16 William Cox Drive, Richmond

Planning Proposal
Transport Impact Assessment

Prepared by: GTA Consultants (NSW) Pty Ltd for Hobartville Stud Pty Ltd
on 17/09/19
Reference: N154240
Issue #: B

GTAconsultants

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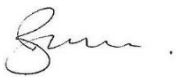
Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A	06/09/19	Final	Sherry Merson	Rhys Hazell	Rhys Hazell	Rhys Hazell
B	17/09/19	Updated to include minor amendments	Sherry Merson	Rhys Hazell	Rhys Hazell	

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CONTENTS

Figures

Tables

1. INTRODUCTION

01

1.1. Background & Proposal

A planning proposal is to be lodged with Hawkesbury Council (Council) for rezoning part of the site for residential uses. The indicative scheme shows residential development on land at 16 William Cox Drive, Richmond. The proposal incorporates 118 residential dwellings (87 terraces and 31 cottages) on land east and west of a central heritage precinct. The area of rezoning covers approximately 10 hectares.

Knight Frank Town Planning engaged GTA Consultants (GTA) to complete a transport assessment as part of the planning proposal.

1.2. Purpose of this Report

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

- existing traffic and parking conditions surrounding the site
- suitability of the proposed parking in terms of supply (quantum) and layout
- service vehicle requirements
- pedestrian and bicycle requirements
- the traffic generating characteristics of the proposal
- suitability of the proposed access arrangements for the site
- 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
- Hawkesbury Development Control Plan (DCP) 2002
- Australian Standard/ New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1:2004AS2890.6:2009.
- Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS 2890.2:2018
- traffic surveys undertaken by Matrix as referenced in the context of this report
- plans for the proposal prepared by Roberts Day, Drawing Number RD1 001 Revision A, dated 18 July 2019
- other documents and data as referenced in this report.

2. STRATEGIC CONTEXT

02

2.1. Overview

The following key strategies and plans have influenced development opportunities in the strategic centre of Richmond and broader north-west growth area, together with real effects on future travel demand and mode splits for both workers and residents alike.

2.2. Relevant Strategies and Plans

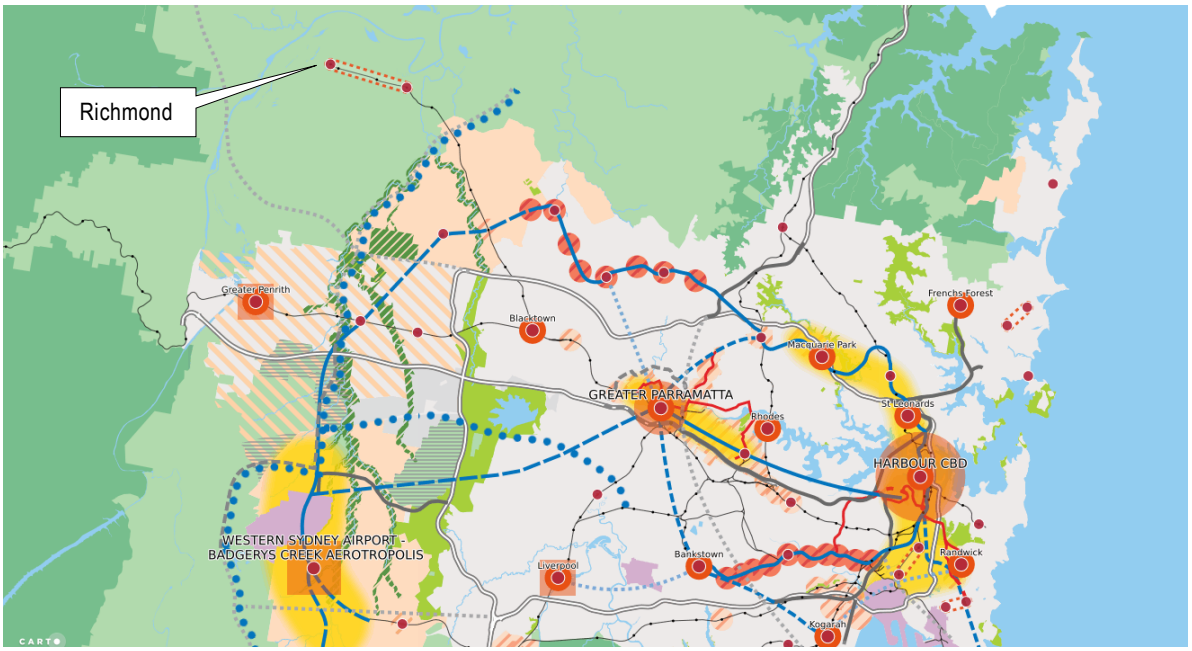
2.2.1. The Greater Sydney Region Plan 2018

The Greater Sydney Commission (GSC) is an independent organisation that leads metropolitan planning for Greater Sydney. It has prepared the Greater Sydney Region Plan which outlines how Greater Sydney will manage growth and guide infrastructure delivery. The plan has been prepared in conjunction with the NSW Government's Future Transport 2056 Strategy and informs Infrastructure NSW's State Infrastructure Strategy.

The GSC's vision is to create three connected cities; a Western Parkland City west of the M7, a Central River City with Greater Parramatta at its heart and an Eastern Harbour City. By integrating land use, transport links and infrastructure across the three cities, more people will have access within 30-minutes to jobs, schools, hospitals and services.

The Greater Sydney Region Plan is a 20-year plan with a 40-year vision and has four key focuses; infrastructure and collaboration, liveability, productivity and sustainability. The Greater Sydney Structure Plan 2056 is shown in Figure 2.1.

Figure 2.1: Structure Plan for the Metropolis of Three Cities



Source: greater.sydney/structure-plan-metropolis-of-three-cities

2.2.2. Western City District Plan

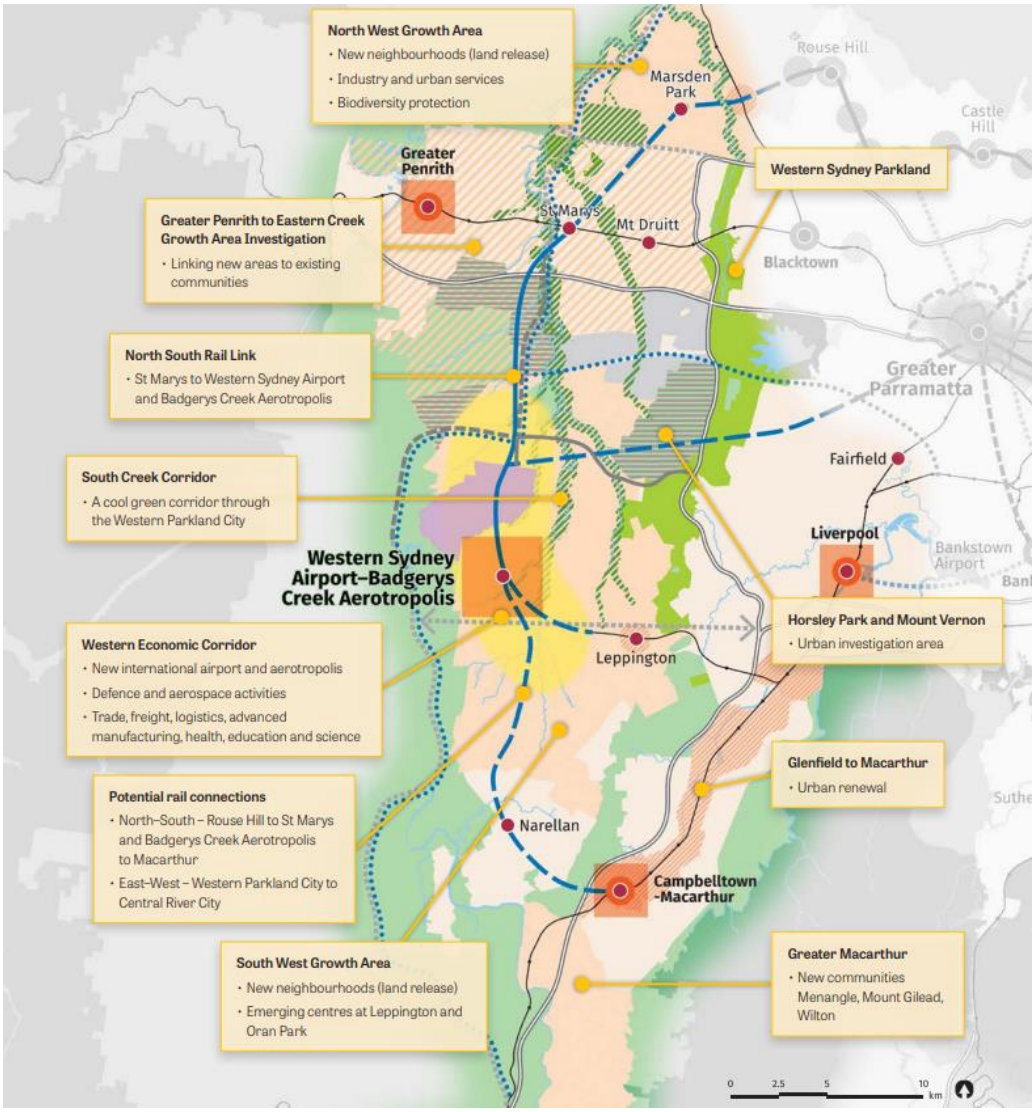
The vision for Greater Sydney as a metropolis of three cities – the Western Parkland City, the Central River City and the Eastern Harbour City and a 30-minute city – means residents in the Western City District Plan will have quicker and easier access to a wider range of jobs, housing types and activities as part of the overall transformation. The vision will improve the District's lifestyle and environmental assets.

The Western City District Plan is at the centre of the Western Parkland City which will be a polycentric city capitalising on the established centres of Liverpool, Greater Penrith and Campbelltown-Macarthur. The Western Parkland City will take on a new shape with the delivery of the North South Rail Link from St Mary's to Western Sydney Airport and

Badgerys Creek Aerotropolis. A potential new east-west mass transit corridor will connect the Western Parkland City to the Central River City. In the long term a potential Outer Sydney Orbital will provide the city with direct connections to Greater Newcastle, Wollongong and Canberra.

The Plan puts emphasis on strengthening the three established centres to optimise infrastructure, employment and liveability outcomes. This attributes to providing green neighbourhoods and centres with generous open space in a parkland setting. The parkland character will be enhanced by the national parks and rural areas framing the city. Although Richmond is 10km north-west of the Western Parkland City, it remains a strategic centre. The Western Parkland City District is shown in Figure 2.2.

Figure 2.2: Western Parkland City District



Source: greater.sydney/metropolis-of-three-cities/vision-of-metropolis-of-three-cities/western-parkland-city-vision

2.2.3. Future Transport 2056

Future Transport 2056 provides a 40-year strategy for how transport will be planned, amended and forecasted within NSW, both regional and metropolitan, for the expected 12 million residents within the state. Future Transport 2056 follows from the 2012 Long Term Transport Master Plan which listed over 700 transport projects, the majority of which are completed or in progress. It also ties in with Greater Sydney Region Plan and the subsequent district plans to support the three cities metropolis vision.

Future Transport 2056 is supported by two key documents, Greater Sydney Services and Infrastructure Plan and Regional NSW Services and Infrastructure Plan, which provide guidance and planning for these areas.

From a metropolitan view, Future Transport 2056 and associated plans include the 30-minute city where jobs and services are within 30 minutes of residents with Greater Sydney. Strategic transport corridors to move people and goods are outlined between metropolitan and strategic centres, clusters and surrounds. The Movement and Place framework is also emphasised to support liveability, productivity and sustainability.

2.3. Local Context

The Australian and NSW Governments are funding several projects in the Richmond and North Richmond area and surrounds, with the aim to reduce traffic delay, manage congestion and improve travel times. These projects include road upgrades and bridge projects.

2.3.1. Alternative Yarramundi Bridge Crossing

The North Richmond 'Redbank' Transport Management and Accessibility Plan (TMAP) assessed the impacts of the proposed Redbank development in North Richmond. It included an assessment of the surrounding road network and its intersections and to identify any upgrade requirements to alleviate the impacts of the development.

The TMAP recommended creating an alternative crossing of the Grose River, connecting to Springwood Road, to facilitate crossing of the Hawkesbury River from North Richmond by a secondary route at Yarramundi. Progress on the delivery of this new river crossing is ongoing with community consultation critical to defining the appropriate alignment, flood prevention and traffic impacts. If implemented, it would provide an alternative local area route and reduce pressure on Richmond Bridge and Richmond Road. In relation to the site, Yarramundi Bridge is shown in Figure 2.3.

Figure 2.3: Location of Yarramundi Bridge to the site

Base image source: Nearmap

2.3.2. Windsor Bridge Replacement

The Windsor Bridge Replacement Project for NSW Roads and Maritime Services involves the replacement of the ageing Windsor Bridge with a new bridge. The new bridge is nearing completion and will include two southbound lanes and one northbound lane 35 metres east of the existing bridge. Given the topography of the area, the new bridge would also cope with greater flood events. The project will free congestion for the bridge that has reached up to 19,000 vehicles

per day and improve safety for pedestrians and cyclists with provision of a shared path. In relation to the site, the location of Windsor Bridge is shown in Figure 2.4.

