand data
- public transport routes
- traffic assignment
- model calibration
- model validation
- model application
- documentation of model development and application.

1.3 Conduct of the audit

Parsons Brinckerhoff conducted the audit of the Rozelle Village Paramics models in line with the model audit procedure outlined in the *RMS Paramics Microsimulation Modelling Manual* (May 2009 Version 1).

This model audit reviewed the base case and two future year scenario cases for weekday AM and PM peaks and Saturday midday peak. No site visits were undertaken.

Representatives from Parsons Brinckerhoff met with GTA on 15 January 2013 to discuss the modelling methodology employed and to seek clarifications on a number of modelling issues.

Parsons Brinckerhoff has made recommendations about several aspects of the modelling and modelling procedures. These are based on the information provided.

1.4 Recommendations index

This audit includes recommendations for future work on the models to ensure they are effective tools to assess the traffic impacts of the proposed development. There are two levels of recommendations and these are colour coded as shown below:

Critical: These must be undertaken.

Noteworthy: These should be reviewed and considered.

2. Audit background

2.1 Standards

Standards	UK Design Manual for Roads and Bridge (DMRB, Volume 12, Section 2, Part 1 – Traffic Appraisal in Urban Area) & Paramics microsimulation modelling – RTA manual

2.2 Submitted models

This model audit covers the following models provided by RMS:

Scenario	Model
Base Case	2011 AM Base with Parking
	2011 PM Base
	2011 Sat Base No Parking
Base Case + Cumulative Traffic	AM Base plus Cumulative
	PM Base plus Cumulative
	Sat Base plus Cumulative
Base Case + Cumulative Traffic + Rozelle Village (Preferred Project)	AM Opt with development left in left out
	PM Opt with development left in left out
	Sat Opt with development left in left out

2.3 Submitted reports

Parsons Brinckerhoff obtained the following documents/reports from the DoPI website to conduct this audit:

Title	Date
Rozelle Village Transport Management and Accessibility Plan (Halcrow's TMAP)	17 February 2012
Rozelle Village TMAP Working Paper 1 – Traffic Modelling Methodology Statement (Halcrow's Traffic Modelling Methodology Statement)	19 September 2011
Rozelle Village TMAP Working Paper 2 – Network Build ((Halcrow's Network Build Report)	31 October 2011
Rozelle Village TMAP Working Paper 3 -- Calibration Report (Halcrow's Calibration Report)	18 January 2012
Rozelle Village TMAP Working Paper 4 – Paramics Modelling Results Report (Halcrow's Modelling Results Report)	10 February 2012
Rozelle Village TMAP Preferred Project Report (GTA's PPR Report)	25 October 2012

3. Audit schedule

3.1 The project

Location/Route/Area	Rozelle, New South Wales
Project description	Rozelle Village Transport Management and Accessibility Plan – Preferred Project Report (GTA's PPR)
Purpose of modelling	Assessment of the proposed Rozelle Village development
Model development history	The original models developed by Halcrow for the Inner West Bus way. The models were later updated to assess the impact of the Rozelle Village Development. The models were subsequently updated again by GTA to assess the Rozelle Village Preferred Project.

3.2 The audit

Reviewers	Graeme Inglis, Bill Chen, Meysam Ahmadpour
Date	January 2013

3.3 Model scope

Geographical extent	The extent of base models includes the Iron Cove Bridge, Victoria Road corridor, The Crescent, City West Link, Anzac Bridge and some local streets in Rozelle.
Year modelled	Base year 2011
Time periods modelled	**Weekday AM peak:** 6.00–7.00 warm up, 7.00–9.00 model peak, 9.00–10.00 cool down **Weekday PM peak:** 15.00–16.00 warm up, 16.00–18.00 model peak, 18.00–19.00 cool down **Saturday Midday peak:** 10.00–11.00 warm up, 11.00–13.00 model peak, 13.00–14.00 cool down
Period in variations in	
Traffic demand	Hourly periodic matrices
Links	No periodic links file
Junction control	No periodic priorities file
Number of zones	24
Number of links	**AM base model:** 314 **PM base model:** 310 **Saturday base model:** 312

Number of nodes	**AM base model:** 138 **PM base model:** 136 **Saturday Base model:** 136
Number of junctions	24
Number of traffic signals **Coded with Signal player plugin** **Fixed time**	10 **AM model:** 1 **Saturday model:** 1 **PM model:** none
Work adequately documented?	YES

3.4 Network

Base network	Source
Basic geometry	Generally acceptable
Intersection layouts	Generally acceptable
Traffic signal controls	Signal operation was modelled using Ceejazz signal player plugin. Signal phasing and average phase timings from SCATS (Sydney Coordination Traffic System) by 15 minutes were coded in the models. In addition, fixed time traffic signals were coded at one location in the models to represent the observed capacity constraints.
Categories file	RMS standard file was used. Some changes were made to RMS standard file, which are discussed in section 4.2.4.
Signposting file	Signposting varies from 23 m to 750 m. **AM model:** 128 warnings on node **PM model:** 125 warnings on node **Saturday model:** 126 warnings on node
Time dependent profiles	Appropriately used
Car parks	None coded

Spot checks	Details
Network scale	JPG file was used. Scale is appropriate.
Detailed layouts	General acceptable.
Signal controls	At Node 655 (the Victoria Road/Darling Street) signal phasing arrangement was coded incorrectly. These are discussed in section 4.11.
Visual check of operating model	A number of vehicles cannot be released into model network due to lack of available travel routes.

Future network	Source
Basic geometry	Generally acceptable
Intersection layouts	Not stated
Traffic signal controls	Not stated
Other variations from base network	Not stated
Detailed layouts	Generally acceptable
Signal controls	Generally acceptable
Visual check of operating model	Significant issues were found at the intersection of Robert Street and Victoria Road (this is outlines in Section 6.4.5)
Work adequately documented	Reporting lacks detail in some areas.

3.5 Vehicle and driver data

Data type	Sources and details
Default vehicle data	RMS standard vehicles file was used. Changes were made to vehicle types, vehicle proportions and driver's familiarity and perturbation. These are discussed in section 4.2.2.
Additional or non-standard vehicle types	Additional vehicles types were incorporated into the models include type 5 car, type 6 car, type 7 car, type 16 OGV2 and type 20 OGV2. A standard vehicle type (type 5 LGV) was not included in the models.
Vehicle proportions	Matrix 1 – light vehicles **type 1 car:** 61.06%; **type 2 car:** 16%; **type 3 car:** 7.05%; **type 4 car:** 5.78%; **type 5 car:** 8.33%; **type 6 car:** 0.45%; **type 7 car:** 1.34%. Matrix 2 – heavy vehicles **type 11 OGV1:** 26%; **type 12 OGV1:** 19%; **type 13 OGV1:** 6%; **type 14 OGV1:** 26%; **type 15 OGV2:** 5%; **type 16 OGV2:** 5%; **type 17 OGV2:** 8%; **type 18 OGV2:** 5%. Vehicle types were defined in the vehicles file, but were not included in the above demand matrices **type 10 OD bus:** 0.1%; **type 19 OGV2:** 13.208%; **type 20 OGV2:** 13.208%; **type 21 OGV2:** 60.376%; **type 22 OGV2:** 13.208%.
Familiarity	Light vehicles: **type 1 car:** 15%; **type 2 car:** 100%; **type 3 car:** 15%; **type 4 car:** 50%; **type 5 car:** 15%; **type 6 car:** 15%; **type 7 car:** 15%. Heavy vehicles: **type 11 OGV1:** 8%; **type 12 OGV1:** 8%; **type 13 OGV1:** 8%; **type 14 OGV1:** 8%; **type 15 OGV2:** 85%; **type 16 OGV2:** 85%; **type 17 OGV2:** 85%; **type 18 OGV2:** 85%; **type 19 OGV2:** 85%; **type 20 OGV2:** 15%; **type 21 OGV2:** 15%; **type 22 OGV2:** 15%.
Aggression distribution	Normal
Awareness distribution	Normal
Headway	Standard headway of 1.0
Reaction time	Standard reaction of 1.0
Work adequately documented	No, many discrepancies were found between reported values and model inputs/results.

3.6 Base year traffic demand

Data type	Details
Automatic vehicle counts	None
Manual vehicle counts	None
Classified counts	Halcrow's Calibration Report states that traffic count surveys were carried out at key intersections on Thursday 8 and 15 September 2011 and Saturday 10 and 17 September 2011.
SCATS counts	None
Number plate survey	Halcrow's Calibration Report states that a number plate survey was undertaken on Thursday 8 September 2011 and Saturday 10 September 2011 to collect bus travel time data. This data was not supplied.

