BARKER RYAN STEWART

TOTAL PROJECT SOLUTIONS

PLANNING
PROJECT MANAGEMENT
ENGINEERING
CERTIFICATION

KOICHI TAKADA ARCHITECTS

Traffic and Parking Impact Assessment Report

52 Alfred Street, Milson's Point

September 2020

BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS

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Author	AWS / AJ
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SYDNEY
Suite 603, Level 6, 12 Century Circuit
Norwest Business Park NSW 2153
P (02) 9659 0005 F (02) 9659 0006
E sydney@brs.com.au

CENTRAL COAST
Studio 5, 78 York Street
East Gosford NSW 2250
P (02) 4325 5255
E coast@brs.com.au

HUNTER
Unit 1, 17 Babilla Close
Beresfield NSW 2322
P (02) 4966 8388 F (02) 4966 1399
E hunter@brs.com.au

brs.com.au

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Suite 603, Level 6, 12 Century Circuit
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brs.com.au

List of Abbreviations, Figures and Tables

Abbreviations

DCP ..... North Sydney Council's DCP 2013
AS/NZS2890.1 ..... Australian Standards, *'AS/NZS 2890.1:2004 Off-Street Car Parking'*
AS2890.2..... Australian Standards, *'AS 2890.2:2018 Off-Street Commercial Vehicle Facilities'*
AS/NZS2890.6..... Australian Standards, 'AS/NZS 2890.6:2002 Off-Street Parking for People with Disabilities'
RMS ..... Roads and Maritime Services
RMS Guide ..... Roads and Maritime Services

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1 Executive Summary

This Traffic and Parking Impact Assessment has been prepared in accordance with the requirements of the North Sydney Council DCP 2013, the Road and Maritime Services (RMS) *'Guide to Traffic Generating Developments'* to accompany a Planning Proposal to North Sydney Council for the development of a mixed-use development.

This Planning Proposal seeks approval for the proposed building height. As such, this report primarily assesses:

- The proposals maximum parking requirement and its ability to appropriately accommodate the parking spaces, and
- The proposals traffic generation and the ability of the surrounding road network to accommodate the traffic generation

The final parking provision is expected to be finalised at the detailed Development Application.

The total proposed provision of 191 spaces, including a covenant for 63 spaces dedicated to Council for the use of the neighbouring commercial developments. The remaining 128 spaces are reserved for the use of the proposed development (residential and commercial / retail uses on-site) which complies with Council DCP requirement of maximum 173 space. It should be noted that the existing car parking structure will be retained for the proposed development. Bicycle parking is also provided in accordance with the minimum requirements set out in the Council DCP.

Taking into account the estimated traffic generation from the proposed development, existing traffic flow conditions and speed environment in Alfred Street South, Glen Street, Dind Street and Fitzroy Street, it is considered that the increase in traffic generated would have a minimal impact on the safety and operating efficiency to these roads, or their intersections. There is no warrant to upgrade these roads or their associated intersections as a result of any additional traffic generated by the development.

The proposed parking and loading facilities have been designed in accordance with the requirements of *AS/NZS 2890.1 – Off Street Car Parking, AS 2890.18 – Off-Street Commercial Vehicle Facilities* and *AS/NZS 2890.6 - Off-street Parking for People with Disabilities*. The design of these facilities has sought to preserve the existing structure and layout where possible. They are considered practical and safe ensuring that all traffic generated by the development can enter and exit the site in a forward direction. The estimated required parking can be generally accommodated within the on-site car park.

The Traffic and Parking Impact Assessment concludes that the subject site is suitable for the redevelopment of the site in relation to the impact of traffic, vehicle access, parking and safety considerations. The development is considered to have negligible effect on the safety and operating outcome of the surrounding transport network.

2 Introduction

Barker Ryan Stewart have been engaged by Koichi Takada Architects to prepare a Traffic and Parking Impact Assessment in accordance with the requirements of the North Sydney DCP 2013 (DCP) and LEP 2013 and the Road and Maritime Service's (RMS's) 'Guide to Traffic Generating Developments' to accompany a Planning Proposal for a mixed-use development comprised of commercial / retail tenancies totalling 2,642m^2 GFA, 159 residential units plus associated basement car parking for 191 vehicles.

A covenant requires 63 parking spaces to be dedicated to Council for the use of the neighbouring development (48-50 and 56 Alfred Street). This covenant would be investigated at the detailed DA phase. The basement layout prepared in the architectural plans show that sufficient parking spaces are available to accommodate these Council spaces and the development parking spaces.

The purpose of this report is to assess and address traffic, access, car parking and pedestrian impacts generated by the proposed development. This can be briefly outlined as follows:

- The expected traffic generation to/from the proposed development.
- The impact of the proposed development on the road network.
- Intersection analysis based on traffic counts.
- Vehicle parking provisions.
- Access design requirements.
- Vehicular requirements for delivery and waste collection.
- Provision for pedestrians.
- Availability of public transport.

3 Existing Conditions

3.1 Site Location

The site is located within a B4 Mixed-Use zone at 52 Alfred Street South, Milsons Point Lot 1/DP738322.

The site is bound by Glen Street to the west, Alfred Street to the east and existing high-rise buildings to the north and south.

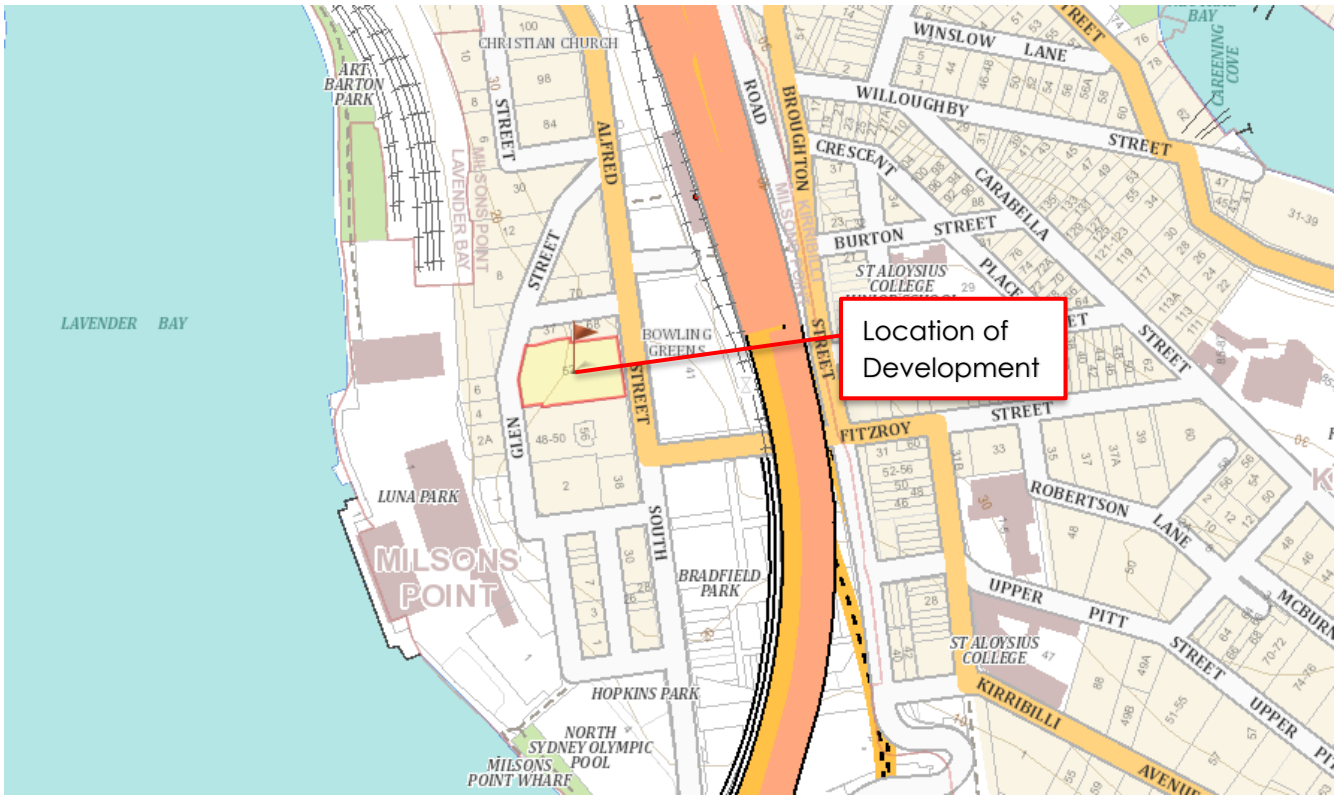


Figure 1: Site Location *(source: NSW Land & Property Information SIX Maps 2017)*

3.2 Existing Development

The site is currently developed and is occupied by an existing commercial tower with basement car parking. Level 1 (ground) features 322.5m^2 GFA of retail and restaurant space, with levels 2-13 providing a total of 10,205m^2 commercial GFA. Basement levels B1-B4 currently accommodate 220 parking spaces.

Figure 2: Aerial Photo of Site *(source: NSW Land & Property Information SIX Maps 2017)*

3.3 Existing Road Conditions

In terms of immediate access to the site, vehicular access to the existing basement is via a vehicular crossing in Glen Street. There is also a ramp connection from the car park to the podium level of 48-50 Alfred Street, which provides access to Alfred Street.

There is full width footpath paving for both street frontages of the site for pedestrians. The site is bound by Glen Street to the west and Alfred Street South to the east, which are both local roads with default speed limits of 50km/h. These roads are two-lane, two-way roads with on-street parking on both sides.

With regards to access to the broader Sydney road network, access to the site from the west and south is restricted by Sydney Harbour due to its location on a peninsula. Therefore, most of the traffic the site will either utilise Fitzroy street to access businesses to the east and the CBD to the south or via Alfred Street South which connects with Lavender Street and the Pacific Highway.

3.4 Traffic Flows and Volumes

Traffic counts were undertaken during the morning and afternoon peak periods to gauge the performance of the current road system.

R.O.A.R Traffic Data undertook traffic counts at the following intersections: Glen Street and Alfred Street South, Alfred Street South and Fitzroy Street, Dind Street and Alfred Street South, site access via Alfred Street South and site access via Glen Street. Counts were undertaken from 7am – 9am and 4pm – 6pm Thursday 7/09/17.

Peak hour periods, traffic volumes and layouts for each of these intersections are summarised below, the full results of the traffic counts are available in Appendix A.

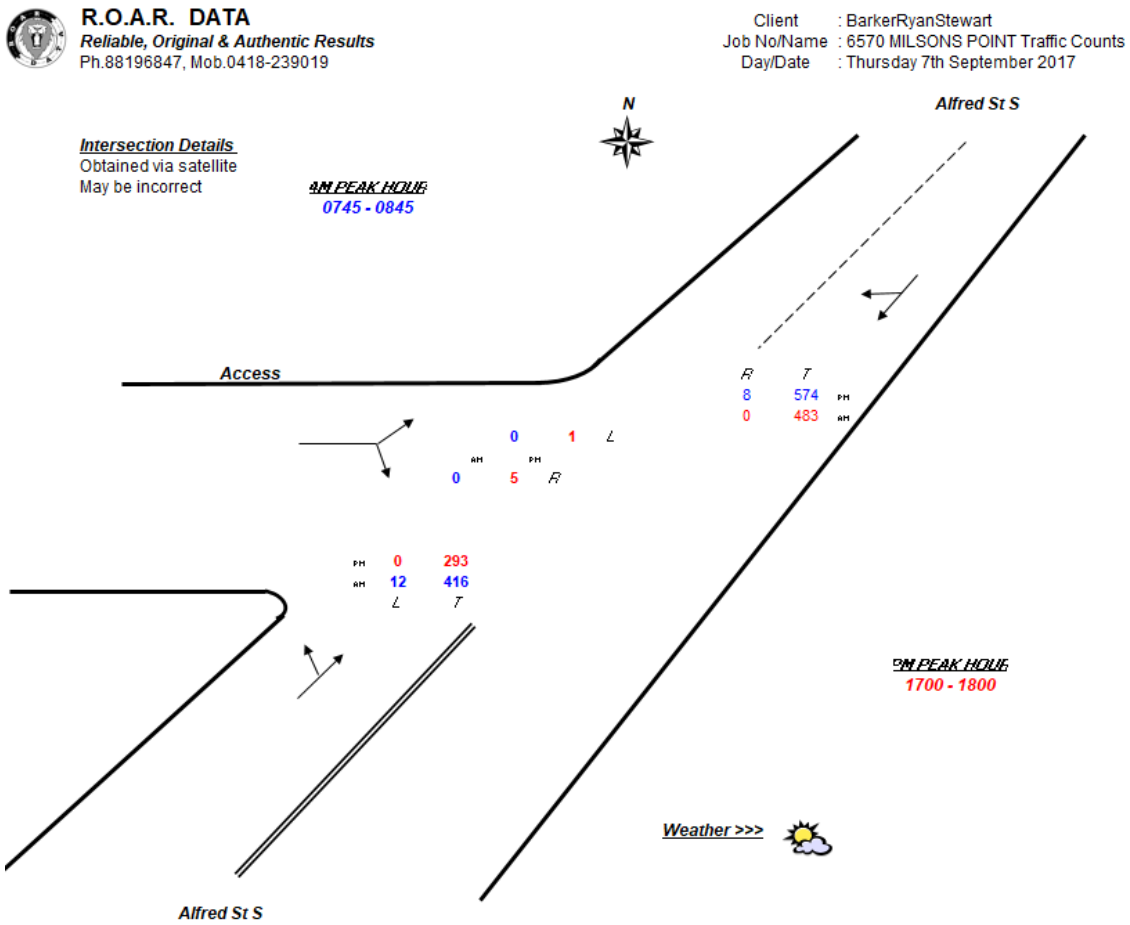


Figure 3: Traffic counts – Alfred Street South/Access AM and PM peak hour

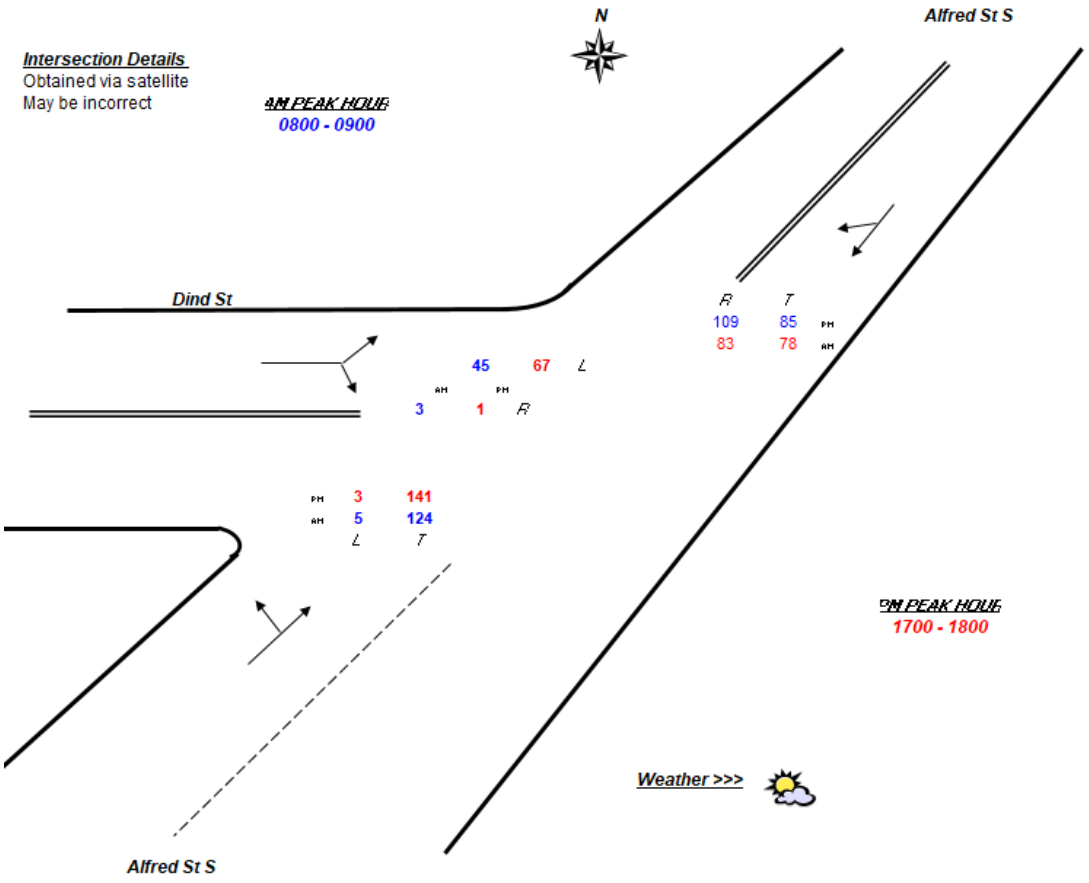


Figure 4: Traffic counts – Dind Street/Alfred Street South AM and PM peak hour

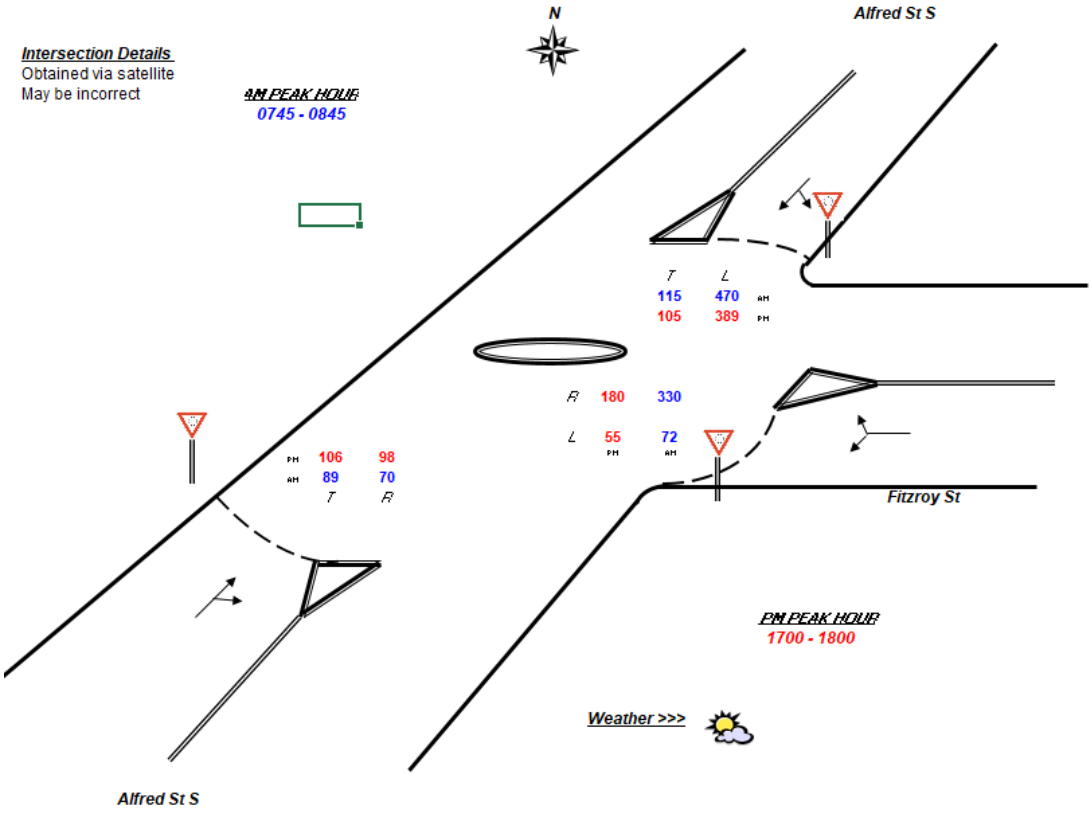


Figure 5: Traffic counts – Alfred Street South/Fitzroy Street AM and PM peak hour

