TRAFFIC AND PARKING ASSESSMENT

ALTERATIONS AND ADDITIONS
NEWCASTLE GRAMMAR SCHOOL PARK CAMPUS
MASTERPLAN AND STAGE 1 WORKS

LOT 102 DP861562
127 UNION STREET, COOKS HILL

PREPARED FOR: NEWCASTLE GRAMMAR SCHOOL

SEPTEMBER 2021

20/027

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NEWCASTLE GRAMMAR SCHOOL

ALTERATIONS AND ADDITIONS TO NEWCASTLE GRAMMAR SCHOOL PARK CAMPUS MASTERPLAN AND STAGE 1 WORKS

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This document has been authorised by

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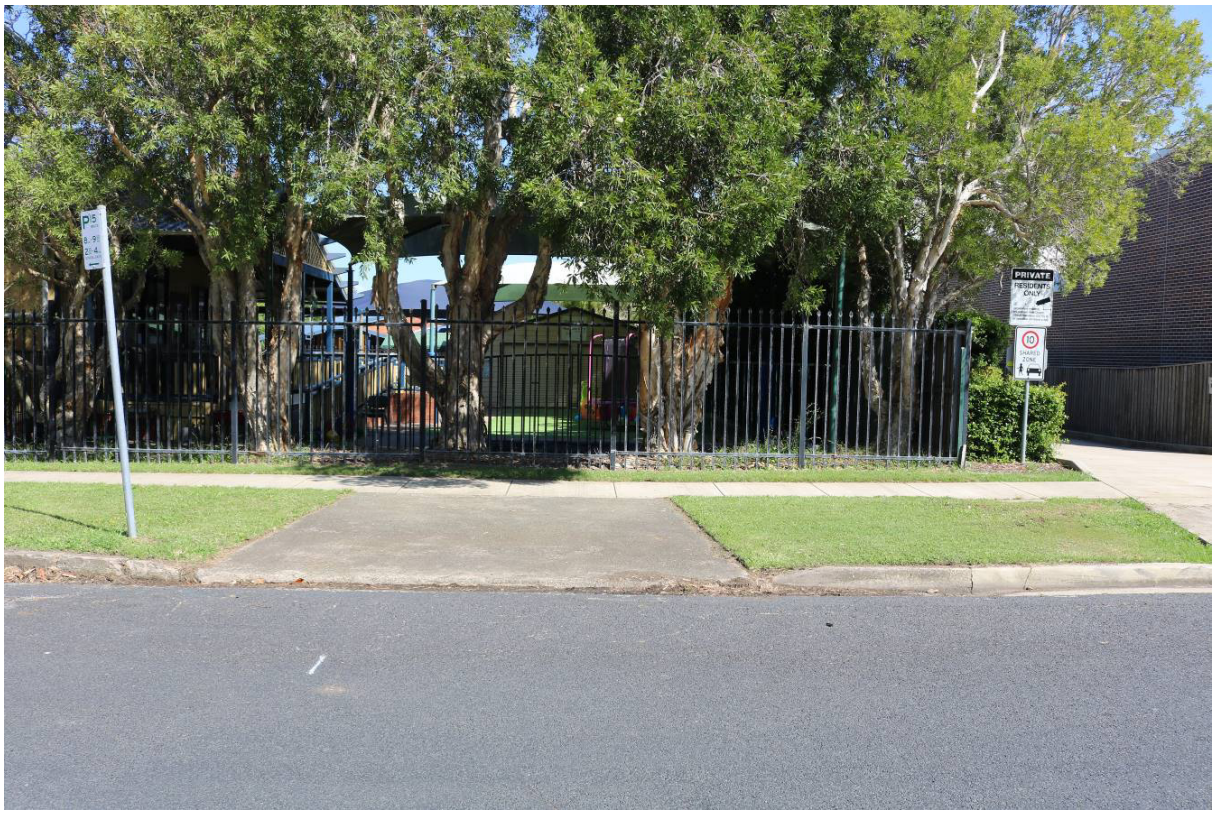


1.0 INTRODUCTION

Intersect Traffic Pty Ltd has been engaged by APP Corporation on behalf of Newcastle Grammar School to prepare a Traffic and Parking Assessment for alterations and additions to the Newcastle Grammar School Park Campus which currently provides schooling for children from Kindergarten to Year 4. The school is seeking to provide additional buildings on the site to increase student numbers from its current capacity of approximately 256 students and 35 staff to 480 students and 50 staff as part of Stage 1. It is anticipated that the future DA for Stage 2 would enable an additional 160 students and 10 staff, resulting in a Stage 2 capacity of 640 students and 60 staff. This application seeks to assess the traffic impacts of the masterplan as well as the Stage 1 works which will result in the campus catering for Kindergarten to Year 6 classes. The concept masterplan and stage 1 works development plans are provided in ***Attachment A***. These plans show both the vehicle and pedestrian accesses to the site.

This report is provided to support a State Significant Development application to the Department of Planning, Industry and Environment (DPIE) as the consent authority. It allows the Department as well as Newcastle City Council (Council) and Transport for NSW (TfNSW) officers to assess the proposal in respect of its impact on the local road network and the amenity of nearby properties.

This report presents the findings of the traffic and parking assessment and includes the following.

1. An outline of the existing situation in the vicinity of the site.
2. Describes the proposed development.
3. Assesses the impact of the development on the capacity of the adjoining local and state road network.
4. Reviews parking and access along with alternate transport mode impacts of the proposed development, including assessment against Council and Australian Standards requirements.
5. Presentation of conclusions and recommendations.

2.0 SITE DESCRIPTION

The subject site is shown in ***Figure 1*** below. It is located between Union Street and Corlette Street immediately north of Parkway Avenue approximately 400 metres north-east of The Junction CBD and 1.7 km south-west of the Newcastle CBD. The site currently contains a number of separate educational buildings which make up the Newcastle Grammar School Park Campus.

The site has a total area of approximately 9,300 m^2 and is most commonly addressed as 127 Union Street, Cooks Hill. Pursuant to the Newcastle LEP (2012) the site is zoned as R3 Medium Density Residential.

