# Residential Apartments 25 George Street, North Strathfield

Clause 4.6 Request

Prepared on behalf of North Strathfield One Pty Ltd

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dowling urban



ABN 94 114 148 659 Suite 302 4-14 Buckingham Street Surry Hills NSW 2010 t: 02 9516 4377 | m: 0407 404 898 | greg@dowlingurban.com.au

## **Table Of Contents**

1	INTRODUCTION	1
1.1	Background to the Contested Parking	2
1.2	Statutory Framework	3
2	PROPOSED VARIATION	5
2.1	Is the planning control a development standard?	5
2.2	The nature of the contravention of the standard	5
2.3	Assessment against the purpose/object of the standard	5
2.4	Consistency with the Aims of CI 4.6	6
2.5	Is compliance unreasonable or unnecessary in the circumstances?	7
2.6	Are there sufficient grounds to justify contravention?	8
2.7	Is the request well founded?	8
2.8	Conclusion	9
AN	NEXURES	9

This Clause 4.6 Request has been prepared by: Greg Dowling, BAS (Env PI) M Urb Des (Syd) MPIA, Dowling Urban Pty Ltd, Suite 302 4-14 Buckingham Street, Surry Hills NSW 2010.

## 1 Introduction

This report has been prepared to supplement the Statement of Environmental Effects (SEE) for the residential development proposal at 25 George Street North Strathfield to request a variation to the floor space ratio (FSR) development standard under Clause 4.6 of Canada Bay Local Environmental Plan 2013 (CBLEP 2013).

The proposed variation request relates to the amount of resident parking proposed and whether part of it is considered surplus to "*car parking to meet any requirements of the consent authority (including access to that car parking)*" as expressed in the Canada Bay Development Control Plan 2013 Special Precincts (CBDCP).

If parking is considered 'surplus' to the maximum parking controls within the DCP, then the space for that parking is considered as gross floor area (GFA) and as such, the FSR standard would then be contravened by the development as currently proposed.

It is argued that the parking cap for the site as expressed in Section 2.15 Control C.34 Table 2 of 126 spaces excludes, or was intended to exclude, 15 visitor parking required by Control C.33 Table 1 having regard to the source of the Table 2 control.

The development proposes 145 apartments served by 126 resident parking spaces and 15 visitor spaces in accordance with the rates set out in C.33 Table 1 which accords with the cap in C34 if it is considered that it refers to resident parking only.

Council is of the opinion that the Table 2 control of 126 parking spaces includes the required 15 visitor parking spaces and has recommended in conditions 34(v) and 42 that parking is therefore reduced by 15 spaces.

The consent authority may conclude an interpretation of the DCP provisions that the C.34 parking cap of 126 for the site either:

- (a) includes visitor parking ;
- (b) was intended to exclude visitor parking; or
- (c) excludes visitor parking.

In the case (a) or (b), a technical breach of the FSR standard would occur. Prior to the consent authority being able to consider the determination of the development application, it must then first consider a request to vary the standard regardless of whether a breach still occurs after the determination.

Further details of the development proposal and site context are contained within the SEE while further details regarding the contested parking are summarised below.

#### 1.1 BACKGROUND TO THE CONTESTED PARKING

CBC DCP Special Precincts sets out parking rates under Controls C33 and C34 with references to Table 1 and 2 respectively. (See extract 'A' attached)

- Table 1 reflects the recommended reduced parking rates set out in the Parramatta Road Corridor Urban Transformation (PRCUT) Strategy. The reduced rates are at a midpoint between that of regional and subregional centres. A Section 9.1 Direction 7.3 aims to facilitate development that is consistent with the Strategy.
- The application of Table 1 rates to the proposal results in the provision of 124 resident parking spaces and 15 visitor spaces for 146 apartments.
- Table 2 also sets out maximum car parking spaces per Concord West Study Area Sub-precincts which is in response to the findings of a Planning Proposal Transport Study undertaken by Council which examined an intersection capacity constraint.
- Council has interpreted Table 2 to include visitor parking. This reduces resident parking from 124 under the already reduced PRCUT rate prescribed in C33 to a significantly lower provision of 111 for residents.

The PRCUT rates results in 13% or 1 in 8 apartments being without a resident parking space while Council's application of C34 would result in 23% or almost 1 in 4 apartments without a parking space. The lower parking rate is considered to be without precedent for a like context and represents an exception burden on te4h development.

It is considered that Council's application of the C34 parking provision, or at least its intent, is without foundation as follows.

- An extract of the Council Report 7 February 2017 which made the DCP Special Precinct makes mention of implementing the PRCUT parking rates (that is, Table 1) and that "an average of one (1) car parking space per dwelling (maximum) should be provided" (that is, Table 2). (See paragraph extract 'B' attached)
- The figures for each sub-precinct in Table 2 exactly match the predicted sub-precinct yields totalling 785 dwellings as set out in the Concord West Masterplan Study prepared by Council and included in the Planning Proposal (Extract 'C' attached)
- The attached Transport Study prepared for Council, recommended that a limit of 1 car space per predicted dwelling be imposed resulting in 785 resident car spaces (that is, excluding visitor parking) in order to mitigate intersection congestion. (Section 4.3 p18). attached)
- The Transport Study further stated that:
  - "Application of this traffic generation rate indicated that the George Street/ Pomeroy Street intersection was capable of accommodating the

additional traffic generated by some 785 dwellings within the rezoned lands" (Executive Summary); and that

- "A capacity assessment of the George Street/ Pomeroy Street intersection indicates that the study area could accommodate the traffic generation associated with the indicative dwelling yield of 785 dwellings." (Conclusion p.37)
- In accordance with the Council Report and Studies, Table 2 is intended to reflect a sub-precinct resident parking cap to ensure that morning peak hour intersection capacity impacts are acceptable.
- The cap is based on the predicted rather than an actual dwelling yield, provided with 1 car parking each from which traffic generation is induced in the study modelling. It excludes visitor parking noting that the availability of visitor parking has no effect on morning peak hour traffic generation from sub-precincts as confirmed by the Transport Study.
- When visitor parking is excluded from Table 2 and, the parking rates and sub-precinct parking caps under Tables 1 and 2 are in general harmony.

#### **1.2 STATUTORY FRAMEWORK**

This request has been prepared under Clause 4.6 of CBLEP 2013 to justify the departure from the development standard for floor space ratio within clause 4.3.

The objectives of clause 4.6 are,

- (a) to provide an appropriate degree of flexibility in applying certain development standards to particular development,
- (b) to achieve better outcomes for and from development by allowing flexibility in particular circumstances,

The request is required under clause 4.6(4) to adequality address the matters required to be demonstrated by clause 4.6(3) which are:

- (a) that compliance with the development standards is unreasonable or unnecessary in the circumstances of the case, and
- (b) that there are sufficient environmental planning grounds to justify contravening the development standards.

Case law (Winten V North Sydney Council, Wehbe V Pittwater, Four2five V Ashfield Council) provides guidance when considering an exception to development standards as follows:

- Is the planning control in question a development standard?
- What is the underlying object or purpose of the standard?
  - Would the proposal, despite numerical non-compliance be consistent with the relevant environmental or planning objectives.

- Is the underlying objective or purpose of the standard not relevant to the development thereby making compliance with any such development standard unnecessary;
- Would the underlying objective or purpose be defeated or thwarted were compliance required, making compliance with any such development standard unreasonable;
- Has Council by its own actions, abandoned the development standard.
- Is non-compliance with the standard consistent with the aims of Cl 4.6?
- Is compliance with the development standard unreasonable or unnecessary in the circumstances of the case?
- Are there sufficient environmental planning grounds (specific to the site and particular to the circumstances of the proposed development) to justify contravening the development standard?
- Is the objection well founded whereby Preston J provided five potential ways in which this may be established (*Wehbe V Pittwater Council (2007) NSW LEC 827*) of which the following is relevant in this case:
  - the objectives of the development standard are achieved notwithstanding non-compliance with the standard

Recent case law (*Micaul Holdings v Randwick City Council, Moskovich v Waverley Counci and Initial Action Pty Ltd v Woollahra Municipal Council*) also established:

- the written request has to adequately address everything necessary in clause 4.6(3), rather than the consent authority being "satisfied directly";
- the consent authority must be personally satisfied that development will be "consistent with" the objectives of the zone and the development standard;
- being "consistent with" these objectives is not a requirement to "achieve" them but that development be "compatible" with them or "capable of existing together in harmony";
- establishing that "compliance with the standard is unreasonable or unnecessary" does not always require that the objectives of the standard are achieved but also that it may not be achieved or would be thwarted by a complying development;
- clarification that while it may be desirable, it is not a requirement to achieve a better environmental planning outcome than a development that complies with the development standard in *Initial Action Initial Action Pty Ltd v Woollahra Municipal Councill [2018] NSWLEC 118.*

## 2 Proposed Variation

#### 2.1 IS THE PLANNING CONTROL A DEVELOPMENT STANDARD?

The planning control in Clause 4.4 of CBLEP 2013 relates to the maximum floor space ratio that applies to the site and is a development standard as defined in Section 1.4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) as follows:

**development standards** means provisions of an environmental planning instrument or the regulations in relation to the carrying out of development, being provisions by or under which requirements are specified or standards are fixed in respect of any aspect of that development, including, ....

- (c) the character, location, siting, bulk, scale, shape, size, height, **density**, design or external appearance of a building or work,
- (d) the cubic content or floor space of a building,
- (e) the intensity or density of the use of any land, building or work, .... (Emphasis added)

The application of clause 4.6 to the FSR development standard is not precluded by the operation of clause 4.6 (8).

### 2.2 THE NATURE OF THE CONTRAVENTION OF THE STANDARD

The site is subject to Clause 4.4 *Floor space ratio* where the Floor Space Ratio Map indicates category S2 for the land which provides for a maximum FSR of 1.6:1.

The submitted architectural plans provide for a GFA of 11,974 m2 on a site area of 7,485 which represents a compliant FSR of 1.60:1.

If the contested 15 parking spaces are considered in addition to the "*requirements of the consent authority*" and therefore included the calculation of GFA, then Fuse Architects advise that the additional 194.4m2 occupied by the spaces would result in a GFA of 12,168 m2 and an FSR of 1.63:1.

Accordingly, the resultant contravention of the FSR development standard would be 0.03:1 or 1.62%.

# 2.3 ASSESSMENT AGAINST THE PURPOSE/OBJECT OF THE STANDARD

The objectives of the floor space ratio development standard stated in clause 4.4 are as follows:

(a) to ensure that buildings are compatible with the bulk, scale, streetscape and desired future character of the locality,

- (b) to provide a suitable balance between landscaping and built form,
- (c) to minimise overshadowing of, and loss of privacy to, neighbouring properties,
- (d) to maximise solar access and amenity for public places,
- (e) to manage the visual impact of development when viewed from public places, including the Parramatta River.

The inclusion of the floor space for the contested parking spaces at 194 m2 represents a limited portion of the basement such that its exclusion is unlikely to alter the extent of an economic basement construction and certainly would not lead to an alteration of the massing of the building above ground nor effect any view from the public domain or neighbouring properties.

Accordingly, the inclusion of additional GFA in the basement would result in a development that remained consistent with standard's objectives in terms of its compatibility with planned bulk, scale and streetscape (obj (a)), the preservation of landscaping (obj. (b)), effect on overshadowing and solar access and amenity of the public domain (objs. (c)&(d)), and visual impact when viewed from a public place.

Similarly, the contravention would be consistent with the objectives of the R3 Medium Density Residential zone that applies to the site to "*provide for the housing needs of the community and a variety of housing types within a medium density residential environment*" (clause 2.8 CDLEP).

An implied objective of the FSR standard may be derived from the inclusion of surplus parking spaces in the definition of gross floor area to discourage excess parking and the influence it has on development impacts including demand for travel by car.

However, if the contested parking is considered either:

- surplus and subsequently, a condition was applied to a development consent which reduced the parking; or
- acceptable having regard to the interpretation or intent of the control derived from transport studies that informed the DCP control;

then the implied objective from the GFA definition would be satisfied in each case.

#### 2.4 CONSISTENCY WITH THE AIMS OF CL 4.6

The aims of Clause 4.6 are:

- (a) to provide an appropriate degree of flexibility in applying certain development standards to particular development,
- (b) to achieve better outcomes for and from development by allowing flexibility in particular circumstances.

Flexibility is required in the application of the FSR standard in the circumstance as it is a potential consequence of the interpretation and/or intent of a maximum cap on parking provision for the site within the development control plan having regard to the Transport Studies which informed the control.

As demonstrated above, the objectives and intent of the standards and related planning provisions are resolved in the determination of the development application whether the contested parking is allowed or conditioned to be reduced accordingly.

In addition, the determination of the parking provision for the site will take into account the appropriate intent for the site and accordingly, ensures the achievement of a better outcomes for and from development by allowing the requested flexibility.

As discussed below, the proposed exception to the development standard will result in a better planning outcome as the resultant development will:

- properly provide for resident accessibility needs with manageable impacts from on-street parking while implementing reduced parking set out in the PRCUT Strategy to moderate car travel demand;
- preserve the housing potential of the site in close proximity to mass public transport services without increasing the floor space used for residential apartments or building mass; and
- not result in an increase in antipated adverse impacts.

Accordingly, it is considered that the exception to the FSR standard in the circumstance is a case where flexibility is justified and achieves a better planning, design and public benefit outcomes for and from development by allowing flexibility.

# 2.5 IS COMPLIANCE UNREASONABLE OR UNNECESSARY IN THE CIRCUMSTANCES?

Strict compliance with the FSR standard to provide for the contested parking is considered unreasonable and unnecessary in the circumstances if it is a result of the interpretation of the DCP parking control C34 when viewed gainst the intent of that control as informed by the Transport Study undertaken by Council.

Compliance with the FSR standard would preclude the proper implementation of the Transport Study which intended to cap parking to a fixed number of resident spaces to ensure acceptable impacts on intersection capacity at morning peak hours for which visitor parking does not contribute.

Therefore, compliance with the FSR would indirectly defeat the intent and purpose of the parking cap while placing an unjustified burden on the economic viability of the development while having no influence on the objectives of the standard. It would also require the reduction of dwellings to compensate for the contested parking and tend to undermine the objectives of the zone in the provision of housing.

# 2.6 ARE THERE SUFFICIENT GROUNDS TO JUSTIFY CONTRAVENTION?

As discussed above, the contravention to the FSR standard is justified in order to implement the proper intent of the parking cap for the site under Control C34 as informed by the Transport Study for the Concord West Masterplan.

Should the contested parking not be provided for resident parking, the shortfall to that anticipated by the Transport Study as well as the Parramatta Road Corridor Urban Transformation Strategy will have negative impacts in terms of accessibility and on-street parking pressures.

The planning provisions and zone objectives anticipate development of an intensity as proposed to best utilise the proximity of the site to mass public transport infrastructure and general services and facilities, in an urban form derived from urban design studies.

Should the provision of the contested parking in accordance with the intended purpose of the parking controls result in a loss of gross floor area available for dwellings, this would tend to defeat the objectives of the zone and the planning provisions as well as the economics and spirit of the voluntary planning agreement to dedicate affordable housing to Council.