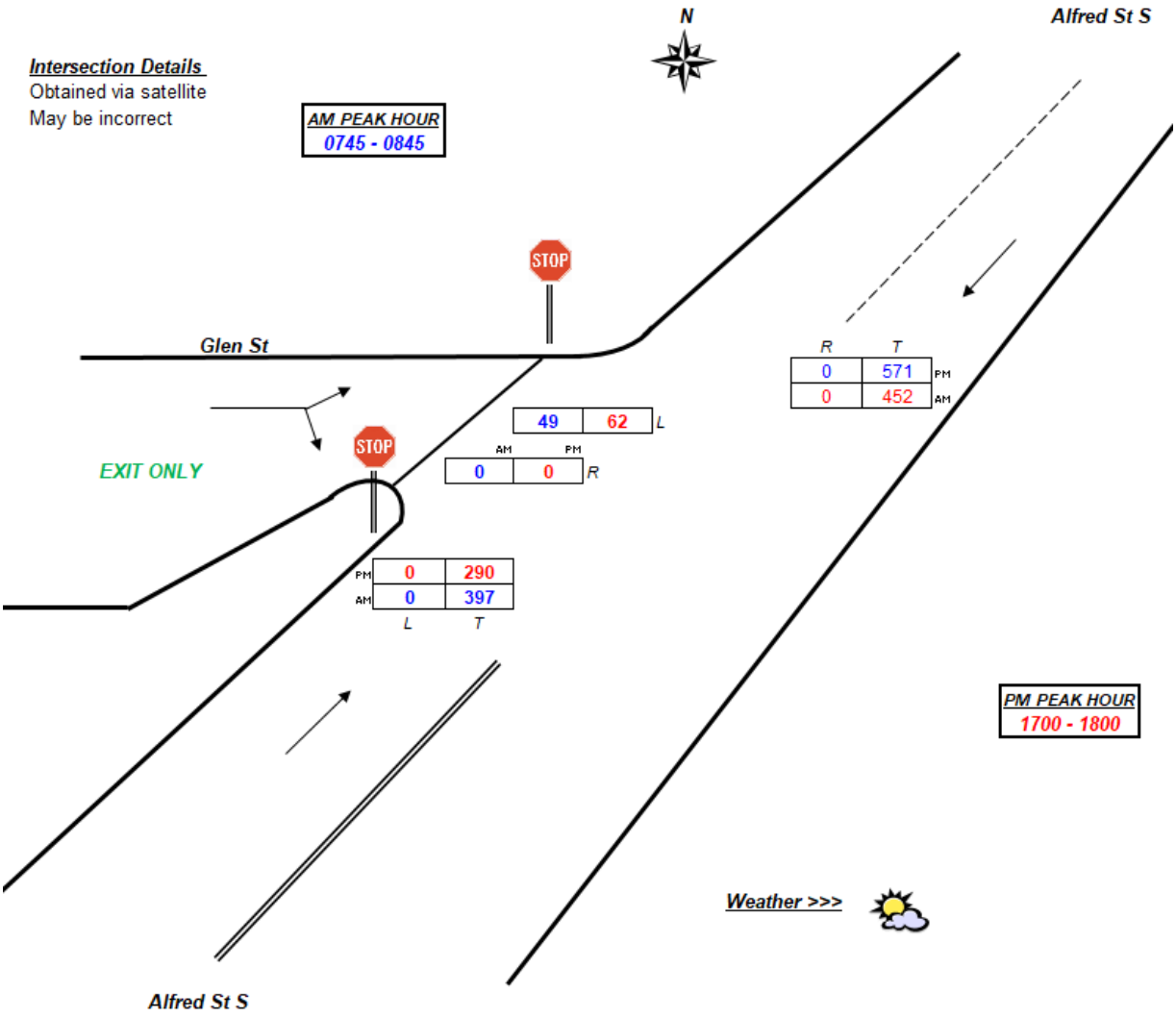


Figure 6: Traffic counts – Glen Street/Alfred Street South AM and PM peak hour

3.5 Public Transport, Pedestrians and Cyclists.

The area is well serviced by public transport, with bus connections and Milson's Point train station located in close proximity to the site. Milson's Point station provides frequent train services to the CBD and Sydney's north on the T1 North Shore Line, which run every 15 minutes during off-peak times and approximately once every 8 minutes during peak times. Given the proposed mixed use residential development replaces an existing commercial premises, it's not anticipated this proposal will have a significant negative impact on peak hour passenger volumes at Milson's Point station. There are also two bus stops located less than 100m north of the site on Alfred Street South service over 20 bus services/routes, with buses stopping every 5 minutes or less during peak hours.

The site is also located within the established Sydney cycle network, close to several shared paths. See Appendix B for more information. Pedestrian infrastructure in the area is also consistent with the high standard generally provided throughout the Sydney CBD.

Overall the existing site has excellent access to pedestrian and cycling infrastructure and public transport, which can accommodate the requirements of the proposed development.

4 Proposed Development

4.1 Development Description

The proposal is to demolish the existing commercial building and construct a mixed-use high-rise building containing 159 residential units and 2,642m^2 commercial / retail GFA. The unit breakdown is as follows:

- 12 x 1-bedroom units
- 71 x 2-bedroom units
- 76 x 3-bedroom units

The amendments to the existing four-level basement will provide 191 parking spaces, apportioned such that 11 retail parking spaces, 4 commercial spaces and 176 residential spaces are provided. The basement also contains 24 motorcycle spaces and 103 bicycle spaces.

The residential and commercial / retail waste will be stored in separate collection areas and will be serviced by private contractors operating Medium Rigid Vehicle (MRV) type trucks, two MRV loading docks have been provided to facilitate this in accordance with the requirements of Council's DCP.

4.2 Access

The proposed entry/exit to the basement area is located on Glen Street. Residential and commercial / retail car parking will share the same access as will waste collection and loading vehicles.

The use of the basement does not increase the requirements for the design requirements of the existing access driveway with respect to Section 3.2.2 of *AS/NZS 2890.1-2004 Parking Facilities – Off Street Car Parking, AS 2890.2-2018 Parking Facilities – Off Street Commercial Vehicle Facilities* and Council's DCP requirements.

The entry/exit driveways comply with *AS/NZS 2890.1-2004 Parking Facilities – Off Street Car Parking, AS 2890.2-2002 Parking Facilities – Off Street Commercial Vehicle Facilities* and Council's DCP requirements.

The proposed driveway locations comply with *Figure 3.3 – Minimum Sight Distance for Pedestrian Safety AS/NZS 2890.1* and the proposed driveway gradients comply with *AS/NZS 2890.1*.

4.3 Service Vehicles

Waste collection will be conducted by a private waste contractor from the collection area near the Glen Street access to the development, accessed via the existing driveway that is to be reconstructed as a part of the development.

It is considered that the shared access of both the waste/loading bay with secondary car park entry/exit will not significantly impact on the flow to and from the overall development as waste collection and deliveries will generally be intermittent and occur outside of peak traffic periods.

Waste and recycling bins will be stored in designated refuse areas. The waste collection contractor will ensure they have the appropriate vehicles to enable collection of waste from with the proposed waste collection area.

5 Car Parking Assessment

5.1 Parking Provision and Requirements

The structure of the car park for the proposed development is largely being retained in its existing configuration with minor amendments to accommodate additional facilities. This acts to minimise demolition and construction and thereby reduce the impact of this development on the local environment. The provision of spaces for the varying uses that will be accommodated on the site are set out in the table below:

Table 1: Car parking Schedule

Level	Car Retail	Car Commercial	Car Residential	Total Cars	Motor bike
B4	11	4	33	**48**	1
B3	0	0	47	**47**	5
B2	0	0	47	**47**	7
B1	0	0	49	**49**	5
Total	**11**	**4**	**176**	**191**	**18**

The proposed car parking and bicycle parking provisions have been assessed against the North Sydney DCP 2013 parking rates contained in table Table B-10.1 for residential uses in a B4 zone outside the St Leonard Precinct and B-10.2 for non-residential uses. A summary of these requirements and the proposed parking provisions are included in tables 2 & 3 below:

Table 2: Car parking requirements and provision

Land Use	North Sydney DCP	Proposed Parking Provision
Residential Component • 12 x 1-bedroom units • 71 x 2-bedroom units • 76 x 3-bedroom units (Total 159)	Maximum Rates 0.5 spaces per 1-br x 12 = 6 spaces 1 space per 2-br/3-br x 147 = 147 spaces **Subtotal = 153 spaces**	113 resident car spaces
Non-Residential Component • 2,642m^2 commercial / retail GFA	Maximum Rates 1 space / 400m^2 non-residential GFA x 2,642m^2 = **7 spaces**	15 car spaces
Other Requirements • Motorcycle Parking	Minimum Rates 1 motorcycle space / 10 car spaces x 160 = 16 spaces	18 motorcycle spaces
Totals	**Max: 160 car spaces** **Min: 16 motorcycle spaces**	**191 car spaces – 63 Council spaces = 128 spaces** **18 motorcycle spaces (compliant)**

Table 3: Bicycle parking requirements and provision

Land Use	North Sydney DCP	Proposed Parking Provision
Residential Component • 159 units	Minimum Rates 1 resident space per dwelling x 159 = 159 spaces 1 visitor space per 10 dwellings x 159 = 16 spaces **Subtotal = 175 spaces**	• 104 resident spaces in storage cages B4-B1 • 55 resident spaces on B4 • 16 residential visitor spaces on B3 **Subtotal = 175** (compliant)
Non-Residential Component • 2,642m² commercial / retail GFA (including 968m² of retail GFA and 1,674 commercial GFA)	Minimum Rates 1 employee space / 150m² office GFA x 1,674m² = 12 spaces 1 visitor space / 400m² office GFA x 1,674m² = 5 spaces 1 space / 25m² retail GFA x 968m² = 39 spaces 2 visitor spaces + (1 / 100m² retail GFA over 100m²) = 2 + (868 / 100) = 11 spaces **Subtotal = 67 spaces**	14 spaces available for commercial employees / visitors and retail visitors on B3 + 60 spaces for retail employees and commercial uses on B4 **Subtotal = 74**
End of Trip Facilities (Non-Residential) Required Bike Parking • 12 commercial employee bike spaces • 5 commercial visitor bike spaces • 39 retail employee bike spaces • 11 retail visitor bike spaces Total 67 spaces	Minimum Rates 1 locker per bicycle space x 67 = 67 lockers 2 shower and change cubicles for up to 20 bikes plus… 2 shower and change cubicles per additional 20 bike spaces x 47 = 2.3 (2) shower/change cubicles Subtotal = 67 lockers and 4 shower/change cubicles	51 lockers (no lockers provided for retail or commercial visitor parking) 2 shower / change cubicles More information provided below
Total	**247 bicycle spaces**	**249 bicycle spaces**

Proposed on-site motorcycle parking and bicycle parking provisions meet the minimums under the DCP.

End of trip facilities have been provided to service retail employee and commercial employee use, however they have not been provided for customers/visitors to these tenancies. Customers are unlikely to bring ablutions to a restaurant or shop and typically will not be willing to take showers or change clothes. Although there is a deficiency of 2 retail visitor spaces, there is a surplus of bicycle spaces provided for the site as a whole. Nevertheless, it should be noted that the non-compliance regarding the final provision of End of Trip facility is expected to be finalised at the detailed Development Application phase.

Overall, it's considered that the above motor vehicle and bicycle parking provisions achieve the development outcomes set out in the North Sydney Council DCP.

5.2 Loading Requirements

The proposed loading facility provision has been assessed against the North Sydney DCP 2013 rates contained in table Table B-10.1 for residential uses in a B4 zone outside the St Leonard Precinct and B-10.2 for non-residential uses. A summary of these requirements and the proposed parking provision is included in the table below:

Table 4: Car parking requirements and provision

Land Use	North Sydney DCP	Proposed Parking Provision
Residential Component • 163 dwellings	Minimum Rates 1 HRV loading bay or 2 MRV loading bays	2 x MRV loading bay (for more information see below)
Non-Residential Component • 2,642m^2 commercial / retail GFA	DCP Requirement To be determined by Council	2 x MRV loading bay shared with residential uses
Total Requirements	**2 MRV loading bays + commercial requirements from Council**	**2 x MRV loading bay**

Waste collection will be organised by private contractor and may be coordinated with loading requirements for residents and businesses. Building by-laws will also be in place requiring deliveries to the retail and commercial tenancies to take place via vehicles of Medium Rigid Vehicle (MRV) size or lesser.

5.3 Parking Compliance Check

Barker Ryan Stewart has reviewed the plans as provided by Koichi Takada Architects. This review included the layout of car parking and internal roadways / ramps and overall, we are satisfied that the design is consistent with the requirements of Standards AS/NZS 2890.1, AS 2890.2-2002 and AS/NZS 2890.6 and The North Sydney Council DCP. It is anticipated that the car park will function in a satisfactory manner and in accordance with the original design intent. A summary of critical parameters assessed regarding the Australian Standards is included below.

Table 5: Compliance Table

Control	Proposed	Compliance
AS2890.1-2004 (Off-street Car Parking) and Council DCP 2.10.12		
2.4.1 Car Space Dimensions: Class 1 & Class 2	Resident - 5.4m x 2.4m. Min 5.8m aisle width, Retail – 5.4m x 2.5m, min 5.8m aisle	Yes
2.4.2 Blind aisle Extension & Clearance	1m blind aisle extension, min 0.3m clear	Yes
2.4.6 Gradients within parking modules	~0% max cross grade	Yes
2.5.2 Layout Roadways/Ramps	Two-way circulation provided throughout site	See swept paths (Appendix C)
2.5.3 Roadway/Ramp Grades	Max 1:12 (8.3%) entry ramp, max 20.5% internal ramps, length <20m. Transitions of 2m at summit and 3m at base.	Yes
3.2.2 Driveway Width	Category 2, combined 6.5m entry/exit	Yes
3.2.3 Driveway location	Located further than 6m from intersection	Yes
3.3 Gradients of Driveways	<6m at 5%, downgrade to street	Yes
5.2 Column Location/Spacing	Located outside car design envelope	Yes
5.3 Headroom	>2.2m to be provided	Yes
2.4.7 Motorcycle Parking	Motorcycle parking 1.2m x 2.5m	Yes
DCP 10.3.1 P7 Security for residents	Resident parking on upper levels, separated from commercial/retail/council	Yes
AS2890.2-2002 (Off-street Commercial Vehicle Facilities)		
3.2.3 Regular Service – Minor Road	(a) Dedicated Service area provided (b) All manoeuvring on-site (c) Forward entry/exit (d) Circulation roadways provided	Yes
3.4.1 Access Driveways	Swept paths show acceptable access and egress for a contractor MRV	Yes
3.3.3 Maximum Grades	Max grade < 15.4%, complying changes of grade may be accommodated.	Yes
3.4.5 Sightlines	Sufficient space available for sufficient sight distance to pedestrians	Yes
4.2 Dimensions of Service Bay-MRV	7m x 9.8m	Yes

Control	Proposed	Compliance
AS2890.6-2009 (Accessible Parking)		
2.2.1 Angle Parking Spaces	2.4m x 5.4m parking and shared spaces + bollard	Yes
2.3 Pavement slope and surface	~Flat 0% grade	Yes
2.4 Headroom	Sufficient space between slabs to provide 2.5m headroom	Yes

6 Traffic Assessment

The impact of the proposed development on the surrounding road network was assessed using SIDRA Intersection modelling software. The traffic counts outlined in section 3.4 and traffic generation estimated below in section 6.1 were used to determine an overall traffic level for the area post-development. Section 6.2 describes how these additional trips were distributed amongst the critical intersections chosen for study. Based on their relatively high volume and critical locations; the intersections of Alfred Street South / Fitzroy Street and Alfred Street South / Glen Street were deemed critical. SIDRA analysis outlined in section 6.3 found that the increased traffic resulting from the proposed development will not have a significant impact on the efficiency of the surrounding road network.

6.1 Traffic Generation

5.1.1 Existing Development

RMS's *'Guide to Traffic Generating Developments'*, Section 3 – Land Use Traffic Generation (RMS Guide) does not have any available rates for NSW. Instead, the existing traffic generation was calculated using the Institute of Traffic Engineers (ITE) Trip Generation Manual (edition 9) (ITE Guide). The existing estimated traffic volumes generated by the site, described in Section 2.2 are outlined in Table 6 below.

Table 6: Existing site use – traffic generation

Use	AM peak hour rate	AM peak hour trips	PM peak hour rate	PM peak hour trips
High Density RFB (1 unit)	0.19 / unit	1	0.15 / unit	1
Commercial (10,205m^2)	2/100m^2	205	2/100m^2	205
Restaurant/Retail (322m^2)	-	-	5/100m^2	17
	Total AM	**206**	**Total PM**	**223**

Note: traffic levels measured at site are significantly lower than the estimations above, potentially due to vacancy of some commercial tenancies in the existing building. For this reason, traffic generation of the proposed development will not be discounted by the estimated traffic of the existing development.

5.1.2 Proposed Development

From the RMS Guide, the proposed estimated traffic volumes generated by the proposed development are outlined in the table below. Residential rates were based on the Guide to Traffic Generating Developments Updated traffic surveys TDT 2013/4A for high density residential developments near train stations.

Table 7: Proposed development – traffic generation

Use	AM peak hour rate	AM peak hour trips	PM peak hour rate	PM peak hour trips
High Density RFB (159 units)	0.19 / unit	30	0.15 / unit	24
Retail Premises (968m^2)	5.6/100m^2-	54	5.6/100m^2	54
Commercial (1,674m^2)	2/100m^2	34	2/100m^2	34
	Total AM	**118**	**Total PM**	**112**

6.2 Trip Distribution

This section outlines the methodology used to distribute the 118 AM and 112 PM trips generated by the proposed development.

- For residential traffic a typical 80-20 outbound/inbound split was adopted for AM traffic and a 20-80 outbound/inbound was chosen for the PM peak.
    - AM: 25 out / 5 in, PM: 5 out / 19 in
- Commercial traffic was assumed to be 100% inbound during the AM peak and 100% outbound for the PM peak.
    - AM: 0 out / 34 in, PM: 34 out / 0 in
- Retail traffic during both the AM and PM peaks was assumed to be 80% inbound and 20% outbound. During each peak it was assumed that most customers would head towards the development for either breakfast or dinner time rushes.
    - AM: 11 out / 43 in, PM: 11 out / 43 in

Total: AM split: 36 out / 82 in, PM split: 50 out / 62 in

Based on the constraints described in Section 3.3 of this report, the following trip distribution estimate has been developed.