3.7 Assignment

Algorithm	Stochastic assignment (all-or-nothing) with perturbation
Cost coefficients	Time (a): 1 Distance (b): 0 mins per km Toll (c): 0
Incidents	None
Strategic routes	Not used
Plugins	Route choice plugin was not used.

3.8 Calibration

Trip length distribution	Not reported
Observed volumes	UK DMRB GEH criteria.
Queue lengths	None
Travel times	None
Other	None
Work adequately documented	No

3.9 Validation

Was an independent data set used	Yes
Observed volumes	None
Queue lengths	Halcrow's Calibration Report documents that the original base models match on-site observations
Travel times	Travel time validation for the original base models was provided in Halcrow's Calibration Report for busses and general traffic.
Other	None
Work adequately documented	No documentation was provided regarding the validation criteria

4. Base model development review

4.1 Model form

The base case models include the network area as shown in Figure 4.1. The network includes the Iron Cove Bridge, Victoria Road corridor, The Crescent, City West Link, Anzac Bridge and some local streets in Rozelle.

Visual inspection of model road widths and vehicle dimensions indicates that the model was constructed at a 1:1 scale which ensures correct vehicle operations and trip lengths.

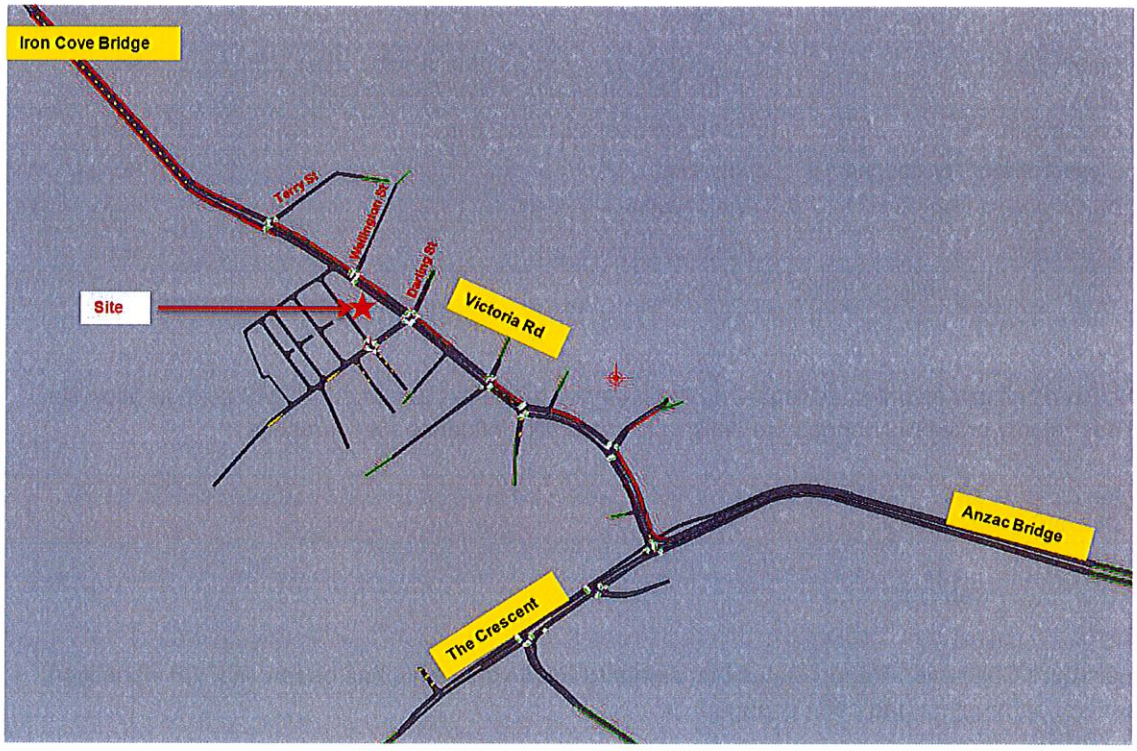


Figure 4.1 Model study area

4.2 Model Parameters and input files

The Rozelle Village models were developed using Q-Paramics version 6.7.1. A review of the model configuration was undertaken by comparing with the RMS standard files for Q-Paramics.

4.2.1 Configuration

Halcrow's Calibration Report states that standard RMS configuration file has been used. On inspection, several parameters have been changed. Table 4.1 summarises the changes made.

Table 4.1 Configuration file changes

Factor	Change made	Justification
Perturbation	Enabled	Traffic assignment
Cost coefficients	Time coefficient was changed from 0.467 to 1.000 Distance coefficient was changed from 0.283 to 0.000	None
Amber time	Changed from 4 s to 3 s (and in some cases 2 s) in the AM and Saturday peak base models	None
Loop length	Changed from 4.5 m to 2.0 m	None
Closest destination car park	Disabled	None
Curve speed factor	Changed from 1 to 10	None
Speed drift	Changed from 5 to 1	None
Optimise route table build option	Enabled	None

No justification was provided regarding the changes made to the standard RMS configuration file. The majority of these changes are unlikely to materially influence model results.

Recommendation: Review the configuration file used in the base model and provide justification for the changes.

4.2.2 Vehicles

Halcrow's Calibration Report states that standard RMS vehicle file has been used. On inspection, several parameters had been changed.

Table 4.2 Vehicles file changes

Factor	Change made	Justification
Lengths	Standard values were changed for some vehicle types	None
Crawl speed	Standard values were changed for some vehicle types	None
Perturbation	Standard values were changed for some vehicle types	None
Familiarity	Standard values were changed for some vehicle types	None
Vehicle type	Large Goods Van (LGV) was not included Additional vehicle types were added	None
Proportion	Separate demand matrices were created for light and heavy vehicles	Traffic demand

No documentation was provided regarding the changes made to the lengths and crawl speed of vehicles.

In addition, there were several discrepancies found in terms of vehicle types and proportions between the vehicles file in the base model and the documented information in Halcrow's Calibration Report. For instance, Halcrow's Calibration Report states that small cars (type 1) accounts for 29% (Table 3-2 of the Halcrow Calibration Report) of the total light vehicle demand. However, review of the vehicles file indicates that it accounts for 61% of the total light vehicles.

These changes made to the standard RMS vehicles file are likely to have significant impacts on the model results.

Recommendation: Review the vehicles file used in the base model and provide justification for these changes.

4.2.3 Behaviour

The standard RMS behaviour file has been used. No change has been made.

4.2.4 Categories

The standard RMS categories file has been used. The following changes have been made.

Table 4.3 Categories file changes

Factor	Change made	Justification
Lanes	Standard values were changed for some categories	None
Speed	Standard values were changed for some categories	None
Width	Standard values were changed for some categories	None
Type	Standard road types were changed for some categories	None
Curve speed factor	Standard curve speed factor of 1.0 were changed to 0.0 for all categories	None
Cost factor	Standard values were changed for some categories	None
Additional categories	A new category were added	None

Halcrow's Calibration Report documents that no change to the categories file was needed for the model. However, review of the categories file indicates the changes were made to the standard RMS values as described in Table 4.3, which contradict the reported information.

The majority of these changes are unlikely to have a material influence on model results.

Recommendation: Review the categories file used in the base model and provide justification for the changes.

4.2.5 Acceleration profiles

The standard RMS acceleration profiles file has been used. No change has been made.

4.3 Traffic data and demand development

4.3.1 Traffic turn count data

Halcrow's Calibration Report states that turn counts were collected at 13 key intersections in the study area in September 2011 for the development of the traffic demand. Data validation was undertaken by developing traffic flow diagram, which indicated the data was found to be generally consistent. This is in line with standard modelling practice.

4.3.2 Demand matrices

Separated demand files have been created for light and heavy vehicles. Periodic (hourly) demand files have been used for all the base models.

Matrix estimation

Halcrow's Calibration Report states that the traffic demand matrices were developed using the Estimator module and the matrix estimation was based on local knowledge, site observation and surveyed turn counts. This is in line with standard modelling practice.

A comparison was undertaken between the percentages of heavy vehicles in the base models and the reported survey results. As shown in Table 4.4, the percentages of heavy vehicles in the models are higher than reported values for all three peak periods.

Table 4.4 Heavy vehicle percentages in the models and the report

Peak period	Base model	Reported survey results
AM peak	0.9%	0.5%
PM peak	0.8%	0.2%
Saturday midday peak	1.0%	0.25%

As there is a low percentage of heavy vehicles in the base year demand, the discrepancies shown in Table 4.4 are unlikely to have significant impact on model results.

Recommendation: Review the heavy vehicle demand in the models to ensure it is consistent with the survey results.

