BETTER TRANSPORT FUTURES
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Nihon University Newcastle Campus Project

Azusa Sekkei

Traffic & Parking Assessment Report
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1. Introduction

Better Transport Futures was commissioned by dwp Australia Pty Ltd on behalf of Azusa Sekkei to prepare a Traffic and Parking Impact Assessment to accompany a Development Application for the Nihon University Newcastle Courthouse Redevelopment Project.

Nihon University, established in 1889, started as a Law School and is commemorating their 130th anniversary in October 2019. An Education reform is to be implemented from 2020 which consists of strengthening the Foreign Language ability of students. As such, Nihon University decided to buy the Former Newcastle Courthouse to create their first campus outside of Japan to use as their exchange language program hub.

The New Nihon University Newcastle Campus is proposed to serve as a language exchange centre, primarily for Japanese students of Nihon University to learn English in an international environment, as well as students of Newcastle University to learn Japanese culture and language.

The Former Courthouse is only one year older that Nihon University, being erected in 1888, and with the historical background of Nihon University starting as a Law School along the nature of the building being a courthouse, it matched all the needs of Nihon University, especially making the Former Courthouse redevelopment a 130th Anniversary Project of the University.

This report focusses on the parking considerations of the project proposal. Traffic matters are also discussed and it is explained why this particular development proposal is considered to not have any significant traffic impacts on the surrounding road network. The report is structured as follows:

- **Chapter 2** outlines the existing situation in the vicinity of and on the subject site, including knowledge of planned development and road network changes.
- **Chapter 3** describes the proposed traffic and parking features of the project.
- **Chapter 4** details the impact assessment of the traffic and parking arrangements for to site.
- **Chapter 5** summarises the findings of this investigation, outlining conclusions and recommendations for the access and parking operations of the site.

The investigations documented in this Traffic and Parking Assessment Report have considered the following Government Strategies and Guides, Council Plans relevant to this review:

- *Hunter Regional Plan 2036, NSW Government, October 2016*
- *Greater Newcastle Metropolitan Plan 2036, NSW Government, September 2018*
- *Greater Newcastle Future Transport Plan, NSW Government, March 2018*
- *Newcastle Transport Strategy, The City of Newcastle, March 2016*
- *Newcastle Local Environmental Plan (LEP) 2012*
- *Newcastle Development Control Plan (DCP) 2012*
- *Newcastle Cycling Strategy and Action Plan, The City of Newcastle, March 2012*
- *Newcastle Transport Strategy, The City of Newcastle, March 2016*
- *City Centre & Surrounding Suburbs Part 1 – Parking Study, The City of Newcastle, July 2014*
- *Guide to Traffic Generating Developments (Version 2.2 RTA October 2002)*
- *Guide to Traffic Management Part 11 – Parking (Austroads 2017)*
- *Guide to Traffic Management Part 12 –Traffic Impacts of Developments (Austroads 2016)*
- *AS NZS 2890.1-2004 Parking facilities - Off-street car parking*
- *AS 2890.2 - 2002 Off-street commercial vehicle facilities*
- *Traffic and Parking Report Newcastle Courthouse, (TTW February 2012)*
- *NeW Space Environmental Impact Statement Appendix O - Transport Access Strategy, July 2014 (NSW Dept. Planning and Environment Website, December 2018)*
- *Secretary's Environmental Assessment Requirements (SEAR's) issued 21st December 2018*

2. Existing Situation

2.1 Background and Site Location

The subject site is located on a parcel known as No 9 Church Newcastle NSW 2300. The site was previously used as the Newcastle Courthouse, established in 1889. (A new Courthouse building was opened on Hunter Street near Darby Street in 2016, making the Church Street site no longer required as an operating court facility.)

The site is occupied by a number of buildings, including the heritage listed former Courthouse Building, which will remain a strong feature of the Nihon University Newcastle Campus. Access to the former Courthouse building is on Church Street opposite Bolton Street.

Other notable land use in the immediate vicinity includes Christ Church Cathedral, Newcastle Grammar School, Newcastle Police Station, Bolton Street Car Park, James Fletcher Hospital and Newcastle Beach.

The site sits within the most historic precinct of Newcastle, now known as the East End, first settled around the turn of the 19th century. Watt Street to the east was the original main street in early settlement years, with Customs House located to the north adjacent to the site of the former Newcastle Railway Station.

The location of the site is illustrated in **Figure 2.1 – Site Location** below.

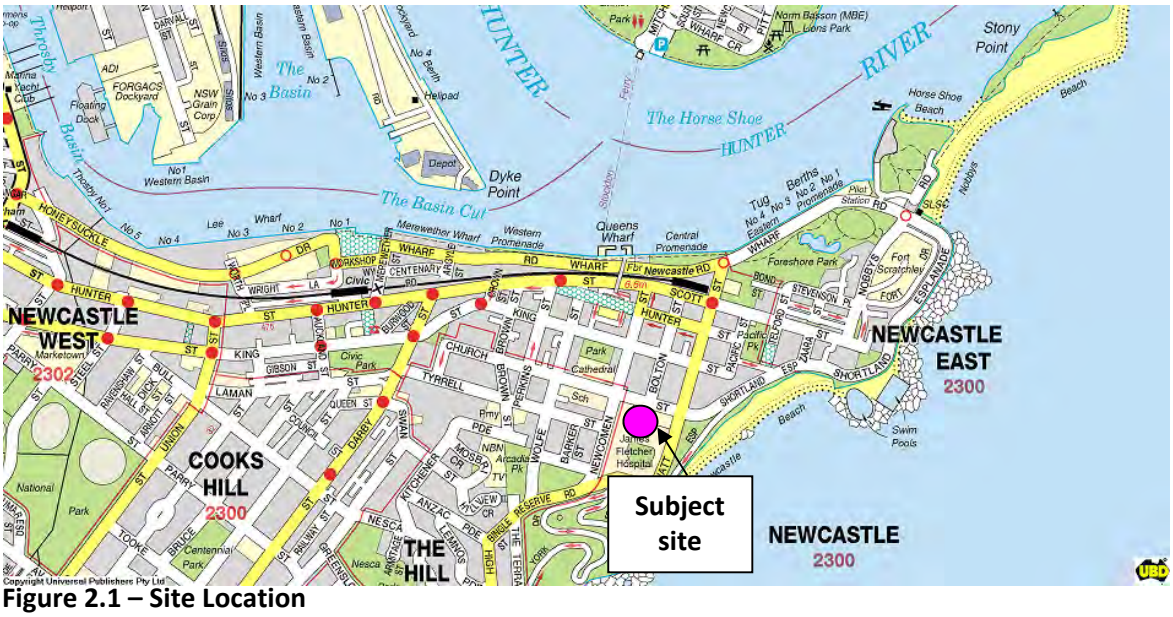


Figure 2.1 – Site Location

Source: UBD City Streets Version 5.0.0

2.2 Local Road Network

Church Street

Church Street is a local road so named because of the location of the site of Christ Church Cathedral, the site of the earliest church in the settlement of Newcastle. It is a two lane two way urban street, with one traffic lane in each direction, and sufficient width for kerb side parallel parking in each direction. Parking is timed and is pay parking, controlled by street meters.

The only access to the subject site, both vehicular and pedestrian, is provided from Church Street.

Photo Plate 1 – Former Newcastle Courthouse. Existing site vehicle access to right of photo.

Photo Plate 2 – Church Street looking west. Site is on the left. Note existing pedestrian crossing at Bolton Street.

Photo Plate 3 – Old Newcastle Courthouse looking east on Church Street. Newcastle Police Station is in the background.

Bolton Street

Bolton Street is a local road connecting Church Street to Scott Street. Running north-south it is a two lane two way urban street, with one traffic lane in each direction, and sufficient width for kerb side parallel parking in each direction. Parking is timed and is pay parking using street meters.

The Bolton Street carpark is located just to the north of the subject site, and is available for public parking as well as tenant parking, on an as timed and fee for pay parking basis.

Photo Plate 4 – Church Street / Bolton Street intersection looking south toward subject site.

Newcomen Street

Newcomen Street is a local road connecting Reserve Road to Scott Street in the north. Running north-south from King Edward Park it is a two lane two way urban street, with one traffic lane in each direction, and sufficient width for kerb side parallel parking in each direction. In the vicinity of Newcastle Grammar School and the James Fletcher Hospital site there is angled parking on the eastern kerb line. Parking is timed and is pay parking, controlled by street meters.

Photo Plate 5 – Church Street / Newcomen Street intersection looking east.

Photo Plate 6 – Newcomen Street / Church Street intersection looking south.

Watt Street

Watt Street is a local road connecting Reserve Road near King Edward Park to Wharf Road and the Hunter River foreshore. Running north-south it is a two lane two way urban street, with one traffic lane in each direction, and sufficient width for kerb side parallel parking in each direction. Parking is timed and is pay parking, controlled by street meters.

Photo Plate 7 – Watt Street /Church Street / Shortland Esplanade intersection looking west.

Local Intersections

All local road intersections in the vicinity of the subject site operate under priority control, with priority control, or stop sign / give way sign control to reinforce priority on the 4 way junctions.

2.3 Traffic and Parking

2.3.1 Site Access and Existing Parking Arrangements

Site Access - The site fronts Church Street opposite the T intersection with Bolton Street. The intersection operates under priority control. The existing site had provision for car parking of up to 34 spaces, with 16 basement spaces, and 18 outdoor spaces. (Refer to Existing Drawings in **Appendix D – Project Plans**.)

Car parking is generally provided in accordance with the rates set out in Council's Development Control Plan (DCP) 2012 s7.03 Parking, except for car parking for non-residential development in the Newcastle City Centre, which is provided at the rate of one space per 60m^2 Gross Floor Area (GFA).

Newcastle LEP 2012 Clause 5.3 "Development near zone boundaries" is directly relevant in this case in that the uses on the subject site and adjacent sites are entirely consistent with the adjacent Newcastle City Centre. (The defined boundary of the City Centre is the northern side of Church Street.)

"The objective of this clause is to provide flexibility where the investigation of a site and its surroundings reveals that a use allowed on the other side of a zone boundary would enable a more logical and appropriate development of the site and be compatible with the planning objectives and land uses for the adjoining zone."

Photo Plate 7 – Existing Newcastle Police Station Access and Site service vehicle access.

Photo Plate 8 – Existing Site vehicle access.

Of note also is that in its DCP, Council reserves the right to vary the rates, subject to merit assessment of the proposal.

The fact that the subject site, and the adjacent sites, Newcastle Police Station and James Fletcher Hospital are all regional facilities consistent with City Centre activities, applying the City Centre Parking rate makes it appropriate to apply the City Centre parking rate for consistency.

With a parking requirement calculated at 65 spaces under these requirements of Council's DCP, this represented a historic parking deficit for the site of 31 spaces (65-34=31 spaces).

Former Newcastle Courthouse Parking Arrangements

It is necessary to consider the parking arrangements for the former site to gain an understanding of the specific traffic generation characteristics of its former (historic) use.

By way of context, up until its recent closure, the site was occupied by Newcastle Courthouse, and its associated administrative functions for the Department of Attorney General and Justice.

The nature of this former site use is such that the low provision of parking space on site, and then hence historic site traffic generation was in line with State and Departmental policies and practices for this specialised state significant land use. The NSW Government policies (Source: NSW Department of Attorney General and Justice, February 2012) in this regard are aimed at:

- providing environmental benefits;
- non-competition with private enterprise (car parks);
- promotion of healthy living opportunities; and
- providing support for public transport use;

The added constraint for the Department of Attorney General and Justice for the operation of courthouses is guided by security and public safety concerns associated with providing open access parking beneath a courthouse. NSW State Government policy (M2008-06 State Property Authority and Government
Property Principles - Principle 11) identifies that car parking spaces that incur a cost to an agency should only be provided for official Government vehicles.

At a Departmental level, the Department of Attorney General and Justice Car Parking Policy identifies the following vehicles that may access Departmental sites and have use of parking facilities as:

- Departmental vehicles;
- Judicial vehicles;
- Authorised service contractor vehicles;
- Service contractors, couriers and delivery vehicles; and
- Pre-determined visitor vehicles (including people with disabilities).

Private vehicles (vehicles owned or used by employees for personal purposes) are not permitted to park on Department of Attorney General and Justice Sites that are located within a one-kilometre radius of a commercial car park in a metropolitan area, (which includes Newcastle). Court users and visitors are not provided with car parking for security reasons.

The above policies and practices have been applied to all recent courthouse developments in NSW and are provided for context only.

Hence the parking requirement calculated at 65 spaces under the requirements of Council's DCP, and the historic parking deficit for the site nominated at 33 spaces.

2.3.2 2019 Traffic Flow Observations

Following a request from Transport for NSW Roads and Maritime Services (RMS) fresh traffic surveys were undertaken at the following junctions in the immediate vicinity if the subject site:

Church Street / Newcomen Street
Church Street / Bolton Street
Church Street / Watt Street / The Esplanade

Turning movement counts were conducted on Thursday 7th February, Friday 8th 2019, and Saturday 9th February 2019. The counts covered both AM and PM operations, and also recorded light and heavy vehicles, and also pedestrian movements. The full results are included as **Appendix A - Traffic Turning Movement's Surveys February 2019**.

In terms of reviewing and analysing the significance of the survey results, reference has been made to the Guide to Traffic Generating Developments (RTA, Version 2.2, October 2002), herein noted as "the Guide".

Table 2.1 - Urban Road peak hour flows per direction is a reproduction of Table 4.4 from the Guide. It notes the ultimate capacity for urban roads in the vicinity of the subject site as 1400 vehicles per hour in a single direction (at Level of Service (LoS) E). For the 2019 observed traffic flows in the vicinity the following levels of service have been generally observed:

1. Newcomen Street LoS A/B
2. Church Street LoS A/B
3. Bolton Street LoS A
4. Watt Street LoS B/C
5. The Esplanade LoS A/B

All the street legs in the vicinity of the subject site exhibit Levels of Service in the stable A/B range, with the exception of the southern leg of Watt Street on the approach to the intersection with Church Street and The Esplanade.

For these flow levels LoS B is described as *"…in the zone of stable flow and drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream, although the general level of comfort and convenience is [a] little less than that of the level of Service A."*

LoS C occurs on Watt Street approaches to the Church Street intersection for the dominant peak movement (i.e. northbound AM, southbound PM.) LoS C is also described as being in the zone of stable flow, *"…but most are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream."*
(For a two lane two way urban street manoeuvrability within the traffic stream is restricted to one lane operation anyway.)

It should be noted that the southern approach, in fact all approaches allow for turning vehicles to be passed by another vehicle and so the level of interruption is not as severe as in in conditions where adjacent lanes are not available.

Table 2.1 - Urban Road peak hour flows per direction

Level of service	One Lane (vph)	Two Lanes (vph)
A	200	900
B	380	1400
C	600	1800
D	900	2200
E	1400	2800

***Source**: Table 4.4, RTA Guide to Traffic Generating Developments, version 2.2 dated October 2002.*
Note: vph – vehicles per hour

2.3.3 Existing Traffic Conditions

Intersections

For the assessment of intersection performance it is useful to firstly consider the Austroads threshold levels for intersection capacity under uninterrupted flow conditions, below which intersection analysis is considered unnecessary. **Table 2.2 Intersection volumes below which capacity analysis is unnecessary** presents these thresholds. Where traffic flows fall within these limits intersection performance is essentially operating with little or no delay for approaching drivers other than to obey the requisite road rules.

Table 2.2 Intersection volumes below which capacity analysis is unnecessary

Road Type	Light Crossing or turning volumes Maximum Design Hour Volumes, Two-way (vph)		
Two Lane through Roadway	400	500	650
Cross Road	250	200	100
Four Lane through roadway	1000	1500	2000
Cross road	100	50	25

Source: Guide to Traffic Management - Part 3 Traffic Studies and Analysis, Austroads 2009

For both the morning and afternoon peak periods, the traffic surveys at the Church Street / Bolton Street intersection indicate volumes are below these limits for the opposing turning volumes. Essentially, traffic is required to slow down to negotiate turns with little if any delay for the through traffic movements. This is consistent with the site observations.

In the case of both the Church Street / Newcomen Street and Church Street / Watt Street intersections these thresholds are exceeded. Application of the SIDRA intersection modelling tool to the existing conditions demonstrate that these two intersections both operate at Levels of Service A (LoS B for through traffic movements crossing Watt Street) which is at the higher ends of operational performance. These results hold even if the conservative assumption of single lane approaches is applied (i.e. without any ability to pass turning vehicles at the junction.) A summary of the results of this modelling are included in **Appendix B** to this report.

Mid-Block Road Volumes and Performance

Recorded approach volumes for the roads in the vicinity of the subject site relating flow to capacity are summarised in **Table 2.3 – Summary of Traffic Volumes & Volume / Capacity Ratios** overleaf.

Table 2.3 – Summary of Traffic Volumes & Volume / Capacity Ratios

Road	Location	Peak Period	Peak flow[1]	Mid-Block Road Capacity[2]	Volume / Capacity
Church Street	W of Newcomen	AM peak	65 eastbound 202 westbound	900 (one-way)	0.07 E/B 0.22 W/B
	W of Newcomen	PM peak	40 eastbound 157 westbound	900 (one-way)	0.04 E/B 0.17 W/B
Church Street	W of Bolton	AM peak	189 eastbound 133 westbound	900 (one-way)	0.21 E/B 0.15 W/B
	W of Bolton	PM peak	84 eastbound 237 westbound	900 (one-way)	0.09 E/B 0.26 W/B
Church Street	W of Watt	AM peak	102 eastbound 126 westbound	900 (one-way)	0.11 E/B 0.14 W/B
	W of Watt	PM peak	119 eastbound 103 westbound	900 (one-way)	0.13 E/B 0.11 W/B
The Esplanade	E of Watt	AM peak	181 eastbound 215 westbound	900 (one-way)	0.20 E/B 0.24 W/B
	E of Watt	PM peak	163 eastbound 364 westbound	900 (one-way)	0.18 E/B 0.40 W/B
Bolton Street	Nth of Church	AM peak	147 northbound 58 southbound	900 (one-way)	0.16 N/B 0.06 S/B
	Nth of Church	PM peak	25 northbound 183 southbound	900 (one-way)	0.03 N/B 0.20 S/B
Newcomen Street	Nth of Church	AM peak	140 northbound 60 southbound	900 (one-way)	0.16 N/B 0.07 S/B
	Nth of Church	PM peak	84 northbound 110 southbound	900 (one-way)	0.09 N/B 0.12 S/B
Newcomen Street	Sth of Church	AM peak	340 northbound 67 southbound	900 (one-way)	0.38 N/B 0.07 S/B
	Sth of Church	PM peak	162 northbound 224 southbound	900 (one-way)	0.18 N/B 0.25 S/B
Watt Street	Nth of Church	AM peak	364 northbound 207 southbound	900 (one-way)	0.089 N/B 0.122 S/B
	Nth of Church	PM peak	298 northbound 252 southbound	900 (one-way)	0.33 N/B 0.28 S/B
Watt Street	Sth of Church	AM peak	447 northbound 296 southbound	900 (one-way)	0.50 N/B 0.33 S/B
	Sth of Church	PM peak	329 northbound 500 southbound	900 (one-way)	0.37 N/B 0.56 S/B

Notes: 1. Peak flows from 8th February 2019 Thursday traffic surveys results (Trans Traffic Surveys for by Better Transport Futures)
2. RTA 2002, Urban Road Conditions Level of Service C

Table 2.2 demonstrates that all mid-block sections of the local road network operate at well within their technical and functional capacity levels. Variations in the observed flows were within expected ranges for fluctuation in daily flows, and for different days of the week.

2.4 Road Network Improvements and Known Developments

Road network improvements in the vicinity of the subject site include the recent work on Watt Street from Wharf Road to Shortland Esplanade. Watt Street was reconstructed in 2017 to accommodate the Newcastle 500 V8 Supercars meeting. The Street is closed from Wharf Road to Shortland Esplanade occupied for a period of 6 to 8 weeks a year from late October. Temporary safety barricades and other equipment are installed for the duration of the race meeting. Current planning is for the race meeting to continue until 2021, with a 5 year option available to extend the life of the race meeting.

In addition to the above road works construction has commenced on redevelopment of the site on the corner of Newcomen Street and King Street, the former Newcastle Herald building.

It is also understood that plans are being considered for redevelopment of the Bolton Street Car Park site. Timing for this development is uncertain, but it is understood that any new development will retain the car parking function of the site.

2.5 Public Transport

Public transport (bus) services are available in the immediate vicinity of the subject site as shown overleaf in **Figure 2-2 Public Transport Network Map**. Bus routes run along Church Street, and nearby Watt Street and King Street. The now operational Newcastle Light Rail Train (LRT) is located a short walking distance, about 400 metres to the north of the site, with LRT stations located at Pacific Park and Market Street. The LRT and many bus services connect directly to the regional heavy rail network at the Newcastle Interchange located on the western fringe of the Newcastle CBD at Wickham.

The combination of bus routes and LRT services linking to the heavy rail network provides public transport access across the Hunter Region, and beyond.

As such the subject site is well located to allow movement to and from the site from across the Greater Newcastle Metropolitan region.

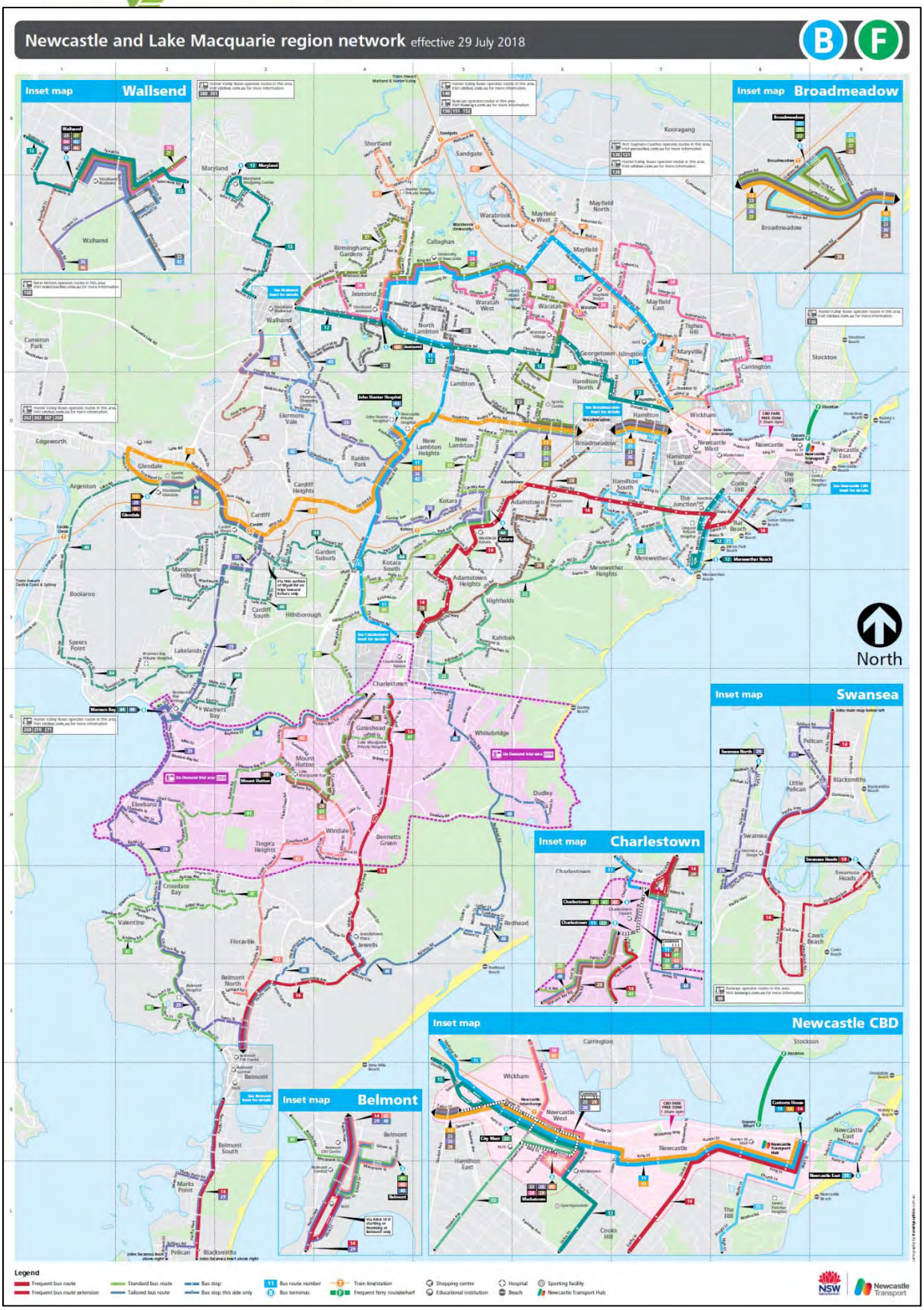


Figure 2.2 – Public Transport Network Map

Source: https://www.newcastletransport.info/uploads/files/network_web.pdf (December 2018)

2.6 Walking and Cycling

Walking and cycling facilities in the immediate vicinity of the subject site are typical of an established business district, with footpaths formed along both sides of all roads.

Photo Plate 7 – Church Street showing established footpaths

The City of Newcastle has long encouraged cycling as a mode of transport as outlined in Council's Newcastle Cycling Strategy and Action Plan. (City of Newcastle, March 2012).

Councils Development controls include provisions for bike parking, strategic plans have allowed for and are continuing to refine the cycling networks supporting the city, including the recent announcement of a review of past proposal for on road cycle facilities in Hunter Street within the CBD, now that the Newcastle LRT project has been built.

These existing and planned cycling facilities within the Newcastle CBD provide the ability for people to use bikes, particularly for short local trips. The topography of the area is generally conducive to cycling, and indeed the subject site can be easily reached from Hunter Street and the Hunter River Foreshore.

Recent initiatives such as the BYKKO and Transport for New South Wales launch of Australia's first electric bike share service in Newcastle in 2017 are indicative of the city's "Smart City" approach to transport access, (including parking)

The scheme provides a new way to reach local destinations quickly, safely and efficiently using BYKKO's electric bike sharing community. With over 156 bicycle docks spread across 19 docking stations throughout the Newcastle CBD, Honeysuckle, Newcastle West, Wickham, The Junction and Bar Beach, finding a bike and getting to your meeting, lunch date or next appointment is simple and easy. Currently the closest docking station to the subject site is at Pacific Park around 500 metres, a comfortable walking distance from the subject site.

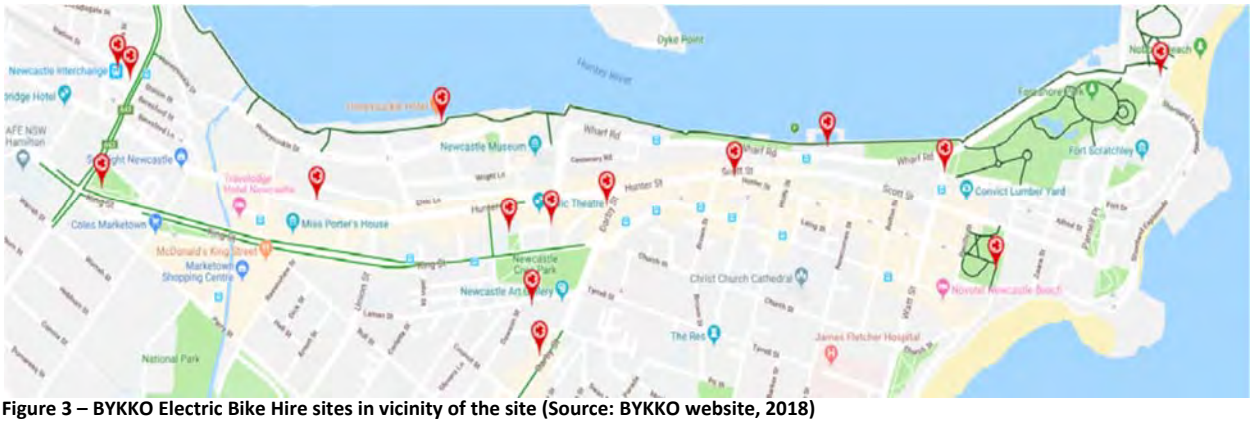


Figure 3 – BYKKO Electric Bike Hire sites in vicinity of the site (Source: BYKKO website, 2018)

2.7 Other Known Development

In the immediate vicinity of the subject site is the Parque Newcastle East development. With access to Bolton Street just north of Church Street this inner city residential development will have some traffic impacts on the nearby junction of Church and Bolton Street. Traffic flows noted previously in Section 2.3.3 above indicate that the volumes even allowing for this development and the subject site will remain at levels below which capacity analysis is unnecessary.