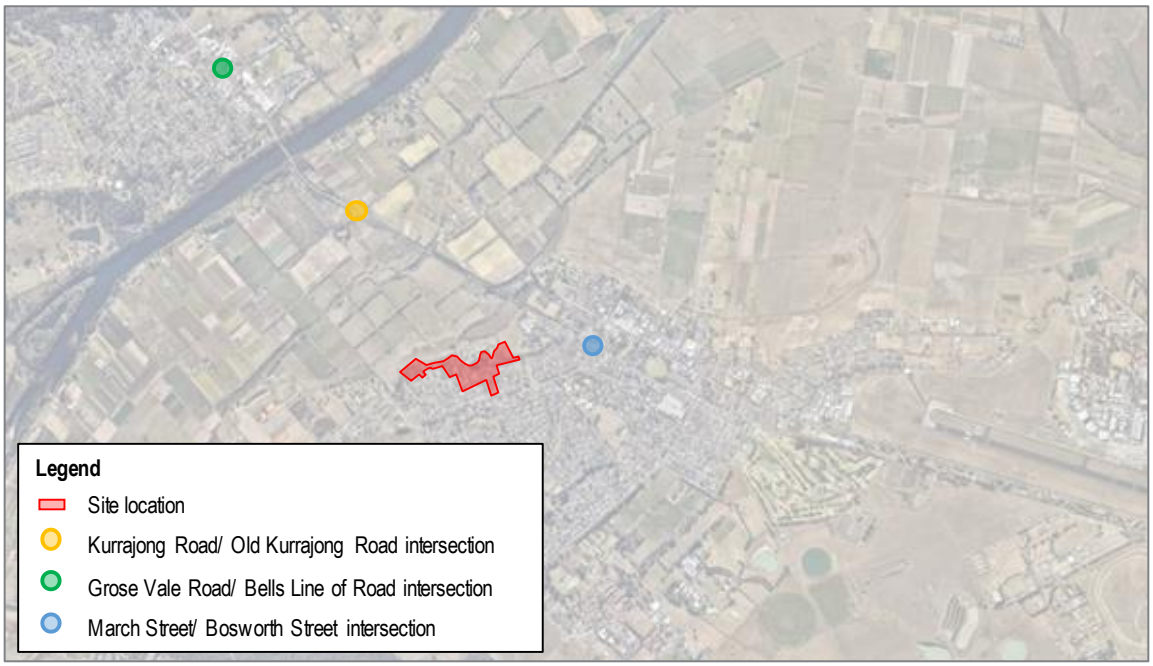
Figure 2.4: Location of Windsor Bridge to the site

Base image source: Nearmap

2.3.3. Richmond Intersection Improvement

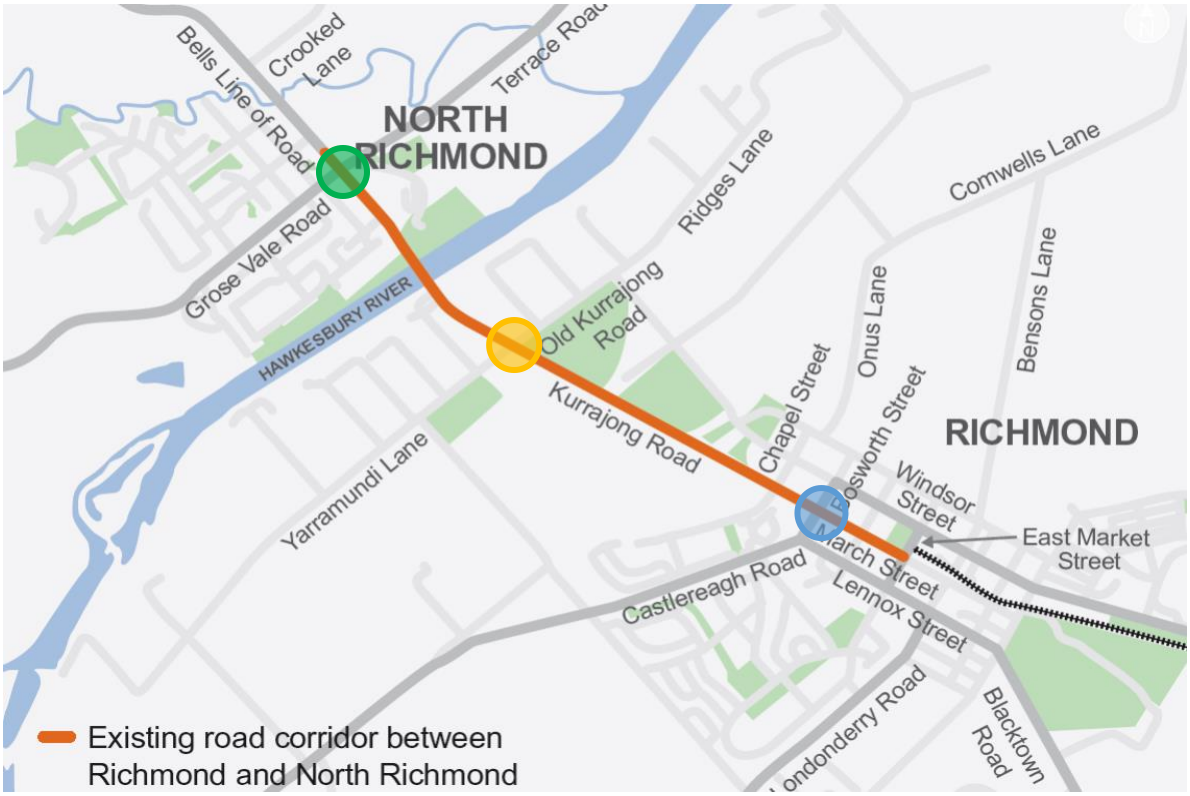
In 2012 Roads and Maritime published the Richmond Bridge and Approaches Congestion Study, which identified three intersections covering three stages. Stage 1 at the Kurrajong Road/ Old Kurrajong Road intersection in Richmond and Stage 2 at the Grose Vale Road/ Bells Line of Road intersection in North Richmond are complete. Stage 3 includes upgrades to the March Street/ Bosworth Street intersection in Richmond. Figure 2.5 identifies the location of intersections in relation to the site, Figure 2.6 the study area and Figure 2.7 details the improvements of the Grose Vale Road/ Bells Line of Road intersection.

Figure 2.5: Location of intersections to the site



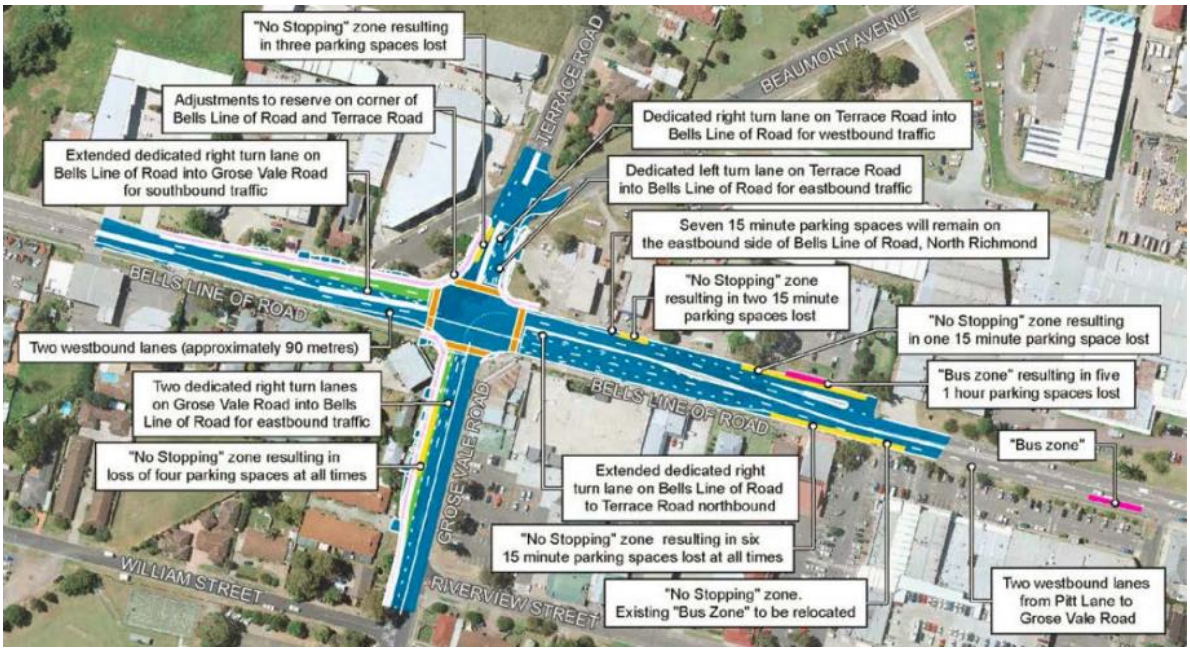
Base image source: Nearmap

Figure 2.6: Roads and Maritime study area



Source: Roads and Maritime Services rms.nsw.gov.au/projects/sydney-west/richmond-area-projects

Figure 2.7: Grose Vale Road and Bells Line of Road upgrade



Source: Roads and Maritime Services rms.nsw.gov.au/projects/sydney-west/richmond-area-projects

The study identified the three intersections as key locations for improvement to help reduce and manage congestion, improve traffic flow, increase road user and pedestrian safety and reduce travel times between Richmond and North Richmond.

2.3.4. Richmond Bridge Duplication

As part of the Richmond Bridge and Approaches Congestion Study, Roads and Maritime are continuing to assess traffic volumes, travel times and queue lengths around several locations within the area as part of an investigation for duplicating the Richmond Bridge over the Hawkesbury River as a longer-term solution.

Overall, the combination of these works in the local area will realise noticeable improvements for locals, and regional benefits through improved travel times through the area. The site itself will also benefit given improved access arrangements and less congestion generally at key intersections and travel paths through Richmond and North Richmond.

3. EXISTING CONDITIONS

03

3.1. Local Context

The site is within Hawkesbury Council LGA, 34 kilometres north-west of Parramatta CBD. The area of the proposed rezoning covers approximately 10 hectares and forms part of the planning proposal. The site is zoned RU2 rural landscape and is occupied by a rural property and various structures and surrounded by RU2 rural landscape and R2 low density residential with R3 medium density residential south of Castlereagh Road.

Richmond is a strategic centre on the outskirts of Sydney and mostly comprises low density residential dwellings that generate low traffic volumes in the immediate vicinity of the site. The study area is approximately 1.5 kilometres north-west of Richmond Station. The broader surrounding area includes residential dwellings, hotels/ motels, education facilities and various retail shops in Richmond town centre.

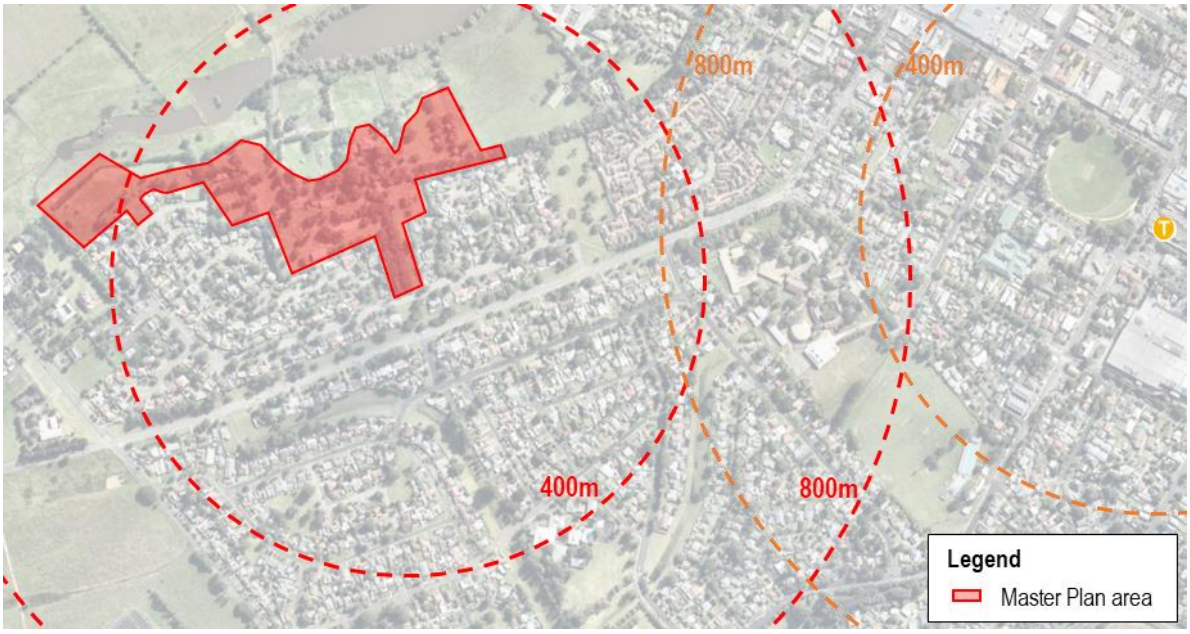
Castlereagh Road, Kurrajong Road and March Street are State Roads and generally provide one traffic lane and one parking lane in each direction. March Street provides access to Richmond Station and Richmond Marketplace.

William Cox Drive and Chapel Street are local roads that provide access to the site and surrounding low density residential dwellings. The aged care facility east of the site also has its main frontage to Chapel Street. William Cox Drive intersects with Castlereagh Road at a priority-controlled intersection south-east of the site. The location of the site and its surrounding environs is shown in Figure 3.1 and Figure 3.2.

Figure 3.1: Site location and surrounds

Basemap source: Sydway

Figure 3.2: Site location and proximity to Richmond Station



Basemap source: Nearmap

3.2. Transport Network

3.2.1. Road Hierarchy

Roads are classified according to the functions they perform. The main purpose of defining a road's functional class is to provide a basis for establishing the policies which guide the management of the road according to their intended service or qualities.

In terms of functional road classification, State roads are strategically important as they form the primary network used for the movement of people and goods between regions, and throughout the State. Roads and Maritime Services (Roads and Maritime) responsible for funding, prioritising and carrying out works on State roads. State roads generally include roads classified as freeways, state highways, and main roads under the Roads Act 1993, and the regulation to manage the road system is stated in the Australian Road Rules, most recently amended on 19 March 2018.

