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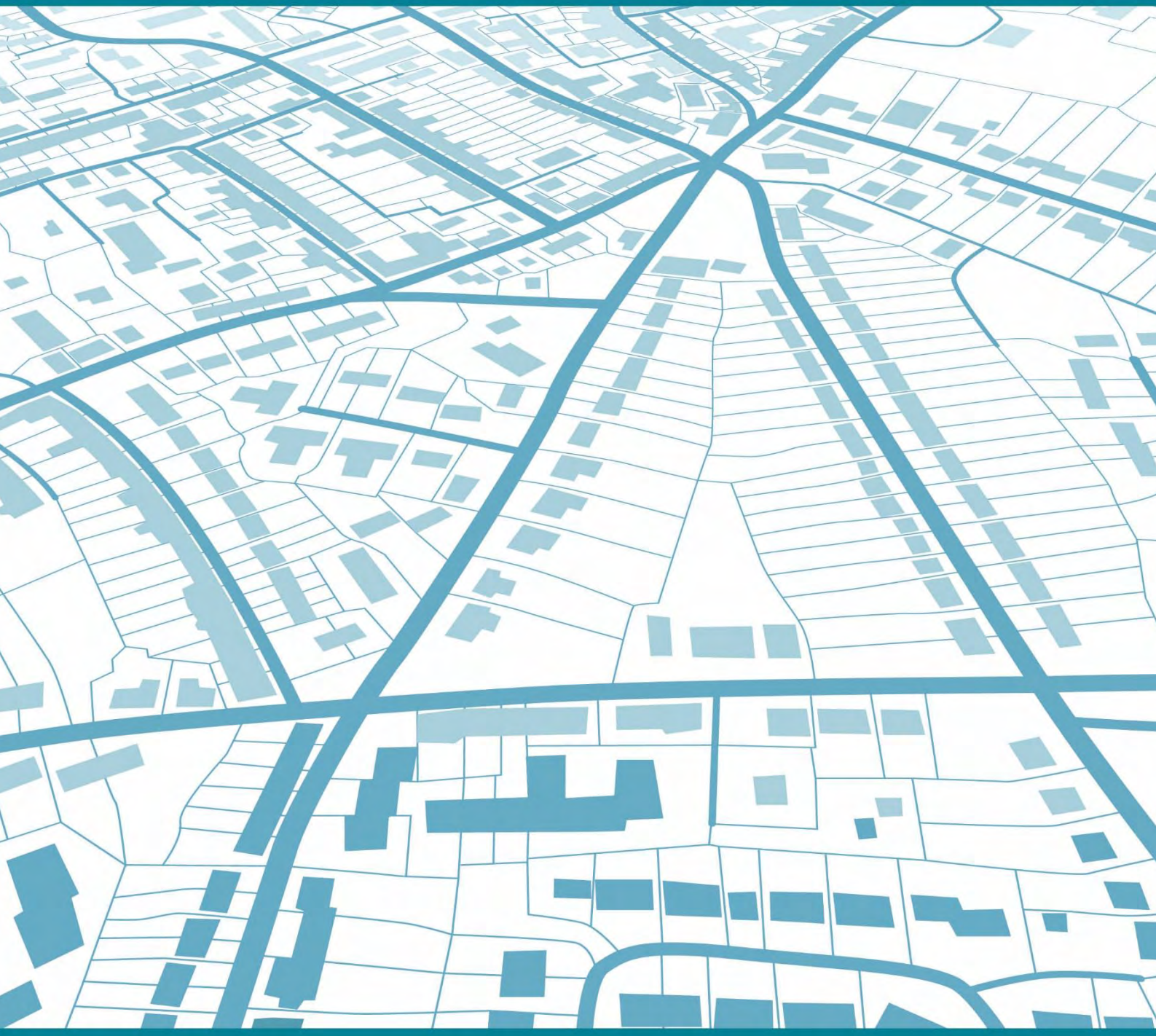


Burwood Uniting Church

134 Burwood Road, Burwood

Proposed Stage 1 DA

Traffic and Parking Impact Assessment

Ref: 16008
Date: September 2018
Issue: B

Table of Contents

List of Figures

List of Appendices

1.0 Introduction

This report has been prepared to accompany a Development Application to Burwood Council for the proposed Stage 1 Development Application (DA) involving the Burwood Uniting Church mixed use complex at 132-134 Burwood Road, Burwood (Figure 1).

Burwood is a popular inner western Regional Centre which is well served by public transport and has shopping, entertainment and educational facilities as well as employment sources. The large Westfield and Burwood Plaza retail centres are well established while older style residential, retail and commercial sites in the Centre are being redeveloped in accordance with the provisions of Burwood LEP (Burwood Town Centre) 2010.

This Stage 1 DA proposes the following development outcome:

Church (GFA)	282m^2
Church admin (GFA)	974m^2
Retail (GFA)	983m^2
Commercial (GFA)	1,482m^2
Medical suites (GFA)	1,380m^2
Childcare centre	80 places
Student accommodation	60 rooms
Residential apartments	134 units
Basement carpark	338 spaces

The purpose of this report is to:

- describe the site and the proposed revised development scheme
- describe the road network serving the site and the prevailing traffic conditions

LEGEND

LOCATION

FIG 1

- assess the adequacy of the proposed parking provision
- assess the potential traffic implications
- establish a high-level travel demand management strategy
- assess the suitability of the proposed vehicle access, internal circulation and servicing arrangements
- establish a high-level construction traffic management plan

2.0 Proposed Development

2.1 Site, Context and Existing Use

The site (Figure 2) being an irregular shaped allotment has a gentle slope towards the east and has frontages to Burwood Road and George Street. The site is currently occupied by 6 older style 2 storey retail and commercial buildings as well as the former Congregational (now The Uniting) Church building and the associated School Hall.

Vehicle access for the site is currently provided on Burwood Road and George Street and carparking is provided at-grade.

The Burwood Plaza Retail Centre is located just to the south west while the Westfield Burwood Shopping Centre is located to the north. Other uses surrounding the site are comprised of the Burwood Road retail strip with upper level commercial offices and the new multi-storey apartment building ('The Burwood') just to the south and the commercial offices fronting Deane Street to the south. Burwood Railway Station is located just 100m to the south.

2.3 Proposed Development

The Stage 1 DA seeks permission to retain the Church and Schoolhouse and demolish the 2-storey retail/commercial buildings and undertake extensive site excavation and leveling to provide a level building platform to accommodate the following development outcome:

To be refurbished

Church (GFA)	282m^2

New works

Church administrative building (GFA)	974m^2

LEGEND

N

SITE

FIG 2

Retail (GFA)	983m^2
Commercial (GFA)	1,482m^2
Medical suites (GFA)	1,380m^2
Childcare centre	80 places
Student accommodation	60 rooms
Residential apartments	134 units
Basement carpark	338 spaces

Site amenity to be provided

New Burwood Road-George Street through site link for pedestrians

Access to the site and basement car parking will be provided on the George Street frontage abutting the eastern site boundary.

Architectural details of the proposed development are provided on the plans prepared by the Turner Architects which accompany the Application and are reproduced in part in Appendix A.

3.0 Existing Road Network and Traffic Conditions

3.1 Road Network

The roads network which serves the site (Figure 3) comprises:

- *Liverpool Road and Parramatta Road* - the State Highway and arterial routes
- *Georges River Road and Coronation Parade - The Boulevarde* the State Road and sub-arterial routes
- *Railway Parade* - the Regional Road and collector route
- *Burwood Road, Shaftsbury Road, Railway Parade and Wentworth Road* - the major collector routes
- *George Street, Deane Street, Victoria Street, Marmaduke Street, Waimea Street* – the local road system connecting between Shaftsbury Road and Burwood Road

Burwood Road is part of a major collector route connecting between Concord/Mortlake to the north and as far south as Campsie to the south and has a carriageway of some 12.5 metres wide being relatively straight and level in the vicinity of the site.

George Street is a local road and is some 6.5m wide except for the narrower western section which is 4.5m wide giving way to an extended aisle as part of the pedestrian rationalisation scheme implemented across the Burwood Town Centre in the recent years.

3.2 Traffic Controls

The traffic controls which have been applied to the road system in the vicinity of the site (Figure 4) comprise:

- the traffic signals at the Burwood Road, Deane Street and Railway Parade intersection

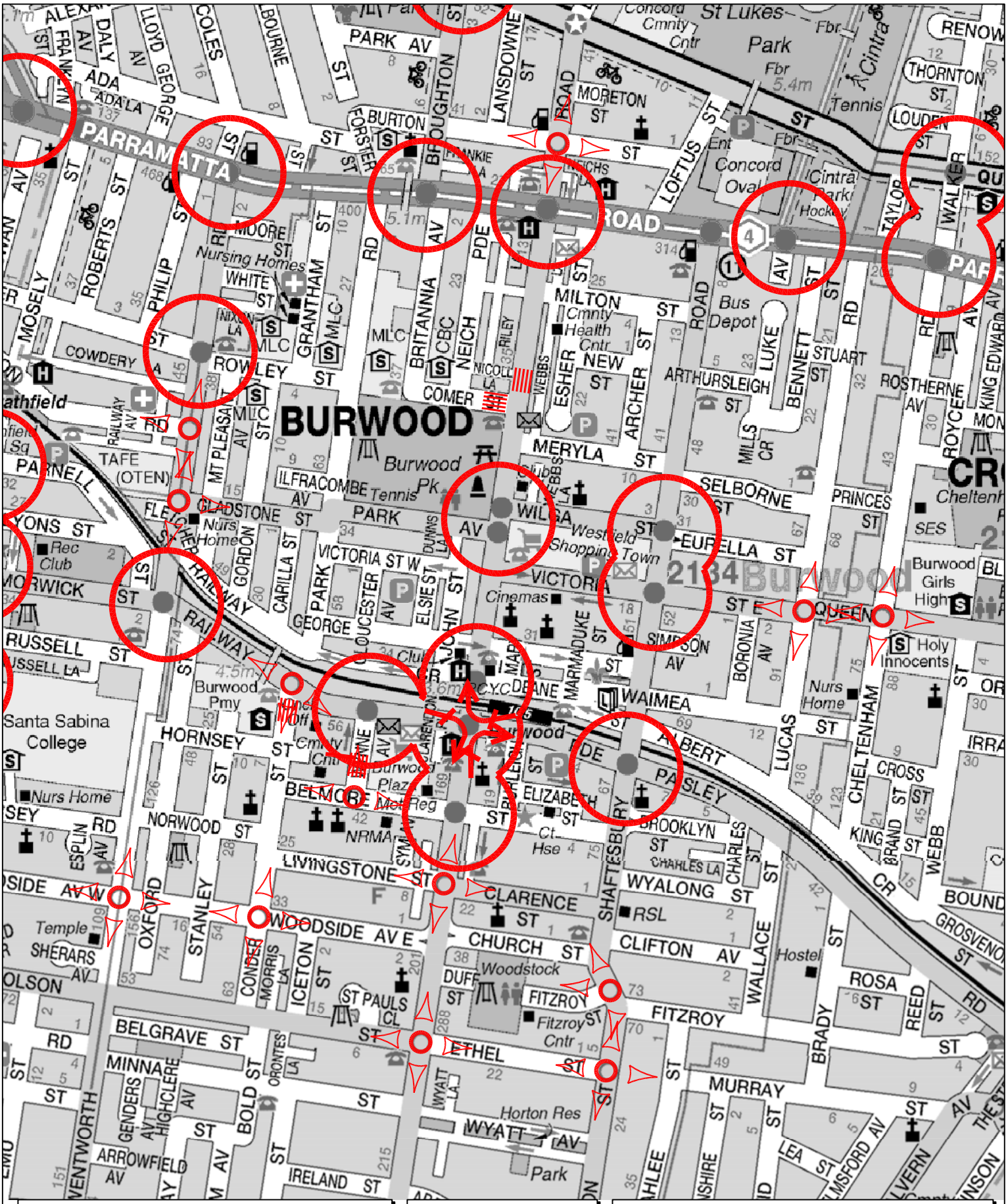
LEGEND

- ARTERIAL
- SUB-ARTERIAL
- COLLECTOR

N

ROAD NETWORK

FIG 3


BURWOOD
PARRAMATTA ROAD
PARK AV
BURTON ST
MORETON ST
LANSDOWNE ST
BROUGHTON ST
LOFTUS ST
Concord Oval
St Lukes Park
Concord Cmnty Cntr
Tennis
Bus Depot
MILTON ST
Cmnty Health Cntr
NEW ST
ESHER ST
ARCHER ST
ARTHURSLEIGH ST
BENNETT ST
STUART ST
LUKE ST
MERYLA ST
SELBORNE ST
EURELLA ST
VICTORIA ST W
VICTORIA
Cinemas
Westfield Shopping Town
2134 Burwood
Burwood Girls High
Holy Innocents
QUEEN ST
PRINCES ST
SES
Cheltenham
WHITE ST
Nursing Homes
MOORE ST
ROBERTS ST
PHILIP ST
MOSELY ST
COWDERY ST
ROWLEY ST
GRANTHAM ST
BRITANNIA AV
NEICH ST
COMER ST
NICOLL LA
WEBBS LA
RILEY ST
MLC
CBC
Burwood Pk
Tennis
ILFRACOMBE AV
PARK AV
WILGA AV
GLADSTONE ST
Nurs Home
GORDON ST
CARILLA ST
PARK AV
GEORGE ST
GLOUCESTER AV
ELSIE ST
JOHN ST
DUNNS LA
MT PLEASANT AV
TAFE (OTEN)
PARNELL ST
RAILWAY AV
RAILWAY
FLEMING ST
YONS ST
Rec Club
MORWICK ST
RUSSELL ST
RUSSELL LA
Santa Sabina College
Nurs Home
Burwood Pmy
HORNSEY ST
BELMORE ST
NORWOOD ST
NRMA
Burwood Plaza
Reg
DUANE ST
MARMADUKE ST
WAIMEA ST
SIMPSON AV
BORONIA AV
Nurs Home
ALBERT ST
LUCAS ST
CHELTENHAM CRES
PASLEY ST
BROOKLYN ST
CHARLES LA
CHARLES ST
KING ST
BRAND ST
WEBB ST
ELIZABETH ST
Ct Hse
SHAFTESBURY
WYALONG ST
RSL
CLIFTON AV
Hostel
WALLACE ST
ROSA ST
REED ST
BRADY ST
FITZROY ST
Fitzroy Cntr
FITZROY
MURRAY ST
LIVINGSTONE ST
CLARENCE ST
CHURCH ST
Woodstock
DUFF ST
WOODSIDE AV E
ST PAULS CL
ICETON ST
MORRIS LA
CONDER ST
OXFORD ST
STANLEY ST
ESPLIN AV
SHERARS AV
Temple
OLSON RD
BELGRAVE ST
MINNA ST
GENDERS AV
HIGHCLERE AV
ARROWFIELD AV
IRELAND ST
BOLD ST
ORONTES LA
ETHEL ST
WYATT LA
WYATT AV
Horton Res
Park
LEA ST
LEMSFORD AV
THE ST
LEGEND
TRAFFIC SIGNAL CONTROL
ROUNDABOUT
RESTRICTED TURNING MOVEMENT
N
TRAFFIC CONTROLS
FIG 4

- the traffic signals at the Burwood Road and Belmore Street intersection
- the traffic signals at the Burwood Road and Wilga Street intersection
- the traffic signals at the Shaftsbury Road and Railway Parade intersection
- the one-way traffic flow restrictions on George Street (easterly) and Deane Street (westerly)
- the various priority controlled intersections within the local road network bounded by Burwood Road and Shaftsbury Road
- the various marked foot crossings implemented at the Burwood Road intersecting minor streets
- the right-turn prohibitions at the Burwood Road/Railway Parade intersection

3.3 Traffic Conditions

An indication of traffic conditions in the vicinity of the precinct is provided by data published by RMS and surveys undertaken as part of this study in Appendix B.

