"Crowle Gardens" Development Concept Plan

76 Belmore Street, Ryde

Transport & Accessibility Impact Assessment

Supplementary Modelling Analysis

14 March 2012

Prepared for

Achieve Australia Limited

Halcrow

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76 Belmore Street, Ryde

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This report has been issued and amended as follows:

Rev	Description	Date	Approved by
V01	Client Issue	1/3/2012	JR
V02	For Submission	8/3/2012	JR
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Contents

1 Introduction

Halcrow has been commissioned by Achieve Australia Limited to undertake a *Transport and Accessibility Impact Assessment* of a proposed Concept Plan for the redevelopment of the Achieve Australia site at 76 Belmore Street Ryde.

A *Transport and Accessibility Impact Assessment Report* (Halcrow, 9 August 2011) was submitted to the Department of Planning and Infrastructure (DoPI).

The DoPI has requested that additional traffic modelling be undertaken for the proposed development. The request for additional traffic modelling is consistent with the request for additional information from the Sydney Regional Development Advisory Committee (SRDAC).

This supplementary report presents the findings of the additional traffic modelling undertaken to address the request for further information.

2 Supplementary Traffic Modelling Analysis

2.1 Application of Revised Traffic Generation Rates

The traffic generation rates used in the *Transport & Accessibility Impact Assessment* report (Halcrow 9 August 2011) to estimate the likely future traffic generation of the proposed Achieve Australia site redevelopment were based on surveys of similar existing residential developments in the immediate vicinity of the site. The surveyed rates were considered to be more representative of the site specific conditions than the generic traffic generation rates in the RTA's Guide to Traffic Generating Development.

The surveys showed a lower generation rate than the generic RTA traffic generation rates for medium density residential flat buildings (0.4 -0.5 trips/unit) but slightly higher than the RTA traffic generation rates for 'high density residential flat buildings in a metropolitan sub-regional centre' (0.29 trips/unit).

In the RTA guidelines a medium density residential flat building is defined to be:

> *"A building containing at least 2 but less than 20 dwellings. This includes villas, townhouses, flats, semi detached houses, terrace of row houses and other medium density developments, not including aged or disabled persons' housing."*

The proposed achieve Australia development will provide some 470 apartments which exceeds the maximum number of dwellings under the definition of medium density residential development. As such the application of the medium density traffic generation rate to the proposed development is considered inappropriate.

The use of surveys of existing residential housing developments adjacent to the proposed development site was undertaken to determine actual traffic generation rates for the site specific conditions that prevail in locality. The surveyed rates were more consistent with the RTA guidelines for high density residential development rates than the medium density rates.

As the surveyed rates showed slightly higher rates than the RTA high density residential development rates the surveyed rates were used in the analysis.

Notwithstanding the above, at the request of the SRDAC the traffic generation potential of the proposed development has been estimated using the RTA's generic rate of 0.4 trips/unit for medium density residential developments (even though this is an inappropriate land use descriptor in this instance). The results should therefore be regarded as the worst case scenario.

A summary of the revised traffic generation rates are shown in Table 2-1 and Table 2-2.

These tables indicate that the application of the generic RTA rates would increase the expected traffic generation potential of the development to 188 vehicles per peak hour or an additional 158 vehicles per hour accessing the surrounding road network when accounting for existing site uses.

The application of the generic RTA rates increases the site generated traffic compared to the assessed generation as follows:

- AM Peak Hour: + 47 vehicles / hour
- PM Peak Hour : + 33 vehicles / hour

It is noted that the Master Plan Traffic Assessment for the Meadowbank Employment Area anticipated and assessed a potential yield on the Achieve Australia site of some 74 vehicle trips per peak hour.