Roads and Maritime defines four levels in a typical functional road hierarchy, ranking from high mobility and low accessibility, to high accessibility and low mobility. These road classes are:

Arterial Roads – Controlled by Roads and Maritime, typically no limit in flow and designed to carry vehicles long distance between regional centres.

Sub-Arterial Roads – Managed by either Council or Roads and Maritime under a joint agreement. Typically, their operating capacity ranges between 10,000 and 20,000 vehicles per day, and their aim is to carry through traffic between specific areas in a sub region or provide connectivity from arterial road routes (regional links).

Collector Roads – Provide connectivity between local sites and the sub-arterial road network, and typically carry between 2,000 and 10,000 vehicles per day.

Local Roads – Provide direct access to properties and the collector road system and typically carry between 500 and 4,000 vehicles per day.

3.2.2. Surrounding Road Network

Castlereagh Road, Kurrajong Road and March Street are classified State Roads and generally provide one traffic lane and one parking lane in each direction. All roads have a posted speed limit of 60km/hr in the vicinity of the site.

William Cox Drive and Chapel Street are local roads that provide access to the site and local residential areas. Each has a posted speed limit of 50km/hr. William Cox Drive intersects with Castlereagh Road at a priority-controlled intersection south-east of the site and Chapel Street the same at Kurrajong Road/ March Street. The surrounding road network is shown in Figure 3.3 to Figure 3.7.

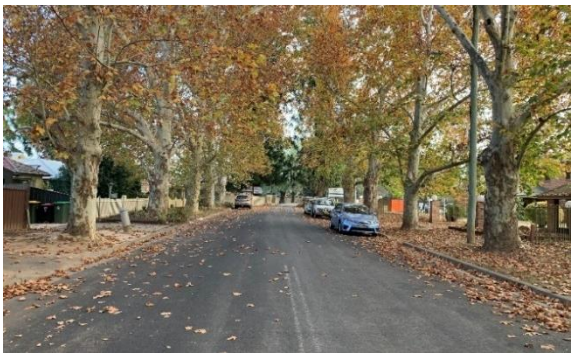
Figure 3.3: Castlereagh Road (looking east)

Figure 3.4: Kurrajong Road (looking north-west)

Figure 3.5: March Street (looking south-east)

Figure 3.6: William Cox Drive (looking south)

Figure 3.7: Chapel Street (looking north-east)



3.3. Traffic Volumes

Traffic surveys were completed during typical weekday peak periods at the Chapel Street/ Kurrajong Road/ March Street and William Cox Drive/ Castlereagh Road intersections. In combination, these intersections provide the only access points for the site. The surveys were completed on 23 May 2019 between 6.30am and 9.30am and 3.00pm and

6.00pm with the peak hours between 8:00am and 9:00am, and 4:45pm and 5:45pm. The survey times cover the known local area and typical broader road network peak hours and are accepted by stakeholders. The traffic volumes are summarised in Figure 3.8 with full survey results included in Appendix A.

Figure 3.8: Existing peak hour traffic volumes

Basemap source: Nearmap

3.4. Intersection Operation

The operation of these intersections have been assessed using SIDRA INTERSECTION[1], a computer based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by the Roads and Maritime, is vehicle delay. SIDRA INTERSECTION determines the average delay that vehicles encounter and provides a measure of the level of service. Table 3.1 shows the criteria that SIDRA INTERSECTION adopts in assessing the level of service.

[1] Program used under license from Akcelik & Associates Pty Ltd.

Table 3.1: SIDRA INTERSECTION level of service criteria

Level of Service (LOS)	Average Delay per vehicle (secs/ veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	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 3.2 presents a summary of the existing intersection, with full results presented in Appendix A of this report.

Table 3.2: Existing Thursday intersection operation

Intersection	Peak	Leg	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
William Cox Drive/ Castlereagh Road	AM	Castlereagh Road (E)	0.02	7	1	A
		William Cox Drive (N)	0.09	9	2	A
		Castlereagh Road (W)	0.19	6	0	A
	PM	Castlereagh Road (E)	0.05	6	2	A
		William Cox Drive (N)	0.08	20	2	A
		Castlereagh Road (W)	0.13	6	0	A
Chapel Street/ Kurrajong Road/ March Street	AM	March Street (S-E)	0.65	14	28	A
		Chapel Street (N-E)	0.13	68	2	E
		Kurrajong Road (N-W)	0.36	16	6	B
		Chapel Street (S-W)	0.06	66	1	E
	PM	March Street (S-E)	0.48	20	19	B
		Chapel Street (N-E)	0.32	78	6	F
		Kurrajong Road (N-W)	0.52	13	4	A
		Chapel Street (S-W)	0.16	69	3	E

On the basis of the above, each of the study intersections operate well with minimal delay and queuing for each approach. The results are supported by site observations noting that right turns, particularly from Chapel Street experience some delay during peak periods. This is typical at priority-controlled intersections where minor roads intersect with major roads carrying relatively high volumes of through traffic. Given the low volumes of traffic using the local roads, these delays are both expected and accepted. Such circumstances are typical across both regional centres and metropolitan areas, and generally accepted by stakeholders by considering overall intersection operation, not minor movements that experience some delay.

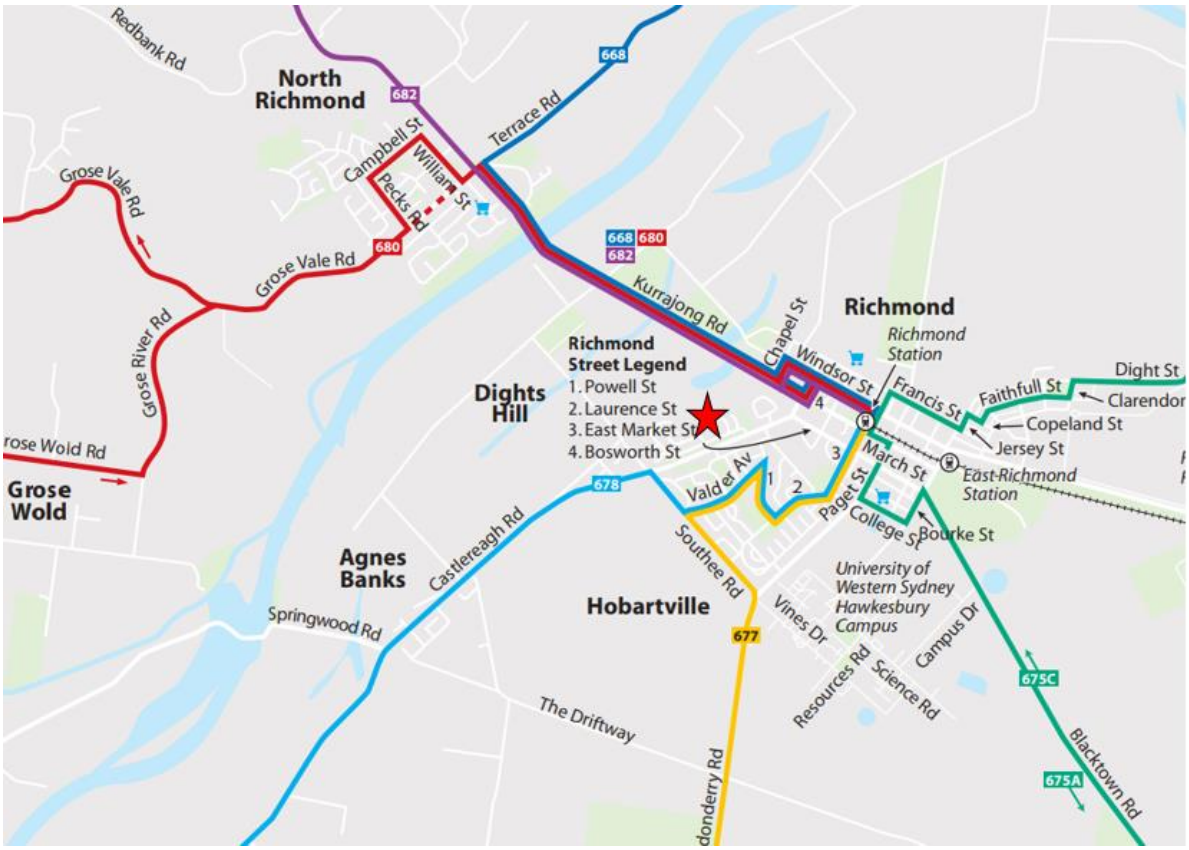
3.5. Public Transport

3.5.1. Buses

Richmond's bus services provide access to Richmond station and the town centre (routes 668, 680 and 682) and further south-east to Windsor CBD (route 675A) and south-west to Penrith CBD (route 678). The surrounding bus network is shown in Figure 3.9, with the closest bus stops between 600 metres and 1.3 kilometre from the site along Kurrajong Road/ March Street and Castlereagh Road/ Southee Road.

Local buses (including route 678) were observed to use William Cox Drive and Grand Flaneur Avenue and likely to be irregular. It does however perhaps point to the need for improvements to local area bus routes, with the site location potentially increasing the need for minor adjustments, including related bus infrastructure and stops etc.

Figure 3.9: Surrounding bus network



Source: Busway

3.5.2. Trains

Richmond station is east of the site with half hourly train services to Sydney CBD via Blacktown and Parramatta on the T1 and T5 lines. The surrounding train route is shown in Figure 3.10.

Figure 3.10: Surrounding train network

Source: Transport for NSW

3.6. Walking and Cycling Infrastructure

3.6.1. Pedestrian Accessibility

There is a general absence of footpaths in the local area, with partial facilities on William Cox Drive at the eastern end to connect with the footpath on the northern side of Castlereagh Road. This footpath connects with more established facilities closer to Richmond town centre. A footpath on the southern side of Castlereagh Road, east of Hereford Street also connects with Lennox Street and March Street. Pedestrians are able to cross the major roads at the March Street/ Bosworth Street signalised intersection, with further upgrades expected as part of Roads and Maritime upgrades, as discussed.

Based on the average walking speed of five kilometres per hour, the walking catchment map is shown in Figure 3.11 and illustrates both existing connectivity throughout Richmond and identifies areas of opportunity to continue to promote walking within the local area.

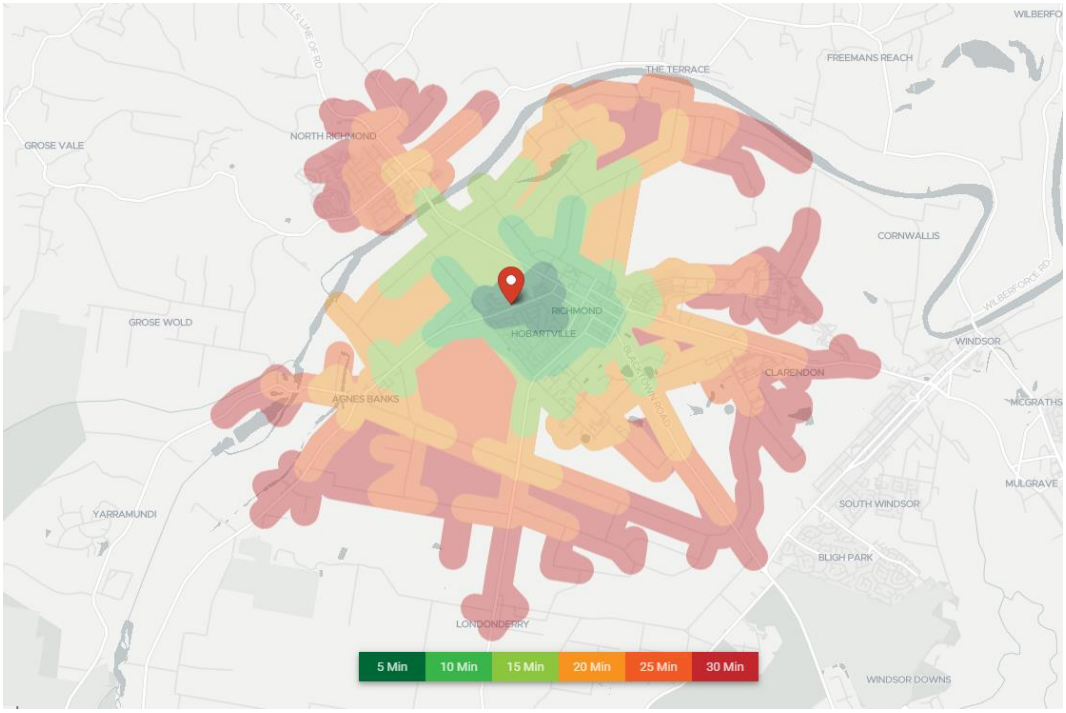
Figure 3.11: Existing catchment map for walking

Source: app.targomo.com

3.6.2. Cycling Facilities

Figure 3.12 highlights the catchment area for cyclists and identifies the benefits of the cycle lanes along both sides of Castlereagh Road in the immediate vicinity. There are cycle trails circulating Richmond Park directly adjacent to Richmond Station and a bicycle-friendly road east of the study area near Laurence Street.