The data published by RMS is expressed in terms of Annual Average Daily Traffic (AADT) and details are provided in the following:

	AADT
Railway Parade at Burwood Road	13,749
Burwood Road at Railway Parade	16,812
Wentworth Road at Railway Parade	8,961
Railway Parade at Wentworth Road	16,359

The operational performance of the road system is dominated by the arterial traffic flows on Parramatta Road however conditions in the precinct are relatively satisfactory apart from some delays and congestion that occur along Burwood Road particularly at peak retail trading times.

The access intersections of Burwood Road and George Street and Shaftesbury Road and George Street have been assessed using SIDRA traffic modelling program. Details of the modelling outcome indicating a satisfactory outcome are provided in Appendix C and summarised in the following while a guide to interpreting SIDRA results is provided overleaf.

	AM			PM		
	AVD	**LOS**	**DS**	**AVD**	**LOS**	**DS**
Burwood/George	1.0s	A	0.31	0.8s	A	0.29
Shaftesbury/George	0.8s	A	0.16	1.0s	A	0.22

3.4 Transport Services

The Burwood Centre is very well served by public transport services comprising:

- the high frequency rail services accessed at Burwood Railway Station located within a short walk of the site
- the numerous State Transit bus services which run along Burwood Road and other routes to/from or through the centre

Comprehensive details of the Trains Network Map and Bus Routes which operate in the vicinity of the site and interchange with the Railway Station are provided in Appendix D.

Criteria for Interpreting Results of SIDRA Analysis

1. Level of Service (LOS)

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'	Good	Good
'B'	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
'C'	Satisfactory	Satisfactory but accident study required
'D'	Operating near capacity	Near capacity and Accident Study required
'E'	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode
'F'	Unsatisfactory and requires additional capacity	Unsatisfactory and requires other control mode

2. Average Vehicle Delay (AVD)

The AVD provides a measure of the operational performance of an intersection as indicated on the table below, which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (ie inner city conditions) and on some roads (ie minor side street intersecting with a major arterial route).

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabouts	Give Way and Stop Signs
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	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode

3. Degree of Saturation (DS)

The DS is another measure of the operational performance of individual intersections.

For intersections controlled by **traffic signals**[1] both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a **roundabout or GIVE WAY or STOP signs**, satisfactory intersection operation is indicated by a DS of 0.8 or less.

[1] *the values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs*

4.0 Parking

4.1 Car Parking

Burwood Council's DCP specifies the following requirements in respect of the proposed uses:

Place of Worship

1 space per 18m^2 GFA or

1 space per 10 seats

Residential Apartments

One and two-bedroom apartments	1.0 spaces
Three-bedroom apartments	1.5 spaces
Visitors	1 space per 5 apartments

Boarding House/Student Accommodation

1 space per 10 residents

1 space per 2 employees/care takers

Retail and Commercial

1 space for 1st 400m² (or part); plus

1 space per 120 m² after

Medicare Centre

4 spaces per health care professional

1 space per employee

2 spaces for patients

Childcare Centre

1 space per 4 children

1 space per staff

Application of these guidelines to the proposed development would indicate:

Place of Worship	
282m^2	16 spaces
Residential Apartments	
10 x one-bed	10 spaces
109 x two-bed	109 spaces
15 x three-bed	23 spaces
Visitors (134 units)	27 spaces
Subtotal	**169 spaces**
Boarding House/Student Accommodation	
60 x rooms	6 spaces
1 x staff/caretaker	1 space
Subtotal	**7 spaces**
Retail and Commercial (including Church admin.)	
3,439m^2 GFA	26 spaces
Medicare Centre	
8 x healthcare professionals	32 spaces
8 x staff members	8 spaces
Patients	2 spaces
Subtotal	**42 spaces**
Childcare Centre	
80 places	20 spaces
6 x staff	6 spaces
Subtotal	**26 spaces**
Total	**286 spaces**

It is proposed to provide a total of 338 spaces in the basement in satisfaction of the DCP requirement and the proposed allocation are as follows:

Church	16
Church Admin.	6
Residential and visitors	168
Student accommodation	8
Retail/commercial	23
Medical centre	80
Child care centre	26
Unallocated (shared)	11
Total	**338 spaces**

It is apparent that the overall parking provision proposed will be adequate for the proposed uses and will comply with Council's requirements.

4.2 Bicycle Parking

Burwood Councils DCP sets out a range of objectives and provisions with respect to the need for new developments to accommodate bicycles. In terms of the number of spaces and the type of facilities, the DCP refers to the Austroads publication "Guide to Traffic Engineering Practice, Part 14 - Bicycles". Table 10.1 of this document recommends the following parking rates in respect of the proposed development.

Land Use	**Employee/Resident Rate**	**Visitor/Shopper Rate**
Residential	1 per 4 apartments	1 per 16 apartments
Retail	1 per 300m^2	1 per 500m^2 over 1,000m^2
Commercial	1 per 200m^2	1 per 750m^2 over 1,000m^2

In general compliance with these rates the proposed development will provide the following:

Residential (134 apts)	36 resident bikes, 13 visitor bikes
Retail (983m^2)	3 staff bikes, 2 shopper bikes
Commercial (1,482m^2)	7 staff bikes, 2 visitor bikes

5.0 Traffic

5.1 Traffic Impact

Peak traffic generation for the existing Church and ancillary elements only occur during the weekends (i.e. Sunday mornings) and as such will not overlap with the typical network peak periods.

Traffic generation rates for high density apartments with constrained carparking and proximity to railway stations (of 800m or less) are guided by the most recently published RMS Technical Circular TDT 2013/04a which indicate the following:

AM peak	0.19 vtph per dwelling
PM peak	0.15 vtph per dwelling

Traffic generation circumstance for student accommodation are not readily available however due to the constrained parking provision and proximity to rail services it is assessed that a peak hour traffic generation rate of 0.1 vtph per room will be quite appropriate having for the site's location.

The traffic generation characteristics of commercial offices are guided by the 2010 RMS Study which is based on 10 sites in the Sydney Metropolitan area. The subject site being just next to the Burwood Railway Station will be most comparable with the surveyed office tower at 1 Smith Street, Paramatta particularly in relation to the mixed use surrounds, constrained nature of parking provision (i.e. 1 space per 100-400m^2) and close proximities to both railway stations and local Westfield shopping centres.

The peak hour traffic generation surveys undertaken for this site reveal the following outcome:

AM peak	0.16 vtph per parking space
PM peak	0.14 vtph per parking space

The constrained parking rates applied to retail use elements preclude reference to the RMS Guidelines which are derived from surveys of large regional shopping centres (Departmental Store, Supermarket etc). The retail floor spaces envisaged for this scheme will be quite ancillary to the site's and its surrounds' workforce providing a one-stop facility which minimises internal trips i.e. lunch places, medical facilities, childcare, and etc. As such any generic traffic generation rates derived from destination type retail uses would not be representative in this context. It is envisaged that the allocated retail parking would be predominately reserved for store tenants and as such a trip generation similar to the associated office component will be quite apparent in this context (i.e. typically 1 arrival and 1 departure per day). Nevertheless, to provide a robust assessment the following rates which are twice as high compared with the commercial rates will be adopted in this assessment:

AM peak	0.32 vtph per parking space
PM peak	0.28 vtph per parking space

Traffic generation circumstances for medical centres are not provided in the RMS Guidelines however it can be assessed that the travel characteristics of staff/health professionals would exhibit very similar to that of offices/retail employees/tenants while the patient activities will be higher as follows:

Staff/Doctors

AM peak	0.19 vtph per parking space
PM peak	0.15 vtph per parking space

Patients

AM & PM peak	2 vtph per parking spaces (provided)

The most recently updated RMS Guidelines indicates the following peak traffic generation outcome for Child Care Centres in the Sydney Metropolitan area:

AM peak	0.64 vtph per child
PM peak	0.40 vtph per child

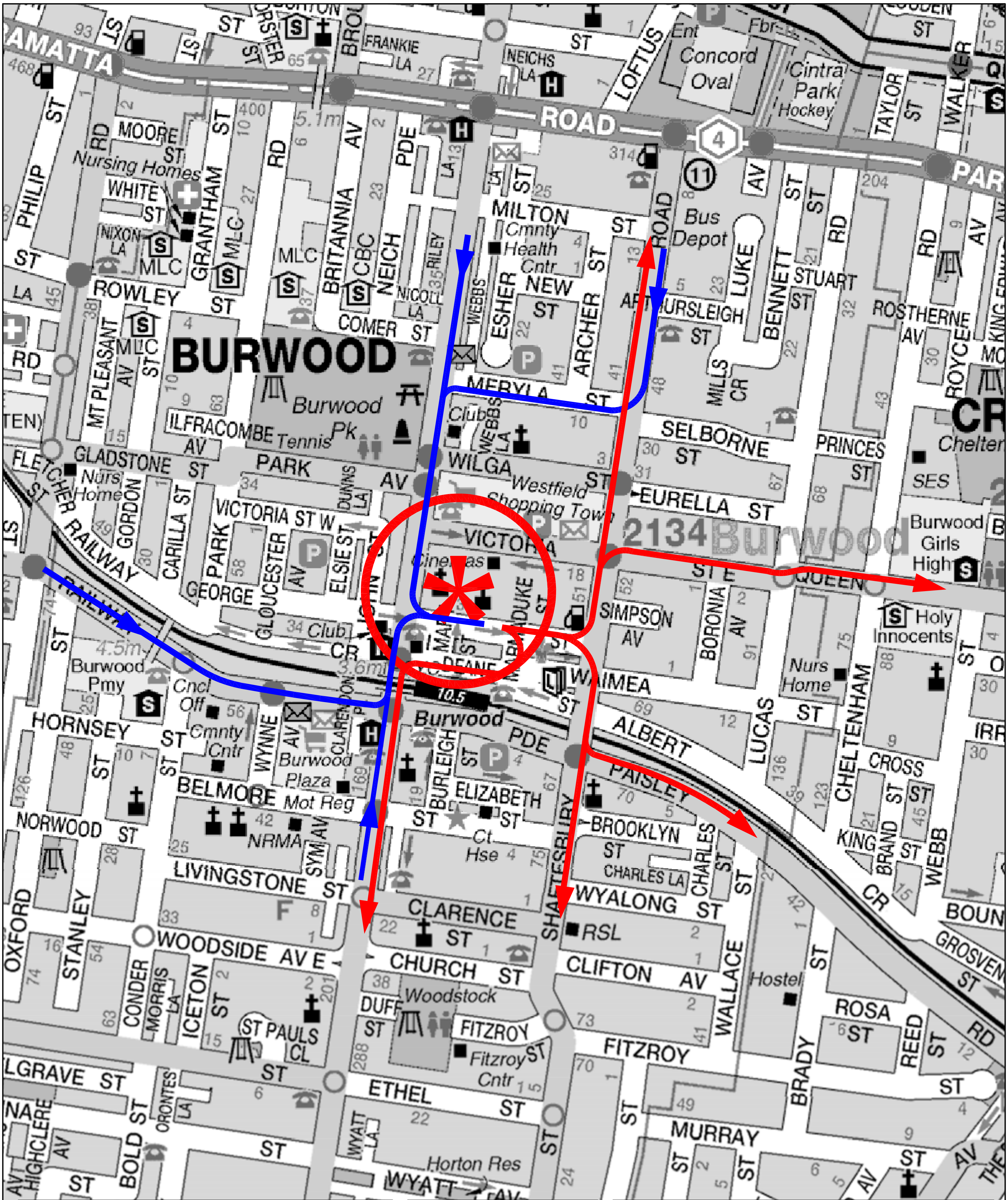
On this basis the assessed post-development peak traffic generation will comprise:

	AM		PM	
	IN	**OUT**	**IN**	**OUT**
Church	N/A	N/A	N/A	N/A
Residential	4	22	14	6
Student accommodation	1	5	1	5
Commercial (23 spaces)	4	0	0	3
Retail (12 spaces)	4	0	0	3
Medical centre (80 spaces)	16	10	10	16
Child care centre	25	25	16	16
Total:	**54**	**62**	**41**	**49**

The assessed access movement will be distributed across the local road system as follows and this is also diagrammatically presented on Figure 5 overleaf.

	Directional Distribution
North	15%
East	45%
West	25%
South	15%

The operation of the access intersections at George Street/Burwood Road George Street/Shaftsbury Road have been assessed using SIDRA. The results of that assessment are provided in Appendix B and summarised in the following.



BURWOOD
ROAD
PARRAMATTA
PHILIP ST
MOORE ST
Nursing Homes
WHITE ST
NIXON LA
GRANTHAM ST
MLC
BRITANNIA AV
CBC
NEICH PDE
RILEY
NICOLL LA
COMER ST
WEBBS
ESHER ST
MILTON ST
Cmnty Health Cntr
NEW ST
ARCHER ST
ROWLEY ST
Burwood Pk
Tennis
MT PLEASANT AV
ILFRACOMBE AV
GLADSTONE ST
PARK AV
MERYLA ST
Club
WILGA ST
Westfield Shopping Town
VICTORIA ST W
VICTORIA ST E
Cinemas
DUKE ST
SELBORNE ST
EURELLA ST
2134 Burwood
QUEEN ST
Burwood Girls High
PRINCES ST
SES
Chelten
ROSTHERNE AV
ROYCE
Bus Depot
ASHBURSLEIGH ST
STUART ST
LUKE
BENNETT ST
MILLS CR
Concord Oval
Cintra Park Hockey
LOFTUS
NEICHS LA
FRANKIE LA
TAYLOR ST
WALKER
FLETCHER ST
Nurs Home
GORDON
CARILLA ST
PARK
GLOUCESTER AV
ELSIE ST
GEORGE
RAILWAY
Burwood Pmy
Cncl Off
HORNSEY ST
WYNNE AV
Cmnty Cntr
Burwood Plaza
BELMORE ST
Mot Reg
NRMA
SYM AV
NORWOOD ST
LIVINGSTONE ST
WOODSIDE AV E
CLARENCE ST
CHURCH ST
Burwood
PDE
ELIZABETH ST
BURLEIGH ST
Ct Hse
DEANE ST
WAIMEA ST
SIMPSON AV
BORONIA AV
ALBERT
PAISLEY
BROOKLYN ST
CHARLES LA
CHARLES ST
WYALONG ST
RSL
CLIFTON AV
SHAFTESBURY
LUCAS
CHELTENHAM
CROSS
KING ST
BRAND ST
WEBB
Holy Innocents
Nurs Home
WALLACE
Hostel
ROSA ST
REED ST
GROSVENOR
FITZROY ST
Fitzroy Cntr
Woodstock
DUFF ST
ST PAULS CL
ETHEL ST
MURRAY
BRADY
OXFORD
STANLEY
CONDER
MORRIS LA
ICETON ST
BELGRAVE ST
BOLD ST
ORONTES
HIGHCLERE AV
Horton Res
WYATT AV
WYATT LA

LEGEND

APPROACH ROUTE

DEPARTURE ROUTE

TRAFFIC DISTRIBUTION

FIG 5

	AM			PM		
	AVD	**LOS**	**DS**	**AVD**	**LOS**	**DS**
Burwood/George	1.3s	A	0.32	1.0s	A	0.31
Shaftesbury/George	1.2s	A	0.16	1.3s	A	0.22

The results of the assessment indicate that satisfactory operational performance will be achieved.