It was noted that at the time of site observations conducted for this assessment that active construction was underway at the Parque development site, and that Construction Traffic Management arrangements were in place.

2.8 Authority Consultation

As part of the consultation process for the Nihon University Newcastle Campus proposal Planning Secretary's Environmental Assessment Requirements (SEAR's) were issued to the proponent on 21st December 2018. The SEAR's were used to update earlier documentation for the proposal that was focussed on parking issues associated with the former Newcastle Courthouse site.
The full list of nominated SEAR's including correspondence with NSW Transport Roads and Maritime Services (RMS) is provided in **Appendix C – Secretary's Environmental Assessment Requirements, along with immediate comments as to the relevance of the individual SEAR's to this development proposal.** Responses to each of the SEAR's also are included in **Appendix C**.

3. Proposed Development

3.1 The Development

3.1.1 Proposed Use of Buildings

The Nihon University Newcastle Courthouse Redevelopment Project includes 3 distinct buildings that will be connected to each other:

- Residential Building
  A 4 x storey building to accommodate approximately 100 x students, 7 x teachers and 1 x staff. It is planned to have 108 beds in total with a small number of single rooms for faculty members and long stay students (up to 7) within the above total numbers of people on site. The building has a cafeteria, a common bathroom and all amenity related facilities and associated machinery equipment rooms. The building footprint area is 1,020m2 with a total gross floor area of approximately 3200m^2.

- Former Courthouse Building
  The Former Courthouse Building would be conserved and adapted for use as an administrative building and an open public facility with auditorium, lecture hall, library and multipurpose hall. Further uses of the building are under investigation by Nihon University.

- Classroom Building
  A 4 x storey building dedicated to linguistic education as its primary purpose. The classrooms are of differing sizes to match the various needs of linguistic education. On the lowest level of the Classroom Building minimum car parking spaces have provided for the permanent staff.

Total Gross Floor Area for the proposal is estimated at 6,605 m^2.
Plans outlining the development proposal are included in **Appendix D – Project Plans**
Site occupancy is planned at the following levels:

- 100 x exchange students
- 7 x teaching staff
- 1 x permanent staff

3.1.2 Special Events using the Old Newcastle Court House

It is understood that a Memorandum of Understanding (MOU) between Nihon University and the University of Newcastle was signed in February 2018. However, both universities are still negotiating as to what joint and collaborative programs they may be offering.

It is anticipated that there would be some exchanges on law courses, making use of the heritage listed court house which is being retained in the site re-development. E.g. for mock trials or for collaborative language programs. The space could also be made available for "Special Events" with invitations to the wider community. (This would not be dissimilar to existing use of the heritage listed Newcastle City Hall.) It should be noted that any such "Special Event" would be restricted to the fixed existing capacity of the court house, and be no different to any past major event at the court house such as a major trial open to the public.

In any such special event it is expected and indeed recommended that the same approach to travel planning to be documented in a Green Travel Plan for the site is not only the most appropriate for of transport to promote, but is indeed entirely consistent with The University of Newcastle approach to its city university campuses such as a NewSpace and the proposed new Honeysuckle University precinct.

Finally it must be stressed that that majority of the students attending the Nihon University Newcastle campus will not have an International Drivers Licence, nor the ability to gain access to a vehicle?

With the excellent public transport available, including the newly opened Newcastle Light Rail, it is expected that movement between the City's campuses would be focussed on the public transport and alternate transport options. The Green Travel Plan (Already a recommendation of this assessment to be implemented before site occupation) should incorporate information to inform students and staff of the range of transport options available to service their movement needs.

3.1.3 On-Site Parking

Parking provisions are proposed at 20 spaces for cars, 1 motorcycle and 22 bicycle spaces.

100% of staff and students will reside on site, so will not need to travel to and from the site to attend the facility. Additionally, it is very unlikely that any staff member (or student) would have access to a vehicle.

3.2 Traffic Generation

Making a conservative assumption of 100% of on-site parking being accessed during peak periods, this sets the maximum traffic generation for the subject site at **20 vehicles in TOTAL**. This is quite unrealistic as mentioned above given all staff and students reside on site, but also because the recorded percentage of travel mode Car as Driver was only 63% for the Newcastle Local Government Area. (Source: Australian Bureau of Statistics NSW State and Regional Indicators for Method of Travel to Work by Employed persons, By Local Government Area of Usual Residence (ABS Release Date 31 Jan 2011) Refer to **Appendix E**). Expanding the dataset to include all 5 Lower Hunter Local Government Areas (LGA's) changes this value minimally, 65% rather than 63%. This would equate to 13 motor vehicle trips, not 20 trips.

And so for the purposes of a "worst case" analysis this assessment has applied the conservative 20 peak period trips.

3.3 Traffic Distribution and Assignment

Figure 3.1 Possible Motor Vehicle Approach Routes illustrates just some of the possible choices for drivers in approaching the subject site by motor vehicle.

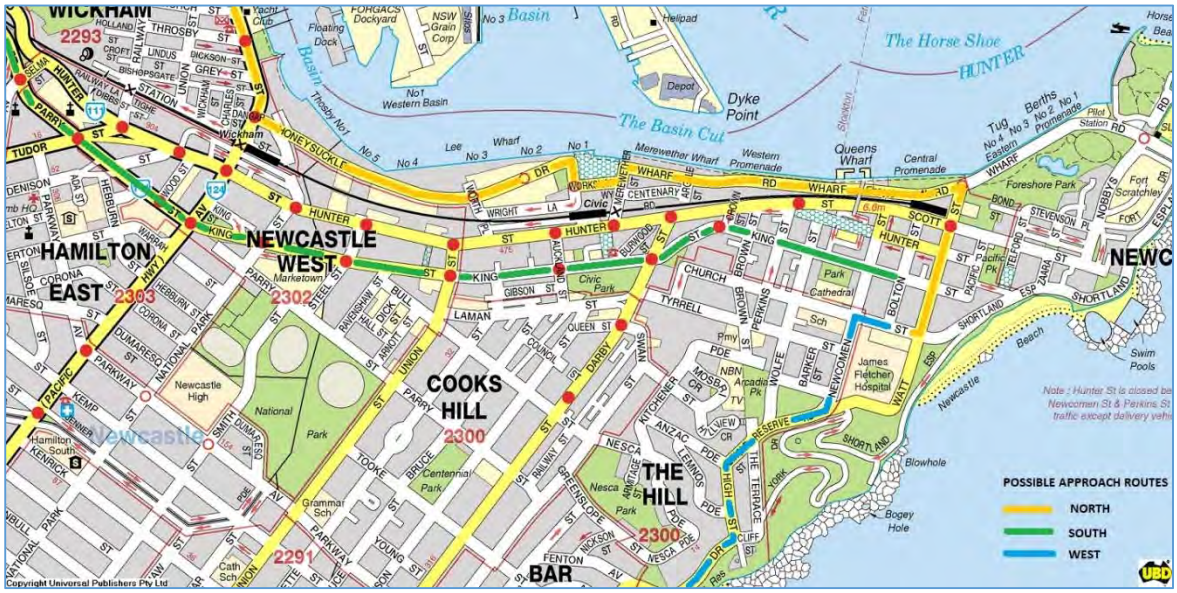


Figure 3.1 Possible Motor Vehicle Approach Routes

Newcastle East being on the eastern end of a peninsular bounded by the Pacific Ocean to the east and Hunter River to the north is really only approachable from the west or south.

The approach routes are therefore the same as for typical journey to work travel to the wider Newcastle CBD.

Northern Approach

- Hannell Street from the north, then either of Honeysuckle Drive / Wharf Road to reach Watt Street, or
- King Street to Bolton Street
- Hunter Street to Watt Street

Western Approach

- Newcastle Link Rd, Thomas St, Newcastle R, Griffiths Rd, Donald St, Parry St, King St

Southern Approach

- Pacific Highway, Glebe Rd, Darby St, Parkway Av, Memorial Dr to Newcomen St, OR
- Pacific Highway, Scenic Dr, Memorial Dr, to Newcomen St leading to Church St

It must be stressed that any or all of the above approach routes can be used, and will depend on individual driver preferences in terms of avoiding delays (e.g. more traffic lights, the new Newcastle Light Rail, school zones, etc.)

3.4 Adopted Trip Assignment for Analysis Purposes

For the purposes of this assessment a highly conservative assumption has been made about the approach routes, such that 100% of the nominated traffic generation has been applied to pass through the busiest approach intersection to the subject site, being Church Street / Watt Street / The Esplanade. Even with this assumption intersection performance remains at very high service levels.

3.5 Site Access

No changes are proposed to vehicle access for the site, with the existing basement car park entrance being replicated in the new building structure.

Similarly pedestrian access to the existing courthouse building will be retained.

Service vehicle access is proposed to remain from the driveway adjacent to the Newcastle Police Station. No large vehicles are proposed to be servicing the site. All deliveries will be managed and controlled using small commercial vans and small rigid vehicles only. These vehicles are required to service the site kitchens and plant areas only.

It is proposed that service vehicles will access the site by performing a reversing manoeuvre to enter the site, and then exit the site in a forward direction.

3.6 Traffic Impacts

It is noted that with the 100% on site accommodation of students and staff means that there is effectively **NO COMMUTING TRAFFIC IMPACT FROM THEIR ACTIVITY DURING PEAK PERIODS.**

Assumed traffic generation for the analysis of the university proposal will be limited to the assumed staff and service vehicle movements. Service vehicle access is able to be managed so as not to coincide with other on street peak activity, but in any case the number and management of service vehicle movements is not expected to be significant, comprising small commercial vehicles only.

Staff movements would be such that even if it were assumed that all staff travelled to and from the subject site during the AM and PM peak periods, the total movements of around 20 vehicles is considered to be less than that of the former site operations.

As such the net impact of the university proposal is expected to be minimal, and certainly less, (a deficit) when compared to the site's historic traffic generation.

It is expected that the incidental movement of students and others by vehicle to and from the site would be comparable to those movements that occurred historically with respect to the former courthouse operations. That is, people attending court as visitors, jurors, law professionals etc. It is considered that the incidental movements of students are unlikely to be higher than this activity generated by the site's former use.

Notwithstanding the very minor nature of the traffic and transport generations of this proposal, traffic survey data collection and intersection modelling was completed as requested in the SEAR's for the project received on 21st December 2018. As noted in section 2.3.4 and Appendices to this report, the existing intersection performance in the vicinity of the subject site is very good, operating at the highest Level of Service ranges of A/B.

Even by assuming 100% of all motor vehicle traffic (20 staff related trips) occurring in the peak periods, and applying this to pass through the business intersection near the site, Church Street / Watt Street / The Esplanade, the performance remains at Levels of Service A/B.

Even applying an RMS required growth factor of say 20% in this mature part of the Newcastle urban area, which again is applied as 100% to the one intersection, the Church Street / Watt Street / The Esplanade, the performance remains at Levels of Service A/B.

The conclusion with respect to traffic related issues associated with the University proposal is that there will be no discernible traffic impacts when compared to the former site use.

3.7 Parking

3.7.1 Development Controls

According to the DCP 7.00 Development Provisions, 7.03 Traffic, Parking & Access, (DCP 2012 s7.03 Parking) the required car parking numbers for a site in the Newcastle City Centre locality, is one space per 60m² of GFA.

This would equate to 111 car parking spaces being required for the subject site (7,200m²/60).

However under the guidelines set out in the planning controls there are a number of mitigating factors that can be taken into consideration, such as: historic parking deficits, and merit assessment of the proposal.

Councils DCP states that parking provision for development proposals not specifically covered by the DCP controls can be assessed having regard to transport and road authority guidelines, and/or demonstration of parking requirements from surveys of comparable establishments and the following criteria. The:

(a) Proportion of visitors or patrons likely to arrive by car
(b) Availability and level of service of public transport relative to the site
(c) Number of employees and their likely spread of work hours
(d) Hours of operation
(e) Location of the premises, particularly in relation to schools, local services, and employment, retail and recreational facilities
(f) Number of occasions during the year when the proposed development is likely to be fully utilised
(g) Availability and affordability of public parking within a reasonable distance of the proposed development
(h) Availability of additional parking facilities to cover peak demands.

The remainder of this assessment focusses on discussing these issues as they would apply to the Nihon University proposal.

3.7.2 Proposed Parking Supply

Parking for up to 20 vehicles is proposed in the western building, with access from Church Street. There is space available in the lower level also for provision of bicycle parking, with a nominal supply proposed of 1 motorcycle and 22 bicycle spaces.

A review of the calculations of parking requirement in accordance with DCP 2012 s7.03 Parking Table 1 has been made using information provided by the client. The results of this review are summarised in **Table 3-2 Review of Proposed On-Site Parking** below.

Table 3-2 Review of Proposed On-Site Parking

Parking Generator	Requirement	Details	No Car Spaces Required		
			Existing	DCP	Proposed
Existing Courthouse	1 / 60 m^2 GFA		65		N/A
Nihon University	1 / 60 m^2 GFA	6605 m^2	N/A	111	-
Staff	1 space per 2	8 staff	N/A	-	4
Visiting Staff Allowance	1 space per 2	10 staff	N/A	-	5
Visitor Spaces			N/A	-	11
Exchange Students – High School			N/A	-	NIL
Exchange Students – University			N/A	-	NIL
Exchange Students – Post Graduate			N/A	-	NIL
Total Required			65	111	20
Total Provision			34	20	20
		Historic Deficit	-31	-31	
		Supply/Deficit		**-60**	**TDM[1] & GTP[2]**
Motorcycles					1
Bicycles					22

Source: Adapted from Nihon University Australia Newcastle Campus Project Basic Design (Draft)
Notes: 1. TDM – Travel Demand Management, 2. GTP – Green Travel Plan

The student and staff levels nominated above reflect the expected usage proposed for the site. The remainder of the site areas are public spaces, kitchens, toilets, circulation, offices, storage and accommodation rooms which are not traffic or parking generating activities.

Site observations at various times of the day, weekends and evenings has indicated that short stay on street parking is generally available within an acceptable walking distance (i.e. a walking threshold of approximately 400 metres)

3.8 Public Transport

The location of the site together with the shift work making employees start and finish at odd times, the demand for public transport to access the site will again remain quite low. As such no additional public transport facilities are considered to be necessary as part of this expansion development.

3.9 Walking and Cycling

With the student cohort for the subject site being 100% foreign high school and university students, and with their residence and primary activity of study being located on the subject site, it is concluded that their peak period travel is likely to be minimal. It is worth mentioning that the majority of the students will not have an International Drivers Licence, nor the ability to gain access to a vehicle.

Student off campus after hours transport needs is expected to be well catered for by the range of public transport, walking and cycling options available for movement within the Newcastle CBD and beyond. The recommended Green Travel Plan will provide students and staff with information on the available alternatives for their movement needs.

As such is considered that there will be minimal need for change to existing pedestrian and cycling facilities in the vicinity of the subject site resulting from its operations. No changes are considered warranted as a result of the Nihon University proposal. Noting that on-site end of trip facilities for cyclists are proposed as part of the site development and are discussed further in section 4.4.3.

4. Impact Assessment

4.1 Site Access

Parking for Staff vehicles is proposed in a basement level of the accommodation building in a similar configuration to that of the existing building on site.

There is provision for up to 20 parking spaces, with space and access aisle dimensions generally confirming to the requirements of AS/NZS 2890.1:2004 Parking facilities - Off-street car parking. Service vehicles will be limited to small rigid vehicles and small commercial vans. Access is proposed using the existing driveway adjacent to Newcastle Police Station.

Service vehicles will be limited to small rigid vehicles and small commercial vans and are proposed to be subject to a management plan developed by Nihon University.

Requirements and recommendations from Australian Standard AS NZS 2890.2 - 2002 Off-street commercial vehicle facilities for providing for occasional service are as follows:
(a) The vehicle shall be able to stand wholly within the site. This is able to be met by the proposal.
(b) Reverse manoeuvres at the property boundary, if permitted by the relevant authority, shall be limited to one only, either on entering or departing, and shall be subject to consideration of both safety and obstruction to other on-street traffic.
It is proposed that Garbage collection from the site will occur on street, in accordance with the recommendations of the Operational Waste Management Report.
With respect to arrival and departure of other service vehicles these are also able to be addressed by way of a management plan for the site. In this way, reverse manoeuvres at the property boundary can be limited to one only (permissible with consent under the Australian Standard.) This would preferably be on entering, and also subject to consideration of both safety and obstruction to other on-street traffic.
It should be noted that the majority of service vehicles are expected to be small commercial vehicles (vans) making for example deliveries to the on-site cafe etc.

(c) The swept path plus clearances shall be accommodated within the access driveway or circulation roadway.
(d) The full width of the access driveway may be used for both entering and leaving the site.

It is proposed that service vehicles access the site in accordance with the site management plan, with larger vehicles using a reversing manoeuvre (similar to a reverse park manoeuvre) on entry, and then exit the site in a forward direction. As noted above arrangements of this nature are allowable under the Australia Standard with local authority approval.

4.2 Traffic and Road Safety

A review of the existing conditions of the local roads and the nearby intersections used for access to the subject site confirms the roads and intersections are well laid out, and conform to Councils road design requirements for established urban environments. All of the roads have wide carriageways to cater for large vehicles with generous turning areas at the intersections and on curves.

Church Street is currently being used as a bus layby area (eastbound) and buses regularly use Church Street, Bolton Street, and Newcomen Street. Parking immediately out the front of the site

on Church Street is signposted for use by Police Vehicles only associated with the adjacent Newcastle Police Station. Large vehicles also require regular access to the Newcastle Police Station driveway adjacent to the subject site on Church Street.

4.3 Parking

4.3.1 DCP Requirements

THE CoN DCP 2012 requirements for parking allow for demonstration of parking requirements from review of comparable establishments. Such a comparison shows that it is now common practice to limit parking for university campuses, with any provision being made for staff, and not the general student cohort.

The wider transport needs of the student population, and staff to some extent are dealt with by promotion and application of alternate (sustainable) transport. More details of this approach are outlined below.

4.3.2 Comparison with Comparable University Campuses

Road authority guidelines specifically allow for demonstration of parking requirements from surveys of comparable establishments. (Guide to Traffic generating Development, RTA Version 2.2 October 2002). This process was used for a University campus most recently in Newcastle for the New Space development on Hunter Street adjacent to the Civic Theatre.

Fundamental characteristics of the various sites considered across many metropolitan campuses are outlined in Table 3-1 University Campus Parking Review below.

Table 3-1 University Campus Parking Review

Campus / Building	Location	GFA	Staff	Students	Parking Provision	Parking Ratio	Active Transport Measures
New Honeysuckle	Honeysuckle Precinct	Currently in Planning Phase			NIL Proposed	Unknown	Currently in Planning Phase
New Space	Newcastle CBD	12434	300	4335	25	1:497 m^2	GTP
CCW Building	UTS Sydney	15488	484	1250	28 General + service vehicles	1:533 m^2	On Line Travel Access Guides
Jeffrey Smart Building	University of South Australia			15000	NIL		Web links
Spot Building	University of Melbourne	25850			NIL		Bicycle Hub, 42 spaces
Medical Faculty	University of Tasmania	20000	450	1100	20	1:769 m^2	On line links, 200 spaces
Swanston Building	RMIT	34350		6600			RMIT Bicycle Information Hub Secure Bike Parking
Mirvac School of Sustainable Development	Bond University				1 space		16 bike spaces, end of trip facilities
Waterfront Building	University of Tasmania	5350	290	290	1 Accessible		110 bike spaces, 34 end of trip lockers
Camp Street Ballarat	Federation University Australia	8000			NIL		Web based information

Source: Adapted from *NeW Space Environmental Impact Statement Appendix O - Transport Access Strategy, July 2014 (NSW Dept. Planning and Environment Website, December 2018)*

The University of Newcastle New Space project in the Newcastle CBD, and also the proposed Honeysuckle Campus, have planned to promote alternate (sustainable) transport through the application of Travel Demand Management, Green Travel Planning, and including a conscious decision to restrict onsite parking as part of this approach. These principles are actively supported by both Local and State Government.

The range of parking provision is considerable, but it is clear that a principle of no parking, and promoting of alternate transport has been adopted across many campuses.

However, to take the "lower" of these observed parking strategies in terms of parking ratio, that is, applying the equivalent Newcastle University City Campus principles (New Space) to the proposed Nihon University Australia Newcastle Campus Project would result in a parking supply requirement of 16 spaces.

As such it is considered entirely consistent with these principles for the proposed Nihon University Newcastle Campus to adopt the same transport, access and parking arrangements.

4.3.3 Recommended Car Parking Arrangements

It is within the context of the historic site parking use (and deficit) and the comparison to university campuses in other metropolitan centres that the provision of 1 space per two staff members, and providing some allowance for (official) visitor parking, that the proposed 20 on site car parking spaces for a staffing level of 8 people is considered satisfactory for the needs of the site.

Transport needs of the student cohort are discussed further below.

4.4 Travel Demand Management

Council's DCP Section 7.03.03 Travel Demand Management (TDM) states objectives of:

1. *Facilitate increased modal share to public transport.*
2. *Encourage consideration of alternatives to private vehicle ownership, use and parking.*

The subject site is well placed to facilitate an increased modal share to public transport ***provided the other aspects of its travel planning are aligned with State and Local Government initiatives in this regard.***

Council's 2016 Transport Strategy outlines its commitments to achieving higher mode share to sustainable transport (public transport, walking, cycling) Strategies that seek to increase use of sustainable modes, influence development to support walking and cycling and strategies to manage parking.

4.4.1 Public Transport

The subject site is well located with respect to public transport access:

1. The site is only about 400 metres from the newly opened Newcastle Light Rail

Figure 4-1 – Proposed Light Rail Route (Source: Newcastle Transport website, 2018)

2. The Route 21 Bus travels along Church Street outside the site
3. There are multiple bus services on King Street, only one block away (~ 200 metres), so service frequency near the site is high.

Figure 4-2 - Bus Routes in vicinity of the site (Source: Newcastle Transport website, effective 29 July 2018)

4. The subject site being within the Newcastle CBD provides good access to taxi and other car hire services.

4.4.2 Green Travel Plans

Green Travel Plans are actively encouraged by the City of Newcastle to encourage alternatives to private vehicle use for trips (Source: Newcastle Development Control Plan 2012). Coupled with promotion of Travel Demand Management.

Council has stated it will lead by example and encourage its own staff to reduce reliance on cars for work (commuter) journeys, through surveying staff travel patterns and developing a travel plan. The process of developing a travel plans of this nature has the potential for wider application and adaptation by other employers and institutions across Greater Newcastle.

A Green Travel Plan (GTP) for the Nihon University Newcastle Campus has the opportunity to take advantage of recent initiatives such as the BYKKO / TfNSW electric bike share service now operating in Newcastle. University students, and particularly foreign students from Asia where bicycle use is much higher and more widely accepted than in western countries such as Australia, are more likely to choose a sustainable transport mode such as cycling. This will also be actively encouraged by way of provision of on-site end of trip facilities.

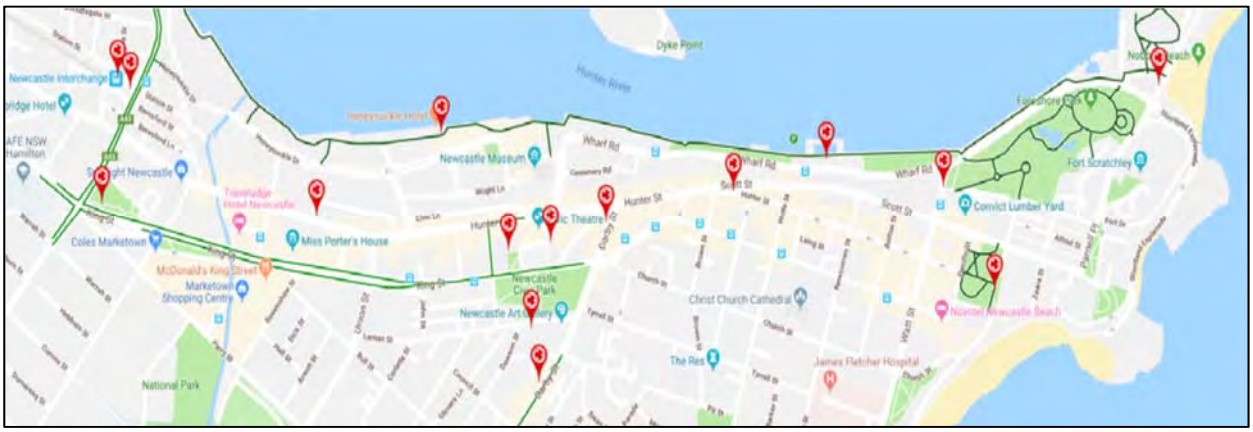


Figure 4-3 – BYKKO Electric Bike Hire sites in vicinity of the site (Source: BYKKO website, 2018)

4.4.3 End of Trip Facilities

End of trip facilities are usually geared toward commuters at the work end of their commuting trip, providing both storage for bikes, and also other facilities such as lockers, change rooms and shower facilities.

In the case of the Nihon University Newcastle Campus, the site is the trip start for other journeys by students, and so the requirement is for bike storage first and foremost, which has been assumed can be facilitated within the student accommodation.

The proposed staff of 8 people will also all live on campus. Shower facilities are already provided to them in the accommodation building.

Noting that bicycle parking is proposed within the development for up to 22 bikes, plus 1 motorcycle, this provides a comparable bicycle parking supply to that of Council's DCP rate for residential dwellings (Attached Dwellings, Dual occupancy, Multi Dwelling Housing, Residential Flat Buildings, Semi-detached dwellings, Shop Top Housing). That is 0.67 spaces per room assuming the 25 allocated rooms, and up to 5 additional single rooms a total of 30 rooms. The Attached Dwelling rate is 0.6 space per dwelling.

An alternative comparison the bicycle parking rate for students at educational establishments (Schools) where the student cohort does not drive, is 1 space per 10 students. This would equate to 10 bicycle parking spaces in this instance.

Noting that the student cohort planned for the Nihon University Newcastle Campus is a combination of high school and university age students, and that it is common practice in Japan for most people (including students) to use public transport and other transport modes, not cars, it is expected that the provision of 22 bike spaces and 1 motorcycle space as well as all the other active transport measures will be adequate for the site needs, and well able to cater for student the travel demand.

5. Summary, Conclusions and Recommendations

5.1 Summary

This parking assessment for the Nihon University Australia Newcastle Campus Project utilising the former Newcastle Courthouse site at No 9 Church Street Newcastle has concluded that:

1. The proposal consists of 3 distinct but connected buildings:
   a. Dormitory Building – A 4 x storey building to accommodate approximately 100 x students, 7 x teachers and 1 x staff. It is planned to have 108 beds in total with a small number of single rooms for faculty members and long stay students within the above total numbers of people on site. The building has a cafeteria, a common bathroom and all amenity related facilities and associated machinery equipment rooms. The building footprint area is 1,020m2 with a total gross floor area of approximately 3200m^2.
   b. Former Courthouse Building
      The Former Courthouse Building would be conserved and adapted for use as an administrative building and an open public facility with auditorium, lecture hall, library and multipurpose hall. Further uses are under investigation by Nihon University.
   c. Classroom Building
      Dedicated to linguistic education as its primary purpose. The classrooms are of differing sizes to match the various needs of linguistic education. On the lowest level of the Classroom Building car parking spaces have provided for the permanent staff.
      Gross Floor Area of the Development is calculated at 6605 m^2
2. Site occupancy is planned at the following levels:
   a. 100 x exchange students
   b. 7 x teaching staff
   c. 1 x permanent staff
3. The existing site had provision for car parking of up to 34 spaces, with 16 basement spaces, and 18 outdoor spaces. With a parking requirement of 65 spaces under the rules of DCP 2012 s7.03 Parking, this represented a historic deficit for the site of 31 spaces
4. The DCP CBD parking requirement is not considered appropriate for this university campus development, based on a review of comparable establishment.
5. Comparable University built facilities in Newcastle CBD (New Space) and also the proposed Honeysuckle Campus) provide a parking ratio of around 1 space per 500m^2, or NO parking at all. This is justified on the basis of application of TDM and GTP principles, whereby use of alternate (sustainable) transport modes such as public transport, walking and cycling are actively encouraged.
6. TDM and GTP principles are now actively supported by both Local and State Government.
7. University campuses across Australia Cities currently operate with parking ratios between NIL (i.e. NO parking) and 1 space for more than 750 m^2 GFA.
8. Applying the equivalent Newcastle University City Campus principles (New Space) to the proposed Nihon University Australia Newcastle Campus Project would result in a parking supply requirement of 16 spaces. The site proposal is for 20 car spaces.
9. Existing intersection and road performance in the vicinity of the site is very good, and service levels A or B.
10. Traffic Generation will be limited to that associated with staff movements and service vehicles and is considered to be less than the comparable activity associated with the former site use. Incidental travel of students is expected to be in the same order of magnitude of former site activity.