The site currently has no existing off-street car parking with vehicular access only available for servicing and maintenance periods via an existing access off Union Street. ***Photograph 1*** below shows the existing on-site development from Parkway Avenue while ***Photograph 2*** shows the existing vehicular access and development off Union Street.

Figure 1 – Site Location

Photograph 1 – Development site from Parkway Avenue

Photograph 2 – Vehicular access and development off Union Street.

3.0 ROAD NETWORK

3.1 Union Street

Union Street is a major local collector / distributor road that collects and distributes traffic from the Cooks Hill and The Junction areas to the arterial and sub-arterial road network in Newcastle and The Junction. As a local road it is under the care and control of Newcastle City Council and is a major transport route into the Newcastle City Centre area.

Near the site it is typically a two-way two-lane undivided sealed urban road with kerb and gutter with additional turning lanes at major intersections. It has a sealed carriageway 13 metres wide which provides a single lane of travel in both directions (3.7 metre wide) and parking lanes on both sides (2.8 metres wide). A 60 km/h speed zoning exist along the road except past the school and another catholic school south of the site where a variable school speed zone reduces the speed to 40 km/h during the peak school drop off and pick up times of 8 am to 9.30 am and 2.30 pm to 4.00 pm. At the time of inspection Union Street was found to be in good condition as shown in ***Photograph 3*** below.

Photograph 3 – Union Street along site frontage.

3.2 Parkway Avenue

Parkway Avenue is a major local collector / distributor road that collects and distributes traffic to the arterial and sub-arterial road networks from the Bar Beach, Cooks Hill, The Junction, Hamilton and Hamilton South areas. As a local road it is under the care and control of Newcastle City Council and is a major transport route in the inner Newcastle City area.

Near the site it is typically a two-way two-lane divided sealed urban road with kerb and gutter with additional turning lanes at major intersections. It has sealed divided carriageways 6.5 metres wide which provides a single lane of travel in each direction (3.7 metre wide) and parking lanes on both

carriageways (2.8 metres wide). The central carriageway which is 17 metres wide is grassed and carries one of the major trunk drainage channels in the Newcastle area. A 60 km/h speed zoning exist along the road except past the school where a variable school speed zone reduces the speed to 40 km/h during the peak school drop off and pick up times of 8 am to 9.30 am and 2.30 pm to 4.00 pm. At the time of inspection Parkway Avenue was found to be in good condition as shown in ***Photograph 4*** below.

Photograph 4 – Parkway Avenue along site frontage.

3.3 Corlette Street

Corlette Street is a local urban road in the Cooks Hill area that provides vehicular access to properties along its length. As a local road it is under the care and control of Newcastle City Council.

Near the site it is typically a two-way two-lane undivided sealed urban road with kerb and gutter. It has a sealed carriageway 9 metres wide which provides a single lane of travel in each direction (3.0 metres wide) whilst allowing some on-street car parking along its length. A permanent 40 km/h speed zoning exist along the road as it is marked as an on-road cycle way. At the time of inspection Corlette Street was found to be in good condition as shown in ***Photograph 4*** below.

4.0 ROAD NETWORK IMPROVEMENTS

There are no known road upgrades in the vicinity of the site that will increase the capacity of the local road network. Maintenance works on the road network would be carried out in line with Newcastle City Council and TfNSW works programs.

Photograph 5 – Corlette Street along site frontage.

5.0 EXISTING TRAFFIC VOLUMES

Northern Transport Planning and Engineering on behalf of Intersect Traffic undertook intersection counts at the Union Street / Parkway Avenue traffic signals and the Parkway Avenue / Corlette Street priority controlled give way intersection during the school AM and PM peak periods in November and early December 2020 to allow intersection analysis of the operation of these intersections in this assessment. However these counts can be used to extract current mid-block peak hour (school) traffic volumes on the road network and extrapolate the data to predicted 2030 traffic volumes using a background traffic growth rate of 1.5 % per annum which is the TfNSW adopted background traffic growth rate for the lower Hunter area. The data sheets from the traffic counts are provided in ***Attachment C***. The relevant two-way mid-block traffic volumes extracted and extrapolated from these counts is shown in ***Table 1*** below.

Table 1 – Existing and 2031 traffic volumes road network.

Road	Section	2021 AM peak vtph	2021 PM peak vtph	2031 AM peak vtph	2031 PM peak vtph
Union Street	south of Parkway Avenue	691	605	802	702
Union Street	north of Parkway Avenue	791	654	918	759
Parkway Avenue	west of Union Street	829	659	962	765
Parkway Avenue	Union St to Corlette St	786	683	912	793
Parkway Avenue	east of Corlette Street	670	583	778	677
Corlette Street	south of Parkway Avenue	127	125	147	145
Corlette Street	north of Parkway Avenue	169	101	196	117

These existing and future peak hour (school) traffic volumes on the local road network have been adopted in this assessment.

6.0 ROAD CAPACITY

The capacity of urban roads is generally determined by the capacity of its intersections. However, Table 4.3 of the *RTA's Guide to Traffic Generating Developments* provides some guidance on mid-block capacities for urban roads for a LoS C. This table is reproduced below.

Table 4.3
Typical mid-block capacities for urban roads with interrupted flow

Type of Road	One-Way Mid-block Lane Capacity (pcu/hr)	
Median or inner lane:	Divided Road	1,000
	Undivided Road	900
Outer or kerb lane:	With Adjacent Parking Lane	900
	Clearway Conditions	900
	Occasional Parked Cars	600
4 lane undivided:	Occasional Parked Cars	1,500
	Clearway Conditions	1,800
4 lane divided:	Clearway Conditions	1,900

Source: - RTA's Guide to Traffic Generating Developments (2002).

Noting the road network around the site is typically two-way two-lane undivided and divided roads the following capacities are determined from the above table.

Union Street – two-lane undivided carriageway with parking lanes – one way mid-block capacity – 900 vtph therefore two-way mid-block capacity – 1,800 vtph.

Parkway Avenue – two-lane divided carriageway with parking lanes – one way mid-block capacity – 1,000 vtph therefore two-way mid-block capacity – 2,000 vtph.