Figure 3.12: Existing catchment map for cycling



Source: app.targomo.com

4. PLANNING PROPOSAL

04

4.1. Overview

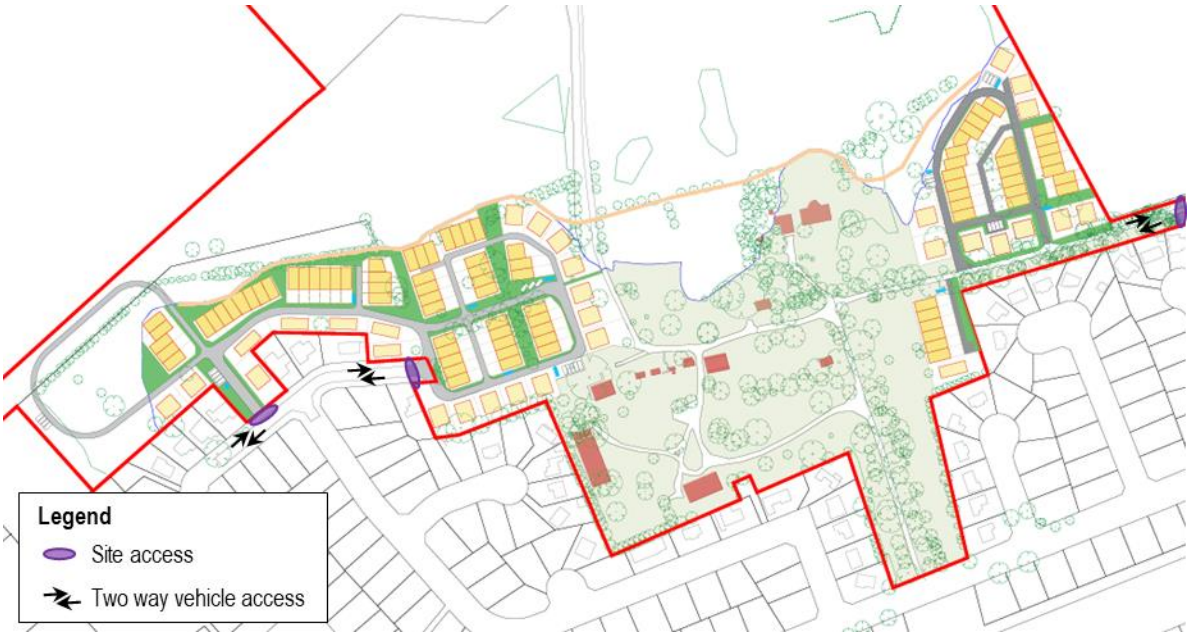
The planning proposal includes 118 residential dwellings comprised of 87 four-bedroom terraces and 31 three-bedroom cottages on land east and west of a central heritage precinct. The rezoning area covers approximately 10 hectares. The internal roads are proposed to continue to connect with Chapel Street to the east and William Cox Drive to the west.

All internal roads will continue to function as private roads and allow for two-way vehicle access to the community titled development. Minimum 3.5-metre-wide carriageways for one-way sections and 5.5 metres for two-way sections are designed in accordance with relevant Australian Standards and allow for access by rigid trucks up to 10-11 metres long. Some roads include one-way access and designed to limit vehicle speed and recognises low traffic volumes. The access roads that connect with the external roads surrounding the site will facilitate two-way traffic flows, where necessary. The existing narrow sections along the eastern access road, west of Chapel Street where one-lane, two-way access arrangements are in place, will continue to be adequate for the purposes of site access and considered appropriate. Overall, the eastern section of the site is intended to accommodate 42 residential dwellings and the western section, 76 dwellings. The central section will be retained as per existing and recognises the heritage nature of the area.

Garbage trucks are proposed to be able to access each of the eastern and western sections of the site, with defined routes through the one-way loops ensuring equitable access to the designated bin storage areas throughout. Removalist trucks and delivery vehicles up to 10-11 metres long would also be able to access the internal roads as required.

The proposed site layout plan is shown in Figure 4.1.

Figure 4.1: Site layout plan



Source: Roberts Day, Drawing No. RD1 001, dated 18/07/19, Rev. A.

4.2. Access Strategy

The western section of the site is proposed to be afforded access via two separate driveways in the western corner of William Cox Drive, close to Grand Flaneur Avenue. The eastern section proposes to retain access via the existing gates on Chapel Street to the east. This eastern section access road is shown in Figure 4.2 and is proposed to be upgraded and widened where possible to ensure two-way vehicle access is achievable. This is appropriate given the anticipated low traffic volumes and would be supported by signage.

Figure 4.2: Chapel Street access road

4.3. Flood Evacuation Measures

Flood levels and evacuation routes are important and a common consideration in the local and regional area. The proposed site layout plans clearly define flood line with all dwellings and internal access roads clear of the one 100 year flood event.

Flood evacuation routes are identified in the Hawkesbury-Nepean Valley Flood Risk Management Strategy summary report, 2017, with the identified routes shown in Figure 4.3. The site and broader Richmond sector are within the Castlereagh Road route catchment (identified by the 'magenta' line), with future residents/ tenants able to use William Cox Drive to directly access the Castlereagh Road evacuation route and travel towards the Penrith Sector and South Creek. Other convenient routes are also available via the Londonderry Sector. A number of the critical points have been upgraded to cope with a one in 500-year local flood event as a result of past Hawkesbury River flooding.

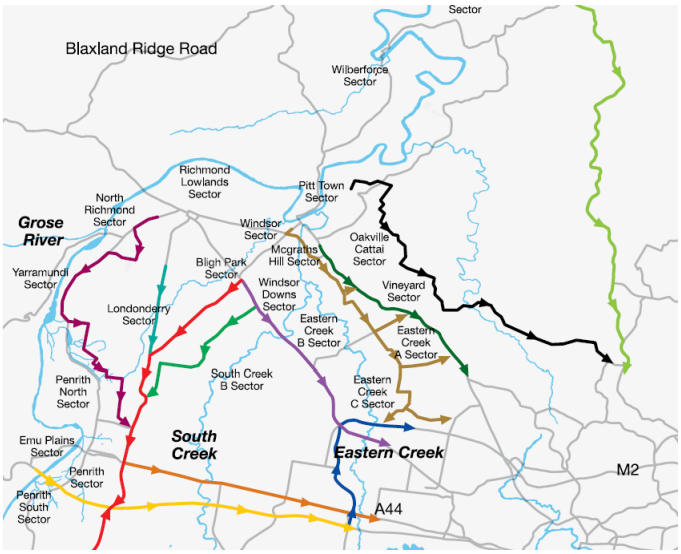
Figure 4.3: Flood evacuation routes

Evacuation constraints and complexity

Evacuating people away from flood affected areas is the primary method of reducing the risk to life during a flood. In the Valley, the NSW State Emergency Service identifies mass self-evacuation by private motor vehicles as the primary method for evacuation, as other transport options are highly vulnerable to floods or have limited capacity. The major regional evacuation road routes are shown in Figure 7.

Legend

- Castlereagh Road route
- Great Western Highway
- Hawkesbury Valley Way
- Llandilo Road route
- Londonderry Road route
- M4 Motorway
- Old Northern Road route
- Park Road route
- Pitt Town route
- Richmond Road route
- The Northern Road route
- Wallacia alternate route
- Windsor Road route
- Westlink M7



Source: Hawkesbury-Nepean Valley Flood Risk Management Strategy Summary report.

5. PARKING ASSESSMENT

05

5.1. Parking and Loading

Parking requirements for different development types are set out in Hawkesbury Development Control Plan 2002 (DCP 2002) with Part C defining the requirements for dwelling houses, dual occupancies and villa and townhouse developments by floor area. The three and four-bedroom dwellings proposed all exceed 85 square metres, as summarised in Table 5.1.

Table 5.1: DCP 2002 car parking requirements

Land use	Type	No.	DCP Parking Rate	Parking Requirement
Residential	3 and 4-bedroom dwellings (more than 85sq.m)	118	2 spaces/ dwelling	236
	Visitor	118	0.2 spaces/ dwelling	24
			Residential total	**260**

Based on DCP 2002, the proposal generates a parking requirement of 260 spaces, 24 of which are required for use by visitors. The site layout plans indicate that an adequate quantum of visitor parking dispersed throughout the eastern and western sections is achievable, with each dwelling to also include provision of two parking spaces on title. Where spaces are accessed via one-way sections along the internal roads, the spaces would need to be adequately set back from the frontage streets to ensure adequate manoeuvring area in accordance with DCP 2002 and AS2890.1:2004. This includes the layout and configuration of visitor parking.

Provision of on-site capacity for bicycle parking facilities within each dwelling is recommended and typical for such residential developments where facilities are provided on each title rather than part of the broader public domain.

As discussed, service vehicles have been considered as part of the site layout plans, with defined paths of travel ensuring all vehicles, including garbage trucks, removalist trucks and emergency services are able to access the key internal roads. This includes access to/ from and within each of the eastern and western sections of the site, with defined routes to access, in particular the bin storage areas. Standard Rural Fire Service vehicles would be able to enter each site, travel through the internal roads in a forward direction and exit as required. Overall, the planning proposal accommodates all vehicles up to 10-11 metres long and is appropriate having regard to the land use type and density.

6. TRAFFIC IMPACT ASSESSMENT

06

6.1. Traffic Generation

6.1.1. Design Rates

Traffic generation estimates for the planning proposal have been sourced from the Roads and Maritime Guide to Traffic Generating Developments 2002 (the Guide) and Technical Direction: Updated Traffic Surveys (TDT 2013/ 04a).

The Guide suggests a generation rate of 0.85 trips per dwelling and TDT 2013/ 04a a rate of 0.99 trips per dwelling. For the purposes of this assessment and having regard to the location of the site on the fringes of the Sydney metropolitan area, it is conservatively assumed that the proposal would generate one vehicle trip per dwelling.

Accounting for the proposed 118 dwellings, the planning proposal could generate up to 118 vehicle trips in any peak hour.

6.2. Distribution and Assignment

The directional distribution and assignment of traffic generated by the proposal will be influenced by several factors, including the:

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

Having consideration to the above and the existing traffic movements in the area, traffic associated with the proposal and known direction of travel.

A 20 per cent inbound and 80 per cent outbound directional split has been applied in the AM peak, reversed in the PM peak. This has been determined based on existing directional movements and broader attractors, including the known employment catchment areas. Broadly, it is assumed that 20 per cent of vehicles are likely to travel north-west to Kurrajong, Lithgow and the Blue Mountains, and 80 per cent south to Parramatta, Norwest, Blacktown and Penrith.

Based on the above, Table 6.1 illustrates the directional split of traffic generated by the proposal. This includes defining traffic based on the eastern and western sections.

Table 6.1: Directional split for traffic generation

Use	AM Peak Hour			PM Peak Hour		
	Total	In	Out	Total	In	Out
Western section	76	15	61	76	61	15
Eastern section	42	8	34	42	34	8
Residential	**118**	**23**	**95**	**118**	**95**	**23**

Figure 6.1 has been prepared to show the estimated marginal increase in traffic volumes following full site development.

Figure 6.1: Post development peak hour traffic volumes

Basemap source: Nearmap

The eastern section traffic volumes are expected to be low with vehicles using the existing access road to Chapel Street and exit the site to the Kurrajong Road/ March Street intersection. Western section traffic volumes are expected to be marginally more, with William Cox Drive (and other local streets) providing the local area access route to Castlereagh Road for vehicles exiting the site.

In this regard, it is also important to understand the environmental capacities of the surrounding streets. With William Cox Drive providing access to approximately 200 existing low-density residential dwellings, application of the above traffic generation rates would result in 200 vehicles entering and exiting the area in any peak hour. The surveys indicate that the area currently generates between 100 and 145 vehicles in any peak hour. This equates to a generation rate of between 0.5 and 0.7 vehicle trips per hour. Based on this, it is clear that application of a trip rate of one vehicle per dwelling is highly conservative in this location.

The Guide specifies environmental capacity performance standards on residential streets with local roads having an environmental goal of 200 vehicles per hour and environmental maximum of 300 vehicles per hour. With the planning expected conservatively expected to generate no more than 76 vehicle trips on William Cox Drive and 42 vehicle trips on Chapel Street in any peak hour, the environmental capacities would not be exceeded on any local road at any time.

6.3. Traffic Impacts

The key intersections surrounding the site have been reassessed to include traffic associated with the proposal, with the SIDRA modelling results summarised in Table 6.2.

Table 6.2: Future operating conditions

Intersection	Peak	Leg	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
William Cox Drive/ Castlereagh Road	AM	Castlereagh Road (E)	0.03	7	1	A
		William Cox Drive (N)	0.15	9	4	A
		Castlereagh Road (W)	0.19	6	0	A
	PM	Castlereagh Road (E)	0.05	6	2	A
		William Cox Drive (N)	0.09	20	2	B
		Castlereagh Road (W)	0.13	6	0	A
Chapel Street/ Kurrajong Road/ March Street	AM	March Street (S-E)	0.65	14	28	A
		Chapel Street (N-E)	0.15	71	3	F
		Kurrajong Road (N-W)	0.36	16	7	B
		Chapel Street (S-W)	0.57	102	12	F
	PM	March Street (S-E)	0.49	20	21	B
		Chapel Street (N-E)	0.41	87	8	F
		Kurrajong Road (N-W)	0.53	13	6	A
		Chapel Street (S-W)	0.29	81	6	F

Against existing traffic volumes in the vicinity of the site, the additional traffic generated by the proposal could not be expected to compromise the function or safety of the surrounding road network.

While select approaches would see a marginal change to operation, including LOS, this is largely attributed to turning movements to and from Chapel Street. As discussed, this does not have a material impact on the overall operation of the intersection with the minor delays involving queuing of no more than one or two vehicles. This would not prove materially different to existing intersection operating conditions.

It is noted that development traffic would also travel through other key intersections in the area, specifically the Castlereagh Road/ Lennox Street and Bosworth Street/ March Street intersections. With the low traffic volumes generated by the proposal, the impact on these intersections is expected to be minor. As discussed, Roads and Maritime is also in the process of upgrading the Bosworth Street/ March Street intersection as part of the broader arterial road network improvements.