Accordingly, it is considered that there are sufficient grounds to justify the proposed contravention of the floor space standard in the circumstance.

#### 2.7 IS THE REQUEST WELL FOUNDED?

The request is considered to be well founded in that the objectives of the FSR standard are achieved notwithstanding the contravention, and that the underlying object or purpose of the standard and zone would be defeated or thwarted if compliance was required and therefore, compliance would be unreasonable.

Variation of the FSR standard as proposed is considered to be minor and technical in nature while its purpose is solely to rectify a potential discrepancy in the DCP parking cap for the site. Without rectification, the intent of the Transport Study and PRCUT Strategy would be undermined unless the dwelling yield of the site was reduced to compensate for the subsequent take up of permitted gross floor area.

It is also considered that the underlying object, intent and purpose of the FSR standard, including the implied objectives of the GFA definition, is best served by allowing its variation to properly implement the Transport Study without unjustifiably impacting on the objectives of the zone, the economics of development and the provision of public benefits.

Therefore, the request to vary the FSR development standard is considered well founded especially in regard to:

- properly implementing the Concord West Masterplan as reflected in the governing planning framework provided by the PRCUT Strategy;
- not result in an increase in potentially and anticipated adverse impacts;
- achieve better planning and public benefit outcomes while satisfying the objectives for the zone and the development standard; and
- maintain the capacity of the site to help meet local needs for suitable housing with a high level of accessibility to mass metropolitan public transport.

#### 2.8 CONCLUSION

Having regard to the above, it is concluded that the proposed contravention with the FSR standard does not undermine or frustrate its underlying objectives.

The non-compliance is minor and technical in nature and does not give rise to any significant adverse environmental impacts but provides for the proper implementation of the PRCUT Strategy and Concord West Transport Study.

It is considered that the request is well-founded and consistent with clause 4.6; that strict compliance with the FSR standard is unreasonable and unnecessary in the circumstances of the case; and that there are sufficient environmental planning grounds to justify contravening the development standard.

It is further considered that this written request has adequately addressed the matters required to be demonstrated by subclause 4.6(3) and that the proposed development will be in the public interest because it is consistent with the objectives of the standard and the zone in which the development is proposed to be carried out.

Accordingly, it is concluded that an exception to the FSR development standard as requested should be supported by the consent authority in the circumstance.

#### ANNEXURES

- Extract of CBDCP
- Extract of the Council Report of 7 February 2017
- Extract of Concord West Masterplan Study
- Traffic, Transport, Accessibility and Parking Report

#### Parking

#### **Objectives**

- O23 To provide car parking that responds to the capacity of the neighbourhood.
- O24 To provide a rate of parking that encourages public transport.
- O25 To minimise traffic generation into and out of the precinct.

Controls	Controls					
C33.	Car and bicycle parking provision is to be in accordance with Section 3.8 Car Parking and Bicycle Parking under the Parramatta Road Urban Transformation Planning and Design Guidelines (see Table 1).					
C34.	Car parking provision must not exceed individual maximums provided per Sub-precinct in Table 2.					

#### Table 1Maximum Car Parking Rates

(Extract of Table 3.2 Paramatta Road Corridor Urban Transformation Strategy, Planning and Design Guidelines, Nov 2016, Page 45)

Category	Residential (max. spaces per dwelling)					Other (max. spaces/m2)		
	Studio	1 bed	2 bed	3 bed	Visitor	Commercial	Retail	Industrial
Homebush Precinct	0.3	0.5	0.9	1.2	0.1	100	70	120

 
 Table 2
 Maximum Car Parking Provisions per Sub-precinct

Sub-precinct	No. of Car Parking Spaces
2	86
3	20
5	157
6	141
7	126

• Negotiation of a Voluntary Planning Agreement (VPA) with the applicant to enable funds to be directed towards the intersection upgrade. There is an adopted Master Plan for the precinct that contains detailed planning controls that were informed by both urban design principles and consultation with the Concord West and North Strathfield communities.

As VPAs are commonly associated with departures to planning controls, this approach is not considered to be the most appropriate mechanism in this instance.

In view of the breach of the development consent condition for the Victoria Avenue School, continued action to pursue compliance with this condition is recommended.

Upon receipt of the detailed design and costing, Council will consider the legal opinion received and liaise with the Department of Planning and Education to resolve outstanding funding required for construction of the intersection upgrade.

Based on outcomes of the above, a position will be determined as to whether legal action in relation to the Department of Education's obligation to fulfil its development consent will be pursued.

#### Canada Bay Development Control Plan

The Sydney Planning Panel also recommended that consideration be given to reducing car parking requirements for the development. Given the location of the site within close proximity to two railway stations, it is considered appropriate to review the proposed car parking rates.

The Concord West Master Plan and associated traffic report recommended that an average of one (1) car parking space per dwelling (maximum) should be provided for development in the precinct. Since this time, the Parramatta Road Urban Transformation Strategy has been released. This document includes the following maximum car parking rates for land in the Homebush precinct:

Studio	0.3 spaces
1 bedroom	0.5 spaces
2 bedroom	0.9 spaces
3 bedroom	1.2 spaces

It is recommended that the Canada Bay Development Control Plan be amended to include the above parking rates for land in the Homebush precinct. This will ensure alignment with the finalised Strategy for Parramatta Road, address the recommendation of the Sydney Planning Panel and encourage a modal shift from private car usage to public transport.

To ensure prospective purchasers of property are aware of the restrictive parking policy that applies to land within close proximity to public transport, it is recommended that the following notation be included on relevant 149 Planning Certificates:

A restrictive parking policy applies to land affected by this Planning Certificate. The policy aims to encourage low car ownership and high public transport use by residents and visitors. Off-street parking in new developments is limited and no on-street residential parking or Resident Parking Schemes will be provided. Time-limited parking will apply across most streets in the area. Residents should ensure they do not rely on onstreet parking for their vehicles and their visitors.

#### **Responsible Planning Authority**

Following the decision of the Panel to submit the Planning Proposal for Gateway Determination, Council was invited to be the Relevant Planning Authority (RPA) and was required to advise within 42 days from the 30 November 2016 of whether it will accept the role of RPA for this proposal. The RPA is responsible for processing the Planning Proposal and making a determination following public exhibition.

Council accepted the role given the collaboration required with the Applicant to address the recommendations of the Panel. This decision is also consistent with the Resolution of Council of 6 September 2016.

#### Conclusion

The Planning Proposal for 25 George Street, North Strathfield has gained support from the Rezoning Review Panel to be submitted for Gateway Determination pending satisfactory arrangements being put in place for the funding of the George, Pomeroy & Beronga Street intersection upgrade.

A detailed design and costing for the upgrade is being prepared and following receipt of final costings, Council will enter discussions with the Department of Education with respect to meeting their obligations under Condition 73 of the Development Consent No. 505/2012 for the Victoria Avenue Public School.

This report recommends that Council submit the Planning Proposal to the Department of Planning and Environment for a Gateway Determination and pursue the Department of Education to deliver the intersection upgrade in accordance with the obligations of the development consent. It is also recommended that the draft Canada Bay Development Control Plan applicable to development in Concord West be updated to include reduced car parking rates.

#### RECOMMENDATION

1. THAT the Planning Proposal for 25 George Street, North Strathfield, be submitted to the Department of Planning and Environment for Gateway Determination.

# **Indicative Yield Plan**

#### Key Conclusions:

- The total study area yield of **785** units is consistent with the upper limit of the maximum yield as determined by the traffic study.
- The built form principles when applied to the indicative building envelopes deliver a balanced development approach across the industrial sites.
- Where one site receives a greater percentage of the overall dwelling yield to site area it is directly related to the application of the built form principles and the relative constraints between each of the sites.
- The 'advantage' or 'disadvantage' gained or lost is minimal and should not adversly impact the development feasibility of the site.

#### **Development Assumptions:**

The development yield was determined using the following calculations:

- Building Envelope to GFA: 85%
- GFA to NSA
- Average Gross Unit Size (m<sup>2</sup>)
   80m<sup>2</sup>

85%

TABL	TABLE 1 - Development Summary Balance							
Site	Address	Dwelling Yield	FSR : 1	Site Area	% Industrial Area	% Dwelling Yield	% Yield - % Area	Notes
1	7 Concord Ave.	255	1.6	14968m <sup>2</sup>	33.0%	32.5%	- 0.5%	neutral
2	204 - 210 George St.	86	1.6	5028m <sup>2</sup>	11.0%	11.0%	0%	neutral
3	3 King St.	20	2.3	809m <sup>2</sup>	1.8%	2.5%	+ 0.72%	Lower constraints due to reduced setbacks that are based on the existing building footprint & mixed use.
4	1 King Street (Westpac)	n/a	n/a	n/a	n/a	n/a	n/a	Zoned B7 - No residential
5	176 - 184 George St.	157	1.9	7806m <sup>2</sup>	17.2%	20.0%	+ 2.8%	Site 5 is the least constrained site due to minimal proximity to existing low scale residential and thus achieves a slightly higher dwelling yield.
6	2 - 10 Rothwell St.	141	1.4	9404m²	20.7%	18.0%	- 2.7%	Site 6 is the most constrained site due to proximity to existing low scale residential and thus achieved a slightly lower dwelling yield.
7	25 George St.	126	1.6	7402m <sup>2</sup>	16.3%	16.0%	- 0.3%	neutral
ΤΟΤΑ	AL	785	units	45417m <sup>2</sup>	100%	100%	0%	Excludes Westpac site





Concord West Precinct Masterplan

Traffic, Transport, Accessibility and Parking Report

transportation planning, design and delivery



## Concord West Precinct

## Masterplan

## Traffic, Transport, Accessibility and Parking Report

Issue: A 29/07/14

Client: City of Canada Bay Council Reference: 14\$1097000 GTA Consultants Office: NSW

Quality Record

lssue	Date	Description	Prepared By	Checked By	Approved By	Signed
А	29/07/14	Final	Andrew Farran	Brett Maynard	Brett Maynard	B.T. Mayned

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## Executive Summary

From a transport perspective, the study area represents a relatively unique situation, with the neighbourhood area bordered by the railway line to the east, Homebush Bay Drive to the west and the Liberty Grove development to the north. As a result, all vehicle access to the study area is provided via George Street to the south. This "funnel" effect results in periods of congestion (including increased delays and queuing) at the George Street/ Pomeroy Street intersection.

The study area has good public transport accessibility with the Concord West Railway Station located within a short walking distance of the majority of the study area. The frequent rail services are complemented by bus services that operate along Concord Road to the east of the site. In addition the study area is well positioned in relation to the regional bicycle network.

Recently, the City of Canada Bay Council (Council) approved the construction of a new primary school facility within the study area. The new school will generate additional traffic onto the surrounding road network and further increase congestion at the George Street/ Pomeroy Street intersection. In order to mitigate the impact of the additional traffic generated by the school, a new left turn slip lane is to be constructed at the George Street/ Pomeroy Street intersection. These works will increase the overall capacity at the intersection.

A sensitivity assessment was undertaken by GTA Consultants (GTA) using SIDRA INTERSECTION modelling software to determine the level of additional traffic from the study area that could be accommodated at the intersection without compromising its operation. The intersection capacity assessment was based on a number of traffic and road network assumptions agreed with the City of Canada Bay Council prior to the assessment and detailed within the GTA transport report.

In order to undertake this sensitivity assessment, residential traffic generation rates were sourced from relevant RMS guidance (i.e. 0.29 peak hour movements per dwelling). Application of this traffic generation rate indicated that the George Street/Pomeroy Street intersection was capable of accommodating the additional traffic generated by some 785 dwellings within the rezoned lands. The Table below provides an overview of the anticipated future traffic volumes on George Street following the rezoning of the industrial lands.

Traffic Source	Vehicles	Per Hour
Iramic Source	AM Peak Hour	PM Peak Hour
Existing Traffic Volumes	730	780
Primary School (under construction)	+356	- [1]
Rezoned Industrial Lands	+228	+228
Total	1,314	1,008

#### Table E1: Future George Street Traffic Volumes (North of Pomeroy Street)

[1] The afternoon school peak will occur outside the road network peak hour.

Table E1 indicates that post development traffic volumes on George Street are anticipated to increase by approximately 580 and 230 vehicles during the AM and PM peak periods. During the AM peak hour the additional traffic generated by the rezoned lands represents 40% of the additional George Street traffic volumes, with the primary school accounting for 60% of the additional traffic. The primary school is not anticipated to generate any significant additional traffic during the road network PM peak hour.



The modelling indicates that, following full development, the intersection is anticipated to operate at a comparable level of service to its current operation, with typically manageable queues and delays on all approaches.

An overall development yield higher that indicated above would likely require additional mitigating works at the George Street/ Pomeroy Street intersection. Any such works would require land acquisition and significant associated property impacts. The provision of additional vehicle access points into and out of the study area was considered as part of the assessment, however, it was concluded that the cost associated with any potential future access points would be prohibitive.

Broader road network considerations are discussed further within the GTA report.

Traffic generation is closely linked to available car parking. As such, in order to minimise traffic generation into and out of the study area, it is recommended that on-site resident car parking be minimised. In this regard it is recommended that maximum resident car parking rates be imposed on future residential development on the rezoned lands, with a focus on encouraging the use of public transport. This approach to car parking policy would be consistent with the current Rhodes West Development Control Plan which specifies an average maximum of 1 car parking space per dwelling.

In conjunction with the reduced car parking provisions, it is recommended that car parking controls (time and/or permit parking restrictions) are introduced to the existing on-street car parking supply. Any resident parking scheme introduced would be for existing eligible residents within the study area. The provision of a car share service within the study area would cater for the needs of smaller dwelling types that may not be provided with a dedicated on-site car parking space.

The introduction of time restricted car parking within the study area would also reduce the level of non-residential trips to the study area, generated by commuter car parking associated with the Concord West Railway Station.

In conjunction with the lower on-site car parking provisions, it is recommended that appropriate minimum residential bicycle parking requirements are included in the relevant planning controls.

As part of the urban renewal of the industrial zoned lands, there is an opportunity to improve the amenity of the existing pedestrian and cycling environments, particularly along George Street where dedicated on-road or separated bicycle lanes could be provided. Additional bicycle links could also be provided from the site to the existing regional bicycle network that services the broader precinct. Additional pedestrian through-site links increases the permeability of the area and has the potential to reduce walking distances.

The transport assessment prepared by GTA provides further details regarding the above arrangements and has been provided as an attachment to this report.