Corlette Street – two-lane undivided carriageway with occasional parked cars – one way mid-block capacity – 600 vtph therefore two-way mid-block capacity – 1,200 vtph.

These two-way mid-block road capacities have been adopted in this assessment. As these are above the existing peak hour traffic volumes recorded on the local road network (see ***Section 5***) then it can be concluded that subject to satisfactory intersection performance the local road network has some spare capacity to cater for future development in the area.

7.0 ALTERNATE TRANSPORT MODES

Newcastle Transport (Keolis Downer) runs both school bus services and public transport (bus) services in the area while the school is also serviced by school buses provided by Hunter Valley Buses and Port Stephens Coaches. A review of the route maps and timetables for the public bus service indicates that the site is serviced by public transport as shown in the bus route extract shown in ***Figure 2*** below. The route most convenient to the site is;

- Route 12 – Maryland to Merewether Beach via Wallsend and Newcastle Interchange. This route runs from Merewether Beach along Union Street past the site, past Marketown to the Newcastle Transport Interchange then to Maryland via Wallsend. It provides a suitable public transport bus service to the site from most parts of Newcastle and the Central Coast with its connection to the Newcastle Transport Interchange. This route therefore provides

significant benefit to the school, making public transport trip making more attractive to staff and some students.

The nearest bus stops are located adjacent to the school on Union Street (school frontage for southbound services and 20 metres south of the school for northbound services) as shown in ***Photograph 6*** which also shows the asphalt footpath along the frontage of the site in Union Street.

Photograph 6 – Bus stop and asphalt footpath – southbound Union Street

The school also operates its own school bus services providing six (6) services that service all the Newcastle. Lower Hunter and Port Stephens areas. The basic details of routes are provided below in ***Figure 3.*** There are also a number of state operated school services that service the school for which students can use.

An excellent concrete and asphalt footpath network exist within the local road network around the site and connecting to the local bus stops, The Junction CBD and Newcastle city centre area ensuring suitable infrastructure for pedestrians in the area. The pedestrian infrastructure around the school is shown in ***Photographs 6 and 7***. Safe pedestrian crossing of both Union Street and Parkway Avenue is provided with pedestrian phases in the Union Street / Parkway Avenue traffic signals and a marked pedestrian crossing also exists on Union Street immediately north of Tooke Street 160 metres north of the school (see ***Photograph 8***).

Corlette Street is marked as an on-road cycle way as shown in ***Photograph 9*** and has a 40 km/h speed limit to improve cyclist safety on this road. Cyclists using the site could utilise the existing Newcastle cycle ways network to access the site up Corlette Street.

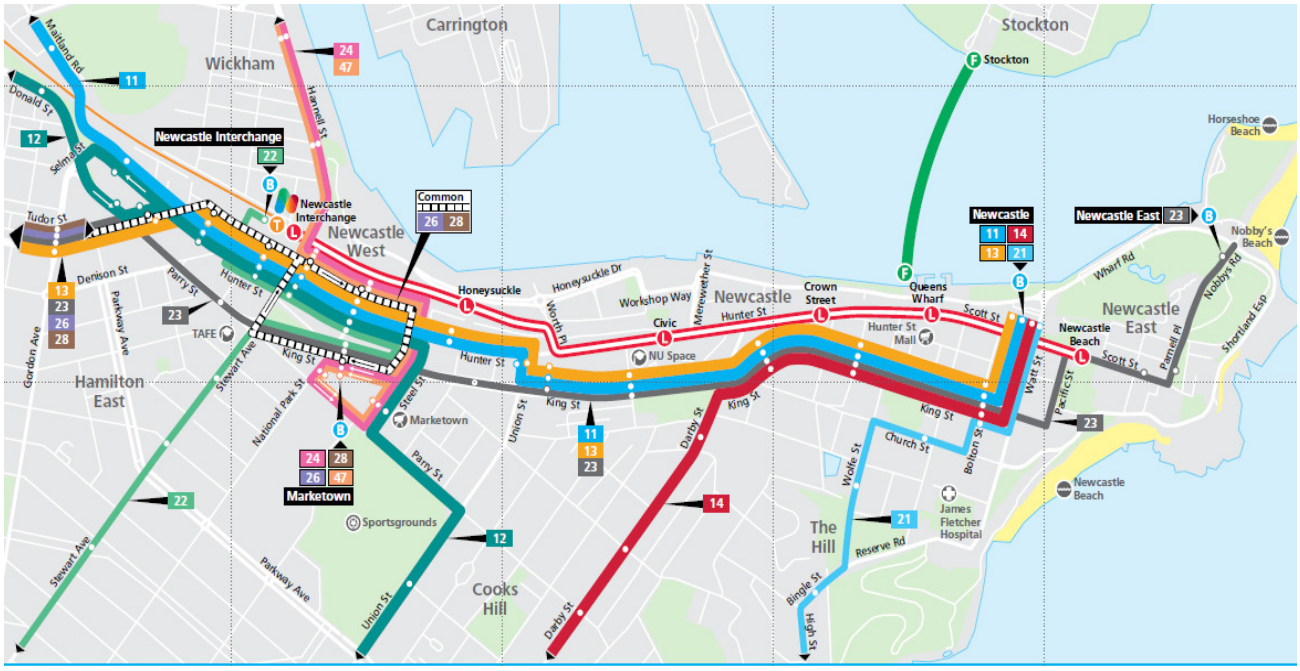
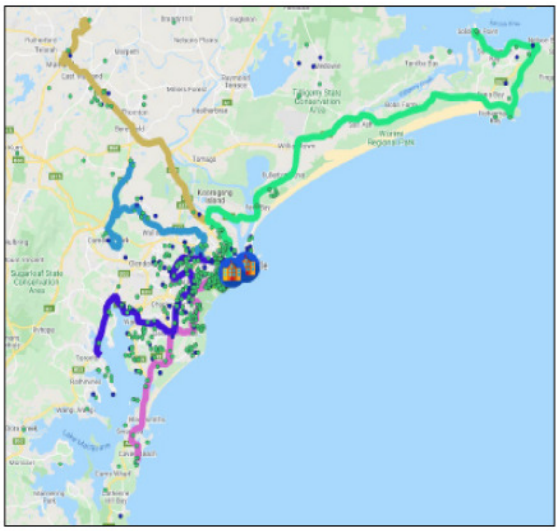