4.3.3 Demand profile

Four periods (including warm-up and cool down periods) have been specified for all the base models. 15-minute interval demand profiles for light and heavy vehicles have been included, which specify the timing of proportional release of vehicles into the model. Halcrow's Calibration Report documents that the demand profiles were estimated based on the survey data and a generally flat profile was used for zones where no data was available.

4.4 Network coding

The coding of links, kerbs and stoplines is generally consistent with data from the aerial photography provided by GTA.

4.5 Road hierarchy

The model has been setup using major and minor links to assist with routing. The main road links in the model have been coded as major, which include City West Link, Anzac Bridge, Victoria Road and Icon Cove Bridge. The rest links representing local and residential streets were coded as minor.

The coding of road hierarchy in the model is appropriate.

4.5.1 Road category coding

Inconsistent category link coding was observed in a number of locations in the base models as shown in Figure 4.2:

- **Location 1:** The Crescent (in both directions) between Victoria Road and City West Link was coded as inconsistent categories (category 32 and 33 vs 49, 50, 56 and 61) with different category speeds
- **Location 2:** M4 Western Distributor Freeway between ANZAC Bridge and The Crescent was coded as inconsistent categories (category 32 vs 49 and 75)
- **Location 3:** Victoria Road (eastbound) between Lilyfield Road and ANZAC Bridge was coded as inconsistent categories (category 77 vs 50 and 55)
- **Location 4:** Victoria Road (northbound) between Lilyfield Road and Robert Street was coded as inconsistent categories (category 76 vs 50).

Recommendation: Links should be coded with consistent categories along similar lengths of road. Category cost factors should be consistent for roads at the same level in the road network hierarchy; link cost factors should be used for route cost calibration.

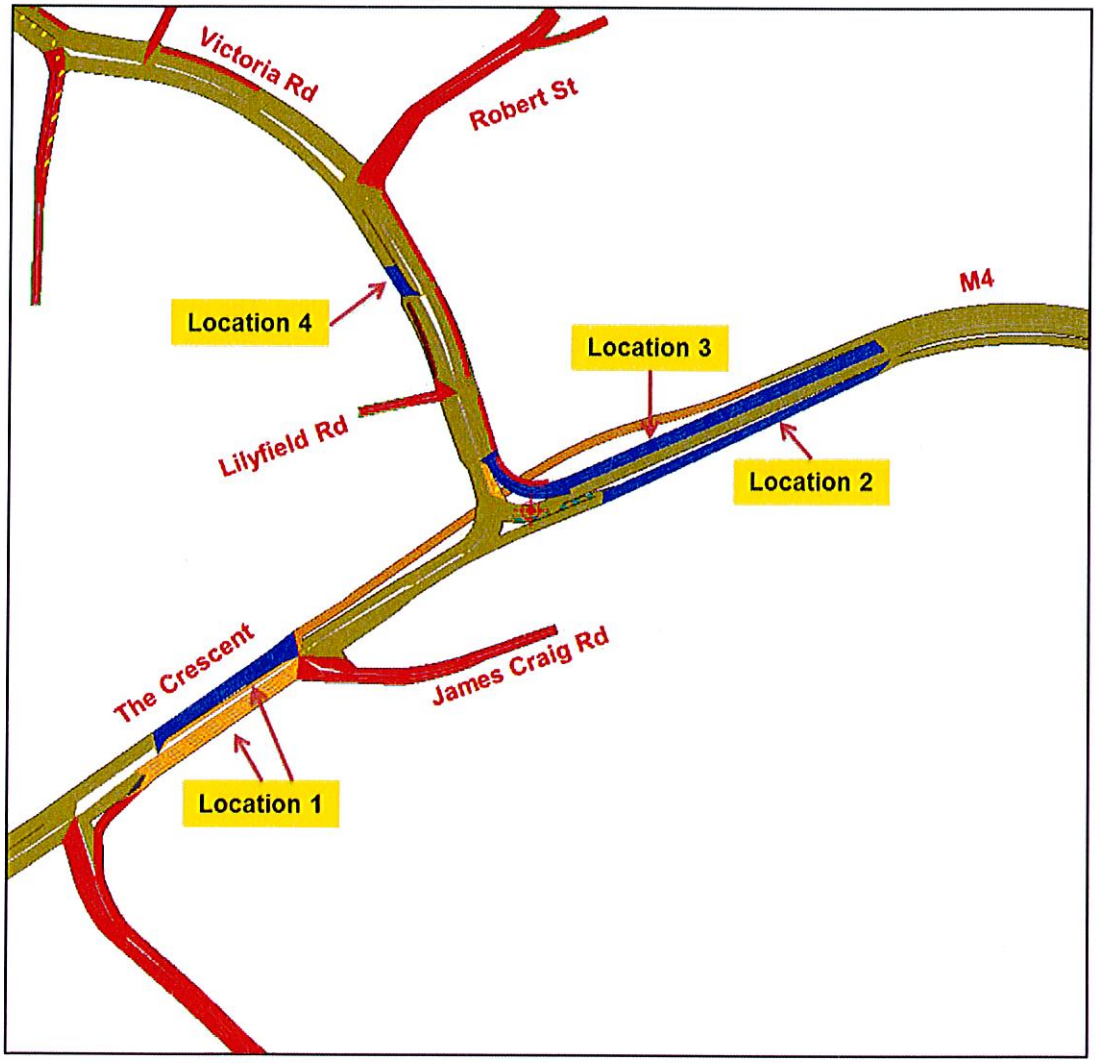


Figure 4.2 Inconsistent road category coding

4.5.2 Link and category cost factors

Link cost factors have been applied to Darling Street and Waterloo Street in the base models. Halcrow's Network Build Report states these cost factors were added to the model to place a cost for using these local streets as an alternative route.

A link cost factor of 1.5 has also been applied to Gordon Street (eastbound) in the base models. This has no impact on route choice as there is none available at this location.

Different link cost factors have been applied in the AM, PM and Saturday base models. Cost factors between the base models ideally should be the same. However, if changed are required these should be noted and justification should be provided.

In addition to link cost factors, categories with category cost factor of 2 have been used. As category cost factors cannot be directly viewed in the model, it is not recommended to use them for the purpose of calibrating route choice, rather link cost factors are preferred.

Recommendation: Provide justification for the changes of cost factors between the base models.

4.6 Lane choice plugin

Ceejazz lane choice plugin has been used in the base models. A review of the lane choice rules in the model indicate they are generally acceptable.

4.7 Next lanes

Next lane rules have been applied extensively throughout the base models and are generally acceptable.

4.8 Restrictions

Coding of bus lanes/bays has been undertaken using restriction rules. In addition, the Ceejazz lane choice plugin has been applied to replicate general traffic turning from the bus lanes. This is in line with standard modelling practice.

4.9 Closures

Lane closure rules have been used in the base models to reflect on-street parking, lane closures, tidal flow arrangements, and banned turning movements. Reviewing the application of closure rules shows it is generally acceptable.

4.10 Public transport

Bus routes and stops have been included in the model.

Thirty-one bus stops have been incorporated into the AM model, while there are thirty-two bus stops in the PM and Saturday models. These bus stops include 'dummy' stops at the extents of the model to account for services that continue outside the extents of the model. A review of bus stop coding reveals the following error:

- the bus stop located on Victoria Road (westbound) between Lilyfield Road and Robert Street was not coded in the AM model.

Separate bus route files have developed for the AM and PM peaks and Saturday midday peak. The number of bus routes for each peak period is provided below:

- sixty-four routes in the AM model
- sixty-five routes in the PM model
- sixty-six routes in the Saturday model.

Generally, majority of the bus routes in the models are representative of the services documented in Halcrow's TMAP, which were sourced from 131 500 Transport info line.

Recommendations: Review the coding of bus stops in the model and make adjustments where necessary. Bus sizes used and dwell time used in the models should also be documented.

4.11 Traffic signals

In the modelled study area there are nine signalised intersections. These have been incorporated into the models using Ceejazz Signal Player Plugin.

A review of signal operations in the model reveals the following error as shown in Figure 4.3:

- The through movement on Darling Street run simultaneously with the conflicting through movements (in both directions) on Victoria Road in the AM base model.

This coding error is likely to have significant impact on the performance of the Victoria Road/Darling Street in the vicinity of the site.