## Table of Contents

1.	Intro	oduction	1
	1.1	Background	1
	1.2	Purpose of this Report	1
	1.3	References	1
2.	Exis	ting Conditions	2
	2.1	Study Area	2
	2.2	Road Network	3
	2.3	Traffic Volumes	5
	2.4	Crash History	6
	2.5	Intersection Operation	7
	2.6	Car Parking	9
	2.7	Public Transport	9
	2.8	Pedestrian and Cycle Infrastructure	10
	2.9	WestConnex	12
3.	Futu	re Land Use Scenario	14
	3.1	Master Plan Overview	14
	3.2	Residential Yield	15
4.	Car	Parking Considerations	16
	4.1	Existing DCP Car Parking Requirements	16
	4.2	Reduced Car Parking Rates	16
	4.3	Recommended Future Car Parking Rates	18
	4.4	Resident Parking Scheme	18
5.	Sust	ainable Transport Infrastructure	20
	5.1	Preamble	20
	5.2	Bicycle End-of-Trip Facilities	20
	5.3	Walking and Cycling Network	20
	5.4	Public Transport	23
6.	Traf	fic Impact Assessment	24
	6.1	Intersection Upgrades	24
	6.2	Traffic Generation	25
	6.3	Distribution and Assignment	28
	6.4	Traffic Impact	29
7.	Res	ponse to Community Consultation	33
	7.1	Community Workshop #1	33
	7.2	Community Workshop #2	35
8.	Cor	clusion	37



#### Appendices

- A: Existing Traffic Volume Survey Results
- B: SIDRA INTERSECTION Results
- C: Assessment of McDonald College Redevelopment
- D: Post Development Traffic Volumes

#### Figures

Figure 2.1:	Subject Site and Its Environs	2
Figure 2.2:	Existing Zoning Map (City of Canada Bay LEP)	3
Figure 2.3:	George Street – Looking North	4
Figure 2.4:	Pomeroy Street – Looking East	4
Figure 2.5:	AM Peak Hour traffic Volumes	5
Figure 2.6:	PM Peak Hour Traffic Volumes	5
Figure 2.7:	Weekday Average Daily Traffic Volumes – George Street (North of Pomeroy Street)	6
Figure 2.8:	Recorded Crash History (2008 to 2012)	7
Figure 2.9:	Public Transport Network	10
Figure 2.10:	Pedestrian and Cycle Networks	11
Figure 2.11:	Regional Cycle Network	12
Figure 2.12:	WestConnex Overview	13
Figure 3.1:	Concord West Master Plan Overview	14
Figure 4.1:	Car Ownership Data Comparison 2006 and 2011 (Postcode 2138)	17
Figure 5.1:	Potential Bicycle Network Upgrades	21
Figure 6.1:	Traffic Generation Summary – RMS Technical Direction	26

#### Tables

Future George Street Traffic Volumes (North of Pomeroy Street)	3
Two-way Traffic Volumes – George Street	6
SIDRA INTERSECTION Level of Service Criteria	8
George Street / Pomeroy Street Existing Operating Conditions	8
Indicative Development Schedule [1]	15
Off-Street Parking Minimum Requirements Residential Buildings	16
Rhodes West Car Parking Controls	17
Recommended Maximum Car Parking Rates	18
Carriageway Requirements – Cycleway	22
George Street / Pomeroy Street Intersection Upgrades	25
Traffic Generation Estimates	26
Primary School Traffic Generation	27
Development Scenarios Assessed	29
George Street / Pomeroy Street Post Development Operating Conditions	30
	Future George Street Traffic Volumes (North of Pomeroy Street) Two-way Traffic Volumes – George Street SIDRA INTERSECTION Level of Service Criteria George Street / Pomeroy Street Existing Operating Conditions Indicative Development Schedule [1] Off-Street Parking Minimum Requirements Residential Buildings Rhodes West Car Parking Controls Recommended Maximum Car Parking Rates Carriageway Requirements – Cycleway George Street / Pomeroy Street Intersection Upgrades Traffic Generation Estimates Primary School Traffic Generation Development Scenarios Assessed George Street / Pomeroy Street Post Development Operating Conditions



Table 6.6:	Pomeroy Street/ Queen Street/ Beronga Street Intersection Traffic Volumes	31
Table 7.1:	Community Workshop #1	33
Table 7.2:	Community Workshop #2	35



## 1. Introduction

## 1.1 Background

The City of Canada Bay Council (Council) is seeking to rezone a number of industrial (IN1 General Industrial) land parcels to residential (R3 Medium Density Residential) within Concord West. At the Council meeting (6 August 2013) it was resolved to endorse the future rezoning of the various properties that form the Concord West Industrial Land (subject site). A Masterplan is being prepared by JBA for the study area which details the indicative future built form and public domain of the rezoned lands.

#### In terms of transport, Council resolved:

"THAT the planning for the precinct occurs on the assumption that new development will prioritise pedestrians, bicycles and the use of public transport and it be noted that the Urban Design and Traffic studies are to include principles and opportunities that seek to minimise traffic and rates of private car parking."

GTA Consultants (GTA) has prepared this Traffic, Transport, Accessibility and Parking Assessment based on the above Council resolution.

GTA was commissioned by JBA and City of Canada Bay Council in October 2013 to undertake the transport impact assessment for the proposed rezoning.

## 1.2 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposed rezoning, including consideration of the following:

- i existing traffic conditions surrounding the study area
- ii identification of future residential car parking rates
- iii pedestrian and bicycle requirements
- iv the traffic generating characteristics of the rezoned lands
- v the transport impact of the development proposal on the surrounding road network.

### 1.3 References

In preparing this report, reference has been made to the following:

- an inspection of the site and its surrounds
- City of Canada Bay Development Control Plan (DCP)
- Rhodes West Development Control Plan
- Ashfield Council Development Control Plan 2007
- Australian Standard, Parking Facilities, Part 5: On-Street Car Parking AS/NZS 2890.5:1993
- traffic and car parking surveys undertaken by SkyHigh Traffic as referenced in the context of this report
- concept plans for the proposed Masterplan prepared by JBA Planning
- other documents and data as referenced in this report.



## 2. Existing Conditions

### 2.1 Study Area

The subject site(s) comprise a number of industrial zoned lands located within a study area bound by Homebush Bay Drive and Powells Creek to the west, Liberty Grove to the north, the railway line to the east and Pomeroy Street to the south.

With the exception of the industrial zoned lands, the study area is generally zoned Low Density Residential (R2), with some areas of Medium Density Residential (R3) and Public Recreation (RE1) also provided.

Liberty Grove, a 'gated' residential community is located to the immediate north of the study area. Rhodes West, an area that has undergone significant urban renewal and intensification is located approximately 1.5km north of the site. McDonald College and the Bakehouse Quarter are located to the south of the study area.

The location of the subject site and its surrounding environs is shown in Figure 2.1, with the existing land use zoning provided in Figure 2.2.



Figure 2.1: Subject Site and Its Environs

Basemap source: Reproduced with permission from Sydway Publishing Pty Ltd





Figure 2.2: Existing Zoning Map (City of Canada Bay LEP)

Source: City of Canada Bay

## 2.2 Road Network

#### 2.2.1 Arterial Road Network

In the vicinity of the study area, Homebush Bay Drive to the west and Concord Rod to the east form the key north-south routes, whilst Parramatta Road and the Western Motorway (M4) to the south of the study area form the key east-west routes. The Concord Road and Homebush Bay Drive corridors forms key north-south links providing access across the Parramatta River, whilst the M4 and Parramatta Road provide the main links between Western Sydney and the CBD. The M4 terminates at Parramatta Road immediately east of Concord Road. During peak periods the



surrounding arterial road network experiences significant congestion which results in some ratrunning through the local road network to the south of the study area (Pomeroy Road).

#### 2.2.2 Key Study Area Roads

#### George Street

George Street is classified as a local road and is aligned in a north-south direction connecting with Parramatta Road to the south and Station Avenue to the north and travels the length of the study area. At Rothwell Avenue, George Street 'kinks' to the west for approximately 170m before returning to its original alignment. It is a two-way road generally configured with a 2-lane, 12.5 metre wide carriageway (varies), set within a 20 metre wide road reserve (approx.). A number of Local Area Traffic Management treatments (roundabout and chicanes) are provided along George Street at Conway Avenue, Mena Street and Lorraine Street. Parallel kerbside parking is permitted along the length of George Street in the study area.

George Street is shown in Figure 2.3 and carries approximately 8,000 vehicles per day (north of George Street) and 1,700 vehicles per day (north of Rothwell Avenue)<sup>1</sup>.

#### Pomeroy Street

Pomeroy Street functions as a collector road, forming part of a broader link between Concord Road and Homebush Bay Drive. It is a two-way road configured with a 2-lane, 11.8 metre wide carriageway, set within a 20 metre wide road reserve (approx.). Parallel kerbside parking is permitted.

Pomeroy Street is shown in Figure 2.4 and carries approximately 18,000 vehicles per day<sup>2</sup>.

#### Figure 2.3: George Street – Looking North





#### 2.2.3 Surrounding Intersections

The following key intersections currently exist in the vicinity of the site:

- George Street/ Pomeroy Street (signalised)
- Pomeroy Street/ Queen Street/ Beronga Street
- Parramatta Road/ George Street (signalised).

In addition to the above a number of lower order intersections exist within the study area.

Figure 2.4: Pomeroy Street – Looking East

<sup>1</sup> Based on 7-day tube counts on George Street commencing 29 October 2013.

<sup>2</sup> Based on the peak hour traffic counts undertaken by SkyHigh Traffic on Tuesday 29 October 2013 and assuming a peakto-daily ratio of 10%.



### 2.3 Traffic Volumes

GTA Consultants commissioned Skyhigh Traffic Data to undertake turning movement counts at the George Street/Pomeroy Street intersection on Tuesday 29 October 2013 during the following peak periods:

- 7:00am and 9:00am
- 4:00pm and 6:00pm.

Peak hour counts were also undertaken of the Pomeroy Street/ Queen Street/ Beronga Street roundabout. However, it is noted that access to Queen Street (north approach) was restricted as a result of road works associated with the Northern Sydney Freight Corridor (North Strathfield Underpass). The results of these surveys are provided in Appendix A.

In addition, 24 hour, 7 day automatic tube count surveys were undertaken on George Street immediately north of Pomeroy Street.

The AM and PM peak hour traffic volumes are summarised in Figure 2.5 and Figure 2.6, with the average weekday daily counts provided in Figure 2.7.



Figure 2.5: AM Peak Hour traffic Volumes



124 143 227

211

Figure 2.6: PM Peak Hour Traffic Volumes





Figure 2.7 indicates that George Street carries greater northbound volumes during the AM peak hour and greater southbound movements during the PM peak hour. These northbound (in)/ southbound (out) splits are more reflective of movements associated with non-residential land uses than residential movements. As such, it can be concluded that there is significant traffic generation from non-residential land uses within the study area. This is potentially made up of a combination of the industrial lands, construction workers associated with the North Strathfield Rail Underpass project and train commuters parking at Concord West Station. In this regard, Table 2.1 has been prepared to provide a summary of the anticipated residential, Westpac Data Centre (based on surveys) and non-residential traffic on George Street.

Anticipated Traffic Type	AM Peak Hour		PM Peak Hour		
	Northbound (IN)	Southbound (OUT)	Northbound (IN)	Southbound (OUT)	
Existing Residential	126 [1]	294	337	144 [1]	
Westpac Data Centre	140	NA	NA	140	
Non-Residential	117	NA	NA	58	
TOTAL	383	294	337	342	

Table 2.1:	Two-way Traffic	Volumes -	George	Street
------------	-----------------	-----------	--------	--------

[1] Based on an in/out split of 30:70 (AM) and 70:30 (PM).

Table 2.1 indicates that a significant proportion of northbound traffic during the AM peak hour and southbound traffic during the PM peak hour is non-residential traffic.

## 2.4 Crash History

The recorded crash history for the George Street/ Pomeroy Street intersection and surrounds for the most recent 5 year period (2008 to 2012) has been sourced from RMS and indicates that there were 4 crashes at the intersection and 4 further crashes the approaches during the 5 year period. The RMS crash data is presented in Figure 2.8.





Figure 2.8: Recorded Crash History (2008 to 2012)

### 2.5 Intersection Operation

#### 2.5.1 George Street/ Pomeroy Street Intersection

The operation of the George Street/Pomeroy Street intersection within the study area has been assessed using SIDRA INTERSECTION<sup>3</sup>, a computer based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by the RMS, is vehicle delay. SIDRA INTERSECTION determines the average delay that vehicles encounter and provides a measure of the level of service.

Table 2.2 shows the criteria that SIDRA INTERSECTION adopts in assessing the level of service.

<sup>&</sup>lt;sup>3</sup> Program used under license from Akcelik & Associates Pty Ltd.



Level of Service (LOS)	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
А	Less than 14	Good operation	Good operation
В	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
С	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

 Table 2.2:
 SIDRA INTERSECTION Level of Service Criteria

Table 2.3 presents a summary of the existing operation of the intersection, with full results presented in Appendix B of this report.

Peak	Leg	DOS	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
AM	George Street (South)	0.69	39	43	D
	Pomeroy Street (East)	0.61	13	102	В
	George Street (North)	0.66	32	59	С
	Pomeroy Street (West)	0.89	34	184	С
PM	George Street (South)	0.88	47	100	D
	Pomeroy Street (East)	0.60	18	91	В
	George Street (North)	0.83	43	103	D
	Pomeroy Street (West)	0.90	41	260	D

 Table 2.3:
 George Street / Pomeroy Street Existing Operating Conditions

On the basis of the above assessment and on-site observations, it is evident that the intersection of George Street/Pomeroy Street currently experiences notable queuing and delays during both the AM and PM peak periods, however still generally operates within acceptable limits (i.e. LOS D or better).

#### 2.5.2 Pomeroy Street/ Queen Street/ Beronga Street

The Pomeroy Street/ Queen Street/ Beronga Street intersection is controlled by an irregular shaped roundabout. At the time of the traffic surveys, there were partial road closures at the intersection as a result of the freight line works.

Given the irregular shape of the roundabout and the partial road closures during the traffic surveys, it is difficult to accurately model the intersection using traditional modelling tools such as SIDRA INTERSECTION. On this basis, the intersection has not been modelled as part of this study.

Notwithstanding, the dominant movements through the intersection are eastbound and westbound through movements, with only localised movements observed to the side streets (Queen Street). In effect, the intersection operates in a manner similar to two separate give-way intersections, with the east-west movements having priority.

Having regard for the above, the intersection was observed to operate satisfactorily during peak periods, with manageable queues and delays observed.



#### 2.5.3 Parramatta Road/ George Street

At its southern end, George Street terminates at Parramatta Road with a signalised T-intersection. Formal traffic surveys have not been undertaken at this intersection as part of this study.

However, observations of this intersection indicate that there is significant congestion during peak periods, consistent with the broader Parramatta Road corridor. As a result, significant queuing and delays are experienced, particularly on George Street.

The majority of traffic on George Street at this intersection is understood to originate from the Bakehouse Quarter precinct, particularly during the PM peak hour when the retail and entertainment uses peak.

## 2.6 Car Parking

Unrestricted parallel on-street car parking is generally provided on both sides of each of the roads within the study area. It is noted that all car parking within the study area is subject to 2P Special Event parking restrictions. These restrictions are associated with larger events being held at the Sydney Olympic Park precinct to the west of the study area. Permit holders are exempt from the 2P restriction, noting that permits are only available for residents of the precinct.

Whilst not strictly surveyed, observations indicate that car parking demands within the study area are moderate, with increased occupancy observed in the vicinity of the Concord West Railway Station. These demands are understood to be generated by commuter car parking associated with the station, overflow employee parking from the Westpac Data Centre and construction workers associated with the Northern Sydney Freight Corridor (North Strathfield Underpass).