Figure 2 – Bus route Map Extract

Bus Routes

We currently have six bus routes running to and from school:
Transport | Newcastle Grammar School (ngs.nsw.edu.au)



Port Stephens	Maitland	Minmi	Toronto	Caves Beach	Jewells
Mayfield	Mayfield	Broadmeadow	Broadmeadow	Merewether Heights	Park Campus
Kooragang	Hexham	Waratah	Kotara	Kahibah	Burwood Road
Fern Bay	Beresfield	Birmingham Gardens	Charlestown	Whitebridge	Dudley
Williamtown	Metford	Wallsend	Gateshead	Dudley	Redhead
Fisherman's Bay	Maitland	Fletcher	Warners Bay	Jewells	Jewells
Nelson Bay	Bolwarra	Cameron Park	Teralba	Belmont	
Soldier's Point		Black Hill		Swansea	

Figure 3 – School Bus Services operated by NGS

Photograph 7 – Pedestrian footpath Parkway Avenue along site frontage

Photograph 8 – Pedestrian crossing facilities Union Street / Parkway Avenue Signals

Photograph 9 – Marked cycleway – Corlette Street

8.0 DEVELOPMENT PROPOSAL

The development involves the approval of a masterplan for the future development of the Newcastle Grammar School Park Campus to a four stream primary school catering for Kindergarten to Year 6 students. This will increase student and staff numbers at the school from the current enrolment capacity of 256 students and 30 staff to 640 students and 60 staff. However the current development application also seeks approval to commence stage 1 works which will bring the school to full three stream school catering for Kindergarten to Year 6 students with 480 students and 50 staff. Note the school operates generally during school terms – Monday to Friday between 8 am and 4 pm.

Additionally, the site has an onsite before and after school service operating between 7.15am and 9am and 3pm-6pm, with capacity for 80 students. Vacation care is also provided during school holiday periods, between 8am-6pm.

Specifically works within the application involves;

Masterplan

- Demolition of four smaller existing buildings on the site as well as associated shade structures and landscaping.
- Refurbishment and/or expansion of the remaining buildings to provide additional and improved staff and administration facilities, as well as an improved library and specialist learning facilities.
- Construction of two new educational buildings each with 2 learning levels.
- Provision of a semi-basement car park for staff and visitor car parking containing 31-35 car parks including 2 accessible spaces.
- Provision of a new under croft play area and rooftop sports courts.

- Provision of a new one-way traffic flow kiss and ride drop off and pick up internal road with new access crossings to Corlette Street (entry) and Union Street (exit).
- Improved pedestrian access from Union Street, Parkway Avenue and Corlette Street; and
- Drainage and landscaping to DPIE and Newcastle City Council requirements.

Stage 1 construction works for which approval is being sought involves;

- Demolition of existing structures to allow for Stage 1 works
- Refurbishment of an existing building (Block B) to provide additional and improved staff and administration facilities.
- Construction of the new Union Street educational building, containing 2 learning levels and ground and roof top place space.
- Provision of a new one-way traffic flow kiss and ride drop off and pick up internal road with new access crossings to Corlette Street (entry) and Union Street (exit).
- Improved pedestrian access from Union Street, Parkway Avenue and Corlette Street; and
- Drainage and landscaping to Newcastle City Council requirements.

The development concept plans for the proposal are provided in ***Attachment A***.

9.0 TRAFFIC GENERATION AND TRIP DISTRIBUTION

The *RTA's Guide to Traffic Generating Developments (2002)* provides guidance on the traffic generating potential of developments. However this guide does not provide any data for primary schools and reference is then made to the Institute of Transportation Engineers (ITE) USA rates.

Common rates from the ITE's publication are provided in ***Attachment F*** and for private schools (K – 8) it recommends a rate of 0.28 trips per student.

Masterplan

Completion of the development as per the full Masterplan will result in the following increase to staff and student numbers;

Students – 384
Staff - 25

Therefore the additional traffic expected from the full development of the school can be calculated as;

Additional peak hour traffic = 384 x 0.28 = 108 vtph.

Stage 1

Completion of Stage 1 development will result in the following increase to staff and student numbers;
Students – 224
Staff - 15

Accordingly, the additional traffic from Stage 1 can be calculated as.

Additional peak hour traffic = 224 x 0.28 = 63 vtph.

The trip distribution for the additional traffic is based on equal distributions from all directions north, south, east and west. Therefore in terms of the main intersections near the school the additional traffic generated by the development is as shown in ***Figure 4*** below also noting that 60 % are inbound and 40 % are outbound trips in the AM peak which is mirrored in the PM peak.