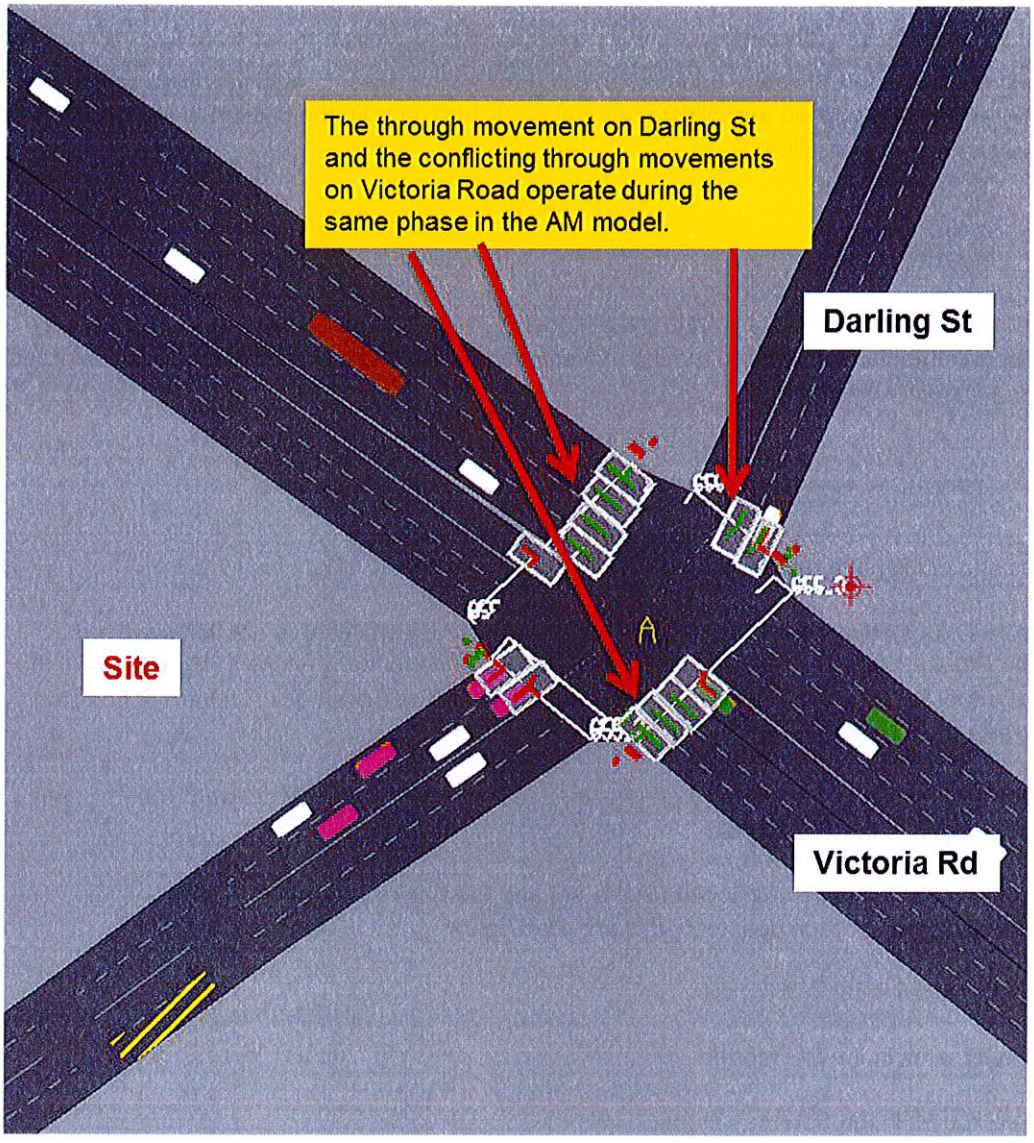


Figure 4.3 Signal coding error

Recommendation: Review the coding of signal operations in the AM model and make adjustments where necessary. Update base model calibration appropriately.

4.12 Pedestrians

Halcrow's Calibration Report states Ceejazz pedestrian plugin was applied in the model to mimic the delays to turning vehicles caused by pedestrians. The pedestrian crossings were coded at the following three intersections in the vicinity of the site:

- Darling Street/Victoria Road
- Darling Street/Waterloo Street
- Victoria Road/Wellington Street.

The pedestrian crossings were coded in the AM base model. However, pedestrians were not modelled in the PM and Saturday base models and no justification was provided.

As the delays to vehicles caused by pedestrians were not modelled in the PM and Saturday base models, this may lead to an underestimation of the intersection delays.

Recommendation: Incorporate the pedestrian crossings into the PM and Saturday base models to reflect the delays to vehicles caused by pedestrians. Update base model calibration appropriately.

4.13 Traffic assignment

4.13.1 Driver familiarity

Driver familiarity has been changed from RMS standard level (50% familiar for cars, 70% familiar for rigid heavy vehicles and 85% familiar for articulated heavy vehicles). No justification on the change of driver familiarity has been provided.

Recommendations: Provide justifications for the driver familiarity used in the models.

4.13.2 Assignment method

The base models have been developed using a stochastic assignment (all-or-nothing). The use of this assignment is appropriate, given the simplicity of model network and limited number of route choices. In addition, perturbation factors have been used, which randomly perturb the calculated cost to account for differences between drivers' perception of the cost to travel between a particular pair of origins and destinations for each vehicle in the network. Reviewing the perturbation factors used in the models show they have been changed from RMS standard level (5% for all vehicles except for fixed-route buses). No justification on the change of perturbation factors has been provided.

The general cost equation, which governs vehicle's decisions on routing through the network, has been changed from the standard RMS equation to include only the time component of the equation. No justification has been provided for not including the distance factor in the generalised cost equation. There are no tolls in the study area and therefore, it is reasonable to disregard the toll factor. Therefore, time is the only factor which will impact on vehicle's routing decisions. Generally, a 50:50 ratio between time and distance is applied for microsimulation models.

Recommendations: Provide justification for the change of perturbation factors and the generalised cost equation used in model assignment.

5. Calibration and validation review

5.1 Calibration review

The calibration criteria adopted for the model calibration is based on the GEH assessment from the UK Design Manual for Roads and Bridges (DMRB). The Halcrow Calibration Report (Rozelle Village Working Paper 3 – Calibration Report, 18/1/2012), Table 6-1, shows that the base models meet the required GEH criteria. The results of the GEH calibration are summarised as follows;

- no flows with GEH greater than 10
- 85% of all flows with GEH of less than 5.

The calibration report documents that multiple runs have been undertaken using five different RMS seed values for calibration and GEH comparison meets DMRB standard the three peak periods.

5.1.1 Changes made to Calibrated Base Models

Base Paramics models were developed for the AM (7:00–9:00), PM (16:00–18:00) and Saturday (11:00–13:00) peaks. The Calibration Report associated with these base models is the Halcrow Report 'Rozelle Village Working Paper 3 – Calibration Report, 18/1/2012'. In the 'Rozelle Village Transport Management and Accessibility Plan, Preferred Project Report' (25/10/12), prepared by GTA, Section 3.2 refers to a number of changes that were made to the base models in response to submissions received on the original planning application.

Following these changes, the base models were not recalibrated to ascertain whether the changes made had any impact the original model calibration. A comparison of the base conditions Levels of Service, between Halcrow report (Table 4-2, 4-3 and 4-4 of Working Paper 4) and GTA report (Tables 4.5, 4.6 and 4.7 of the PPR) shows that the base conditions have changed, particularly in the AM peak (see Table 5.1 below).

Table 5.1 Network performance between Halcrow WP4 Report and the GTA PPR

Level of Service	Base AM peak		Base PM peak		Base SAT peak	
	Halcrow WP4	GTA PPR	Halcrow WP4	GTA PPR	Halcrow WP4	GTA PPR
Terry Street/Victoria Road	F	F	A	A	F	F
Darling Street/Victoria Road	E	E	D	D	E	E
The Crescent/Victoria Road	F	F	F	F	D	D
The Crescent/City West Link	E	F	E	E	D	D
Wellington Street/Victoria Road	C	E	B	B	D	D
Waterloo Street/Darling Street	B	B	A	A	E	D
Evans Street/Victoria Road	D	D	B	A	B	B
Gordon Street/Victoria Road	C	D	B	A	B	A
Roberts Street/Victoria Road	E	F	C	C	C	C
James Craig Road/The Crescent	B	B	B	B	A	A

Recommendation: These LOS results suggest that the changes made to the models (as outlined in Section 3.2 of the GTA PPR) may have impacted the model performance. Further checks should be made to determine whether the Halcrow Calibration report is still valid for the GTA Base Models.

5.2 Validation review

5.2.1 Travel time validation

The Halcrow Calibration Report provides travel time validation for the base models. The travel time validation was undertaken for two bi-directional routes along Victoria Road for the AM, PM and Saturday midday peaks. No validation criterion is stipulated in the report.

The travel time criteria from the DMRB (which was adopted for the GEH calibration) stipulates:

- 85% of movements to have modelled journey times within 15% (or 1 minute, whichever is higher) of the observed journey times.