## 2.7 Public Transport

The study area has good accessibility to surrounding public transport facilities. The Concord West and North Strathfield Railway Stations are located in reasonable walking distance of the study area. Both stations are located on the T1 North Shore, Northern and Western Line, with services provided to Hornsby and Berowra via Central and to Epping. Services generally operate at 15 and 30 minute frequencies for the weekday and weekend periods, respectively.

In addition to the rail services, a number of buses operate along Concord Road to the east of the study area, as follows:

- M41: Hurstville to Macquarie Park
- 458: Burwood to Ryde via Rhodes Shopping Centre
- 459: Strathfield Station to Macquarie University

Pedestrian connections across the railway line to Concord Road are provided at Station Avenue, Victoria Avenue and Pomeroy Street.

An overview of the existing public transport network is provided in Figure 2.9.





#### Figure 2.9: Public Transport Network

## 2.8 Pedestrian and Cycle Infrastructure

There are a number of barriers (Homebush Bay Drive, the railway line, Powell's Creek and Liberty Grove) that limit the full integration of the local pedestrian/cycle network into the broader network. However, unlike the traffic network there are a number of access points at these key barriers, as follows:

- Homebush Bay Drive at Victoria Avenue
- Powell's Creek crossings at Conway Avenue and Pomeroy Street
- Railway Line at Pomeroy Street, Victoria Avenue (at the station) and Station Avenue
- Liberty Grove at Concord Avenue

In addition to the above links, pedestrian footpaths are generally provided on both sides of each of the roads within the study area. A number of off-road paths are provided to the west of the study area in the vicinity of Bicentennial Park.

The fine grain pedestrian/cycle network is illustrated in Figure 2.10.





Figure 2.10: Pedestrian and Cycle Networks

There is an extensive network of the regional cycling links in the vicinity of the study area, including connectivity to the following areas:

- Macquarie Park to the north
- Sydney CBD to the east
- Sydney Airport to the south
- Parramatta to the west

There are some gaps within the above links, particularly to the north and east that are progressively being developed.

Figure 2.11 provides an overview the regional bike network. A typical cyclist commutes up to 10km to work which suggests that accessing Macquarie Park and Parramatta CBD are realistic options for residents of the study area.





Figure 2.11: Regional Cycle Network

## 2.9 WestConnex

Once completed, the WestConnex project will provide a new continuous 33km link between the M4 and M5 Motorways. The project is to be delivered in 3 stages, commencing in 2015 with anticipated final completion date of 2023.

Key benefits of the WestConnex project have been sourced from the WestConnex Delivery Authority website, reproduced below:

- "Provide quicker, more reliable trips between Western Sydney and the Port Botany/Sydney Airport precinct to support Sydney's urban freight task
- Help distribute traffic across the wider road network, removing bottlenecks and relieving congestion for local trips
- Provide better connections along the M4 and M5 corridors to cater for the forecast growth in employment and population along these routes
- Allow urban revitalisation and increase opportunities for active and public transport along and across Parramatta Road."



The WestConnex project will increase capacity along the M4 corridor. It is anticipated that the project will reduce existing traffic volumes along the length of Parramatta Road and in turn potentially create additional capacity for lower order streets that intersect Parramatta Road.

An overview of the project is illustrated in Figure 2.12.



Figure 2.12: WestConnex Overview

Source: <u>http://www.westconnex.com.au/</u>



## 3. Future Land Use Scenario

## 3.1 Master Plan Overview

An overview of the indicative Master Plan is provided in Figure 3.1.

Figure 3.1: Concord West Master Plan Overview



Source: JBA


# 3.2 Residential Yield

As previously noted, the study area is divided into seven (7) sites. It is noted that this assessment does not include any future redevelopment of the Westpac Data Centre site (Site 4).

Table 3.1 provides a summary of the indicative development yields for each of the sites. It is noted that no retail or commercial land uses have been anticipated at this stage (i.e. residential land uses only).

Site	Site Name	Site Area	Anticipated Max No. of Storeys	No. of Residential Apartments
1	7 Station Street	14,968sq.m	7	
2	204-210 George Street	5,028sq.m	2-6	
3	3 King Street	809sq.m	2-4	705 duyallin m
5	George Street	7,806sq.m	2-6	785 Gweilings
6	Rothwell Street	9,404sq.m	2-4	
7	25 George Street	7,402sq.m	4-6	

Table 3.1: Indicative Development Schedule [1]

[1] Sourced from JBA Planning Draft Masterplan.

On the basis of the above, an indicative residential yield of 785 apartments has been adopted for the traffic assessment.



# 4. Car Parking Considerations

# 4.1 Existing DCP Car Parking Requirements

The car parking requirements for different development types are set out in Part 6 of the City of Canada Bay Council's DCP 'Residential: Controls for detached dual occupancies, multi dwelling housing & residential flat buildings'. In terms of parking and access the DCP states that:

"The provision of car parking should reasonably satisfy the needs of current and future residents. New development should accommodate parking for visitors and residents within the site and minimise excavation."

The <u>minimum</u> car parking requirements for residential uses are set out in Section 6.4.8 of the DCP and are summarised in Table 4.1 below.

	<b>Resident Parking</b>	Visitor Parking	<b>Disabled Parking</b>
Detached Dual Occupancy	1 per dwelling	Nil	Nil
Multi Dwelling Housing & Residential Flat Buildings	Small – 1 per dwelling Medium – 1.5 per dwelling Large 2.0 per dwelling	≤ 5 dwellings – 1 spaces > 5 dwellings – 0.5 spaces per dwelling	Reference should be made to Adaptable Housing Requirements

#### Table 4.1: Off-Street Parking Minimum Requirements Residential Buildings

The above DCP rates are generally applicable for the entire City of Canada Bay LGA Area, however, there are precincts within the LGA that are subject to specific parking controls that vary from the generic car parking rates presented above. Typically locations subject to site-specific parking controls are located within town centres, urban renewal areas and/or close to public transport nodes.

In this regard, it is considered appropriate that specific residential car parking rates be developed for the study area.

# 4.2 Reduced Car Parking Rates

As detailed above, the current car parking controls (City of Canada Bay DCP) for the study area recommend a minimum car parking provision be provided for residential land uses. Limiting onsite car parking provisions for future multi-dwelling residential uses in the study area is considered appropriate for the following reasons:

- i Study areas accessibility to public transport
- ii Reduce traffic generation from the study area
- iii Minimise impact on the George Street / Pomeroy Street intersection
- iv Existing pedestrian and cycle links in the vicinity of the study area.

In order to determine an appropriate future car parking rate reference has been made to the following sources:

- Other car parking controls in Canada Bay(Rhodes West)
- RMS recommended car parking rates
- ABS car ownership data for existing residents.



### 4.2.1 Rhodes West Development Control Plan

Rhodes West is located approximately 1.5km to the north of the study area within the City of Canada Bay LGA. It is located adjacent to Rhodes Railway Station, has been identified for significant urban renewal and is subject to specific planning controls. The car parking requirements for residential uses within Rhodes West are set out in Section 4.3.29 of the Rhodes West DCP. The Strategy for on-site car parking is reproduced below:

"The higher residential density and mixed-use envisaged for the Rhodes Peninsula will enhance public transport use and viability and reduce travel demand. This DCP promotes public transport use by minimising car parking requirements whilst providing for on-site service vehicle parking."

Table 4.2 provides a summary of the DCP car parking provisions for Rhodes West. It is noted that a <u>maximum</u> car parking rate is imposed on resident parking provisions.

	*	
Use	Туре	Rate
Residential	All dwelling types	Max 1 space per dwelling (average)
	Visitors	Max 1 space per 10 apartments, min 1 space per 20 apartments
	Service vehicles	Max 1 space per 50 apartments for first 200 apartments plus 1

Table 4.2: Rhodes West Car Parking Controls

### 4.2.2 ABS Car Ownership Data

In order to assess the likely car ownership of the future residents reference has been made to the 2006 and 2011 Census undertaken by the Australian Bureau of Statistics (ABS). The Census collected data on the car ownership levels associated with a variety of dwelling types and in this instance GTA have reviewed the car ownership levels of different housing stock (separate/ detached house, semi-detached house, apartment building etc.) for postcode: 2138 (Concord West, Liberty Grove, Rhodes).

The average car ownership data for the different housing stock in 2006 and 2011 are illustrated in Figure 4.1.



Figure 4.1: Car Ownership Data Comparison 2006 and 2011 (Postcode 2138)

The 2011 ABS data indicates that apartments (all types) have average car ownership rates of between 1.0 and 1.2 cars per dwelling. Of particular note, Figure 4.1 indicates that with the



exception of 'separate house' the car ownership for all dwelling types reduced between 2006 and 2011. In addition, the number of dwellings with zero car ownership increased from 290 to 532 between 2006 and 2011 (83% increase).

Based on the above it is concluded that car ownership rates for apartment residents in the vicinity of the site are on the decline.

#### 4.2.3 RMS Guidance

Reference to the RMS 'Guide to Traffic Generating Developments' (2002) indicates the following resident car parking rates for high density residential uses in Metropolitan Sub-Regional Centres:

- 0.6 spaces per 1 bedroom unit
- 0.9 spaces per 2 bedroom unit
- 1.4 spaces per 3 bedroom unit

In addition, the Guide recommends a visitor car parking rate of 1 space per 5 units.

## 4.3 Recommended Future Car Parking Rates

Having regard for the above, it is recommended that multi-dwelling residential developments within the study area are subject to maximum car parking rates, as summarised in Table 4.3.

Туре	Rate	Basis
Resident	Maximum 1 resident space per dwelling	Consistent with existing Rhodes West Parking Controls, ABS trends and RMS Guide
Visitor	1 space per 5 to 10 dwellings (based on block size and parking layout)	Consistent with existing Rhodes West Parking Controls and RMS Guide

#### Table 4.3: Recommended Maximum Car Parking Rates

In order to ensure the effective implementation of the above car parking rates it is recommended that the following measures are implemented:

- introduction of a resident car parking scheme (details to be confirmed)
- introduction of time restricted on-street car parking in the vicinity of the railway station to discourage commuter car parking as well as at strategic locations within the study area
- provision of appropriate end of trip bicycle facilities (see Section 6).

## 4.4 Resident Parking Scheme

As detailed above it is recommended that a resident parking scheme be implemented to manage future on-street car parking demands in the vicinity of the development sites. Eligibility for the resident parking scheme would be limited to existing residents of the precinct and would not be available to residents of the rezoned lands. Typically, resident parking schemes are only available to residents of single dwelling properties with access to one or less off-street car parking spaces. If this were to be implemented, existing dwellings with access to two or more off-street spaces would not be eligible for the scheme.

The details of any future resident parking scheme would need to be determined as part of a detailed parking study for the area. The study would identify the following:

- Eligibility criteria for resident parking permits
- Extent of the scheme (potentially north of Argonne Street and south of Liberty Grove)
- Complementary car parking restrictions (time restrictions, e.g. 2-4 hours).



The resident parking scheme should be implemented prior to resident occupation of the rezoned lands.

It is noted that the study area is already subject to 2P Special Event parking restrictions when large events take place at the adjacent Sydney Olympic Park precinct.

The introduction of a resident parking scheme and time restricted parking would limit nonresidential car parking demands within the study area generated by commuter parking associated with the Concord West railway station and employee parking associated with the Sydney Olympic Park precinct.



# 5. Sustainable Transport Infrastructure

# 5.1 Preamble

# As detailed in the introduction of this report, when Council resolved to endorse the redevelopment of the industrial lands it noted:

"THAT the planning for the precinct occurs on the assumption that new development will prioritise pedestrians, bicycles and the use of public transport"

The rezoned lands have the following attributes and as such are proposed to be developed as transport oriented developments:

- Good accessibility to public transport facilities
- Walkable neighbourhood with access to recreational facilities
- End-of-trip bicycle facilities
- Limited resident car parking provisions (approximately 1 space per dwelling).

In this regard, the following sections identify measures that could be implemented to promote the use of sustainable transport modes (non-private motor vehicle) to access the site.

# 5.2 Bicycle End-of-Trip Facilities

Part 3.7 of the City of Canada Bay DCP recommends that bicycle parking be provided for residential uses, as follows:

- Resident: 1 bicycle storage space per dwelling
- Visitor: 1 bicycle parking space for every 12 dwellings

It is recommended that the residential bicycle parking rates specified above be applied for future development of the rezoned lands and treated as a minimum provision.

# 5.3 Walking and Cycling Network

### 5.3.1 Network Upgrades

The existing fine grain and regional bicycle and pedestrian networks are presented in Section 2 of this report. A number of opportunities to improve the local pedestrian and cycle network have been identified, as follows:

- improved streetscape (including an upgrade of existing footpaths)
- new off-road link to the west of sites 1 and 2
- new off-road link between Liberty Grove and Homebush Bay Drive
- improved north-south link on George Street (e.g. cycleway, shared path, on-road lanes)
- continuation of above George Street facilities along King Street, should Site 4 (Westpac Data Centre) be redeveloped in the future
- improved east-west link on Victoria Avenue between Homebush Bay and the rail crossing (potential for integration with broader street improvements)
- improved links to Powell's Creek Reserve
- Powell's Creek crossing on the north side of Pomeroy Street
- provision of future formal Shared Zone treatments within rezoned lands to prioritise pedestrian and bicycle movements over vehicles.

Ideally new east-west links would be provided across the railway line; however, they would likely be cost prohibitive.

An overview of the potential upgrades is provided in Figure 5.1.

Figure 5.1: Potential Bicycle Network Upgrades



## 5.3.2 Bicycle Treatments

As detailed above, there may be an opportunity to improve the existing cyclist facilities along George Street, as follows:

- separated cycleway
- on-road bike lanes
- shared path.



Such a facility would be complementary to the Queen Street facility already proposed by Council and caters for a separate desire line between Bakehouse Quarter and Liberty Grove.

In regards to the potential provision of a separated cycleway, Table 5.1 provides an overview of the dimensional requirements of any potential future facility, should one be pursued on George Street.

#### Table 5.1: Carriageway Requirements – Cycleway

Component	Cross-Section Requirement		
Component	Desirable	Minimum	
Cycleway	3.0m	2.4m	
Separator	1.0m	400mm	
Parking Lanes	2.1m	2.1m	
Traffic Lane	3.2m	2.8m [1]	

[1] Minimum 3.0m wide carriageway where regular route bus services are catered for.

Based on the above, there would be an opportunity to provide a separated cycleway and maintain parking on both sides of the carriageway at the northern end of George Street where the existing carriageway exceeds 12.6m wide (or 13.0m where buses need to be catered for), without the need to widen the existing kerb alignment.

Where the George Street carriageway is less than 12.6m wide and a separated cycleway is to be provided, on-street car parking would only be able to be provided on one side of the carriageway.