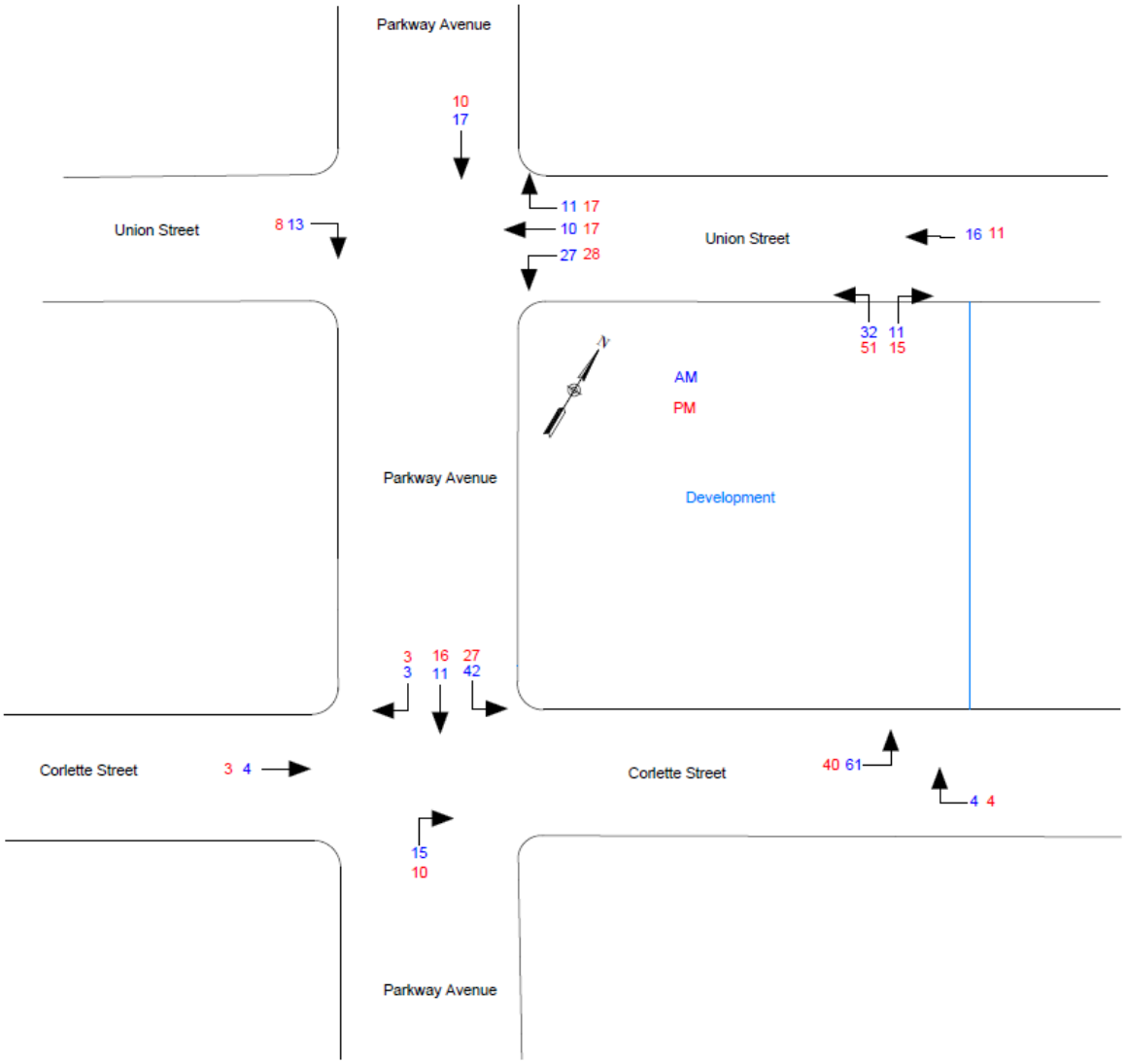


Figure 4 – Additional Development Peak Hour Traffic Trip Distribution

10.0 TRAFFIC IMPACTS

Two-way Mid-Block Capacity

Section 6 of this report determined that the existing network was operating within its two way mid-block capacity while Section 9 has determined that the proposed development will add the following traffic onto the adjacent road network.

Union Street south of Parkway Avenue – 23 vtph in the AM peak and 25 vtph in the PM peak
Union Street north of Parkway Avenue – 48 vtph in the AM peak and 62 vtph in the PM peak.
Parkway Avenue west of Union Street – 28 vtph in the AM peak and 27 vtph in the PM peak.
Parkway Avenue - Union St to Corlette St – 57 vtph in the AM peak and 46 vtph in the PM peak.
Corlette Street – north of Parkway Avenue – 61 vtph in the AM peak and 40 vtph in the PM peak.
Corlette Street – south of Parkway Avenue – 7 vtph in the AM peak and 6 vtph in the PM peak.

The additional traffic from the development does not result in the two-way mid-block road capacities for the adjacent road network to be exceeded even through to 2031 as shown in ***Table 2*** below.

Table 2 – Two-way mid-block road capacity assessment.

Road	Section	Capacity vtph	2021 AM peak vtph	2021 PM peak vtph	2031 AM peak vtph	2031 PM peak vtph	Development	
							AM	PM
Union Street	south of Parkway Avenue	1800	714	630	825	727	23	25
Union Street	north of Parkway Avenue	1800	839	716	966	821	48	62
Parkway Avenue	west of Union Street	2000	857	686	990	792	28	27
Parkway Avenue	east of Union Street	2000	843	729	969	839	57	46
Corlette Street	south of Parkway Avenue	1200	852	165	208	185	61	40
Corlette Street	north of Parkway Avenue	1200	176	107	203	123	7	6

This shows that subject to satisfactory intersection performance the local road network around the school has sufficient spare network capacity to cater for the proposed development.

Intersection Capacity

The main intersections impacted by the proposal will be the Union Street / Parkway Avenue signalised intersection and the Parkway Avenue / Corlette Street priority controlled stop intersection. To determine the impact of this development on these intersections they have been modelled as a network using the Sidra Intersection 9 model.

This software package predicts likely delays, queue lengths and thus levels of service that will occur at intersections. Assessment is then based on the level of service requirements of TfNSW shown below. Modelling was undertaken for the 2021 and 2031 AM and PM peak school periods with and without the school development. In undertaking this modelling it is assumed;

- The models were developed for the as constructed and operating intersections;
- Traffic count data was as collected by NTPE in November and December 2020;
- A 1.5 % per annum background traffic growth was assumed for 2031 models;

The results of the Sidra modelling are summarised below in ***Table 3*** and ***Table 4*** while the Sidra Intersection movement summary tables are provided in ***Attachment D***. It is noted that the 'all vehicles' case has been used for the summary table for the Union Street / Parkway Avenue signals while for the Parkway Avenue / Corlette Street stop controlled intersection the worst average delay and worst level of service are recorded.