Table 5.2 shows a summary of the validation results for general traffic shown in the Halcrow Calibration report (Table 6-2, 6-3 and 6-4). The results indicate that the AM peak travel times do not meet the DMRB criteria in the AM peak.

Table 5.2 Review of validation statistics for total vehicles

	AM	PM	Saturday
% meets travel time difference criteria	62.5%	88%	88%
Acceptable	No	Yes	Yes

Recommendation: Undertake travel time validation against stipulated criteria for each peak. Demonstrate that the travel times meet the criteria used or provide commentary as to why the criteria cannot be met and what impact this will have on the modelling outcome.

5.2.2 Bus Travel times

The Halcrow calibration report (Table 6-5, 6-6 and 6-7) shows that the travel times for buses on the Victoria Road. While no validation criteria are stipulated, an analysis bus travel times indicate that they generally comply with DMRB criteria.

No travel time calibration was undertaken for buses on any of the side road off Victoria Road. Some key bus routes which use Darling Street and Robert Street have not been considered.

Recommendation: In order to assess the impacts on all the key bus routes in the study area, the bus routes on the Darling Street and Robert Street should be included in the model calibration/validation process.

5.3 Queue length validation

The Halcrow Calibration Report provides queue length validation for the original base models (Tables 6-8, 6-9 and 6-10), which shows the queuing in the model generally represent the observed conditions for all the three peak periods. A review of the base models reveals that the Iron Cove Bridge in the westbound direction operates well in the AM model, which contradicts the observed slow moving traffic conditions described in Halcrow's Calibration Report.

Recommendations: Review the westbound queuing on Iron Cove Bridge in the AM base model and make adjustments where necessary.

5.3.1 Queuing on Side Roads

No queue length calibration/validation was undertaken on any of the side roads off Victoria Road. Several side roads in the base models show extensive queuing, which in some cases extends back into the zone, leading to high numbers of unreleased vehicles.

The delay on the side roads may be underestimated as the unreleased demand is not included in the downstream intersection delay calculations. Figure 5.1 shows 170 unrealised vehicles at Wellington Street and 197 vehicles at Evans Street during the AM peak.

No queue length calibration has been undertaken at the intersection of Waterloo Street and Darling Street. Given that Waterloo Road will be a key access/egress route to/from the development, the queuing on Waterloo Street ad Darling Street should also be considered in the model calibration/validation so that the impacts can be suitably assessed with the development in place.

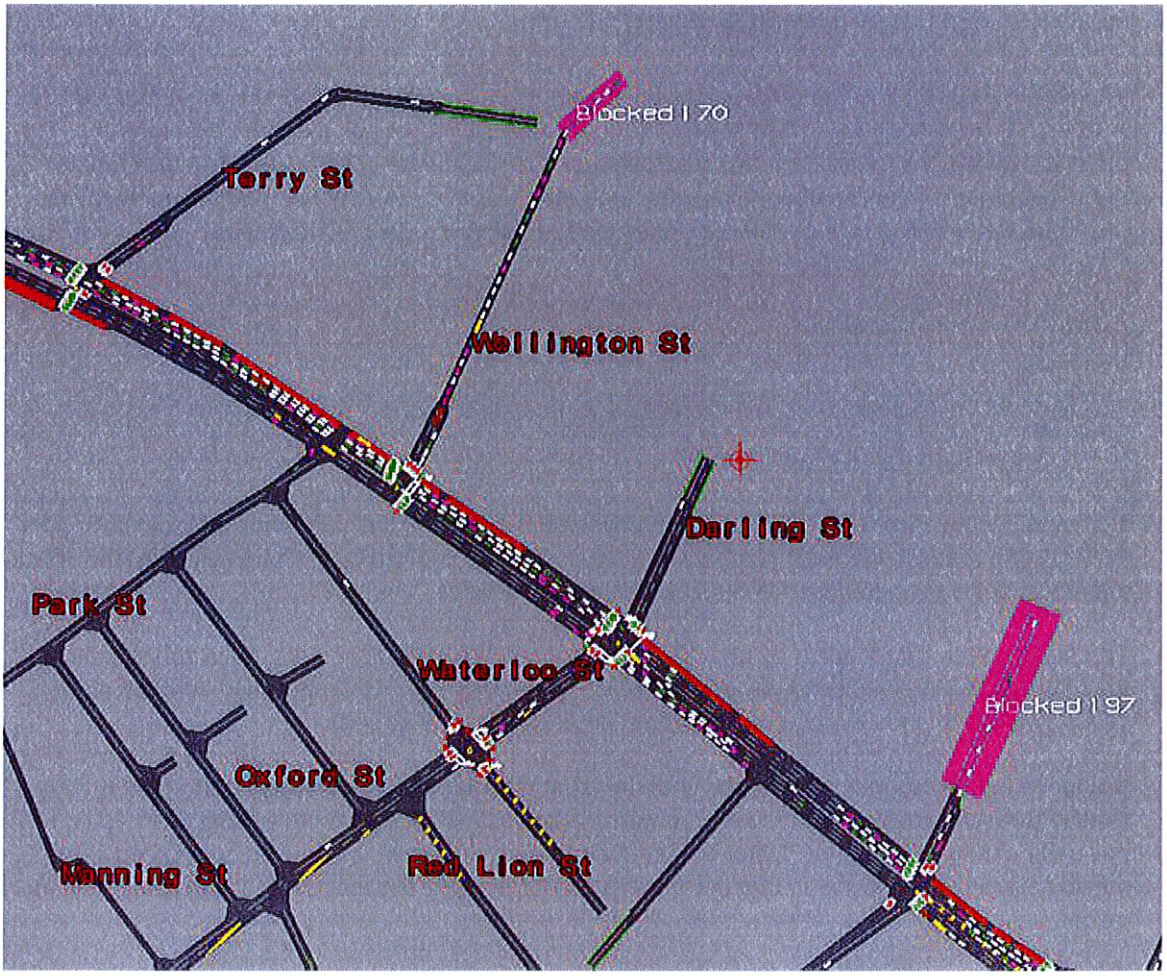


Figure 5.1 AM peak – Unreleased vehicles on Wellington Street and Evans Street

Recommendation: Queuing on the key side roads (including, Terry Street, Darling Street, Evans Street and Robert Street) should be included in the model calibration/validation and numbers of unreleased vehicles reported for each model run (by zone). Alternatively the network should be extended to reduce the number of unreleased vehicles and to capture the true delay experienced on these side roads. A queue length calibration exercise should be undertaken at the Waterloo Road/Darling Street intersection.

5.4 Terry Street/Wellington Street

Section 3.2 of the PPR report discussed the inclusion of Terry Street/Wellington Street roundabout as part of the modelling analysis. This intersection was not included in the Paramics Model, but as a separate SIDRA modelling analysis. (Note that the SIDRA modelling has not been reviewed as part of this audit process.)

The base models show that there is extensive queuing on Wellington Street which extends back approximately 170 vehicles into the zone. It is unlikely therefore the LOS at this intersection will remain at LOS A, as outlined in the GTA report.

Within the models, Terry Street is coded with a separate zone so vehicles entering the zone experience no delay despite being directly adjacent to the Wellington Street zone which shows large numbers of unreleased vehicles (particularly during the AM peak).

In the future year models the role of Terry Street and Wellington Street will be significant both for trips entering the site from the west (preforming the G-Turn) and also for vehicles wishing to exit the site and travel east via Terry Street and Waterloo Street.

Recommendation: The Paramics Models should be extended to include the roundabout at Terry Street and Wellington Street to capture the true impacts of the development at this location.

6. Future scenarios model audit

In addition to reviewing the base year Rozelle Village Paramics models, the audit also assesses the following future scenario modelling for the AM, PM and Saturday peaks models:

- Base case + cumulative traffic
- Base case + cumulative traffic + Rozelle Village Preferred Project (Option 2 – Left-out only at Victoria Road).

6.1 Development traffic development

6.1.1 Estimated trip generation

A review of the development traffic generation was undertaken. Parsons Brinckerhoff compared the GTA report (Table 2.2), the spread sheets provided by GTA and the trips matrices in the models.

When assessing this information Parsons Brinckerhoff were unable to reconcile the trip generation numbers between the three data sources mentioned above.

Table 6.1 Review development trip generation

	GTA report (Table 3.2)	GTA spreadsheets	GTA models
AM peak	209	357	419
PM peak	299	392	358
Saturday peak	364	364	470

Recommendation: Further discussion/explanation is required as to how the trip generation and distribution was applied to the models.

6.1.2 Cumulative trip generation

The GTA report outlines the trip generation for the surrounding cumulative developments. It has not been specified how these have been apportioned or distributed onto the model network.

Recommendation: Further discussion/explanation is required as to how the cumulative development has been applied to the models.