It is recommended that the desirable traffic lane widths be provided at the southern end of George Street where traffic volumes are greater. As a result, if a separated cycleway is to be provided, on-street car parking could only be provided on one side of the carriageway south of Rothwell Avenue. On-site observations indicated that on-street car parking demands were low at the southern end of George Street and as such, the removal of on-street car parking from one side of the carriageway would not significantly impact availability of car parking. Indeed on-street car parking demands were highest in the vicinity of the industrial zoned lands and appeared to be associated with employee car parking.

#### 5.3.3 Shared Zones

A number of shared zone treatments are earmarked for a number of the development sites within the study area. A shared zone is defined by the Transport for NSW (TfNSW) as:

"A Shared Zone is a road or network of roads where the road space is shared safely by vehicles and pedestrians. The maximum speed limit is always 10 km/h.

There may be no road lines, kerb or gutter in a Shared Zone to show that pedestrians and vehicles are equal. Drivers must give way to pedestrians at all times.

Vehicles can only stop in a Shared Zone if they obey the parking signs and park in marked bays, if they are provided.

Drivers travelling at a lower speed are better able to control their vehicles and safely avoid impact with other road users."

As formal Shared Zones include the introduction of speed limits they require approval by TfNSW/ RMS. As such, to be considered for a Shared Zone treatment, each location should comply with the TfNSW Policy and Guidelines for Shared Zones. In this regard the following key characteristics should be met:



- the traffic volume in a Shared Zone should be less than 100 vehicles per hour and less than 1000 vehicles per day
- the current speed limit on a road earmarked to be a Shared Zone should be less than 50km/h
- a Shared Zone should be less than 400 metres in length
- the current carriageway should be a minimum of 2.8 metres in width
- the road must not be located along a bus or heavy vehicle route, except for delivery or garbage uses.

A high level review suggests that any Shared Zones provided within the future development sites would meet the above criteria. However, a detailed review of any future Shared Zone treatments would be required at the design stage.

## 5.4 Public Transport

As detailed earlier the study area has good public transport accessibility with the Concord West Railway Station located within a short walking distance of the majority of the study area. The rail services are complemented by bus services that operate along Concord Road to the east of the site.

The Concord West railway station is being upgraded as part of the Northern Sydney Freight Corridor (North Strathfield Underpass) upgrade works, including upgrades to the existing platforms, a new concourse over the railway lines and four lifts between the platforms and new aerial concourse, and station exterior improvements. The new station facilities will be DDA compliant and offer improved accessibility for future users of the station.

Public transport accessibility would be further enhanced with any public domain upgrades (including the proposed new station square), in addition to the bicycle and pedestrian network improvements identified above.



# 6. Traffic Impact Assessment

# 6.1 Intersection Upgrades

The George Street/Pomeroy Street intersection is to be upgraded (via a consent condition) as part of the primary school (Victoria Avenue) development within the study area. A new left turn slip lane and 30m short auxiliary left turn lane will be provided on George Street (north approach).

Additional intersection upgrades are recommended based on the likely traffic capacity required for the indicative site yields (i.e. total 785 dwellings).

It is proposed to lengthen the 'No Parking' restriction on the south approach from 40 m to 120m (i.e. to Malta Street) during the AM peak periods, consistent with the existing 'No Parking' restriction during the PM peak periods (3:00 to 7:00pm). The works will increase the capacity of the north (additional intersection approach lane) and south (additional queuing area and more capacity for the right turn) approaches to the intersection during the AM peak hour. The above works are considered satisfactory to cater for the development of 785 dwellings within the study area, as detailed in the following assessment.

Beyond this level of development, additional intersection works would be required to accommodate additional dwelling numbers.

The existing and proposed George Street/ Pomeroy Street intersection works are summarised in Table 6.1.



Stage	Intersection Layout	Summary of Intersection Works
Existing Conditions	for compto-big n	• No change
Post Primary School	Purple-ung Geget-Etsp	<ul> <li>30m left turn short lane and slip lane provided on the north approach</li> </ul>
Post-Development (+785 dwellings)	Corpet-Wile Corpe	<ul> <li>Extension of 'No Parking' restriction from 40m to 120m on the south approach during the AM peak hour</li> </ul>

Table 6.1: George Street / Pomeroy Street Intersection Upgrades

# 6.2 Traffic Generation

#### 6.2.1 Subject Site

The rezoned lands are proposed to be developed as transit oriented developments. Reference has been made to the RMS Guide to Traffic Generating Developments (2002) which indicates a peak hour traffic generation rate of **0.29 movements per dwelling** for high density residential developments in metropolitan subregional centres.

It is noted that the more recent RMS Technical Direction (August 2013) indicates lower traffic generation rates than those quoted in the 2002 document. Figure 6.1 provides a summary of the traffic generation of each of the sites surveyed as part of the update, including a breakdown of the traffic generated by dwelling (unit) and car space.



Figure 6.1: Traffic Generation Summary – RMS Technical Direction

Figure 6.1 indicates that Liberty Grove located to the north of the site, generates traffic at a rate of 0.34 trips per dwelling per peak hour. The relatively high trip generation rate at Liberty Grove is reflective of the high on-site car parking provision at this location. In this regard, the Liberty Grove site generates traffic at a rate of 0.23 trips per car parking space.

Based on the above the traffic generation rate of 0.29 trips per peak hour is considered appropriate. This also confirms that limiting car parking provision (i.e. to 1 space per dwelling) should inturn reduce trip generation to and from the site.

The peak hour and daily traffic volumes for the post-development scenario are set out in Table 6.2.

Table 6.2: Traffic Generation Estimates

Stago	No. of	Design Generation Rates		Traffic Generation Estimates	
sidge	Dwellings	Peak Hour [1]	Daily	Peak Hour	Daily
Post Development	785	0.29 vehicle movements / dwelling	2.9 vehicle movements / dwelling	228	2,280

[1] Adopting a peak to daily ratio of 10%.

Table 6.2 indicates that the rezoned lands could be expected to generate some 230 and 2,300 peak hour and daily vehicle movements, respectively.

### 6.2.2 Other Development

#### Primary School

A new public primary school is currently under construction at 64-66 Victoria Avenue within the study area. The primary school will have up to 600 enrolments and is anticipated to open for the beginning of the 2015 school year. A transport impact assessment was prepared by McLaren Traffic Engineering (December 2012) on behalf of the Department of Education and Training.



The transport impact assessment includes an estimate of the peak hour traffic generation from the school and an assessment of the existing and post development operation of the George Street/Pomeroy Street intersection.

The peak hour traffic generation estimates presented in the McLaren Report are reproduced below in Table 6.3.

Devied	Direction	Traffic Generation		
renoa	Direction	Student Trips	Staff Trips	Total
AM (8:00 to 9:30am)	In	160	36	196
	Out	160	0	160
PM (2:30 to 4:00pm)	In	160	0	160
	Out	160	36	196

Table 6.3: Primary School Traffic Generation

Table 6.3 indicates that the new primary school is anticipated to add some 356 vehicle trips to the road network during the morning and afternoon school peak hours. It is noted that the afternoon school traffic generation will occur prior to the evening road network peak hour, with the primary school not anticipated to generate any traffic during the evening road network peak hour (5:00 to 6:00pm).

As detailed above, an additional short left turn slip lane will be provided on the north approach of the George Street / Pomeroy Street intersection as part of the primary school project. These works will increase the capacity of the north approach to the intersection.

The traffic volumes used to assess the impact of the rezoned lands traffic generation includes both existing traffic as well as the estimated primary school traffic.

#### McDonald College

It is understood that McDonald College may seek to incorporate a new primary school within part of its existing grounds. However, Council are yet to receive any firm proposal for the site and as such, any change of use for the site has not been captured within the GTA traffic modelling.

Notwithstanding, a high level assessment of the potential traffic impact from the redevelopment of the McDonald College is presented in Appendix C.

In addition to any impacts on the George Street/Pomeroy Street intersection, the primary school would impact on the midblock operation of George Street south of the intersection. The provision of increased turning movements into the school from George Street and increased pick-up/ drop-off activity on George Street would cause additional delays to through traffic on George Street. The increased congestion around the school could impact on the ability of non-school traffic to access the George Street/Pomeroy Street intersection, particularly during the morning peak hour when the school peak corresponds with the road network peak.

It is noted that should additional development be provided at the site, it is envisaged that a transport impact assessment would be prepared to assess the impacts of any additional traffic generated by the site. In addition, similar to the primary school on Victoria Avenue and the study area itself, any significant development on the McDonald College site would require mitigation measures for associated traffic impacts on the local road network.

Given the expectation that any additional development of McDonald College would mitigate the respective traffic impact to the George Street/ Pomeroy Street intersection, the uncertainty around any future redevelopment of the College does not affect the rezoning of the industrial lands from a traffic perspective.



### Westpac Data Centre

This assessment does not consider any change of use for the existing Westpac Data Centre site located within the study area. Any rezoning of this site would need to be assessed separately. Traffic surveys of the Westpac Data Centre site indicate that it currently generates approximately 140 movements during each of the road network peak hours. The existing traffic generation of the site could be removed from the surrounding road network to form the future base traffic volume scenario as part of any future analysis for the site.

# 6.3 Distribution and Assignment

The directional distribution and assignment of traffic generated by the proposed development will be influenced by a number of factors, including the:

- i configuration of the arterial road network in the immediate vicinity of the site
- ii existing operation of intersections providing access between the local and arterial road network
- iii distribution of households in the vicinity of the site
- iv surrounding employment centres, retail centres and schools in relation to the site
- v configuration of access points to the site.

Having consideration for the above, for the purposes of estimating vehicle movements, the existing peak hour directional distributions<sup>4</sup> at the George Street / Pomeroy Street intersection have been adopted.

In addition, the following directional splits of traffic (i.e. the ratio between the inbound and outbound traffic movements) have been adopted:

- AM Peak Hour: 30% in / 70% out
- PM Peak Hour: 70% in / 30% out

The base, additional and post development traffic volume scenarios are presented in Appendix D.

The assessment does not take into account any reduction in existing George Street traffic generated by industrial land uses as a result of the rezoning or a reduction in east-west traffic volumes through the intersection as a result of the WestConnex project. Nor does the assessment include traffic generated by future land uses to the south of the intersection such as the McDonald College expansion detailed above or any further works to the Bakehouse Quarter.

The development scenarios assessed are provided in Table 6.4.

<sup>&</sup>lt;sup>4</sup> The adopted distribution vary for each of the peak hours reflective of the current distributions to George Street.



Assessment Includes	Base Case	Post-Development
Existing Traffic Volumes	$\checkmark$	✓
Primary School Traffic Volumes (64-66 Victoria Avenue)	$\checkmark$	~
Development Traffic (+785 dwellings)	×	✓
Existing Industrial Lands Traffic Volumes	×	×

Table 6.4: Development Scenarios Assessed

The assessment does not take into account a reduction in network traffic volumes as a result of rezoning the industrial lands. Therefore the following assessment is considered conservative (higher traffic volumes assumes that may actually eventuate).

## 6.4 Traffic Impact

### 6.4.1 George Street/ Pomeroy Street Intersection

The post development traffic volumes for the base case and post-development scenario have been assessed for the George Street/ Pomeroy Street intersection using SIDRA INTERSECTION. Table 6.5 presents a summary of the anticipated operation of the intersection, with full results presented in Appendix B of this report.

Scenario	Peak	Leg	DOS	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
		George Street (South)	0.69	39	43	D
		Pomeroy Street (East)	0.61	13	102	В
	AM	George Street (North)	0.66	32	59	С
Existing		Pomeroy Street (West)	0.89	34	184	С
Conditions		George Street (South)	0.88	47	100	D
	DAA	Pomeroy Street (East)	0.60	18	91	В
	F <i>I</i> VI	George Street (North)	0.83	43	103	D
		Pomeroy Street (West)	0.90	41	260	D
		George Street (South)	0.61	37	54	D
	AM	Pomeroy Street (East)	0.61	14	102	В
		George Street (North)	0.66	25	42	С
Post Primary		Pomeroy Street (West)	0.89	33	184	С
Development	PM	George Street (South)	0.82	40	74	D
		Pomeroy Street (East)	0.48	13	67	В
		George Street (North)	0.76	30	43	С
		Pomeroy Street (West)	0.85	29	187	С
		George Street (South)	0.72	38	59	D
		Pomeroy Street (East)	0.68	14	102	В
Post	AM	George Street (North)	0.87	28	56	С
Development		Pomeroy Street (West)	0.89	33	184	С
(+785		George Street (South)	0.74	39	96	D
dwellings)	DAA	Pomeroy Street (East)	0.77	18	79	В
	F <i>1</i> V1	George Street (North)	0.90	36	63	С
		Pomeroy Street (West)	0.89	36	231	D

 Table 6.5:
 George Street / Pomeroy Street Post Development Operating Conditions

Table 6.5 indicates that the George Street/ Pomeroy Street intersection is anticipated to operate with comparable Levels of Service to the existing operation of the intersection. Indeed the modelling indicates that the average queues and 95<sup>th</sup> percentile queues are anticipated to remain similar to those currently experienced at the intersection.

### 6.4.2 Pomeroy Street/ Queen Street/ Beronga Street

As detailed in Section 2, the Pomeroy Street / Queen Street / Beronga Street intersection is an irregular shaped roundabout that caters for greater traffic volumes on the east, south and west approaches. It is anticipated that any additional traffic at the intersection, generated by the rezoned lands, will also be to and from these approaches.

Table 6.6 provides a summary of the existing and anticipated future traffic volumes at the Pomeroy Street/ Queen Street/ Beronga Street intersection.

Development Seenavie	Peak Hour Traffic Volumes		
Development Scenario	AM Peak Hour	PM Peak Hour	
Existing	1,888	1,703	
Base Case (with Primary School)	2,065	1,703	
Post Development	2,164	1,787	

#### Table 6.6: Pomeroy Street/ Queen Street/ Beronga Street Intersection Traffic Volumes

Table 6.6 indicates that the additional traffic generated by the rezoned lands could generate some 100 and 80 traffic movements through the roundabout during the AM and PM peak hours, respectively. This equates to approximately 5% additional traffic through the intersection during peak periods, or:

- 1 additional vehicle every 36 seconds during the AM peak hour
- 1 additional vehicle every 45 seconds during the PM peak hour

It is anticipated that the roundabout would be able to accommodate this level of additional traffic. The additional traffic may result in minor additional delays and queues to traffic entering the roundabout.

## 6.4.3 Parramatta Road/ George Street

Traffic distributed to the south is anticipated to either access the retail and entertainment land uses provided at the Bakehouse Quarter or continue south to the Parramatta Road/ George Street intersection. The existing intersection currently operates near its capacity.

It is understood that a new fourth leg is to be provided at the intersection as part of an approved mixed use development for lands immediately south of the site. Furthermore, traffic volumes along Parramatta Road are anticipated to change significantly as a result of the WestConnex project (likely a reduction of traffic volumes).

The future operation of this intersection cannot be assessed until the future traffic volumes are determined by the modelling currently being undertaken for the WestConnex project is complete and the long-term layout of the intersection is confirmed.

### 6.4.4 Pomeroy Street/ Underwood Road

The Pomeroy Street/ Underwood Road intersection located to the west of the study area (in the Strathfield Council LGA) currently limits the capacity of the east-west corridor. A large proportion of vehicles through this intersection undertake the north-west movement between Pomeroy Street and Underwood Road.