11. Even if 100% of traffic associated with the proposal were to approach and depart through the one intersection Church Street / Watt Street / The Esplanade, and even allowing for growth (2% p.a.) the performance level remains at Service Level A/B.
12. All service vehicles will be subject to a management plan by Nihon University. Vehicles will be limited to small rigid vehicles and small commercial vans. Access is prosed using the existing driveway adjacent to Newcastle Police Station. It is proposed that service vehicles access the site via a reversing manoeuvre (similar to a reverse park manoeuvre) and then exit the site in a forward direction. Such arrangements are allowable under the Australia Standard with Local authority approval.
13. Green Travel Plans are best suited to development where there is a high degree of control over campus transport activity. The Nihon University Australia Newcastle Campus Project lends itself to application of these principles.
14. End of trip facilities proposed include 22 bicycle and 1 motorcycle parking spaces. This is a comparable rate to that provided for other accommodation / residential type land uses.
15. Based on the proposed supply of parking, which will cater well for staff needs, as well as the high level of public transport access, it is concluded that the subject site will operate well, with limited on-street traffic or parking impacts in the immediate vicinity.

5.2 Conclusions

It is noted that with the 100% on site accommodation of students and staff means that there is effectively **NO COMMUTING TRAFFIC IMPACT FROM THEIR ACTIVITY DURING PEAK PERIODS.**

The net traffic impact of the university proposal is expected to be minimal, and certainly less, (a deficit) when compared to the site's historic traffic generation.

With the student cohort for the subject site being 100% foreign high school and university students on short term exchanges, and with their residence and primary activity of study being located on the subject site, it is concluded that their off campus after hours campus transport needs will be well catered for by the range of public transport, walking and cycling options available for movement within the Newcastle CBD and beyond.

Based on the traffic generation profile, proposed supply of parking, which will cater well for staff needs, as well as the high level of public transport access, it is concluded that the subject site will operate well, with limited on-street traffic or parking impacts in the immediate vicinity.

5.3 Recommendations

It is recommended that:

1. A Green Travel Plan for the operations of the subject site be developed and available for implementation at the commencement of site operations. Subject to the development of a Green Travel Plan it is recommended that the proposed Nihon University Australia Newcastle Campus Project be approved on traffic and parking grounds.

2. A Construction Traffic and Pedestrian Management plan be prepared for implementation in consultation with the construction contractor (when appointed) and prior to the issuing of a Construction Certificate for the project.

Subject to implementation of the above to plans, and facilities as outlined in the project plans, the Nihon University Newcastle Campus project is recommended for approval on traffic and transport grounds.

Appendix A Traffic Survey Results February 2019

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au

Intersection of Church St and Newcomen St, Newcastle

GPS *-32.929634, 151.781207*

Date:	Thu 07-02-19
Weather:	Fine
Suburban:	Newcastle
Customer:	BTFF

North:	Newcomen St
East:	Church St
South:	Newcomen St
West:	Church St

Survey Period	AM:	7:00 AM-10:00 AM
	PM:	3:30 PM-6:30 PM
Traffic Peak	AM:	8:00 AM-9:00 AM
	PM:	4:45 PM-5:45 PM

All Vehicles

Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
7:00	7:15	1	0	10	2	0	1	11	5	0	18	12	0	0	3	2	0	304	
7:15	7:30	0	1	8	11	0	3	14	5	0	9	8	3	0	2	5	0	365	
7:30	7:45	0	2	2	6	0	3	12	10	0	19	17	9	0	1	2	0	453	
7:45	8:00	0	1	4	4	0	3	18	5	0	27	15	3	0	1	5	1	552	
8:00	8:15	0	1	8	11	0	6	18	7	0	22	23	15	0	2	12	1	598	Peak
8:15	8:30	0	0	7	6	0	4	16	5	0	30	30	44	0	2	8	5	582	
8:30	8:45	0	2	6	6	0	11	18	6	0	25	31	53	0	1	18	5	509	
8:45	9:00	0	2	6	5	0	4	21	17	0	38	17	12	0	0	8	3	395	
9:00	9:15	0	2	8	5	0	6	13	8	0	31	23	5	0	0	9	0	328	
9:15	9:30	0	1	9	5	0	6	15	9	0	17	15	1	0	0	6	0		
9:30	9:45	0	2	2	5	0	4	15	7	0	14	11	0	0	2	6	0		
9:45	10:00	0	0	5	5	0	9	19	5	0	10	6	0	0	0	6	1		
15:30	15:45	0	1	13	4	0	3	15	15	0	16	10	7	0	3	5	1	327	
15:45	16:00	0	3	8	3	0	4	19	10	0	13	11	1	0	1	4	0	329	
16:00	16:15	0	0	10	5	0	6	12	15	0	12	5	0	0	1	3	5	357	
16:15	16:30	0	1	11	1	0	2	23	15	0	11	11	1	0	1	6	0	431	
16:30	16:45	0	5	22	1	0	3	14	19	0	9	13	3	0	2	3	1	529	
16:45	17:00	0	4	11	3	0	6	19	20	0	11	14	9	0	2	4	2	549	Peak
17:00	17:15	0	1	17	3	0	7	25	36	0	8	13	24	0	5	4	5	538	
17:15	17:30	0	1	36	2	0	4	32	42	0	25	10	21	0	0	6	2	475	
17:30	17:45	0	0	30	2	0	2	19	25	0	9	16	2	0	0	7	3	363	
17:45	18:00	0	2	11	2	0	4	19	17	0	13	13	1	0	1	9	2		
18:00	18:15	0	1	9	0	0	2	21	21	0	12	13	1	0	0	4	1		
18:15	18:30	0	3	9	4	0	5	11	9	0	11	6	2	0	2	7	0		

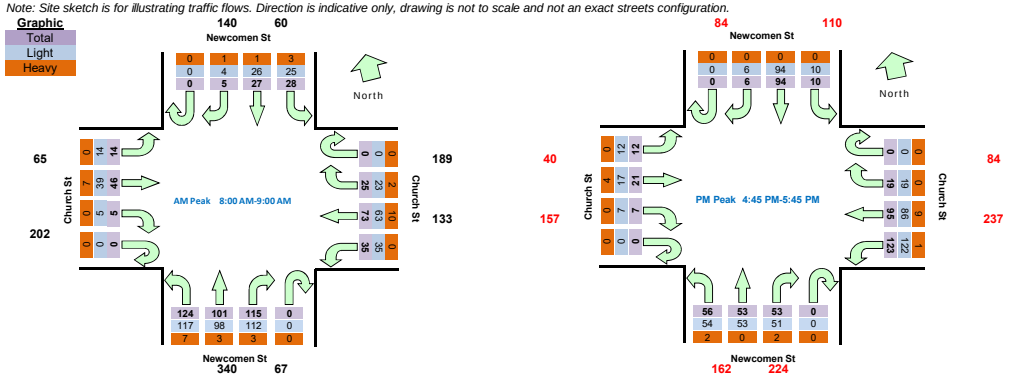
Peak Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St				Peak total
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	
8:00	9:00	0	5	27	28	0	25	73	35	0	115	101	124	0	5	46	14	598
16:45	17:45	0	6	94	10	0	19	95	123	0	53	53	56	0	7	21	12	549

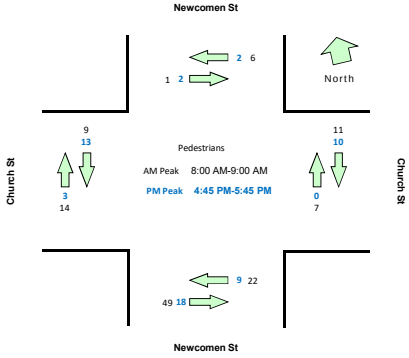
Pedestrians Crossing

Time		North Approach Newcomen St		East Approach Church St		South Approach Newcomen St		West Approach Church St		Hourly Total
Period Start	Period End	Eastbound	Westbound	Southbound	Northbound	Eastbound	Westbound	Southbound	Northbound	
7:00	7:15	3	1	0	4	2	5	0	5	75
7:15	7:30	3	0	0	5	1	1	0	4	73
7:30	7:45	2	0	1	2	8	5	0	1	86
7:45	8:00	0	0	0	6	6	5	0	5	118
8:00	8:15	1	1	3	1	3	5	4	0	119
8:15	8:30	3	0	0	0	7	8	2	7	129
8:30	8:45	2	0	5	4	8	28	2	2	123
8:45	9:00	0	0	3	2	4	8	1	5	86
9:00	9:15	5	0	0	7	9	4	0	3	75
9:15	9:30	4	1	2	3	6	1	2	2	
9:30	9:45	2	2	0	4	5	1	0	0	
9:45	10:00	4	0	1	0	6	0	1	0	
15:30	15:45	0	0	5	0	2	5	3	2	72
15:45	16:00	0	0	9	0	3	7	1	3	70
16:00	16:15	2	0	1	0	2	5	0	4	56
16:15	16:30	5	0	2	1	1	6	2	1	50
16:30	16:45	2	0	0	1	3	8	1	0	54
16:45	17:00	1	0	0	0	2	3	3	0	57
17:00	17:15	0	0	0	0	3	3	1	1	66
17:15	17:30	0	0	4	0	2	10	4	2	70
17:30	17:45	1	2	6	0	2	2	5	0	62
17:45	18:00	1	2	2	1	2	7	3	0	
18:00	18:15	3	0	1	0	4	4	0	0	
18:15	18:30	0	0	0	5	9	0	0	0	

Peak Time		North Approach Newcomen St		East Approach Church St		South Approach Newcomen St		West Approach Church St		Peak hour total
Period Start	Period End	Eastbound	Westbound	Southbound	Northbound	Eastbound	Westbound	Southbound	Northbound	
8:00	9:00	6	1	11	7	22	49	9	14	119
16:45	17:45	2	2	10	0	9	18	13	3	57

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.





Light Vehicles

Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	9	2	0	1	11	5	0	15	10	0	0	3	1	0
7:15	7:30	0	1	8	8	0	3	14	5	0	9	7	1	0	1	2	0
7:30	7:45	0	2	2	4	0	2	11	7	0	19	16	9	0	1	1	0
7:45	8:00	0	1	4	4	0	3	17	5	0	27	15	3	0	1	4	0
8:00	8:15	0	1	8	9	0	5	14	7	0	21	22	14	0	2	8	1
8:15	8:30	0	0	6	5	0	3	14	5	0	29	30	42	0	2	7	5
8:30	8:45	0	1	6	6	0	11	15	6	0	25	31	49	0	1	17	5
8:45	9:00	0	2	6	5	0	4	20	17	0	37	15	12	0	0	7	3
9:00	9:15	0	1	8	5	0	6	13	7	0	31	22	4	0	0	7	0
9:15	9:30	0	0	8	3	0	6	13	9	0	17	14	1	0	0	5	0
9:30	9:45	0	2	2	4	0	2	15	7	0	14	11	0	0	2	3	0
9:45	10:00	0	0	5	5	0	6	14	4	0	9	6	0	0	0	5	1
15:30	15:45	0	1	13	3	0	2	15	13	0	15	10	7	0	3	2	1
15:45	16:00	0	3	7	3	0	4	16	10	0	13	11	1	0	1	3	0
16:00	16:15	0	0	10	4	0	6	12	15	0	12	5	0	0	1	3	5
16:15	16:30	0	1	11	1	0	2	22	13	0	10	11	1	0	1	6	0
16:30	16:45	0	5	22	1	0	2	13	19	0	9	13	3	0	2	2	1
16:45	17:00	0	4	11	3	0	6	17	20	0	11	14	9	0	2	3	2
17:00	17:15	0	1	17	3	0	7	22	36	0	7	13	23	0	5	4	5
17:15	17:30	0	1	36	2	0	4	29	42	0	24	10	20	0	0	5	2
17:30	17:45	0	0	30	2	0	2	18	24	0	9	16	2	0	0	5	3
17:45	18:00	0	2	11	2	0	4	18	16	0	13	13	1	0	1	7	2
18:00	18:15	0	1	9	0	0	2	19	21	0	12	13	1	0	0	3	1
18:15	18:30	0	3	9	4	0	5	11	9	0	11	5	2	0	2	6	0

Peak Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:00	9:00	0	4	26	25	0	23	63	35	0	112	98	117	0	5	39	14	561
16:45	17:45	0	6	94	10	0	19	86	122	0	51	53	54	0	7	17	12	531

Heavy Vehicles

Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	1	0	1	0	0	0	0	0	0	3	2	0	0	0	1	0
7:15	7:30	0	0	0	3	0	0	0	0	0	0	1	2	0	1	0	0
7:30	7:45	0	0	0	2	0	1	0	2	0	0	1	0	0	0	0	0
7:45	8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:00	8:15	0	0	0	2	0	1	3	0	0	1	1	1	0	0	2	0
8:15	8:30	0	0	1	1	0	1	0	0	0	1	0	0	0	0	0	0
8:30	8:45	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8:45	9:00	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0
9:00	9:15	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
9:15	9:30	0	1	1	2	0	0	0	0	0	0	1	0	0	0	0	0
9:30	9:45	0	0	0	1	0	2	0	0	0	0	0	0	0	0	1	0
9:45	10:00	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0
15:30	15:45	0	0	0	1	0	1	0	2	0	1	0	0	0	0	0	0
15:45	16:00	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
16:00	16:15	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	18:30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

Peak Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:00	9:00	0	1	1	3	0	2	10	0	0	3	3	7	0	0	7	0	37
16:45	17:45	0	0	0	0	0	0	9	1	0	2	0	2	0	0	4	0	18

Bus

Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St			
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15	7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
7:30	7:45	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0
7:45	8:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
8:00	8:15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0
8:15	8:30	0	0	0	0	0	0	2	0	0	0	0	2	0	0	1	0
8:30	8:45	0	1	0	0	0	0	2	0	0	0	0	4	0	0	1	0
8:45	9:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
9:00	9:15	0	1	0	0	0	0	0	1	0	0	0	0	0	0	2	0
9:15	9:30	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0
9:30	9:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
9:45	10:00	0	0	0	0	0	0	5	1	0	0	0	0	0	0	1	0
15:30	15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
15:45	16:00	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0
16:00	16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
16:45	17:00	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0
17:00	17:15	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0
17:15	17:30	0	0	0	0	0	0	3	0	0	1	0	1	0	0	1	0
17:30	17:45	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0
17:45	18:00	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2	0
18:00	18:15	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0
18:15	18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

Peak Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St				Peak
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	**total**
8:00	9:00	0	1	0	0	0	0	6	0	0	0	0	6	0	0	5	0	18
16:45	17:45	0	0	0	0	0	0	7	0	0	2	0	2	0	0	4	0	15

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au

Intersection of Church St and Bolton St, Newcastle

GPS -32.929927, 151.782333

Date:	Thu 07-02-19
Weather:	Fine
Suburban:	Newcastle
Customer:	BTFF

North:	Bolton St
East:	Church St
South:	N/A
West:	Church St

Survey Period	AM:	7:00 AM-10:00 AM
	PM:	3:30 PM-6:30 PM
Traffic Peak	AM:	8:15 AM-9:15 AM
	PM:	5:00 PM-6:00 PM

All Vehicles

Time		North Approach Bolton St			East Approach Church St			West Approach Church St			Hourly Total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Hour	Peak
7:00	7:15	0	4	5	0	3	13	0	10	12	235	
7:15	7:30	0	4	3	0	3	18	0	10	15	280	
7:30	7:45	0	7	8	0	6	18	0	8	19	312	
7:45	8:00	0	5	3	0	4	21	0	15	21	347	
8:00	8:15	0	6	8	0	8	25	0	19	26	384	
8:15	8:30	0	7	6	0	10	18	0	17	27	387	Peak
8:30	8:45	0	5	7	0	10	30	0	27	22	371	
8:45	9:00	0	11	6	0	7	31	0	21	30	335	
9:00	9:15	0	7	9	0	14	20	0	18	27	294	
9:15	9:30	0	13	4	0	7	17	0	13	15		
9:30	9:45	0	6	9	0	5	20	0	9	16		
9:45	10:00	0	8	6	0	5	25	0	11	10		
15:30	15:45	0	5	11	0	5	28	0	18	7	284	
15:45	16:00	0	9	13	0	6	24	0	10	10	278	
16:00	16:15	0	9	10	0	1	24	0	14	6	278	
16:15	16:30	0	22	11	0	5	18	0	11	7	312	
16:30	16:45	0	15	16	0	3	21	0	9	4	364	
16:45	17:00	0	19	7	0	2	26	0	14	4	373	
17:00	17:15	0	45	14	0	1	23	0	14	1	376	Peak
17:15	17:30	0	48	14	0	1	30	0	25	8	358	
17:30	17:45	0	21	11	0	2	25	0	12	6	295	
17:45	18:00	0	20	10	0	1	20	0	19	5		
18:00	18:15	0	20	14	0	6	24	0	14	2		
18:15	18:30	0	10	14	0	2	15	0	17	5		

Peak Time		North Approach Bolton St			East Approach Church St			West Approach Church St			Peak total
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	
8:15	9:15	0	30	28	0	41	99	0	83	106	387
17:00	18:00	0	134	49	0	5	98	0	70	20	376

Pedestrians Crossing

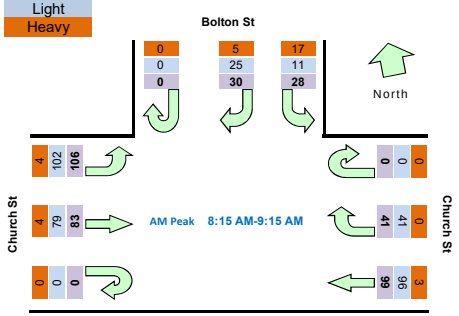
Time		North Approach Bolton St		East Approach Church St		West Approach Church St		Hourly Total
Period Start	Period End	Westbound	Eastbound	Northbound	Southbound	Northbound	Southbound	
7:00	7:15	0	2	2	7	3	0	85
7:15	7:30	0	1	6	6	1	1	95
7:30	7:45	0	3	16	7	2	0	112
7:45	8:00	0	0	16	10	2	0	134
8:00	8:15	1	4	12	6	1	0	131
8:15	8:30	0	3	18	11	0	0	132
8:30	8:45	0	1	25	24	0	0	127
8:45	9:00	0	2	14	9	0	0	87
9:00	9:15	2	3	12	8	0	0	98
9:15	9:30	0	4	10	13	0	0	
9:30	9:45	0	2	6	1	1	0	
9:45	10:00	1	7	16	8	3	1	
15:30	15:45	0	2	8	10	1	14	118
15:45	16:00	3	4	9	6	0	3	110
16:00	16:15	1	2	5	15	0	0	101
16:15	16:30	1	9	3	20	1	1	99
16:30	16:45	3	1	7	15	1	0	92
16:45	17:00	1	3	3	9	0	0	88
17:00	17:15	2	4	2	12	1	0	83
17:15	17:30	3	1	3	20	1	0	77
17:30	17:45	0	2	4	10	2	5	60
17:45	18:00	0	1	1	9	0	0	
18:00	18:15	1	4	4	3	3	0	
18:15	18:30	1	1	4	3	1	1	

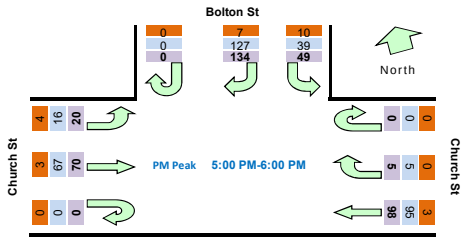
Peak Time		North Approach Bolton St		East Approach Church St		West Approach Church St		Peak total
Period Start	Period End	Westbound	Eastbound	Northbound	Southbound	Northbound	Southbound	
8:15	9:15	2	9	69	52	0	0	132
17:00	18:00	5	8	10	51	4	5	83

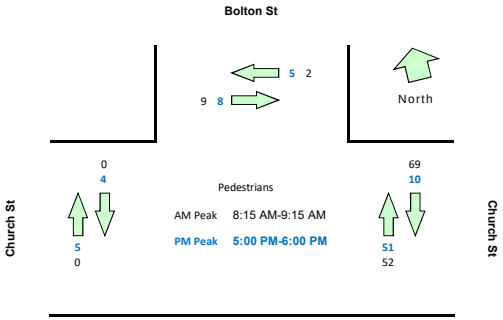
Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy







Light Vehicles

Time		North Approach Bolton St			East Approach Church St			West Approach Church St		
Period Start	Period End	U	R	L	U	R	WB	U	EB	L
7:00	7:15	0	4	3	0	3	13	0	6	12
7:15	7:30	0	4	1	0	3	18	0	8	11
7:30	7:45	0	4	0	0	6	16	0	5	19
7:45	8:00	0	4	1	0	4	21	0	14	21
8:00	8:15	0	5	3	0	8	21	0	16	22
8:15	8:30	0	5	1	0	10	17	0	16	25
8:30	8:45	0	4	2	0	10	28	0	27	21
8:45	9:00	0	10	4	0	7	31	0	19	30
9:00	9:15	0	6	4	0	14	20	0	17	26
9:15	9:30	0	12	2	0	6	16	0	10	15
9:30	9:45	0	6	4	0	5	18	0	7	14
9:45	10:00	0	5	2	0	5	19	0	10	9
15:30	15:45	0	4	4	0	4	26	0	15	5
15:45	16:00	0	7	11	0	5	23	0	9	10
16:00	16:15	0	9	6	0	1	24	0	14	5
16:15	16:30	0	19	8	0	5	18	0	11	6
16:30	16:45	0	14	10	0	3	20	0	8	4
16:45	17:00	0	19	3	0	2	24	0	13	4
17:00	17:15	0	44	12	0	1	21	0	13	1
17:15	17:30	0	45	11	0	1	30	0	24	7
17:30	17:45	0	20	8	0	2	24	0	12	4
17:45	18:00	0	18	8	0	1	20	0	18	4
18:00	18:15	0	18	10	0	6	24	0	13	2
18:15	18:30	0	10	8	0	2	15	0	16	5

Peak Time		North Approach Bolton St			East Approach Church St			West Approach Church St			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
8:15	9:15	0	25	11	0	41	96	0	79	102	354
17:00	18:00	0	127	39	0	5	95	0	67	16	349

Heavy Vehicles

Time		North Approach Bolton St			East Approach Church St			West Approach Church St		
Period Start	Period End	U	R	L	U	R	WB	U	EB	L
7:00	7:15	0	0	0	0	0	0	0	4	0
7:15	7:30	0	0	0	0	0	0	0	0	3
7:30	7:45	0	1	2	0	0	2	0	2	0
7:45	8:00	0	0	0	0	0	0	0	0	0
8:00	8:15	0	0	1	0	0	4	0	2	3
8:15	8:30	0	0	0	0	0	1	0	0	2
8:30	8:45	0	0	0	0	0	1	0	0	0
8:45	9:00	0	0	0	0	0	0	0	1	0
9:00	9:15	0	0	0	0	0	0	0	0	0
9:15	9:30	0	0	0	0	1	0	0	2	0
9:30	9:45	0	0	0	0	0	2	0	1	1
9:45	10:00	0	0	2	0	0	3	0	1	0
15:30	15:45	0	1	2	0	1	2	0	2	0
15:45	16:00	0	0	1	0	1	1	0	0	0
16:00	16:15	0	0	0	0	0	0	0	0	1
16:15	16:30	0	0	0	0	0	0	0	0	1
16:30	16:45	0	0	1	0	0	1	0	0	0
16:45	17:00	0	0	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	2	0	0	0
17:15	17:30	0	0	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	1	0	0	0
17:45	18:00	0	0	0	0	0	0	0	0	0
18:00	18:15	0	0	0	0	0	0	0	0	0
18:15	18:30	0	0	0	0	0	0	0	0	0

Peak Time		North Approach Bolton St			East Approach Church St			West Approach Church St			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
8:15	9:15	0	5	17	0	0	3	0	4	4	33
17:00	18:00	0	7	10	0	0	3	0	3	4	27

Bus

Time		North Approach Bolton St			East Approach Church St			West Approach Church St		
Period Start	Period End	U	R	L	U	R	WB	U	EB	L
7:00	7:15	0	0	2	0	0	0	0	0	0
7:15	7:30	0	0	2	0	0	0	0	2	1
7:30	7:45	0	2	6	0	0	0	0	1	0
7:45	8:00	0	1	2	0	0	0	0	1	0
8:00	8:15	0	1	4	0	0	0	0	1	1
8:15	8:30	0	2	5	0	0	0	0	1	0
8:30	8:45	0	1	5	0	0	1	0	0	1
8:45	9:00	0	1	2	0	0	0	0	1	0
9:00	9:15	0	1	5	0	0	0	0	1	1
9:15	9:30	0	1	2	0	0	1	0	1	0
9:30	9:45	0	0	5	0	0	0	0	1	1
9:45	10:00	0	3	2	0	0	3	0	0	1
15:30	15:45	0	0	5	0	0	0	0	1	2
15:45	16:00	0	2	1	0	0	0	0	1	0
16:00	16:15	0	0	4	0	0	0	0	0	0
16:15	16:30	0	3	3	0	0	0	0	0	0
16:30	16:45	0	1	5	0	0	0	0	1	0
16:45	17:00	0	0	4	0	0	2	0	1	0
17:00	17:15	0	1	2	0	0	0	0	1	0
17:15	17:30	0	3	3	0	0	0	0	1	1
17:30	17:45	0	1	3	0	0	0	0	0	2
17:45	18:00	0	2	2	0	0	0	0	1	1
18:00	18:15	0	2	4	0	0	0	0	1	0
18:15	18:30	0	0	6	0	0	0	0	1	0

Peak Time		North Approach Bolton St			East Approach Church St			West Approach Church St			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
8:15	9:15	0	5	17	0	0	1	0	3	2	28
17:00	18:00	0	7	10	0	0	0	0	3	4	24

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY trafficsurvey.com.au

Intersection of The Esplanade and Watt St, Newcastle

GPS -32.930218, 151.783472

Date:	Thu 07-02-19
Weather:	Fine
Suburban:	Newcastle
Customer:	BTFF

North:	Watt St
East:	The Esplanade
South:	Watt St
West:	Church St

Survey	AM:	7:00 AM-10:00 AM
Period	PM:	3:30 PM-6:30 PM
Traffic	AM:	7:45 AM-8:45 AM
Peak	PM:	5:00 PM-6:00 PM

All Vehicles

Time		North Approach Watt St				East Approach The Esplanade				South Approach Watt St				West Approach Church St				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
7:00	7:15	0	5	20	3	0	9	6	28	0	11	32	5	0	3	3	9	767	
7:15	7:30	0	6	25	7	0	17	11	36	0	20	47	4	0	0	2	11	865	
7:30	7:45	0	9	30	1	0	8	8	34	0	31	58	7	0	0	3	13	921	
7:45	8:00	0	11	36	5	0	12	0	51	0	30	68	14	0	4	6	8	971	Peak
8:00	8:15	0	15	37	4	0	9	12	34	0	32	56	6	0	1	4	22	950	
8:15	8:30	0	14	36	6	0	10	1	30	0	42	67	13	0	4	7	12	954	
8:30	8:45	0	15	27	1	0	8	13	35	0	37	70	12	0	1	7	26	906	
8:45	9:00	0	11	25	2	0	7	12	27	0	33	65	15	0	3	5	19	823	
9:00	9:15	0	7	30	4	0	18	14	44	0	25	54	13	0	3	6	18	806	
9:15	9:30	0	13	29	5	0	15	6	30	0	26	48	5	0	4	4	9		
9:30	9:45	0	7	14	7	0	8	14	16	0	26	55	4	0	3	1	14		
9:45	10:00	0	10	19	19	0	11	16	44	0	20	47	4	0	1	5	11		
15:30	15:45	0	12	29	3	0	17	15	54	0	29	43	6	0	5	11	13	908	
15:45	16:00	0	4	31	2	0	10	18	50	0	29	35	8	0	2	3	18	935	
16:00	16:15	0	2	37	8	0	10	12	58	0	25	40	11	0	1	5	18	955	
16:15	16:30	0	4	36	5	0	9	13	42	0	32	65	6	0	1	6	15	1022	
16:30	16:45	0	6	40	7	0	6	12	63	0	31	68	6	0	4	4	17	1049	
16:45	17:00	0	12	34	9	0	5	14	58	0	27	48	2	0	4	2	15	1022	
17:00	17:15	0	11	65	6	0	11	9	76	0	32	52	4	0	9	7	12	1064	Peak
17:15	17:30	0	11	55	7	0	10	12	55	0	27	37	8	0	9	4	26	1059	
17:30	17:45	0	7	39	6	0	3	17	75	0	26	38	3	0	3	7	13	1035	
17:45	18:00	0	5	37	3	0	10	12	74	0	34	64	4	0	3	4	22		
18:00	18:15	0	5	61	15	0	15	19	67	0	29	44	6	0	3	10	15		
18:15	18:30	0	3	35	8	0	11	10	62	0	23	50	4	0	2	6	23		