The scale of the proposed development and the land uses are generally consistent with the LEP vision for development within the Burwood Town Centre. In summary, the access intersections operate satisfactorily at the present time. The projected increased peak traffic generation is not significant in relation to the existing traffic flows on the road system and it is demonstrated in this assessment that no adverse traffic implications will result from the proposed development.

5.2 Travel Demand Management

Council's DCP specifies that Travel Demand Management requires to be addressed for major developments in the Town Centre. While Travel Demand Management is an increasingly important aspect of contemporary land use/transport planning, the proposed development does not present a circumstance where substantial planning and application is needed because:

- the site is located in very close proximity to the Railway Station, bus services and taxi services
- the existing ease of pedestrian travel to/from the public transport services will be facilitated by the design/nature of the development
- the parking provisions permitted by the DCP are "constrained"
- the residents in the development will readily be able to walk to the shopping, entertainment services and employment available in the town centre
- tenants/workers in the development will be able to walk to the shopping and entertainment and services in the Town Centre

- there will be appropriate provisions for cyclists as well as car share spaces in the development
- the resident visitor parking is integrated with the retail parking and there will only be a very limited provision for tenant parking

It is apparent that there are separate considerations in relation to the resident population of the development and the tenant/employee/visitor population and that separate Travelsmart Plans are applicable. The desirability of these plans is acknowledged with the Resident Plan focused on:

- a Transport Access Guide
- use of the car share facility
- cycling information
- potential car pooling for “journey to work”
- encouraging visitors to travel by public transport or walk/cycle

While the Tenant/Employee/Visitor Plan would:

- “signpost” details of public trans port and time tables to support a Transport Access Guide
- identify and encourage the use of the bicycle facilities available
- encourage occupant car sharing schemes
- establishing a Trip Planner to provide guidance to people wishing to visit the site
- using taxis for work related journeys

The plans should be implemented by the Body Corporate and be subject to regular monitoring and update. Consent Conditions should be applied to require draft plans to be submitted for the Occupation Certificate.

6.0 Access, Internal Circulation and Servicing

6.1 Access

The basement parking spaces and loading dock will be accessed via George Street. The access provision along with the one-way easterly traffic restriction at George Street will facilitate an efficient left in and left out only access arrangement which presents minimal pedestrian conflicts.

A new pedestrian thoroughfare will also be provided linking between the Burwood Road and the George Street frontages.

This access will comprise a 6m wide driveway located with appropriate sight distances and will be designed to comply with the AS2890.1 design criteria.

6.2 Internal Circulation

The internal ramps, aisles and parking bay, which are subject to detailed design, will have regard for the minimum requirements of AS 2890.1 & 6 while a two-way circulation system will be provided in the carpark to minimise potential conflict points.

6.3 Servicing

The loading dock area will incorporate a truck turn table capable of accommodating up to a 12.5m HRV. Couriers and service personnel etc will be able to use the visitor/retail spaces. Appropriate turning provision and head room clearances will be incorporated into the detailed design at the subsequent design stages.

7.0 Construction Traffic Management

7.1 Program

The envisaged program for the construction process will involve a range of works including site establishment, demolition, excavation, construction and final fitout. Details of each of the work packages shall be confirm following appointment of a project contractor however it is understood that the project will be constructed and delivered in 2 consecutive stages involving:

Stage 1 **22-24 months**

- Residential tower
- Childcare centre
- Commercial offices
- Medical centre
- Carpark

Stage 2 **14-16 months**

- Church administration
- Commercial offices
- Student accommodation
- Retail units
- Church refurbishment

7.2 Hoardings and Access

B Class Hoardings will be erected on the Burwood Road and George Street frontages. Vehicle access will be provided at Burwood Road and George Street.

7.3 Works Zone

A Works Zone will be provided on the site frontage with site tower cranes for materials handling.

7.4 Truck Routes

Trucks will approach and depart the site via Burwood Road and Shaftesbury Road and access via George Street.

7.5 Traffic Control

Traffic Controllers will supervise all truck movements accessing the site and any works within the roadway and footway areas (e.g. erecting hoardings, services connections).

7.6 Truck Movements

The volume/frequency of truck movements will vary throughout the processes with the major movements occurring during the excavation process and major concrete pours. The general nature and volumes of movements will be as follows:

	Visitations Per Day	Truck
Demolition	8	Truck & Dog
Excavation	20	Truck & Dog
Construction	10-15 *	Various
Fitout	10	Various

* *more during major concrete pour*

7.7 Materials Handling

Material handling process will vary across the stages of construction as follows:

Demolition	-	on site loading by machinery
Excavation	-	on site loading by machinery except final stages by tower crane to truck on the WORKS ZONE
Construction	-	Tower cranes with trucks standing in WORKS ZONE
Fitout	-	Tower crane with trucks standing in the WORKS ZONE with use of loading docks in latter stages

7.8 CTMP And TMP Documents

A detailed Construction Traffic Management Plan will be submitted for the Construction Certificate. Traffic Control Plans will be prepared by the Traffic Control contractor and submitted to Council for approval progressively during the process as required.

8.0 Conclusion

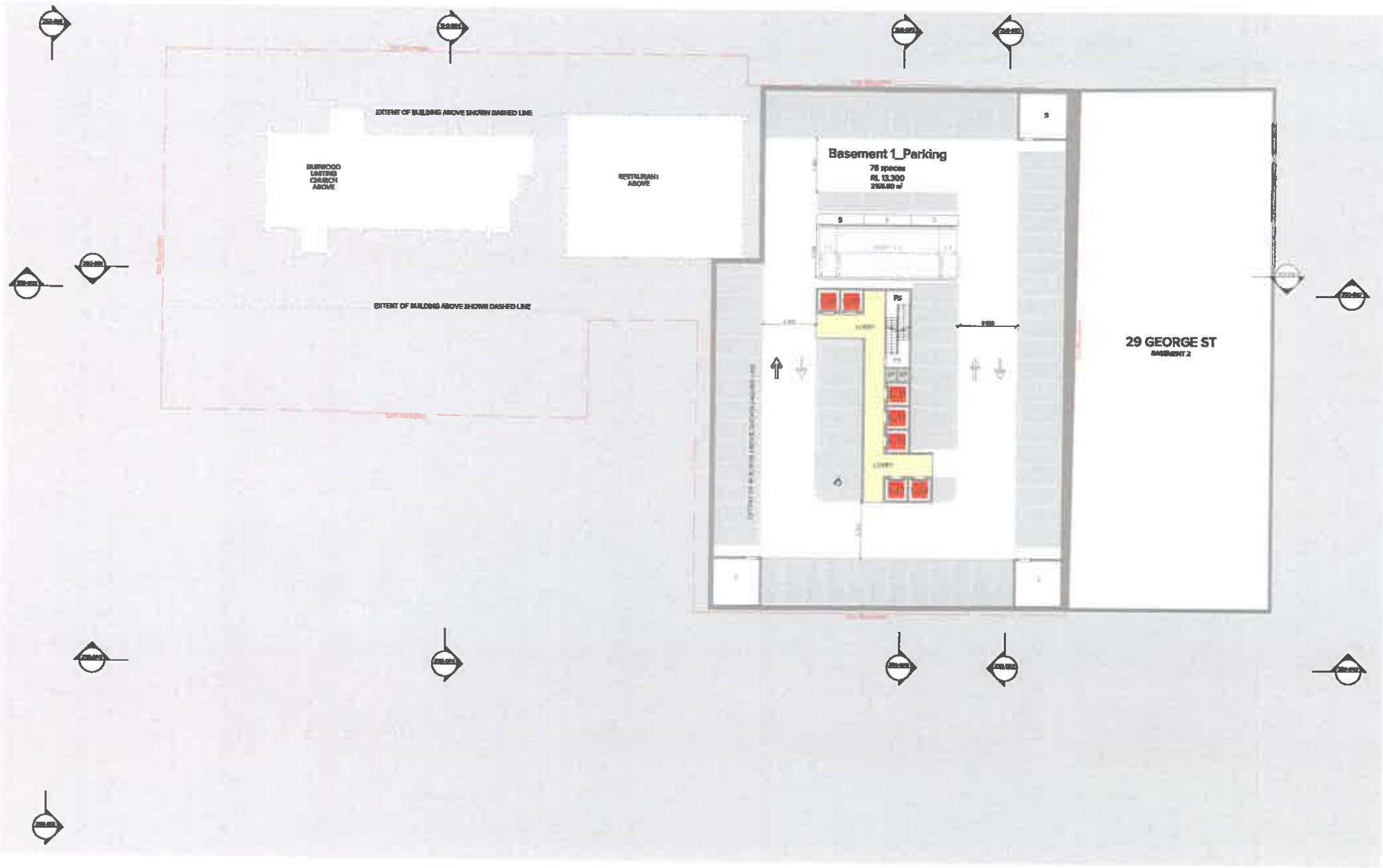
The proposed Stage 1 DA for a mixed development with Place of Worship, Residential, Commercial and Retail elements, Medical and Childcare facilities will be a suitable and appropriate outcome for the site at the 134 Burwood Road site.

This assessment has concluded that:

- the development will not present any adverse traffic implications
- the proposed parking provision will be quite appropriate and adequate for the uses
- the proposed access, internal circulation and servicing arrangements are adequate.