The intersection is currently experiences long delays during peak periods, with vehicles required to wait a number of traffic cycles before being able to clear the intersection. The addition of traffic through this intersection will further increase delays and queues.

In order to improve the existing operation of the intersection, increased capacity is required. This could be achieved via the provision of additional lanes; in particular an additional right turn lane on the Pomeroy Street (east) approach to the intersection.

However, in order to do accommodate additional lane(s) at the intersection, some property acquisition would likely be required.

Additional capacity through the intersection could be created by reducing the level of east-west through traffic along the Pomeroy Street-Underwood Road link (see following section).



#### 6.4.5 Summary

Against existing traffic volumes in the vicinity of the site, the additional traffic generated by the proposed rezoned lands, in conjunction with the proposed intersection works, would not compromise the safety or function of the George Street/ Pomeroy Street and Pomeroy Street/ Beronga Street/ Queen Street intersections.

Additional capacity is required at the nearby Pomeroy Street/ Underwood Road intersection to adequately cater for the existing traffic demands as well as the future demands at this intersection. Alternatively, additional future capacity could be provided at the intersection by limiting the amount of through traffic along the Pomeroy Street-Underwood Road corridor. This could be achieved by introducing a number of local area traffic management treatments along the corridor that would slow vehicles and in turn discourage non-local vehicle trips.

Furthermore, the WestConnex project will increase the capacity of the east-west road network and should in turn reduce the number of non-local trips along this corridor.



# 7. Response to Community Consultation

# 7.1 Community Workshop #1

In November 2013, two community workshops were held to allow the existing Concord West community to provide their suggestions, concerns and ideas for the future Master Plan. It is noted that the workshops were held prior to a draft Master Plan being considered by the Consultant team.

The workshops provided the community an opportunity to comment on the following key areas:

- i Built form
- ii Public domain / Open space
- iii Traffic and Transport

An overview and a response to each of the suggestions and ideas and concerns and issues from the Community Workshop #1 are provided in Table 7.1.

ltem	Community Comment	Response	Refer to Section in GTA Report
1	Sug	igestions and Ideas	
1.1	Ramp (either entry or exit) to Homebush Bay Drive would help traffic issues in the area	An intersection with Homebush Bay Drive would promote through trips through the precinct and could further compromise the George Street / Pomeroy Street intersection. A link would come at a significant cost	-
1.2	Open an access lane or one/two way street to Liberty Grove to create another connection	Given the existing lot layout in Liberty Grove there is no opportunity to provide a future vehicle link	-
1.3	Remove parking on Pomeroy Street near George Street and the bridge	The proposed intersection works include the extension of existing 'No Parking' restrictions	6.1
1.4	A second underpass should be provided to increase access and safety. A good location is on Queen and Yaralla Streets	The works associated with the freight line will likely prohibit the provision of an additional pedestrian underpass A new underpass of the rail line would be very costly	
1.5	Support for parking permits for existing residents, this ratio must consider residents with more than 1 car	The details of the resident parking scheme would need to be confirmed by Council prior to implementation	4.4
1.6	Support for resident parking permits/schemes	The resident parking scheme would benefit eligible residents	4.4
1.7	Finding a balance between street parking and provision of bicycle paths	The detailed design of any future cycle facilities will need to be determined	5.3
1.8	Upgrades are needed for pedestrian and cycling amenity along George Street	New facilities are recommended	5.3

Table	7.1:	Community	Workshop	#1
IUDIC	1.1.	Community	<b>WORKSHOP</b>	



ltem	Community Comment	Response	Refer to Section in GTA Report
2	Co	oncerns and Issues	
2.1	Suggestions to open Liberty Grove or build new entry/exit ramps at Homebush Bay Drive will cause traffic to ran run through the area (use George Street)	Agreed	-
2.2	Need roundabouts at the dead end streets to help residents get out when George Street gets busy	Additional roundabouts could be provided on George Street to assist residents exiting side streets and to slow vehicle speeds on George Street	-
2.3	The school will generate additional traffic on top of the proposed residential uses. This will further impact on poor traffic conditions at the Pomeroy Road and George Street intersection	The additional traffic generated by the new primary school has been accounted for in the modelling assessment	6.2
2.4	Street car parking spaces are often occupied by people working at Olympic Park (this was seconded by several people)	The provision of a resident parking scheme and time restricted parking would restrict employee and commuter car parking in the study area	4.4
2.5	How will the existing residents be accommodated in regards to parking? King Street is already occupied with overflow car parking. Existing residents have already raised this issue in a survey	Overflow parking from industrial uses will disappear once these lands are rezoned	-
2.6	There is a need for increased pedestrian access to buses (on Concord Road), the underpass is dangerous and often flooded	Improved access will be provided via the new concourse across Concord West Railway Station which is understood top allow non-ticket holders to cross	5.4
2.7	Commuter parking in the streets will be addressed with 2P,4P parking schemes	New car parking restrictions would restrict employee and commuter car parking	4.4
2.8	Footpaths aren't maintained- 50 to 60 years old	There would be an opportunity to improve the streetscape through the development of the rezoned lands	5.3
2.9	Trains aren't regular enough	TfNSW would need to be lobbied to improve train frequencies	-
2.10	A need for increased pedestrian links along the river and connection with other local pedestrian and cycle networks	New off-road links have been identified	5.3
2.11	Traffic noise is getting worse during the day	The proposed development will have negligible impact on traffic generation on Homebush Bay Drive where the noise is being generated	6.2
2.12	An additional turning lane on George and Pomeroy Streets must consider residents turning into their driveways on George Street, in particular the houses close to the intersection	The proposed intersection changes will have minimal effect on residents entering driveways	
2.13	Traffic on George Street is forced to U-turn due to limited opportunities to turn left and right	The proposed intersection works will increase the capacity of the right turn movement on the south approach to the George Street / Pomeroy Street intersection	6.4
2.14	Some trips from the precinct to Parramatta Road can take in excess of 50 minutes	On-site observations indicate that typical average delays are less than 50 minutes	-



# 7.2 Community Workshop #2

The draft Masterplan was presented to the Community at a follow up workshop in March 2014. This subsequent workshop gave the community an opportunity to raise any suggestions and ideas or concerns and issues.

An overview and a response to each of the suggestions and ideas and concerns and issues from the Community Workshop #2 are provided in Table 7.2.

ltem	Community Comment	Response	Refer to Section in GTA Report
3	Sug	igestions and Ideas	
3.1	Please don't include speed humps – roundabouts are better. Please don't include speed humps – speed humps are harsh	Local area traffic management treatments lower vehicle speeds, a preference for roundabouts or speed humps has not been determined as part of this study	-
3.2	Propose staggered hours of operation for new school in order to lessen traffic congestion	Delaying the start time of the new primary school to after the road network peak (say 9am) would spread the peak traffic load and reduce congestion on the network	
3.3	The Powell Creek Bridge should incorporate a pedestrian path as it is almost impossible, and very dangerous, for pedestrians to cross the bridge especially at peak hours	The provision of a pedestrian bridge on the north side of Pomeroy Street has been identified	5.3
3.4	Provide financial incentives for residents who don't own a car (possibly reduced rates or vouchers for local shops)	Apartments without an allocated car parking space would demand a lower market price. Other financial incentives could be investigated at the DA stage	-
3.5	If road upgrades are going to be delayed due to finances, developers should contribute to the funding	Planning controls relating to road network upgrades should be put in place	-
3.6	Permits for residents	Eligible residents would be granted car parking permits under the resident parking scheme	4.4
3.7	Suggestion for an underpass at Station Avenue	The cost associated with an additional rail crossing is prohibitive	-
3.8	Suggestion to make Pomeroy Street 2 lanes in each direction	Additional lanes would increase the midblock capacity of Pomeroy Street but would not increase capacity at the intersections where the delays are caused	-
3.9	The lack of parking provision will decrease the property value of the units, preventing high market prices. The demographics of the area are likely to change along with the unit prices	Comment only	-

 Table 7.2:
 Community Workshop #2



Item	Community Comment	Response	Refer to Section in GTA Report
4	Co	oncerns and Issues	
4.1	Traffic concerns – concerned that the school is going to generate more traffic than the proposed development. Concern about the speed limits along Victoria Avenue- cars travel down that street way too fast	The traffic generation from the school has been accounted for in the modelling. Local area traffic management treatments could be introduced if vehicle speeds are determined to be to high	-
4.2	Trains are already over capacity at peak hours	TfNSW would need to be lobbied to improve train capacity	-
4.3	The George/Pomeroy St intersection is already over capacity and the additional left turn slip way will not be significant enough to solve the issue	Modelling indicates that the proposed intersection layout will be able to accommodate the additional traffic forecasts	6.4
4.4	Residents want to be informed about the timing of the delivery of these road upgrades and who will be responsible for them (possibly contact with the local member would be helpful)	RMS would be able to provide details on any road upgrade in the area	-
4.5	Will there be additional roundabouts implemented to improve traffic flow (especially on Victoria Avenue and George Street)?	The anticipated traffic volumes at the George Street / Victoria Avenue intersection do not warrant the provision of a roundabout	-
4.6	How will the quality of roads be dealt with as a result of increased traffic volume?	Ongoing road maintenance will be undertaken by Council	-
4.7	Narrow streets can create potential traffic conflicts and hazards for emergency services vehicles	Designed appropriately narrow streets lower vehicle speeds and cater for design vehicles	5.3
4.8	The school will generate more traffic than apartments	The school is anticipated to generate 356 peak hour movements compared to the rezoned lands 228 movements	6.2
4.9	What about visitor parking?	Visitor parking will be provided on each of the sites and accommodated on-street	-
4.10	There is no provision for commuter car parking	Correct	4.4
4.11	George Street school zone/no parking has existing issues especially within 50 km/hr zone	This would appear to be an existing issues that should be dealt with by Council	-



# 8. Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

- i All traffic to and from the study area is required to pass through the George Street/ Pomeroy Street intersection.
- ii The study area has good accessibility to nearby public transport services and the surrounding walking and cycling network.
- iii There are opportunities to improve the existing pedestrian and cycle networks, for the benefit of future sustainable transport mode choice.
- iv In order to minimise traffic generation, a maximum average car parking rate of 1 space per dwelling should be imposed on the rezoned lands.
- v On-street parking restrictions should be implemented, with a resident parking scheme to cater for existing resident car parking demands.
- vi The rezoned lands are expected to generate up to 228 and 2,280 vehicle movements in any peak hour and daily respectively.
- vii A capacity assessment of the George Street/ Pomeroy Street intersection indicates that the study area could accommodate the traffic generation associated with the indicative dwelling yield of 785 dwellings.
- viii A number of suggestions, ideas, concerns and issues have been raised by the community as detailed in Section 7. These have either been addressed by this report or can be explored further during the design process.

Appendix A



# Appendix A



Existing Traffic Volume Survey Results

Job No.: N1236Client: GTASuburb: Concord WestLocation: 1. George St / Pomeroy StDay/Date: Tue, 29th October 2013Weather: FineDescription: Classified Intersection Count: Peak Hour Summary





	Арј	proa	ich		G	George S	t			Po	omeroy	St			G	George S	t			P	omeroy	St		otal
	Time	e Per	riod	Cars	Trucks	Buses	Cyclists	Total	Cars	Trucks	Buses	Cyclists	Total	Cars	Trucks	Buses	Cyclists	Total	Cars	Trucks	Buses	Cyclists	Total	Grand T
AM	7:45	to	8:45	279	14	1	1	295	1,122	23	2	11	1,158	337	13	0	5	355	661	24	4	7	696	2,504
PM	17:00	to	18:00	489	1	1	3	494	764	17	0	6	787	390	3	0	5	398	692	13	2	0	707	2,386

Approach		C	George S	t			Po	omeroy	St			(	George S	it			P	omeroy	St		otal
Time Period	Cars	Trucks	Buses	Cyclists	Total	Cars	Trucks	Buses	Cyclists	Total	Cars	Trucks	Buses	Cyclists	Total	Cars	Trucks	Buses	Cyclists	Total	Grand T
7:00 to 8:00	228	14	0	1	243	757	33	3	14	807	300	11	0	5	316	654	36	2	5	697	2,063
7:15 to 8:15	249	13	0	1	263	965	35	3	11	1,014	309	11	0	6	326	658	35	4	7	704	2,307
7:30 to 8:30	270	14	1	1	286	1,087	31	3	12	1,133	326	12	0	6	344	678	32	4	8	722	2,485
7:45 to 8:45	279	14	1	1	295	1,122	23	2	11	1,158	337	13	0	5	355	661	24	4	7	696	2,504
8:00 to 9:00	299	10	1	1	311	1,117	22	3	10	1,152	349	8	0	3	360	633	18	2	7	660	2,483
AM Totals	527	24	1	2	554	1,874	55	6	24	1,959	649	19	0	8	676	1,287	54	4	12	1,357	4,546
16:00 to 17:00	383	9	0	3	395	749	34	0	1	784	358	7	0	1	366	572	17	1	4	594	2,139
16:15 to 17:15	422	7	0	4	433	793	27	0	1	821	351	8	0	0	359	603	12	0	3	618	2,231
16:30 to 17:30	472	5	0	4	481	797	23	0	4	824	369	5	0	1	375	659	11	0	2	672	2,352
16:45 to 17:45	474	3	0	6	483	766	19	0	5	790	372	4	0	1	377	714	14	1	0	729	2,379
17:00 to 18:00	489	1	1	3	494	764	17	0	6	787	390	3	0	5	398	692	13	2	0	707	2,386
PM Totals	872	10	1	6	889	1,513	51	0	7	1,571	748	10	0	6	764	1,264	30	3	4	1,301	4,525

Job No.	: N1236
Client	: GTA
Suburb	: Concord West
Location	: 2. Queen St / Pomeroy St / Beronga St
Day/Date	: Tue, 29th October 2013
Weather	: Fine
Description	: Classified Intersection Count
	: Peak Hour Summary





	Ар	proa	ach		(	Queen S	t			В	eronga	St			(	Queen S	t			Po	omeroy	St		otal
	Tim	e Pe	riod	Cars	Trucks	Buses	Cyclists	Total	Cars	Trucks	Buses	Cyclists	Total	Cars	Trucks	Buses	Cyclists	Total	Cars	Trucks	Buses	Cyclists	Total	Grand T
AM	7:45	to	8:45	461	15	2	10	488	481	7	0	4	492	209	3	2	3	217	685	28	6	13	732	1,929
PM	17:00	to	18:00	384	14	0	2	400	312	3	0	2	317	100	1	0	2	103	899	12	2	3	916	1,736