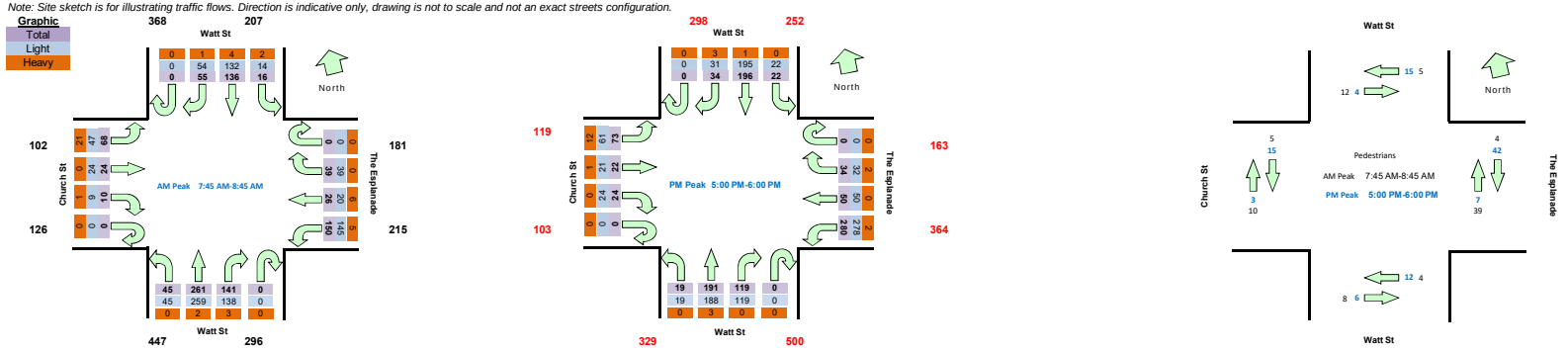
Peak Time		North Approach Watt St				East Approach The Esplanade				South Approach Watt St				West Approach Church St				Peak total
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	
7:45	8:45	0	55	136	16	0	39	26	150	0	141	261	45	0	10	24	68	971
17:00	18:00	0	34	196	22	0	34	50	280	0	119	191	19	0	24	22	73	1064

Pedestrians Crossing

Time		North Approach Watt St		East Approach The Esplanade		South Approach Watt St		West Approach Church St		Hourly Total
Period Start	Period End	Eastbound	Westbound	Southbound	Northbound	Eastbound	Westbound	Southbound	Northbound	
7:00	7:15	0	3	0	2	4	0	1	1	62
7:15	7:30	1	0	0	9	4	1	1	3	72
7:30	7:45	0	1	1	5	0	1	0	1	78
7:45	8:00	2	5	0	6	1	4	2	3	87
8:00	8:15	2	2	1	14	0	1	0	1	90
8:15	8:30	1	3	1	15	1	2	0	2	94
8:30	8:45	0	2	2	4	2	1	3	4	85
8:45	9:00	5	1	2	6	3	3	4	2	75
9:00	9:15	9	3	0	4	3	1	2	3	76
9:15	9:30	4	1	2	1	4	0	2	2	
9:30	9:45	1	2	1	1	2	0	0	1	
9:45	10:00	8	3	3	2	4	0	3	4	
15:30	15:45	4	1	3	0	3	1	2	0	65
15:45	16:00	3	1	3	1	0	0	0	2	64
16:00	16:15	9	1	6	0	1	1	2	2	72
16:15	16:30	4	3	6	0	2	0	3	1	89
16:30	16:45	1	0	6	0	0	0	3	3	98
16:45	17:00	6	2	3	2	3	0	1	1	93
17:00	17:15	2	1	23	1	4	1	5	2	104
17:15	17:30	5	3	9	2	3	0	6	0	80
17:30	17:45	1	0	4	1	2	0	0	0	64
17:45	18:00	7	0	6	3	3	5	4	1	
18:00	18:15	2	4	2	4	2	0	0	1	
18:15	18:30	3	2	2	0	1	1	0	3	

Peak Time		North Approach Watt St		East Approach The Esplanade		South Approach Watt St		West Approach Church St		Peak hour total
Period Start	Period End	Eastbound	Westbound	Southbound	Northbound	Eastbound	Westbound	Southbound	Northbound	
7:45	8:45	5	12	4	39	4	8	5	10	87
17:00	18:00	15	4	42	7	12	6	15	3	104

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.



Light Vehicles

Time		North Approach Watt St				East Approach The Esplanade				South Approach Watt St				West Approach Church St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	5	20	3	0	9	6	28	0	11	31	5	0	3	3	3
7:15	7:30	0	6	24	6	0	16	11	36	0	20	47	4	0	0	2	7
7:30	7:45	0	9	30	1	0	7	7	32	0	31	58	6	0	0	3	2
7:45	8:00	0	11	36	4	0	12	0	50	0	30	68	14	0	4	6	5
8:00	8:15	0	15	35	4	0	9	8	33	0	32	56	6	0	0	4	15
8:15	8:30	0	14	36	5	0	10	0	28	0	41	67	13	0	4	7	6
8:30	8:45	0	14	25	1	0	8	12	34	0	35	68	12	0	1	7	21
8:45	9:00	0	11	24	2	0	7	12	27	0	32	64	15	0	3	5	15
9:00	9:15	0	7	30	4	0	17	14	44	0	24	54	13	0	3	6	12
9:15	9:30	0	11	28	4	0	14	6	30	0	26	48	5	0	4	4	4
9:30	9:45	0	7	14	7	0	8	12	15	0	25	55	4	0	3	1	7
9:45	10:00	0	7	17	19	0	11	13	40	0	19	45	4	0	1	5	6
15:30	15:45	0	9	28	2	0	17	15	54	0	29	42	6	0	5	11	3
15:45	16:00	0	4	31	2	0	10	17	50	0	29	35	7	0	2	3	15
16:00	16:15	0	2	37	8	0	10	12	58	0	25	39	11	0	1	5	14
16:15	16:30	0	4	36	5	0	9	13	42	0	32	64	6	0	1	6	12
16:30	16:45	0	5	40	7	0	6	12	62	0	31	66	6	0	3	4	11
16:45	17:00	0	10	34	9	0	5	14	58	0	27	48	2	0	4	2	10
17:00	17:15	0	9	64	6	0	11	9	75	0	32	50	4	0	9	7	9
17:15	17:30	0	11	55	7	0	8	12	54	0	27	37	8	0	9	4	22
17:30	17:45	0	6	39	6	0	3	17	75	0	26	38	3	0	3	6	11
17:45	18:00	0	5	37	3	0	10	12	74	0	34	63	4	0	3	4	19
18:00	18:15	0	5	61	15	0	14	19	67	0	29	44	6	0	3	10	10
18:15	18:30	0	3	35	8	0	11	10	62	0	23	50	4	0	2	6	16

Peak Time		North Approach Watt St				East Approach The Esplanade				South Approach Watt St				West Approach Church St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
7:45	8:45	0	54	132	14	0	39	20	145	0	138	259	45	0	9	24	47	926
17:00	18:00	0	31	195	22	0	32	50	278	0	119	188	19	0	24	21	61	1040

Heavy Vehicles

Time		North Approach Watt St				East Approach The Esplanade				South Approach Watt St				West Approach Church St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	4
7:15	7:30	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
7:30	7:45	0	0	0	0	0	1	1	2	0	0	0	1	0	0	0	4
7:45	8:00	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
8:00	8:15	0	0	2	0	0	0	4	1	0	0	0	0	0	1	0	2
8:15	8:30	0	0	0	1	0	0	1	2	0	1	0	0	0	0	0	0
8:30	8:45	0	0	1	0	0	0	1	1	0	2	1	0	0	0	0	0
8:45	9:00	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	1
9:00	9:15	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
9:15	9:30	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	2
9:30	9:45	0	0	0	0	0	0	2	1	0	1	0	0	0	0	0	1
9:45	10:00	0	2	0	0	0	0	1	3	0	1	0	0	0	0	0	3
15:30	15:45	0	3	1	1	0	0	0	0	0	0	1	0	0	0	0	4
15:45	16:00	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1
16:00	16:15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	16:45	0	1	0	0	0	0	0	1	0	0	1	0	0	1	0	0
16:45	17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	17:15	0	2	1	0	0	0	0	1	0	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0
17:30	17:45	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Peak Time		North Approach Watt St				East Approach The Esplanade				South Approach Watt St				West Approach Church St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
7:45	8:45	0	1	4	2	0	0	6	5	0	3	2	0	0	1	0	21	45
17:00	18:00	0	3	1	0	0	2	0	2	0	0	3	0	0	0	1	12	24

Bus

Time		North Approach Watt St				East Approach The Esplanade				South Approach Watt St				West Approach Church St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7:15	7:30	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4
7:30	7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
7:45	8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8:00	8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
8:15	8:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
8:30	8:45	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	5
8:45	9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
9:00	9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
9:15	9:30	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	3
9:30	9:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
9:45	10:00	0	1	2	0	0	0	2	1	0	0	2	0	0	0	0	2
15:30	15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
15:45	16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
16:00	16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
16:15	16:30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3
16:30	16:45	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	6
16:45	17:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5
17:00	17:15	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	3
17:15	17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
17:30	17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
17:45	18:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3
18:00	18:15	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	5
18:15	18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7

Peak Time		North Approach Watt St				East Approach The Esplanade				South Approach Watt St				West Approach Church St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
7:45	8:45	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	19	22
17:00	18:00	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	12	16

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au

Intersection of Church St and Newcomen St, Newcastle

GPS -32.929634, 151.781207

Date:	Fri 08-02-19
Weather:	Fine
Suburban:	Newcastle
Customer:	BTFF

North:	Newcomen St
East:	Church St
South:	Newcomen St
West:	Church St

Survey	AM:	7:00 AM-10:00 AM
Period	PM:	3:30 PM-6:30 PM
Traffic	AM:	8:00 AM-9:00 AM
Peak	PM:	4:45 PM-5:45 PM

All Vehicles

Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
7:00	7:15	0	0	9	10	0	2	9	8	0	16	9	4	0	0	3	0	314	
7:15	7:30	0	2	7	7	0	3	13	6	0	17	9	0	0	1	3	1	361	
7:30	7:45	0	3	6	4	0	3	8	11	0	19	10	13	0	0	3	1	446	
7:45	8:00	0	4	6	2	0	2	11	11	0	21	19	8	0	1	8	1	528	
8:00	8:15	0	0	7	8	0	6	11	8	0	29	16	15	0	0	14	3	569	Peak
8:15	8:30	0	3	6	4	0	6	24	10	0	21	31	40	0	0	8	1	541	
8:30	8:45	0	1	7	6	0	7	18	15	0	29	31	38	0	4	6	1	453	
8:45	9:00	0	1	12	9	0	5	16	12	0	33	19	7	0	2	16	3	377	
9:00	9:15	0	2	7	5	0	3	17	6	0	22	17	2	0	1	7	0	304	
9:15	9:30	0	1	4	2	0	5	10	4	0	20	12	3	0	0	5	0		
9:30	9:45	0	2	1	6	0	5	26	6	0	19	14	1	0	2	4	1		
9:45	10:00	0	1	10	4	0	3	13	6	0	13	8	0	0	0	3	1		
15:30	15:45	0	2	13	2	0	1	19	8	0	15	10	8	0	2	6	0	355	
15:45	16:00	0	2	7	3	0	2	19	15	0	10	10	4	0	2	3	4	367	
16:00	16:15	0	3	10	7	0	6	9	14	0	9	12	8	0	2	7	0	408	
16:15	16:30	0	2	6	4	0	4	21	22	0	12	19	1	0	3	6	1	487	
16:30	16:45	0	4	15	4	0	5	18	17	0	14	10	2	0	2	6	1	532	
16:45	17:00	0	2	13	3	0	6	22	26	0	17	18	9	0	0	5	1	548	Peak
17:00	17:15	0	1	15	7	0	8	35	30	0	18	15	25	0	2	10	0	513	
17:15	17:30	0	6	25	3	0	4	25	37	0	18	8	5	0	7	6	2	417	
17:30	17:45	0	0	19	4	0	5	23	27	0	13	13	4	0	2	3	1	330	
17:45	18:00	0	2	9	5	0	3	25	15	0	13	8	0	0	1	4	2		
18:00	18:15	0	3	8	2	0	1	14	15	0	11	8	0	0	0	8	0		
18:15	18:30	0	2	4	1	0	1	17	8	0	13	8	0	0	1	4	0		

Peak Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:00	9:00	0	5	32	27	0	24	69	45	0	112	97	100	0	6	44	8	569
16:45	17:45	0	9	72	17	0	23	105	120	0	66	54	43	0	11	24	4	548

Pedestrians Crossing

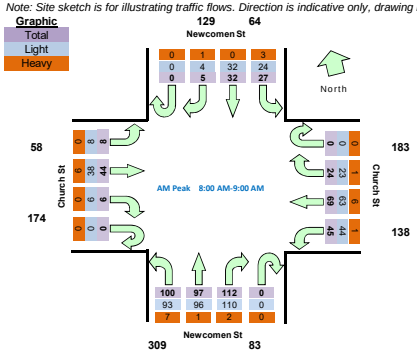
Time		North Approach Newcomen St		East Approach Church St		South Approach Newcomen St		West Approach Church St		Hourly Total
Period Start	Period End	Eastbound	Westbound	Southbound	Northbound	Eastbound	Westbound	Southbound	Northbound	
7:00	7:15	1	0	1	7	6	5	0	2	79
7:15	7:30	2	0	1	3	3	5	0	4	77
7:30	7:45	0	0	0	8	0	5	0	2	86
7:45	8:00	0	1	1	4	7	7	1	3	120
8:00	8:15	0	0	2	2	3	7	2	4	121
8:15	8:30	2	0	1	6	3	8	1	6	128
8:30	8:45	1	0	7	5	11	18	3	4	120
8:45	9:00	1	1	3	4	6	4	1	5	86
9:00	9:15	3	0	0	3	12	0	0	9	77
9:15	9:30	0	1	0	3	13	0	0	2	
9:30	9:45	2	1	0	7	4	0	0	1	
9:45	10:00	4	1	1	2	5	0	3	0	
15:30	15:45	0	2	5	1	5	1	2	1	54
15:45	16:00	1	0	3	2	0	3	1	5	53
16:00	16:15	1	0	0	1	0	5	3	3	47
16:15	16:30	0	2	1	1	1	2	2	0	60
16:30	16:45	0	1	1	0	2	2	10	0	77
16:45	17:00	0	1	0	0	1	4	3	0	80
17:00	17:15	0	0	2	5	10	6	2	1	82
17:15	17:30	0	0	3	0	0	7	14	2	69
17:30	17:45	3	0	0	0	1	11	4	0	50
17:45	18:00	0	0	0	1	4	1	4	1	
18:00	18:15	1	1	1	0	7	2	1	0	
18:15	18:30	1	0	0	1	3	1	1	0	

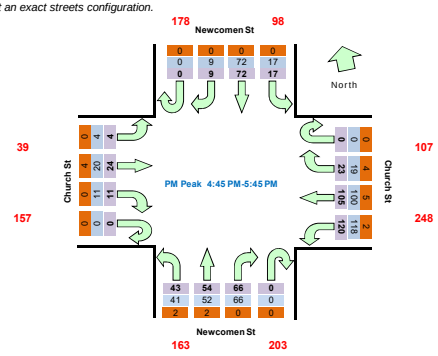
Peak Time		North Approach Newcomen St		East Approach Church St		South Approach Newcomen St		West Approach Church St		Peak hour
Period Start	Period End	Eastbound	Westbound	Southbound	Northbound	Eastbound	Westbound	Southbound	Northbound	total
8:00	9:00	4	1	13	17	23	37	7	19	121
16:45	17:45	3	1	5	5	12	28	23	3	80

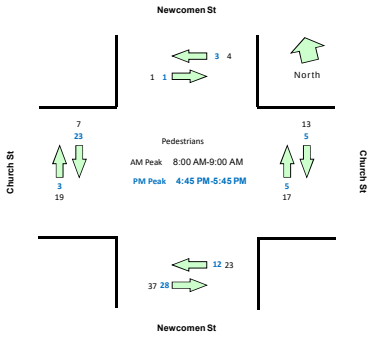
Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy







Light Vehicles

Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	9	6	0	2	9	8	0	16	7	4	0	0	3	0
7:15	7:30	0	1	5	3	0	3	13	5	0	17	7	0	0	1	2	1
7:30	7:45	0	3	6	3	0	3	7	7	0	19	9	13	0	0	3	1
7:45	8:00	0	4	6	2	0	2	10	10	0	21	19	8	0	1	7	1
8:00	8:15	0	0	7	6	0	6	11	8	0	29	16	15	0	0	11	3
8:15	8:30	0	3	6	4	0	6	21	10	0	19	30	38	0	0	8	1
8:30	8:45	0	0	7	6	0	7	16	15	0	29	31	34	0	4	5	1
8:45	9:00	0	1	12	8	0	4	15	11	0	33	19	6	0	2	14	3
9:00	9:15	0	2	7	4	0	3	16	5	0	20	17	2	0	1	6	0
9:15	9:30	0	1	4	2	0	3	10	4	0	20	12	2	0	0	4	0
9:30	9:45	0	2	1	5	0	5	25	6	0	19	14	1	0	2	3	1
9:45	10:00	0	1	10	4	0	1	12	6	0	13	8	0	0	0	2	1
15:30	15:45	0	2	13	2	0	1	18	8	0	15	10	7	0	2	5	0
15:45	16:00	0	2	7	3	0	2	18	15	0	10	10	4	0	2	1	4
16:00	16:15	0	3	10	6	0	4	8	12	0	9	12	8	0	2	7	0
16:15	16:30	0	2	6	3	0	4	20	22	0	12	19	1	0	3	6	1
16:30	16:45	0	4	15	4	0	2	17	17	0	14	10	2	0	2	5	1
16:45	17:00	0	2	13	3	0	5	20	25	0	17	16	9	0	0	4	1
17:00	17:15	0	1	15	7	0	6	34	29	0	18	15	24	0	2	9	0
17:15	17:30	0	6	25	3	0	4	24	37	0	18	8	4	0	7	5	2
17:30	17:45	0	0	19	4	0	4	22	27	0	13	13	4	0	2	2	1
17:45	18:00	0	2	9	5	0	3	23	14	0	13	8	0	0	1	2	2
18:00	18:15	0	3	8	2	0	1	12	15	0	11	8	0	0	0	7	0
18:15	18:30	0	2	4	1	0	1	17	8	0	13	8	0	0	1	3	0

Peak Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:00	9:00	0	4	32	24	0	23	63	44	0	110	96	93	0	6	38	8	541
16:45	17:45	0	9	72	17	0	19	100	118	0	66	52	41	0	11	20	4	529

Heavy Vehicles

Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	0	4	0	0	0	0	0	0	2	0	0	0	0	0
7:15	7:30	0	0	2	4	0	0	0	1	0	0	2	0	0	0	0	0
7:30	7:45	0	0	0	1	0	0	0	4	0	0	1	0	0	0	0	0
7:45	8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00	8:15	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
8:15	8:30	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
8:30	8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45	9:00	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
9:00	9:15	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0
9:15	9:30	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0
9:30	9:45	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0
9:45	10:00	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	16:15	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0
16:15	16:30	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	1	2	1	0	0	2	0	0	0	0	0
17:00	17:15	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
18:00	18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Peak Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:00	9:00	0	1	0	3	0	1	6	1	0	2	1	7	0	0	6	0	28
16:45	17:45	0	0	0	0	0	4	5	2	0	0	2	2	0	0	4	0	19

Bus

Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15	7:30	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:30	7:45	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
7:45	8:00	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0
8:00	8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
8:15	8:30	0	0	0	0	0	0	3	0	0	1	0	2	0	0	0	0
8:30	8:45	0	1	0	0	0	0	2	0	0	0	0	4	0	0	1	0
8:45	9:00	0	0	0	0	0	0	1	1	0	0	0	1	0	0	2	0
9:00	9:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0
9:15	9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
9:30	9:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
9:45	10:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
15:30	15:45	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0
15:45	16:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0
16:00	16:15	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0
16:45	17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
17:00	17:15	0	0	0	0	0	1	1	0	0	0	0	1	0	0	1	0
17:15	17:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
17:30	17:45	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0
17:45	18:00	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0
18:00	18:15	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0
18:15	18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

Peak Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:00	9:00	0	1	0	0	0	0	6	1	0	1	0	7	0	0	6	0	22
16:45	17:45	0	0	0	0	0	2	2	0	0	0	0	2	0	0	4	0	10

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Church St and Bolton St, Newcastle

GPS *-32.929927, 151.782333*

Date:	Fri 08-02-19
Weather:	Fine
Suburban:	Newcastle
Customer:	BTFF

North:	Bolton St
East:	Church St
South:	N/A
West:	Church St

Survey Period	AM:	7:00 AM-10:00 AM
	PM:	3:30 PM-6:30 PM
Traffic Peak	AM:	8:00 AM-9:00 AM
	PM:	4:45 PM-5:45 PM

All Vehicles

Time		North Approach Bolton St			East Approach Church St			West Approach Church St			Hourly Total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Hour	Peak
7:00	7:15	0	6	6	0	2	13	0	15	14	246	
7:15	7:30	0	6	7	0	3	16	0	14	13	281	
7:30	7:45	0	6	10	0	6	16	0	13	13	314	
7:45	8:00	0	6	6	0	6	18	0	14	17	356	
8:00	8:15	0	8	7	0	8	17	0	22	29	400	Peak
8:15	8:30	0	11	11	0	8	29	0	21	12	387	
8:30	8:45	0	6	9	0	16	34	0	24	17	357	
8:45	9:00	0	12	10	0	10	21	0	29	29	333	
9:00	9:15	0	8	8	0	10	18	0	14	20	284	
9:15	9:30	0	4	8	0	8	15	0	12	15		
9:30	9:45	0	6	11	0	5	31	0	12	17		
9:45	10:00	0	7	11	0	9	15	0	13	7		
15:30	15:45	0	8	7	0	4	20	0	14	9	273	
15:45	16:00	0	12	6	0	3	24	0	8	8	289	
16:00	16:15	0	13	10	0	6	16	0	19	4	322	
16:15	16:30	0	21	9	0	4	26	0	12	10	374	
16:30	16:45	0	20	11	0	3	20	0	17	7	404	
16:45	17:00	0	32	11	0	4	22	0	19	6	425	Peak
17:00	17:15	0	35	7	0	5	38	0	28	7	412	
17:15	17:30	0	37	16	0	3	29	0	22	5	362	
17:30	17:45	0	27	18	0	6	28	0	16	4	326	
17:45	18:00	0	20	13	0	3	23	0	16	6		
18:00	18:15	0	16	9	0	10	14	0	16	5		
18:15	18:30	0	9	24	0	8	17	0	15	3		

Peak Time		North Approach Bolton St			East Approach Church St			West Approach Church St			Peak total
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	
8:00	9:00	0	37	37	0	42	101	0	96	87	400
16:45	17:45	0	131	52	0	18	117	0	85	22	425

Pedestrians Crossing

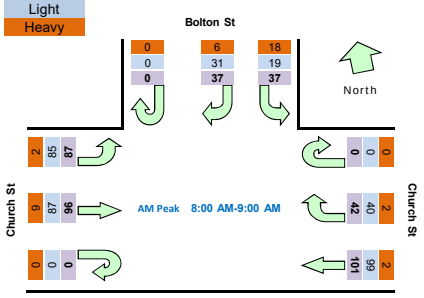
Time		North Approach Bolton St		East Approach Church St		West Approach Church St		Hourly Total
Period Start	Period End	Westbound	Eastbound	Northbound	Southbound	Northbound	Southbound	
7:00	7:15	0	4	3	5	5	0	90
7:15	7:30	0	1	12	3	0	0	96
7:30	7:45	1	2	9	9	1	2	113
7:45	8:00	2	1	14	16	0	0	131
8:00	8:15	0	0	12	11	0	0	127
8:15	8:30	3	3	16	11	0	0	141
8:30	8:45	2	3	17	20	0	0	126
8:45	9:00	0	4	23	2	0	0	95
9:00	9:15	5	10	10	9	3	0	95
9:15	9:30	1	2	14	0	1	0	
9:30	9:45	0	3	4	4	0	0	
9:45	10:00	2	4	19	3	0	1	
15:30	15:45	2	0	8	3	1	9	87
15:45	16:00	2	4	5	6	3	0	85
16:00	16:15	3	0	3	6	0	9	87
16:15	16:30	0	0	3	19	0	1	84
16:30	16:45	4	5	3	5	0	4	93
16:45	17:00	0	3	1	15	2	1	92
17:00	17:15	1	0	7	9	0	1	81
17:15	17:30	0	0	9	19	2	2	71
17:30	17:45	2	4	0	13	0	1	56
17:45	18:00	2	0	4	4	0	1	
18:00	18:15	0	1	3	4	0	0	
18:15	18:30	1	1	11	4	0	0	

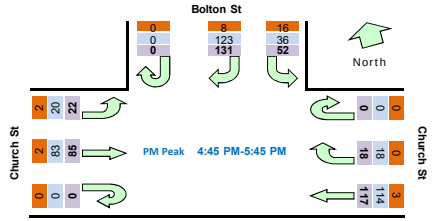
Peak Time		North Approach Bolton St		East Approach Church St		West Approach Church St		Peak total
Period Start	Period End	Westbound	Eastbound	Northbound	Southbound	Northbound	Southbound	
8:00	9:00	5	10	68	44	0	0	127
16:45	17:45	3	7	17	56	4	5	92

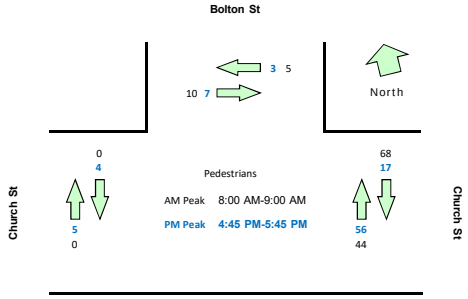
Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy







Light Vehicles

Time		North Approach Bolton St			East Approach Church St			West Approach Church St		
Period Start	Period End	U	R	L	U	R	WB	U	EB	L
7:00	7:15	0	6	4	0	2	13	0	13	12
7:15	7:30	0	5	3	0	3	16	0	13	9
7:30	7:45	0	3	2	0	4	14	0	13	12
7:45	8:00	0	4	2	0	6	18	0	13	17
8:00	8:15	0	8	4	0	6	17	0	18	28
8:15	8:30	0	8	7	0	8	29	0	19	12
8:30	8:45	0	5	2	0	16	33	0	24	16
8:45	9:00	0	10	6	0	10	20	0	26	29
9:00	9:15	0	7	4	0	10	17	0	11	19
9:15	9:30	0	3	5	0	7	14	0	11	15
9:30	9:45	0	5	4	0	4	31	0	11	16
9:45	10:00	0	6	4	0	9	13	0	13	6
15:30	15:45	0	7	1	0	4	20	0	14	8
15:45	16:00	0	11	3	0	3	24	0	7	7
16:00	16:15	0	9	4	0	4	15	0	19	3
16:15	16:30	0	20	6	0	4	26	0	12	9
16:30	16:45	0	18	7	0	3	18	0	16	7
16:45	17:00	0	30	7	0	4	20	0	19	5
17:00	17:15	0	31	5	0	5	38	0	27	7
17:15	17:30	0	37	12	0	3	28	0	21	5
17:30	17:45	0	25	12	0	6	28	0	16	3
17:45	18:00	0	18	9	0	3	22	0	14	6
18:00	18:15	0	14	6	0	10	14	0	15	5
18:15	18:30	0	9	18	0	8	17	0	14	3

Peak Time		North Approach Bolton St			East Approach Church St			West Approach Church St			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
8:00	9:00	0	31	19	0	40	99	0	87	85	361
16:45	17:45	0	123	36	0	18	114	0	83	20	394