Appendix A

Architectural Plans



Burwood Uniting Church

UPDATED ARCHITECTURAL DRAWINGS 31.05.18

RESIDENTIAL/RETAIL DEVELOPMENT
134 Burwood Road Burwood NSW 2134

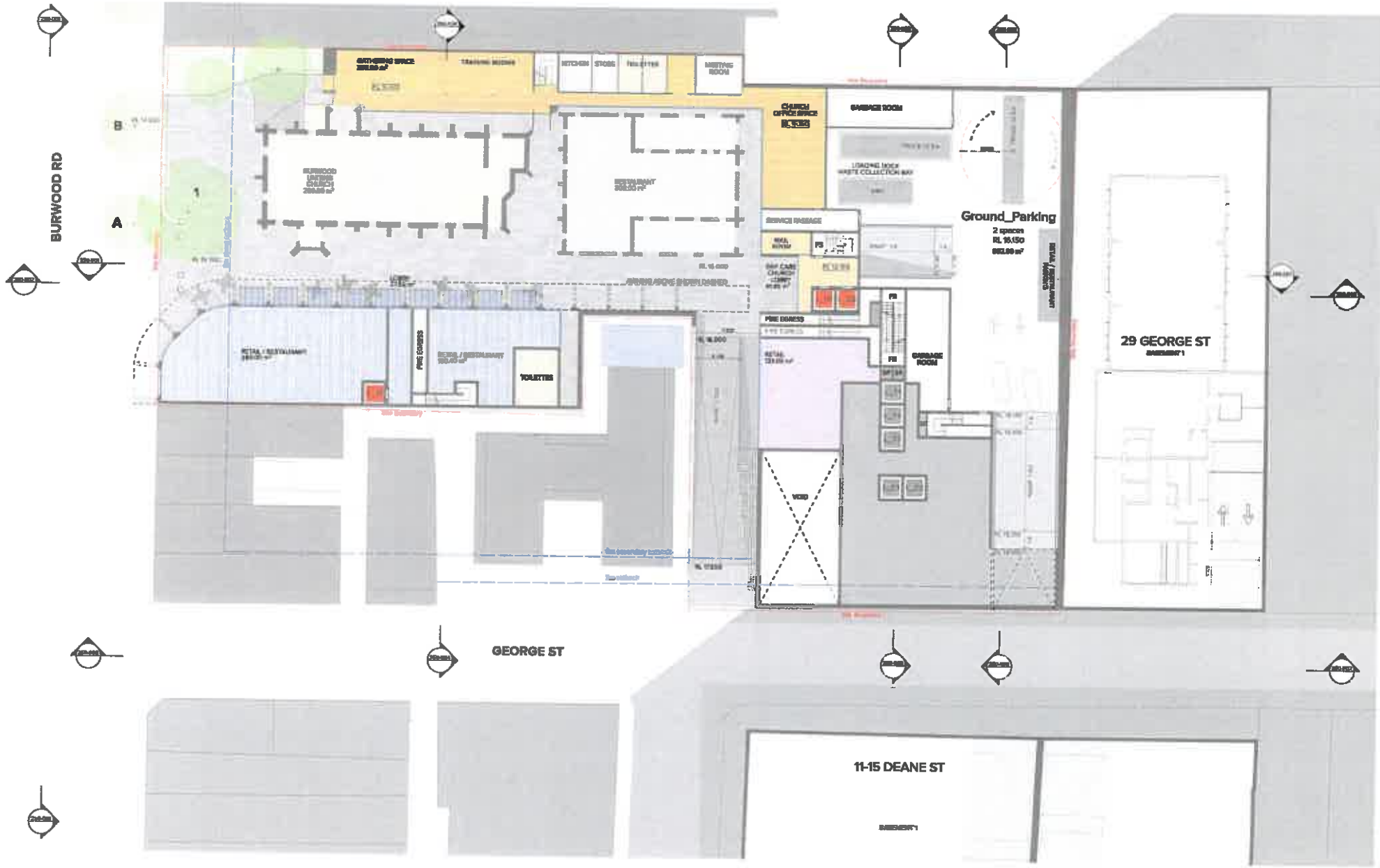
GA Plans
Basement 1

1402

DA-11

C

TURNER



Burwood Uniting Church

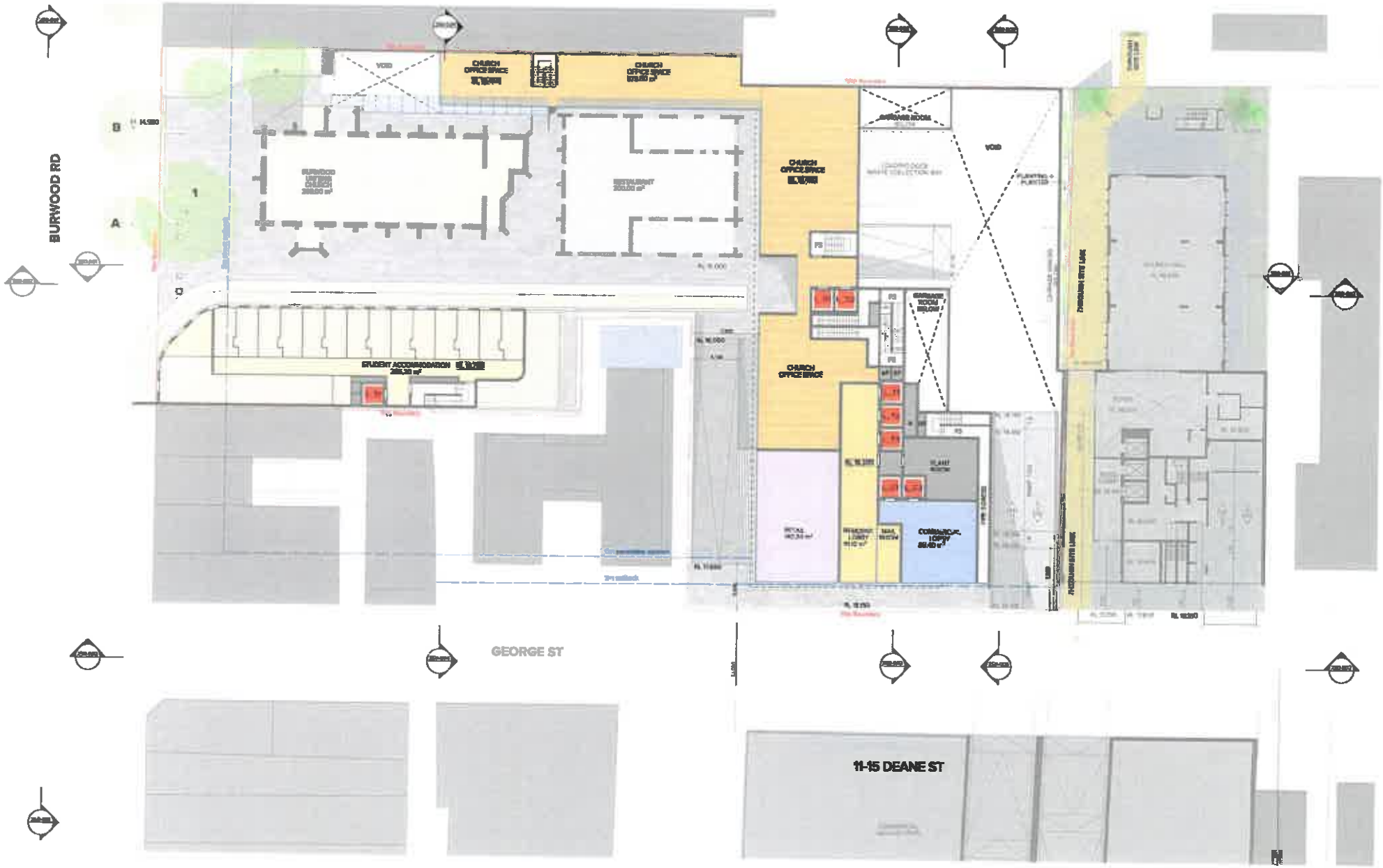
UPDATED ARCHITECTURAL DRAWINGS 31.05.18

RESIDENTIAL/RETAIL DEVELOPMENT
134 Burwood Road Burwood NSW 2134

14012 DA-110-002 C

GA Plans
Ground Level

TURNER



Burwood Uniting Church

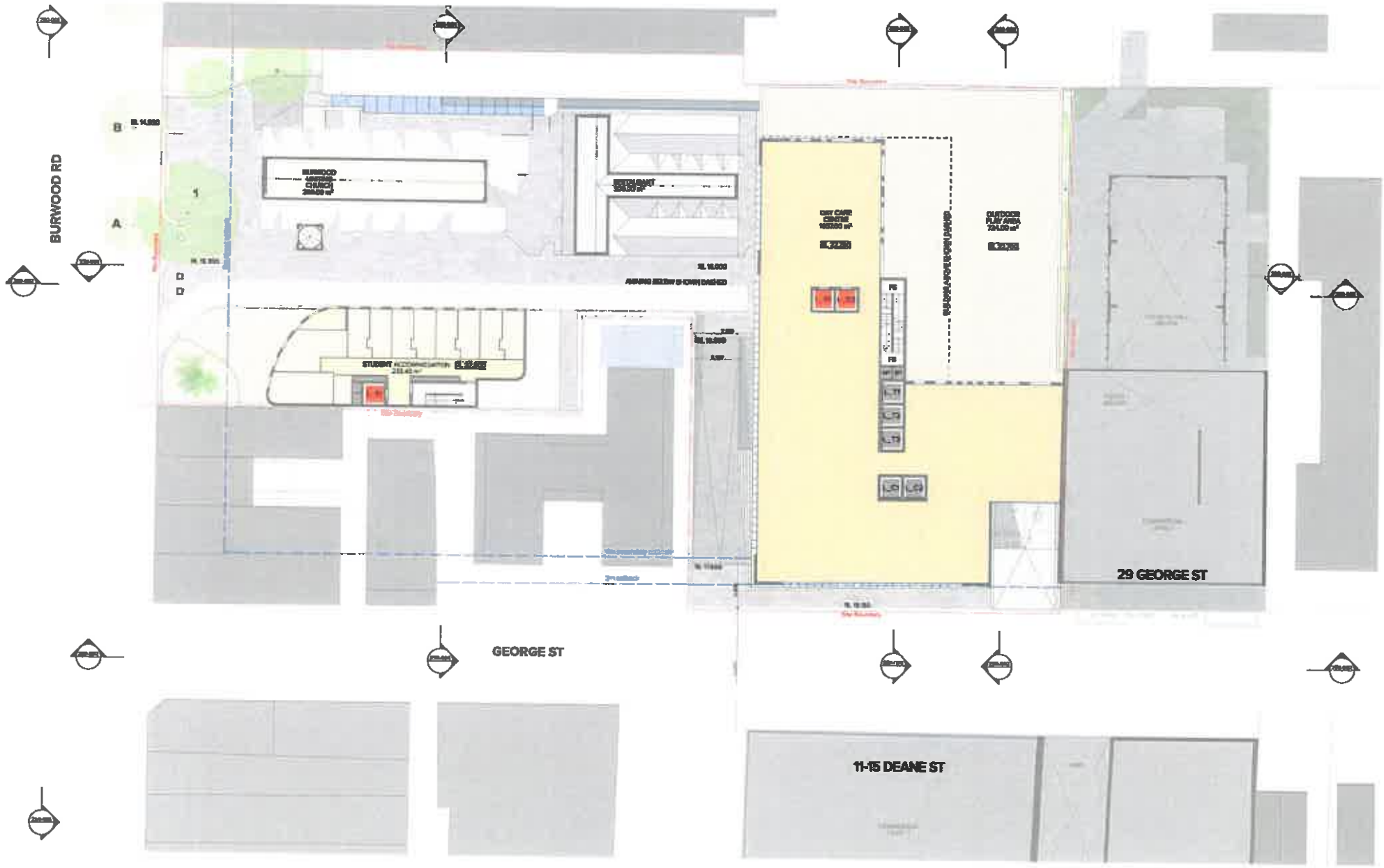
UPDATED ARCHITECTURAL DRAWINGS 01.08.18

RESIDENTIAL/RETAIL DEVELOPMENT
134 Burwood Road Burwood NSW 2134

GA Plans
Upper Ground

14012
DA-110-003
02
C

TURNER



Burwood Uniting Church

RESIDENTIAL/RETAIL DEVELOPMENT
134 Burwood Road Burwood NSW 2134

GA Plans
Level 1

14012

UPDATED ARCHITECTURAL DRAWINGS 31.05.19

TURNER

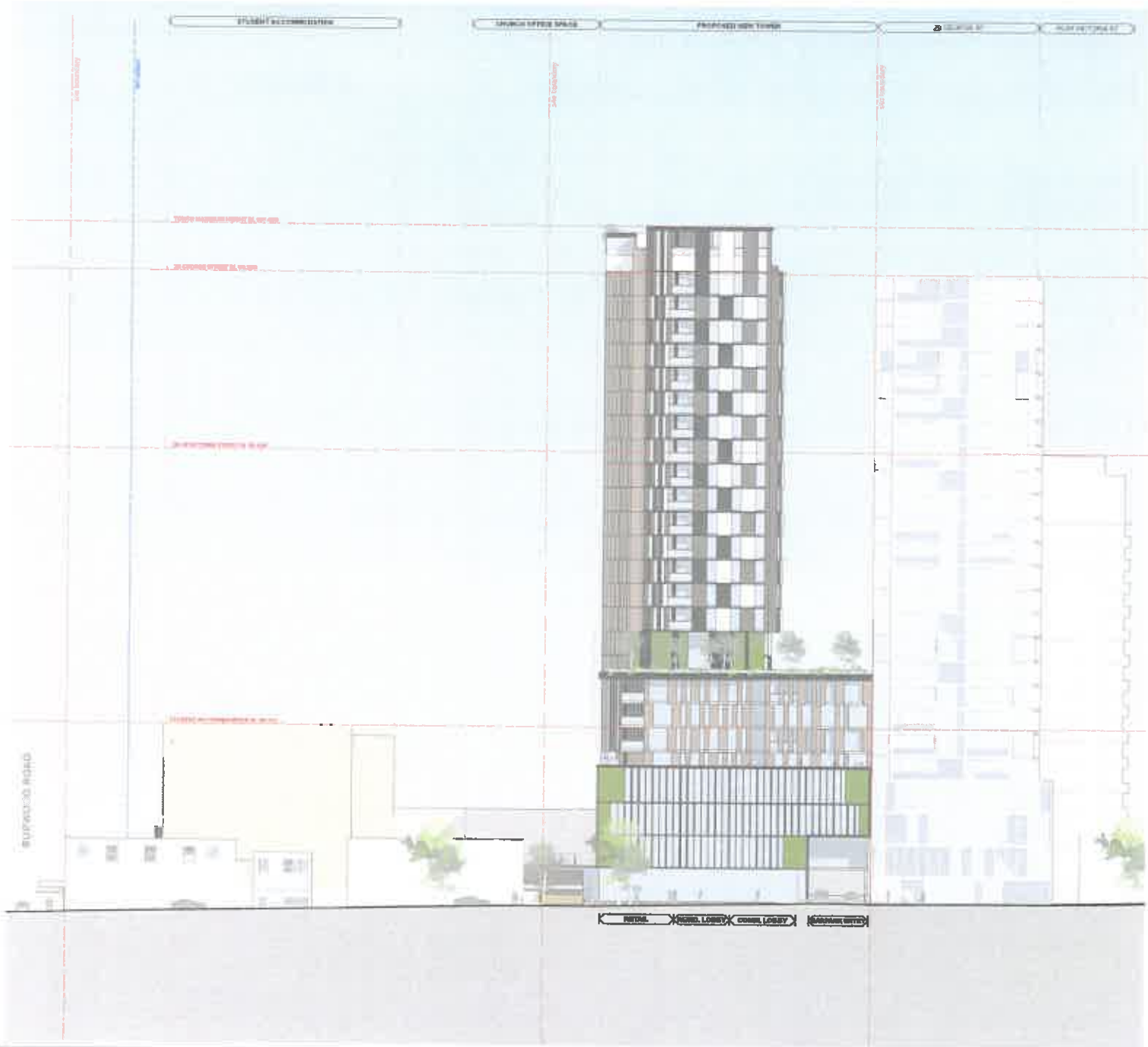
Burwood Uniting Church

RESIDENTIAL/RETAIL DEVELOPMENT
134 Burwood Road Burwood NSW 2134

GA Elevations
Burwood Road

14012

TURNER



Burwood Uniting Church

RESIDENTIAL/RETAIL DEVELOPMENT
134 Burwood Road Burwood NSW 2134

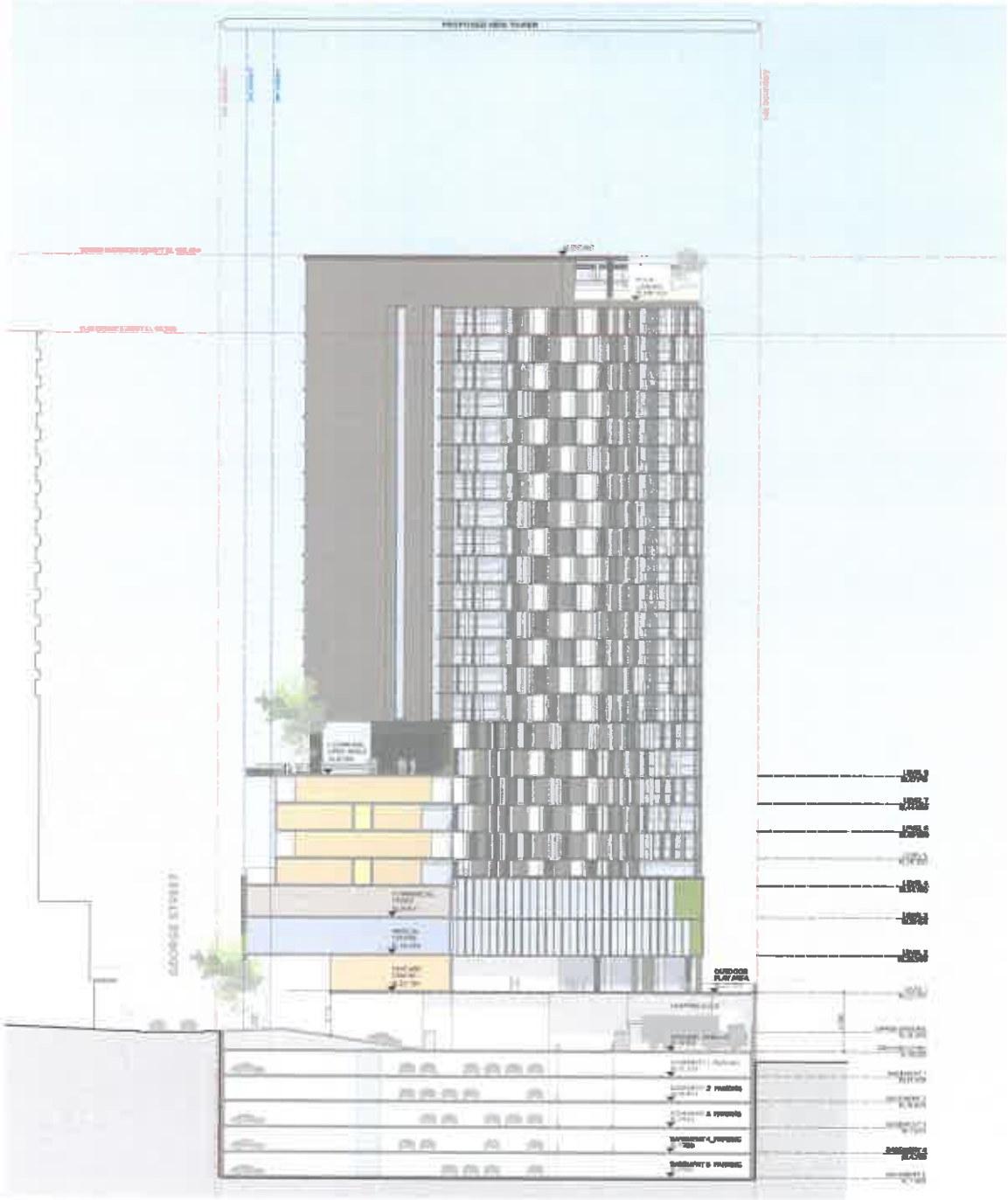
GA Elevations
George Street

1012

DA-250-002