Table 2-1 Traffic Generation of Achieve Australia Redevelopment (AM Peak)

Development Scenario	Number of Residential Units	Peak Hour Period Traffic Generation Rate (veh / unit / hr)	Peak Hour Period Traffic Generation (veh/hr)
Existing	n/a		30
Under Meadowbank Employment Area Master Plan	184		74
Using Surveyed Traffic Generation Rates	470	0.30	141
Using RTA Generic Rates	470	0.40	188
Net Change between surveyed and generic rates	-	-	+47

Table 2-2 Traffic Generation of Achieve Australia Redevelopment (PM Peak)

Development Scenario	Number of Residential Units	Peak Hour Period Traffic Generation Rate (veh / unit / hr)	Peak Hour Period Traffic Generation (veh/hr)
Existing	n/a		30
Under Meadowbank Employment Area Master Plan	184		74
Using Surveyed Traffic Generation Rates	470	0.33	155
Using RTA Generic Rates	470	0.40	188
Net Change between surveyed and generic rates	-	-	+33

2.2 Intersection Operation

2.2.1 Existing Intersection Configurations

As requested the following intersections have been remodelling using the aaSIDRA software with the revised traffic generation (ie. 0.4 trips / hr / unit) for the proposed Achieve Australia development.

- Victoria Road / Bowden Street
- Constitution Road / Belmore Street

In additional to the above, the key intersections along the primary vehicle access routes to and from the Achieve Australia site were reassessed. These intersections are:

- Junction Street / Church Street
- Belmore Street / Junction Street

It is noted that the distribution assumptions of traffic to and from the proposed Achieve Australia development remain unchanged from those presented in the *Transport and Accessibility Impact Assessment* (Halcrow, 9 August 2011).

aaSIDRA determines the average delay that vehicles encounter, the degree of saturation of the intersection, and the level of service. SIDRA provides analysis of the operating conditions which can be compared to the performance criteria set out in Table 2-3.

Table 2-3 – Level of Service Criteria

Level of Service	Average Delay per Vehicle (secs/veh)	Signals & Roundabouts	Give Way & Stop Signs
A	less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & Spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode
F	> 70	Extra capacity required	Extreme delay, traffic signals or other major treatment required

Adapted from RTA Guide to Traffic Generating Developments, 2002.

The results are presented in Table 2-4 and Table 2-5.

The results indicate that the operating conditions at these intersections are not significantly different, if at all, under the two site traffic generation scenarios.

An analysis of the intersection results indicated that:

- Constitution Road / Belmore Street
  - The high degree of saturation is the result of the demand for the right turn movement from Belmore Street into Constitution Road; and
  - The lane length (45 metres) for the above right turn is insufficient to accommodate the traffic demands.
  - Providing additional storage capacity will address the issue of "degree of saturation.

- Victoria Road / Bowden Street
  - The Achieve Australia site is estimated to generate some 8 vehicles per peak hour through this intersection.
  - This intersection is not located such that it provides the most direct or convenient access to and from the Achieve Australia site.
  - Other more convenient routes to access the regional road network are Junction Road, Belmore Street and Constitution Road.
  - The addition of some 8 vehicles per hour to the intersection will not trigger the need for intersection upgrades.

Table 2-4 AM Peak - Future Intersection Operation (Revised Traffic Generation)

Intersection	Control	Traffic Generation Rate 0.33 veh/unit			Traffic Generation Rate 0.40 veh/unit		
		LoS	Av. Delay	DoS	LoS	Av. Delay	DoS
Junction St x Church St	Signals	B	16	0.88	B	16	0.88
Belmore St x Junction St	Signals	B	20	0.39	B	20	0.41
Victoria Rd x Bowden St	Signals	D	47	1.00	D	47	1.00
Constitution Rd x Belmore St [1.]	Signals	B	21	1.00	B	21	0.96

Notes: 1. Average delay results vary from EA Traffic Report. Adjustments made to the lane length on the Constitution Road approach to reflect existing on site conditions, namely the eastbound bus stop and shared use of this lane for turning traffic.