Heavy Vehicles

Time		North Approach Bolton St			East Approach Church St			West Approach Church St		
Period Start	Period End	U	R	L	U	R	WB	U	EB	L
7:00	7:15	0	0	0	0	0	0	0	2	2
7:15	7:30	0	1	2	0	0	0	0	1	3
7:30	7:45	0	2	1	0	2	2	0	0	1
7:45	8:00	0	0	2	0	0	0	0	0	0
8:00	8:15	0	0	0	0	2	0	0	2	0
8:15	8:30	0	0	0	0	0	0	0	1	0
8:30	8:45	0	0	1	0	0	0	0	0	0
8:45	9:00	0	0	1	0	0	1	0	1	0
9:00	9:15	0	0	2	0	0	1	0	2	0
9:15	9:30	0	1	0	0	1	1	0	0	0
9:30	9:45	0	1	1	0	1	0	0	1	0
9:45	10:00	0	0	2	0	0	2	0	0	0
15:30	15:45	0	0	1	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0	0	0
16:00	16:15	0	1	0	0	1	1	0	0	1
16:15	16:30	0	0	0	0	0	0	0	0	1
16:30	16:45	0	0	0	0	0	2	0	0	0
16:45	17:00	0	2	0	0	0	2	0	0	0
17:00	17:15	0	2	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	1	0	0	0
17:30	17:45	0	0	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	1	0	0	0
18:00	18:15	0	0	0	0	0	0	0	0	0
18:15	18:30	0	0	0	0	0	0	0	0	0

Peak Time		North Approach Bolton St			East Approach Church St			West Approach Church St			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
8:00	9:00	0	6	18	0	2	2	0	9	2	39
16:45	17:45	0	8	16	0	0	3	0	2	2	31

Bus

Time		North Approach Bolton St			East Approach Church St			West Approach Church St		
Period Start	Period End	U	R	L	U	R	WB	U	EB	L
7:00	7:15	0	0	2	0	0	0	0	0	0
7:15	7:30	0	0	2	0	0	0	0	0	1
7:30	7:45	0	1	7	0	0	0	0	0	0
7:45	8:00	0	2	2	0	0	0	0	1	0
8:00	8:15	0	0	3	0	0	0	0	2	1
8:15	8:30	0	3	4	0	0	0	0	1	0
8:30	8:45	0	1	6	0	0	1	0	0	1
8:45	9:00	0	2	3	0	0	0	0	2	0
9:00	9:15	0	1	2	0	0	0	0	1	1
9:15	9:30	0	0	3	0	0	0	0	1	0
9:30	9:45	0	0	6	0	0	0	0	0	1
9:45	10:00	0	1	5	0	0	0	0	0	1
15:30	15:45	0	1	5	0	0	0	0	0	1
15:45	16:00	0	1	3	0	0	0	0	1	1
16:00	16:15	0	3	6	0	1	0	0	0	0
16:15	16:30	0	1	3	0	0	0	0	0	0
16:30	16:45	0	2	4	0	0	0	0	1	0
16:45	17:00	0	0	4	0	0	0	0	0	1
17:00	17:15	0	2	2	0	0	0	0	1	0
17:15	17:30	0	0	4	0	0	0	0	1	0
17:30	17:45	0	2	6	0	0	0	0	0	1
17:45	18:00	0	2	4	0	0	0	0	2	0
18:00	18:15	0	2	3	0	0	0	0	1	0
18:15	18:30	0	0	6	0	0	0	0	1	0

Peak Time		North Approach Bolton St			East Approach Church St			West Approach Church St			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
8:00	9:00	0	6	16	0	0	1	0	5	2	30
16:45	17:45	0	4	16	0	0	0	0	2	2	24

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au

Intersection of Church St and Watt St, Newcastle

GPS -32.930218, 151.783472

Date:	Fri 08-02-19
Weather:	Fine
Suburban:	Newcastle
Customer:	BTFF

North:	Watt St
East:	Church St
South:	Watt St
West:	Church St

Survey Period	AM:	7:00 AM-10:00 AM
	PM:	3:30 PM-6:30 PM
Traffic Peak	AM:	8:00 AM-9:00 AM
	PM:	5:15 PM-6:15 PM

All Vehicles

Time		North Approach Watt St				East Approach Church St				South Approach Watt St				West Approach Church St				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
7:00	7:15	0	5	25	2	0	15	8	25	0	16	46	2	0	0	3	18	780	
7:15	7:30	0	5	30	3	0	11	9	42	0	27	46	5	0	3	6	12	853	
7:30	7:45	0	10	27	4	0	4	4	40	0	17	54	8	0	2	5	16	939	
7:45	8:00	0	4	33	10	0	8	12	32	1	38	59	8	0	4	5	11	1039	
8:00	8:15	0	13	36	2	0	12	2	31	0	43	60	10	0	3	6	20	1063	Peak
8:15	8:30	0	19	30	9	0	15	5	41	0	45	76	13	0	2	5	25	1038	
8:30	8:45	0	11	33	4	0	8	29	43	0	48	72	10	0	3	7	23	954	
8:45	9:00	0	7	24	5	0	10	14	40	0	40	60	10	0	3	4	32	874	
9:00	9:15	0	7	14	5	0	15	14	49	0	31	49	7	0	3	2	17	835	
9:15	9:30	0	3	22	5	0	15	15	46	0	23	47	5	0	1	3	16		
9:30	9:45	0	7	20	8	0	16	26	51	0	21	36	3	0	1	4	18		
9:45	10:00	0	8	29	8	0	7	16	58	0	21	39	0	0	1	4	19		
15:30	15:45	0	5	30	4	0	7	12	57	0	39	37	7	0	0	5	16	938	
15:45	16:00	0	6	27	9	0	9	15	65	0	31	40	6	0	1	1	12	969	
16:00	16:15	0	6	31	11	0	8	10	59	0	37	59	6	0	3	10	16	979	
16:15	16:30	0	7	23	9	0	12	17	70	0	34	42	6	0	2	6	13	1013	
16:30	16:45	0	5	51	8	0	11	13	59	0	31	39	5	0	2	7	19	1089	
16:45	17:00	0	6	42	6	0	8	11	58	0	18	44	9	0	4	10	16	1081	
17:00	17:15	0	8	54	10	0	7	31	58	0	29	54	4	0	8	10	17	1110	
17:15	17:30	0	9	71	10	0	11	18	68	0	36	51	5	0	7	2	29	1125	Peak
17:30	17:45	0	11	34	10	0	6	20	48	0	33	43	3	0	8	6	20	1082	
17:45	18:00	0	17	35	7	0	18	4	61	0	35	50	5	0	2	11	16		
18:00	18:15	0	11	39	20	0	22	7	73	0	41	61	6	0	3	4	18		
18:15	18:30	0	9	30	20	0	20	12	58	0	41	41	4	0	7	13	19		

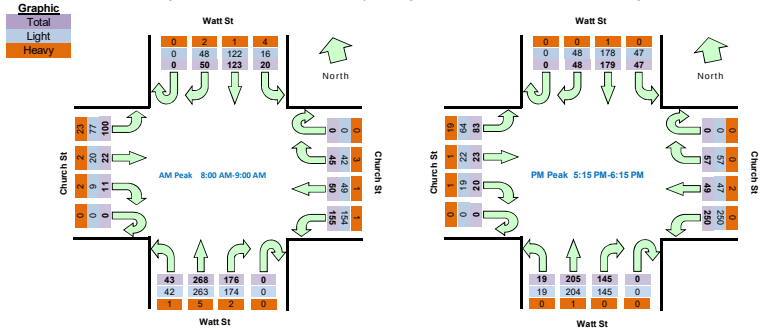
Peak Time		North Approach Watt St				East Approach Church St				South Approach Watt St				West Approach Church St				Peak total
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	
8:00	9:00	0	50	123	20	0	45	50	155	0	176	268	43	0	11	22	100	1063
17:15	18:15	0	48	179	47	0	57	49	250	0	145	205	19	0	20	23	83	1125

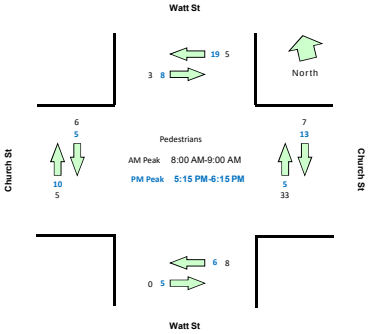
Pedestrians Crossing

Time		North Approach Watt St		East Approach Church St		South Approach Watt St		West Approach Church St		Hourly Total
Period Start	Period End	Eastbound	Westbound	Southbound	Northbound	Eastbound	Westbound	Southbound	Northbound	
7:00	7:15	3	1	0	7	2	0	0	1	58
7:15	7:30	0	2	0	3	0	0	0	2	63
7:30	7:45	1	3	3	7	0	0	1	0	73
7:45	8:00	0	3	6	7	1	0	1	4	73
8:00	8:15	2	0	0	14	0	0	1	2	67
8:15	8:30	0	0	2	11	1	0	1	2	72
8:30	8:45	1	1	3	4	3	0	3	0	70
8:45	9:00	2	2	2	4	4	0	1	1	69
9:00	9:15	7	9	0	1	0	0	2	5	66
9:15	9:30	3	0	0	3	3	0	3	3	
9:30	9:45	2	3	2	1	3	0	2	1	
9:45	10:00	4	1	0	0	5	0	1	2	
15:30	15:45	2	4	0	2	4	1	2	1	51
15:45	16:00	3	1	1	1	0	3	1	1	54
16:00	16:15	6	1	2	0	0	0	2	1	62
16:15	16:30	3	3	2	0	2	1	1	0	100
16:30	16:45	5	3	3	0	2	0	3	3	99
16:45	17:00	3	2	8	1	0	0	2	3	96
17:00	17:15	7	2	23	1	0	4	8	5	100
17:15	17:30	4	1	4	0	0	0	2	0	71
17:30	17:45	4	4	3	1	0	1	3	0	83
17:45	18:00	5	1	4	1	4	4	0	4	
18:00	18:15	6	2	2	3	2	0	0	6	
18:15	18:30	3	2	0	10	0	1	3	4	

Peak Time		North Approach Watt St		East Approach Church St		South Approach Watt St		West Approach Church St		Peak hour total
Period Start	Period End	Eastbound	Westbound	Southbound	Northbound	Eastbound	Westbound	Southbound	Northbound	
8:00	9:00	5	3	7	33	8	0	6	5	67
17:15	18:15	19	8	13	5	6	5	5	10	71

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.





Light Vehicles

Time		North Approach Watt St				East Approach Church St				South Approach Watt St				West Approach Church St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	5	24	2	0	13	8	25	0	15	42	2	0	0	3	14
7:15	7:30	0	5	29	3	0	9	9	42	0	26	46	5	0	3	5	8
7:30	7:45	0	9	26	4	0	4	2	38	0	17	52	7	0	2	5	8
7:45	8:00	0	4	33	10	0	8	12	32	1	37	59	8	0	3	5	7
8:00	8:15	0	12	36	2	0	11	2	31	0	43	59	9	0	2	6	14
8:15	8:30	0	19	30	7	0	15	5	41	0	45	75	13	0	2	5	19
8:30	8:45	0	10	32	3	0	7	29	42	0	47	70	10	0	3	6	17
8:45	9:00	0	7	24	4	0	9	13	40	0	39	59	10	0	2	3	27
9:00	9:15	0	6	14	4	0	15	14	46	0	31	48	7	0	3	2	10
9:15	9:30	0	3	22	5	0	13	13	46	0	22	46	5	0	0	3	13
9:30	9:45	0	7	18	8	0	16	26	50	0	21	36	2	0	1	4	10
9:45	10:00	0	8	29	7	0	6	14	55	0	20	38	0	0	1	4	12
15:30	15:45	0	5	30	4	0	7	12	55	0	37	37	7	0	0	5	10
15:45	16:00	0	6	27	9	0	7	15	65	0	31	39	6	0	1	1	8
16:00	16:15	0	5	31	11	0	6	10	59	0	37	58	4	0	3	10	10
16:15	16:30	0	7	22	9	0	12	17	70	0	34	42	6	0	1	6	11
16:30	16:45	0	4	51	8	0	11	13	59	0	30	39	4	0	2	7	14
16:45	17:00	0	6	42	6	0	8	9	58	0	18	44	9	0	4	10	12
17:00	17:15	0	8	53	10	0	7	31	57	0	29	54	4	0	8	10	14
17:15	17:30	0	9	70	10	0	11	17	68	0	36	50	5	0	6	2	25
17:30	17:45	0	11	34	10	0	6	20	48	0	33	43	3	0	8	6	14
17:45	18:00	0	17	35	7	0	18	3	61	0	35	50	5	0	2	10	11
18:00	18:15	0	11	39	20	0	22	7	73	0	41	61	6	0	3	4	14
18:15	18:30	0	9	30	20	0	20	12	57	0	41	41	4	0	7	13	12

Peak Time		North Approach Watt St				East Approach Church St				South Approach Watt St				West Approach Church St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:00	9:00	0	48	122	16	0	42	49	154	0	174	263	42	0	9	20	77	1016
17:15	18:15	0	48	178	47	0	57	47	250	0	145	204	19	0	19	22	64	1100

Heavy Vehicles

Time		North Approach Watt St				East Approach Church St				South Approach Watt St				West Approach Church St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	0	0	0	2	0	0	0	1	2	0	0	0	0	2
7:15	7:30	0	0	1	0	0	2	0	0	0	1	0	0	0	0	1	2
7:30	7:45	0	1	1	0	0	0	2	2	0	0	2	1	0	0	0	1
7:45	8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
8:00	8:15	0	1	0	0	0	1	0	0	0	0	1	1	0	1	0	1
8:15	8:30	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1
8:30	8:45	0	0	0	1	0	1	0	1	0	1	1	0	0	0	1	0
8:45	9:00	0	0	0	1	0	1	1	0	0	1	1	0	0	1	1	0
9:00	9:15	0	1	0	1	0	0	0	3	0	0	1	0	0	0	0	4
9:15	9:30	0	0	0	0	0	1	2	0	0	1	1	0	0	0	0	0
9:30	9:45	0	0	2	0	0	0	0	1	0	0	0	1	0	0	0	2
9:45	10:00	0	0	0	0	0	1	2	3	0	1	1	0	0	0	0	2
15:30	15:45	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	1
15:45	16:00	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0
16:00	16:15	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0
16:15	16:30	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	16:45	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0
16:45	17:00	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	17:30	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
18:00	18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Peak Time		North Approach Watt St				East Approach Church St				South Approach Watt St				West Approach Church St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:00	9:00	0	2	1	4	0	3	1	1	0	2	5	1	0	2	2	23	47
17:15	18:15	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	19	25

Bus

Time		North Approach Watt St				East Approach Church St				South Approach Watt St				West Approach Church St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	2
7:15	7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7:30	7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
7:45	8:00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3
8:00	8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
8:15	8:30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	5
8:30	8:45	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	6
8:45	9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
9:00	9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
9:15	9:30	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	3
9:30	9:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
9:45	10:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	5
15:30	15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
15:45	16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
16:00	16:15	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	6
16:15	16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
16:30	16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
16:45	17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
17:00	17:15	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	3
17:15	17:30	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	4
17:30	17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
17:45	18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5
18:00	18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
18:15	18:30	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	7

Peak Time		North Approach Watt St				East Approach Church St				South Approach Watt St				West Approach Church St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:00	9:00	0	1	1	0	0	0	0	0	0	0	2	0	0	0	0	21	25
17:15	18:15	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	19	22

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

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Intersection of Church St and Newcomen St, Newcastle

GPS -32.929634, 151.781207

Date:	Sat 09-02-19
Weather:	Fine
Suburban:	Newcastle
Customer:	BTFF

North:	Newcomen St
East:	Church St
South:	Newcomen St
West:	Church St

Survey Period	AM:	10:00 AM-12:00 PM
	PM:	12:00 PM-4:00 PM
Traffic Peak	AM:	11:15 AM-12:15 PM
	PM:	12:00 PM-1:00 PM

All Vehicles

Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
10:00	10:15	0	6	6	3	0	5	16	9	0	15	9	0	0	1	2	1	258	
10:15	10:30	0	1	6	0	0	4	17	12	0	12	7	0	0	0	3	0	253	
10:30	10:45	0	3	7	0	0	4	14	3	0	13	14	0	0	0	4	3	261	
10:45	11:00	0	2	3	1	0	3	16	8	0	9	8	3	0	0	4	1	265	
11:00	11:15	0	3	10	1	0	2	24	5	0	11	7	0	0	1	3	1	287	
11:15	11:30	0	2	9	6	0	2	12	10	0	13	8	1	0	1	6	0	301	Peak
11:30	11:45	0	1	7	1	0	7	20	7	0	9	4	3	0	0	7	3	294	
11:45	12:00	0	3	14	4	1	3	20	4	0	10	10	1	0	2	7	1	291	
12:00	12:15	0	2	8	3	0	7	22	10	0	9	15	1	0	0	4	1	280	
12:15	12:30	0	2	6	4	0	2	14	5	0	8	16	1	0	0	4	1	257	
12:30	12:45	0	3	7	3	0	5	20	9	0	7	7	1	0	0	4	0	271	
12:45	13:00	0	2	9	2	0	2	14	10	0	13	8	0	0	1	7	1	266	
13:00	13:15	0	2	7	2	0	2	20	4	0	10	6	1	0	0	4	1	249	
13:15	13:30	0	3	9	6	0	2	17	9	0	14	11	1	0	0	5	0	256	
13:30	13:45	0	1	5	4	0	4	19	10	0	6	7	3	0	0	2	0	234	
13:45	14:00	0	1	1	2	0	3	16	4	0	3	13	1	0	2	4	2	223	
14:00	14:15	0	1	2	2	0	4	15	6	0	10	14	2	0	1	8	1	233	
14:15	14:30	0	2	5	4	0	0	19	5	0	5	8	1	0	0	6	0	225	
14:30	14:45	0	0	8	1	0	1	16	5	0	8	4	0	0	0	5	2	209	
14:45	15:00	0	0	4	6	0	4	16	7	0	7	11	2	0	0	4	1	215	
15:00	15:15	0	4	5	2	0	2	14	5	0	8	13	2	0	1	2	0	212	
15:15	15:30	0	0	5	2	0	1	14	4	0	1	6	1	0	2	1	2		
15:30	15:45	0	1	7	2	0	4	19	9	0	4	6	1	0	0	3	0		
15:45	16:00	0	5	6	1	0	2	13	4	0	13	7	1	0	0	6	1		

Peak Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St				Peak total
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	
11:15	12:15	0	8	38	14	1	19	74	31	0	41	37	6	0	3	24	5	301
12:00	13:00	0	9	30	12	0	16	70	34	0	37	46	3	0	1	19	3	280

Pedestrians Crossing

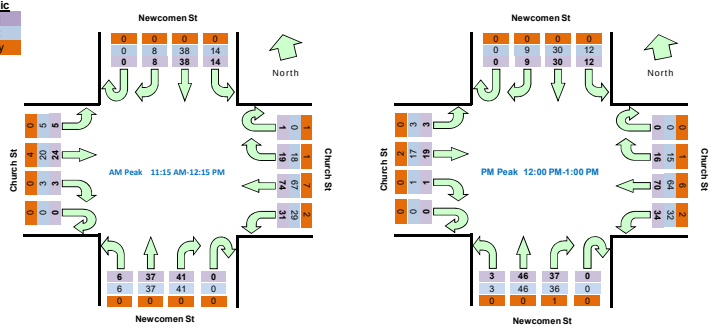
Time		North Approach Newcomen St		East Approach Church St		South Approach Newcomen St		West Approach Church St		Hourly Total
Period Start	Period End	Westbound	Eastbound	Southbound	Northbound	Westbound	Eastbound	Southbound	Northbound	
10:00	10:15	6	4	7	1	2	2	2	0	87
10:15	10:30	5	2	0	2	2	2	1	6	77
10:30	10:45	9	3	4	0	8	0	0	0	78
10:45	11:00	4	3	3	2	0	2	0	5	79
11:00	11:15	5	7	2	0	0	0	0	0	87
11:15	11:30	9	1	0	2	4	2	3	0	101
11:30	11:45	2	0	0	0	10	10	1	2	101
11:45	12:00	5	0	0	3	2	17	0	0	94
12:00	12:15	5	3	2	1	1	12	0	4	83
12:15	12:30	12	1	0	2	0	4	2	0	72
12:30	12:45	5	2	2	5	2	0	2	0	73
12:45	13:00	7	6	1	0	0	1	1	0	84
13:00	13:15	2	1	0	0	7	3	4	0	79
13:15	13:30	1	1	1	0	6	7	6	0	72
13:30	13:45	2	0	2	1	11	8	2	3	58
13:45	14:00	0	0	2	2	1	0	4	2	44
14:00	14:15	6	2	0	0	0	2	0	0	40
14:15	14:30	4	2	0	0	0	0	2	0	43
14:30	14:45	2	0	0	0	5	3	5	0	46
14:45	15:00	0	4	0	0	1	2	0	0	48
15:00	15:15	2	1	1	0	0	5	4	0	67
15:15	15:30	0	6	0	3	1	1	0	0	
15:30	15:45	2	2	2	2	4	2	1	2	
15:45	16:00	2	2	0	12	4	5	0	1	

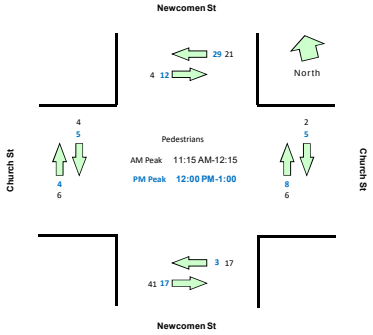
Peak Time		North Approach Newcomen St		East Approach Church St		South Approach Newcomen St		West Approach Church St		Peak hour total
Period Start	Period End	Westbound	Eastbound	Southbound	Northbound	Westbound	Eastbound	Southbound	Northbound	
11:15	12:15	21	4	2	6	17	41	4	6	101
12:00	13:00	29	12	5	8	3	17	5	4	83

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy





Light Vehicles

Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
10:00	10:15	0	5	5	3	0	5	15	9	0	15	9	0	0	1	2	1
10:15	10:30	0	1	6	0	0	4	14	11	0	11	7	0	0	0	3	0
10:30	10:45	0	2	7	0	0	2	13	3	0	13	14	0	0	0	3	3
10:45	11:00	0	1	2	1	0	3	14	8	0	8	8	3	0	0	4	1
11:00	11:15	0	3	10	1	0	1	22	5	0	11	7	0	0	1	3	1
11:15	11:30	0	2	9	6	0	2	10	8	0	13	8	1	0	1	6	0
11:30	11:45	0	1	7	1	0	7	18	7	0	9	4	3	0	0	5	3
11:45	12:00	0	3	14	4	0	3	18	4	0	10	10	1	0	2	6	1
12:00	12:15	0	2	8	3	0	6	21	10	0	9	15	1	0	0	3	1
12:15	12:30	0	2	6	4	0	2	13	4	0	7	16	1	0	0	4	1
12:30	12:45	0	3	7	3	0	5	18	8	0	7	7	1	0	0	3	0
12:45	13:00	0	2	9	2	0	2	12	10	0	13	8	0	0	1	7	1
13:00	13:15	0	2	7	1	0	2	17	4	0	10	6	1	0	0	4	1
13:15	13:30	0	3	9	6	0	2	16	9	0	14	11	1	0	0	3	0
13:30	13:45	0	1	5	4	0	4	17	10	0	6	7	2	0	0	2	0
13:45	14:00	0	1	1	2	0	3	15	4	0	3	13	0	0	2	3	2
14:00	14:15	0	1	1	1	0	4	14	6	0	10	14	2	0	0	6	1
14:15	14:30	0	2	5	4	0	0	17	5	0	5	8	1	0	0	5	0
14:30	14:45	0	0	8	1	0	1	14	5	0	8	4	0	0	0	4	2
14:45	15:00	0	0	1	5	0	3	15	7	0	7	11	1	0	0	2	1
15:00	15:15	0	4	4	2	0	2	11	5	0	8	13	2	0	1	2	0
15:15	15:30	0	0	5	2	0	1	14	4	0	1	6	1	0	2	0	2
15:30	15:45	0	1	7	1	0	3	19	9	0	4	6	1	0	0	3	0
15:45	16:00	0	5	6	1	0	2	13	4	0	13	7	1	0	0	4	1

Peak Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
11:15	12:15	0	8	38	14	0	18	67	29	0	41	37	6	0	3	20	5	286
12:00	13:00	0	9	30	12	0	15	64	32	0	36	46	3	0	1	17	3	268

Heavy Vehicles

Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
10:00	10:15	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15	10:30	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
10:30	10:45	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0
10:45	11:00	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	11:15	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
11:15	11:30	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0
11:30	11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	12:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
12:00	12:15	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
12:15	12:30	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
12:30	12:45	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
12:45	13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	13:15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
13:15	13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	14:15	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0
14:15	14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	15:00	0	0	3	1	0	1	0	0	0	0	0	0	0	0	0	0
15:00	15:15	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	15:45	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Peak Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
11:15	12:15	0	0	0	0	1	1	7	2	0	0	0	0	0	0	4	0	15
12:00	13:00	0	0	0	0	0	1	6	2	0	1	0	0	0	0	2	0	12

Bus

Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
10:00	10:15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
10:15	10:30	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
10:30	10:45	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
10:45	11:00	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0
11:00	11:15	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
11:15	11:30	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
11:30	11:45	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0
11:45	12:00	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0
12:00	12:15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
12:15	12:30	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
12:30	12:45	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0
12:45	13:00	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
13:00	13:15	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0
13:15	13:30	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0
13:30	13:45	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0
13:45	14:00	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0
14:00	14:15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0
14:15	14:30	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0
14:30	14:45	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0
14:45	15:00	0	0	0	0	0	0	1	0	0	0	0	1	0	0	2	0
15:00	15:15	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
15:30	15:45	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0

Peak Time		North Approach Newcomen St				East Approach Church St				South Approach Newcomen St				West Approach Church St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
11:15	12:15	0	0	0	0	0	0	6	0	0	0	0	0	0	0	4	0	10
12:00	13:00	0	0	0	0	0	0	6	0	0	1	0	0	0	0	2	0	9

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Church St and Bolton St, Newcastle

GPS *-32.929927, 151.782333*

Date:	Sat 09-02-19
Weather:	Fine
Suburban:	Newcastle
Customer:	BTFF

North:	Bolton St
East:	Church St
South:	N/A
West:	Church St

Survey Period	AM:	10:00 AM-12:00 PM
	PM:	12:00 PM-4:00 PM
Traffic Peak	AM:	11:15 AM-12:15 PM
	PM:	12:00 PM-1:00 PM

All Vehicles

Time		North Approach Bolton St			East Approach Church St			West Approach Church St			Hourly Total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Hour	Peak
10:00	10:15	0	10	7	0	7	20	0	14	6	236	
10:15	10:30	0	12	14	0	3	21	0	3	12	229	
10:30	10:45	0	8	5	0	7	13	0	7	10	217	
10:45	11:00	0	6	11	0	5	21	0	13	1	231	
11:00	11:15	0	7	7	0	4	24	0	12	3	228	
11:15	11:30	0	9	3	0	1	15	0	23	2	241	
11:30	11:45	0	11	7	0	6	23	0	10	7	238	
11:45	12:00	0	9	5	0	1	18	0	16	5	236	
12:00	12:15	0	7	11	0	4	32	0	13	3	245	Peak
12:15	12:30	0	6	7	0	6	15	0	11	5	224	
12:30	12:45	0	5	5	0	9	29	0	10	4	233	
12:45	13:00	0	5	11	0	4	21	0	15	7	226	
13:00	13:15	0	6	4	0	3	20	0	13	3	210	
13:15	13:30	0	9	5	0	1	19	0	21	4	214	
13:30	13:45	0	7	6	0	4	26	0	10	2	202	
13:45	14:00	0	3	10	0	5	20	0	5	4	199	
14:00	14:15	0	4	3	0	5	21	0	18	2	202	
14:15	14:30	0	6	3	0	5	18	0	12	3	187	
14:30	14:45	0	2	11	0	5	20	0	8	6	171	
14:45	15:00	0	3	4	0	2	24	0	13	4	169	
15:00	15:15	0	5	3	0	2	16	0	11	1	165	
15:15	15:30	0	7	3	0	5	12	0	4	0		
15:30	15:45	0	6	3	0	6	26	0	7	2		
15:45	16:00	0	5	2	0	5	14	0	16	4		

Peak Time		North Approach Bolton St			East Approach Church St			West Approach Church St			Peak total
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	
11:15	12:15	0	36	26	0	12	88	0	62	17	241
12:00	13:00	0	23	34	0	23	97	0	49	19	245