- All inbound and outbound trips are distributed equally to north, south, east and west cardinal directions.
    - AM Split to each direction: 9 out / 21 in, PM Split each direction: 12.5 out / 15.5 in.
- Trips OUT to the north and west are assumed to use Glen Street -> Alfred Street South.
    - AM: 18, PM 25
- Trips OUT to the south and east are assumed to use Glen Street -> Dind Street -> Alfred Street South -> Fitzroy Street.
    - AM: 18, PM 25
- Trips IN from the north and east are assumed to use Fitzroy Street -> Alfred Street South -> Dind Street -> Glen Street.
    - AM: 42, PM 32
- Trips IN from the south and west are assumed to use Alfred Street South -> Dind Street -> Glen Street.
    - AM: 42 PM 32

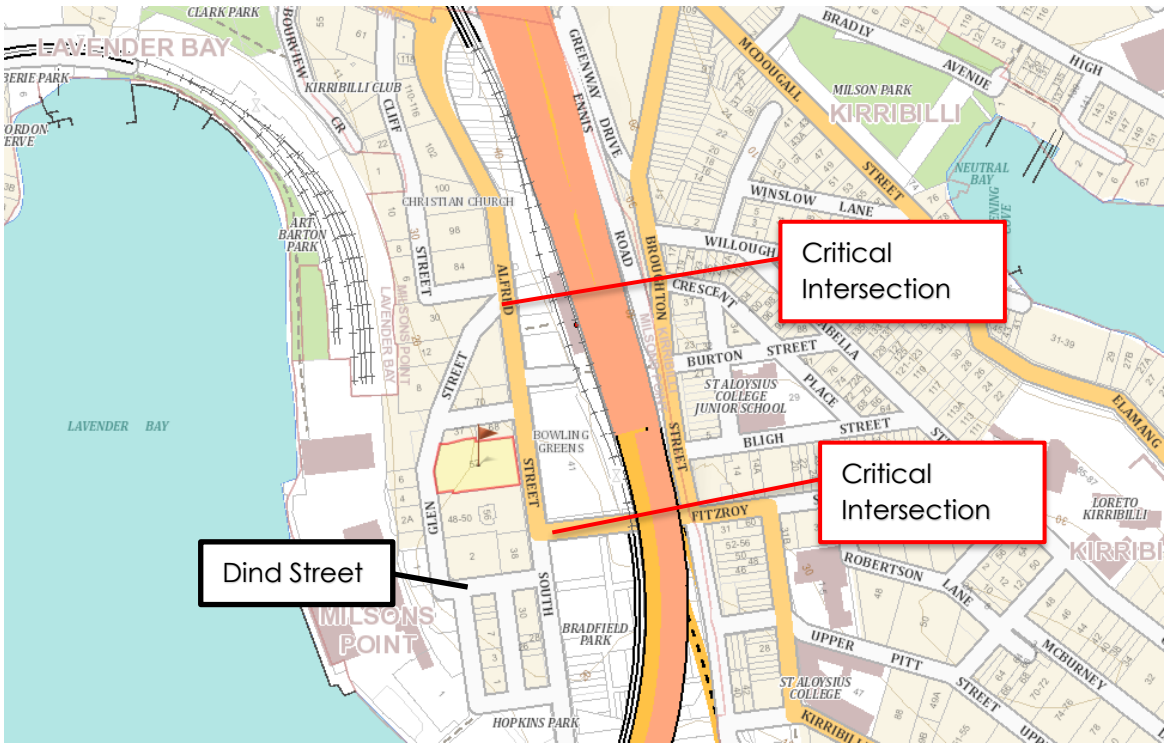


Figure 7: Site and critical intersections locations *(source: NSW Land & Property Information SIX Maps 2017)*

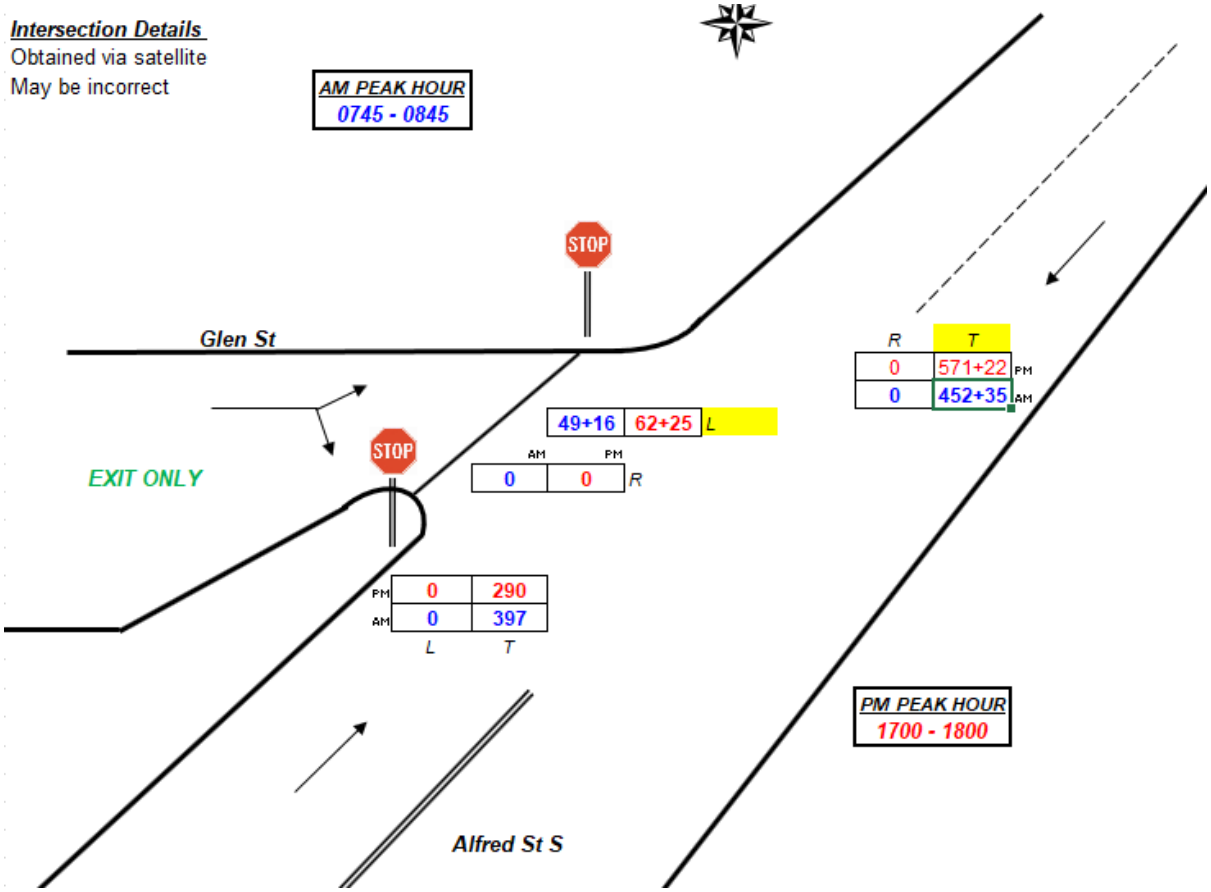


Figure 8: **Projected traffic volumes at Alfred Street South / Glen Street post-development**

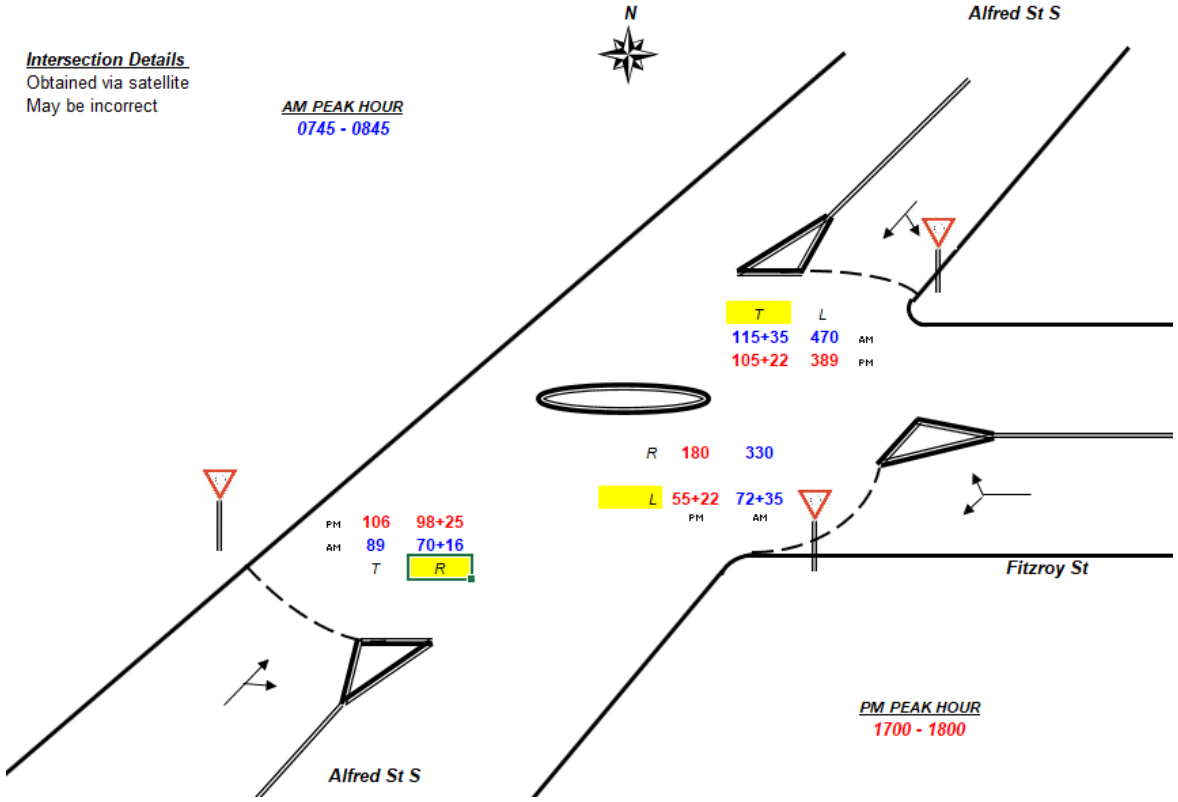


Figure 9: Projected traffic volumes at Alfred Street South / Fitzroy Street post-development

6.3 SIDRA Analysis and Impact of Generated Traffic

Intersection performance has been assessed using the SIDRA modelling software which uses the level of service (delay) model adopted by the Roads and Maritime Services (RMS) in NSW to assess intersection performance. Average delay is used to determine the level of service (LOS).

The intersections of Alfred Street South / Glen Street and Alfred Street South / Fitzroy Street were modelled as a network for both the AM and PM peak periods found by the traffic counts in Section 3.4. Traffic volumes modelled for each peak period were based on three scenarios: the existing traffic volume, the predicted traffic volume post-development and the traffic volume for the 'design life' of the intersections. In this case the design life refers to the existing traffic volumes plus volumes generated by the development, compounded annually at 2% growth over 10 years. This growth rate assumption is in keeping with the RMS Guide to Traffic Modelling recommendations.

For each of the three traffic volume scenarios modelled, level of service for all movements through all intersections remains at 'A'. Negligible increases in average delays (on the order of ~1-2 seconds) are anticipated. Considering this there is no warrant to provide any mitigating treatments for the intersections on Alfred Street South. The proposed development will not have a significant impact on the efficiency of the surrounding road network and over its design life of 10 years the existing infrastructure will be suitable to meet the needs of the proposed development. There should be no warrant to upgrade any of the intersections surrounding the development as a result of this development. For more information refer to the detailed SIDRA outputs provided in Appendix D of this report.

7 Conclusion

This Traffic and Parking Impact Assessment has been prepared in accordance with the requirements of the North Sydney DCP 2013, the Road and Maritime Services (RMS) '*Guide to Traffic Generating Developments'* to accompany a Planning Proposal to North Sydney Council for the development of a mixed use residential / retail / commercial development.

This Planning Proposal seeks approval for the proposed building height. As such, this report assesses the maximum parking requirement and the appropriateness of the proposal to accommodate these spaces and assess the ability of the surrounding road network to accommodate the development traffic. Accordingly, the parking provision is expected to be finalised at the detailed Development Application stage.

The proposed parking and loading facilities have been designed in accordance with the requirements of *AS/NZS 2890.1 – Off Street Car Parking, AS 2890.2 – Off-Street Commercial Vehicle Facilities* and *AS/NZS 2890.6 - Off-street Parking for People with Disabilities*. These facilities are also considered practical and safe ensuring that all traffic generated by the development can enter and exit the site in a forward direction. The estimated required parking is able to be generally accommodated within the on-site car park.

Taking into account the estimated traffic generation from the proposed development, existing traffic flow conditions and speed environment in both Alfred Street South and Glen Street, it is considered that the increase in traffic generated would have a minimal impact on the safety and operating efficiency to these frontage roads, or their intersections with Dind Street and Fitzroy Street.

There would be no warrant to upgrade the local road network as a result of any additional traffic generated by the development.

The total proposed provision of 191 spaces, including a covenant for 63 spaces dedicated to Council for the use of the neighbouring commercial developments. The remaining 128 spaces are reserved for the use of the proposed development (residential and commercial / retail uses on-site) which complies with Council DCP requirement of maximum 160 spaces. The provision of 249 bicycle spaces, 18 motorcycle parking spaces and 2 MRV loading bays also comply with Council DCP requirements.

The Traffic and Parking Impact Assessment concludes that the subject site is suitable for the proposed intensification of use of the site in relation to the impact of traffic, vehicle access, parking and safety considerations. The development is considered to have negligible effect on the safety and operating outcome of the surrounding transport network.

8 References

Australian Standards, *'AS/NZS 2890.1:2004 Off-Street Car Parking'*.

Australian Standards, *'AS 2890.2:2002 Off-Street Commercial Vehicle Facilities'*.

Australian Standards, 'AS/NZS 2890.6:2002 Off-Street Parking for People with Disabilities'.

Roads and Maritime Services, *'Guide to Traffic Generating Developments'* Version 2.2 dated October 2002.

Roads and Maritime Services, *'Guide to Traffic Modelling'* Version 1.0 dated February 2013.

Austroads *'Guide to Traffic Engineering Practice, Intersections at Grade – Part 5'*.

NSW Department of Planning, *'SEPP (Infrastructure) 2007'*.

North Sydney Council's DCP 2013.

Appendix A

Traffic counts

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : BarkerRyanStewart

Job No/Name : 6570 MILSONS POINT Traffic Counts

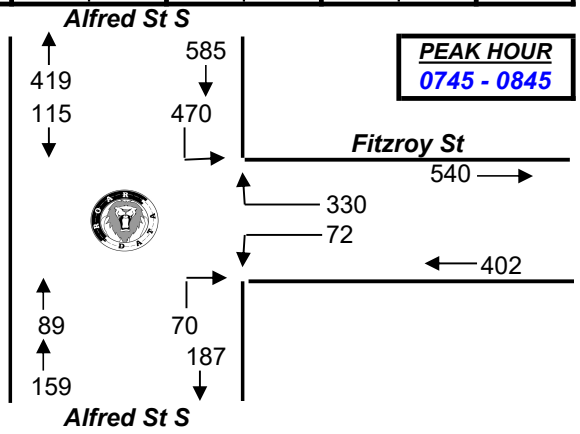
Day/Date : Thursday 7th September 2017

All Vehicles

	NORTH		EAST		SOUTH		
	Alfred St S		*Fitzroy St*		*Alfred St S*		
Time Per	**T**	**L**	**R**	**L**	**R**	**T**	**TOTAL**
0700 - 0715	10	96	48	16	11	13	**194**
0715 - 0730	22	90	37	16	18	10	**193**
0730 - 0745	21	96	58	11	14	10	**210**
0745 - 0800	21	120	85	22	20	21	**289**
0800 - 0815	29	126	67	13	17	23	**275**
0815 - 0830	36	129	87	17	16	26	**311**
0830 - 0845	29	95	91	20	17	19	**271**
0845 - 0900	18	90	77	23	25	23	**256**
Period End	**186**	**842**	**550**	**138**	**138**	**145**	**1999**

	NORTH		EAST		SOUTH		
	Alfred St S		*Fitzroy St*		*Alfred St S*		
Peak Per	**T**	**L**	**R**	**L**	**R**	**T**	**TOTAL**
0700 - 0800	74	402	228	65	63	54	**886**
0715 - 0815	93	432	247	62	69	64	**967**
0730 - 0830	107	471	297	63	67	80	**1085**
0745 - 0845	115	470	330	72	70	89	**1146**
0800 - 0900	112	440	322	73	75	91	**1113**

PEAK HR	**115**	**470**	**330**	**72**	**70**	**89**	**1146**

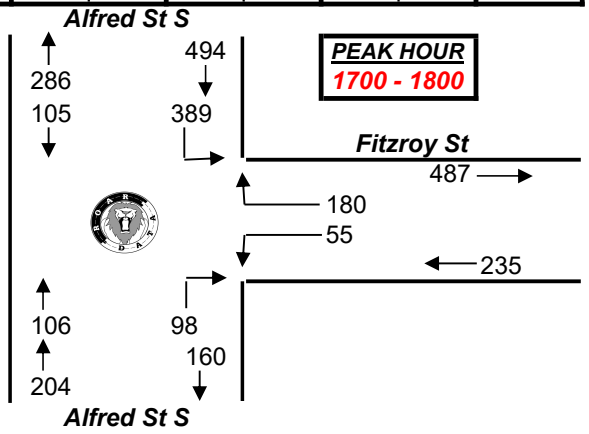


All Vehicles

	NORTH		EAST		SOUTH		
	Alfred St S		*Fitzroy St*		*Alfred St S*		
Time Per	**T**	**L**	**R**	**L**	**R**	**T**	**TOTAL**
1600 - 1615	17	53	37	9	13	21	**150**
1615 - 1630	17	81	38	18	5	16	**175**
1630 - 1645	19	83	32	12	14	22	**182**
1645 - 1700	16	71	32	14	22	23	**178**
1700 - 1715	26	100	50	10	17	26	**229**
1715 - 1730	27	92	38	10	22	27	**216**
1730 - 1745	27	100	54	18	30	30	**259**
1745 - 1800	25	97	38	17	29	23	**229**
Period End	**174**	**677**	**319**	**108**	**152**	**188**	**1618**

	NORTH		EAST		SOUTH		
	Alfred St S		*Fitzroy St*		*Alfred St S*		
Peak Per	**T**	**L**	**R**	**L**	**R**	**T**	**TOTAL**
1600 - 1700	69	288	139	53	54	82	**685**
1615 - 1715	78	335	152	54	58	87	**764**
1630 - 1730	88	346	152	46	75	98	**805**
1645 - 1745	96	363	174	52	91	106	**882**
1700 - 1800	105	389	180	55	98	106	**933**