Table 2-5 PM Peak - Future Intersection Operation – Revised Traffic Generation

Intersection	Control	Traffic Generation Rate 0.33 veh/unit			Traffic Generation Rate 0.40 veh/unit		
		LoS	Av. Delay	DoS	LoS	Av. Delay	DoS
Junction St x Church St	Signals	B	17	0.89	B	17	0.89
Belmore St x Junction St	Signals	B	20	0.43	B	20	0.48
Victoria Rd x Bowden St	Signals	D	50	1.00	D	50	1.00
Constitution Rd x Belmore St [1]	Signals	B	21	1.00	B	21	1.00

Notes: 1. Average delay results vary from EA Traffic Report. Adjustments made to the lane length on the Constitution Road approach to reflect existing on site conditions, namely the eastbound bus stop and shared use of this lane for turning traffic.

2.2.2 Belmore Street / Constitution Road - Suggested Modifications to Intersection Configurations

As noted above, the intersection of Belmore Street and Constitution Road is modelled to operate near capacity (DoS = 1.0) for future conditions with development of the Meadowbank Employment Area.

It is noted that future average vehicle delays and level of service measure indicate satisfactory future operating conditions.

The DoS measures can be improved by providing additional capacity for the right hand turn from Belmore Street to Constitution Road.

Two options to provide the additional capacity are either:

- Increase the existing right turn lane length from 45 – 90 metres; or
- Provide a dual right turn facility at the intersection with additional exit lane on Constitution Road.

Neither option requires altering the carriageway width or road reserve.

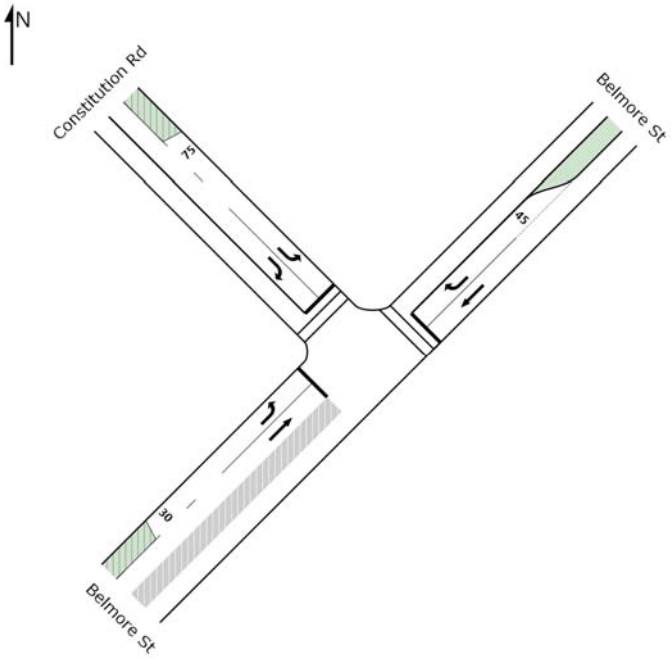
The intersection layouts for these options are set out below.

Both alternatives include the remove of 3-4 on street parking spaces on the western side of Belmore Street south of Constitution Road to increase the left turn lane length.

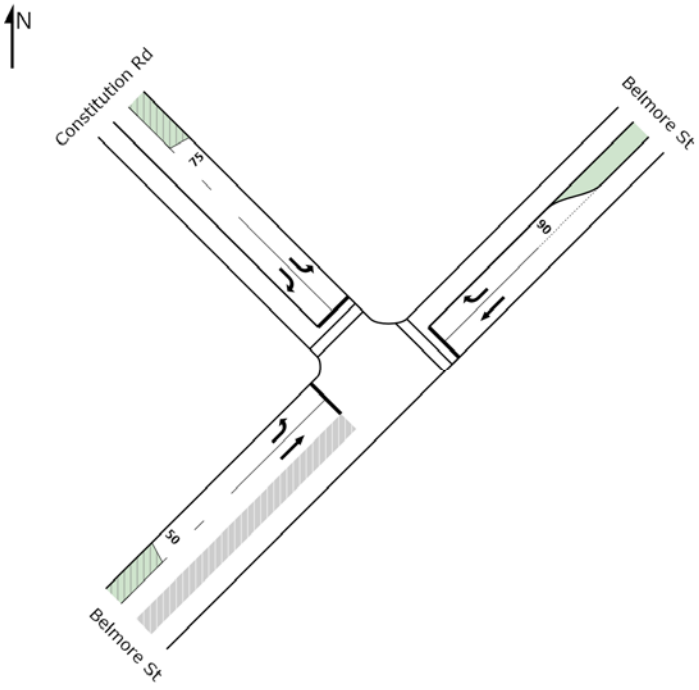
The extension of the right turn lane will require the removal of 7-8 parking spaces on the western side of Belmore Street to the north of Constitution Road.