C

TURNER



Burwood Uniting Church

RESIDENTIAL/RETAIL DEVELOPMENT
134 Burwood Road Burwood NSW 2134

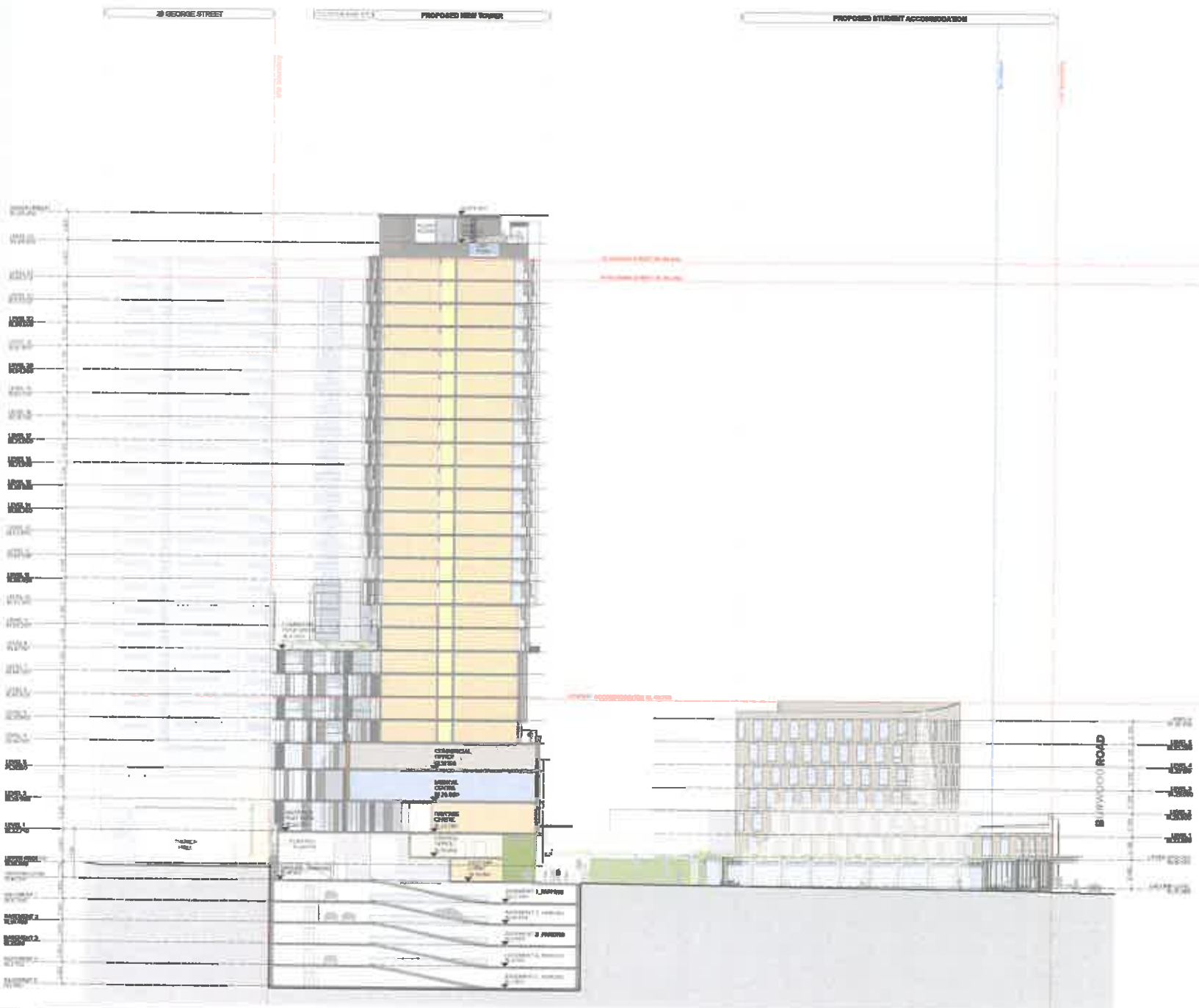
14012

DA-250.003

A

GA Elevations
East Elevation

TURNER



Burwood Uniting Church

RESIDENTIAL/RETAIL DEVELOPMENT
134 Burwood Road Burwood NSW 2134

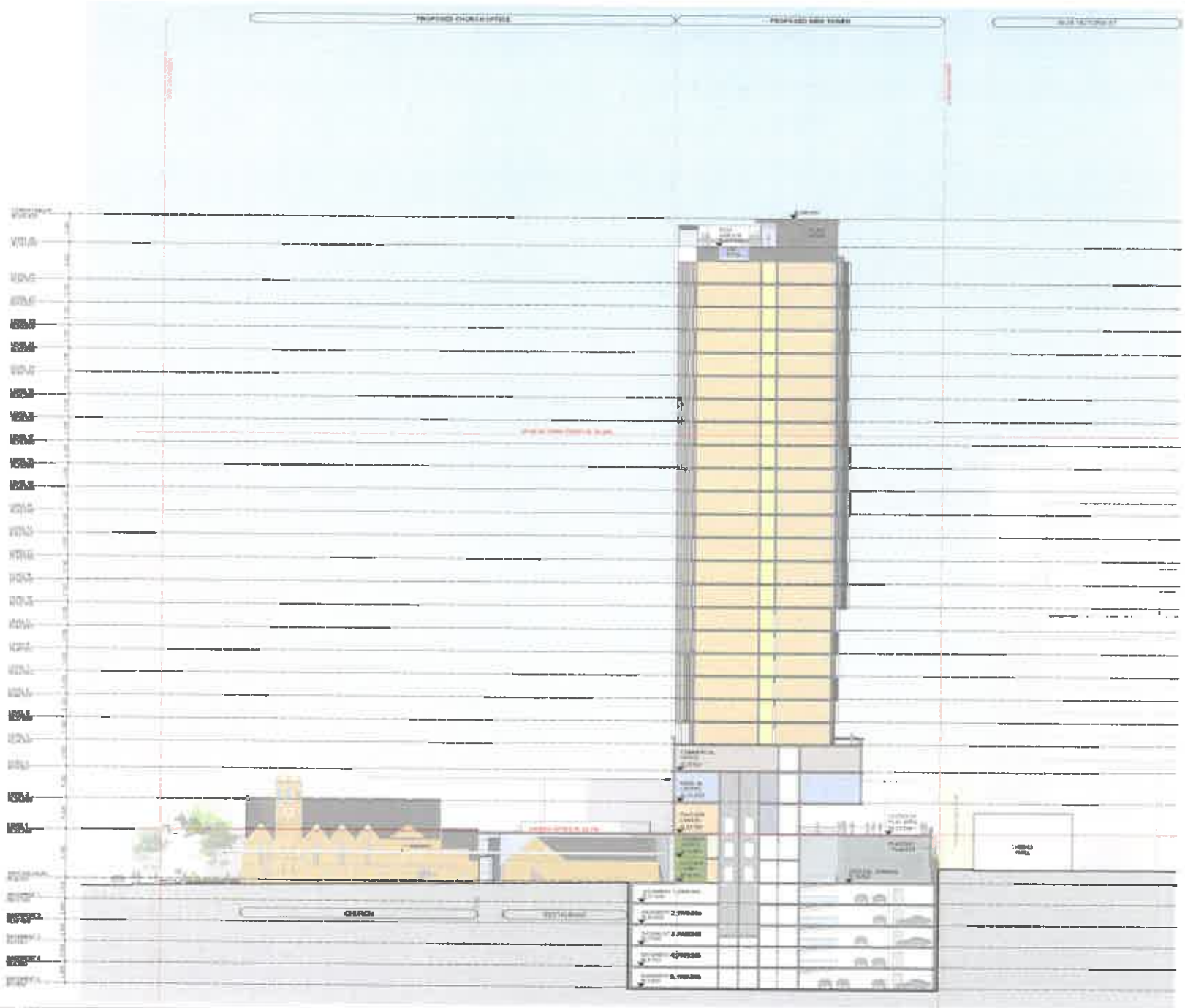
GA Sections
Longitudinal Section 1

14012

DA-330-001

C

TURNER



Burwood Uniting Church

RESIDENTIAL/RETAIL DEVELOPMENT
134 Burwood Road Burwood NSW 2134

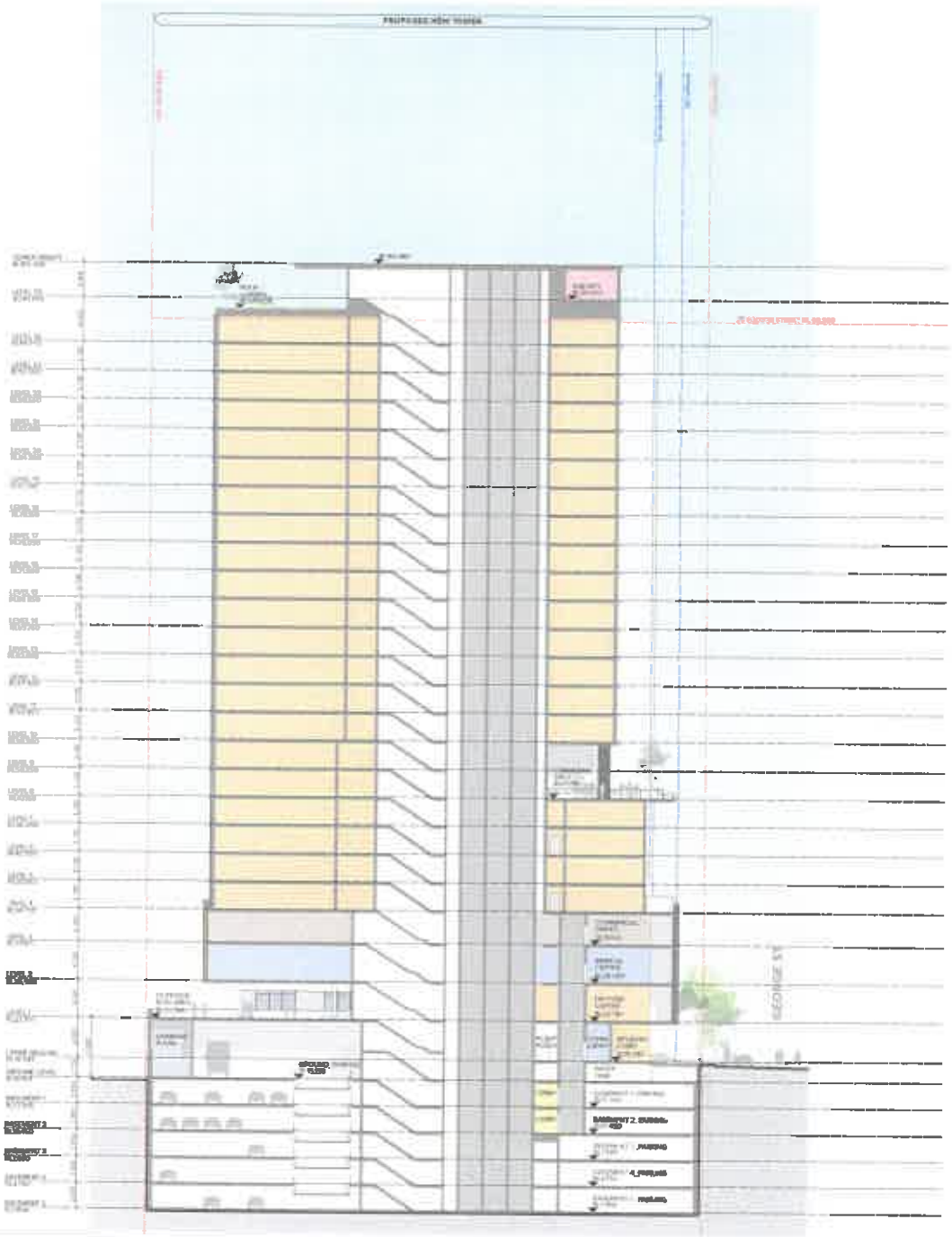
GA Sections
Longitudinal Section 2

14012

DA-380-002

C

TURNER



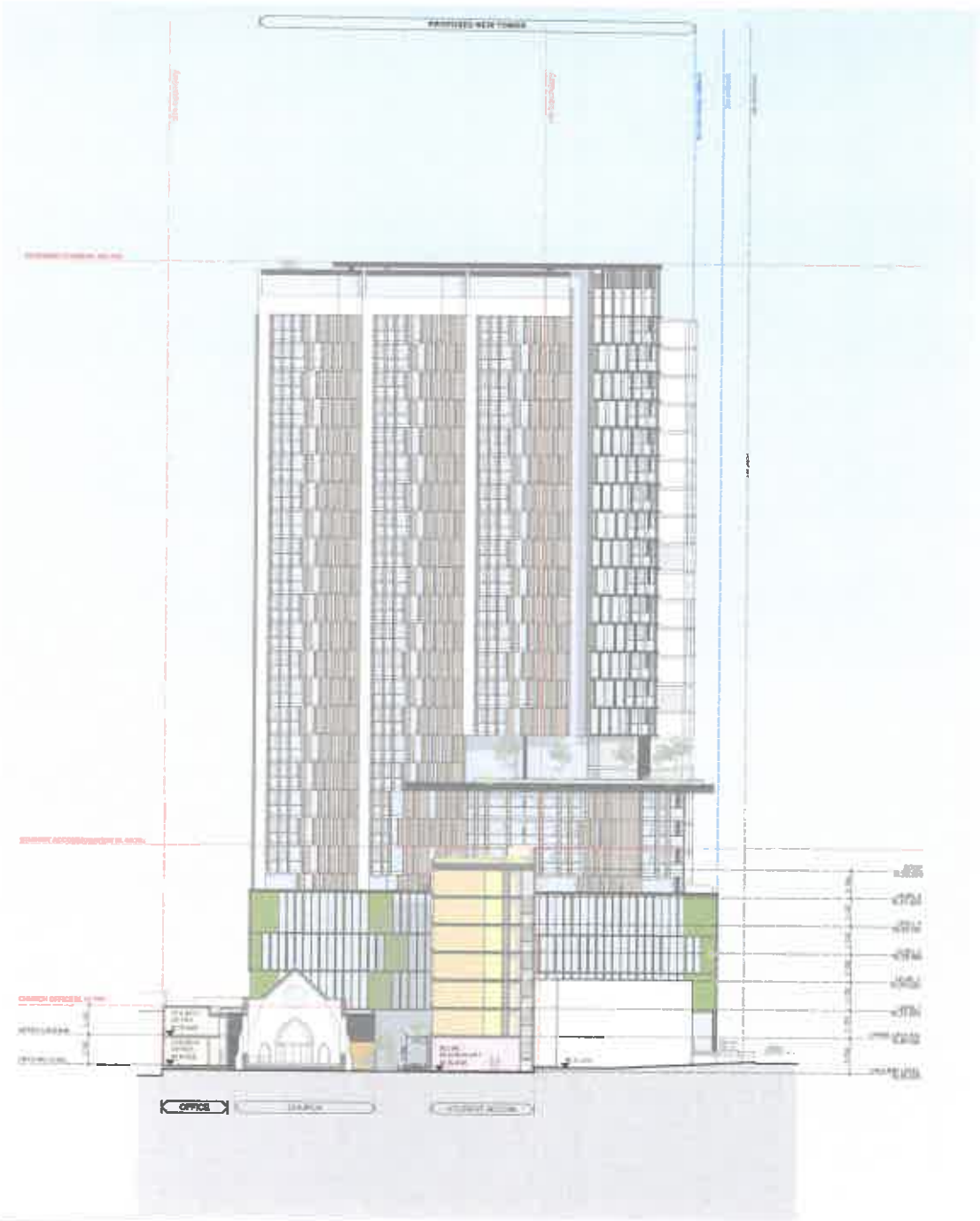
Burwood Uniting Church

RESIDENTIAL/RETAIL DEVELOPMENT
134 Burwood Road Burwood NSW 2134

6A Sections
Cross Section 1

14012
DA-350-003
DD
C

TURNER



Burwood Uniting Church

RESIDENTIAL/RETAIL DEVELOPMENT
134 Burwood Road Burwood NSW 2134

GA Sections
Cross Section 2

14012
DA 210-004
DC
A

TURNER

Appendix B

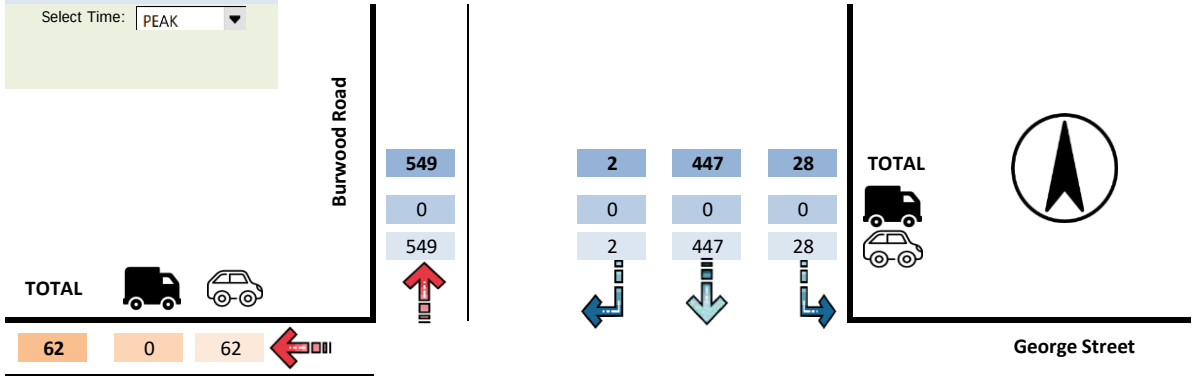
Traffic Surveys

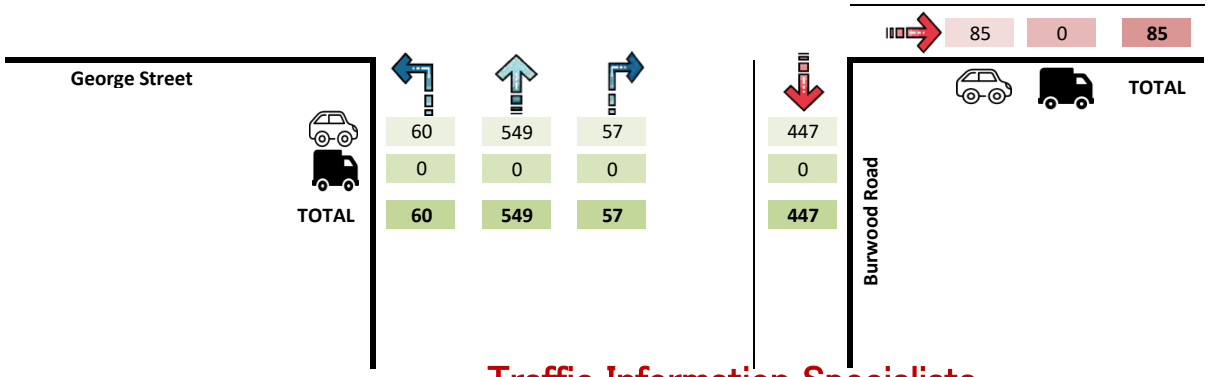
Location	Burwood Road	Duration	0700 - 0900
	George Street		1600 - 1800
	Burwood Road		-
	George Street	Day/Date	Friday, February 23, 2018
Suburb	BURWOOD	Weather	-