Pedestrians Crossing

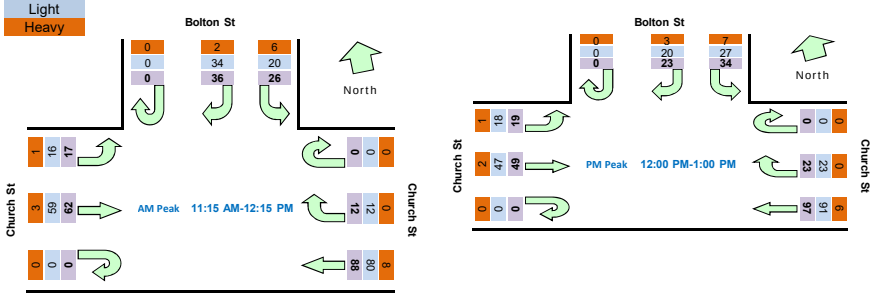
Time		North Approach Bolton St		East Approach Church St		West Approach Church St		Hourly Total
Period Start	Period End	Westbound	Eastbound	Northbound	Southbound	Northbound	Southbound	
10:00	10:15	4	2	8	2	0	2	73
10:15	10:30	0	5	2	4	0	0	73
10:30	10:45	4	13	8	4	2	0	91
10:45	11:00	0	0	1	12	0	0	90
11:00	11:15	9	3	2	4	0	0	96
11:15	11:30	5	6	15	3	0	0	90
11:30	11:45	1	3	5	19	0	2	65
11:45	12:00	4	2	3	5	0	5	38
12:00	12:15	0	5	0	6	0	1	31
12:15	12:30	0	2	0	1	0	1	28
12:30	12:45	2	1	0	0	0	0	44
12:45	13:00	0	7	2	3	0	0	52
13:00	13:15	3	0	0	5	0	1	50
13:15	13:30	1	2	8	9	0	0	52
13:30	13:45	0	4	2	2	3	0	50
13:45	14:00	1	2	4	2	1	0	43
14:00	14:15	1	1	1	8	0	0	53
14:15	14:30	2	3	0	10	3	0	53
14:30	14:45	0	1	1	2	0	0	41
14:45	15:00	7	4	5	4	0	0	54
15:00	15:15	4	2	1	4	0	0	50
15:15	15:30	0	1	2	0	3	0	
15:30	15:45	4	0	5	8	0	0	
15:45	16:00	4	5	5	2	0	0	

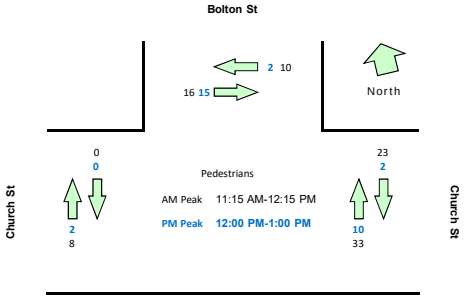
Peak Time		North Approach Bolton St		East Approach Church St		West Approach Church St		Peak total
Period Start	Period End	Westbound	Eastbound	Northbound	Southbound	Northbound	Southbound	
11:15	12:15	10	16	23	33	0	8	90
12:00	13:00	2	15	2	10	0	2	31

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy





Light Vehicles

Time		North Approach Bolton St			East Approach Church St			West Approach Church St		
Period Start	Period End	U	R	L	U	R	WB	U	EB	L
10:00	10:15	0	9	7	0	7	20	0	14	6
10:15	10:30	0	11	12	0	2	18	0	3	11
10:30	10:45	0	7	5	0	7	11	0	7	9
10:45	11:00	0	6	10	0	4	19	0	12	1
11:00	11:15	0	5	4	0	4	23	0	12	3
11:15	11:30	0	8	2	0	1	12	0	23	2
11:30	11:45	0	11	6	0	6	21	0	8	7
11:45	12:00	0	9	3	0	1	16	0	16	4
12:00	12:15	0	6	9	0	4	31	0	12	3
12:15	12:30	0	5	6	0	6	14	0	10	5
12:30	12:45	0	5	4	0	9	26	0	10	3
12:45	13:00	0	4	8	0	4	20	0	15	7
13:00	13:15	0	5	3	0	3	18	0	12	3
13:15	13:30	0	9	4	0	1	18	0	19	4
13:30	13:45	0	7	4	0	4	24	0	10	2
13:45	14:00	0	2	8	0	5	20	0	5	3
14:00	14:15	0	3	1	0	5	21	0	15	2
14:15	14:30	0	4	2	0	5	18	0	11	3
14:30	14:45	0	2	10	0	5	18	0	8	5
14:45	15:00	0	2	2	0	2	23	0	10	4
15:00	15:15	0	4	1	0	2	14	0	11	1
15:15	15:30	0	7	1	0	5	12	0	3	0
15:30	15:45	0	5	3	0	6	26	0	6	2
15:45	16:00	0	5	0	0	5	14	0	15	3

Peak Time		North Approach Bolton St			East Approach Church St			West Approach Church St			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
11:15	12:15	0	34	20	0	12	80	0	59	16	221
12:00	13:00	0	20	27	0	23	91	0	47	18	226

Heavy Vehicles

Time		North Approach Bolton St			East Approach Church St			West Approach Church St		
Period Start	Period End	U	R	L	U	R	WB	U	EB	L
10:00	10:15	0	0	0	0	0	0	0	0	0
10:15	10:30	0	0	0	0	0	1	0	0	1
10:30	10:45	0	0	0	0	0	2	0	0	0
10:45	11:00	0	0	0	0	0	0	0	0	0
11:00	11:15	0	0	1	0	0	1	0	0	0
11:15	11:30	0	0	0	0	0	3	0	0	0
11:30	11:45	0	0	0	0	0	0	0	0	0
11:45	12:00	0	0	0	0	0	0	0	0	0
12:00	12:15	0	0	0	0	0	1	0	0	0
12:15	12:30	0	0	0	0	0	1	0	0	0
12:30	12:45	0	0	0	0	0	1	0	0	0
12:45	13:00	0	0	0	0	0	0	0	0	0
13:00	13:15	0	0	0	0	0	1	0	0	0
13:15	13:30	0	0	0	0	0	0	0	0	0
13:30	13:45	0	0	0	0	0	0	0	0	0
13:45	14:00	0	0	0	0	0	0	0	0	0
14:00	14:15	0	0	0	0	0	0	0	1	0
14:15	14:30	0	0	0	0	0	0	0	0	0
14:30	14:45	0	0	0	0	0	0	0	0	0
14:45	15:00	0	0	0	0	0	1	0	1	0
15:00	15:15	0	0	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0	1	0
15:45	16:00	0	0	0	0	0	0	0	0	0

Peak Time		North Approach Bolton St			East Approach Church St			West Approach Church St			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
11:15	12:15	0	2	6	0	0	8	0	3	1	20
12:00	13:00	0	3	7	0	0	6	0	2	1	19

Bus

Time		North Approach Bolton St			East Approach Church St			West Approach Church St		
Period Start	Period End	U	R	L	U	R	WB	U	EB	L
10:00	10:15	0	1	0	0	0	0	0	0	0
10:15	10:30	0	1	2	0	1	2	0	0	0
10:30	10:45	0	1	0	0	0	0	0	0	1
10:45	11:00	0	0	1	0	1	2	0	1	0
11:00	11:15	0	2	2	0	0	0	0	0	0
11:15	11:30	0	1	1	0	0	0	0	0	0
11:30	11:45	0	0	1	0	0	2	0	2	0
11:45	12:00	0	0	2	0	0	2	0	0	1
12:00	12:15	0	1	2	0	0	0	0	1	0
12:15	12:30	0	1	1	0	0	0	0	1	0
12:30	12:45	0	0	1	0	0	2	0	0	1
12:45	13:00	0	1	3	0	0	1	0	0	0
13:00	13:15	0	1	1	0	0	1	0	1	0
13:15	13:30	0	0	1	0	0	1	0	2	0
13:30	13:45	0	0	2	0	0	2	0	0	0
13:45	14:00	0	1	2	0	0	0	0	0	1
14:00	14:15	0	1	2	0	0	0	0	2	0
14:15	14:30	0	2	1	0	0	0	0	1	0
14:30	14:45	0	0	1	0	0	2	0	0	1
14:45	15:00	0	1	2	0	0	0	0	2	0
15:00	15:15	0	1	2	0	0	2	0	0	0
15:15	15:30	0	0	2	0	0	0	0	1	0
15:30	15:45	0	1	0	0	0	0	0	0	0
15:45	16:00	0	0	2	0	0	0	0	1	1

Peak Time		North Approach Bolton St			East Approach Church St			West Approach Church St			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
11:15	12:15	0	2	6	0	0	4	0	3	1	16
12:00	13:00	0	3	7	0	0	3	0	2	1	16

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au

Intersection of Church St and Watt St, Newcastle

GPS *-32.930218, 151.783472*

Date:	Sat 09-02-19
Weather:	Fine
Suburban:	Newcastle
Customer:	BTFF

North:	Watt St
East:	Church St
South:	Watt St
West:	Church St

Survey	AM:	10:00 AM-12:00 PM
Period	PM:	12:00 PM-4:00 PM
Traffic	AM:	11:45 AM-12:45 PM
Peak	PM:	12:15 PM-1:15 PM

All Vehicles

Time		North Approach Watt St				East Approach Church St				South Approach Watt St				West Approach Church St				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
10:00	10:15	0	10	41	5	0	18	15	70	0	32	54	2	0	4	4	13	1061	
10:15	10:30	0	7	37	5	0	15	14	76	0	38	58	3	0	4	6	7	1046	
10:30	10:45	0	7	48	9	0	13	9	74	0	29	55	4	0	2	2	8	1059	
10:45	11:00	0	9	38	2	0	20	12	66	0	49	38	5	0	2	12	10	1082	
11:00	11:15	0	6	32	1	0	11	17	77	0	32	53	5	0	3	5	11	1097	
11:15	11:30	0	5	47	7	0	13	4	82	0	32	60	7	0	2	3	21	1146	
11:30	11:45	0	4	36	8	0	14	19	87	0	38	54	6	0	2	5	10	1167	
11:45	12:00	0	7	39	6	0	13	10	86	0	36	58	2	0	1	5	15	1181	
12:00	12:15	0	15	38	6	0	16	14	76	0	35	71	7	0	1	7	16	1188	
12:15	12:30	0	8	53	8	0	12	2	74	0	50	68	11	0	1	6	11	1199	Peak
12:30	12:45	0	6	57	10	0	17	23	63	0	49	48	9	0	1	6	8	1177	
12:45	13:00	0	4	39	7	0	14	17	71	0	49	54	4	0	0	8	18	1153	
13:00	13:15	0	7	53	5	0	18	14	94	0	43	60	2	0	2	3	12	1170	
13:15	13:30	0	6	50	13	0	8	9	81	0	35	49	5	0	2	10	14	1147	
13:30	13:45	0	5	37	6	0	20	21	89	0	36	39	4	0	1	2	13	1144	
13:45	14:00	0	7	43	3	0	13	15	93	0	47	63	3	0	4	2	9	1119	
14:00	14:15	0	6	40	5	0	18	14	97	0	38	45	6	0	3	7	11	1067	
14:15	14:30	0	7	37	4	0	22	12	89	0	28	61	4	0	3	5	7	993	
14:30	14:45	0	3	38	5	0	9	15	72	0	29	51	7	0	2	8	9	946	
14:45	15:00	0	5	32	3	0	17	18	79	0	24	52	3	0	3	5	9	925	
15:00	15:15	0	4	30	2	0	12	11	70	0	20	50	3	0	3	3	8	890	
15:15	15:30	0	5	33	1	0	14	8	82	0	23	55	4	0	2	2	3		
15:30	15:45	0	4	23	3	0	12	23	76	0	22	49	5	0	1	3	6		
15:45	16:00	0	2	28	3	0	13	15	66	0	23	45	2	0	2	4	12		

Peak Time		North Approach Watt St				East Approach Church St				South Approach Watt St				West Approach Church St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
11:45	12:45	0	36	187	30	0	58	49	299	0	170	245	29	0	4	24	50	1181
12:15	13:15	0	25	202	30	0	61	56	302	0	191	230	26	0	4	23	49	1199

Pedestrians Crossing

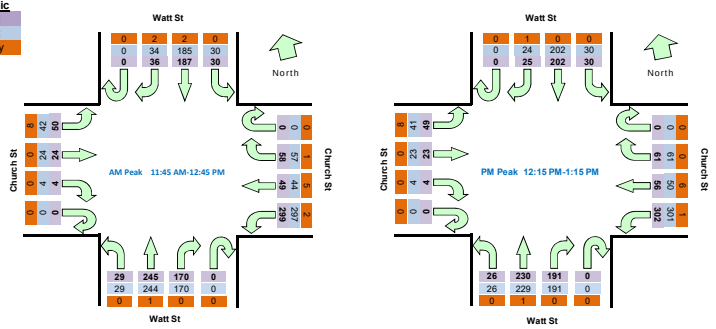
Time		North Approach Watt St		East Approach Church St		South Approach Watt St		West Approach Church St		Hourly Total
Period Start	Period End	Eastbound	Westbound	Southbound	Northbound	Eastbound	Westbound	Southbound	Northbound	
10:00	10:15	5	2	2	1	11	0	0	0	78
10:15	10:30	7	2	5	3	3	0	0	0	83
10:30	10:45	14	3	0	0	0	0	0	0	110
10:45	11:00	9	3	2	0	2	0	2	2	123
11:00	11:15	3	6	2	3	6	1	5	0	120
11:15	11:30	20	6	10	6	4	1	0	0	118
11:30	11:45	10	13	1	0	2	0	1	3	91
11:45	12:00	6	7	0	0	2	2	0	0	80
12:00	12:15	7	2	3	0	2	5	4	1	96
12:15	12:30	5	0	0	0	4	3	1	7	92
12:30	12:45	6	2	0	3	2	2	1	3	89
12:45	13:00	13	4	1	0	6	3	2	4	96
13:00	13:15	1	9	1	0	2	2	4	1	86
13:15	13:30	10	1	2	0	0	0	2	2	102
13:30	13:45	6	0	1	1	10	1	2	5	106
13:45	14:00	6	11	0	4	2	0	0	0	99
14:00	14:15	6	11		8	6	0	5	0	83
14:15	14:30	8	2	2	1	4	0	3	1	58
14:30	14:45	2	5	1	4	2	2	1	2	48
14:45	15:00	3	0	2	0	1	0	1	0	43
15:00	15:15	2	2	2	3	1	0	1	0	46
15:15	15:30	3	1	0	1	3	0	2	1	
15:30	15:45	1	3	1	2	2	2	3	0	
15:45	16:00	2	2	1	2	1	0	1	1	

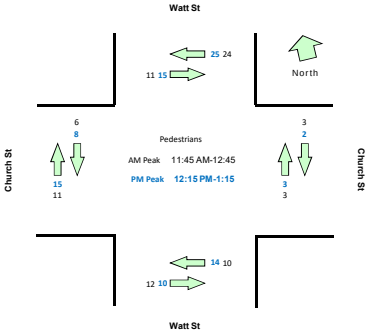
Peak Time		North Approach Watt St		East Approach Church St		South Approach Watt St		West Approach Church St		Peak hour
Period Start	Period End	Eastbound	Westbound	Southbound	Northbound	Eastbound	Westbound	Southbound	Northbound	total
11:45	12:45	24	11	3	3	10	12	6	11	80
12:15	13:15	25	15	2	3	14	10	8	15	92

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy





Light Vehicles

Time		North Approach Watt St				East Approach Church St				South Approach Watt St				West Approach Church St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
10:00	10:15	0	10	40	5	0	18	15	70	0	32	53	2	0	4	4	13
10:15	10:30	0	5	37	5	0	15	12	76	0	38	57	3	0	4	6	5
10:30	10:45	0	7	47	9	0	13	7	74	0	29	55	4	0	2	2	8
10:45	11:00	0	8	38	2	0	20	10	66	0	49	38	5	0	2	12	8
11:00	11:15	0	6	31	1	0	11	16	77	0	31	52	5	0	3	5	8
11:15	11:30	0	5	47	7	0	13	1	82	0	32	60	7	0	2	3	20
11:30	11:45	0	4	36	8	0	14	17	86	0	38	54	6	0	2	5	7
11:45	12:00	0	6	38	6	0	12	9	85	0	36	58	2	0	1	5	13
12:00	12:15	0	15	37	6	0	16	13	76	0	35	71	7	0	1	7	13
12:15	12:30	0	8	53	8	0	12	1	73	0	50	67	11	0	1	6	9
12:30	12:45	0	5	57	10	0	17	21	63	0	49	48	9	0	1	6	7
12:45	13:00	0	4	39	7	0	14	16	71	0	49	54	4	0	0	8	15
13:00	13:15	0	7	53	5	0	18	12	94	0	43	60	2	0	2	3	10
13:15	13:30	0	6	50	13	0	8	8	79	0	35	48	5	0	2	10	11
13:30	13:45	0	5	37	6	0	20	19	89	0	36	39	4	0	1	2	11
13:45	14:00	0	7	42	3	0	13	15	93	0	47	63	3	0	4	2	7
14:00	14:15	0	6	40	5	0	18	14	97	0	38	45	6	0	2	7	7
14:15	14:30	0	7	37	4	0	22	12	89	0	28	61	4	0	3	5	5
14:30	14:45	0	3	38	5	0	9	13	72	0	29	51	7	0	2	8	8
14:45	15:00	0	5	32	3	0	17	17	79	0	24	51	3	0	3	5	4
15:00	15:15	0	4	30	2	0	12	9	70	0	20	50	3	0	3	3	6
15:15	15:30	0	5	33	1	0	14	8	82	0	23	55	4	0	2	2	0
15:30	15:45	0	4	23	3	0	12	23	76	0	22	49	5	0	1	3	5
15:45	16:00	0	2	28	3	0	13	15	66	0	23	45	2	0	2	4	9

Peak Time		North Approach Watt St				East Approach Church St				South Approach Watt St				West Approach Church St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
11:45	12:45	0	34	185	30	0	57	44	297	0	170	244	29	0	4	24	42	1160
12:15	13:15	0	24	202	30	0	61	50	301	0	191	229	26	0	4	23	41	1182

Heavy Vehicles

Time		North Approach Watt St				East Approach Church St				South Approach Watt St				West Approach Church St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
10:00	10:15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
10:15	10:30	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
10:30	10:45	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
10:45	11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	11:15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
11:15	11:30	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
11:30	11:45	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
11:45	12:00	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
12:00	12:15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:15	12:30	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:30	12:45	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:45	13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	13:15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
13:15	13:30	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
13:30	13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	14:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
14:15	14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	15:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
15:00	15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
15:45	16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Peak Time		North Approach Watt St				East Approach Church St				South Approach Watt St				West Approach Church St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
11:45	12:45	0	2	2	0	0	1	5	2	0	0	1	0	0	0	0	8	21
12:15	13:15	0	1	0	0	0	0	6	1	0	0	1	0	0	0	0	8	17

Bus

Time		North Approach Watt St				East Approach Church St				South Approach Watt St				West Approach Church St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
10:00	10:15	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15	10:30	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	2
10:30	10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45	11:00	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	2
11:00	11:15	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	2
11:15	11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:30	11:45	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	3
11:45	12:00	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	2
12:00	12:15	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3
12:15	12:30	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	2
12:30	12:45	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1
12:45	13:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3
13:00	13:15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
13:15	13:30	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	3
13:30	13:45	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
13:45	14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
14:00	14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3
14:15	14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
14:30	14:45	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1
14:45	15:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	4
15:00	15:15	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
15:15	15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
15:30	15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3

Peak Time		North Approach Watt St				East Approach Church St				South Approach Watt St				West Approach Church St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
11:45	12:45	0	2	2	0	0	0	2	1	0	0	1	0	0	0	0	8	16
12:15	13:15	0	1	0	0	0	0	3	1	0	0	1	0	0	0	0	8	14

Appendix B Criteria for Interpreting Sidra Modelling Results

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 requires accident study
D	Operating near capacity	Near capacity and requires accident study
E	At capacity, excessive delay: roundabout requires other control method	At capacity, requires other control mode
F	Unsatisfactory, requires other control mode or additional capacity	Unsatisfactory, requires other control mode

2-Average Vehicle Delay (AVD)

The AVD is a measure of operational performance of an intersection relating to its LoS. The average delay should be taken as a guide only for an average intersection. Longer delays may be tolerated at some intersections where delays are expected by motorists (e.g. those in inner city areas or major arterial roads).

LoS	Average Delay / Vehicle (secs)	Traffic Signals and Roundabouts	Give Way and Stop Signs
A	Less than 15	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	28 to 42	Satisfactory	Satisfactory but accident study required
D	42 to 56	Operating near capacity	Near capacity, accident study required
E	56 to 70	At capacity, excessive delays: roundabout requires other control mode	At capacity; requires other control mode
F	Exceeding 70	Unsatisfactory, requires additional capacity	Unsatisfactory, requires other control mode

3-Degree of Saturation (D/S)

The D/S of an intersection is usually taken as the highest ratio of traffic volumes on an approach to an intersection compared with the theoretical capacity, and is a measure of the utilisation of available green time. For intersections controlled by traffic signals, both queues and delays increase rapidly as DS approaches 1.0. An intersection operates satisfactorily when its D/S is kept below 0.75. When D/S exceeds 0.9, queues are expected.

LANE LEVEL OF SERVICE

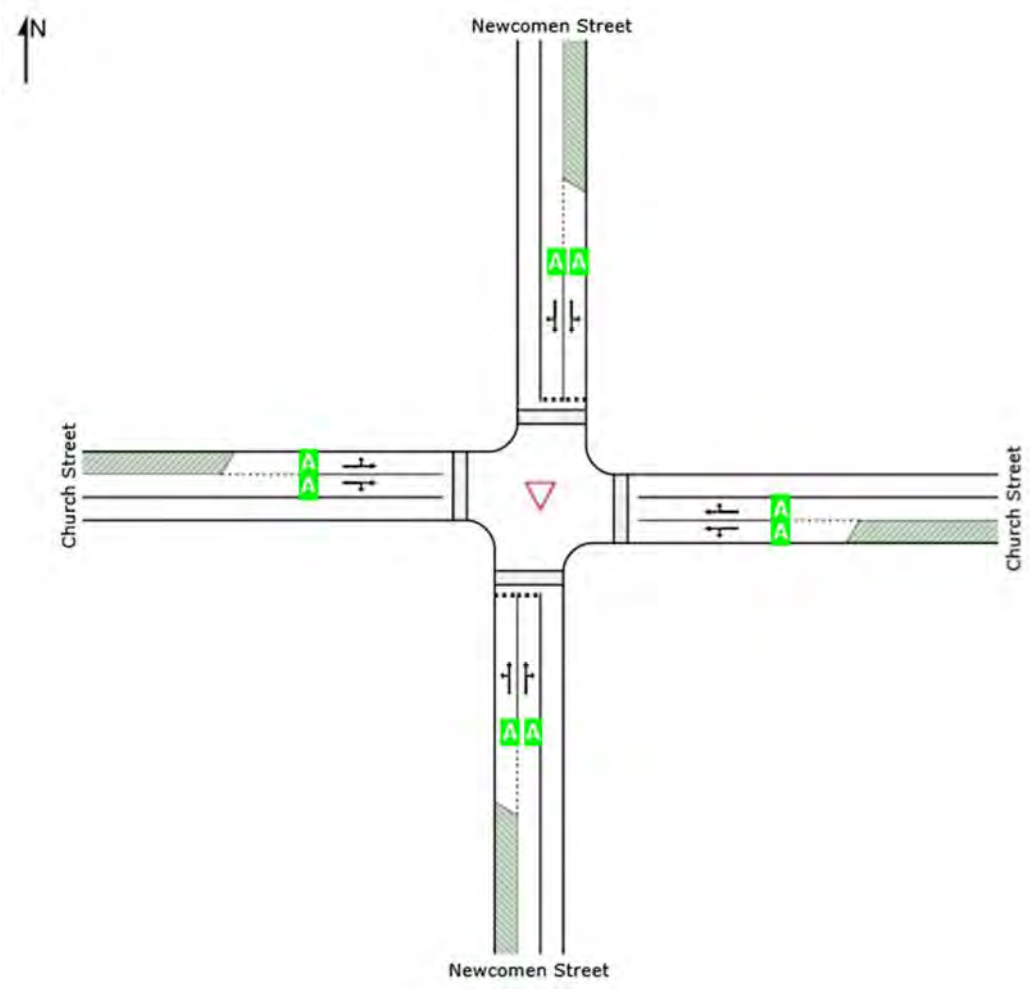
Lane Level of Service

Site: 101 [Church & Newcomen AM]

Church Street & Newcomen Street Newcastle East
Giveway / Yield (Two-Way)

All Movement Classes

	South	East	North	West	Intersection
LOS	A	NA	A	NA	NA



Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

MOVEMENT SUMMARY

Site: 101 [Church & Newcomen AM]

Church Street & Newcomen Street Newcastle East
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: Newcomen Street											
1	L2	131	5.6	0.109	5.9	LOS A	0.4	3.0	0.18	0.55	49.0
2	T1	106	3.0	0.302	6.3	LOS A	1.4	10.4	0.46	0.66	48.4
3	R2	121	2.6	0.302	8.4	LOS A	1.4	10.4	0.46	0.66	47.7
Approach		358	3.8	0.302	6.9	LOS A	1.4	10.4	0.36	0.62	48.4
East: Church Street											
4	L2	37	0.0	0.020	5.5	LOS A	0.0	0.0	0.00	0.58	50.2
5	T1	77	13.7	0.063	0.1	LOS A	0.2	1.4	0.09	0.15	57.1
6	R2	26	8.0	0.063	5.9	LOS A	0.2	1.4	0.09	0.15	53.7
Approach		140	9.0	0.063	2.6	NA	0.2	1.4	0.07	0.26	54.5
North: Newcomen Street											
7	L2	29	10.7	0.024	5.9	LOS A	0.1	0.7	0.13	0.54	48.9
8	T1	28	3.7	0.045	6.0	LOS A	0.2	1.3	0.39	0.57	49.2
9	R2	5	20.0	0.045	10.8	LOS A	0.2	1.3	0.39	0.57	47.4
Approach		63	8.3	0.045	6.3	LOS A	0.2	1.3	0.27	0.56	48.9
West: Church Street											
10	L2	15	0.0	0.008	5.5	LOS A	0.0	0.0	0.00	0.58	50.2
11	T1	48	15.2	0.031	0.1	LOS A	0.0	0.3	0.05	0.06	58.6
12	R2	5	0.0	0.031	5.9	LOS A	0.0	0.3	0.05	0.06	55.7
Approach		68	10.8	0.031	1.7	NA	0.0	0.3	0.04	0.17	56.4
All Vehicles		629	6.2	0.302	5.3	NA	1.4	10.4	0.25	0.48	50.4

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

LANE LEVEL OF SERVICE

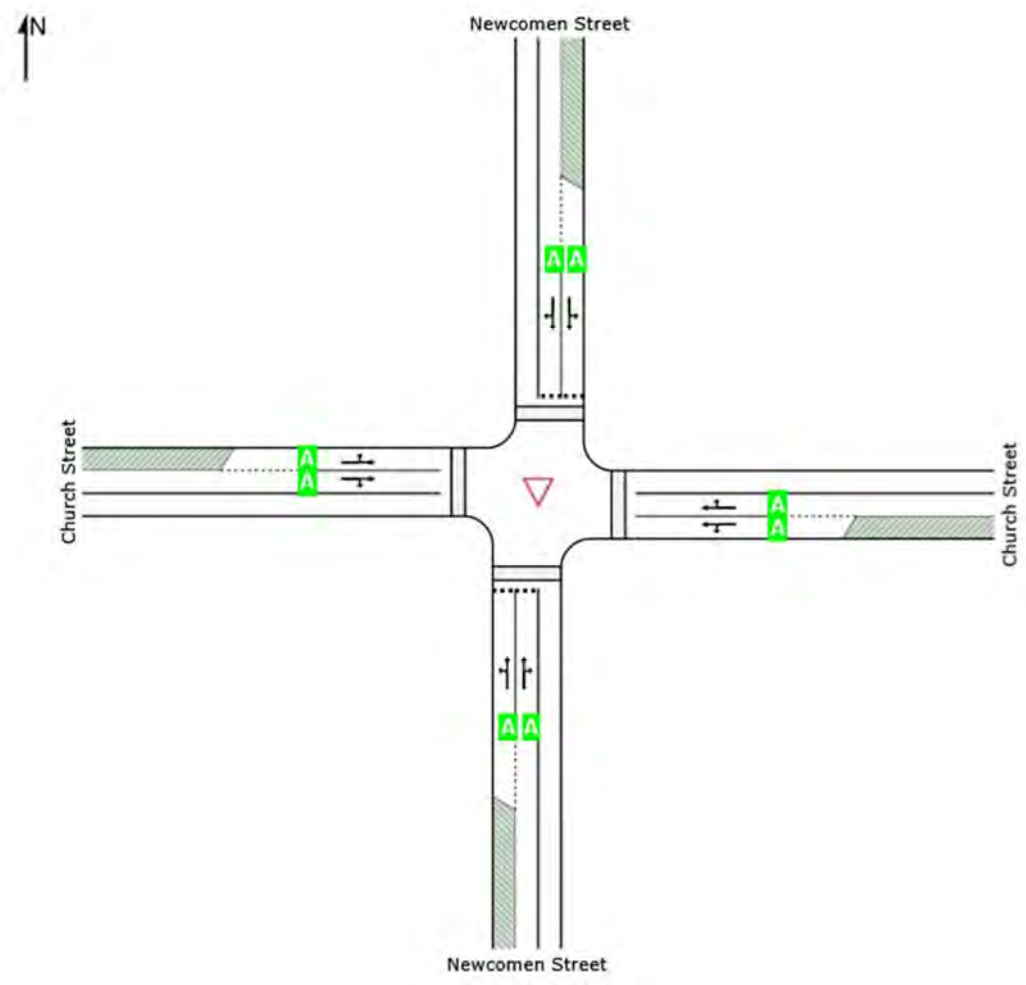
Lane Level of Service

Site: 101 [Church & Newcomen PM]

Church Street & Newcomen Street Newcastle East
Giveway / Yield (Two-Way)

All Movement Classes

	South	East	North	West	Intersection
LOS	A	NA	A	NA	NA



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

Lane LOS values are based on average delay per lane.