The provision of the dual right turn lane requires the removal of on street parking on the southern side of Constitution Road between Belmore Street and Gale Street (approximately 4 spaces).

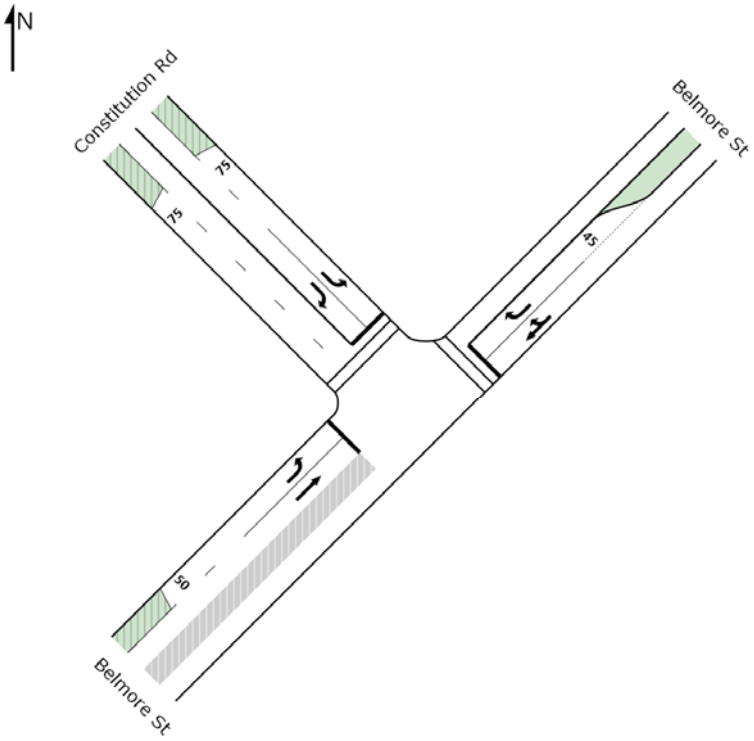
Existing Intersection Layout



Increased Right Turn Lane Length



Dual Right Turn from Belmore Street



The results of the aaSIDRA analysis for the modified intersection layouts are provided in Table 2-6.

Table 2-6 Belmore Street / Constitution Road Operation with Modifications

	Level of Service	Degree of Saturation	Ave. Delay (sec/veh)
Increased Right Turn Lane			
AM Peak	B	0.65	22
PM Peak	B	0.83	27
Dual Right Turn Lane			
AM Peak	B	0.62	22
PM Peak	B	0.77	25

The analysis indicates that both these modifications alternatives would:

- increase the capacity for the right turn movements from Belmore Street to Constitution Road (ie, reduce the Degree of Saturation to an acceptable operating level); and
- Maintain satisfactory levels of service and average delays for the peak periods.

3 Summary

This report has presented the findings of the additional intersection modelling requested by the SRDAC and the DoPI.

The analysis has indicated that the use of different land use generation rates do not change the assessment outcomes or findings of the Concept Plan transport assessment.

Intersection improvement options have been identified to reduce the degree of saturation modelled to occur at the Belmore Street / Constitution Road intersection. The options include a degree of on street parking loss on the approaches to the intersection.