Approach		(	Queen S	t			В	eronga S	St			(	Queen S	t			P	omeroy	St		otal
Time Period	Cars	Trucks	Buses	Cyclists	Total	Cars	Trucks	Buses	Cyclists	Total	Cars	Trucks	Buses	Cyclists	Total	Cars	Trucks	Buses	Cyclists	Total	Grand T
7:00 to 8:00	329	23	2	12	366	374	12	1	5	392	97	6	2	4	109	629	35	3	8	675	1,542
7:15 to 8:15	386	24	2	9	421	458	10	1	4	473	158	7	2	3	170	639	33	5	11	688	1,752
7:30 to 8:30	436	20	2	10	468	494	8	1	3	506	192	7	2	4	205	667	30	6	12	715	1,894
7:45 to 8:45	461	15	2	10	488	481	7	0	4	492	209	3	2	3	217	685	28	6	13	732	1,929
8:00 to 9:00	444	14	3	10	471	477	6	0	2	485	223	4	0	2	229	706	22	3	12	743	1,928
AM Totals	773	37	5	22	837	851	18	1	7	877	320	10	2	6	338	1,335	57	6	20	1,418	3,470
16:00 to 17:00	392	16	0	0	408	304	13	0	1	318	98	9	0	0	107	758	11	2	8	779	1,612
16:15 to 17:15	416	8	0	0	424	315	12	0	1	328	102	8	0	0	110	809	12	0	8	829	1,691
16:30 to 17:30	437	11	0	0	448	310	6	0	2	318	90	7	0	0	97	758	7	0	7	772	1,635
16:45 to 17:45	400	11	0	1	412	312	5	0	2	319	93	2	0	2	97	800	6	1	4	811	1,639
17:00 to 18:00	384	14	0	2	400	312	3	0	2	317	100	1	0	2	103	899	12	2	3	916	1,736
PM Totals	776	30	0	2	808	616	16	0	3	635	198	10	0	2	210	1,657	23	4	11	1,695	3,348

Job No	N1236		
Client	GTA		
Road	George St - Adj No 37 (north of C	hild Care Centre)	
Location	Concord West		
Site No	1	Average Weekday	1,649
Start Date	29-Oct-13	7 Day Average	1,590
Description	- Volume Summary		
Direction	Combined		

			Da	ay of We	ek				
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Ave	7 Day
Time	4-Nov	29-Oct	30-Oct	31-Oct	1-Nov	2-Nov	3-Nov	W'day	Ave
AM Peak	143	152	162	136	172	148	96		
PM Peak	155	134	160	130	140	134	120		
0:00	9	9	8	14	16	21	17	11	13
1:00	5	10	2	2	11	10	16	6	8
2:00	3	1	4	3	2	9	8	3	4
3:00	1	4	2	6	2	3	6	3	3
4:00	6	4	3	4	5	1	9	4	5
5:00	26	33	27	31	34	16	9	30	25
6:00	76	59	80	70	86	33	14	74	60
7:00	127	124	133	119	117	51	30	124	100
8:00	143	152	162	136	172	71	48	153	126
9:00	107	98	100	95	126	108	74	105	101
10:00	81	75	78	74	101	106	81	82	85
11:00	78	76	72	80	87	148	96	79	91
12:00	76	85	84	71	93	123	115	82	92
13:00	63	73	88	80	66	134	108	74	87
14:00	95	92	98	68	98	97	120	90	95
15:00	116	111	125	109	135	100	106	119	115
16:00	120	113	102	102	101	102	68	108	101
17:00	155	122	127	130	140	130	88	135	127
18:00	135	134	160	129	127	109	83	137	125
19:00	78	61	106	99	78	85	75	84	83
20:00	28	40	49	63	71	44	46	50	49
21:00	41	25	37	51	63	38	49	43	43
22:00	20	43	32	27	47	23	22	34	31
23:00	12	10	15	20	35	23	12	18	18
Total	1601	1554	1694	1583	1813	1585	1300	1649	1590
7-19	1296	1255	1329	1193	1363	1279	1017	1287	1247
6-22	1519	1440	1649	14/6	1661	14/9	1201	1539	1482
0-24	1601	1554	1694	1583	1813	1585	1300	1649	1590

Job No	N1236		
Client	GTA		
Road	George St - 30m south of Warsaw St		
Location	Concord West		
Site No	2	Average Weekday	7,949
Start Date	29-Oct-13	7 Day Average	7,480
Description	- Volume Summary		
Direction	Combined		

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Ave	7 Day
Time	4-Nov	29-Oct	30-Oct	31-Oct	1-Nov	2-Nov	3-Nov	W'day	Ave
AM Peak	644	671	729	643	696	540	352		
PM Peak	646	726	686	676	662	510	424		
0:00	58	56	50	65	75	126	138	61	81
1:00	33	25	26	28	47	78	81	32	45
2:00	11	12	13	20	9	42	53	13	23
3:00	15	21	27	23	25	28	47	22	27
4:00	39	32	27	27	35	38	30	32	33
5:00	131	128	144	134	135	93	34	134	114
6:00	346	334	364	349	357	163	61	350	282
7:00	555	585	639	594	589	210	95	592	467
8:00	644	671	729	643	696	333	186	677	557
9:00	479	469	541	508	517	464	258	503	462
10:00	323	313	337	367	397	540	352	347	376
11:00	315	292	315	353	366	525	340	328	358
12:00	324	366	318	335	345	494	415	338	371
13:00	326	323	349	333	395	502	353	345	369
14:00	398	394	409	346	432	434	388	396	400
15:00	525	537	542	492	593	412	406	538	501
16:00	595	620	625	633	572	415	316	609	539
17:00	646	726	686	676	662	510	381	679	612
18:00	576	618	642	565	616	469	424	603	559
19:00	428	384	455	455	499	388	340	444	421
20:00	245	315	370	364	363	264	295	331	317
21:00	221	228	301	282	313	230	236	269	259
22:00	135	193	181	180	238	195	150	185	182
23:00	83	73	103	127	209	172	114	119	126
Total	7451	7715	8193	7899	8485	7125	5493	7949	7480
		5011		50.45			0011		
/-19	5/06	5914	6132	5845	6180	5308	3914	5955	55/1
6-22	7164	7175	7906	7295	8159	6720	4040 5110	7350	7157
0-24	7451	7715	8193	7899	8485	7125	5493	7949	7480

Appendix B



# Appendix B

SIDRA INTERSECTION Results



Pomeroy St / George St EXISTING CONDITIONS AM PEAK HOUR Signals - Fixed Time Cycle Time = 80 seconds (Practical Cycle Time)

Moven	nent Per	formance - '	Vehicles								
	-	Demand	1.11.7	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Average
	Turn	Flow	HV	Satn	Delay	Service	Vehicles	Distance	Queued	Stop Rate	Speed
Osutha	2	veh/h	%	V/C	sec		veh	m		per veh	km/h
South: 0	Jeorge S	ot - S Leg	0.0	0.000	07.0			00 5	0.00	0.04	00.0
1	L	69	3.0	0.629	37.0	LOS D	5.5	39.5	0.88	0.84	30.6
2	Т	93	3.0	0.629	28.7	LOS C	5.5	39.5	0.88	0.73	31.2
3	R	148	3.0	0.686	46.4	LOS D	6.0	43.1	1.00	0.86	26.4
Approad	ch	311	3.0	0.686	39.0	LOS D	6.0	43.1	0.94	0.82	28.6
East: Po	omeroy S	St - E Leg									
4	L	474	3.0	0.607	17.0	LOS B	9.6	69.2	0.56	0.79	40.9
5	Т	634	3.0	0.541	9.6	LOS A	14.3	102.3	0.62	0.56	45.3
6	R	112	3.0	0.341	20.1	LOS C	2.0	14.1	0.77	0.77	38.7
Approad	ch	1219	3.0	0.607	13.4	LOS B	14.3	102.3	0.61	0.67	42.9
North: C	George S	t - N Leg									
7	L	157	3.0	0.500	26.0	LOS C	4.1	29.5	0.71	0.77	35.0
8	Т	132	3.0	0.662	33.1	LOS C	8.2	59.1	0.97	0.84	29.2
9	R	85	3.0	0.662	41.4	LOS D	8.2	59.1	0.97	0.86	29.0
Approa	ch	374	3.0	0.662	32.0	LOS C	8.2	59.1	0.86	0.81	31.3
West: P	omeroy	St - W Leg									
10	L	191	3.0	0.397	22.2	LOS C	4.5	32.0	0.64	0.77	37.3
11	Т	463	3.0	0.886	36.7	LOS D	25.6	183.8	0.98	1.09	28.3
12	R	79	3.0	0.886	45.0	LOS D	25.6	183.8	0.98	1.11	28.1
Approad	ch	733	3.0	0.886	33.8	LOS C	25.6	183.8	0.89	1.01	30.1
All Vehi	cles	2636	3.0	0.886	24.8	LOS C	25.6	183.8	0.76	0.80	34.9

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model used.

Mover	Novement Performance - Pedestrians												
	D	Demand	Average	Level of	Average Back	of Queue	Prop.	Effective					
	Description	Flow	Delay	Service	Pedestrian	Distance	Queued	Stop Rate					
		ped/h	sec		ped	m		per ped					
P1	Across S approach	53	10.5	LOS B	0.1	0.1	0.51	0.51					
P3	Across E approach	53	34.2	LOS D	0.1	0.1	0.93	0.93					
P5	Across N approach	53	17.6	LOS B	0.1	0.1	0.66	0.66					
P7	Across W approach	53	31.5	LOS D	0.1	0.1	0.89	0.89					
All Ped	estrians	212	23.4	LOS C			0.75	0.75					

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay) Pedestrian movement LOS values are based on average delay per pedestrian movement. Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.



Pomeroy St / George St EXISTING CONDITIONS PM PEAK HOUR Signals - Fixed Time Cycle Time = 100 seconds (Practical Cycle Time)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flow	ΗV	Deg. Satn	Average Delay	Level of Service	95% Back o Vehicles	of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed	
0 11 0		veh/h	%	v/c	sec		veh	m		per veh	km/h	
South: G	Seorge S	St - S Leg										
1	L	131	3.0	0.470	37.7	LOS D	11.0	79.2	0.85	0.85	30.2	
2	Т	151	3.0	0.470	29.4	LOS C	11.0	79.2	0.85	0.72	30.9	
3	R	239	3.0	0.881	64.1	LOS E	13.9	99.6	1.00	1.01	21.7	
Approac	h	520	3.0	0.881	47.4	LOS D	13.9	99.6	0.92	0.89	25.8	
East: Po	meroy S	St - E Leg										
4	L	222	3.0	0.352	20.0	LOS B	5.4	38.4	0.53	0.76	38.8	
5	Т	457	3.0	0.427	13.5	LOS B	12.7	91.4	0.62	0.55	41.9	
6	R	149	3.0	0.600	28.3	LOS C	3.8	27.6	0.91	0.80	33.8	
Approac	h	828	3.0	0.600	17.9	LOS B	12.7	91.4	0.65	0.65	39.3	
North: G	eorge S	St - N Leg										
7	L	151	3.0	0.531	26.5	LOS C	4.4	31.9	0.65	0.76	34.7	
8	Т	129	3.0	0.831	48.3	LOS D	14.3	102.7	1.00	0.99	24.1	
9	R	139	3.0	0.831	56.6	LOS E	14.3	102.7	1.00	0.99	24.0	
Approac	h	419	3.0	0.831	43.2	LOS D	14.3	102.7	0.87	0.90	27.0	
West: Po	omeroy	St - W Leg										
10	L	102	3.0	0.258	26.0	LOS C	2.9	21.0	0.63	0.75	35.0	
11	Т	575	3.0	0.898	42.8	LOS D	36.2	260.0	1.00	1.08	26.2	
12	R	67	3.0	0.898	51.2	LOS D	36.2	260.0	1.00	1.08	26.1	
Approac	h	744	3.0	0.898	41.3	LOS D	36.2	260.0	0.95	1.03	27.1	
All Vehic	les	2512	3.0	0.898	35.2	LOS D	36.2	260.0	0.83	0.85	29.8	

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model used.

Moven	nent Performance -	Pedestrians						
		Demand	Average	Level of	Average Back	of Queue	Prop.	Effective
Mov ID	Description	Flow	Delay	Service	Pedestrian	Distance	Queued	Stop Rate
		ped/h	sec		ped	m		per ped
P1	Across S approach	53	14.6	LOS B	0.1	0.1	0.54	0.54
P3	Across E approach	53	32.8	LOS D	0.1	0.1	0.81	0.81
P5	Across N approach	53	21.8	LOS C	0.1	0.1	0.66	0.66
P7	Across W approach	53	30.4	LOS D	0.1	0.1	0.78	0.78
All Ped	estrians	212	24.9	LOS C			0.70	0.70

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay) Pedestrian movement LOS values are based on average delay per pedestrian movement. Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.



Pomeroy St / George St EXISTING + SCHOOL (WITH INTERSECTION UPGRADES) AM PEAK HOUR Signals - Fixed Time Cycle Time = 80 seconds (Practical Cycle Time)

Movement Performance - Vehicles												
Max ID	Ture	Demand	111/	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Average	
	Turn	Flow	HV	Satn	Delay	Service	Vehicles	Distance	Queued	Stop Rate	Speed	
		veh/h	%	V/C	sec		veh	m		per veh	km/h	
South: C	Jeorge S	st - S Leg										
1	L	69	3.0	0.603	37.3	LOS D	7.5	53.9	0.91	0.83	30.7	
2	Т	148	3.0	0.603	29.0	LOS C	7.5	53.9	0.91	0.75	31.2	
3	R	148	3.0	0.608	43.9	LOS D	5.7	41.2	0.98	0.82	27.2	
Approac	h	366	3.0	0.608	36.6	LOS D	7.5	53.9	0.94	0.80	29.4	
East: Po	omeroy S	st - E Leg										
4	L	474	3.0	0.608	17.0	LOS B	9.6	69.2	0.56	0.79	40.9	
5	Т	634	3.0	0.541	9.6	LOS A	14.3	102.3	0.62	0.56	45.3	
6	R	194	3.0	0.600	21.1	LOS C	3.6	26.0	0.84	0.80	38.1	
Approac	:h	1301	3.0	0.608	14.0	LOS B	14.3	102.3	0.63	0.68	42.4	
North: G	George St	t - N Leg										
7	L	261	3.0	0.660	14.3	LOS B	4.2	30.2	0.53	0.74	43.3	
8	Т	174	3.0	0.382	28.1	LOS C	5.8	41.7	0.88	0.72	32.3	
9	R	107	3.0	0.509	44.1	LOS D	4.1	29.4	0.97	0.79	27.1	
Approac	h	542	3.0	0.660	24.6	LOS C	5.8	41.7	0.73	0.75	35.3	
West: P	omeroy S	St - W Leg										
10	L	259	3.0	0.541	22.8	LOS C	6.3	45.5	0.67	0.78	36.9	
11	Т	463	3.0	0.886	36.7	LOS D	25.6	183.8	0.98	1.09	28.3	
12	R	79	3.0	0.886	45.0	LOS D	25.6	183.8	0.98	1.11	28.1	
Approac	h	801	3.0	0.886	33.0	LOS C	25.6	183.8	0.88	0.99	30.5	
All Vehic	cles	3011	3.0	0.886	23.7	LOS C	25.6	183.8	0.75	0.79	35.5	

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model used.