DATA SELECTION

Select Time: PEAK

TIME RANGE		
PEAK	-	AM
PEAK		
8:00	-	9:00





Traffic Information Specialists

ABN: 42 613 389 923

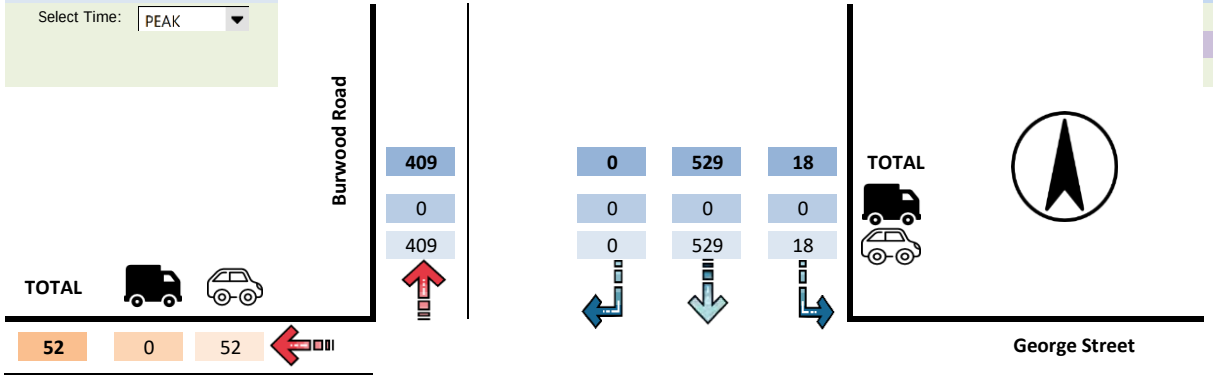
Email info@trafficinfospecialist.com.au

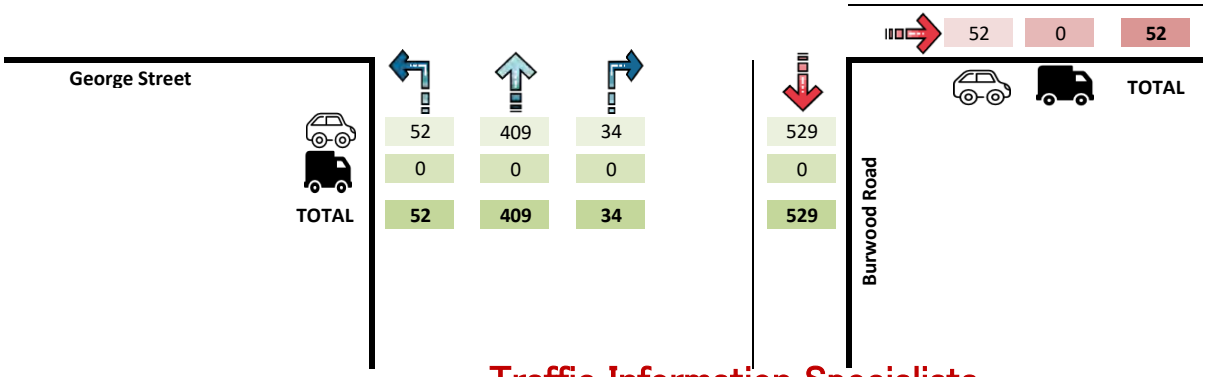
Location	Burwood Road	Duration	0700 - 0900
	George Street		1600 - 1800
	Burwood Road		-
	George Street	Day/Date	Friday, February 23, 2018
Suburb	BURWOOD	Weather	-

DATA SELECTION

Select Time: PEAK

TIME RANGE		
PEAK	-	PM
PEAK		
16:30	-	17:30





Traffic Information Specialists

ABN: 42 613 389 923

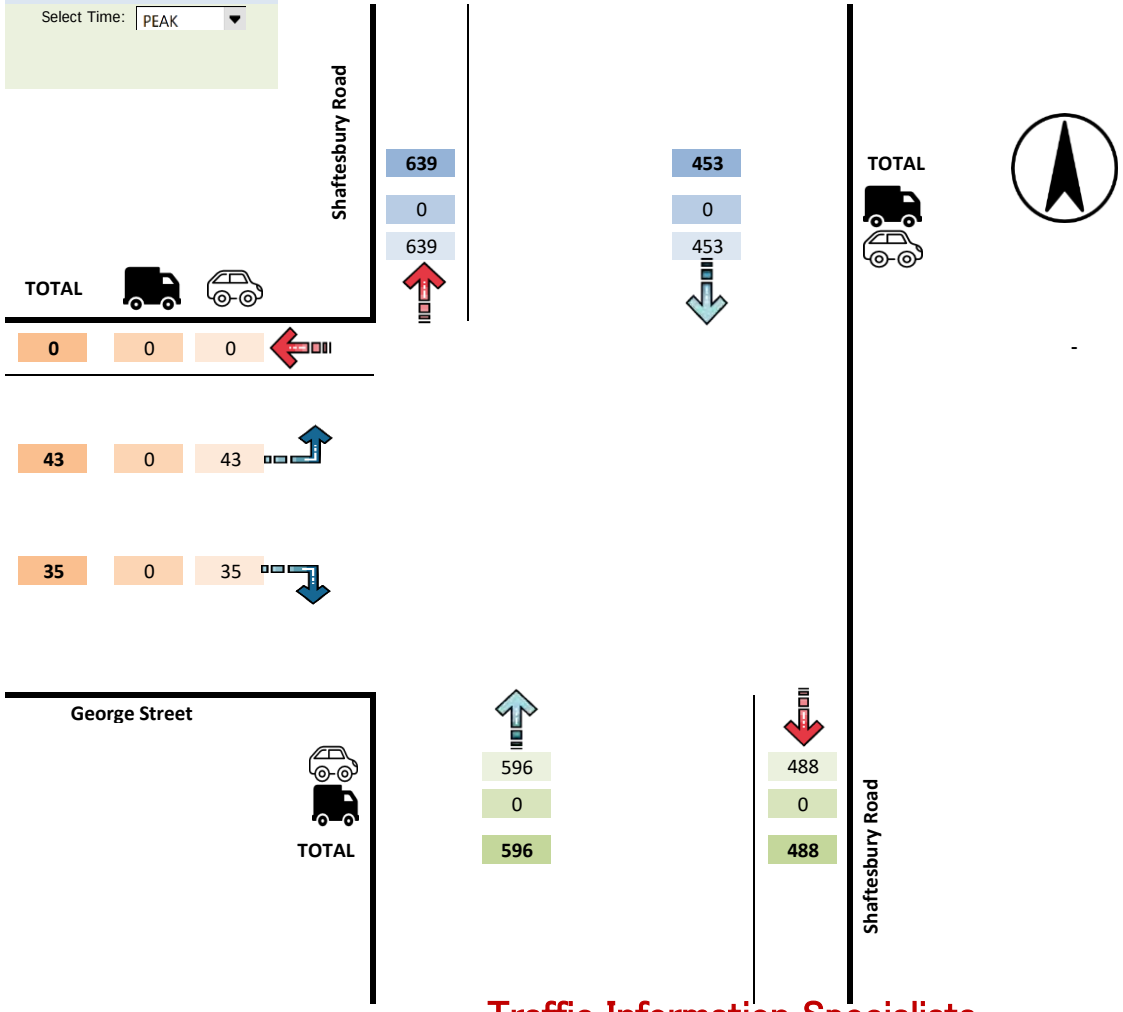
Email info@trafficinfospecialist.com.au

Location	**Shaftesbury Road**	**Duration**	**0700 - 0900**
	-		**1600 - 1800**
	Shaftesbury Road		-
	George Street	**Day/Date**	**Friday, February 23, 2018**
Suburb	**BURWOOD**	**Weather**	-

DATA SELECTION

Select Time: PEAK

TIME RANGE		
PEAK	-	AM
PEAK		
8:00	-	9:00



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Traffic Information Specialists

ABN: 42 613 389 923

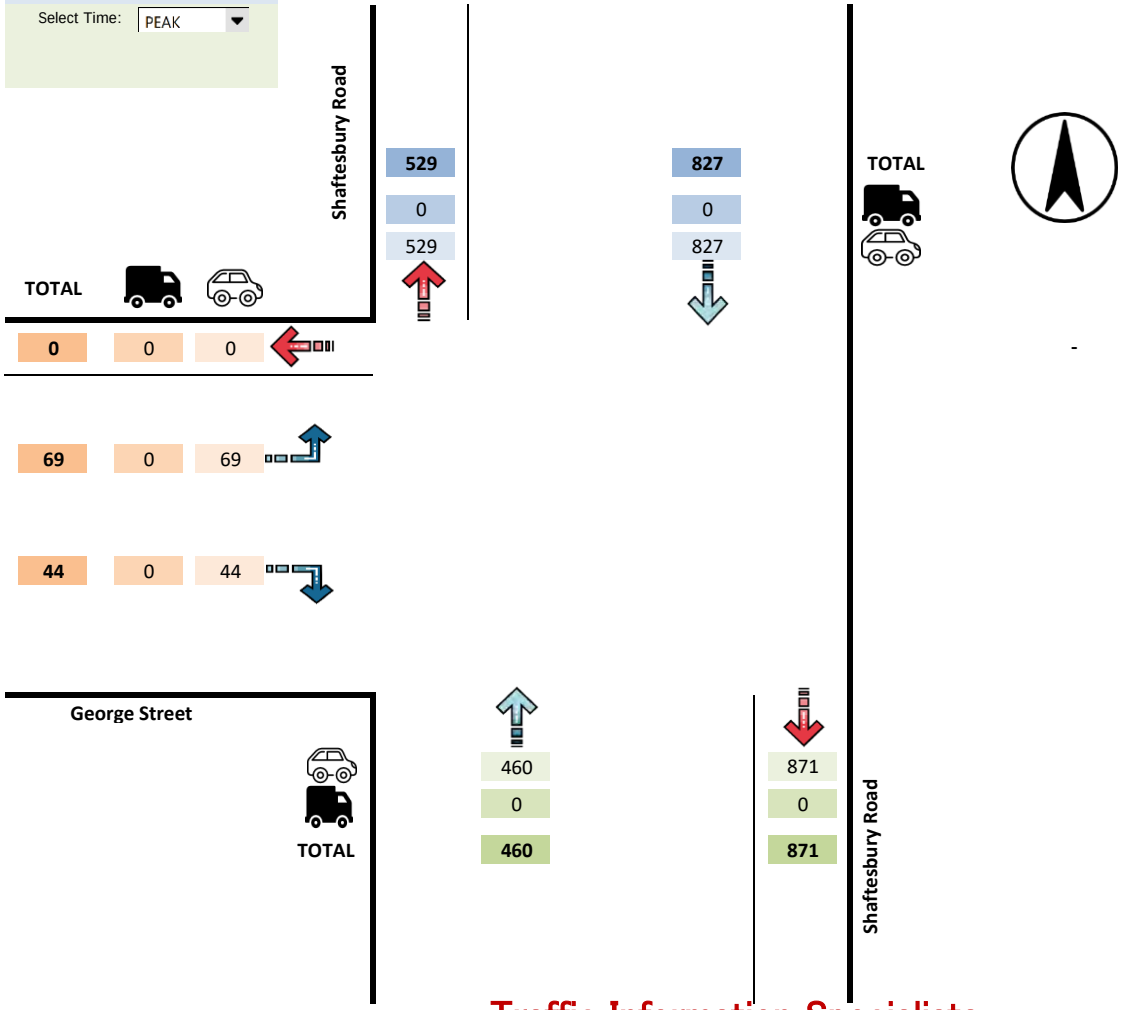
Email info@trafficinfospecialist.com.au

Location	Shaftesbury Road	**Duration**	0700 - 0900
	-		1600 - 1800
	Shaftesbury Road		-
	George Street	**Day/Date**	Friday, February 23, 2018
Suburb	BURWOOD	**Weather**	-

DATA SELECTION

Select Time: PEAK

TIME RANGE		
PEAK	-	PM
PEAK		
17:00	-	18:00



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Traffic Information Specialists

ABN: 42 613 389 923

Email info@trafficinfospecialist.com.au

Location	**Burwood Road**	**Duration**	**0700 - 0900**
	George Street		**1600 - 1800**
	Burwood Road		-
	George Street	**Day/Date**	**Friday, 23 February 2018**
Suburb	**BURWOOD**	**Weather**	-

All Vehicles Time Per 15 Mins	NORTH *Burwood Road*				EAST *George Street*				SOUTH *Burwood Road*				WEST *George Street*				
	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
7:00 - 7:15	3	81	0	**84**					14	75	8	**97**					**181**
7:15 - 7:30	4	97	0	**101**					11	84	4	**99**					**200**
7:30 - 7:45	5	71	0	**76**					19	71	7	**97**					**173**
7:45 - 8:00	4	95	0	**99**					14	125	16	**155**					**254**
8:00 - 8:15	7	131	0	**138**					13	127	17	**157**					**295**
8:15 - 8:30	8	121	2	**131**					14	181	11	**206**					**337**
8:30 - 8:45	4	92	0	**96**					17	123	15	**155**					**251**
8:45 - 9:00	9	103	0	**112**					16	118	14	**148**					**260**
Period End	**44**	**791**	**2**	**837**					**118**	**904**	**92**	**1114**					**1951**
16:00 - 16:15	6	112	0	**118**					17	115	3	**135**					**253**
16:15 - 16:30	4	108	0	**112**					21	97	9	**127**					**239**
16:30 - 16:45	3	133	0	**136**					23	118	7	**148**					**284**
16:45 - 17:00	8	129	0	**137**					13	91	6	**110**					**247**
17:00 - 17:15	4	126	0	**130**					7	107	14	**128**					**258**
17:15 - 17:30	3	141	0	**144**					9	93	7	**109**					**253**
17:30 - 17:45	7	101	0	**108**					11	102	8	**121**					**229**
17:45 - 18:00	9	139	2	**150**					12	104	7	**123**					**273**
Period End	**44**	**989**	**2**	**1035**					**113**	**827**	**61**	**1001**					**2036**