6.2 Network coding

6.2.1 Signal timings

In order to accommodate the development access, a fourth leg has been added to the Wellington Street/Victoria Road Intersection. An addition 'Phase' has been added to the traffic signals to allow traffic to egress the site (left only). Figure 6.1 shows the Base case signals phasing and the revised phasing with the Rozelle Village Development in place.

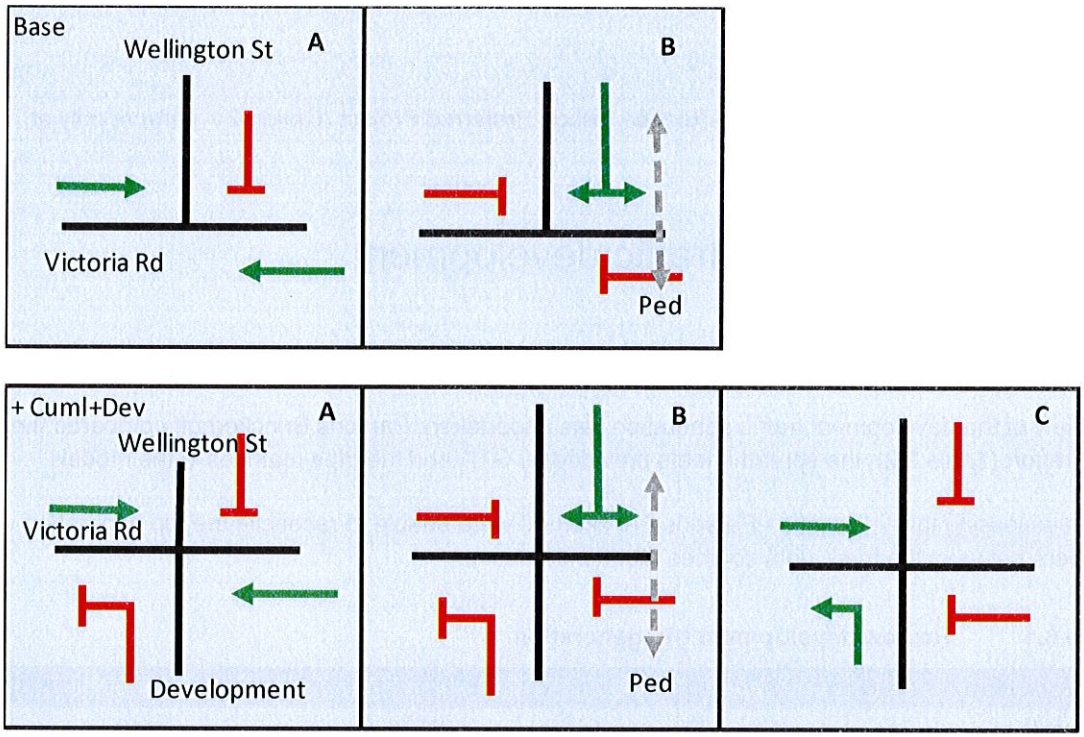


Figure 6.1 Signal timings at Victoria Road/Wellington Street, Base and Proposed

Table 6.2 shows the green time allocation for the base case modelling and with the development in place. The table highlights that green time for Wellington Street is reduced in all three peaks when the fourth leg is introduced. The Westbound movement on Victoria Road also reduced in all three scenarios.

The base models show that there is currently extensive queuing on Wellington Street with up to 170 unreleased vehicles blocked in the zone (during the AM peak). By reducing the green time for Wellington Street, the queuing increases, as does the number of vehicles blocked in the zone. In the AM peak the number of unreleased vehicles exceeds 200 vehicles.

The GTA report shows that the Level of Service at this intersection does not change greatly with the development in place, going from LOS F with a Delay of 152 Seconds in the AM Base Case to LOS F with a delay of 154 Seconds with the development in place (Appendix C), however the delay on Wellington Street is only calculated for vehicles which are able enter the network, and does not capture the delay for the unreleased vehicles within the zone. Therefore the results are significantly underestimating the impact of the development at this intersection.

Table 6.2 Signal timings for Base Case and with Rozelle Village Scenarios

AM Base				
		AM Base +Cuml+Dev		
Phase Seq	Secs		Secs	Diff
Phase A	105	Phase A	96	9
Phase B	35	Phase B	29	6
		Phase C	14	-14
Cycle	140		140	0
PM Base				
		PM Base +Cuml+Dev		
Phase Seq	Secs		Secs	Diff
Phase A	109	Phase A	102	7
Phase B	31	Phase B	24	7
		Phase C	14	-14
Cycle	140		140	0
Sat Base				
		Sat Base +Cuml+Dev		
Phase Seq	Secs		Secs	Diff
Phase A	104	Phase A Green	90	14
Phase B	36	Phase B Green	30	6
		Phase C Green	20	-20
Cycle	140		140	0

Recommendation: The network should be extended at Wellington Street to capture the true impacts of the changes proposed.

6.2.2 Terry Street/Wellington Street

With the development in place, the green time allocated for Wellington Street is reduced. This increases the delay experienced on Wellington Street. In order to fully determine the traffic impacts of the development on the surrounding road network, it is critical that the Terry Street/Wellington Street roundabout is included in the Paramics models, particularly because it is such a crucial access route into the development site. The current arrangement in Paramics, where Terry Street and Wellington Street are coded as separate zones does not accurately capture the delays in this part of the network.

Recommendation: As Terry Street and Wellington Street is such a critical access route into the site, the modelling should be extended to include the roundabout at Terry Street/Wellington Street.

6.2.3 Pedestrian Crossing at Victoria Road/Wellington Street

A pedestrian crossing has been included in the AM peak and Saturday peak models but not in the PM peak model. No justification is provided as to why a pedestrian phase has not been included during the PM peak.

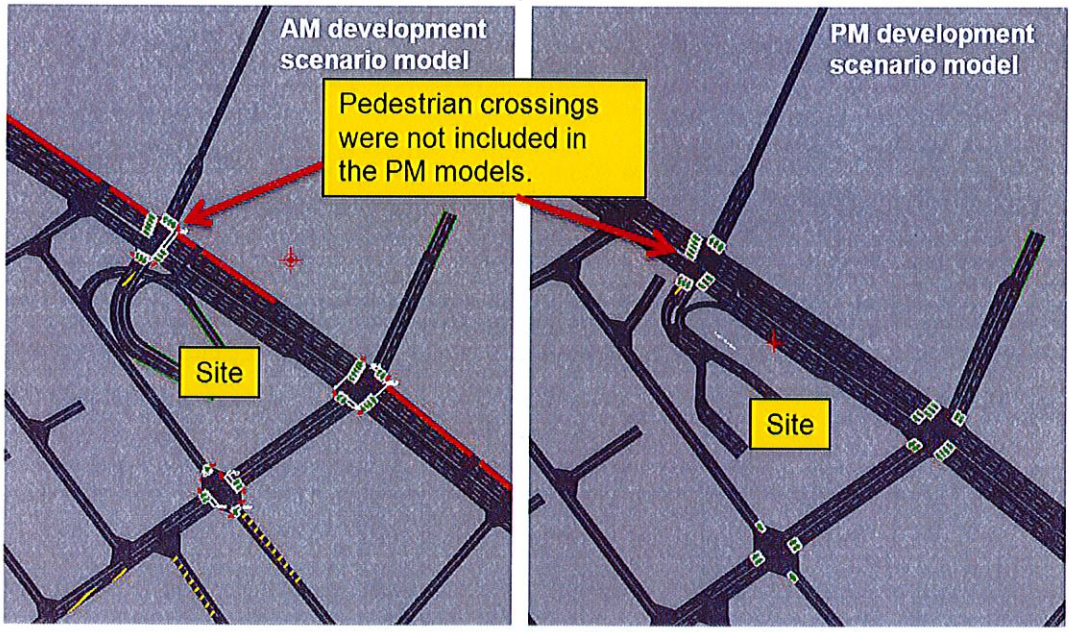


Figure 6.2 Signal timings at Victoria Road/Wellington Street

Recommendation: Include a Pedestrian Crossing in the PM Models.

6.2.4 Robert Street/Victoria Street Intersection

In the AM peak model (with the Rozelle Village development in place), nine trips have been assigned from Robert Street (Zone 13) to the Rozelle Village development. During the AM peak the right turn from Robert Street into Victoria Road is banned. Because the banned turn is defined at a signalised intersection, the nine trips are released onto the network. These trips are subsequently unable to turn right at the intersection of Robert Street/Victoria Street eventually blocking all traffic from exiting Robert Street (this generally occurs about 30 minutes into first peak hour). With no traffic able to exit Robert Street, there are over 1,700 unreleased vehicles by the end of the second peak hour.