Table 3 – Sidra summary results –Union Street / Parkway Avenue signals

Scenario	Deg. Satn	Ave. delay (s)	LoS	95 % back of queue (cars)
2021 AM – no development	0.926	70.6	F	20.2
2021 AM + development	0.967	80.0	F	23.2
2031 AM – no development	1.079	130.0	F	35.1
2031 AM + development	1.126	156.0	F	39.3
2021 PM – no development	0.914	38.5	C	7.2
2021 PM + development	0.918	42.1	C	9.8
2031 PM – no development	0.903	67.8	E	16.1
2031 PM + development	0.973	80.2	F	20.0

Table 4 – Sidra worst movement summary results – Parkway Avenue / Corlette Street stop intersection

Scenario	Movement	Worst Ave. delay (s)	Worst LoS	95 % back of queue (cars)
2021 AM – no development	right out Corlette St south	14.2	A	0.4
2021 AM + development	right out Corlette St south	15.1	B	1.3
2031 AM – no development	right out Corlette St south	15.7	B	8.1
2031 AM + development	right out Corlette St south	16.5	B	10.6
2021 PM – no development	right out Corlette St south	14.1	A	0.2
2021 PM + development	right out Corlette St south	14.8	B	0.2
2031 PM – no development	right out Corlette St south	15.8	B	0.2
2031 PM + development	right out Corlette St south	16.4	B	1.9

The modelling shows that the Union Street / Parkway Avenue signals already operates with a LoS F in the AM peak but operates satisfactorily in the PM peak at a LoS C. The impact of the increased traffic from the school is to increase average delays by only 4 to 10 seconds and queue lengths by an average of less than 1 vehicle. This is insignificant and does not result in a deterioration of LoS. By 2031 the intersection is beginning to fail in the PM with a LoS E however even with the intersection be under stress the impact of the development is only to increase average delays by less than 30 seconds and queue lengths by an average of less than 5 vehicles. Therefore even though in the PM peak the development results in a deterioration of the LoS from E to F the development only has an insignificant impact on the operation of the intersection. It is therefore reasonable to conclude that the development does not adversely impact on the operation of the Union Street / Parkway Avenue signals.

The modelling also shows the Parkway Avenue / Corlette Street stop intersection will continue to operate satisfactorily with the proposed development through to 2031 and beyond in both the AM and PM peaks. Average delays and back of queue lengths remain within the thresholds set by TfNSW for satisfactory intersection performance. Therefore it is reasonable to conclude that the proposed development will not adversely impact on the operation of this intersection and therefore as the traffic gets further distributed and diluted through the network intersections on the wider road network.

Table 4.2
Level of service criteria for intersections

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode

Source: - RTA's Guide to Traffic Generating Developments (2002

11.0 ON-SITE CAR PARKING

On-site car parking provision needs to be in accordance with *AS2890.1 – 2004 Parking facilities – Part 1 Off street car parking* and *Newcastle City Council's DCP (2012) Section 7.03 Traffic, Parking and Access.*

The relevant section within the Newcastle DCP provides the following advice for *schools* noting as a primary school this school has no senior students;

Car Parking

- *1 space per 2 staff; and*
- *1 space per 100 students for visitors*

Bicycle Parking

- *1 space per 10 staff (Class 2)*
- *1 space per 10 students (Class 3)*

Motor Bike Parking

- *1 space per 20 car spaces.*

Note: Council may vary the parking standard depending on location and will require the provision of additional parking where a school auditorium is proposed. Council may require preparation of a Traffic Impact Study to support the proposal.

Council has previously approved the school for up to 256 students and 35 staff with no on-site car parks. Therefore the school already has an historically parking deficiency calculated as follows'

Historical car parking deficiency = 35/2 + 256/100 = 17.5 + 2.56 = **say 20 car spaces**.

Based on the projected staff and student numbers the car, bicycle and motorbike parking requirements for the development under the DCP are as follows.

Masterplan

Car parking required = 60/2 + 640/100 = 30 + 6.4 = **say 36.4 car parks**.
Bicycle parking = 60/10 + 640/10 = 6 (secure) + 64 (racks only) = **70 bicycle spaces.**
Motor bike parking = 1 space per 20 car parks = 36.4 / 20 = **say 2 motorcycle spaces**.

Stage 1

Car parking required = 50/2 + 480/100 = 25 + 4.8 = **say 29.8 car parks**.
Bicycle parking = 50/10 + 480/10 = 5 (secure) + 48 (racks only) = **53 bicycle spaces.**
Motor bike parking = 1 space per 20 car parks = 30 / 20 = **say 2 motorcycle space**.

In relation to Stage 1, an additional say 10 car spaces are required to be provided. While no additional traditional car spaces are being provided, the kiss and ride facility has capacity for 7 cars to drop off children at any time, and further standby capacity. This results in at least 10 car queue spaces. It is noted that the ability for this kiss and ride facility to quickly and effectively manage parent parking results in an optimised parking management strategy, eliminating the need for parents to permanently park and leave their vehicles, and thereby eliminates the associated on street car parking demand.

The temporary additional parking demand from staff (say 8 spaces), these spaces will be addressed at the commencement of Stage 2, where staff parking can be accommodated in the

future carpark, providing 31-35 spaces. The temporary additional short fall resulting during Stage 1 would be offset by the parking and traffic benefits resulting from the kiss and ride facility. In the context of the existing on street car parking demand from commuters and residents, it is unlikely that any significant impacts would result from this temporary shortfall.

The Masterplan development will provide sufficient on-site car parking to meet the requirements of Newcastle Council's DCP. Whilst bicycle and motorbike parking are not currently detailed on the plans there is sufficient room on site to provide suitable facilities to meet the DCP requirements and these can be conditioned on any consent issued for the development.

The car parking is required to be compliant with Australian Standard *AS2890.1-2004 Parking facilities – Part 1 Off-street car parking*. In assessing compliance it is noted the staff car parking would be Class1A parking and the visitor spaces Class 2 parking. The relevant standards for the car park assessment are, therefore.

- Class 1A parking – minimum 2.4 metres wide by 5.4 metres long (30 required).
- Class 2 parking – minimum 2.5 metres wide by 5.4 metres long (minimum 5 required).
- Accessible space – 2.4 metres wide by 5.4 metres long with similarly dimensioned shared zone with bollard beside it (minimum 1 required under AS2890.6-2009).
- Minimum aisle width – 5.8 metres wide.
- As car park is designed as a long blind aisle a turning bay is required at the end of the blind aisle.
- 1 metre wide blind aisle extension also required at the end of the blind aisle.