7. SUMMARY

07

7.1. Summary

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

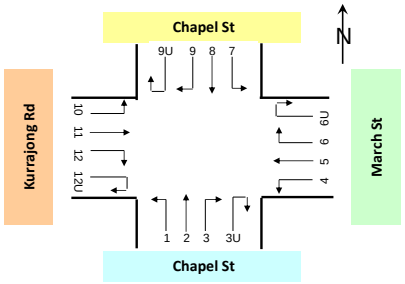
1. The planning proposal will allow for 118 residential dwellings comprised of 87 four-bedroom terraces and 31 three-bedroom cottages of more than 85 square metres each within an area of rezoning of approximately 10 hectares.
2. The site and surrounding area are capable of supporting the proposed land use on transport grounds with residents and visitors able to travel to and from the site with minimal impacts on the surrounding local streets.
3. The site access arrangements via the existing driveway on Chapel Street and the two new driveways on William Cox Drive are appropriate and able to accommodate the anticipated peak traffic volumes.
4. The passing bays within the internal private roads would allow for two-way accessibility and designed in accordance with relevant Australian Standards.
5. Based on Hawkesbury Council DCP 2002, the proposal generates a parking requirement of 260 spaces, 24 of which would be for use by visitors.
6. The internal private roads would be designed in accordance with relevant Australian Standards and able to accommodate all vehicles up to 10-11-metres long. This includes Council's garbage truck and emergency services (including Rural Fire Service vehicles), with swept paths confirming access requirements and travel paths.
7. The strategy splits the site into an eastern and western section and likely to result in up to 76 additional vehicle trips on William Cox Drive and 42 vehicle trips on Chapel Street during any peak hour.
8. All local roads providing access to the site would continue to operate well, and below the environmental capacities for local roads as defined by Roads and Maritime Guide to Traffic Generating Developments, 2002.
9. The additional traffic generated by the proposal would be low and presents a minor impact on the surrounding road network, with local area intersections clearly having sufficient capacity to accommodate the full development of the site. Broader road network improvements by Roads and Maritime would also further improve traffic conditions through the area.
10. Flood event planning has been a key consideration, with all dwellings and available travel paths above the one in 100-year event. Defined evacuation routes are also readily accessible with the quantum of vehicle movements not having a significant impact on these routes.
11. From a transport perspective, the proposal does not raise specific nor significant matters with respect to impacts on the road network nor unnecessarily affect existing land uses.

A. TRAFFIC SURVEY DATA

A

Job No.	: N5008
Client	: GTA
Suburb	: Richmond
Location	: 1. Kurrajong Rd / March St / Chapel St
Day/Date	: Thu, 23rd May 2019
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

Classifications	**Class 1**	**Class 2**
	Lights	Heavies



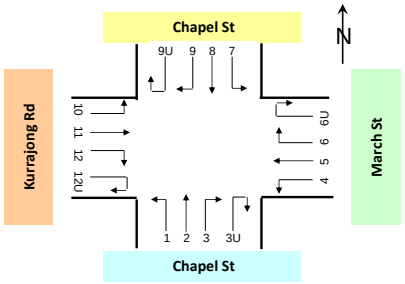
MATRIX Traffic and Transport Data

Approach	**Chapel St**												**March St**											
Direction	**Direction 1 (Left Turn)**			**Direction 2 (Through)**			**Direction 3 (Right Turn)**			**Direction 3U (U Turn)**			**Direction 4 (Left Turn)**			**Direction 5 (Through)**			**Direction 6 (Right Turn)**			**Direction 6U (U Turn)**		
Time Period	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**
6:30 to 6:45	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	210	17	**227**	21	2	**23**	0	0	**0**
6:45 to 7:00	4	0	**4**	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	232	13	**245**	20	0	**20**	0	0	**0**
7:00 to 7:15	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	253	14	**267**	22	1	**23**	0	0	**0**
7:15 to 7:30	0	0	**0**	2	0	**2**	0	0	**0**	0	0	**0**	2	0	**2**	248	11	**259**	18	0	**18**	0	0	**0**
7:30 to 7:45	0	0	**0**	1	0	**1**	0	0	**0**	0	0	**0**	0	0	**0**	242	19	**261**	21	5	**26**	0	0	**0**
7:45 to 8:00	0	0	**0**	2	0	**2**	1	0	**1**	0	0	**0**	1	0	**1**	245	11	**256**	17	2	**19**	0	0	**0**
8:00 to 8:15	0	0	**0**	1	0	**1**	1	0	**1**	0	0	**0**	0	0	**0**	228	16	**244**	20	1	**21**	0	0	**0**
8:15 to 8:30	1	0	**1**	0	0	**0**	1	0	**1**	0	0	**0**	0	0	**0**	216	9	**225**	23	1	**24**	0	0	**0**
8:30 to 8:45	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	216	14	**230**	21	3	**24**	0	0	**0**
8:45 to 9:00	1	0	**1**	0	0	**0**	0	0	**0**	0	0	**0**	1	0	**1**	210	15	**225**	32	1	**33**	0	0	**0**
9:00 to 9:15	2	0	**2**	2	0	**2**	1	0	**1**	0	0	**0**	2	0	**2**	165	9	**174**	25	1	**26**	0	0	**0**
9:15 to 9:30	3	1	**4**	2	0	**2**	3	0	**3**	0	0	**0**	0	0	**0**	229	22	**251**	19	1	**20**	0	0	**0**
AM Totals	**11**	**1**	**12**	**10**	**0**	**10**	**7**	**0**	**7**	**0**	**0**	**0**	**6**	**0**	**6**	**2,694**	**170**	**2,864**	**259**	**18**	**277**	**0**	**0**	**0**
15:00 to 15:15	6	0	**6**	2	0	**2**	4	0	**4**	0	0	**0**	0	0	**0**	144	15	**159**	16	1	**17**	0	0	**0**
15:15 to 15:30	6	0	**6**	0	0	**0**	2	0	**2**	0	0	**0**	1	0	**1**	169	12	**181**	13	3	**16**	0	0	**0**
15:30 to 15:45	3	0	**3**	0	0	**0**	0	0	**0**	0	0	**0**	1	0	**1**	159	10	**169**	9	0	**9**	0	0	**0**
15:45 to 16:00	2	0	**2**	3	0	**3**	1	0	**1**	0	0	**0**	1	0	**1**	164	16	**180**	17	2	**19**	0	0	**0**
16:00 to 16:15	3	0	**3**	0	0	**0**	2	0	**2**	0	0	**0**	0	0	**0**	166	11	**177**	12	0	**12**	0	0	**0**
16:15 to 16:30	0	0	**0**	0	0	**0**	2	0	**2**	0	0	**0**	0	0	**0**	144	16	**160**	11	1	**12**	0	0	**0**
16:30 to 16:45	0	0	**0**	1	0	**1**	1	0	**1**	0	0	**0**	0	0	**0**	150	11	**161**	9	2	**11**	0	0	**0**
16:45 to 17:00	2	0	**2**	1	0	**1**	1	0	**1**	0	0	**0**	0	0	**0**	153	2	**155**	12	1	**13**	0	0	**0**
17:00 to 17:15	4	0	**4**	1	0	**1**	2	0	**2**	0	0	**0**	0	0	**0**	165	4	**169**	13	0	**13**	0	0	**0**
17:15 to 17:30	5	0	**5**	3	0	**3**	2	0	**2**	0	0	**0**	0	0	**0**	162	9	**171**	20	0	**20**	0	0	**0**
17:30 to 17:45	1	0	**1**	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	158	6	**164**	12	2	**14**	0	0	**0**
17:45 to 18:00	3	0	**3**	0	0	**0**	1	0	**1**	0	0	**0**	0	0	**0**	141	6	**147**	9	0	**9**	0	0	**0**
PM Totals	**35**	**0**	**35**	**11**	**0**	**11**	**18**	**0**	**18**	**0**	**0**	**0**	**3**	**0**	**3**	**1,875**	**118**	**1,993**	**153**	**12**	**165**	**0**	**0**	**0**

Approach	Chapel St												Kurrajong Rd											
Direction	Direction 7 (Left Turn)			Direction 8 (Through)			Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11 (Through)			Direction 12 (Right Turn)			Direction 12U (U Turn)		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
6:30 to 6:45	0	0	**0**	0	0	**0**	2	0	**2**	0	0	**0**	0	0	**0**	91	26	**117**	2	0	**2**	1	0	**1**
6:45 to 7:00	1	0	**1**	0	0	**0**	2	0	**2**	0	0	**0**	1	0	**1**	83	17	**100**	4	0	**4**	0	0	**0**
7:00 to 7:15	1	0	**1**	0	0	**0**	2	0	**2**	0	0	**0**	0	0	**0**	87	30	**117**	0	0	**0**	0	0	**0**
7:15 to 7:30	1	0	**1**	0	0	**0**	1	0	**1**	0	0	**0**	1	0	**1**	102	15	**117**	2	0	**2**	0	0	**0**
7:30 to 7:45	3	0	**3**	0	0	**0**	1	0	**1**	0	0	**0**	1	0	**1**	116	7	**123**	0	0	**0**	0	0	**0**
7:45 to 8:00	1	0	**1**	0	0	**0**	2	0	**2**	0	0	**0**	3	0	**3**	106	7	**113**	4	0	**4**	0	0	**0**
8:00 to 8:15	2	0	**2**	0	0	**0**	0	0	**0**	0	0	**0**	5	0	**5**	102	15	**117**	4	0	**4**	0	0	**0**
8:15 to 8:30	1	0	**1**	0	0	**0**	3	0	**3**	0	0	**0**	3	0	**3**	115	15	**130**	2	0	**2**	0	0	**0**
8:30 to 8:45	0	0	**0**	0	0	**0**	2	0	**2**	0	0	**0**	2	0	**2**	147	13	**160**	4	0	**4**	0	0	**0**
8:45 to 9:00	0	0	**0**	0	0	**0**	1	0	**1**	0	0	**0**	1	0	**1**	149	8	**157**	5	0	**5**	0	0	**0**
9:00 to 9:15	0	0	**0**	1	0	**1**	1	0	**1**	0	0	**0**	2	0	**2**	126	13	**139**	4	1	**5**	0	0	**0**
9:15 to 9:30	2	0	**2**	0	0	**0**	2	0	**2**	0	0	**0**	1	0	**1**	115	6	**121**	3	0	**3**	0	0	**0**
AM Totals	**12**	**0**	**12**	**1**	**0**	**1**	**19**	**0**	**19**	**0**	**0**	**0**	**20**	**0**	**20**	**1,339**	**172**	**1,511**	**34**	**1**	**35**	**1**	**0**	**1**
15:00 to 15:15	4	0	**4**	0	0	**0**	3	0	**3**	0	0	**0**	2	0	**2**	215	12	**227**	2	0	**2**	0	0	**0**
15:15 to 15:30	6	0	**6**	0	0	**0**	2	0	**2**	0	0	**0**	4	0	**4**	219	13	**232**	4	0	**4**	0	0	**0**
15:30 to 15:45	8	0	**8**	1	0	**1**	4	0	**4**	0	0	**0**	0	0	**0**	226	14	**240**	5	0	**5**	0	0	**0**
15:45 to 16:00	6	0	**6**	0	0	**0**	1	0	**1**	0	0	**0**	2	0	**2**	228	14	**242**	4	0	**4**	0	0	**0**
16:00 to 16:15	6	0	**6**	0	0	**0**	3	1	**4**	0	0	**0**	4	0	**4**	202	7	**209**	3	0	**3**	0	0	**0**
16:15 to 16:30	5	0	**5**	0	0	**0**	1	0	**1**	0	0	**0**	2	0	**2**	252	6	**258**	3	0	**3**	0	0	**0**
16:30 to 16:45	8	0	**8**	0	0	**0**	3	0	**3**	0	0	**0**	1	0	**1**	213	11	**224**	3	0	**3**	0	0	**0**
16:45 to 17:00	4	0	**4**	0	0	**0**	6	0	**6**	0	0	**0**	2	0	**2**	200	12	**212**	1	0	**1**	0	0	**0**
17:00 to 17:15	6	0	**6**	2	0	**2**	5	0	**5**	0	0	**0**	3	0	**3**	212	7	**219**	4	0	**4**	0	0	**0**
17:15 to 17:30	3	0	**3**	0	0	**0**	4	0	**4**	0	0	**0**	2	0	**2**	182	5	**187**	1	0	**1**	0	0	**0**
17:30 to 17:45	6	0	**6**	0	0	**0**	4	1	**5**	0	0	**0**	1	0	**1**	219	7	**226**	5	0	**5**	0	0	**0**
17:45 to 18:00	1	0	**1**	0	0	**0**	4	0	**4**	0	0	**0**	1	0	**1**	197	3	**200**	1	0	**1**	0	0	**0**
PM Totals	**63**	**0**	**63**	**3**	**0**	**3**	**40**	**2**	**42**	**0**	**0**	**0**	**24**	**0**	**24**	**2,565**	**111**	**2,676**	**36**	**0**	**36**	**0**	**0**	**0**

Job No. : N5008
Client : GTA
Suburb : Richmond
Location : 1. Kurrajong Rd / March St / Chapel St

Day/Date : Thu, 23rd May 2019
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