PEAK HR	**105**	**389**	**180**	**55**	**98**	**106**	**933**



R.O.A.R DATA

Reliable, Original & Authentic Results

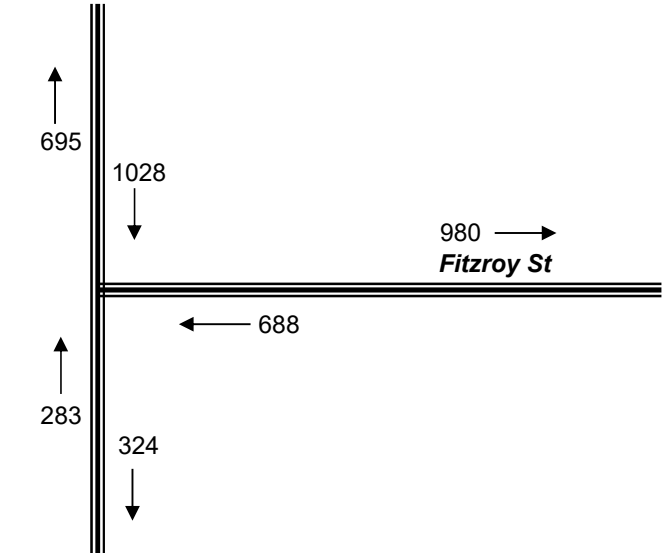
Ph.88196847, Mob.0418-239019

Client : BarkerRyanStewart

Job No/Name : 6570 MILSONS POINT Traffic Counts

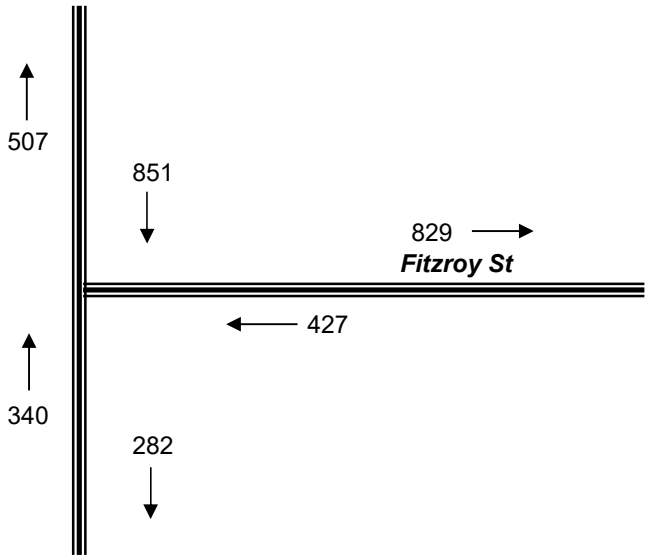
Day/Date : Thursday 7th September 2017

AM



TOTAL VOLUMES FOR COUNT PERIODS

PM



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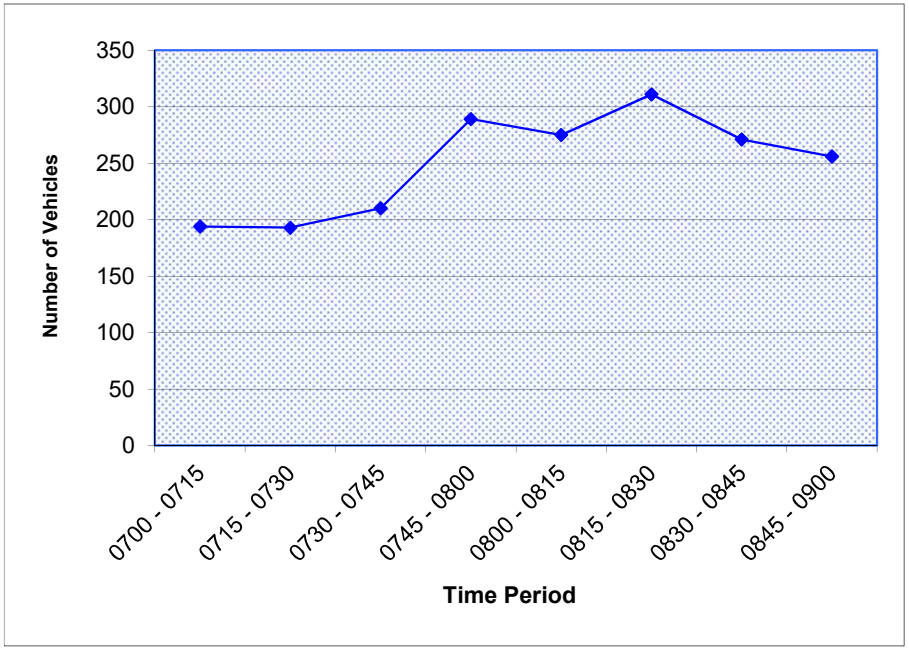
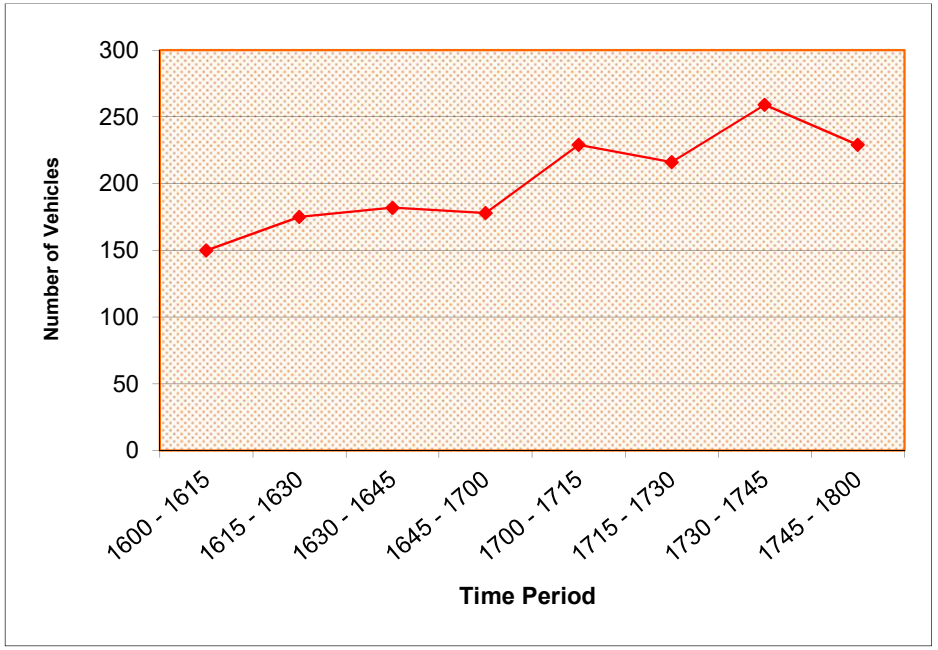
R.O.A.R DATA
Reliable, Original & Authentic Results
Ph.88196847, Mob.0418-239019

Client : BarkerRyanStewart
Job No/Name : 6570 MILSONS POINT Traffic Counts
Day/Date : Thursday 7th September 2017

AM ***PM***

Alfres St S & Fitzroy St





R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : BarkerRyanStewart

Job No/Name : 6570 MILSONS POINT Traffic Counts

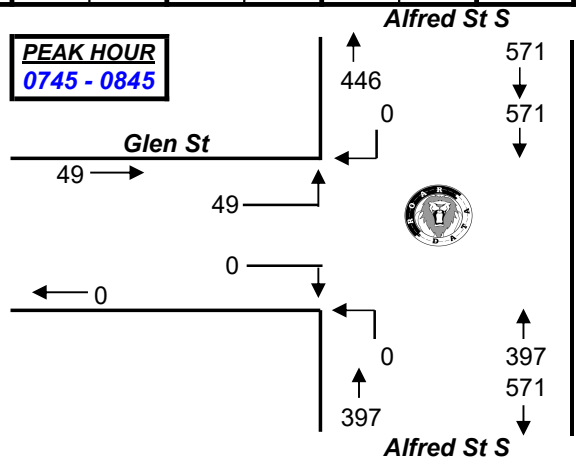
Day/Date : Thursday 7th September 2017

All Vehicles

	NORTH		WEST		SOUTH		
	Alfred St S		*Glen St*		*Alfred St S*		
Time Per	**T**	**R**	**L**	**R**	**L**	**T**	**TOTAL**
0700 - 0715	92	0	4	0	0	58	**154**
0715 - 0730	117	0	8	0	0	46	**171**
0730 - 0745	134	0	5	0	0	68	**207**
0745 - 0800	144	0	8	0	0	97	**249**
0800 - 0815	135	0	11	0	0	81	**227**
0815 - 0830	171	0	14	0	0	112	**297**
0830 - 0845	121	0	16	0	0	107	**244**
0845 - 0900	101	0	8	0	0	87	**196**
Period End	**1015**	**0**	**74**	**0**	**0**	**656**	**1745**

	NORTH		WEST		SOUTH		
	Alfred St S		*Glen St*		*Alfred St S*		
Peak Per	**T**	**R**	**L**	**R**	**L**	**T**	**TOTAL**
0700 - 0800	487	0	25	0	0	269	**781**
0715 - 0815	530	0	32	0	0	292	**854**
0730 - 0830	584	0	38	0	0	358	**980**
0745 - 0845	571	0	49	0	0	397	**1017**
0800 - 0900	528	0	49	0	0	387	**964**

PEAK HR	**571**	**0**	**49**	**0**	**0**	**397**	**1017**

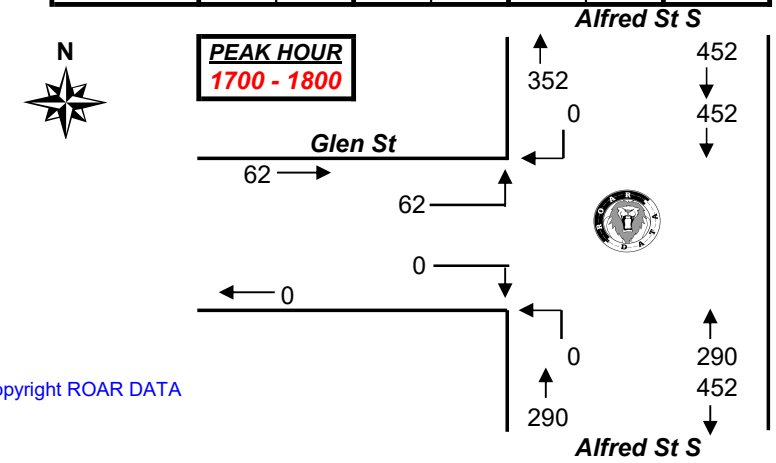


All Vehicles

	NORTH		WEST		SOUTH		
	Alfred St S		*Glen St*		*Alfred St S*		
Time Per	**T**	**R**	**L**	**R**	**L**	**T**	**TOTAL**
1600 - 1615	89	0	4	0	0	66	**159**
1615 - 1630	96	0	5	0	0	60	**161**
1630 - 1645	92	0	13	0	0	58	**163**
1645 - 1700	89	0	14	0	0	57	**160**
1700 - 1715	115	0	15	0	0	70	**200**
1715 - 1730	106	0	17	0	0	73	**196**
1730 - 1745	117	0	13	0	0	84	**214**
1745 - 1800	114	0	17	0	0	63	**194**
Period End	**818**	**0**	**98**	**0**	**0**	**531**	**1447**

	NORTH		WEST		SOUTH		
	Alfred St S		*Glen St*		*Alfred St S*		
Peak Per	**T**	**R**	**L**	**R**	**L**	**T**	**TOTAL**
1600 - 1700	366	0	36	0	0	241	**643**
1615 - 1715	392	0	47	0	0	245	**684**
1630 - 1730	402	0	59	0	0	258	**719**
1645 - 1745	427	0	59	0	0	284	**770**
1700 - 1800	452	0	62	0	0	290	**804**

PEAK HR	**452**	**0**	**62**	**0**	**0**	**290**	**804**



R.O.A.R DATA

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Ph.88196847, Mob.0418-239019

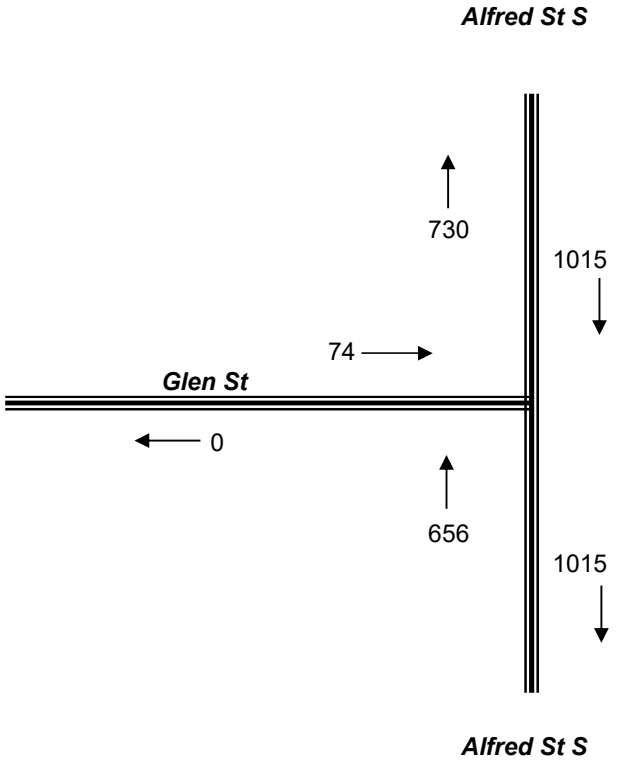
Client : BarkerRyanStewart

Job No/Name : 6570 MILSONS POINT Traffic Counts

Day/Date : Thursday 7th September 2017

TOTAL VOLUMES FOR COUNT PERIODS

AM



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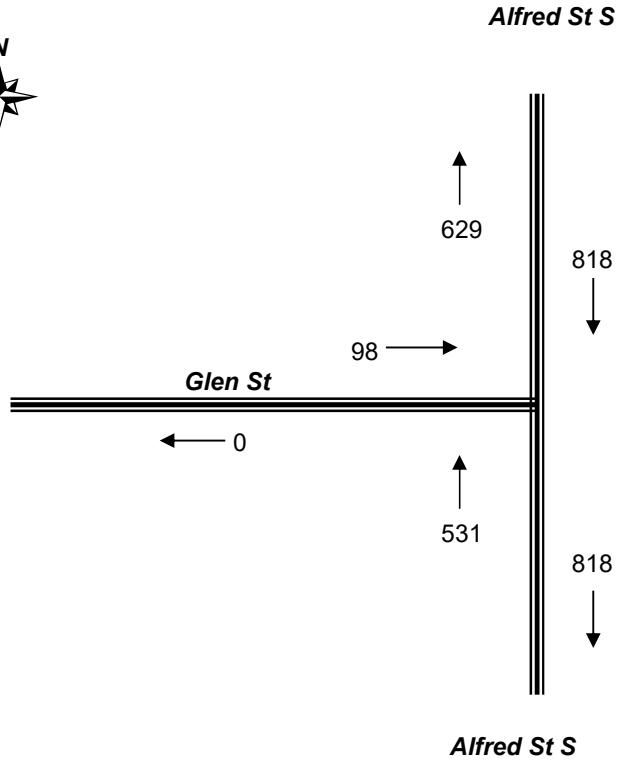

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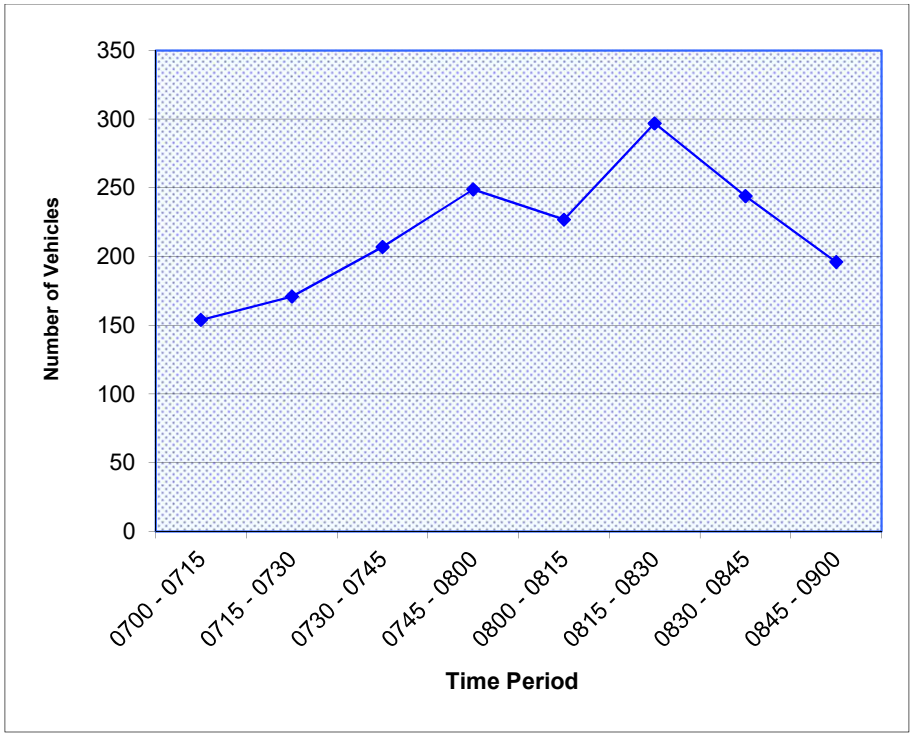
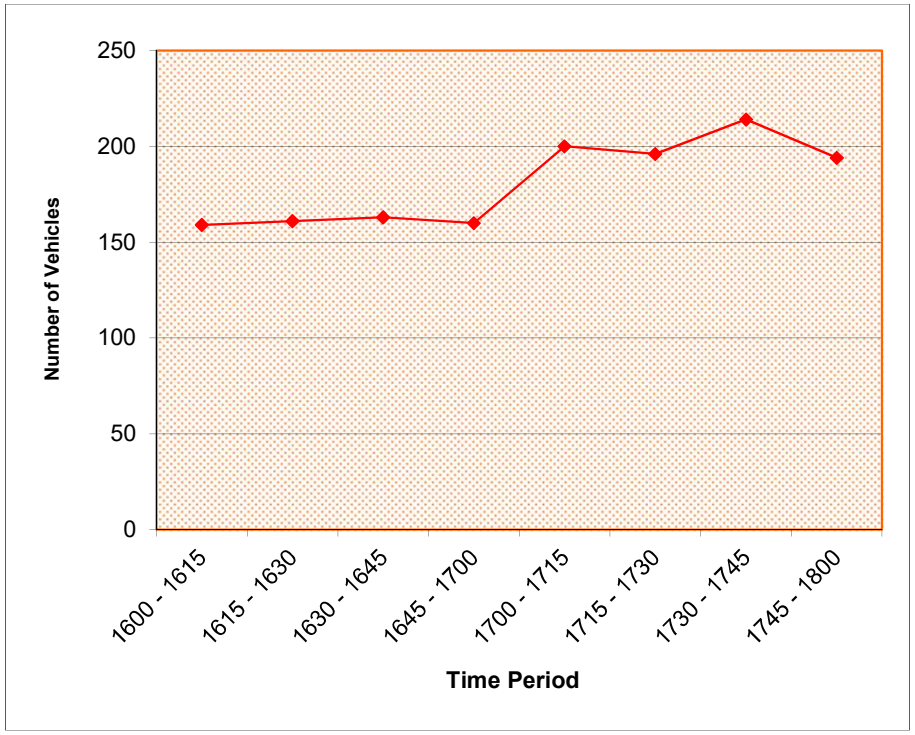
Reliable, Original & Authentic Results
Ph.88196847, Mob.0418-239019

Client : BarkerRyanStewart
Job No/Name : 6570 MILSONS POINT Traffic Counts
Day/Date : Thursday 7th September 2017

AM ***PM***

Alfred St S & Glen St





R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : BarkerRyanStewart

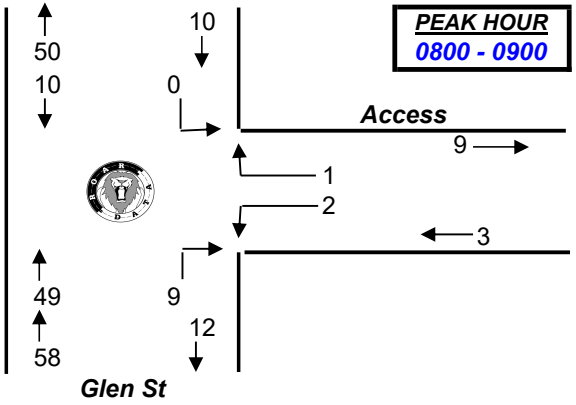
Job No/Name : 6570 MILSONS POINT Traffic Counts

Day/Date : Thursday 7th September 2017

All Vehicles

	NORTH		EAST		SOUTH		
	Glen St		*Access*		*Glen St*		
Time Per	**T**	**L**	**R**	**L**	**R**	**T**	**TOTAL**
0700 - 0715	1	0	1	0	1	4	**7**
0715 - 0730	1	0	0	0	2	2	**5**
0730 - 0745	2	0	0	0	5	7	**14**
0745 - 0800	2	0	0	0	8	3	**13**
0800 - 0815	2	0	0	1	1	10	**14**
0815 - 0830	3	0	0	0	0	17	**20**
0830 - 0845	2	0	0	0	2	14	**18**
0845 - 0900	3	0	1	1	6	8	**19**
Period End	**16**	**0**	**2**	**2**	**25**	**65**	**110**