Minor Road Approach LOS values are based on average delay for all lanes.

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 lanes.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

MOVEMENT SUMMARY

Site: 101 [Church & Newcomen PM]

Church Street & Newcomen Street Newcastle East
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: Newcomen Street											
1	L2	59	3.6	0.050	6.0	LOS A	0.2	1.3	0.20	0.55	49.0
2	T1	56	0.0	0.161	6.3	LOS A	0.7	4.8	0.45	0.66	48.3
3	R2	56	3.8	0.161	9.1	LOS A	0.7	4.8	0.45	0.66	47.3
Approach		171	2.5	0.161	7.1	LOS A	0.7	4.8	0.37	0.62	48.2
East: Church Street											
4	L2	129	0.8	0.070	5.6	LOS A	0.0	0.0	0.00	0.58	50.1
5	T1	100	9.5	0.069	0.0	LOS A	0.1	1.0	0.04	0.10	58.1
6	R2	20	0.0	0.069	5.6	LOS A	0.1	1.0	0.04	0.10	55.2
Approach		249	4.2	0.070	3.3	NA	0.1	1.0	0.02	0.35	53.5
North: Newcomen Street											
7	L2	11	0.0	0.024	5.6	LOS A	0.1	0.7	0.10	0.54	49.5
8	T1	99	0.0	0.122	6.7	LOS A	0.5	3.6	0.41	0.62	49.2
9	R2	6	0.0	0.122	8.1	LOS A	0.5	3.6	0.45	0.63	48.4
Approach		116	0.0	0.122	6.7	LOS A	0.5	3.6	0.38	0.61	49.2
West: Church Street											
10	L2	13	0.0	0.007	5.5	LOS A	0.0	0.0	0.00	0.58	50.2
11	T1	22	19.0	0.019	0.3	LOS A	0.1	0.4	0.17	0.15	56.4
12	R2	7	0.0	0.019	6.4	LOS A	0.1	0.4	0.17	0.15	53.6
Approach		42	10.0	0.019	3.0	NA	0.1	0.4	0.12	0.28	53.9
All Vehicles		578	3.3	0.161	5.1	NA	0.7	4.8	0.20	0.48	51.0

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

LANE LEVEL OF SERVICE

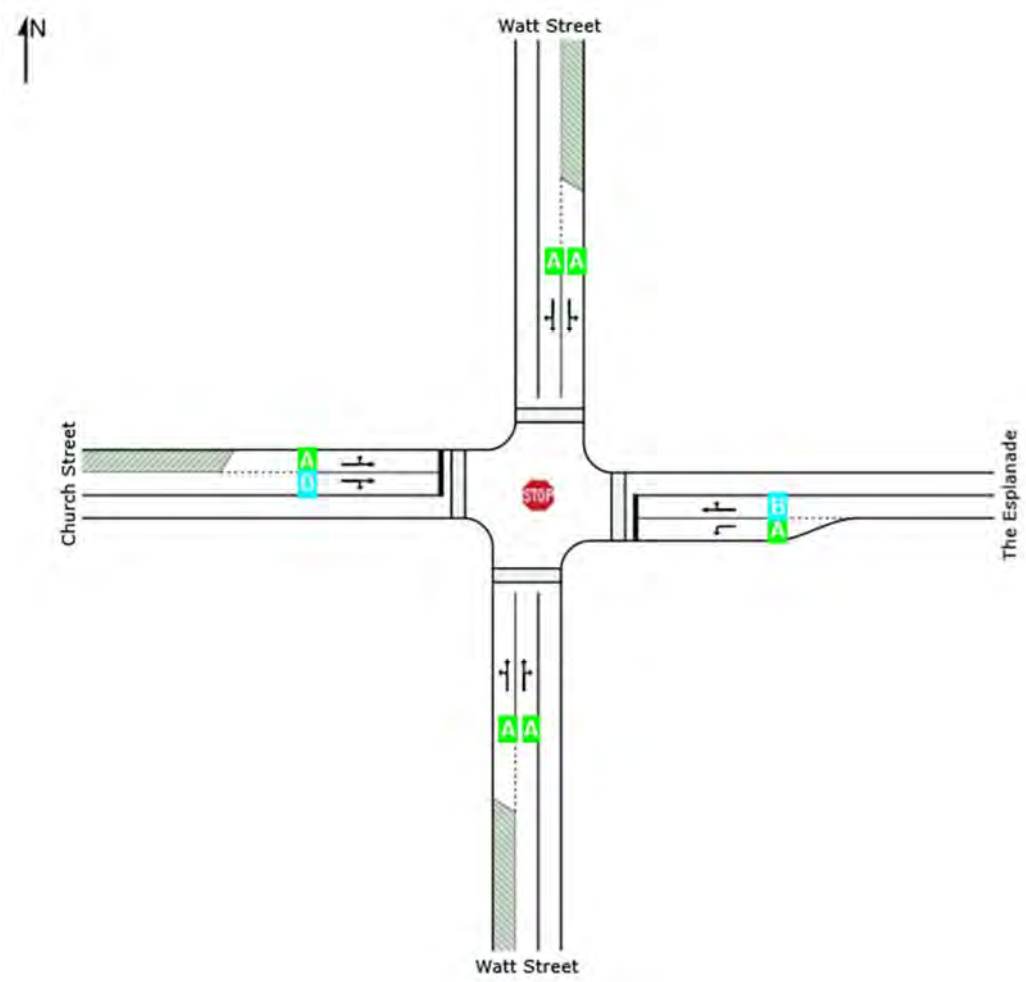
Lane Level of Service

Site: 101 [Watt & Church AM]

Watt Street & Church Street & The Esplanade Newcastle East
Stop (Two-Way)

All Movement Classes

	South	East	North	West	Intersection
LOS	NA	A	NA	A	NA



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

Lane LOS values are based on average delay per lane.

Minor Road Approach LOS values are based on average delay for all lanes.

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 lanes.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

MOVEMENT SUMMARY

Site: 101 [Watt & Church AM]

Watt Street & Church Street & The Esplanade Newcastle East
Stop (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: Watt Street											
1	L2	47	0.0	0.049	5.5	LOS A	0.0	0.0	0.00	0.30	54.9
2	T1	275	0.8	0.243	0.4	LOS A	1.1	8.1	0.21	0.25	57.1
3	R2	148	2.1	0.243	6.4	LOS A	1.1	8.1	0.25	0.24	55.2
Approach		471	1.1	0.243	2.8	NA	1.1	8.1	0.20	0.25	56.3
East: The Esplanade											
4	L2	158	3.3	0.156	9.0	LOS A	0.6	4.4	0.28	0.89	51.4
5	T1	27	23.1	0.265	23.0	LOS B	1.0	7.9	0.77	1.04	40.1
6	R2	41	0.0	0.265	23.0	LOS B	1.0	7.9	0.77	1.04	43.5
Approach		226	5.1	0.265	13.2	LOS A	1.0	7.9	0.43	0.93	48.5
North: Watt Street											
7	L2	17	12.5	0.024	5.7	LOS A	0.0	0.0	0.00	0.23	55.9
8	T1	143	2.9	0.118	0.7	LOS A	0.5	3.5	0.24	0.22	57.3
9	R2	58	1.8	0.118	7.1	LOS A	0.5	3.5	0.30	0.21	54.2
Approach		218	3.4	0.118	2.8	NA	0.5	3.5	0.24	0.22	56.4
West: Church Street											
10	L2	72	30.9	0.098	11.4	LOS A	0.4	3.1	0.41	0.93	47.7
11	T1	25	0.0	0.128	16.7	LOS B	0.5	3.3	0.73	1.00	42.5
12	R2	11	10.0	0.128	27.3	LOS B	0.5	3.3	0.73	1.00	42.1
Approach		107	21.6	0.128	14.2	LOS A	0.5	3.3	0.51	0.96	45.8
All Vehicles		1022	4.6	0.265	6.3	NA	1.1	8.1	0.29	0.47	53.3

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

LANE LEVEL OF SERVICE

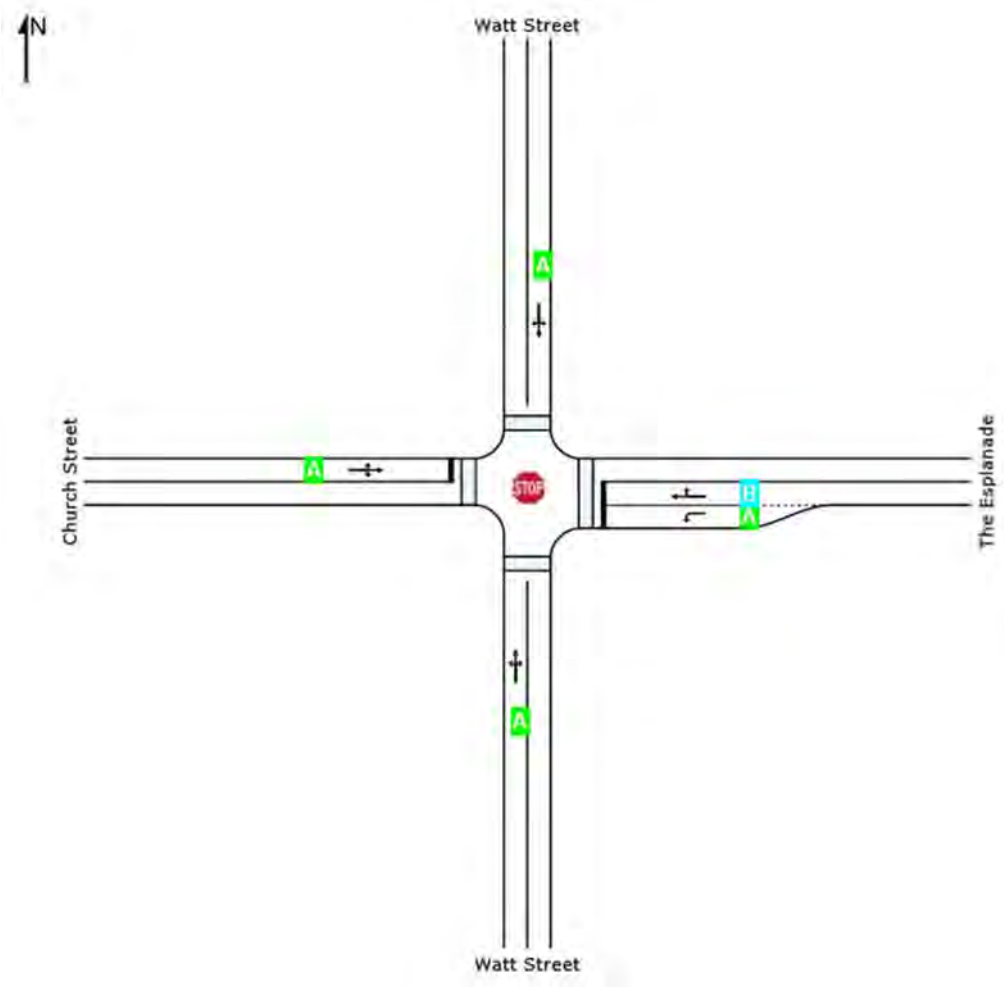
Lane Level of Service

Site: 101 [Watt & Church AM - 1L NSW Approaches +20% + 100% Dev't]

Watt Street & Church Street & The Esplanade Newcastle East
Stop (Two-Way)

All Movement Classes

	South	East	North	West	Intersection
LOS	NA	A	NA	A	NA



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

Lane LOS values are based on average delay per lane.

Minor Road Approach LOS values are based on average delay for all lanes.

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 lanes.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

MOVEMENT SUMMARY

Site: 101 [Watt & Church AM - 1L NSW Approaches +20% + 100% Dev't]

Watt Street & Church Street & The Esplanade Newcastle East
Stop (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: Watt Street											
1	L2	57	0.0	0.324	6.3	LOS A	1.6	11.1	0.28	0.23	54.3
2	T1	329	1.0	0.324	0.5	LOS A	1.6	11.1	0.28	0.23	56.8
3	R2	178	2.4	0.324	6.4	LOS A	1.6	11.1	0.28	0.23	54.9
Approach		564	1.3	0.324	2.9	NA	1.6	11.1	0.28	0.23	56.0
East: The Esplanade											
4	L2	189	3.3	0.159	9.0	LOS A	0.7	4.9	0.31	0.88	51.5
5	T1	34	21.9	0.272	20.2	LOS B	1.0	7.4	0.77	1.05	41.9
6	R2	49	0.0	0.272	19.4	LOS B	1.0	7.4	0.77	1.05	45.1
Approach		273	5.0	0.272	12.2	LOS A	1.0	7.4	0.45	0.93	49.1
North: Watt Street											
7	L2	21	10.0	0.180	7.2	LOS A	0.8	6.0	0.36	0.25	54.7
8	T1	172	3.1	0.180	1.0	LOS A	0.8	6.0	0.36	0.25	56.6
9	R2	93	3.4	0.180	7.2	LOS A	0.8	6.0	0.36	0.25	53.2
Approach		285	3.7	0.180	3.4	NA	0.8	6.0	0.36	0.25	55.4
West: Church Street											
10	L2	86	30.5	0.233	11.5	LOS A	0.9	7.2	0.54	0.97	45.9
11	T1	31	0.0	0.233	15.6	LOS B	0.9	7.2	0.54	0.97	46.9
12	R2	13	8.3	0.233	24.2	LOS B	0.9	7.2	0.54	0.97	46.3
Approach		129	21.1	0.233	13.7	LOS A	0.9	7.2	0.54	0.97	46.2
All Vehicles		1252	4.7	0.324	6.2	NA	1.6	11.1	0.36	0.46	53.2

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

LANE LEVEL OF SERVICE

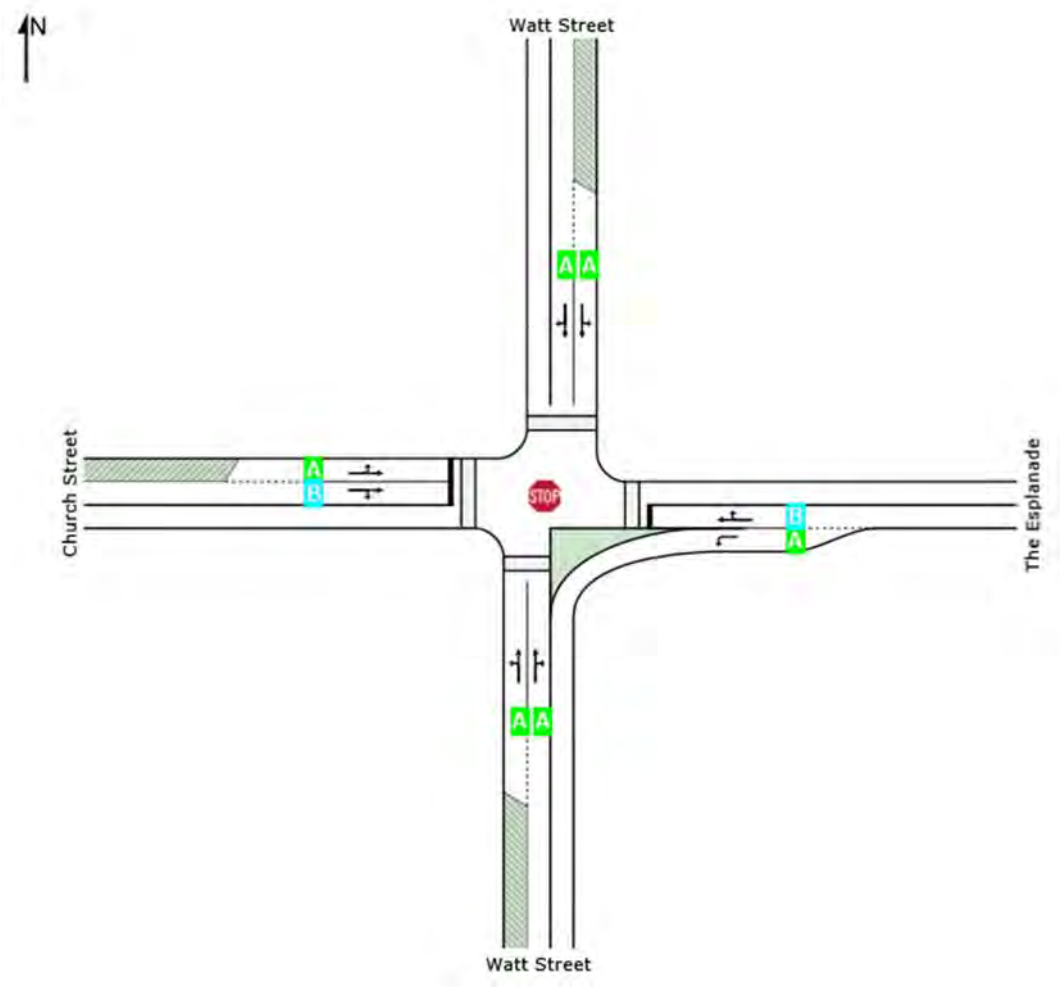
Lane Level of Service

Site: 101 [Watt & Church PM]

Watt Street & Church Street & The Esplanade Newcastle East
Stop (Two-Way)

All Movement Classes

	South	East	North	West	Intersection
LOS	NA	A	NA	B	NA



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

Lane LOS values are based on average delay per lane.

Minor Road Approach LOS values are based on average delay for all lanes.

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 lanes.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

MOVEMENT SUMMARY

Site: 101 [Watt & Church PM]

Watt Street & Church Street & The Esplanade Newcastle East
Stop (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: Watt Street											
1	L2	20	0.0	0.038	5.5	LOS A	0.0	0.0	0.00	0.17	56.2
2	T1	201	1.6	0.188	0.6	LOS A	0.9	6.3	0.23	0.25	57.0
3	R2	125	0.0	0.188	6.6	LOS A	0.9	6.3	0.31	0.28	54.7
Approach		346	0.9	0.188	3.1	NA	0.9	6.3	0.25	0.26	56.1
East: The Esplanade											
4	L2	295	0.7	0.160	5.6	LOS A	0.0	0.0	0.00	0.53	54.9
5	T1	53	0.0	0.262	16.4	LOS B	1.1	7.7	0.71	1.03	43.3
6	R2	36	5.9	0.262	21.8	LOS B	1.1	7.7	0.71	1.03	45.5
Approach		383	1.1	0.262	8.6	LOS A	1.1	7.7	0.16	0.64	52.3
North: Watt Street											
7	L2	23	0.0	0.025	5.5	LOS A	0.0	0.0	0.00	0.28	56.0
8	T1	206	0.5	0.127	0.3	LOS A	0.3	2.4	0.12	0.12	58.5
9	R2	36	8.8	0.127	6.7	LOS A	0.3	2.4	0.14	0.10	55.5
Approach		265	1.6	0.127	1.6	NA	0.3	2.4	0.11	0.13	57.9
West: Church Street											
10	L2	77	16.4	0.087	9.9	LOS A	0.3	2.6	0.33	0.90	48.9
11	T1	23	4.5	0.197	16.1	LOS B	0.7	5.0	0.76	1.01	41.0
12	R2	25	0.0	0.197	27.7	LOS B	0.7	5.0	0.76	1.01	41.0
Approach		125	10.9	0.197	14.7	LOS B	0.7	5.0	0.50	0.94	45.5
All Vehicles		1120	2.3	0.262	5.9	NA	1.1	7.7	0.21	0.44	54.0

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

LANE LEVEL OF SERVICE

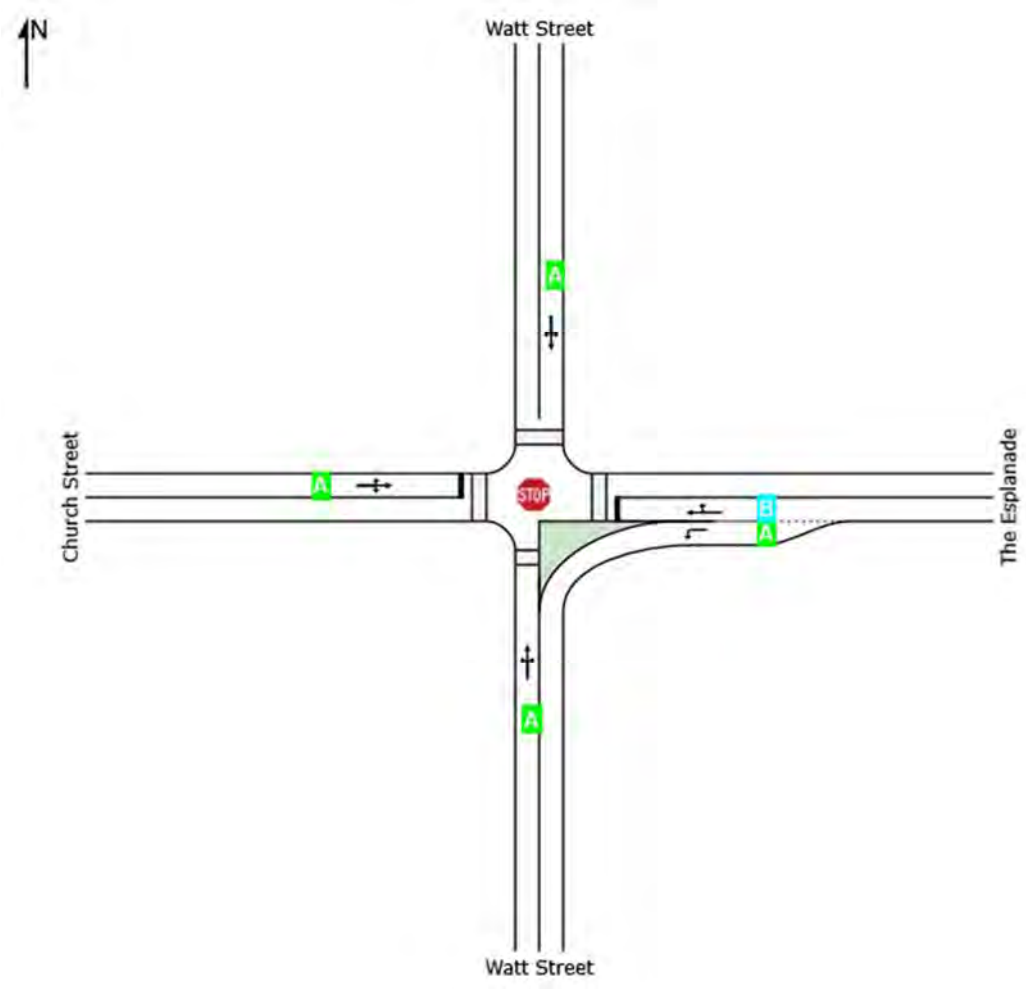
Lane Level of Service

Site: 101 [Watt & Church PM - 1L NSW Approaches - +20% + 100% Dev't]

Watt Street & Church Street & The Esplanade Newcastle East
Stop (Two-Way)

All Movement Classes

	South	East	North	West	Intersection
LOS	NA	A	NA	A	NA



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

Lane LOS values are based on average delay per lane.

Minor Road Approach LOS values are based on average delay for all lanes.

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 lanes.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

MOVEMENT SUMMARY

Site: 101 [Watt & Church PM - 1L NSW Approaches - +20% + 100% Dev't]

Watt Street & Church Street & The Esplanade Newcastle East
Stop (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: Watt Street											
1	L2	24	0.0	0.246	6.6	LOS A	1.2	8.2	0.31	0.25	54.1
2	T1	241	1.7	0.246	0.6	LOS A	1.2	8.2	0.31	0.25	56.6
3	R2	151	0.0	0.246	6.6	LOS A	1.2	8.2	0.31	0.25	54.9
Approach		416	1.0	0.246	3.1	NA	1.2	8.2	0.31	0.25	55.8
East: The Esplanade											
4	L2	354	0.9	0.192	5.6	LOS A	0.0	0.0	0.00	0.53	54.9
5	T1	63	0.0	0.252	13.8	LOS A	0.9	6.7	0.68	1.04	45.2
6	R2	43	4.9	0.252	17.7	LOS B	0.9	6.7	0.68	1.04	47.2
Approach		460	1.1	0.252	7.9	LOS A	0.9	6.7	0.16	0.65	52.8
North: Watt Street											
7	L2	28	0.0	0.166	6.3	LOS A	0.4	3.1	0.16	0.14	56.6
8	T1	227	0.9	0.166	0.3	LOS A	0.4	3.1	0.16	0.14	58.1
9	R2	43	7.3	0.166	6.6	LOS A	0.4	3.1	0.16	0.14	54.6
Approach		299	1.8	0.166	1.8	NA	0.4	3.1	0.16	0.14	57.5
West: Church Street											
10	L2	115	12.8	0.296	10.2	LOS A	1.2	9.3	0.49	0.95	46.4
11	T1	28	3.7	0.296	14.5	LOS B	1.2	9.3	0.49	0.95	46.5
12	R2	31	0.0	0.296	23.8	LOS B	1.2	9.3	0.49	0.95	46.4
Approach		174	9.1	0.296	13.3	LOS A	1.2	9.3	0.49	0.95	46.4
All Vehicles		1348	2.3	0.296	5.8	NA	1.2	9.3	0.25	0.45	53.9

Site Level of Service (LOS) Method: Delay (RTA NSW). 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 C Secretary's Environmental Assessment Requirements

The following SEAR's were received from the Department of Planning and Environment, and NSW Transport Roads and Maritime Services on 21st December 2018.