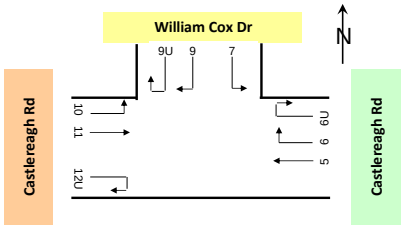
MATRIX Traffic and Transport Data

Approach	Chapel St												March St											
Direction	Direction 1 (Left Turn)			Direction 2 (Through)			Direction 3 (Right Turn)			Direction 3U (U Turn)			Direction 4 (Left Turn)			Direction 5 (Through)			Direction 6 (Right Turn)			Direction 6U (U Turn)		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
6:30 to 7:30	4	0	**4**	2	0	**2**	0	0	**0**	0	0	**0**	2	0	**2**	943	55	**998**	81	3	**84**	0	0	**0**
6:45 to 7:45	4	0	**4**	3	0	**3**	0	0	**0**	0	0	**0**	2	0	**2**	975	57	**1,032**	81	6	**87**	0	0	**0**
7:00 to 8:00	0	0	**0**	5	0	**5**	1	0	**1**	0	0	**0**	3	0	**3**	988	55	**1,043**	78	8	**86**	0	0	**0**
7:15 to 8:15	0	0	**0**	6	0	**6**	2	0	**2**	0	0	**0**	3	0	**3**	963	57	**1,020**	76	8	**84**	0	0	**0**
7:30 to 8:30	1	0	**1**	4	0	**4**	3	0	**3**	0	0	**0**	1	0	**1**	931	55	**986**	81	9	**90**	0	0	**0**
7:45 to 8:45	1	0	**1**	3	0	**3**	3	0	**3**	0	0	**0**	1	0	**1**	905	50	**955**	81	7	**88**	0	0	**0**
8:00 to 9:00	2	0	**2**	1	0	**1**	2	0	**2**	0	0	**0**	1	0	**1**	870	54	**924**	96	6	**102**	0	0	**0**
8:15 to 9:15	4	0	**4**	2	0	**2**	2	0	**2**	0	0	**0**	3	0	**3**	807	47	**854**	101	6	**107**	0	0	**0**
8:30 to 9:30	6	1	**7**	4	0	**4**	4	0	**4**	0	0	**0**	3	0	**3**	820	60	**880**	97	6	**103**	0	0	**0**
AM Totals	**11**	**1**	**12**	**10**	**0**	**10**	**7**	**0**	**7**	**0**	**0**	**0**	**6**	**0**	**6**	**2,694**	**170**	**2,864**	**259**	**18**	**277**	**0**	**0**	**0**
15:00 to 16:00	17	0	**17**	5	0	**5**	7	0	**7**	0	0	**0**	3	0	**3**	636	53	**689**	55	6	**61**	0	0	**0**
15:15 to 16:15	14	0	**14**	3	0	**3**	5	0	**5**	0	0	**0**	3	0	**3**	658	49	**707**	51	5	**56**	0	0	**0**
15:30 to 16:30	8	0	**8**	3	0	**3**	5	0	**5**	0	0	**0**	2	0	**2**	633	53	**686**	49	3	**52**	0	0	**0**
15:45 to 16:45	5	0	**5**	4	0	**4**	6	0	**6**	0	0	**0**	1	0	**1**	624	54	**678**	49	5	**54**	0	0	**0**
16:00 to 17:00	5	0	**5**	2	0	**2**	6	0	**6**	0	0	**0**	0	0	**0**	613	40	**653**	44	4	**48**	0	0	**0**
16:15 to 17:15	6	0	**6**	3	0	**3**	6	0	**6**	0	0	**0**	0	0	**0**	612	33	**645**	45	4	**49**	0	0	**0**
16:30 to 17:30	11	0	**11**	6	0	**6**	6	0	**6**	0	0	**0**	0	0	**0**	630	26	**656**	54	3	**57**	0	0	**0**
16:45 to 17:45	12	0	**12**	5	0	**5**	5	0	**5**	0	0	**0**	0	0	**0**	638	21	**659**	57	3	**60**	0	0	**0**
17:00 to 18:00	13	0	**13**	4	0	**4**	5	0	**5**	0	0	**0**	0	0	**0**	626	25	**651**	54	2	**56**	0	0	**0**
PM Totals	**35**	**0**	**35**	**11**	**0**	**11**	**18**	**0**	**18**	**0**	**0**	**0**	**3**	**0**	**3**	**1,875**	**118**	**1,993**	**153**	**12**	**165**	**0**	**0**	**0**

Approach	Chapel St												Kurrajong Rd											
Direction	Direction 7 (Left Turn)			Direction 8 (Through)			Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11 (Through)			Direction 12 (Right Turn)			Direction 12U (U Turn)		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
6:30 to 7:30	3	0	**3**	0	0	**0**	7	0	**7**	0	0	**0**	2	0	**2**	363	88	**451**	8	0	**8**	1	0	**1**
6:45 to 7:45	6	0	**6**	0	0	**0**	6	0	**6**	0	0	**0**	3	0	**3**	388	69	**457**	6	0	**6**	0	0	**0**
7:00 to 8:00	6	0	**6**	0	0	**0**	6	0	**6**	0	0	**0**	5	0	**5**	411	59	**470**	6	0	**6**	0	0	**0**
7:15 to 8:15	7	0	**7**	0	0	**0**	4	0	**4**	0	0	**0**	10	0	**10**	426	44	**470**	10	0	**10**	0	0	**0**
7:30 to 8:30	7	0	**7**	0	0	**0**	6	0	**6**	0	0	**0**	12	0	**12**	439	44	**483**	10	0	**10**	0	0	**0**
7:45 to 8:45	4	0	**4**	0	0	**0**	7	0	**7**	0	0	**0**	13	0	**13**	470	50	**520**	14	0	**14**	0	0	**0**
8:00 to 9:00	3	0	**3**	0	0	**0**	6	0	**6**	0	0	**0**	11	0	**11**	513	51	**564**	15	0	**15**	0	0	**0**
8:15 to 9:15	1	0	**1**	1	0	**1**	7	0	**7**	0	0	**0**	8	0	**8**	537	49	**586**	15	1	**16**	0	0	**0**
8:30 to 9:30	2	0	**2**	1	0	**1**	6	0	**6**	0	0	**0**	6	0	**6**	537	40	**577**	16	1	**17**	0	0	**0**
AM Totals	**12**	**0**	**12**	**1**	**0**	**1**	**19**	**0**	**19**	**0**	**0**	**0**	**20**	**0**	**20**	**1,339**	**172**	**1,511**	**34**	**1**	**35**	**1**	**0**	**1**
15:00 to 16:00	24	0	**24**	1	0	**1**	10	0	**10**	0	0	**0**	8	0	**8**	888	53	**941**	15	0	**15**	0	0	**0**
15:15 to 16:15	26	0	**26**	1	0	**1**	10	1	**11**	0	0	**0**	10	0	**10**	875	48	**923**	16	0	**16**	0	0	**0**
15:30 to 16:30	25	0	**25**	1	0	**1**	9	1	**10**	0	0	**0**	8	0	**8**	908	41	**949**	15	0	**15**	0	0	**0**
15:45 to 16:45	25	0	**25**	0	0	**0**	8	1	**9**	0	0	**0**	9	0	**9**	895	38	**933**	13	0	**13**	0	0	**0**
16:00 to 17:00	23	0	**23**	0	0	**0**	13	1	**14**	0	0	**0**	9	0	**9**	867	36	**903**	10	0	**10**	0	0	**0**
16:15 to 17:15	23	0	**23**	2	0	**2**	15	0	**15**	0	0	**0**	8	0	**8**	877	36	**913**	11	0	**11**	0	0	**0**
16:30 to 17:30	21	0	**21**	2	0	**2**	18	0	**18**	0	0	**0**	8	0	**8**	807	35	**842**	9	0	**9**	0	0	**0**
16:45 to 17:45	19	0	**19**	2	0	**2**	19	1	**20**	0	0	**0**	8	0	**8**	813	31	**844**	11	0	**11**	0	0	**0**
17:00 to 18:00	16	0	**16**	2	0	**2**	17	1	**18**	0	0	**0**	7	0	**7**	810	22	**832**	11	0	**11**	0	0	**0**
PM Totals	**63**	**0**	**63**	**3**	**0**	**3**	**40**	**2**	**42**	**0**	**0**	**0**	**24**	**0**	**24**	**2,565**	**111**	**2,676**	**36**	**0**	**36**	**0**	**0**	**0**

Job No.	: N5008
Client	: GTA
Suburb	: Richmond
Location	: 2. Castlereagh Rd / William Cox Dr
Day/Date	: Thu, 23rd May 2019
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

	Class 1	**Class 2**
Classifications	Lights	Heavies



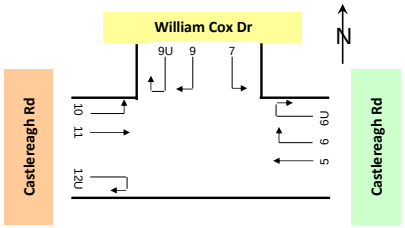
MATRIX Traffic and Transport Data

Approach		**Castlereagh Rd**								
Direction		**Direction 5 (Through)**			**Direction 6 (Right Turn)**			**Direction 6U (U Turn)**		
Time Period		**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**
6:30	to 6:45	21	6	**27**	3	0	**3**	0	0	**0**
6:45	to 7:00	10	1	**11**	0	0	**0**	0	0	**0**
7:00	to 7:15	18	2	**20**	1	0	**1**	0	0	**0**
7:15	to 7:30			**0**			**0**			**0**
7:30	to 7:45			**0**			**0**			**0**
7:45	to 8:00			**0**			**0**			**0**
8:00	to 8:15			**0**			**0**			**0**
8:15	to 8:30			**0**			**0**			**0**
8:30	to 8:45			**0**			**0**			**0**
8:45	to 9:00			**0**			**0**			**0**
9:00	to 9:15			**0**			**0**			**0**
9:15	to 9:30			**0**			**0**			**0**
AM Totals		**49**	**9**	**58**	**4**	**0**	**4**	**0**	**0**	**0**
15:00	to 15:15	88	8	**96**	18	1	**19**	0	0	**0**
15:15	to 15:30	78	7	**85**	18	1	**19**	0	0	**0**
15:30	to 15:45	107	4	**111**	17	1	**18**	0	0	**0**
15:45	to 16:00	95	5	**100**	11	1	**12**	1	0	**1**
16:00	to 16:15	109	6	**115**	19	1	**20**	0	0	**0**
16:15	to 16:30	121	6	**127**	16	1	**17**	0	0	**0**
16:30	to 16:45	114	9	**123**	8	0	**8**	0	0	**0**
16:45	to 17:00	120	3	**123**	25	0	**25**	0	0	**0**
17:00	to 17:15	121	3	**124**	18	4	**22**	0	0	**0**
17:15	to 17:30	134	2	**136**	21	1	**22**	0	0	**0**
17:30	to 17:45	103	7	**110**	12	0	**12**	0	0	**0**
17:45	to 18:00	98	2	**100**	14	0	**14**	0	0	**0**
PM Totals		**1,288**	**62**	**1,350**	**197**	**11**	**208**	**1**	**0**	**1**

Approach	William Cox Dr										Castlereagh Rd									
Direction	Direction 7 (Left Turn)				Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11 (Through)				Direction 12U (U Turn)		
Time Period	Lights	Heavies	Total		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total
6:30 to 6:45	6	0	**6**		2	0	**2**	0	0	**0**	1	0	**1**	63	9	**72**		0	0	**0**
6:45 to 7:00	12	0	**12**		0	0	**0**	0	0	**0**	1	0	**1**	57	4	**61**		0	0	**0**
7:00 to 7:15	9	0	**9**		0	0	**0**	0	0	**0**	0	0	**0**	51	4	**55**		0	0	**0**
7:15 to 7:30			**0**				**0**			**0**			**0**			**0**				**0**
7:30 to 7:45			**0**				**0**			**0**			**0**			**0**				**0**
7:45 to 8:00			**0**				**0**			**0**			**0**			**0**				**0**
8:00 to 8:15			**0**				**0**			**0**			**0**			**0**				**0**
8:15 to 8:30			**0**				**0**			**0**			**0**			**0**				**0**
8:30 to 8:45			**0**				**0**			**0**			**0**			**0**				**0**
8:45 to 9:00			**0**				**0**			**0**			**0**			**0**				**0**
9:00 to 9:15			**0**				**0**			**0**			**0**			**0**				**0**
9:15 to 9:30			**0**				**0**			**0**			**0**			**0**				**0**
AM Totals	**27**	**0**	**27**		**2**	**0**	**2**	**0**	**0**	**0**	**2**	**0**	**2**	**171**	**17**	**188**		**0**	**0**	**0**
15:00 to 15:15	13	1	**14**		1	0	**1**	0	0	**0**	6	1	**7**	65	5	**70**		0	0	**0**
15:15 to 15:30	2	1	**3**		3	0	**3**	0	0	**0**	1	0	**1**	60	1	**61**		0	0	**0**
15:30 to 15:45	7	1	**8**		1	0	**1**	0	0	**0**	1	1	**2**	50	3	**53**		0	0	**0**
15:45 to 16:00	7	1	**8**		3	0	**3**	0	0	**0**	2	0	**2**	51	1	**52**		0	0	**0**
16:00 to 16:15	6	0	**6**		2	0	**2**	0	0	**0**	4	0	**4**	58	4	**62**		0	0	**0**
16:15 to 16:30	6	0	**6**		2	1	**3**	0	0	**0**	3	1	**4**	49	4	**53**		0	0	**0**
16:30 to 16:45	16	0	**16**		2	0	**2**	0	0	**0**	2	0	**2**	58	2	**60**		0	0	**0**
16:45 to 17:00	10	0	**10**		1	0	**1**	0	0	**0**	5	0	**5**	62	2	**64**		0	0	**0**
17:00 to 17:15	10	1	**11**		1	0	**1**	0	0	**0**	2	0	**2**	65	3	**68**		0	0	**0**
17:15 to 17:30	7	1	**8**		4	1	**5**	0	0	**0**	1	0	**1**	62	3	**65**		0	0	**0**
17:30 to 17:45	6	0	**6**		2	0	**2**	0	0	**0**	3	0	**3**	49	4	**53**		0	0	**0**
17:45 to 18:00	8	1	**9**		4	0	**4**	0	0	**0**	2	0	**2**	62	2	**64**		0	0	**0**
PM Totals	**98**	**7**	**105**		**26**	**2**	**28**	**0**	**0**	**0**	**32**	**3**	**35**	**691**	**34**	**725**		**0**	**0**	**0**