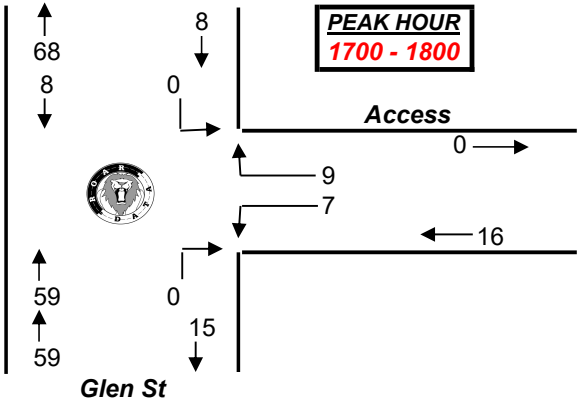
	NORTH		EAST		SOUTH		
	Glen St		*Access*		*Glen St*		
Peak Per	**T**	**L**	**R**	**L**	**R**	**T**	**TOTAL**
0700 - 0800	6	0	1	0	16	16	**39**
0715 - 0815	7	0	0	1	16	22	**46**
0730 - 0830	9	0	0	1	14	37	**61**
0745 - 0845	9	0	0	1	11	44	**65**
0800 - 0900	10	0	1	2	9	49	**71**
PEAK HR	**10**	**0**	**1**	**2**	**9**	**49**	**71**



All Vehicles

	NORTH		EAST		SOUTH		
	Glen St		*Access*		*Glen St*		
Time Per	**T**	**L**	**R**	**L**	**R**	**T**	**TOTAL**
1600 - 1615	1	0	1	0	0	15	**17**
1615 - 1630	3	0	0	1	0	10	**14**
1630 - 1645	0	0	1	1	0	10	**12**
1645 - 1700	1	0	3	1	0	17	**22**
1700 - 1715	2	0	1	4	0	16	**23**
1715 - 1730	0	0	3	2	0	12	**17**
1730 - 1745	3	0	2	1	0	15	**21**
1745 - 1800	3	0	3	0	0	16	**22**
Period End	**13**	**0**	**14**	**10**	**0**	**111**	**148**

	NORTH		EAST		SOUTH		
	Glen St		*Access*		*Glen St*		
Peak Per	**T**	**L**	**R**	**L**	**R**	**T**	**TOTAL**
1600 - 1700	5	0	5	3	0	52	**65**
1615 - 1715	6	0	5	7	0	53	**71**
1630 - 1730	3	0	8	8	0	55	**74**
1645 - 1745	6	0	9	8	0	60	**83**
1700 - 1800	8	0	9	7	0	59	**83**
PEAK HR	**8**	**0**	**9**	**7**	**0**	**59**	**83**



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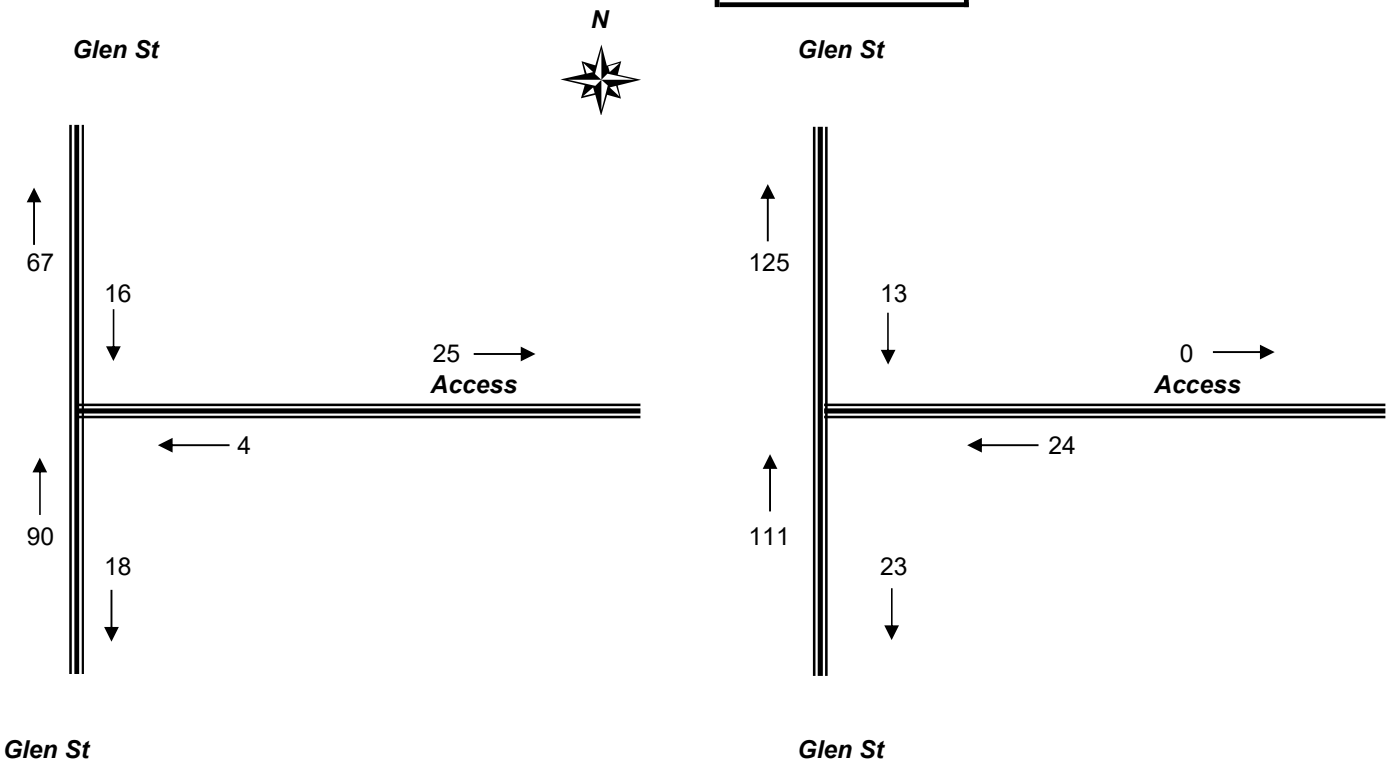
Reliable, Original & Authentic Results
Ph.88196847, Mob.0418-239019

Client : BarkerRyanStewart
Job No/Name : 6570 MILSONS POINT Traffic Counts
Day/Date : Thursday 7th September 2017

AM ***PM***

TOTAL VOLUMES FOR COUNT PERIODS



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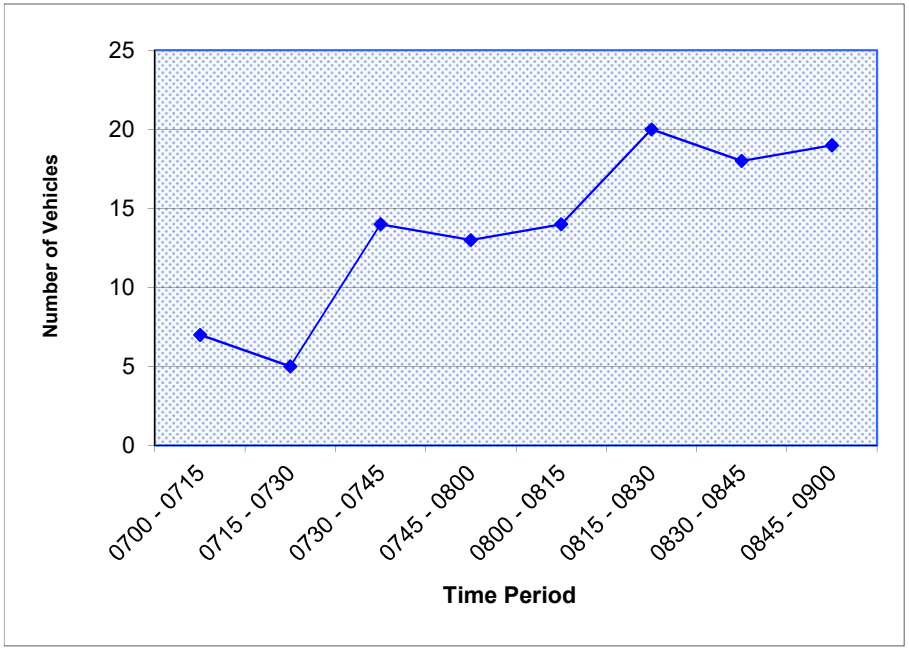
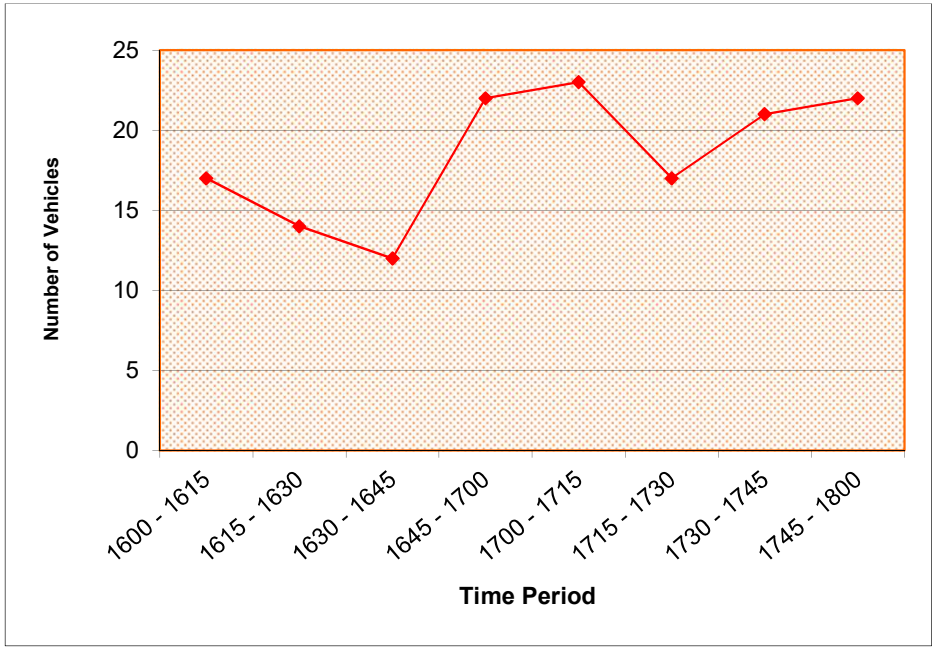
Ph.88196847, Mob.0418-239019

Client : BarkerRyanStewart
Job No/Name : 6570 MILSONS POINT Traffic Counts
Day/Date : Thursday 7th September 2017

AM ***PM***

Glen St & Access





R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : BarkerRyanStewart

Job No/Name : 6570 MILSONS POINT Traffic Counts

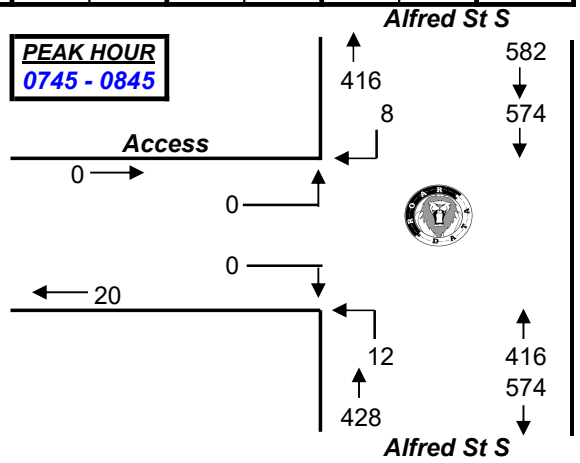
Day/Date : Thursday 7th September 2017

All Vehicles

	NORTH		WEST		SOUTH		
	Alfred St S		*Access*		*Alfred St S*		
Time Per	**T**	**R**	**L**	**R**	**L**	**T**	**TOTAL**
0700 - 0715	89	1	0	1	1	55	**147**
0715 - 0730	117	1	0	0	1	53	**172**
0730 - 0745	134	0	0	0	1	78	**213**
0745 - 0800	132	2	0	0	5	102	**241**
0800 - 0815	160	1	0	0	2	91	**254**
0815 - 0830	156	4	0	0	1	112	**273**
0830 - 0845	126	1	0	0	4	111	**242**
0845 - 0900	91	3	0	0	5	80	**179**
Period End	**1005**	**13**	**0**	**1**	**20**	**682**	**1721**

	NORTH		WEST		SOUTH		
	Alfred St S		*Access*		*Alfred St S*		
Peak Per	**T**	**R**	**L**	**R**	**L**	**T**	**TOTAL**
0700 - 0800	472	4	0	1	8	288	**773**
0715 - 0815	543	4	0	0	9	324	**880**
0730 - 0830	582	7	0	0	9	383	**981**
0745 - 0845	574	8	0	0	12	416	**1010**
0800 - 0900	533	9	0	0	12	394	**948**

PEAK HR	**574**	**8**	**0**	**0**	**12**	**416**	**1010**

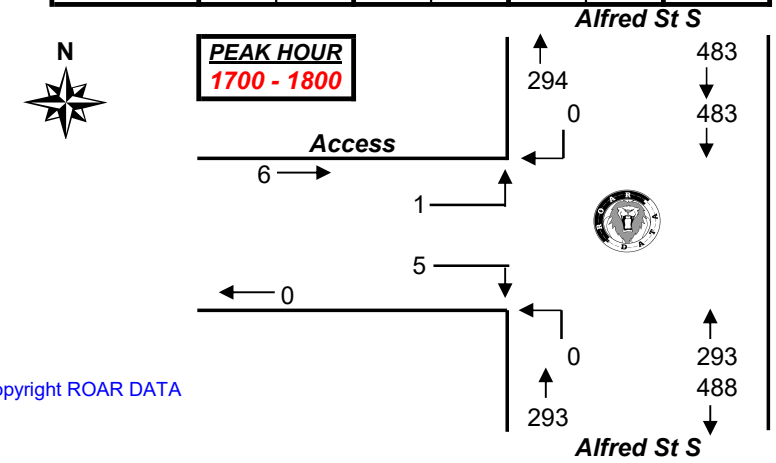


All Vehicles

	NORTH		WEST		SOUTH		
	Alfred St S		*Access*		*Alfred St S*		
Time Per	**T**	**R**	**L**	**R**	**L**	**T**	**TOTAL**
1600 - 1615	89	0	1	0	0	68	**158**
1615 - 1630	94	1	0	2	1	63	**161**
1630 - 1645	102	0	2	4	0	54	**162**
1645 - 1700	102	0	2	1	0	52	**157**
1700 - 1715	119	0	0	1	0	76	**196**
1715 - 1730	113	0	0	1	0	66	**180**
1730 - 1745	127	0	1	0	0	91	**219**
1745 - 1800	124	0	0	3	0	60	**187**
Period End	**870**	**1**	**6**	**12**	**1**	**530**	**1420**

	NORTH		WEST		SOUTH		
	Alfred St S		*Access*		*Alfred St S*		
Peak Per	**T**	**R**	**L**	**R**	**L**	**T**	**TOTAL**
1600 - 1700	387	1	5	7	1	237	**638**
1615 - 1715	417	1	4	8	1	245	**676**
1630 - 1730	436	0	4	7	0	248	**695**
1645 - 1745	461	0	3	3	0	285	**752**
1700 - 1800	483	0	1	5	0	293	**782**

PEAK HR	**483**	**0**	**1**	**5**	**0**	**293**	**782**



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Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : BarkerRyanStewart

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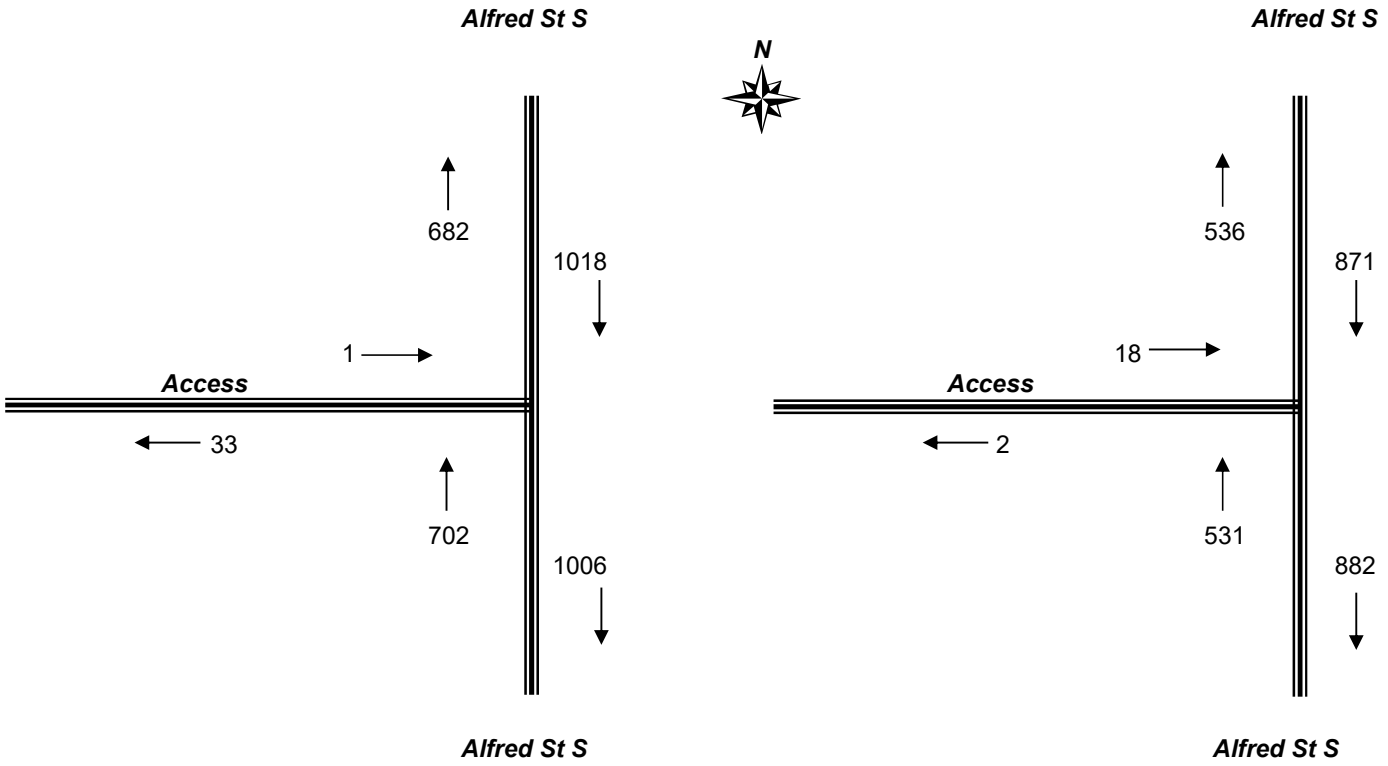
Day/Date : Thursday 7th September 2017