Traffic Information Specialists

ABN: 42 613 389 923

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Location	**Burwood Road**	**Duration**	**0700 - 0900**
	George Street		**1600 - 1800**
	Burwood Road		**-**
	George Street	**Day/Date**	**Friday, 23 February 2018**
Suburb	**BURWOOD**	**Weather**	**-**

All Vehicles Time Per Hour	**NORTH** *Burwood Road*				**EAST** *George Street*				**SOUTH** *Burwood Road*				**WEST** *George Street*				
	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
7:00 - 8:00	16	344	0	**360**					58	355	35	**448**					**808**
7:15 - 8:15	20	394	0	**414**					57	407	44	**508**					**922**
7:30 - 8:30	24	418	2	**444**					60	504	51	**615**					**1059**
7:45 - 8:45	23	439	2	**464**					58	556	59	**673**					**1137**
8:00 - 9:00	28	447	2	**477**					60	549	57	**666**					**1143**
Period End	**111**	**2042**	**6**	**2159**					**293**	**2371**	**246**	**2910**					**5069**
16:00 - 17:00	21	482	0	**503**					74	421	25	**520**					**1023**
16:15 - 17:15	19	496	0	**515**					64	413	36	**513**					**1028**
16:30 - 17:30	18	529	0	**547**					52	409	34	**495**					**1042**
16:45 - 17:45	22	497	0	**519**					40	393	35	**468**					**987**
17:00 - 18:00	23	507	2	**532**					39	406	36	**481**					**1013**
Period End	**103**	**2511**	**2**	**2616**					**269**	**2042**	**166**	**2477**					**5093**

Traffic Information Specialists

ABN: 42 613 389 923

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Location	**Shaftesbury Road**	**Duration**	**0700 - 0900**
	-		**1600 - 1800**
	Shaftesbury Road		**-**
	George Street	**Day/Date**	**Friday, February 23, 2018**
Suburb	**BURWOOD**	**Weather**	**-**

All Vehicles Time Per 15 Mins	**NORTH** *Shaftesbury Road*				**EAST** -				**SOUTH** *Shaftesbury Road*				**WEST** *George Street*				
	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
7:00 - 7:15		83		**83**						68		**68**	9		3	**12**	**163**
7:15 - 7:30		67		**67**						71		**71**	11		1	**12**	**150**
7:30 - 7:45		91		**91**						77		**77**	9		5	**14**	**182**
7:45 - 8:00		89		**89**						99		**99**	7		5	**12**	**200**
8:00 - 8:15		111		**111**						101		**101**	14		7	**21**	**233**
8:15 - 8:30		103		**103**						146		**146**	13		11	**24**	**273**
8:30 - 8:45		117		**117**						168		**168**	9		7	**16**	**301**
8:45 - 9:00		122		**122**						181		**181**	7		10	**17**	**320**
Period End		**783**		**783**						**911**		**911**	**79**		**49**	**128**	**1822**
16:00 - 16:15		161		**161**						141		**141**	9		11	**20**	**322**
16:15 - 16:30		162		**162**						114		**114**	14		5	**19**	**295**
16:30 - 16:45		176		**176**						105		**105**	13		7	**20**	**301**
16:45 - 17:00		186		**186**						102		**102**	17		6	**23**	**311**
17:00 - 17:15		210		**210**						141		**141**	11		13	**24**	**375**
17:15 - 17:30		219		**219**						124		**124**	21		4	**25**	**368**
17:30 - 17:45		194		**194**						96		**96**	16		11	**27**	**317**
17:45 - 18:00		204		**204**						99		**99**	21		16	**37**	**340**
Period End		**1512**		**1512**						**922**		**922**	**122**		**73**	**195**	**2629**

Traffic Information Specialists

ABN: 42 613 389 923

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Location	**Shaftesbury Road**	**Duration**	**0700 - 0900**
	-		**1600 - 1800**
	Shaftesbury Road		**-**
	George Street	**Day/Date**	**Friday, February 23, 2018**
Suburb	**BURWOOD**	**Weather**	**-**

All Vehicles Time Per Hour	NORTH *Shaftesbury Road*				EAST -				SOUTH *Shaftesbury Road*				WEST *George Street*				
	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
7:00 - 8:00		330		**330**						315		**315**	36		14	**50**	**695**
7:15 - 8:15		358		**358**						348		**348**	41		18	**59**	**765**
7:30 - 8:30		394		**394**						423		**423**	43		28	**71**	**888**
7:45 - 8:45		420		**420**						514		**514**	43		30	**73**	**1007**
8:00 - 9:00		453		**453**						596		**596**	43		35	**78**	**1127**
Period End		**1955**		**1955**						**2196**		**2196**	**206**		**125**	**331**	**4482**
16:00 - 17:00		685		**685**						462		**462**	53		29	**82**	**1229**
16:15 - 17:15		734		**734**						462		**462**	55		31	**86**	**1282**
16:30 - 17:30		791		**791**						472		**472**	62		30	**92**	**1355**
16:45 - 17:45		809		**809**						463		**463**	65		34	**99**	**1371**
17:00 - 18:00		827		**827**						460		**460**	69		44	**113**	**1400**
Period End		**3846**		**3846**						**2319**		**2319**	**304**		**168**	**472**	**6637**

Traffic Information Specialists

ABN: 42 613 389 923

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Appendix C

SIDRA Model Results

MOVEMENT SUMMARY

Site: [BURWOOD RD - GEORGE ST AM EX]

Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand 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: BURWOOD RD											
1	L2	60	0.0	0.061	4.7	LOS A	0.0	0.0	0.00	0.30	53.6
2	T1	549	2.0	0.306	0.5	LOS A	0.7	5.1	0.12	0.09	55.5
3	R2	57	0.0	0.306	7.5	LOS A	0.7	5.1	0.13	0.07	54.1
Approach		666	1.6	0.306	1.4	NA	0.7	5.1	0.11	0.11	55.0
North: BURWOOD RD											
7	L2	28	0.0	0.247	5.5	LOS A	0.0	0.0	0.00	0.04	57.2
8	T1	447	2.0	0.247	0.0	LOS A	0.0	0.0	0.00	0.04	58.8
Approach		475	1.9	0.247	0.3	NA	0.0	0.0	0.00	0.04	58.6
All Vehicles		1141	1.7	0.306	1.0	NA	0.7	5.1	0.06	0.08	56.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

MOVEMENT SUMMARY

Site: [BURWOOD RD - GEORGE ST PM EX]

Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand 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: BURWOOD RD											
1	L2	52	0.0	0.045	4.7	LOS A	0.0	0.0	0.00	0.35	53.0
2	T1	409	2.0	0.227	0.4	LOS A	0.4	3.1	0.11	0.08	55.9
3	R2	34	0.0	0.227	7.8	LOS A	0.4	3.1	0.12	0.06	54.3
Approach		495	1.7	0.227	1.4	NA	0.4	3.1	0.10	0.11	55.2
North: BURWOOD RD											
7	L2	18	0.0	0.285	5.6	LOS A	0.0	0.0	0.00	0.02	57.4
8	T1	529	2.0	0.285	0.0	LOS A	0.0	0.0	0.00	0.02	59.3
Approach		547	1.9	0.285	0.2	NA	0.0	0.0	0.00	0.02	59.1
All Vehicles		1042	1.8	0.285	0.8	NA	0.4	3.1	0.05	0.06	57.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

MOVEMENT SUMMARY

Site: [SHAFTSBURY RD - GEORGE ST AM EX]

Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand 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: BURWOOD RD											
2	T1	596	2.0	0.155	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		596	2.0	0.155	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: BURWOOD RD											
8	T1	453	2.0	0.118	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		453	2.0	0.118	0.0	NA	0.0	0.0	0.00	0.00	60.0
West: GEORGE ST											
10	L2	45	0.0	0.044	6.8	LOS A	0.2	1.3	0.36	0.58	45.0
12	R2	37	0.0	0.107	14.9	LOS B	0.4	2.7	0.71	0.88	37.9
Approach		82	0.0	0.107	10.4	LOS B	0.4	2.7	0.52	0.72	41.3
All Vehicles		1131	1.9	0.155	0.8	NA	0.4	2.7	0.04	0.05	57.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

MOVEMENT SUMMARY

Site: [SHAFTSBURY RD - GEORGE ST PM EX]

Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand 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: BURWOOD RD											
2	T1	460	2.0	0.119	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		460	2.0	0.119	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: BURWOOD RD											
8	T1	827	2.0	0.215	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		827	2.0	0.215	0.0	NA	0.0	0.0	0.00	0.00	60.0
West: GEORGE ST											
10	L2	73	0.0	0.066	6.5	LOS A	0.3	2.0	0.32	0.57	45.2
12	R2	46	0.0	0.189	20.5	LOS C	0.7	4.7	0.81	0.93	33.9
Approach		119	0.0	0.189	11.9	LOS B	0.7	4.7	0.51	0.71	39.7
All Vehicles		1406	1.8	0.215	1.0	NA	0.7	4.7	0.04	0.06	56.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

MOVEMENT SUMMARY

Site: [BURWOOD RD - GEORGE ST AM DEV]

Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand 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: BURWOOD RD											
1	L2	60	0.0	0.063	4.7	LOS A	0.0	0.0	0.00	0.29	53.7
2	T1	549	2.0	0.315	0.6	LOS A	0.9	6.4	0.15	0.10	54.6
3	R2	66	0.0	0.315	7.9	LOS A	0.9	6.4	0.17	0.08	53.6
Approach		675	1.6	0.315	1.7	NA	0.9	6.4	0.14	0.12	54.3
North: BURWOOD RD											
7	L2	77	0.0	0.274	5.5	LOS A	0.0	0.0	0.00	0.09	56.6
8	T1	447	2.0	0.274	0.0	LOS A	0.0	0.0	0.00	0.09	57.1
Approach		524	1.7	0.274	0.8	NA	0.0	0.0	0.00	0.09	57.0
All Vehicles		1199	1.7	0.315	1.3	NA	0.9	6.4	0.08	0.11	55.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

MOVEMENT SUMMARY

Site: [BURWOOD RD - GEORGE ST PM DEV]

Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand 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: BURWOOD RD											
1	L2	52	0.0	0.047	4.7	LOS A	0.0	0.0	0.00	0.34	53.1
2	T1	409	2.0	0.234	0.6	LOS A	0.5	3.8	0.13	0.09	55.1
3	R2	41	0.0	0.234	8.1	LOS A	0.5	3.8	0.15	0.07	53.9
Approach		502	1.6	0.234	1.6	NA	0.5	3.8	0.12	0.12	54.6
North: BURWOOD RD											
7	L2	57	0.0	0.306	5.6	LOS A	0.0	0.0	0.00	0.06	56.9
8	T1	529	2.0	0.306	0.0	LOS A	0.0	0.0	0.00	0.06	58.0
Approach		586	1.8	0.306	0.6	NA	0.0	0.0	0.00	0.06	57.8
All Vehicles		1088	1.7	0.306	1.0	NA	0.5	3.8	0.06	0.08	56.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

MOVEMENT SUMMARY

Site: [SHAFTSBURY RD - GEORGE ST AM DEV]

Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand 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: BURWOOD RD											
2	T1	596	2.0	0.155	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		596	2.0	0.155	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: BURWOOD RD											
8	T1	453	2.0	0.118	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		453	2.0	0.118	0.0	NA	0.0	0.0	0.00	0.00	60.0
West: GEORGE ST											
10	L2	102	0.0	0.100	6.9	LOS A	0.4	3.0	0.37	0.60	44.9
12	R2	47	0.0	0.137	15.1	LOS C	0.5	3.5	0.71	0.88	37.8
Approach		149	0.0	0.137	9.5	LOS A	0.5	3.5	0.48	0.69	42.2
All Vehicles		1198	1.8	0.155	1.2	NA	0.5	3.5	0.06	0.09	55.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

MOVEMENT SUMMARY

Site: [SHAFTSBURY RD - GEORGE ST PM DEV]

Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand 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: BURWOOD RD											
2	T1	460	2.0	0.119	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		460	2.0	0.119	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: BURWOOD RD											
8	T1	827	2.0	0.215	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		827	2.0	0.215	0.0	NA	0.0	0.0	0.00	0.00	60.0
West: GEORGE ST											
10	L2	117	0.0	0.107	6.5	LOS A	0.5	3.2	0.33	0.58	45.2
12	R2	54	0.0	0.219	21.1	LOS C	0.8	5.6	0.82	0.94	33.5
Approach		171	0.0	0.219	11.1	LOS B	0.8	5.6	0.48	0.69	40.4
All Vehicles		1458	1.8	0.219	1.3	NA	0.8	5.6	0.06	0.08	55.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

Appendix D

Transport Services

Sydney Trains Network

Sydney train lines

T1 *North Shore, Northern & Western Line*
North Shore
Northern
Epping
Western
Richmond

T3 *Bankstown Line*
Liverpool
Lidcombe
City

T5 *Cumberland Line*
Leppington
Richmond

T7 *Olympic Park Line*
Olympic Park
Lidcombe

T2 *Inner West & Leppington Line*
Inner West
Leppington
City

T4 *Eastern Suburbs & Illawarra Line*
Eastern Suburbs
Illawarra
Cronulla

T6 *Carlingford Line*
Carlingford
Clyde

T8 *Airport & South Line*
Airport
South
City

Stop · Interchange · Interchange · End of line

NORTH

Check timetables and trip planners for train services and connections

Visit **transportnsw.info**

1709TMS-E-MWT-A4P

Sydney Trains Network Key

Key

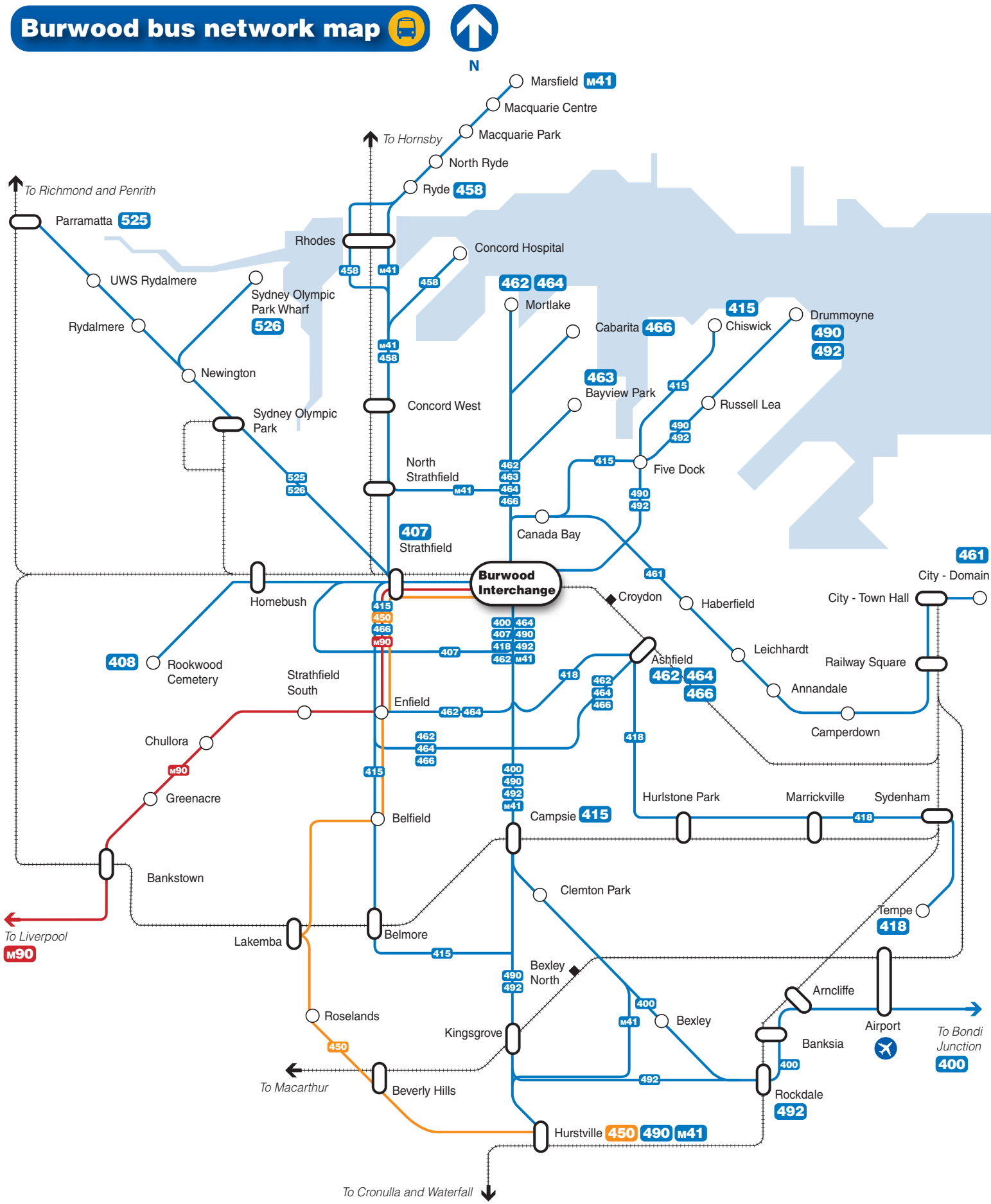
Wheelchair access

The following Sydney Trains Network information includes an alphabetical list of stations, its map grid references, wheelchair access and connecting train service details where applicable.