Job No. : N5008
Client : GTA
Suburb : Richmond
Location : 2. Castlereagh Rd / William Cox Dr

Day/Date : Thu, 23rd May 2019
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary

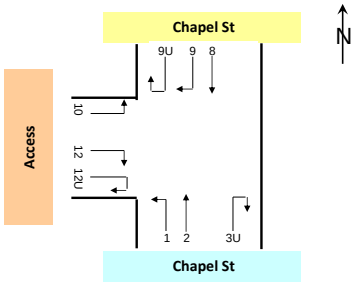


Approach		Castlereagh Rd								
Direction		Direction 5 (Through)			Direction 6 (Right Turn)			Direction 6U (U Turn)		
Time Period		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
6:30 to 7:30		49	9	**58**	4	0	**4**	0	0	**0**
6:45 to 7:45		28	3	**31**	1	0	**1**	0	0	**0**
7:00 to 8:00		18	2	**20**	1	0	**1**	0	0	**0**
7:15 to 8:15		0	0	**0**	0	0	**0**	0	0	**0**
7:30 to 8:30		0	0	**0**	0	0	**0**	0	0	**0**
7:45 to 8:45		0	0	**0**	0	0	**0**	0	0	**0**
8:00 to 9:00		0	0	**0**	0	0	**0**	0	0	**0**
8:15 to 9:15		0	0	**0**	0	0	**0**	0	0	**0**
8:30 to 9:30		0	0	**0**	0	0	**0**	0	0	**0**
AM Totals		**49**	**9**	**58**	**4**	**0**	**4**	**0**	**0**	**0**
15:00 to 16:00		368	24	**392**	64	4	**68**	1	0	**1**
15:15 to 16:15		389	22	**411**	65	4	**69**	1	0	**1**
15:30 to 16:30		432	21	**453**	63	4	**67**	1	0	**1**
15:45 to 16:45		439	26	**465**	54	3	**57**	1	0	**1**
16:00 to 17:00		464	24	**488**	68	2	**70**	0	0	**0**
16:15 to 17:15		476	21	**497**	67	5	**72**	0	0	**0**
16:30 to 17:30		489	17	**506**	72	5	**77**	0	0	**0**
16:45 to 17:45		478	15	**493**	76	5	**81**	0	0	**0**
17:00 to 18:00		456	14	**470**	65	5	**70**	0	0	**0**
PM Totals		**1,288**	**62**	**1,350**	**197**	**11**	**208**	**1**	**0**	**1**

Approach	William Cox Dr										Castlereagh Rd									
Direction	Direction 7 (Left Turn)				Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11 (Through)				Direction 12U (U Turn)		
Time Period	Lights	Heavies	Total		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total
6:30 to 7:30	27	0	**27**		2	0	**2**	0	0	**0**	2	0	**2**	171	17	**188**		0	0	**0**
6:45 to 7:45	21	0	**21**		0	0	**0**	0	0	**0**	1	0	**1**	108	8	**116**		0	0	**0**
7:00 to 8:00	9	0	**9**		0	0	**0**	0	0	**0**	0	0	**0**	51	4	**55**		0	0	**0**
7:15 to 8:15	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**		0	0	**0**
7:30 to 8:30	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**		0	0	**0**
7:45 to 8:45	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**		0	0	**0**
8:00 to 9:00	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**		0	0	**0**
8:15 to 9:15	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**		0	0	**0**
8:30 to 9:30	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**		0	0	**0**
AM Totals	**27**	**0**	**27**		**2**	**0**	**2**	**0**	**0**	**0**	**2**	**0**	**2**	**171**	**17**	**188**		**0**	**0**	**0**
15:00 to 16:00	29	4	**33**		8	0	**8**	0	0	**0**	10	2	**12**	226	10	**236**		0	0	**0**
15:15 to 16:15	22	3	**25**		9	0	**9**	0	0	**0**	8	1	**9**	219	9	**228**		0	0	**0**
15:30 to 16:30	26	2	**28**		8	1	**9**	0	0	**0**	10	2	**12**	208	12	**220**		0	0	**0**
15:45 to 16:45	35	1	**36**		9	1	**10**	0	0	**0**	11	1	**12**	216	11	**227**		0	0	**0**
16:00 to 17:00	38	0	**38**		7	1	**8**	0	0	**0**	14	1	**15**	227	12	**239**		0	0	**0**
16:15 to 17:15	42	1	**43**		6	1	**7**	0	0	**0**	12	1	**13**	234	11	**245**		0	0	**0**
16:30 to 17:30	43	2	**45**		8	1	**9**	0	0	**0**	10	0	**10**	247	10	**257**		0	0	**0**
16:45 to 17:45	33	2	**35**		8	1	**9**	0	0	**0**	11	0	**11**	238	12	**250**		0	0	**0**
17:00 to 18:00	31	3	**34**		11	1	**12**	0	0	**0**	8	0	**8**	238	12	**250**		0	0	**0**
PM Totals	**98**	**7**	**105**		**26**	**2**	**28**	**0**	**0**	**0**	**32**	**3**	**35**	**691**	**34**	**725**		**0**	**0**	**0**

Job No.	: N5008
Client	: GTA
Suburb	: Richmond
Location	: 3. Chapel St / Site Access
Day/Date	: Thu, 23rd May 2019
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

	Class 1	**Class 2**
Classifications	Lights	Heavies



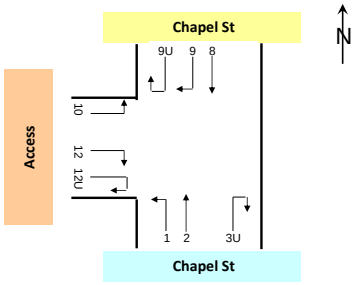
MATRIX
Traffic and Transport Data

Approach	**Chapel St**											
Direction	**Direction 1 (Left Turn)**			**Direction 2 (Through)**				**Direction 3U (U Turn)**				
Time Period	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**		**Lights**	**Heavies**	**Total**		
6:30 to 6:45	0	0	**0**	0	0	**0**		0	0	**0**		
6:45 to 7:00	0	0	**0**	0	0	**0**		0	0	**0**		
7:00 to 7:15	0	0	**0**	0	0	**0**		0	0	**0**		
7:15 to 7:30	0	0	**0**	0	0	**0**		0	0	**0**		
7:30 to 7:45	0	0	**0**	0	0	**0**		0	0	**0**		
7:45 to 8:00	0	0	**0**	1	0	**1**		0	0	**0**		
8:00 to 8:15	0	0	**0**	1	0	**1**		0	0	**0**		
8:15 to 8:30	0	0	**0**	0	0	**0**		0	0	**0**		
8:30 to 8:45	0	0	**0**	0	0	**0**		0	0	**0**		
8:45 to 9:00	0	0	**0**	0	0	**0**		0	0	**0**		
9:00 to 9:15	0	0	**0**	0	0	**0**		0	0	**0**		
9:15 to 9:30	0	0	**0**	0	0	**0**		0	0	**0**		
AM Totals	**0**	**0**	**0**	**2**	**0**	**2**		**0**	**0**	**0**		
15:00 to 15:15	0	0	**0**	0	0	**0**		0	0	**0**		
15:15 to 15:30	0	0	**0**	0	0	**0**		0	0	**0**		
15:30 to 15:45	0	0	**0**	0	0	**0**		0	0	**0**		
15:45 to 16:00	0	0	**0**	0	0	**0**		0	0	**0**		
16:00 to 16:15	0	0	**0**	0	0	**0**		0	0	**0**		
16:15 to 16:30	0	0	**0**	0	0	**0**		0	0	**0**		
16:30 to 16:45	0	0	**0**	0	0	**0**		0	0	**0**		
16:45 to 17:00	0	0	**0**	0	0	**0**		0	0	**0**		
17:00 to 17:15	0	0	**0**	0	0	**0**		0	0	**0**		
17:15 to 17:30	0	0	**0**	0	0	**0**		0	0	**0**		
17:30 to 17:45	0	0	**0**	0	0	**0**		0	0	**0**		
17:45 to 18:00	0	0	**0**	0	0	**0**		0	0	**0**		
PM Totals	**0**	**0**	**0**	**0**	**0**	**0**		**0**	**0**	**0**		

Approach	Chapel St									Access								
Direction		Direction 8 (Through)			Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)				Direction 12 (Right Turn)			Direction 12U (U Turn)		
Time Period		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total	Lights	Heavies	Total
6:30 to 6:45		1	0	**1**	3	0	**3**	0	0	**0**	0	0	**0**		0	0	**0**	0	0	**0**
6:45 to 7:00		3	0	**3**	1	0	**1**	0	0	**0**	4	0	**4**		0	0	**0**	0	0	**0**
7:00 to 7:15		2	0	**2**	0	0	**0**	0	0	**0**	0	0	**0**		0	0	**0**	0	0	**0**
7:15 to 7:30		0	0	**0**	2	0	**2**	0	0	**0**	2	0	**2**		0	0	**0**	0	0	**0**
7:30 to 7:45		0	0	**0**	0	0	**0**	0	0	**0**	1	0	**1**		0	0	**0**	0	0	**0**
7:45 to 8:00		0	0	**0**	5	0	**5**	0	0	**0**	2	0	**2**		0	0	**0**	0	0	**0**
8:00 to 8:15		0	0	**0**	4	0	**4**	0	0	**0**	0	0	**0**		0	0	**0**	0	0	**0**
8:15 to 8:30		0	0	**0**	2	0	**2**	0	0	**0**	2	0	**2**		0	0	**0**	0	0	**0**
8:30 to 8:45		1	0	**1**	2	0	**2**	1	0	**1**	0	0	**0**		0	0	**0**	0	0	**0**
8:45 to 9:00		1	0	**1**	3	0	**3**	1	0	**1**	1	0	**1**		0	0	**0**	0	0	**0**
9:00 to 9:15		0	0	**0**	6	1	**7**	0	0	**0**	3	0	**3**		0	0	**0**	0	0	**0**
9:15 to 9:30		0	0	**0**	3	0	**3**	0	0	**0**	4	1	**5**		0	0	**0**	0	0	**0**
AM Totals		**8**	**0**	**8**	**31**	**1**	**32**	**2**	**0**	**2**	**19**	**1**	**20**		**0**	**0**	**0**	**0**	**0**	**0**
15:00 to 15:15		0	0	**0**	2	0	**2**	0	0	**0**	13	0	**13**		0	0	**0**	0	0	**0**
15:15 to 15:30		0	0	**0**	5	0	**5**	0	0	**0**	6	0	**6**		0	0	**0**	0	0	**0**
15:30 to 15:45		2	0	**2**	2	0	**2**	0	0	**0**	3	0	**3**		0	0	**0**	0	0	**0**
15:45 to 16:00		0	0	**0**	5	0	**5**	0	0	**0**	2	0	**2**		0	0	**0**	0	0	**0**
16:00 to 16:15		0	0	**0**	2	0	**2**	0	0	**0**	5	0	**5**		0	0	**0**	0	0	**0**
16:15 to 16:30		0	0	**0**	2	0	**2**	0	0	**0**	2	0	**2**		0	0	**0**	0	0	**0**
16:30 to 16:45		0	0	**0**	3	0	**3**	0	0	**0**	2	0	**2**		0	0	**0**	0	0	**0**
16:45 to 17:00		0	0	**0**	1	0	**1**	0	0	**0**	4	0	**4**		0	0	**0**	0	0	**0**
17:00 to 17:15		2	0	**2**	3	0	**3**	1	0	**1**	8	0	**8**		0	0	**0**	0	0	**0**
17:15 to 17:30		0	0	**0**	1	0	**1**	0	0	**0**	6	0	**6**		0	0	**0**	0	0	**0**
17:30 to 17:45		0	0	**0**	2	0	**2**	1	0	**1**	0	0	**0**		0	0	**0**	0	0	**0**
17:45 to 18:00		0	0	**0**	1	0	**1**	0	0	**0**	3	0	**3**		0	0	**0**	0	0	**0**
PM Totals		**4**	**0**	**4**	**29**	**0**	**29**	**2**	**0**	**2**	**54**	**0**	**54**		**0**	**0**	**0**	**0**	**0**	**0**

Job No. : N5008
Client : GTA
Suburb : Richmond
Location : 3. Chapel St / Site Access

Day/Date : Thu, 23rd May 2019
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



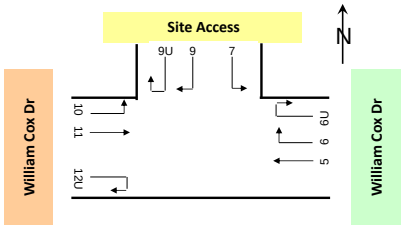
MATRIX Traffic and Transport Data

Approach	Chapel St								
Direction	Direction 1 (Left Turn)			Direction 2 (Through)				Direction 3U (U Turn)	
Time Period	Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total
6:30 to 7:30	0	0	**0**	0	0	**0**		0	0	**0**
6:45 to 7:45	0	0	**0**	0	0	**0**		0	0	**0**
7:00 to 8:00	0	0	**0**	1	0	**1**		0	0	**0**
7:15 to 8:15	0	0	**0**	2	0	**2**		0	0	**0**
7:30 to 8:30	0	0	**0**	2	0	**2**		0	0	**0**
7:45 to 8:45	0	0	**0**	2	0	**2**		0	0	**0**
8:00 to 9:00	0	0	**0**	1	0	**1**		0	0	**0**
8:15 to 9:15	0	0	**0**	0	0	**0**		0	0	**0**
8:30 to 9:30	0	0	**0**	0	0	**0**		0	0	**0**
AM Totals	**0**	**0**	**0**	**2**	**0**	**2**		**0**	**0**	**0**
15:00 to 16:00	0	0	**0**	0	0	**0**		0	0	**0**
15:15 to 16:15	0	0	**0**	0	0	**0**		0	0	**0**
15:30 to 16:30	0	0	**0**	0	0	**0**		0	0	**0**
15:45 to 16:45	0	0	**0**	0	0	**0**		0	0	**0**
16:00 to 17:00	0	0	**0**	0	0	**0**		0	0	**0**
16:15 to 17:15	0	0	**0**	0	0	**0**		0	0	**0**
16:30 to 17:30	0	0	**0**	0	0	**0**		0	0	**0**
16:45 to 17:45	0	0	**0**	0	0	**0**		0	0	**0**
17:00 to 18:00	0	0	**0**	0	0	**0**		0	0	**0**
PM Totals	**0**	**0**	**0**	**0**	**0**	**0**		**0**	**0**	**0**