TOTAL VOLUMES FOR COUNT PERIODS



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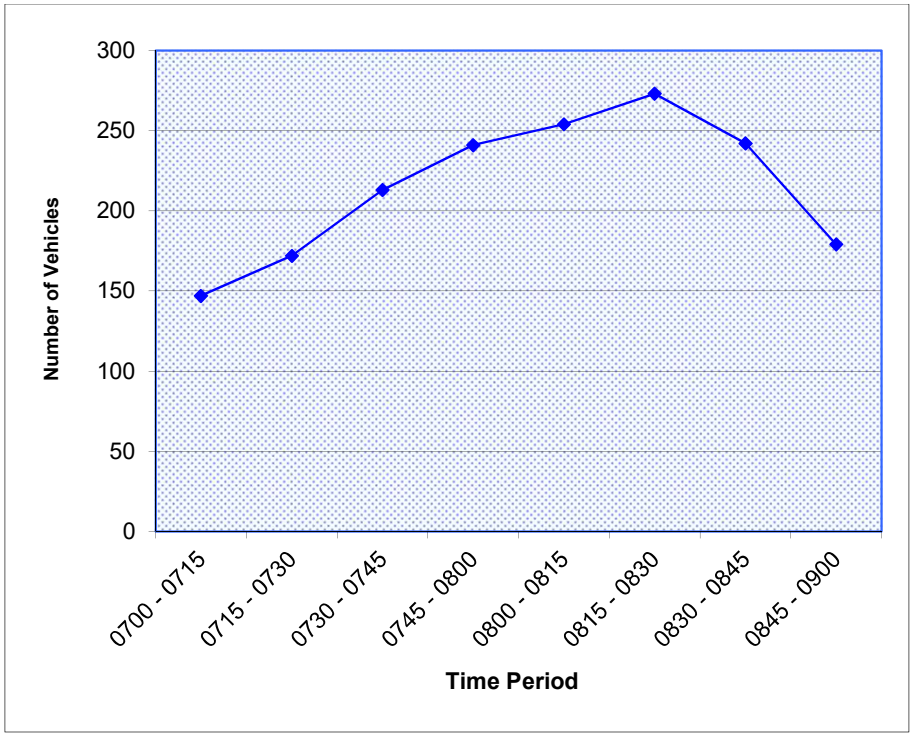
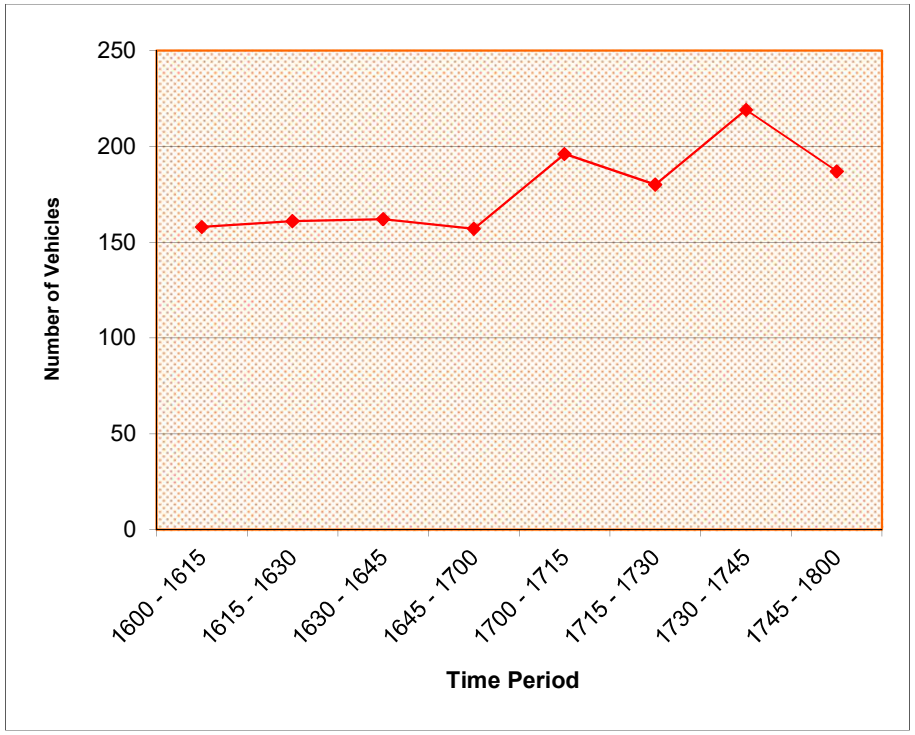
Ph.88196847, Mob.0418-239019

Client : BarkerRyanStewart
Job No/Name : 6570 MILSONS POINT Traffic Counts
Day/Date : Thursday 7th September 2017

AM ***PM***

Alfred St S & Access





R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : BarkerRyanStewart

Job No/Name : 6570 MILSONS POINT Traffic Counts

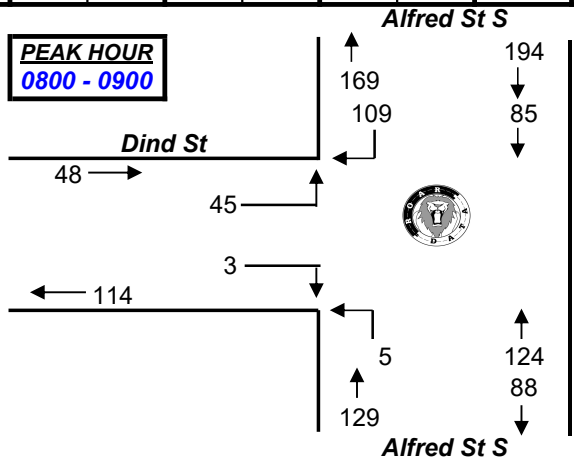
Day/Date : Thursday 7th September 2017

All Vehicles

	NORTH		WEST		SOUTH		
	Alfred St S		*Dind St*		*Alfred St S*		
Time Per	**T**	**R**	**L**	**R**	**L**	**T**	**TOTAL**
0700 - 0715	20	6	6	0	1	18	**51**
0715 - 0730	23	16	9	0	0	19	**67**
0730 - 0745	6	24	7	0	1	18	**56**
0745 - 0800	22	19	12	0	2	28	**83**
0800 - 0815	25	19	10	1	1	30	**86**
0815 - 0830	22	30	15	1	1	28	**97**
0830 - 0845	21	29	8	1	1	29	**89**
0845 - 0900	17	31	12	0	2	37	**99**
Period End	**156**	**174**	**79**	**3**	**9**	**207**	**628**

	NORTH		WEST		SOUTH		
	Alfred St S		*Dind St*		*Alfred St S*		
Peak Per	**T**	**R**	**L**	**R**	**L**	**T**	**TOTAL**
0700 - 0800	71	65	34	0	4	83	**257**
0715 - 0815	76	78	38	1	4	95	**292**
0730 - 0830	75	92	44	2	5	104	**322**
0745 - 0845	90	97	45	3	5	115	**355**
0800 - 0900	85	109	45	3	5	124	**371**

PEAK HR	**85**	**109**	**45**	**3**	**5**	**124**	**371**

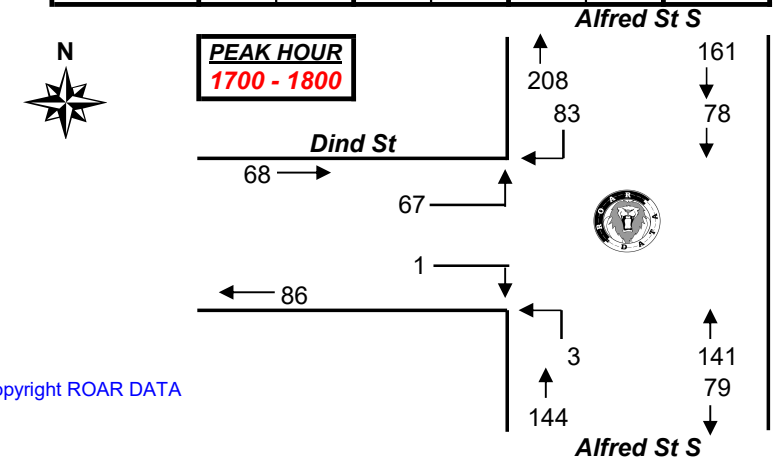


All Vehicles

	NORTH		WEST		SOUTH		
	Alfred St S		*Dind St*		*Alfred St S*		
Time Per	**T**	**R**	**L**	**R**	**L**	**T**	**TOTAL**
1600 - 1615	10	17	4	0	0	28	**59**
1615 - 1630	14	22	5	0	1	16	**58**
1630 - 1645	12	18	11	0	0	25	**66**
1645 - 1700	11	20	8	1	0	35	**75**
1700 - 1715	14	21	14	1	0	30	**80**
1715 - 1730	18	19	15	0	1	37	**90**
1730 - 1745	22	23	17	0	1	43	**106**
1745 - 1800	24	20	21	0	1	31	**97**
Period End	**125**	**160**	**95**	**2**	**4**	**245**	**631**

	NORTH		WEST		SOUTH		
	Alfred St S		*Dind St*		*Alfred St S*		
Peak Per	**T**	**R**	**L**	**R**	**L**	**T**	**TOTAL**
1600 - 1700	47	77	28	1	1	104	**258**
1615 - 1715	51	81	38	2	1	106	**279**
1630 - 1730	55	78	48	2	1	127	**311**
1645 - 1745	65	83	54	2	2	145	**351**
1700 - 1800	78	83	67	1	3	141	**373**

PEAK HR	**78**	**83**	**67**	**1**	**3**	**141**	**373**



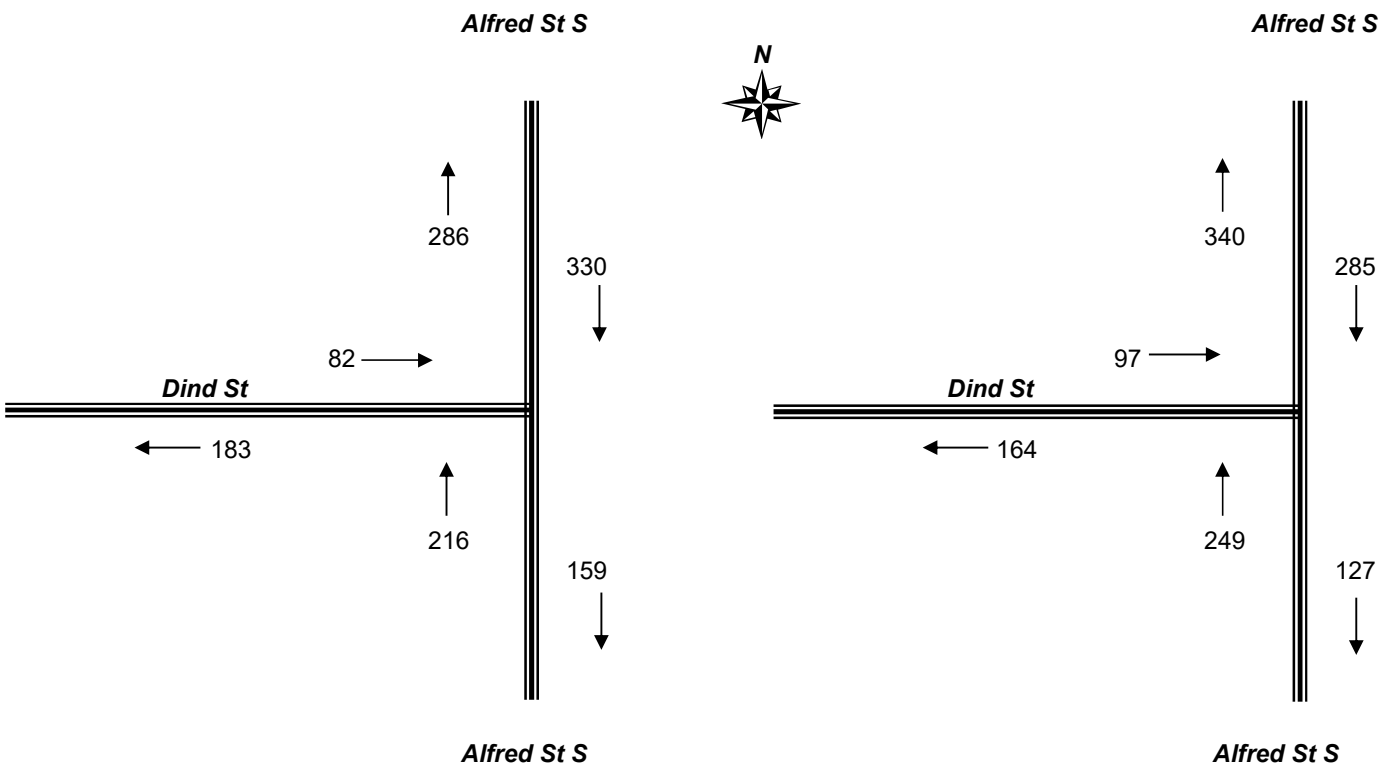
R.O.A.R DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client	: BarkerRyanStewart
Job No/Name	: 6570 MILSONS POINT Traffic Counts
Day/Date	: Thursday 7th September 2017

TOTAL VOLUMES FOR COUNT PERIODS

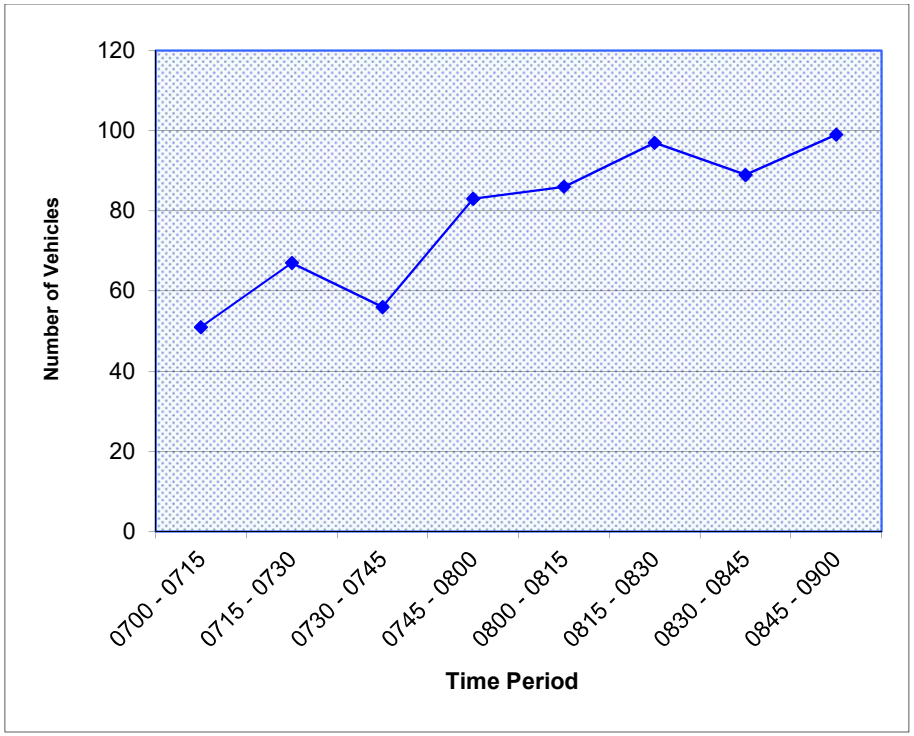


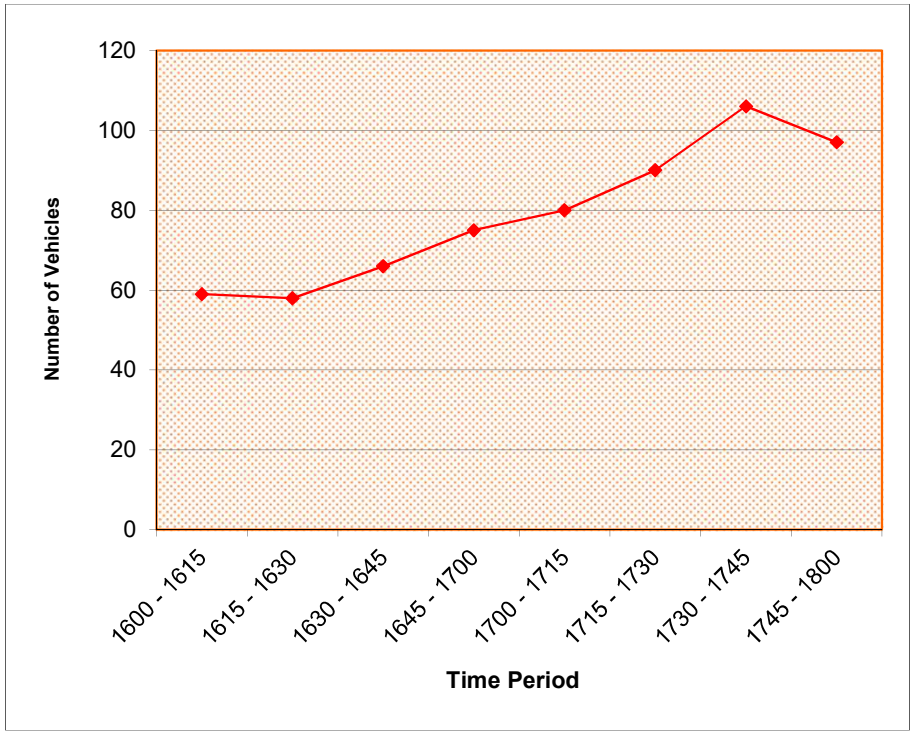
R.O.A.R DATA
Reliable, Original & Authentic Results
Ph.88196847, Mob.0418-239019

Client : BarkerRyanStewart
Job No/Name : 6570 MILSONS POINT Traffic Counts
Day/Date : Thursday 7th September 2017