The results of the AM peak modelling are severely impacted by this issue. The results presented in the GTA report show that the 'Base +Cumulative+ Rozelle Village Scenario' actually improves network operations when compared against the AM base case scenario. Table 4.5 in the GTA PPR shows the LOS at Robert Street/Victoria Street goes from LOS F in the Base to LOD D with the development in place. This is because so much so much traffic is unreleased onto the network and Victoria Road operates much better as a result.

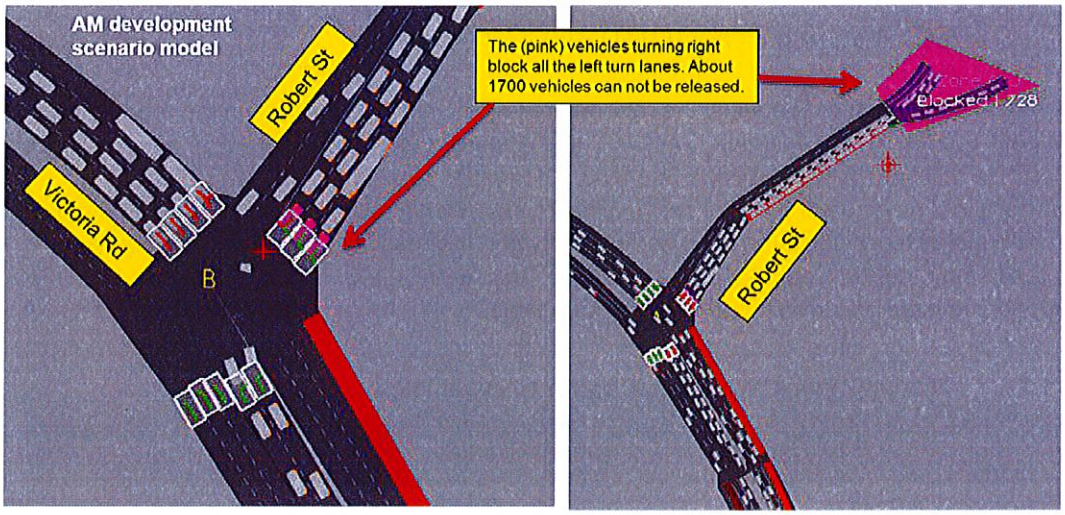


Figure 6.3 Coding error at Robert Street

Recommendation: This issue need to be fixed and the AM peak models rerun. All AM peak reporting (with the development in place) will need to be undertaken again.

6.3 Travel time results

6.3.1 Travel time for general traffic

The impacts of travel times for general traffic have not been assessed in with the development in place. Therefore it is not possible to determine the impacts of journey times on general traffic.

Recommendation: Travel times for the with-development scenarios should be considered to assess the impacts of the development for general traffic.

6.3.2 Bus travel time

The bus travel time results were compared between the GTA report and the model runs. The results in the reporting generally matched the results taken from the models.

There are several key bus routes which use Darling Street and Robert Street. No analysis has been undertaken on any of these routes.

Recommendation: The impact on bus travel times/speeds on Darling Street and Robert Street should also be assessed.

6.4 Intersection performance results

A review of the model outputs against the reported results highlighted an error in the reporting for the PM peak results. The GTA report (Table 4.7 and Appendix C) reports 5.00–6.00 pm results for the Base +Cumulative+ Rozelle Village Scenario. The results reported are actually the 4.00–5.00 pm results. The actual 5.00–6.00 pm results are significantly worse than the 4.00–5.00 pm results. The table below highlights the difference between the results reported and the actual results taken from the PM Peak Base +Cumulative+ Rozelle Village Scenario model outputs. This error appears to have occurred in the result look up table.

Table 6.3 Review of validation statistics for total vehicles

	GTA report 5.00–6.00 pm	Model results 4.00–6.00 pm	Model results 5.00–6.00 pm	Difference
Terry Street/Victoria Road	B	B	D	
	22	22	54	**32**
Darling Street/Victoria Road	D	D	F	
	52	52	71	**19**
The Crescent/Victoria Road	F	F	F	
	76	76	169	**93**
The Crescent/City West Link	F	F	F	
	79	79	117	**38**
Wellington Street/Victoria Road	C	C	E	
	35	35	62	**27**
Waterloo Street/Darling Street	B	B	B	
	18	18	18	**0**
Evans Street/Victoria Road	B	B	B	
	18	18	25	**7**
Gordon Street/Victoria Road	B	B	D	
	21	21	54	**33**
Roberts Street/Victoria Road	C	C	E	
	33	33	66	**33**
James Craig Rd/The Crescent	A	A	B	
	14	14	24	**10**

Recommendation: The reporting should be corrected and the impacts discussed in the report.

6.4.1 Development trips

An assessment of the Base +Cumulative+ Rozelle Village Scenario shows that due to congestion in other parts of the network and unrealised vehicles that not all the development trips reach the development during the peak period. Table 6.4 below shows the number of trips which do not reach the development during the peak.

Table 6.4 Review of validation statistics for total vehicles

	Inbound development trips (from Matrices)	Inbound trips which reach the development during the peak	Trips which do not reach the development during the peak	%Diff
AM peak	232	187	45	19%
PM peak	213	118	95	**45%**
Saturday peak	233	189	45	**19%**

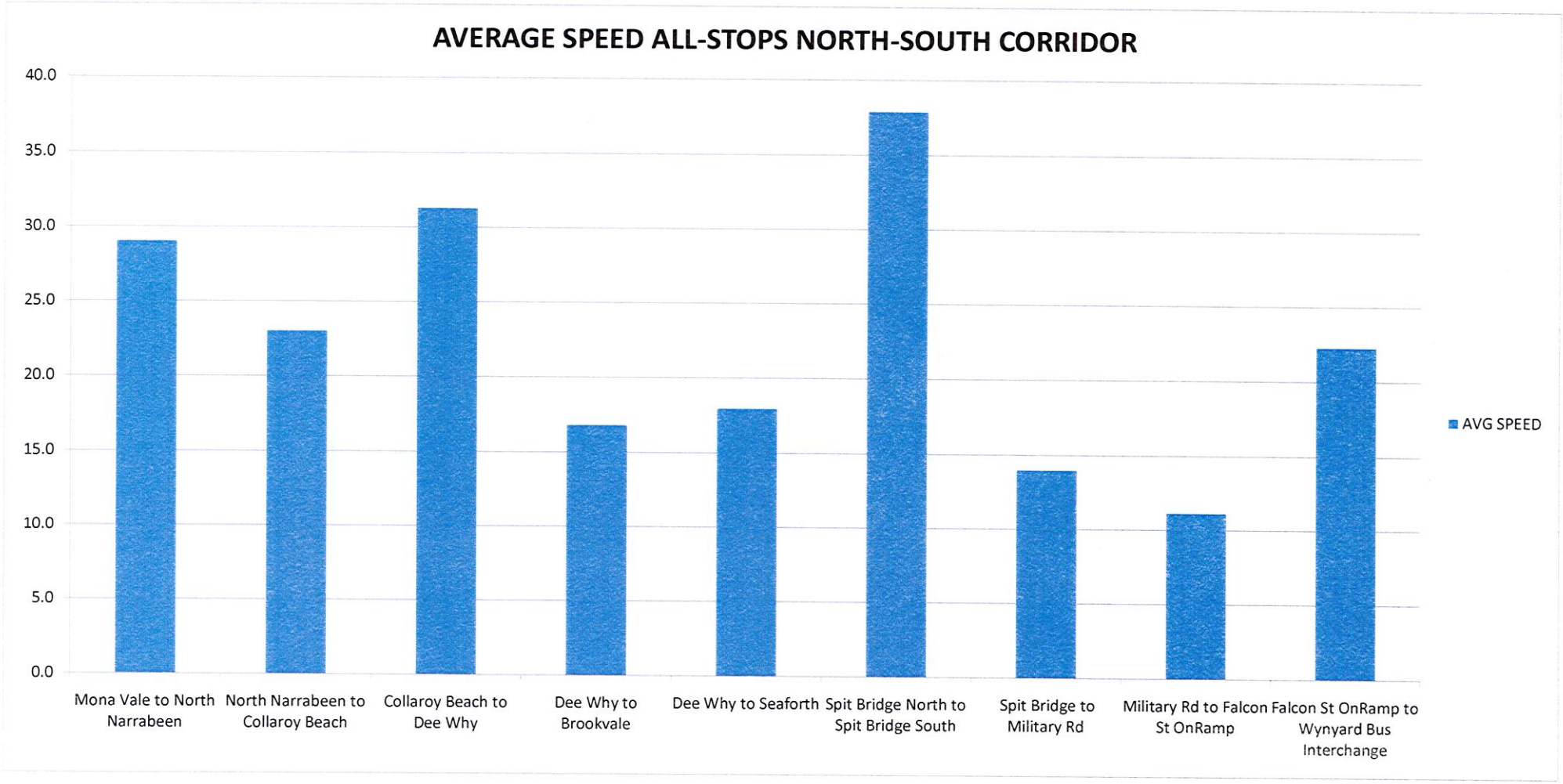
Recommendation: This is a common occurrence in congested networks and means that the full impact of the development on at the intersection closest to the development is difficult to determine. It is however important to capture the impact on the wider network, by collecting network statistics such as VKT and VHT and also to compare the number of unrealised vehicles between model options. Alternatively the network should be extended to reduce the numbers of unreleased vehicles.