Mover	Movement Performance - Pedestrians												
MoviD	Description	Demand	Average	Level of	Average Back	of Queue	Prop.	Effective					
	Description	ped/h	Delay sec	Service	pedestrian	Distance	Queuea	per ped					
P1	Across S approach	53	10.5	LOS B	0.1	0.1	0.51	0.51					
P3	Across E approach	53	34.2	LOS D	0.1	0.1	0.93	0.93					
P5	Across N approach	53	17.6	LOS B	0.1	0.1	0.66	0.66					
P7	Across W approach	53	31.5	LOS D	0.1	0.1	0.89	0.89					
All Ped	estrians	212	23.4	LOS C			0.75	0.75					

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay) Pedestrian movement LOS values are based on average delay per pedestrian movement. Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Processed: Tuesday, 18 February 2014 12:17:52 PM SIDRA INTERSECTION 5.1.13.2093 Project: P:\14S1000-1099\14S1097000 Concord West Master Plan\Modelling\140501sidra-141097000 - 70sq.m scenario - Updates.sip 8000056, GTA CONSULTANTS, ENTERPRISE



Pomeroy St / George St EXISTING (WITH INTERSECTION UPGRADES) PM PEAK HOUR Signals - Fixed Time Cycle Time = 80 seconds (Practical Cycle Time)

Movement Performance - Vehicles												
May ID	Turn	Demand	1157	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Average	
	Turn	Flow	ΗV	Satn	Delay	Service	Vehicles	Distance	Queued	Stop Rate	Speed	
		veh/h	%	V/C	sec	_	veh	m	_	per veh	km/h	
South: G	Seorge S	St - S Leg										
1	L	131	3.0	0.602	37.5	LOS D	9.9	71.2	0.94	0.84	30.4	
2	Т	151	3.0	0.602	29.2	LOS C	9.9	71.2	0.94	0.79	30.8	
3	R	239	3.0	0.816	48.3	LOS D	10.3	74.2	1.00	0.96	25.8	
Approac	h	520	3.0	0.816	40.1	LOS D	10.3	74.2	0.97	0.88	28.2	
East: Po	meroy S	St - E Leg										
4	L	222	3.0	0.290	16.1	LOS B	3.9	28.1	0.48	0.75	41.7	
5	Т	457	3.0	0.398	9.0	LOS A	9.3	66.8	0.56	0.50	46.1	
6	R	149	3.0	0.480	22.1	LOS C	2.8	20.0	0.86	0.79	37.4	
Approac	h	828	3.0	0.480	13.3	LOS B	9.3	66.8	0.60	0.62	43.1	
North: G	eorge S	St - N Leg										
7	L	151	3.0	0.417	14.0	LOS B	2.3	16.5	0.55	0.72	43.5	
8	Т	129	3.0	0.271	26.4	LOS C	4.1	29.7	0.85	0.68	33.2	
9	R	139	3.0	0.763	50.3	LOS D	5.9	42.6	1.00	0.91	25.2	
Approac	h	419	3.0	0.763	29.9	LOS C	5.9	42.6	0.79	0.77	32.6	
West: Po	omeroy	St - W Leg										
10	L	102	3.0	0.255	22.2	LOS C	2.8	19.8	0.62	0.77	37.5	
11	Т	575	3.0	0.852	29.0	LOS C	26.0	186.6	0.95	0.98	31.5	
12	R	67	3.0	0.852	37.8	LOS D	26.0	186.6	0.96	1.04	31.0	
Approac	h	744	3.0	0.852	28.9	LOS C	26.0	186.6	0.90	0.96	32.1	
All Vehic	les	2512	3.0	0.852	26.2	LOS C	26.0	186.6	0.80	0.80	34.1	

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model used.

Mover	lovement Performance - Pedestrians												
		Demand	Average	Level of	Average Back	of Queue	Prop.	Effective					
Mov ID	Description	Flow	Delay	Service	Pedestrian	Distance	Queued	Stop Rate					
		ped/h	sec		ped	m		per ped					
P1	Across S approach	53	11.0	LOS B	0.1	0.1	0.53	0.53					
P3	Across E approach	53	33.3	LOS D	0.1	0.1	0.91	0.91					
P5	Across N approach	53	18.2	LOS B	0.1	0.1	0.68	0.68					
P7	Across W approach	53	30.6	LOS D	0.1	0.1	0.88	0.88					
All Ped	estrians	212	23.3	LOS C			0.75	0.75					

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay) Pedestrian movement LOS values are based on average delay per pedestrian movement. Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Pomeroy St / George St EXISTING + 785 DWELLINGS (WITH INTERSECTION UPGRADES) PM PEAK HOUR Signals - Fixed Time Cycle Time = 90 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
		Demand	1.15.7	Deg.	Average	Level of	95% Back o	of Queue	Prop.	Effective	Average
NOV ID	Turn	Flow	HV	Satn	Delay	Service	Vehicles	Distance	Queued	Stop Rate	Speed
Cauthy		veh/h	%	V/C	sec		veh	m		per veh	km/h
South: C	seorge S	I-SLeg	0.0	0.005	00.7	100 0	40.4	05.0	0.00	0.00	00.0
1	L	131	3.0	0.635	38.7	LOS D	13.4	95.9	0.93	0.86	30.0
2	Т	214	3.0	0.635	30.4	LOS C	13.4	95.9	0.93	0.79	30.4
3	R	239	3.0	0.744	46.7	LOS D	10.7	76.5	0.98	0.90	26.3
Approad	h	583	3.0	0.744	38.9	LOS D	13.4	95.9	0.95	0.85	28.5
East: Po	omeroy S	it - E Leg									
4	L	222	3.0	0.321	18.0	LOS B	4.6	33.3	0.51	0.76	40.2
5	Т	457	3.0	0.413	11.2	LOS B	11.0	79.1	0.60	0.53	43.9
6	R	212	3.0	0.772	30.9	LOS C	5.6	40.5	0.95	0.89	32.5
Approac	ch	891	3.0	0.772	17.6	LOS B	11.0	79.1	0.66	0.67	39.7
North: G	George S	t - N Leg									
7	L	177	3.0	0.549	15.2	LOS B	3.2	23.1	0.56	0.72	42.6
8	Т	152	3.0	0.274	26.8	LOS C	5.2	37.2	0.81	0.66	33.0
9	R	163	3.0	0.902	65.6	LOS E	8.9	63.6	1.00	1.05	21.4
Approac	h	492	3.0	0.902	35.5	LOS D	8.9	63.6	0.78	0.81	30.1
West: P	omeroy S	St - W Leg									
10	L	144	3.0	0.336	24.4	LOS C	3.8	27.3	0.64	0.76	35.9
11	т	575	3.0	0.886	37.5	LOS D	32.2	230.9	0.99	1.06	28.0
12	R	67	3.0	0.886	45.8	LOS D	32.2	230.9	0.99	1.07	27.8
Approac	ch	786	3.0	0.886	35.8	LOS D	32.2	230.9	0.92	1.01	29.2
All Vehic	cles	2752	3.0	0.902	30.5	LOS C	32.2	230.9	0.82	0.83	31.9

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model used.

Mover	Novement Performance - Pedestrians												
		Demand	Average	Level of	Average Back	of Queue	Prop.	Effective					
Mov ID	Description	Flow	Delay	Service	Pedestrian	Distance	Queued	Stop Rate					
		ped/h	sec		ped	m		per ped					
P1	Across S approach	53	12.8	LOS B	0.1	0.1	0.53	0.53					
P3	Across E approach	53	32.9	LOS D	0.1	0.1	0.86	0.86					
P5	Across N approach	53	20.0	LOS B	0.1	0.1	0.67	0.67					
P7	Across W approach	53	30.4	LOS D	0.1	0.1	0.82	0.82					
All Ped	lestrians	212	24.0	LOS C			0.72	0.72					

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay) Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.



Pomeroy St / George St EXISTING + SCHOOL + 785 DWELLINGS (WITH INTERSECTION UPGRADES) AM PEAK HOUR Signals - Fixed Time Cycle Time = 80 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
		Demand	1.15.7	Deg.	Average	Level of	95% Back o	of Queue	Prop.	Effective	Average
Mov ID	Turn	Flow	HV	Satn	Delay	Service	Vehicles	Distance	Queued	Stop Rate	Speed
0 11 0		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: C	Jeorge S	st - S Leg									
1	L	69	3.0	0.527	37.6	LOS D	8.2	59.0	0.92	0.84	30.6
2	Т	166	3.0	0.527	29.3	LOS C	8.2	59.0	0.92	0.77	31.1
3	R	148	3.0	0.718	47.9	LOS D	6.1	44.0	1.00	0.88	25.9
Approad	h	384	3.0	0.718	38.0	LOS D	8.2	59.0	0.95	0.82	28.8
East: Po	omeroy S	St - E Leg									
4	L	474	3.0	0.609	17.0	LOS B	9.6	69.2	0.56	0.79	40.9
5	Т	634	3.0	0.541	9.6	LOS A	14.3	102.3	0.62	0.56	45.3
6	R	217	3.0	0.675	22.8	LOS C	4.4	31.5	0.87	0.83	36.9
Approac	:h	1324	3.0	0.675	14.4	LOS B	14.3	102.3	0.64	0.69	42.1
North: G	George S	t - N Leg									
7	L	342	3.0	0.865	18.7	LOS B	6.8	49.0	0.57	0.79	39.9
8	Т	227	3.0	0.501	29.1	LOS C	7.9	56.4	0.92	0.76	31.8
9	R	141	3.0	0.709	48.0	LOS D	5.8	41.8	1.00	0.87	25.9
Approac	h	711	3.0	0.865	27.8	LOS C	7.9	56.4	0.77	0.80	33.6
West: P	omeroy S	St - W Leg									
10	L	289	3.0	0.605	23.1	LOS C	7.2	51.9	0.68	0.79	36.7
11	Т	463	3.0	0.886	36.7	LOS D	25.6	183.8	0.98	1.09	28.3
12	R	79	3.0	0.886	45.0	LOS D	25.6	183.8	0.98	1.11	28.1
Approac	h	832	3.0	0.886	32.7	LOS C	25.6	183.8	0.88	0.99	30.7
All Vehic	cles	3251	3.0	0.886	24.8	LOS C	25.6	183.8	0.77	0.80	34.9

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
		Demand	Average	Level of	Average Back of Queue		Prop.	Effective
Mov ID	Description	Flow	Delay	Service	Pedestrian	Distance	Queued	Stop Rate
		ped/h	sec		ped	m		per ped
P1	Across S approach	53	10.5	LOS B	0.1	0.1	0.51	0.51
P3	Across E approach	53	34.2	LOS D	0.1	0.1	0.93	0.93
P5	Across N approach	53	17.6	LOS B	0.1	0.1	0.66	0.66
P7	Across W approach	53	31.5	LOS D	0.1	0.1	0.89	0.89
All Pedestrians		212	23.4	LOS C			0.75	0.75

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay) Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.



Appendix C



# Appendix C

Assessment of McDonald College Redevelopment




# McDonald College Traffic Impact Assessment

McDonald College is located on the southeast corner of the Pomeroy Street / George Street intersection south of the study area. Whilst a formal Development Application has not been lodged with the City of Canada Bay, it is understood that a new primary school facility is proposed. It is unknown as to whether or not the new primary school will replace existing uses within the College or operate in addition to the current uses. It is understood that once complete, the primary school will cater for up to 600 students, the same as the approved primary school within the study area.

A preliminary assessment of the anticipated traffic impact of a potential primary school (600 students) at this location on the George Street/ Pomeroy Street intersection is presented below.

For assessment purposes the following assumptions have been made:

- The new school will generate 356 peak hour movements (consistent with the approved primary school in the study area McLaren Traffic Engineering Report).
- The school will not generate any significant traffic during the PM road network peak hour (the PM school peak hour would need to be assessed as part of any future DA application for the site).
- The existing McDonald College will continue to generate its current levels of traffic.
- Traffic Distribution:
  - 67% north to the George Street/ Pomeroy Street intersection comprising:
    - 55% east
    - 5% north
    - 40% west
  - 33% south to the Parramatta Road / George Street intersection
- The McDonald College traffic has been added to the base case scenario (existing + approved primary school traffic).
- The George Street/ Pomeroy Street intersection upgrades associated with the approved primary school have taken place prior to opening.

The additional traffic generated by the potential school and the post development traffic volumes are presented in Figures C1 and C2. The post-development traffic volumes do not include any development within the study area.



Appendix C







The post development operation of the intersection during the AM Peak hour has been assessed using SIDRA INTERSECTION, with the results presented in Table C1.

Scenario	Peak	Leg	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Existing Traffic Volumes + Approved School Development + McDonald College	AM	George Street (south)	1.1	91	131	F
		Pomeroy Street (east)	0.74	15	108	В
		George Street (north)	0.81	35	56	D
		Pomeroy Street (west)	1.1	104	448	F

Table C1: Intersection Operation (incl. McDonald College Development)

Table C1 indicates that following the potential development of the McDonald College the George Street/Pomeroy Street intersection would be operating above its capacity. In particular the south and west approaches to the intersection are anticipated to fail (DOS's greater than 1.0).

Given the above, it is anticipated that any DA application for the McDonald College of a similar intensity to the one assessed above would need to include mitigation works at the George Street/Pomeroy Street intersection to increase its capacity.

Appendix D



# Appendix D

Post Development Traffic Volumes







Figure D.1: AM Peak Hour – Existing Traffic Volumes







Figure D.2: PM Peak Hour – Existing Traffic Volumes





Figure D.4: AM Peak Hour – Base Traffic Volumes







Figure D.5: PM Peak Hour – Base Traffic Volumes

Figure D.7: PM Peak Hour – Post Development Traffic Volumes





- A Level 25, 55 Collins Street PO Box 24055
- MELBOURNE VIC 3000
- P +613 9851 9600
- F +613 9851 9610
- E melbourne@gta.com.au

### Sydney

- A Level 6, 15 Help Street CHATSWOOD NSW 2067 PO Box 5254
- WEST CHATSWOOD NSW 1515 P +612 8448 1800
- **F** +612 8448 1810
- E sydney@gta.com.au

#### Brisbane

- A Level 4, 283 Elizabeth Street BRISBANE QLD 4000 GPO Box 115
- BRISBANE QLD 4001 P +617 3113 5000
- **F** +617 3113 5010
- E brisbane@gta.com.au

#### Canberra

- A Unit 4, Level 1, Sparta Building, 55 Woolley Street A Level 1, 25 Sturt Street PO Box 62 PO Box 1064
- DICKSON ACT 2602
- **P** +612 6243 4826
- **F** +612 6243 4848
- E canberra@gta.com.au

#### Adelaide

- A Suite 4, Level 1, 136 The Parade PO Box 3421
- NORWOOD SA 5067
- P +618 8334 3600F +618 8334 3610
- E adelaide@gta.com.au

## Gold Coast

- A Level 9, Corporate Centre 2 Box 37
- 1 Corporate Court
- BUNDALL QLD 4217
- P +617 5510 4800F +617 5510 4814
- E goldcoast@gta.com.au

#### Townsville

- et A Level 1, 25 Sturt Street PO Box 1064 TOWNSVILLE QLD 4810 P +617 4722 2765
  - **F** +617 4722 2763 **F** +617 4722 2761
- E townsville@gta.com.au