Whilst the current concept plans are not currently suitably detailed or dimensioned for a rigorous assessment for compliance with Australian Standard requirements by scaling it appears the car park could be constructed to Australian Standards requirements without the loss of a car park. Therefore the requirement for compliance with Australian Standards could also be conditioned on any consent issued for the development with confirmation required before the issue of a Construction Certificate.

It is noted the extensions to the school are unlikely to change the servicing arrangements for the school.

12.0 VEHICULAR ACCESS

The proposal involves the construction of two new vehicular accesses to the site at Corlette Street (entry only) and Union Street (exit only) to service the proposed kiss and ride facility (7 spaces) and the proposed car park (36 spaces). In accordance with Australian Standard *AS2890.1-2004 Parking facilities – Part 1 Off-street car parking* a car park with between 25 and 100 spaces serviced from local roads is required to have a minimum Category 2 access. A category 2 access is a combined entry / exit 6 to 9 metres wide. The proposed access arrangement provides separate entry and exits connected to a one way flow internal road therefore is considered a Category 3 access as described in the Australian Standard. It therefore exceeds the Australian Standards requirements described in Tables 3.1 and 3.2 of the standard.

Approach sight distance (ASD) at the entry and safe intersection sight distance (SISD) at the Union Street exit exceed the requirements of Australian Standards and Austroads with available sight distance being observed to be in excess of 150 metres. The Australian Standard for SISD for a 40 km/h speed frontage is 55 metres or 83 metres for a 60 km/h speed frontage. Austroads requires an ASD of 40 metres for a 40 km/h speed frontage and an SISD of 73 metres for a 40 km/h speed zoning and 123 metres for a 60 km/h speed zoning.

As a one way internal road servicing the kiss and ride facility and the on-site car park this road under Australian Standards is required to be a minimum 3 metres wide. The proposal complies with this requirement. Use of the kiss and ride facility may result in some queuing back onto Corlette Street particularly during the afternoon pick up period. To mitigate these impacts a traffic management plan has been developed (see ***Attachment E***) for the kiss and ride which seeks to

educate parents on the use of the kiss and ride and detail the levels of enforcement to be undertaken by the school in marshalling the facility during the afternoon pick up period.

The provision of the new accesses will result in the loss of 2 on-street car parks in both Union Street and Corlette Street. This is however compensated by the fact that the development will on completion comply with Council's DCP parking requirements and eradicate a 20 space historical car parking deficiency in the current school. Therefore theoretically on completion of the development there will be an additional 16 on-street car parks available during school hours in Corlette Street and Union Street.

Overall it is concluded the proposed access arrangements to the kiss and ride facility and on-site car park are compliant with Australian Standard and Newcastle City Council requirements therefore is suitable for use by the development.

13.0 CONSTRUCTION TRAFFIC

The construction of the buildings will be undertaken in two stages with the new Union Street building being constructed in the first stage. A construction access to the site will be installed at the location of the kiss and ride entry access off Corlette Street to allow limited construction employees driving utes with tools and products in the tray to enter the site as well as smaller deliveries and waste collection vehicles. Approval will be sought in Stage 1 for a construction zone with reduced speed limits during daylight hours on the eastern side of Union Street along the school frontage. This will require the temporary relocation of a bus stop 70 metres further north along Union Street and will be subject to Newcastle City Council Traffic Committee approval. The construction zone will allow larger deliveries to park along this kerb for unloading. Traffic marshals will be employed to direct pedestrian traffic through or around the construction zone during construction with pedestrians protected with jersey kerb barriers where necessary and pedestrian paths delineated with hi-vis bunting. During Stage 2 construction works approval will be sought to relocate the construction zone to the Corlette Street frontage of the site if required. No construction access is proposed to be provided off Union Street.

All construction employees not requiring to carry tools or product to the site will be directed to park in the northern end of the Bar Beach public car park in Memorial Drive and they will be transported to the site via a shuttle service using company utilities or other appropriate vehicles. It is also noted that where possible major construction works on the site will be programmed for either the 7 week end of year school break (December – January) or the 3 week mid-year school break (June – July) to minimise the impact of the construction on school activities.

It would be expected that up to 30 tradesman / construction employees would be on-site at anyone time which is likely to represent a traffic generation of approximately 20 to 25 vtph at the start and finish of work. Deliveries and waste removals during the day would not be expected to exceed 10 vtph even during major concrete pours. The worst case construction traffic scenario would be an early morning concrete pour when along with concrete pumping services a peak construction traffic generation of up to 35 vtph would be expected. This is less than the additional traffic generated by the Stage 1 extensions therefore as this assessment has concluded that the Stage 1 extensions do not adversely impact on the local road network then it would be reasonable to conclude that the proposed construction works would also not adversely impact on the local road network.

Construction traffic is a short term loading usually lasting less than 6 months and is best mitigated through the preparation and implementation of a Construction Traffic and Pedestrian Management Plan. This document identifies strategies to reduce the impact of the construction works not only on the local road network but also on the operation and amenity of the school and nearby residents. A concept Construction Traffic and Pedestrian Management Plan has been prepared and is provided in ***Attachment G***. It would be expected the finalisation of this plan prior to construction commencing would be conditioned on any consent issued for the development by the building contractor engaged to undertake the construction works.

14.0 PEDESTRIAN AND CYCLE FACILITIES

The proposed development would generate additional pedestrian traffic however the existing concrete and asphalt footpath network, with crossing facilities, which already exists within the area, is considered suitable for the level of additional pedestrian traffic resulting from this development. Therefore, no nexus exists for additional pedestrian facilities in the area. The development will also generate some additional cycle traffic particularly with the improved end of trip facilities provided at the school though the level of increase would not be sufficient such that a nexus exists for the provision of additional cycle ways in the vicinity of the site.

15.0 PUBLIC TRANSPORT FACILITIES

The proposed development may generate an increase in patronage of the existing public transport system servicing the site. The site is already serviced by public transport with bus routes and bus stops being within convenient walking distance of the site. Further school bus services are likely to be improved and increased with additional students at the school. There is however opportunity within this development for the school to encourage public transport use among staff and students, particularly through the School Student Transport Scheme which provides free or subsidised public transport for travel to and from school, to reduce light vehicle trips to and from the site and the need for some on-site or on-street car parking. This can be undertaken through the preparation of a Green Travel Plan for the school and a concept plan has been provided in ***Attachment B***.