AM ***PM***

Alfred St S & Dind St

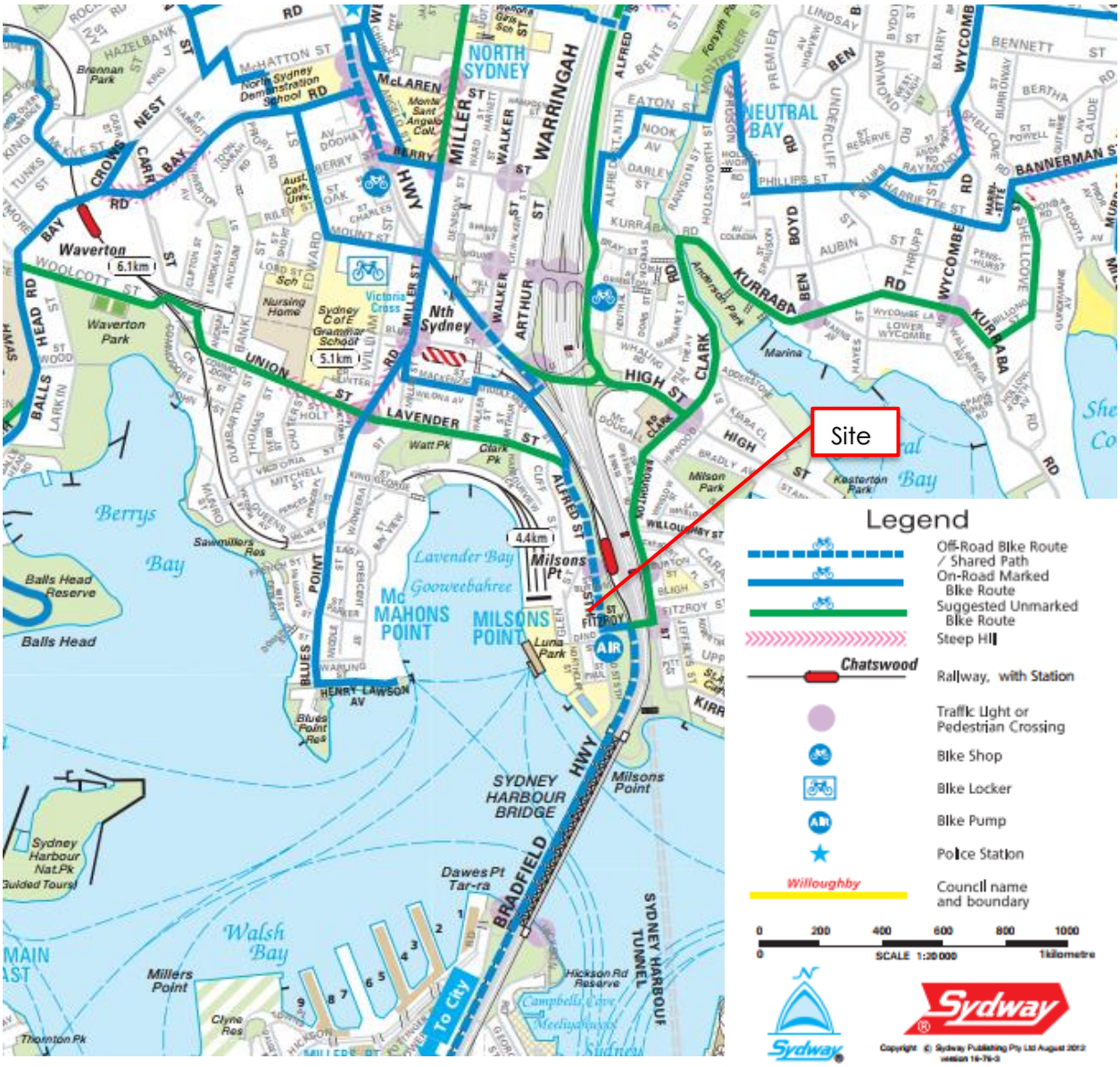




Appendix B

Public Transport and Cycling Information

Excerpt of 2012 Sydney Cycle Map

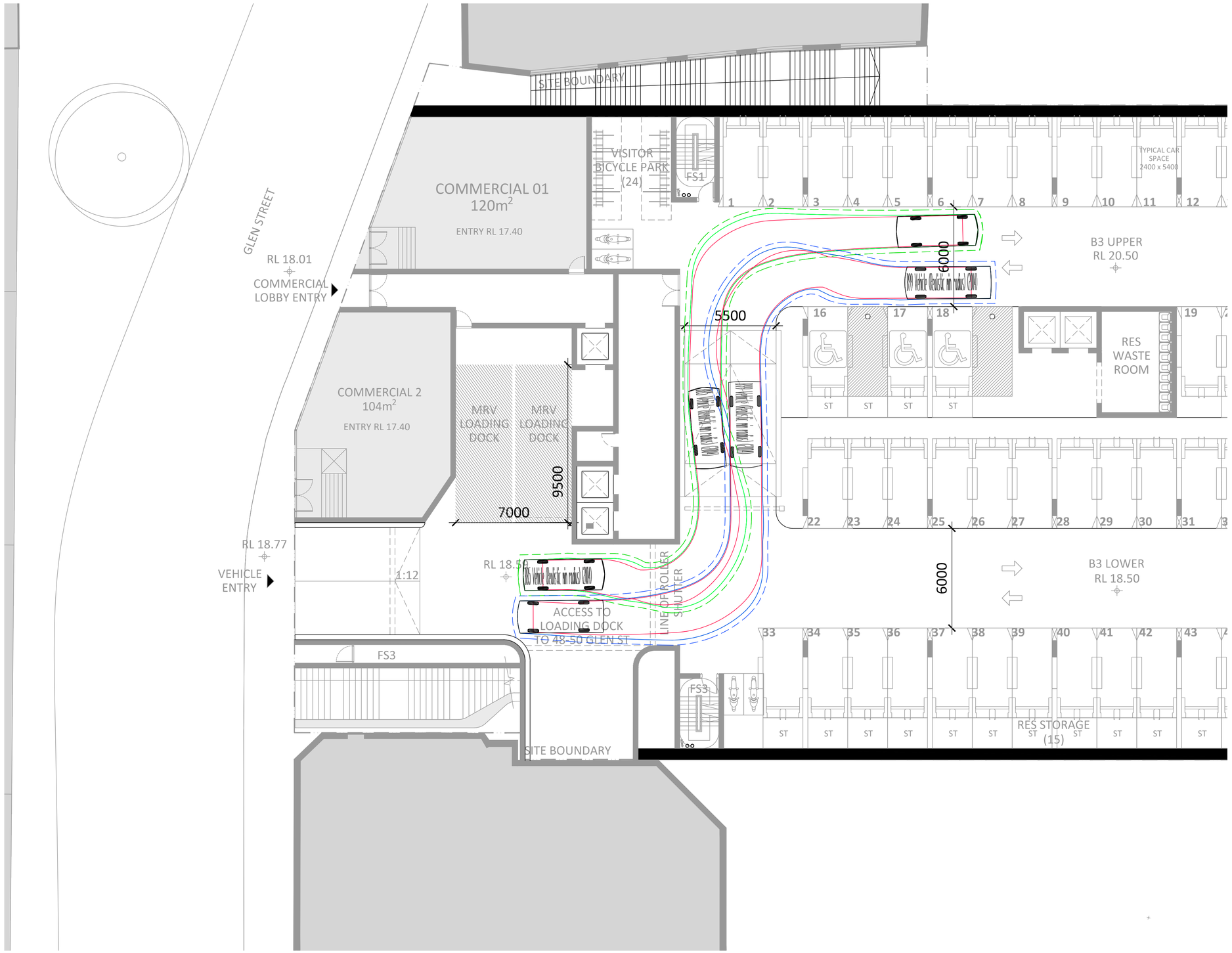


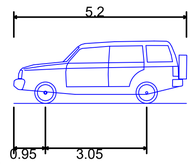
Source:
https://www.northsydney.nsw.gov.au/Recreation_Facilities/Walking_Cycling/Cycling/Cycling

Appendix C

Swept Paths

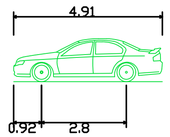
A1





B99 Vehicle (Realistic min radius) (2004) EGRESS

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m



B85 Vehicle (Realistic min radius) (2004) INGRESS

Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5.750m

NOTE: AS2890.1-2004 DOES NOT REQUIRE 300mm CLEARANCE IN BETWEEN B99 AND B85 VEHICLE SWEPT PATHS. ONLY 300mm CLEARANCE "ON ONE SIDE" OF EACH VEHICLE I.E. TO STRUCTURAL ELEMENTS

2.5 0 2.5 5.0 7.5 10.5 12.5
METRES
1:125

No	DATE	AMENDMENT
A	21/09/17	INITIAL ISSUE
B	29/09/17	CLIENT AMENDMENTS
C	7/11/17	CLIENT AMENDMENTS
D	23/11/17	CLIENT AMENDMENTS
E	21/02/19	CLIENT AMENDMENTS

BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS
PLANNING - PROJECT MANAGEMENT - ENGINEERING - CERTIFICATION
SYDNEY P: 02 9659 0005
CENTRAL COAST P: 02 4325 5255
HUNTER P: 02 4966 8388
ABN: 26 134 067 842
brs.com.au
mail@brs.com.au

Client: KOICHI TAKADA ARCHITECTS

52 ALFRED STREET, MILSONS POINT - SWEPT PATHS

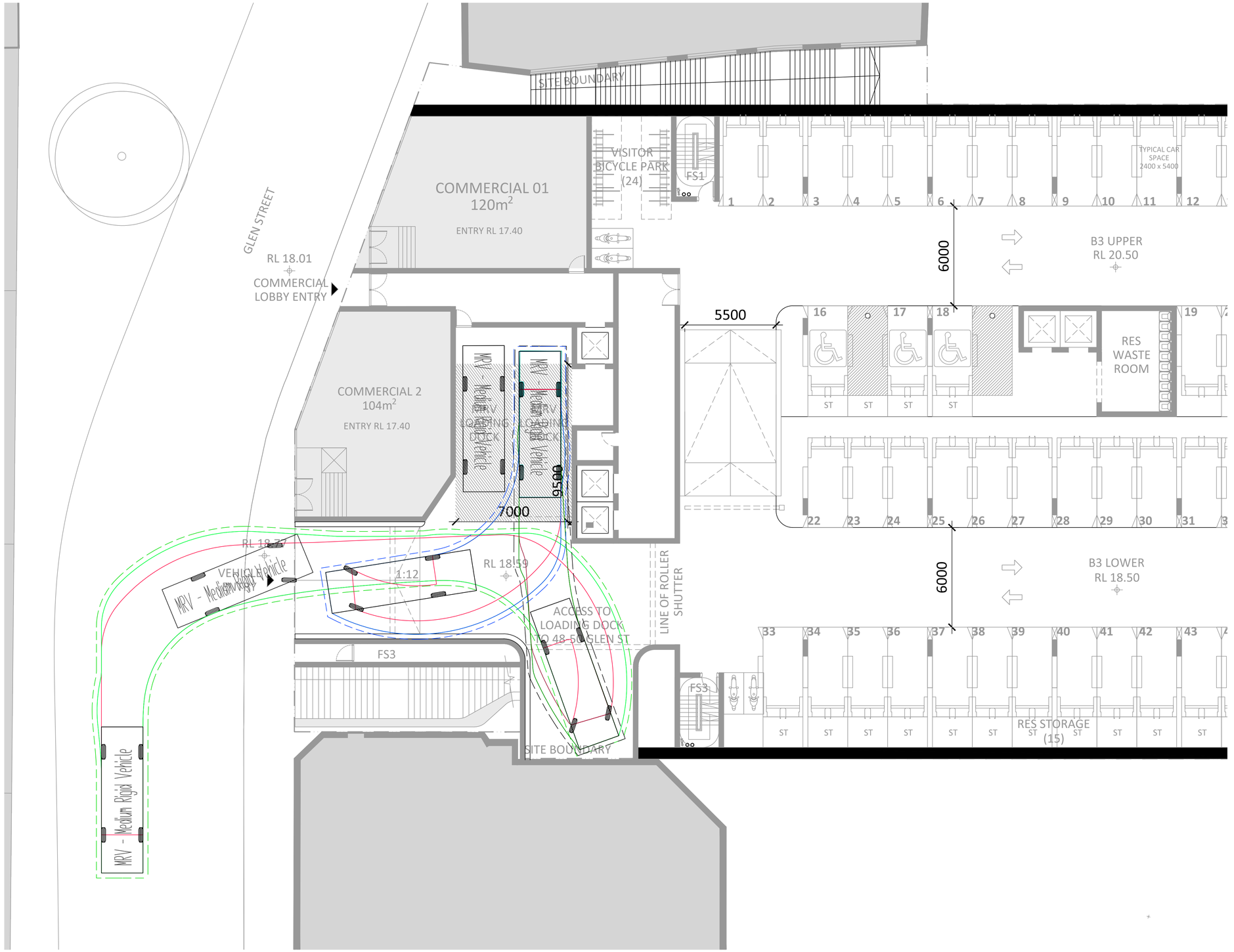
B3 ACCESS CIRCULATION - B85 & B99

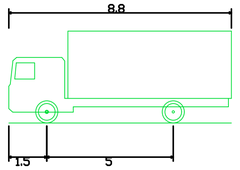
Designed: AWS
Drawn: AWS
Checked: EA

Scales: Plan 1:125
Horiz.
Vert.
X-Sect.
Datum:

Plan No.
SY170197SP1E
File Ref. REV.
SY170197SP1E.DWG E
SHEET 1 OF 5 SHEETS

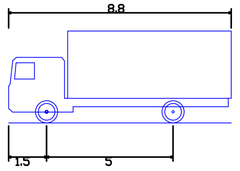
A1





MRV - Medium Rigid Vehicle INGRESS

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m



MRV - Medium Rigid Vehicle EGRESS

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

2.5 0 2.5 5.0 7.5 10.5 12.5 1:125
METRES

No	DATE	AMENDMENT
A	21/09/17	INITIAL ISSUE
B	29/09/17	CLIENT AMENDMENTS
C	7/11/17	CLIENT AMENDMENTS
D	23/11/17	CLIENT AMENDMENTS
E	21/02/19	CLIENT AMENDMENTS

BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS
PLANNING - PROJECT MANAGEMENT - ENGINEERING - CERTIFICATION
SYDNEY P: 02 9659 0005
CENTRAL COAST P: 02 4325 5255
HUNTER P: 02 4966 8388
ABN: 26 134 067 842
brs.com.au
mail@brs.com.au

Client: KOICHI TAKADA ARCHITECTS

52 ALFRED STREET, MILSONS POINT - SWEPT PATHS

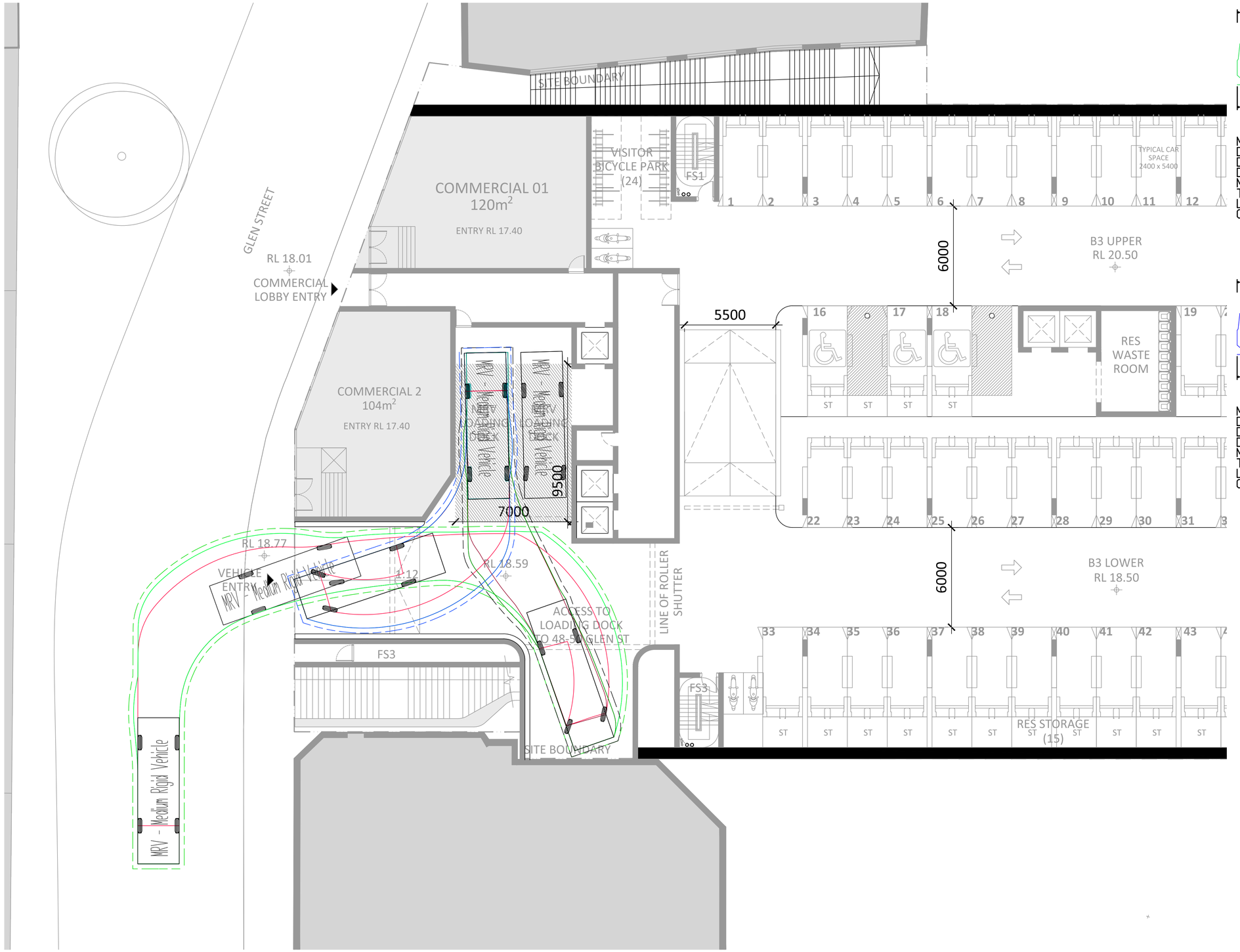
B3 ACCESS CIRCULATION - MRV BAY 1

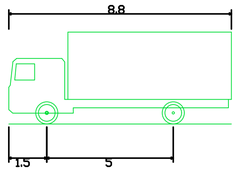
Designed: AWS
Drawn: AWS
Checked: EA

Scales: Plan 1:125
Horiz.
Vert.
X-Sect.
Datum:

Plan No. SY170197SP1E
File Ref. SY170197SP1E.DWG
REV. E
SHEET 2 OF 5 SHEETS

A1





MRV - Medium Rigid Vehicle INGRESS

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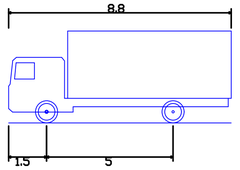
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m



MRV - Medium Rigid Vehicle EGRESS

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Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

2.5 0 2.5 5.0 7.5 10.5 12.5 1:125
METRES

No	DATE	AMENDMENT
A	21/09/17	INITIAL ISSUE
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D	23/11/17	CLIENT AMENDMENTS
E	21/02/19	CLIENT AMENDMENTS

BARKER RYAN STEWART
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CENTRAL COAST P: 02 4325 5255
HUNTER P: 02 4966 8388
ABN: 26 134 067 842
brs.com.au
mail@brs.com.au

Client: KOICHI TAKADA ARCHITECTS

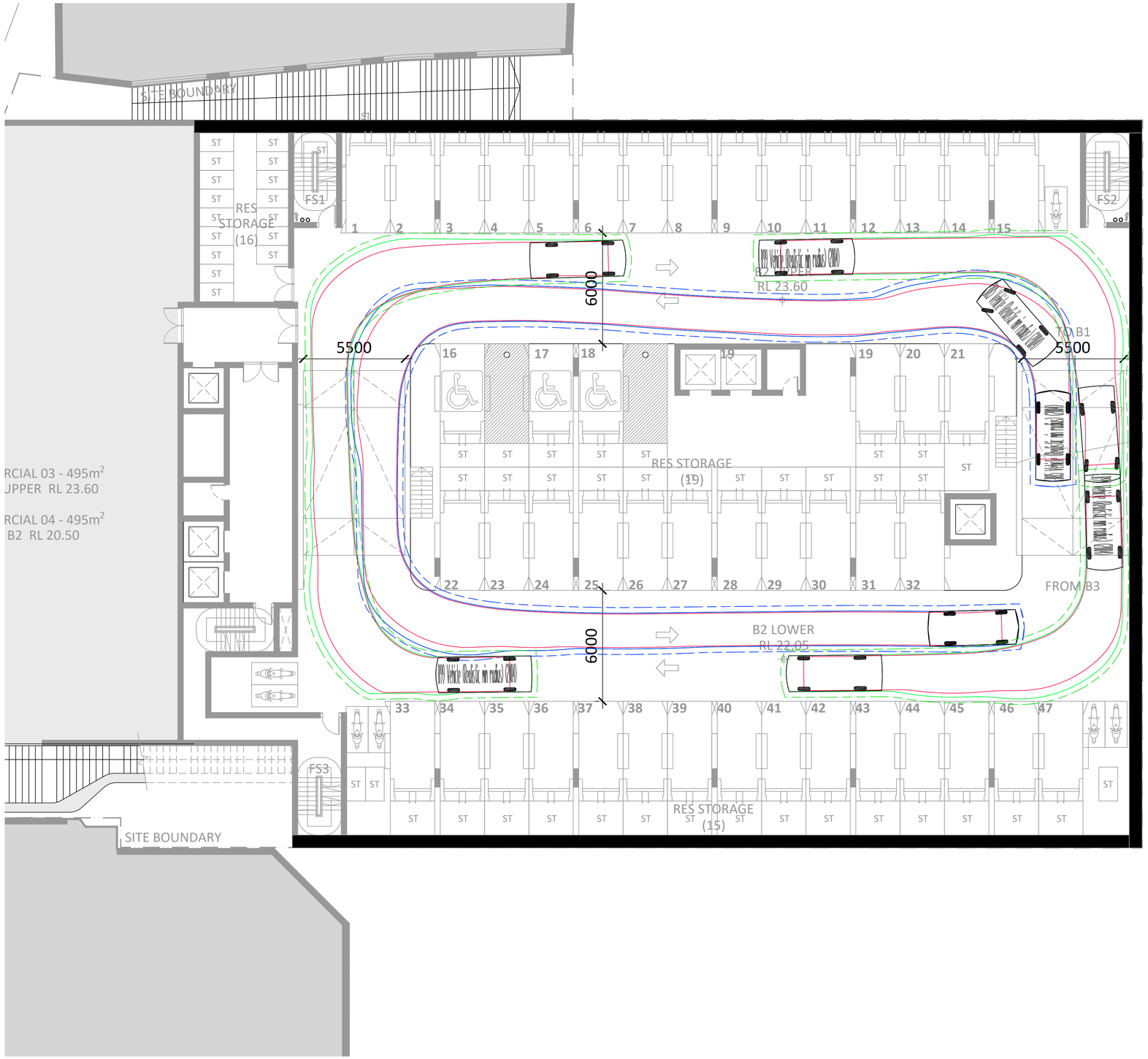
52 ALFRED STREET, MILSONS POINT - SWEPT PATHS