Approach	Chapel St									Access								
Direction		Direction 8 (Through)			Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)				Direction 12 (Right Turn)			Direction 12U (U Turn)		
Time Period		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total	Lights	Heavies	Total
6:30 to 7:30		6	0	**6**	6	0	**6**	0	0	**0**	6	0	**6**		0	0	**0**	0	0	**0**
6:45 to 7:45		5	0	**5**	3	0	**3**	0	0	**0**	7	0	**7**		0	0	**0**	0	0	**0**
7:00 to 8:00		2	0	**2**	7	0	**7**	0	0	**0**	5	0	**5**		0	0	**0**	0	0	**0**
7:15 to 8:15		0	0	**0**	11	0	**11**	0	0	**0**	5	0	**5**		0	0	**0**	0	0	**0**
7:30 to 8:30		0	0	**0**	11	0	**11**	0	0	**0**	5	0	**5**		0	0	**0**	0	0	**0**
7:45 to 8:45		1	0	**1**	13	0	**13**	1	0	**1**	4	0	**4**		0	0	**0**	0	0	**0**
8:00 to 9:00		2	0	**2**	11	0	**11**	2	0	**2**	3	0	**3**		0	0	**0**	0	0	**0**
8:15 to 9:15		2	0	**2**	13	1	**14**	2	0	**2**	6	0	**6**		0	0	**0**	0	0	**0**
8:30 to 9:30		2	0	**2**	14	1	**15**	2	0	**2**	8	1	**9**		0	0	**0**	0	0	**0**
AM Totals		**8**	**0**	**8**	**31**	**1**	**32**	**2**	**0**	**2**	**19**	**1**	**20**		**0**	**0**	**0**	**0**	**0**	**0**
15:00 to 16:00		2	0	**2**	14	0	**14**	0	0	**0**	24	0	**24**		0	0	**0**	0	0	**0**
15:15 to 16:15		2	0	**2**	14	0	**14**	0	0	**0**	16	0	**16**		0	0	**0**	0	0	**0**
15:30 to 16:30		2	0	**2**	11	0	**11**	0	0	**0**	12	0	**12**		0	0	**0**	0	0	**0**
15:45 to 16:45		0	0	**0**	12	0	**12**	0	0	**0**	11	0	**11**		0	0	**0**	0	0	**0**
16:00 to 17:00		0	0	**0**	8	0	**8**	0	0	**0**	13	0	**13**		0	0	**0**	0	0	**0**
16:15 to 17:15		2	0	**2**	9	0	**9**	1	0	**1**	16	0	**16**		0	0	**0**	0	0	**0**
16:30 to 17:30		2	0	**2**	8	0	**8**	1	0	**1**	20	0	**20**		0	0	**0**	0	0	**0**
16:45 to 17:45		2	0	**2**	7	0	**7**	2	0	**2**	18	0	**18**		0	0	**0**	0	0	**0**
17:00 to 18:00		2	0	**2**	7	0	**7**	2	0	**2**	17	0	**17**		0	0	**0**	0	0	**0**
PM Totals		**4**	**0**	**4**	**29**	**0**	**29**	**2**	**0**	**2**	**54**	**0**	**54**		**0**	**0**	**0**	**0**	**0**	**0**

Job No.	: N5008
Client	: GTA
Suburb	: Richmond
Location	: 4. William Cox Dr / Site Access
Day/Date	: Thu, 23rd May 2019
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

	Class 1	Class 2
Classifications	Lights	Heavies



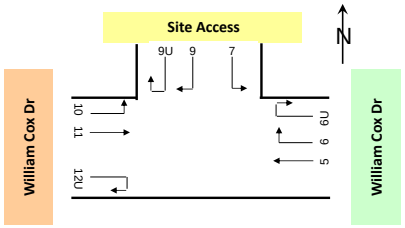
MATRIX Traffic and Transport Data

Approach		William Cox Dr									
Direction			Direction 5 (Through)			Direction 6 (Right Turn)			Direction 6U (U Turn)		
Time Period		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
6:30	to 6:45	3	0	**3**	0	0	**0**	0	0	**0**
6:45	to 7:00	2	0	**2**	0	0	**0**	0	0	**0**
7:00	to 7:15	0	0	**0**	0	0	**0**	0	0	**0**
7:15	to 7:30	0	1	**1**	0	0	**0**	0	0	**0**
7:30	to 7:45	3	0	**3**	0	0	**0**	0	0	**0**
7:45	to 8:00	5	0	**5**	0	0	**0**	0	0	**0**
8:00	to 8:15	4	0	**4**	0	0	**0**	0	0	**0**
8:15	to 8:30	4	2	**6**	0	0	**0**	0	0	**0**
8:30	to 8:45	3	0	**3**	1	0	**1**	0	0	**0**
8:45	to 9:00	6	0	**6**	0	0	**0**	0	0	**0**
9:00	to 9:15	4	0	**4**	0	0	**0**	0	0	**0**
9:15	to 9:30	8	1	**9**	0	0	**0**	0	0	**0**
AM Totals		**42**	**4**	**46**	**1**	**0**	**1**	**0**	**0**	**0**
15:00	to 15:15	15	2	**17**	0	0	**0**	0	0	**0**
15:15	to 15:30	12	1	**13**	0	0	**0**	0	0	**0**
15:30	to 15:45	15	2	**17**	0	0	**0**	0	0	**0**
15:45	to 16:00	9	1	**10**	1	0	**1**	0	0	**0**
16:00	to 16:15	5	0	**5**	0	0	**0**	0	0	**0**
16:15	to 16:30	3	2	**5**	0	0	**0**	0	0	**0**
16:30	to 16:45	11	0	**11**	0	0	**0**	0	0	**0**
16:45	to 17:00	5	0	**5**	0	0	**0**	0	0	**0**
17:00	to 17:15	8	0	**8**	0	0	**0**	0	0	**0**
17:15	to 17:30	8	2	**10**	0	0	**0**	0	0	**0**
17:30	to 17:45	5	0	**5**	0	0	**0**	0	0	**0**
17:45	to 18:00	11	0	**11**	0	0	**0**	0	0	**0**
PM Totals		**107**	**10**	**117**	**1**	**0**	**1**	**0**	**0**	**0**

Approach	Site Access										William Cox Dr									
Direction	Direction 7 (Left Turn)				Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11 (Through)				Direction 12U (U Turn)		
Time Period	Lights	Heavies	Total		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total
6:30 to 6:45	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	5	0	**5**		0	0	**0**
6:45 to 7:00	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	9	0	**9**		0	0	**0**
7:00 to 7:15	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	9	1	**10**		0	0	**0**
7:15 to 7:30	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	3	2	**5**		0	0	**0**
7:30 to 7:45	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	14	0	**14**		0	0	**0**
7:45 to 8:00	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	8	0	**8**		0	0	**0**
8:00 to 8:15	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	13	0	**13**		0	0	**0**
8:15 to 8:30	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	12	1	**13**		0	0	**0**
8:30 to 8:45	1	0	**1**		0	0	**0**	0	0	**0**	0	0	**0**	15	1	**16**		0	0	**0**
8:45 to 9:00	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	12	0	**12**		0	0	**0**
9:00 to 9:15	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	6	0	**6**		0	0	**0**
9:15 to 9:30	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	6	0	**6**		0	0	**0**
AM Totals	**1**	**0**	**1**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**112**	**5**	**117**		**0**	**0**	**0**
15:00 to 15:15	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	15	0	**15**		0	0	**0**
15:15 to 15:30	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	4	1	**5**		0	0	**0**
15:30 to 15:45	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	8	1	**9**		0	0	**0**
15:45 to 16:00	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	9	0	**9**		0	0	**0**
16:00 to 16:15	1	0	**1**		0	0	**0**	0	0	**0**	0	0	**0**	17	0	**17**		0	0	**0**
16:15 to 16:30	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	13	1	**14**		0	0	**0**
16:30 to 16:45	2	0	**2**		0	0	**0**	0	0	**0**	0	0	**0**	6	0	**6**		0	0	**0**
16:45 to 17:00	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	16	0	**16**		0	0	**0**
17:00 to 17:15	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	14	0	**14**		0	0	**0**
17:15 to 17:30	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	16	0	**16**		0	0	**0**
17:30 to 17:45	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	14	0	**14**		0	0	**0**
17:45 to 18:00	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	12	0	**12**		0	0	**0**
PM Totals	**3**	**0**	**3**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**144**	**3**	**147**		**0**	**0**	**0**

Job No. : N5008
Client : GTA
Suburb : Richmond
Location : 4. William Cox Dr / Site Access

Day/Date : Thu, 23rd May 2019
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



MATRIX Traffic and Transport Data

Approach		William Cox Dr									
Direction		Direction 5 (Through)			Direction 6 (Right Turn)			Direction 6U (U Turn)			
Time Period		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
6:30	to 7:30	5	1	**6**	0	0	**0**	0	0	**0**
6:45	to 7:45	5	1	**6**	0	0	**0**	0	0	**0**
7:00	to 8:00	8	1	**9**	0	0	**0**	0	0	**0**
7:15	to 8:15	12	1	**13**	0	0	**0**	0	0	**0**
7:30	to 8:30	16	2	**18**	0	0	**0**	0	0	**0**
7:45	to 8:45	16	2	**18**	1	0	**1**	0	0	**0**
8:00	to 9:00	17	2	**19**	1	0	**1**	0	0	**0**
8:15	to 9:15	17	2	**19**	1	0	**1**	0	0	**0**
8:30	to 9:30	21	1	**22**	1	0	**1**	0	0	**0**
AM Totals		**42**	**4**	**46**	**1**	**0**	**1**	**0**	**0**	**0**
15:00	to 16:00	51	6	**57**	1	0	**1**	0	0	**0**
15:15	to 16:15	41	4	**45**	1	0	**1**	0	0	**0**
15:30	to 16:30	32	5	**37**	1	0	**1**	0	0	**0**
15:45	to 16:45	28	3	**31**	1	0	**1**	0	0	**0**
16:00	to 17:00	24	2	**26**	0	0	**0**	0	0	**0**
16:15	to 17:15	27	2	**29**	0	0	**0**	0	0	**0**
16:30	to 17:30	32	2	**34**	0	0	**0**	0	0	**0**
16:45	to 17:45	26	2	**28**	0	0	**0**	0	0	**0**
17:00	to 18:00	32	2	**34**	0	0	**0**	0	0	**0**
PM Totals		**107**	**10**	**117**	**1**	**0**	**1**	**0**	**0**	**0**

Approach	Site Access									William Cox Dr								
Direction	Direction 7 (Left Turn)				Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11 (Through)				Direction 12U (U Turn)	
Time Period	Lights	Heavies	Total		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total
6:30 to 7:30	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	26	3	**29**		0	0	**0**
6:45 to 7:45	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	35	3	**38**		0	0	**0**
7:00 to 8:00	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	34	3	**37**		0	0	**0**
7:15 to 8:15	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	38	2	**40**		0	0	**0**
7:30 to 8:30	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	47	1	**48**		0	0	**0**
7:45 to 8:45	1	0	**1**		0	0	**0**	0	0	**0**	0	0	**0**	48	2	**50**		0	0	**0**
8:00 to 9:00	1	0	**1**		0	0	**0**	0	0	**0**	0	0	**0**	52	2	**54**		0	0	**0**
8:15 to 9:15	1	0	**1**		0	0	**0**	0	0	**0**	0	0	**0**	45	2	**47**		0	0	**0**
8:30 to 9:30	1	0	**1**		0	0	**0**	0	0	**0**	0	0	**0**	39	1	**40**		0	0	**0**
AM Totals	**1**	**0**	**1**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**112**	**5**	**117**		**0**	**0**	**0**
15:00 to 16:00	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	36	2	**38**		0	0	**0**
15:15 to 16:15	1	0	**1**		0	0	**0**	0	0	**0**	0	0	**0**	38	2	**40**		0	0	**0**
15:30 to 16:30	1	0	**1**		0	0	**0**	0	0	**0**	0	0	**0**	47	2	**49**		0	0	**0**
15:45 to 16:45	3	0	**3**		0	0	**0**	0	0	**0**	0	0	**0**	45	1	**46**		0	0	**0**
16:00 to 17:00	3	0	**3**		0	0	**0**	0	0	**0**	0	0	**0**	52	1	**53**		0	0	**0**
16:15 to 17:15	2	0	**2**		0	0	**0**	0	0	**0**	0	0	**0**	49	1	**50**		0	0	**0**
16:30 to 17:30	2	0	**2**		0	0	**0**	0	0	**0**	0	0	**0**	52	0	**52**		0	0	**0**
16:45 to 17:45	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	60	0	**60**		0	0	**0**
17:00 to 18:00	0	0	**0**		0	0	**0**	0	0	**0**	0	0	**0**	56	0	**56**		0	0	**0**
PM Totals	**3**	**0**	**3**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**144**	**3**	**147**		**0**	**0**	**0**

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