A. Department of Planning and Environment - Transport and Accessibility

Include a transport and accessibility impact assessment, which details, but not limited to the following:

- accurate details of the current daily and peak hour vehicle, existing and future public transport networks and pedestrian and cycle movement provided on the road network located adjacent to the proposed development
  - ➔ **COMPLETED. Detailed in Section 2.3 of this Document**
- details of estimated total daily and peak hour trips generated by the proposal, including vehicle, public transport, pedestrian and bicycle trips based on surveys within the local area
  - ➔ **RESPONSE. Car trips calculated. Other non-peak related trips by alternate modes to be addressed in Green Travel Plan prior to Occupation Certificate being issued.**
- the adequacy of existing public transport or any future public transport infrastructure within the vicinity of the site, pedestrian and bicycle networks and associated infrastructure to meet the likely future demand of the proposed development
  - ➔ **RESPONSE Site loading on public transport are minimal. Existing services including busses outside the front door, and new light rail within comfortable working distance are more than able to accommodate this site's travel.**
- measures to integrate the development with the existing/future public transport network
  - ➔ **RESPONSE. Non-car related trips by alternate modes to be addressed in Green Travel Plan prior to Occupation Certificate being issued.**
- the impact of trips generated by the development on nearby intersections, with consideration of the cumulative impacts from other approved developments in the vicinity, and the need/associated funding for, and details of, upgrades or road improvement works, if required (Traffic modelling is to be undertaken using SIDRA network modelling for current and future years)
  - ➔ **COMPLETED. Detailed in Section 3.6 and Appendix B of this Document**
- the identification of infrastructure required to ameliorate any impacts on traffic efficiency and road safety impacts associated with the proposed development, including details on improvements required to affected intersections
  - ➔ **COMPLETED. NONE REQUIRED**
- details of travel demand management measures to minimise the impact on general traffic and bus operations, including details of a location specific sustainable travel plan (Green Travel Plan and specific Workplace travel plan) and the provision of facilities to increase the non-car mode share for travel to and from the site
  - ➔ **RESPONSE. Non-car related trips by alternate modes to be addressed in Green Travel Plan prior to Occupation Certificate being issued.**
- the proposed walking and cycling access arrangements and connections to public transport services
  - ➔ **RESPONSE. Non-car related trips by alternate modes to be addressed in Green Travel Plan prior to Occupation Certificate being issued.**
- the proposed access arrangements, including car and bus pick-up/drop off facilities, and measures to mitigate any associated traffic impacts and impacts on public transport, pedestrian and bicycle networks, including pedestrian crossings and refuges and speed control devices and zones
  - ➔ **COMPLETED. NONE REQUIRED**
- proposed bicycle parking provision, including end of trip facilities, in secure, convenient, accessible areas close to main entries incorporating lighting and passive surveillance
  - ➔ **COMPLETED. Bicycle parking provisions noted on DA Plans**
- proposed number of on-site car parking spaces for staff and visitors and corresponding compliance with existing parking codes and justification for the level of car parking provided on-site
  - ➔ COMPLETED. Car parking - 20 spaces noted on DA Plans

- an assessment of the cumulative on-street parking impacts of cars, staff parking and any other parking demands associated with the development
  - ➔ COMPLETED. NO cumulative impacts are anticipated as a result of the style and type of on-site activity (i.e. Student cohort is 100% accommodated on site.)
- an assessment of road and pedestrian safety adjacent to the proposed development and the details of required road safety measures and personal safety in line with CPTED
  - ➔ COMPLETED. NO CHANGES OT EXISTING FACILITIES REQUIRED
- emergency vehicle access, service vehicle access, delivery and loading arrangements and estimated service vehicle movements (including vehicle type and the likely arrival and departure times)
  - ➔ COMPLETED. SERVICE VEHICLE ACCESS VIA EXISTING ACCESS
- the preparation of a preliminary Construction Traffic and Pedestrian Management Plan to demonstrate the proposed management of the impact in relation to construction traffic addressing the following:
  - o assessment of cumulative impacts associated with other construction activities (if any)
  - o an assessment of road safety at key intersection and locations subject to heavy vehicle construction traffic movements and high pedestrian activity
  - o details of construction program detailing the anticipated construction duration and highlighting significant and milestone stages and events during the construction process
  - o details of anticipated peak hour and daily construction vehicle movements to and from the site
  - o details of on-site car parking and access arrangements of construction vehicles, construction workers to and from the site, emergency vehicles and service vehicle
  - o details of temporary cycling and pedestrian access during construction.
  - ➔ RESPONSE CTPMP to be completed with input from construction contractor prior to issue of Construction Certificate

- Relevant Policies and Guidelines:
  - o Guide to Traffic Generating Developments (Roads and Maritime Services)
  - o EIS Guidelines – Road and Related Facilities (DoPI)
  - o Cycling Aspects of Austroads Guides
  - o NSW Planning Guidelines for Walking and Cycling
  - o Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development
  - o Standards Australia AS2890.3 (Bicycle Parking Facilities).
  - ➔ RESPONSE – Refer to comprehensive list of references in Section 1 applied in this assessment.

B. NSW Transport Roads and Maritime Services Correspondence (10 Dec 18) received 21 Dec 18

Roads and Maritime Services (RMS) response and requirements reflects standard Traffic Engineering Practice in requiring a traffic and transport study to be prepared in accordance with the Guide to Traffic Generating Developments, (Version 2.2, RTA October 2002).

- ➔ RESPONSE - This Document represents the response by the proponent in reply to this request from RMS.
- ➔ Contact was made with RMS on 14 Jan 19 in particular seeking clarification of the following:
  1. Traffic Impacts – if it is able to be proven/confirmed that traffic from the re-development is in fact a reduction from the site's previous use, can the request for updated traffic counts and analysis be waived? If not what extent of surveys is expected, 1 day, 3 day, and geographic coverage.
     - RMS reply received Mon 4 Feb 19 seeking counts on Scott / Hunter Street.
     - → RESPONSE – NOT RELEVANT to the scale and significance of this development and being too remote from the subject site to be relevant. Counts were conducted at the three (3) junctions on Church Street in the immediate vicinity of the subject site, for 3 consecutive days. These and subsequent analysis confirm the negligible impact levels of traffic from the development proposal.

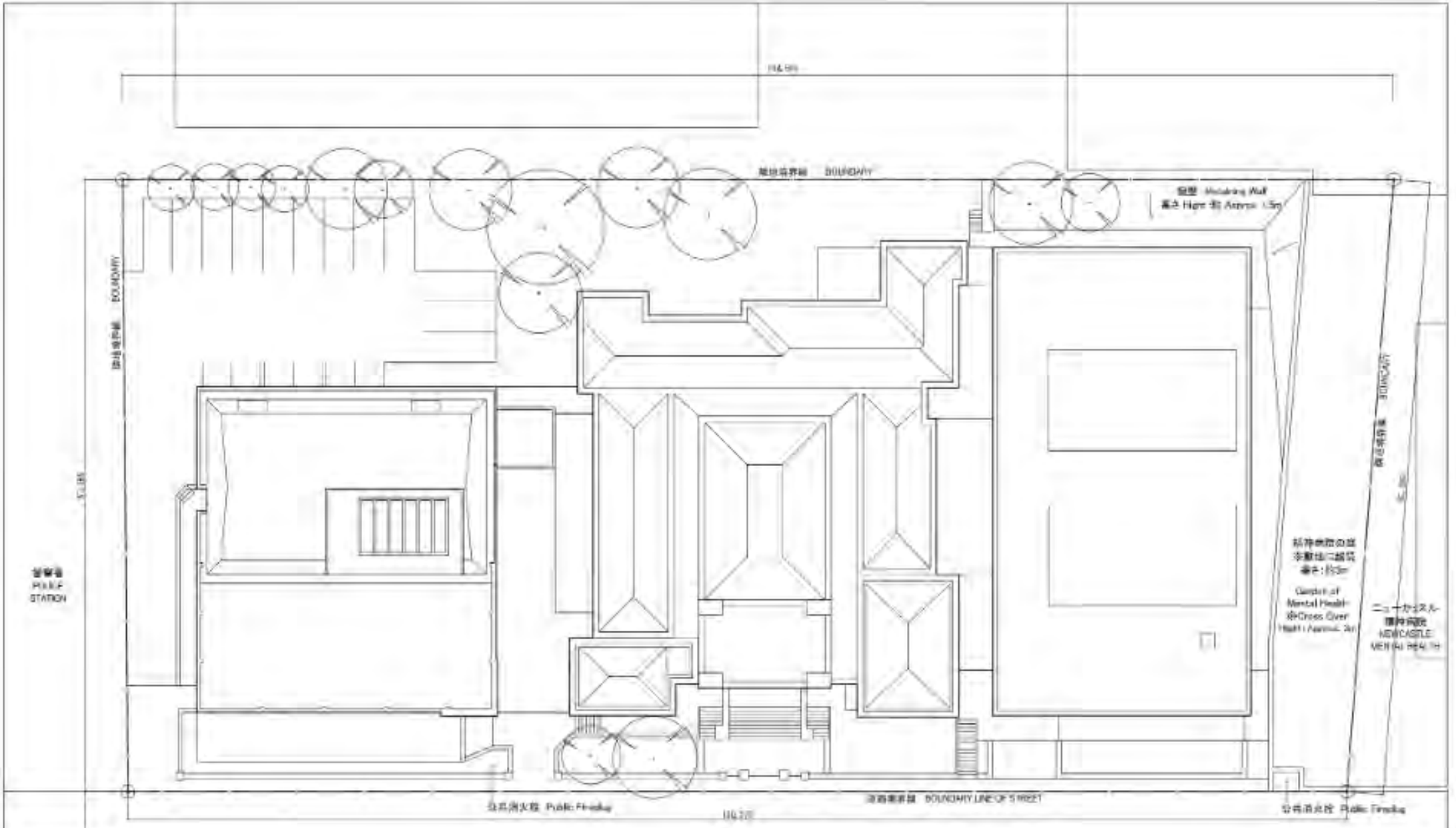
2. Green Travel Plan (GTP) – The project team is in agreement and has already recommended to the client a GTP be prepared. However we would seek for the development of a GTP to be stipulated as a condition of development consent, to be completed prior to occupation of the site, so that the operators of the site can be fully engaged in its development. By using this timing unnecessary duplication (both in product and cost) can be avoided.
    - RMS reply received Mon 4 Feb 19 noting request for GTP was not an RMS requirement.
    - → RESPONSE – It is proposed to complete a GTP prior to release of Occupation Certificate, so that the site operators and designers can have input to produce a meaningful and relevant GTP. Matter to be discussed and negotiated with Council and DPE.

3. Construction Traffic and Pedestrian Management Plan (CTPMP) – The project team is also in agreement a CTPMP needs to be completed, and would request such is also stipulated as a condition of development consent, to be completed prior to issue of a construction certificate of the site. (i.e. Upon completion of detailed design.) Again by using this timing unnecessary duplication (both in product and cost) can be avoided.
    - RMS reply received Mon 4 Feb 19 noting request for CTPMP was not an RMS requirement.
    - → RESPONSE – It is proposed to complete a CTPMP prior to release of Construction Certificate, so that detailed design considerations and construction contractor inputs can be accommodated to produce a CTPMP relevant to the final design proposed construction methods. Matter to be discussed and negotiated with Council and DPE.

➔ COMMENTS - While the subject site is a historically significant site in the Newcastle East landscape, the scale of this re-development proposal is quite minor, with only around 100 students living on campus full time, and 7 teachers plus 1 staff member accommodated on site.

➔ Traffic and Transport Impacts are therefore quite minor and will have negligible impact on the existing transport networks.

Appendix D Project Plans



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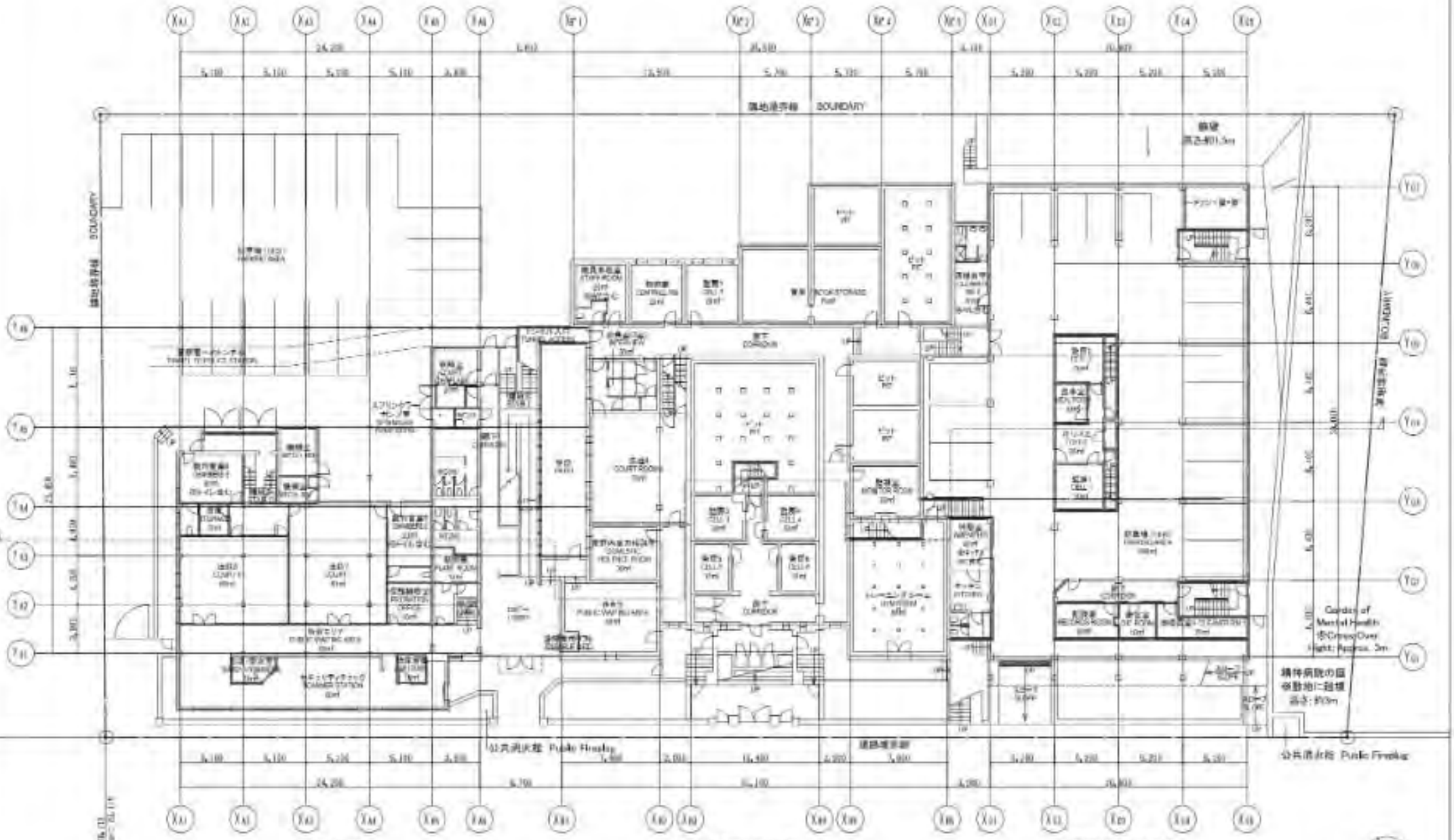
日本大学オーストラリアニューカッスルキャンパス
Nihon University Australia Newcastle Campus Project

配置図 Site Plan

SCALE A3：1/300

DRAWING NO. A — 02

DATE 2017. 4. 21



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日本大学オーストラリアニューカッスルキャンパス
Nihon University Australia Newcastle Campus Project

1階平面図 1st Floor Plan

縮尺	A3：1/200
図面番号	A － 03
日付	2017.4.21

Nihon University Australia Newcastle Campus Project

Basic Design (For Development Application)

AZUSA SEKKEI
Architects, Engineers & Consultants

Feb. 2019

Nihon University Australia Newcastle Campus Project

	Drawing No.	Title of Drawing (Diagram & Information)
Rev-0	A - 000	Drawing List
Rev-0	A - 001	Project Summary
Rev-0	A - 002	Perspective-1
Rev-0	A - 003	Perspective-2
Rev-0	A - 004	Perspective-3
Rev-0	A - 005	Perspective-4
Rev-0	A - 006	Perspective-5
Rev-0	A - 007	Perspective-6
Rev-0	A - 008	Conservation Plan
Rev-0	A - 009	Demolition Plan
Rev-0	A - 010	Conversion Plan
Rev-0	A - 011	Design Option Studies-1
Rev-0	A - 012	Design Option Studies-2

	Drawing No.	Title of Drawing (General)
Rev-0	A - 101	Car Circulation Diagram & Services
Rev-0	A - 102	Site Analysis Plan
Rev-0	A - 103	North East Perspective
Rev-0	A - 104	North West Perspective
Rev-0	A - 105	South East/South West Perspective
Rev-0	A - 106	Aerial Perspective
Rev-0	A - 107	Site Plan
Rev-0	A - 108	1st Floor Plan
Rev-0	A - 109	2nd Floor Plan
Rev-0	A - 110	3rd Floor Plan
Rev-0	A - 111	4th Floor Plan
Rev-0	A - 112	Roof Floor Plan
Rev-0	A - 113	Existing Elevation
Rev-0	A - 114	North & South Elevations
Rev-0	A - 115	East & West Elevations
Rev-0	A - 116	Courthouse Elevations & Section
Rev-0	A - 117	Sections-1
Rev-0	A - 118	Sections-2
Rev-0	A - 119	Amenity Planning
Rev-0	A - 120	Shadow Diagram_Shadow by Neighbours
Rev-0	A - 121	Shadow Diagram_Shadow by Campus
Rev-0	A - 122	Sunlight Analysis
Rev-0	A - 123	Notification Plan

	Drawing No.	Title of Drawing
Rev-C	LP - 01	Cover Sheet
Rev-C	LP - 02	Site Analysis
Rev-C	LP - 03	Site Photography
Rev-C	LP - 04	Design Statement
Rev-C	LP - 05	Lanscape Plan 1st Floor
Rev-C	LP - 06	Lanscape Plan 4th Floor + Street Elevation
Rev-C	LP - 07	Planting & Theming Palette
Rev-1	CI - 100	Cover Sheet
Rev-1	CI - 120	Stormwater Management Plan
Rev-1	CI - 125	Typical Sections and Details
Rev-1	CI - 130	Erosion and Sediment Control Plan and Details
Rev-A	S - 1	Survey Information-1
Rev-A	S - 2	Survey Information-2

	Drawing No.	Title of Drawing

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marline MECHANICAL, ELECTRICAL, HYDRAULIC AND ENERGY

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Australia Newcastle Campus Project

Drawing List

Scale 1/∞ A1:NS A3:NS

Date 2019・12・14

Drawing No. A — 000

No Rev-0

Project Brief

The development site is located within the Hill Heritage Conservation Area, and it incorporates Newcastle's former Courthouse (referred to as Old Courthouse), designed by Colonial Architect James Barnet, a state significant heritage listed item, and two twentieth century buildings which were part of the courthouse complex.
The Project consists of the rehabilitation of the Old Courthouse and the construction of two new buildings, by replacing the existing administration building and supreme courthouse building. The two new buildings shall be connected to the Old Courthouse via atria.
The new building would form part of the campus complex dedicated to student accommodation, and the other dedicated to educational spaces, and the Old Courthouse would house the administration and management of the Campus as well as the conference room.
The Residential building would house 102 beds for students and 7 rooms for professors and long staying researchers.
The main purpose of the campus is to act as a center of international language exchange program. Students from Nihon University Group (including students from Junior High-school of related school) would come for a short stay of one to two months to experience international living and practice English on site. The students would be housed in the residential building and would take English class courses in the educational building.
There is also a plan for an exchange program with Newcastle University and the Faculty of Law of Nihon University. The program is not finalised yet but the main purpose of this program is the efficient re-use of the Old Courthouse. The Nihon Faculty of Law has, in its Curriculum has a series of training programs, including mock-up trials. Currently, Nihon University does not have facilities to conduct mock-up trials and the Old Courthouse is best suited to conduct such courses.
It is also intended to open the doors to students of Newcastle University to experience mock-up trials, debating with visiting Japanese students, cross learn the judicial systems of both countries in the environment of the Courthouse. The Faculty of Law of Nihon University would donate more than 5,000 books related to Japanese criminology and law related books so that researchers from Newcastle University can enjoy comparative studies of judicial system.
It is also planned to organise lectures open to public in the Old Courthouse, and in some of the classrooms when not in use, as part of social contribution activities of Nihon University. Such open lectures could be on judicial and law matters but also on cultural issues such as Tea Ceremony, Calligraphy, Flower Arrangement, and other culture oriented activities.

Design Approach / Aesthetic Conosiderations

The design intent is to respect the existing Old Courthouse building.
The Old Courthouse is very symbolic in its location and style. The design of the new buildings would be in line with the symmetric design of the existing Old Courthouse.
The new buildings have a 10m height limitation to the front façade but proportionately wide opening to the street, so the building design is horizontally focused.
The Old Courthouse has 2 strong horizontal lines at base and parapet, and these two lines would be used as leitmotif to express the continuity from the Old Courthouse to the new buildings.
As such, the proposed design does not have a strong design expression in itself, so as not to fight with the Old Courthouse, instead it is a simple and timeless design, that reflects the concept of continuous flow of knowledge as an educational facility is proposed.
The design would also express Japanese minimalistic Zen design so as to bring to the façade a touch of Asian Culture. The two leitmotif lines would create the frame and in between, double-height wooden louvres are installed. These louvres would reflect the Japanese traditional shoji screens. The vertical repetitive rhythm of the double height louvre panel would also be in line with the vertical motives of the Old Courthouse.
The details of the louvres would bring gentle light pattern to the interior and from the outside, these louvres screen would soften the strong character of a massing block.
The screen is stopped at Police station side and is continuous to the hospital side, reflecting the site context.
The horizontal louvres is efficient on the north front façade, reducing thermal input from direct sun-light in the living areas, while securing views from inside and protecting views towards and from the neighbouring context for privacy point of view.
The new buildings have a rooftop terrace for students to retreat to for fresh air and contemplation: Behind the terrace is the remaining necessary floors that are not visible from the front street.

Development Controls

Site Area	5,191 ㎡
Floor Space Ratio	1.3:1
Maximum Height	18.9m (Old Court House) 16.6m (New buiding)
Maximum Gross Floor Area (GFA)	6,605 ㎡

Gross Floor Area (GFA)

REFER TO GROSS FLOOR AREA CALCULATION TABLE FOR INDIVIDUAL FLOOR AREAS.
Gross Floor Area is defined in the Newcastle LEP as the total floor area of a building.
Measured from the internal face of external walls measured at a height of 1.4m above the floor, and includes:
-The area ofa mezzanine.
-Habitable rooms in a basement or an attic
-Anyshop, auditorium, cinema, and the like, in a basement or attic.
but excludes:
-Areas for common vertical circulation, such as lifts and stairs.
-Basements.
-Storage.
-Vehicular access, loading areas, garbage and services.
-Plant rooms, lift towers and other areas used exclusively for mechanical services.
-Car parking to meet any requirements of the consent authority (including access to that car parking).
-Spaces used for the loading or unloading of goods (including access to it).
-Terraces and balconies with outer walls less than 1.4 metres high.
-Voids above a floor at the level of a storey or storey above.

Total GFA	6,605 ㎡
Floor Space Ratio	1.3:1

Carparking

Total Car Spaces Required (1 space per 60㎡)	111
Total Car Spaces Provided (Includes 2 x Accessible)	20
Motorbike Parking Provided	1

Bicycle End of TripCarparking

Bicycle Spaces Provided	22

Gross Floor Area Calculation
(※1-4 Floor excluded Old Court House GFA)

Name	Level	Education Building	Old Court House	Residential Building
GFA	1st Floor	80㎡	1,664㎡	916㎡
GFA	2nd Floor	699㎡		950㎡
GFA	3rd Floor	686㎡		929㎡
GFA	4th Floor	259㎡		392㎡
				6,605㎡

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Project Summary

Scale 1/-
Date 2019・12・14
Drawing No. A — 001
No Rev-0

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Perspective - 1

Scale 1/—

Date 2018・12・14

Drawing No. A — 002

Rev — 0

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Perspective - 2

Scale 1/-

Date 2018・12・14

Drawing No. A — 003

Rev — 0

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Perspective - 3

Scale 1/

Date 2018・12・14

Drawing No. A — 004

Rev — 0

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Australia Newcastle Campus Project

Perspective - 4

Scale 1/-

Date 2018・12・14

Drawing No. A — 005

Rev — 0

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Nihon University
Australia Newcastle Campus Project

Perspective - 5

Scale 1/—

Date 2018・12・14

Drawing No. A — 006

Rev — 0

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Nihon University
Australia Newcastle Campus Project

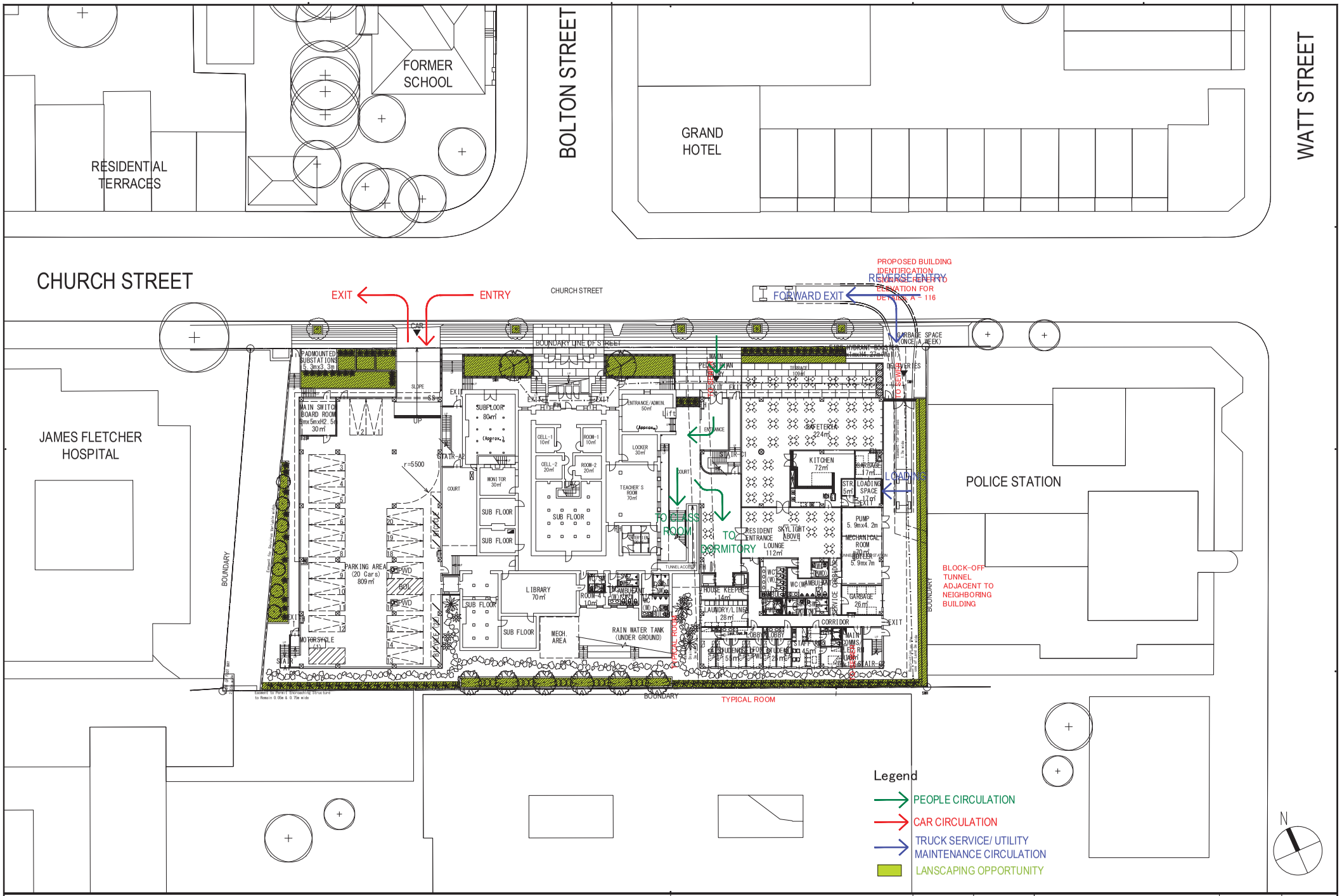
Perspective - 6

Scale 1/—

Date 2018・12・14

Drawing No. A — 007

Rev — 0



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Australia Newcastle Campus Project

Car Circulation Diagram & Services

Scale 1/A1:250 A3:500

Date 2018・12・14

Drawing No. A — 101

No Rev-0

Appendix E Lower Hunter LGA's Journey To Work Statistics

Australian Bureau of Statistics

13381DO007_201012 NSW State and Regional Indicators, Dec 2010

Released at 11:30 am (Canberra time) Mon 31 Jan 2011

Table 10 METHOD OF TRAVEL TO WORK BY EMPLOYED PERSONS, By LGA of usual residence, Sydney GMR, NSW–2006

	Single method of travel													
	Car as driver	Car as passenger	Train	Walked only	Bus	Bicycle	Motorbike / Scooter	Other	Total	Two or more methods of travel	Worked at home	Did not go to work	Not stated	Total
Newcastle (C)	39,148	3,864	425	2,850	1,417	1,041	484	1,052	50,281	765	1,849	8,521	1,010	62,426
	63%	**6%**	**1%**	**5%**	**2%**	**2%**	**1%**	**2%**	**81%**	**1%**	**3%**	**14%**	**2%**	**100%**
Cessnock (C)	11,532	1,298	25	488	77	57	96	455	14,028	195	740	2,589	422	17,974
Lake Macquarie (C)	51,757	4,542	546	1,370	914	370	481	1,716	61,696	943	2,553	10,151	1,394	76,737
Maitland (C)	18,065	1,823	419	545	92	122	169	553	21,788	334	966	3,734	443	27,265
Newcastle (C)	39,148	3,864	425	2,850	1,417	1,041	484	1,052	50,281	765	1,849	8,521	1,010	62,426
Port Stephens (A)	15,240	1,529	27	870	211	145	170	561	18,753	286	1,139	3,290	417	23,885
LOWER HUNTER	**135,742**	**13,056**	**1,442**	**6,123**	**2,711**	**1,735**	**1,400**	**4,337**	**166,546**	**2,523**	**7,247**	**28,285**	**3,686**	**208,287**
	65%	**6%**	**1%**	**3%**	**1%**	**1%**	**1%**	**2%**	**80%**	**1%**	**3%**	**14%**	**2%**	**100%**