B3 ACCESS CIRCULATION - MRV BAY 2

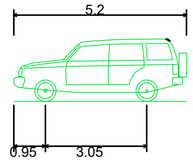
Designed: AWS
Drawn: AWS
Checked: EA
Scales: Plan 1:125, Horiz., Vert., X-Sect.
Datum:

Plan No. SY170197SP1E
File Ref. SY170197SP1E.DWG
REV. E
SHEET 3 OF 5 SHEETS

A1

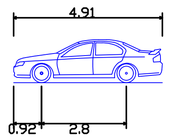


ALFRED STREET



B99 Vehicle (Realistic min radius) (2004) INGRESS

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m



B85 Vehicle (Realistic min radius) (2004) EGRESS

Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5.750m

NOTE: AS2890.1-2004 DOES NOT REQUIRE 300mm CLEARANCE IN BETWEEN B99 AND B85 VEHICLE SWEPT PATHS. ONLY 300mm CLEARANCE "ON ONE SIDE" OF EACH VEHICLE I.E. TO STRUCTURAL ELEMENTS

2.5 0 2.5 5.0 7.5 10.5 12.5
METRES
1:125

No	DATE	AMENDMENT
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D	23/11/17	CLIENT AMENDMENTS
E	21/02/19	CLIENT AMENDMENTS

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TOTAL PROJECT SOLUTIONS
PLANNING - PROJECT MANAGEMENT - ENGINEERING - CERTIFICATION
SYDNEY P: 02 9659 0005
CENTRAL COAST P: 02 4325 5255
HUNTER P: 02 4966 8388
ABN: 26 134 067 842
brs.com.au
mail@brs.com.au

Client: KOICHI TAKADA ARCHITECTS

52 ALFRED STREET, MILSONS POINT - SWEPT PATHS

B99 AND B85 VEHICLE INDICATIVE CIRCULATION

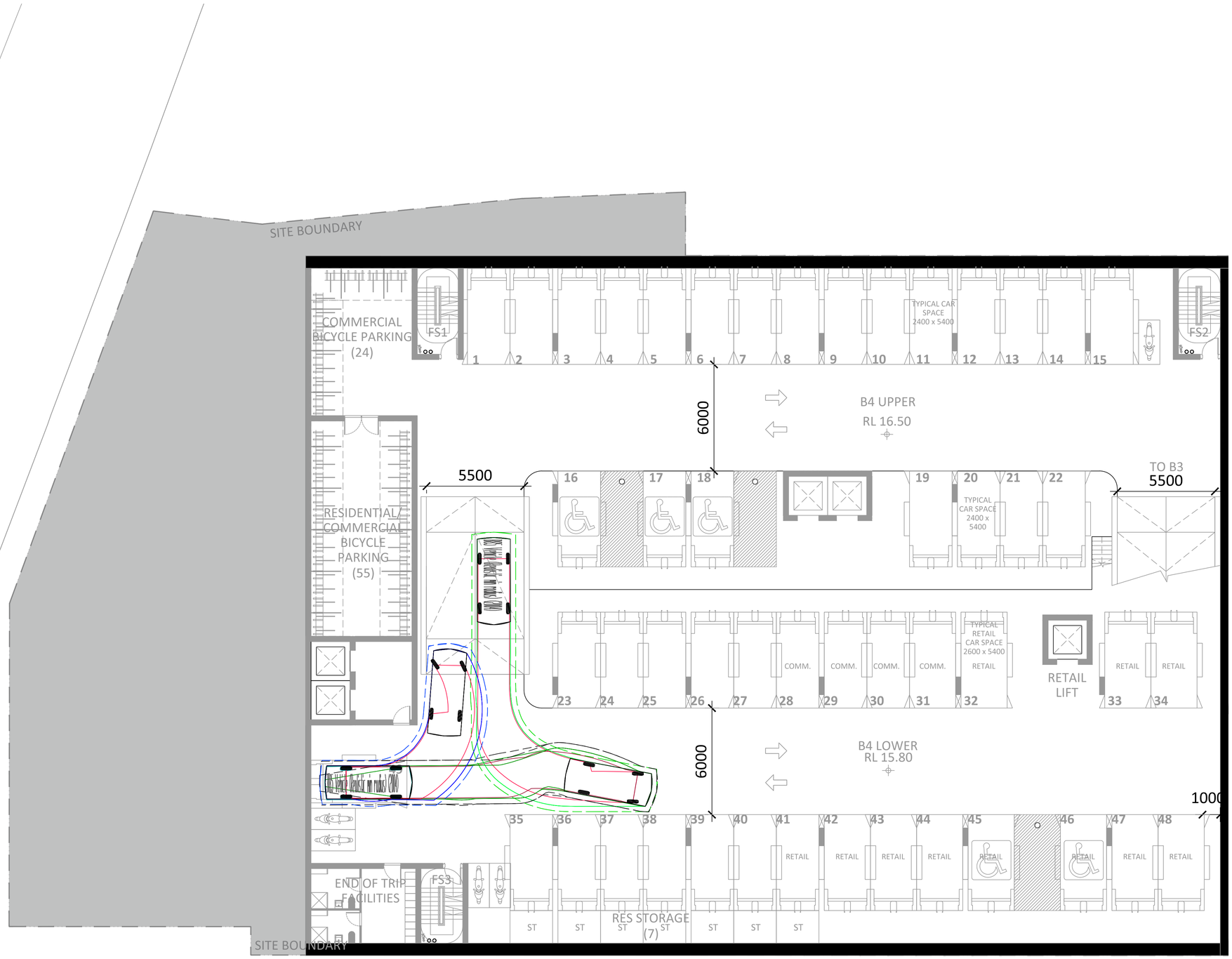
Designed: AWS
Drawn: AWS
Checked: EA

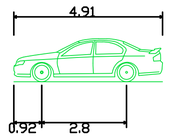
Scales: Plan 1:125
Horiz.
Vert.
X-Sect.

Datum:

Plan No.
SY170197SP1E
File Ref. SY170197SP1E.DWG
REV. E
SHEET 4 OF 5 SHEETS

A1





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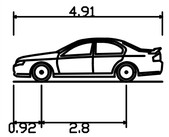

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Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5.750m

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2.5 0 2.5 5.0 7.5 10.5 12.5
METRES
1:125

No	DATE	AMENDMENT
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E	21/02/19	CLIENT AMENDMENTS

BARKER RYAN STEWART
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PLANNING - PROJECT MANAGEMENT - ENGINEERING - CERTIFICATION
SYDNEY P: 02 9659 0005
CENTRAL COAST P: 02 4325 5255
HUNTER P: 02 4966 8388
ABN: 26 134 067 842
brs.com.au
mail@brs.com.au

Client: KOICHI TAKADA ARCHITECTS

52 ALFRED STREET, MILSONS POINT - SWEPT PATHS

B85 VEHICLE PARKING AND UNPARKING

Designed: AWS
Drawn: AWS
Checked: EA
Scales: Plan 1:125 Horiz. Vert. X-Sect.
Datum:

Plan No. SY170197SP1E
File Ref. SY170197SP1E.DWG
REV. E
SHEET 5 OF 5 SHEETS

Appendix D

SIDRA Output

MOVEMENT SUMMARY

Site: 102 [GlenXAlfred - AM - Post Dev]

Network: 1 [AM Post Dev]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: RoadName													
2	T1	418	5.0	418	5.0	0.221	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		418	5.0	418	5.0	0.221	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: RoadName													
8	T1	513	5.0	513	5.0	0.271	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		513	5.0	513	5.0	0.271	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: RoadName													
10	L2	68	0.0	68	0.0	0.063	7.1	LOS A	0.2	1.7	0.44	0.65	48.2
Approach		68	0.0	68	0.0	0.063	7.1	LOS A	0.2	1.7	0.44	0.65	48.2
All Vehicles		999	4.7	999	4.7	0.271	0.5	NA	0.2	1.7	0.03	0.04	58.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [FitzroyXAlfred - AM - Post Dev]

Network: 1 [AM Post Dev]

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: RoadName													
2	T1	94	0.0	94	0.0	0.179	4.0	LOS A	1.0	7.2	0.53	0.66	23.6
3	R2	91	0.0	91	0.0	0.179	7.9	LOS A	1.0	7.2	0.53	0.66	32.5
Approach		184	0.0	184	0.0	0.179	5.9	LOS A	1.0	7.2	0.53	0.66	29.3
East: RoadName													
4	L2	113	0.0	113	0.0	0.369	4.8	LOS A	2.5	18.3	0.42	0.62	29.5
6	R2	347	5.0	347	5.0	0.369	9.7	LOS A	2.5	18.3	0.42	0.62	28.8
Approach		460	3.8	460	3.8	0.369	8.5	LOS A	2.5	18.3	0.42	0.62	29.0
North: RoadName													
7	L2	495	5.0	495	5.0	0.472	4.5	LOS A	4.0	28.7	0.38	0.48	43.8
8	T1	158	0.0	158	0.0	0.472	4.7	LOS A	4.0	28.7	0.38	0.48	40.6
Approach		653	3.8	653	3.8	0.472	4.6	LOS A	4.0	28.7	0.38	0.48	43.2
All Vehicles		1297	3.2	1297	3.2	0.472	6.2	LOS A	4.0	28.7	0.42	0.55	37.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
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.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 102 [GlenXAlfred - PM - Post Dev]

Network: 1 [PM Post Dev]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: RoadName													
2	T1	305	5.0	305	5.0	0.162	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		305	5.0	305	5.0	0.162	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: RoadName													
8	T1	624	5.0	624	5.0	0.331	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		624	5.0	624	5.0	0.331	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: RoadName													
10	L2	92	0.0	92	0.0	0.074	6.6	LOS A	0.3	2.1	0.37	0.61	48.5
Approach		92	0.0	92	0.0	0.074	6.6	LOS A	0.3	2.1	0.37	0.61	48.5
All Vehicles		1021	4.6	1021	4.6	0.331	0.6	NA	0.3	2.1	0.03	0.05	58.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [FitzroyXAlfred - PM - Post Dev]

Network: 1 [PM Post Dev]

New Site
Roundabout

Movement Performance - Vehicles													
Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: RoadName													
2	T1	112	0.0	112	0.0	0.204	3.2	LOS A	1.2	8.2	0.40	0.60	25.1
3	R2	129	0.0	129	0.0	0.204	7.1	LOS A	1.2	8.2	0.40	0.60	33.5
Approach		241	0.0	241	0.0	0.204	5.3	LOS A	1.2	8.2	0.40	0.60	30.9
East: RoadName													
4	L2	81	0.0	81	0.0	0.217	4.5	LOS A	1.3	9.3	0.34	0.60	30.2
6	R2	189	5.0	189	5.0	0.217	9.4	LOS A	1.3	9.3	0.34	0.60	29.7
Approach		271	3.5	271	3.5	0.217	8.0	LOS A	1.3	9.3	0.34	0.60	29.9
North: RoadName													
7	L2	409	5.0	409	5.0	0.418	4.8	LOS A	3.1	22.3	0.41	0.50	43.5
8	T1	134	0.0	134	0.0	0.418	4.9	LOS A	3.1	22.3	0.41	0.50	40.3
Approach		543	3.8	543	3.8	0.418	4.8	LOS A	3.1	22.3	0.41	0.50	42.9
All Vehicles		1055	2.8	1055	2.8	0.418	5.7	LOS A	3.1	22.3	0.39	0.55	38.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
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.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 102 [GlenXAlfred - AM - Design]

Network: 1 [AM Design]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles													
Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: RoadName													
2	T1	418	5.0	418	5.0	0.221	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		418	5.0	418	5.0	0.221	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: RoadName													
8	T1	513	5.0	513	5.0	0.271	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		513	5.0	513	5.0	0.271	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: RoadName													
10	L2	68	0.0	68	0.0	0.063	7.1	LOS A	0.2	1.7	0.44	0.65	48.2
Approach		68	0.0	68	0.0	0.063	7.1	LOS A	0.2	1.7	0.44	0.65	48.2
All Vehicles		999	4.7	999	4.7	0.271	0.5	NA	0.2	1.7	0.03	0.04	58.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [FitzroyXAlfred - AM - Design]

Network: 1 [AM Design]

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: RoadName													
2	T1	94	0.0	94	0.0	0.179	4.0	LOS A	1.0	7.2	0.53	0.66	23.6
3	R2	91	0.0	91	0.0	0.179	7.9	LOS A	1.0	7.2	0.53	0.66	32.5
Approach		184	0.0	184	0.0	0.179	5.9	LOS A	1.0	7.2	0.53	0.66	29.3
East: RoadName													
4	L2	113	0.0	113	0.0	0.369	4.8	LOS A	2.5	18.3	0.42	0.62	29.5
6	R2	347	5.0	347	5.0	0.369	9.7	LOS A	2.5	18.3	0.42	0.62	28.8
Approach		460	3.8	460	3.8	0.369	8.5	LOS A	2.5	18.3	0.42	0.62	29.0
North: RoadName													
7	L2	495	5.0	495	5.0	0.472	4.5	LOS A	4.0	28.7	0.38	0.48	43.8
8	T1	158	0.0	158	0.0	0.472	4.7	LOS A	4.0	28.7	0.38	0.48	40.6
Approach		653	3.8	653	3.8	0.472	4.6	LOS A	4.0	28.7	0.38	0.48	43.2
All Vehicles		1297	3.2	1297	3.2	0.472	6.2	LOS A	4.0	28.7	0.42	0.55	37.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
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.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 102 [GlenXAlfred - PM - Design]

Network: 1 [PM Design]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: RoadName													
2	T1	305	5.0	305	5.0	0.162	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		305	5.0	305	5.0	0.162	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: RoadName													
8	T1	624	5.0	624	5.0	0.331	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		624	5.0	624	5.0	0.331	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: RoadName													
10	L2	92	0.0	92	0.0	0.074	6.6	LOS A	0.3	2.1	0.37	0.61	48.5
Approach		92	0.0	92	0.0	0.074	6.6	LOS A	0.3	2.1	0.37	0.61	48.5
All Vehicles		1021	4.6	1021	4.6	0.331	0.6	NA	0.3	2.1	0.03	0.05	58.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [FitzroyXAlfred - PM - Design]

Network: 1 [PM Design]

New Site
Roundabout

Movement Performance - Vehicles													
Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: RoadName													
2	T1	112	0.0	112	0.0	0.204	3.2	LOS A	1.2	8.2	0.40	0.60	25.1
3	R2	129	0.0	129	0.0	0.204	7.1	LOS A	1.2	8.2	0.40	0.60	33.5
Approach		241	0.0	241	0.0	0.204	5.3	LOS A	1.2	8.2	0.40	0.60	30.9
East: RoadName													
4	L2	81	0.0	81	0.0	0.217	4.5	LOS A	1.3	9.3	0.34	0.60	30.2
6	R2	189	5.0	189	5.0	0.217	9.4	LOS A	1.3	9.3	0.34	0.60	29.7
Approach		271	3.5	271	3.5	0.217	8.0	LOS A	1.3	9.3	0.34	0.60	29.9
North: RoadName													
7	L2	409	5.0	409	5.0	0.418	4.8	LOS A	3.1	22.3	0.41	0.50	43.5
8	T1	134	0.0	134	0.0	0.418	4.9	LOS A	3.1	22.3	0.41	0.50	40.3
Approach		543	3.8	543	3.8	0.418	4.8	LOS A	3.1	22.3	0.41	0.50	42.9
All Vehicles		1055	2.8	1055	2.8	0.418	5.7	LOS A	3.1	22.3	0.39	0.55	38.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
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.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 102 [GlenXAlfred - AM - Ex]

Network: 1 [AM Ex]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: RoadName													
2	T1	418	5.0	418	5.0	0.221	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		418	5.0	418	5.0	0.221	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: RoadName													
8	T1	601	5.0	601	5.0	0.318	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		601	5.0	601	5.0	0.318	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: RoadName													
10	L2	52	0.0	52	0.0	0.048	7.1	LOS A	0.2	1.3	0.44	0.64	48.2
Approach		52	0.0	52	0.0	0.048	7.1	LOS A	0.2	1.3	0.44	0.64	48.2
All Vehicles		1071	4.8	1071	4.8	0.318	0.4	NA	0.2	1.3	0.02	0.03	58.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [FitzroyXAlfred - AM - Ex]

Network: 1 [AM Ex]

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: RoadName													
2	T1	94	0.0	94	0.0	0.161	3.9	LOS A	0.9	6.3	0.51	0.64	24.1
3	R2	74	0.0	74	0.0	0.161	7.9	LOS A	0.9	6.3	0.51	0.64	32.9
Approach		167	0.0	167	0.0	0.161	5.7	LOS A	0.9	6.3	0.51	0.64	29.3
East: RoadName													
4	L2	76	0.0	76	0.0	0.319	4.5	LOS A	2.1	14.5	0.35	0.61	29.6
6	R2	347	0.0	347	0.0	0.319	9.4	LOS A	2.1	14.5	0.35	0.61	29.0
Approach		423	0.0	423	0.0	0.319	8.5	LOS A	2.1	14.5	0.35	0.61	29.1
North: RoadName													
7	L2	495	5.0	495	5.0	0.435	4.4	LOS A	3.5	25.4	0.32	0.46	44.3
8	T1	121	0.0	121	0.0	0.435	4.6	LOS A	3.5	25.4	0.32	0.46	41.2
Approach		616	4.0	616	4.0	0.435	4.4	LOS A	3.5	25.4	0.32	0.46	43.8
All Vehicles		1206	2.1	1206	2.1	0.435	6.0	LOS A	3.5	25.4	0.36	0.54	37.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
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.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 102 [GlenXAlfred - PM - Ex]

Network: 1 [PM Ex]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: RoadName													
2	T1	305	5.0	305	5.0	0.162	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		305	5.0	305	5.0	0.162	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: RoadName													
8	T1	476	5.0	476	5.0	0.252	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		476	5.0	476	5.0	0.252	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: RoadName													
10	L2	65	0.0	65	0.0	0.053	6.6	LOS A	0.2	1.4	0.37	0.60	48.5
Approach		65	0.0	65	0.0	0.053	6.6	LOS A	0.2	1.4	0.37	0.60	48.5
All Vehicles		846	4.6	846	4.6	0.252	0.5	NA	0.2	1.4	0.03	0.05	58.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [FitzroyXAlfred - PM - Ex]

Network: 1 [PM Ex]

New Site
Roundabout

Movement Performance - Vehicles													
Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: RoadName													
2	T1	112	0.0	112	0.0	0.182	3.2	LOS A	1.0	7.1	0.39	0.58	25.4
3	R2	103	0.0	103	0.0	0.182	7.1	LOS A	1.0	7.1	0.39	0.58	33.8
Approach		215	0.0	215	0.0	0.182	5.0	LOS A	1.0	7.1	0.39	0.58	30.8
East: RoadName													
4	L2	58	0.0	58	0.0	0.193	4.4	LOS A	1.1	8.0	0.30	0.59	30.2
6	R2	189	5.0	189	5.0	0.193	9.3	LOS A	1.1	8.0	0.30	0.59	29.6
Approach		247	3.8	247	3.8	0.193	8.2	LOS A	1.1	8.0	0.30	0.59	29.8
North: RoadName													
7	L2	409	5.0	409	5.0	0.387	4.6	LOS A	2.8	20.1	0.35	0.48	44.0
8	T1	111	0.0	111	0.0	0.387	4.7	LOS A	2.8	20.1	0.35	0.48	40.9
Approach		520	3.9	520	3.9	0.387	4.6	LOS A	2.8	20.1	0.35	0.48	43.5
All Vehicles		982	3.0	982	3.0	0.387	5.6	LOS A	2.8	20.1	0.35	0.53	38.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
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.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)