7. Summary and recommendations

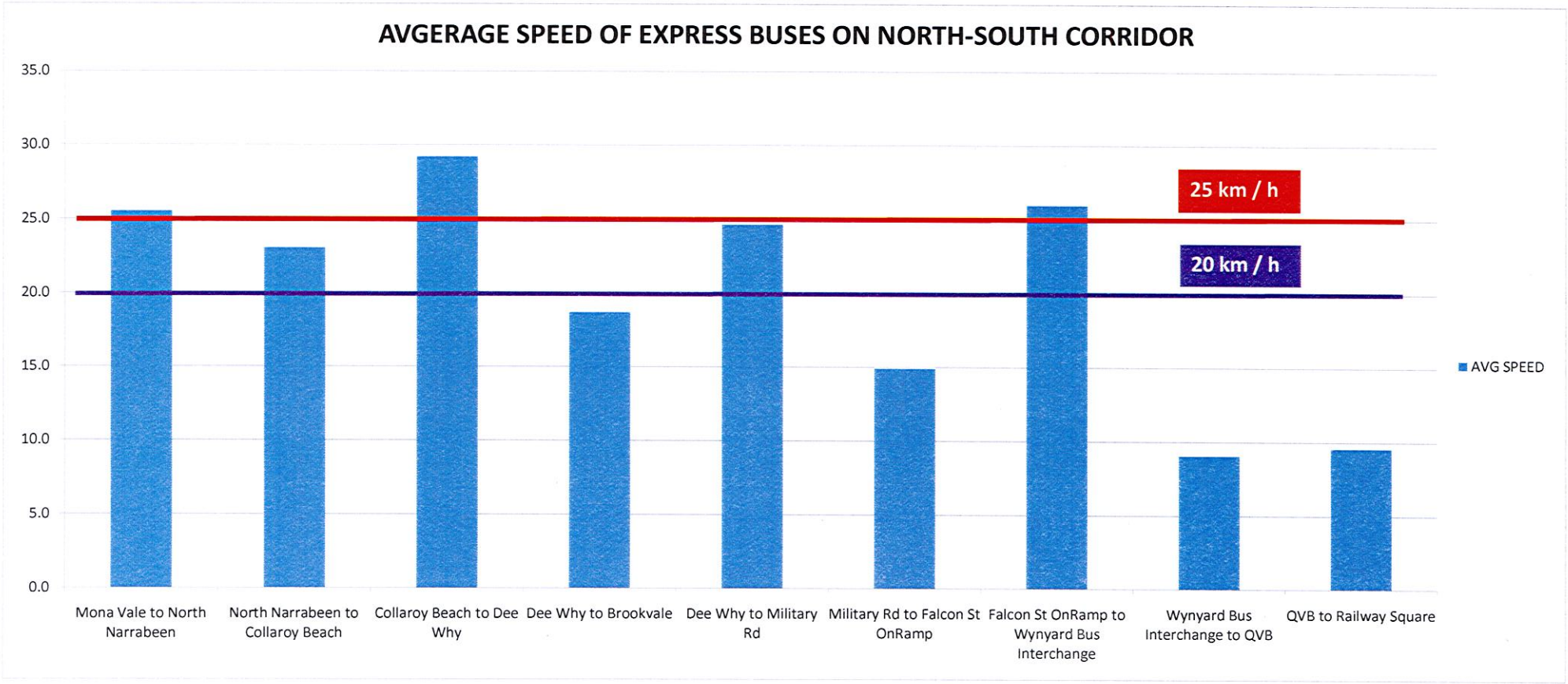
Parsons Brinckerhoff has undertaken an Audit of the Paramics Modelling associated with the Rozelle Village Transport Management and Accessibility Plan, Preferred Project Report. Where possible the audit has been undertaken in accordance with the Paramics Microsimulation Modelling – RTA manual.

The audit has found a number of issues with both the base models and the future year models. In their current form the models and their supporting documentation are not deemed 'fit for purpose' and do not allow RMS to adequately assess the impact of the Rozelle Village Development.

Parsons Brinckerhoff have made a number of recommendations to address the issues identified in the audit.


AVERAGE SPEED ALL-STOPS NORTH-SOUTH CORRIDOR
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Mona Vale to North Narrabeen
North Narrabeen to Collaroy Beach
Collaroy Beach to Dee Why
Dee Why to Brookvale
Dee Why to Seaforth
Spit Bridge North to Spit Bridge South
Spit Bridge to Military Rd
Military Rd to Falcon St OnRamp
Falcon St OnRamp to Wynyard Bus Interchange
AVG SPEED

AVGERAGE SPEED OF EXPRESS BUSES ON NORTH-SOUTH CORRIDOR



Attachment 3

STATE ENVIRONMENTAL PLANNING POLICY (INFRASTRUCTURE) 2007
CONCURRENCE ISSUED UNDER CLAUSE 88

Rozelle Village/Balmain Leagues Club Development off Victoria Road, Rozelle (MP11_0015)

Pursuant to clause 88 of *State Environmental Planning Policy (Infrastructure)* 2007 (the "**Infrastructure SEPP**"), Transport for NSW confirms the following:

The Proposed Development could have an adverse affect on the viability of the CBD Metro corridor for the following reasons:

1. *Failure to adequately address:*

    - *Electrolysis impacts on the proposal*
    - *Noise impacts on the proposal*
    - *Vibration impacts on the proposal*

2. *Potential impacts of the proposed development on the future construction, operation and maintenance of the CBD Metro, as the proposed development is located adjacent and above the proposed alignment for the CBD Metro.*

3. *The placing of any foundations, other structures and building loads in or near the proposed rail alignment may affect the practicability of the CBD Metro, its construction cost and the capacity to design it to meet metro railway operational needs.*

However, if the following conditions of consent were imposed, the Proposed Development would not have an adverse affect on the viability of the CBD Metro.
Therefore, the proposed conditions of consent are:

1. *Prior to issue of construction certification, the applicant must satisfy the Director-General of the Department of Planning and Infrastructure that the owners of the site of the approved development have entered into an agreement acceptable to Transport for NSW that addresses the potential impacts of the development on the metro corridor, for the relevant works and the commencement of any excavation below the existing surface level.*

    The Agreement must provide for the following:

    (i) the design, construction and maintenance of the approved development so as to satisfy the requirements in conditions 2 to 5 below;

    (ii) allowances for the future construction of Metro railway tunnels in the vicinity of the approved development;

    (iii) allowances in the design, construction and maintenance of the approved development for the future operation of Metro railway tunnels in the vicinity of the approved development, especially in relation to noise, vibration, stray currents, electromagnetic fields and fire safety;

    (iv) consultation with Transport for NSW;

    (v) access by representatives of Transport for NSW to the site of the approved

development and all structures on that site;

(vi) *provision to Transport for NSW of drawings, reports and other information related to the design, construction and maintenance of the approved development, including but not necessarily limited to:*

- *Relevant basement excavation plans which include reduced levels (RLs);*
- *Foundation arrangements including proposed location of piles; and*
- *Structural load calculations of transfer of loads from proposed building/s and associated structures to foundation design.*

(vii) *such other matters which Transport for NSW considers are appropriate to give effect to (i) to (vi) above; and*

(viii) *such other matters as the owners and Transport for NSW may agree.*

2. *The location of any building footings must be determined in consultation with the Transport for NSW prior to excavation works to ensure the structural integrity of the CBD Metro.*

3. *All structures which are proposed for construction or installation in connection with the approved development which have a potential impact on the CBD Metro must be designed, constructed and maintained in accordance with design criteria specified by the Transport for NSW.*

4. *No modifications may be made to that approved design without the consent of Transport for NSW.*

5. *In addition, prior to the issue of any Occupation Certificate, provide Transport for NSW with drawings, reports and other information related to the design, construction and maintenance of the approved development to allow Transport for NSW to fully understand the interaction between the approved development and metro corridor.*

Dated: 14/2/13

.....

For and on behalf of Sydney Metro
Transport for NSW