Allawah	E5	♿
Arncliffe	D5	♿
Artarmon	B5	♿
Ashfield	D4	♿
Asquith	A4	
Auburn	C3	♿
Banksia	D5	
Bankstown	D3	♿
Bardwell Park	D4	
Beecroft	B4	
Belmore	D4	♿
Berala	D3	♿
Berowra	A4	♿
Beverly Hills	E4	♿
Bexley North	E4	
Birrong	D3	
Blacktown	C2	♿
Bondi Junction	C6	♿
Burwood	D4	♿
Cabramatta	D2	♿
Camellia	C3	
Campbelltown	F2	♿
Campsie	D4	♿
Canley Vale	D2	
Canterbury	D4	
Caringbah	F6	♿
Carlingford	B3	♿
Carlton	E5	♿
Carramar	D2	
Casula	E2	♿
Central	C5	♿
Chatswood	B5	♿
Cheltenham	B4	♿
Chester Hill	D3	
Circular Quay	C5	♿
Clarendon	B1	
Clyde	C3	
Como	E5	
Concord West	C3	♿
Cronulla	F6	♿
Croydon	D4	♿
Denistone	C3	
Domestic Airport	D5	♿
Doonside	C2	
Dulwich Hill	D4	
Dundas	C3	♿
East Hills	E3	
East Richmond	A1	♿
Eastwood	B3	♿
Edgecliff	C6	
Edmondson Park	E1	♿
Emu Plains	C1	♿
Engadine	F5	♿
Epping	B4	♿
Erskineville	D5	
Fairfield	D2	♿
Flemington	D3	♿
Glenfield	E2	♿
Gordon	B4	♿
Granville	C3	♿
Green Square	D5	♿
Guildford	D2	♿
Gymea	F5	♿
Harris Park	C3	
Heathcote	F5	♿
Holsworthy	E3	♿
Homebush	D3	
Hornsby	A4	♿
Hurlstone Park	D4	
Hurstville	E5	♿
Ingleburn	E2	♿
International Airport	D5	♿
Jannali	F5	♿
Killara	B4	
Kings Cross	C6	♿
Kingsgrove	E4	♿
Kingswood	C1	
Kirrawee	F5	♿
Kogarah	E5	♿
Lakemba	D4	♿
Leightonfield	D3	
Leppington	E1	♿
Leumeah	F2	♿
Lewisham	D4	
Lidcombe	D3	♿
Lindfield	B4	♿
Liverpool	E2	♿
Loftus	F5	
Macarthur	F2	♿
Macdonaldtown	D5	
Macquarie Fields	E2	
Macquarie Park	B4	♿
Macquarie University	B4	♿
Marayong	B1	♿
Marrickville	D4	♿
Martin Place	C5	♿
Mascot	D5	♿
Meadowbank	C3	♿
Merrylands	D2	♿
Milsons Point	C5	♿
Minto	F2	♿
Miranda	F6	♿
Mortdale	E5	♿
Mount Colah	A4	
Mount Druitt	C1	♿
Mount Kuring-gai	A4	
Mulgrave	B1	
Museum	C5	♿
Narwee	E4	♿
Newtown	D4	♿
Normanhurst	A4	
North Ryde	B4	♿
North Strathfield	C3	
North Sydney	C5	♿
Oatley	E5	♿
Olympic Park	C3	♿
Padstow	E3	♿
Panania	E3	
Parramatta	C3	♿
Pendle Hill	C2	♿
Pennant Hills	B4	♿
Penrith	C1	♿
Penshurst	E5	♿
Petersham	D4	
Punchbowl	D3	
Pymble	B4	
Quakers Hill	B1	♿
Redfern	D5	
Regents Park	D3	♿
Revesby	E3	♿
Rhodes	C3	♿
Richmond	A1	♿
Riverstone	B1	
Riverwood	E4	♿
Rockdale	D5	♿
Rooty Hill	C2	
Rosehill	C3	
Roseville	B4	
Rydalmere	C3	
Schofields	B1	♿
Sefton	D3	♿
Seven Hills	C2	♿
St James	C6	♿
St Leonards	B5	♿
St Marys	C1	♿
St Peters	D5	
Stanmore	D4	
Strathfield	D4	♿
Summer Hill	D4	♿
Sutherland	F5	♿
Sydenham	D5	♿
Telopea	B3	
Tempe	D5	
Thornleigh	B4	
Toongabbie	C2	
Town Hall	C5	♿
Turramurra	B4	♿
Turrella	D4	
Villawood	D3	
Vineyard	B1	
Wahroonga	B4	
Waitara	B4	
Warrawee	B4	
Warwick Farm	D2	♿
Waterfall	F5	♿
Waverton	C5	♿
Wentworthville	C2	♿
Werrington	C1	♿
West Ryde	C3	♿
Westmead	C2	♿
Wiley Park	D4	
Windsor	B1	♿
Wolli Creek	D5	♿
Wollstonecraft	C5	
Woolooware	F6	♿
Wynyard	C5	♿
Yagoona	D3	
Yennora	D2	

1709TMS-E-MWT-A4P

Burwood bus network map

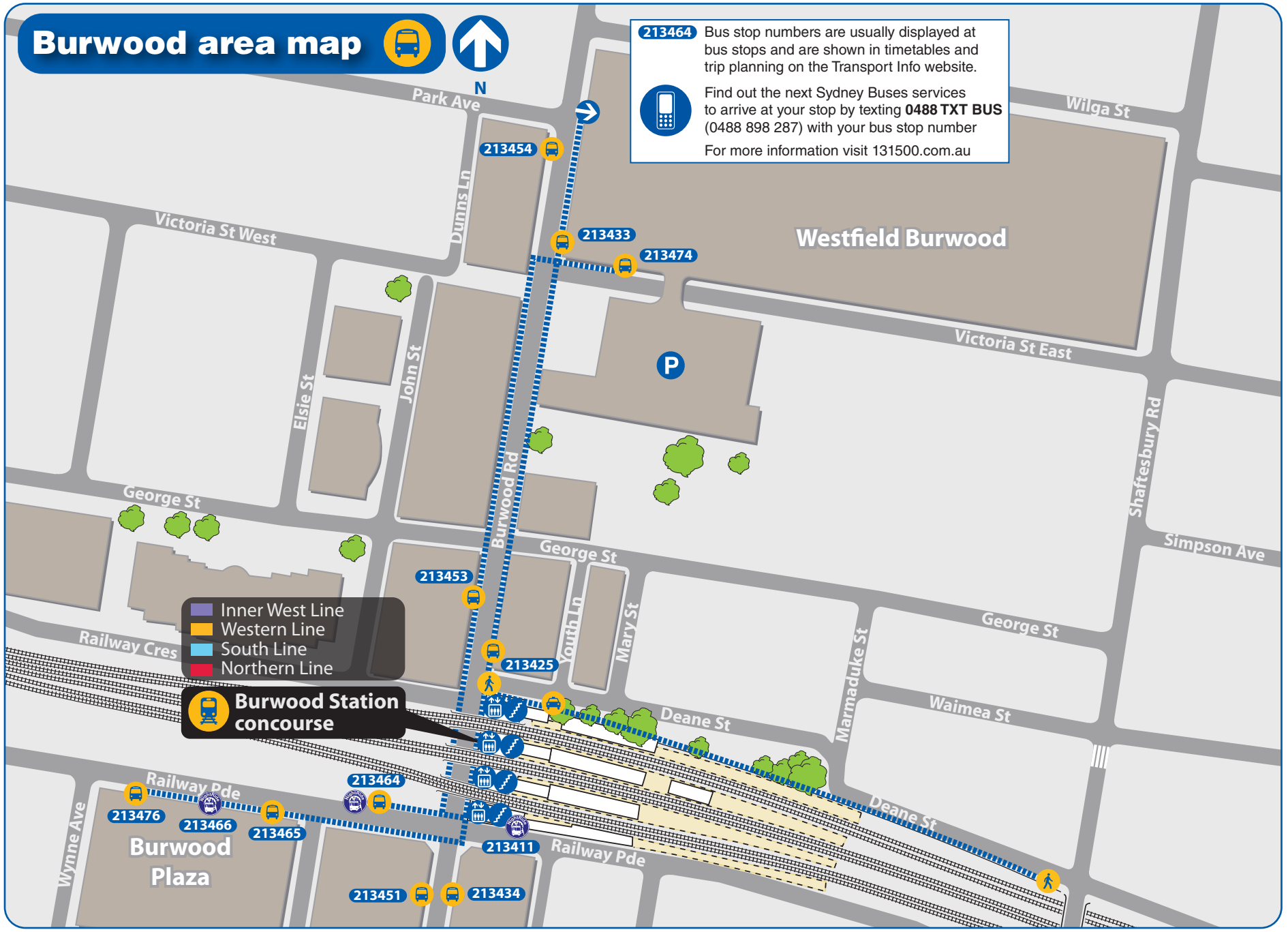


Legend

- Sydney Buses routes
- Veolia Transport routes
- Punchbowl Bus Co routes
- Rail line
- Railway station
- Bus route/suburb
- Bus/Rail interchange

Diagrammatic Map - Not to Scale

Burwood area map



Legend

- Walking route
- Taxi rank
- Lift
- Stairs
- Bus stop
- Parking
- Entry
- NightRide
- 213464 Bus stop number

Bus services at Burwood

Bus departure information

Please use this listing to find your bus number, route destination and bus stand.
Refer to the Interchange Map to find the bus stand location.

Bus Stand & Number	Route Number	Bus Route Destination
Burwood Rd nr Westfield 213433	400	Bondi Junction via Rockdale, Airport, Eastgardens & UNSW (Limited Stops)
	407	Strathfield via Strathfield West
	408	Rookwood via Strathfield & Homebush
	415	Campsie via Strathfield & Belfield
	418	Tempe via Ashfield & Marrickville
	450	Hurstville via Lakemba & Roselands
	458	Ryde via Strathfield & Concord Hospital
	462/464/466	Ashfield via South Enfield
	490	Hurstville via Campsie
	492	Rockdale via Campsie
	525	Parramatta via Strathfield & Newington
	526	Sydney Olympic Park Wharf via Newington
	M41	Metrobus to Hurstville via Campsie
	M90	Metrobus to Liverpool via Bankstown & UWS Milperra
Burwood Rd nr Railway Pde 213434	400	Bondi Junction via Rockdale, Airport, Eastgardens & UNSW (Limited Stops)
	490	Hurstville via Campsie
	492	Rockdale via Campsie
	M41	Metrobus to Hurstville via Campsie
Burwood Rd nr Burwood Stn 213425	407	Strathfield via Strathfield West
	408	Rookwood via Strathfield & Homebush
	418	Tempe via Ashfield & Marrickville
	458	Ryde via Strathfield, North Strathfield & Rhodes
	462/464	Ashfield via South Enfield
	M41	Metrobus to Hurstville via Campsie
Victoria St nr Westfield 213474	490	Drummoyne via Five Dock & Rodd Point
	492	Drummoyne via Five Dock
Burwood Rd nr Railway Pde 213451	462	Mortlake via Concord
	464	Mortlake via Concord
	490	Drummoyne via Five Dock & Rodd Point
	492	Drummoyne via Five Dock
	M41	Metrobus to Marsfield via Concord Hospital & Ryde
Burwood Rd nr George St 213453	415	Chiswick via Five Dock
	462	Mortlake via Concord
	463	Bayview Park
	464	Mortlake via Concord
	466	Cabarita Wharf via Concord
	M41	Metrobus to Marsfield via Concord Hospital & Ryde

Bus Operator Legend

- Sydney Buses
- Veolia Transport
- Punchbowl Bus Co

213464 Bus stop numbers are usually displayed at bus stops and are shown in timetables and trip planning on the Transport Info website.

Find out the next Sydney Buses services to arrive at your stop by texting **0488 TXT BUS** (0488 898 287) with your bus stop number

For more information visit 131500.com.au

Bus services at Burwood

Bus departure information

Please use this listing to find your bus number, route destination and bus stand.
Refer to the Interchange Map to find the bus stand location.

Bus Stand & Number	Route Number	Bus Route Destination
Burwood Rd nr Park Av 213454	**415**	Chiswick via Five Dock
	461	City - Domain via Parramatta Rd
	462	Mortlake via Concord
	463	Bayview Park
	464	Mortlake via Concord
	466	Cabarita Wharf via Concord
	M41	Metrobus to Marsfield via Concord Hospital & Ryde
Railway Pde nr Burwood Rd 213464	**415**	Chiswick via Five Dock
	461	City - Domain via Parramatta Rd
	466	Cabarita Wharf via Concord
	N60	City via Ashfield
	N61	City via Ashfield
Railway Pde 213465	**407**	Strathfield via Strathfield West
	408	Rookwood via Strathfield & Homebush
Railway Pde 213466	**N50**	Liverpool via Regents Park
	N60	Fairfield via Parramatta
	N61	Carlingford via Clyde
	415	Campsie via Strathfield & Belfield
	450	Hurstville via Lakemba & Roselands
	466	Ashfield via Strathfield & Enfield
Railway Pde 213476	**458**	Ryde via Strathfield & Concord Hospital
	525	Parramatta via Strathfield & Newington
	526	Sydney Olympic Park Wharf via Newington
Railway Pde 213411	**N50**	City via Ashfield

Bus Operator Legend

- Sydney Buses
- Punchbowl Bus Co
- NightRide

213464 Bus stop numbers are usually displayed at bus stops and are shown in timetables and trip planning on the Transport Info website.

Find out the next Sydney Buses services to arrive at your stop by texting **0488 TXT BUS** (0488 898 287) with your bus stop number

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