Currently all school bus services utilise a bus set down bay along the school frontage in Parkway Avenue between Union Street and Corlette Street for the dropping off and pick up of school students. This provides convenient access to the school grounds for students and allows the buses to use the Union Street / Parkway Avenue signalised intersection for safe and convenient turning movements into the set down area. The school bus bay will not be impacted by the construction works and will be able to be continuously used during construction. The public bus stop on the eastern side of Union Street along the school frontage site may need to be temporarily relocated 70 metres north during construction works to allow a construction zone to be installed on Union Street along the school frontage during construction. This will however be subject to the approval of Newcastle City Council's Traffic Committee.

However, overall, it is reasonable to conclude that the existing public transport services and infrastructure in the vicinity of the site is suitable for the development and changes to the existing public transport system or additional infrastructure are not required.

16.0 CONCLUSIONS

This traffic and parking assessment for the proposed masterplan and stage 1 construction works for the future development of Newcastle Grammar School – Park Campus at 127 Union Street, Cooks Hill has determined the following;

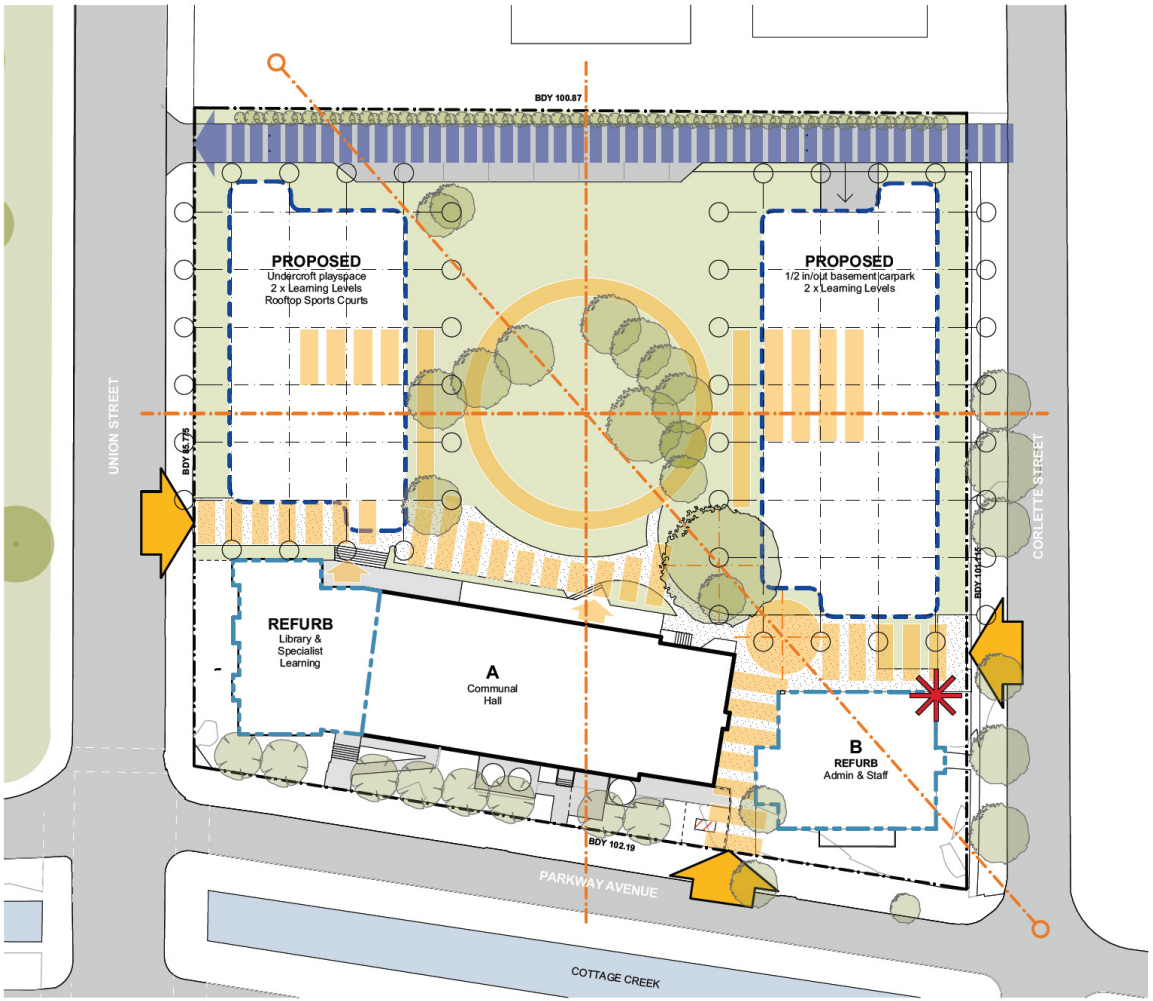
- The existing road network around the site is currently operating satisfactorily with good levels of service for motorists.
- The proposed full development of the site to a 4 stream school catering for Kindergarten to Year 6 students is likely to generate an additional 108 vtph during the AM and PM peaks.
- The addition of this traffic onto the local road network does not result in the road capacity thresholds for two-way mid-block capacity to be reached or result in an adverse impact on the operation of adjoining intersections. Therefore it can be concluded that the proposed development does not adversely impact on the local road network.
- Sidra Intersection modelling has demonstrated that the development does not adversely impact on the operation of the Union Street / Parkway Avenue signals.
- Sidra Intersection modelling has demonstrated that the development does not adversely impact on the Parkway Avenue / Corlette Street stop intersection and therefore as the traffic gets further distributed and diluted through the network intersections on the wider road network.
- The masterplan by providing a 31-35 space on-site car park provides sufficient and suitable on-site car parking to meet the requirements of Newcastle City Council's DCP (2012) and Australian Standard *AS2890.1-2004 Parking facilities – part 1 Off-street car parking*.
- The extensions to the school are unlikely to change the servicing arrangements for the school.
- The proposed access arrangements to the kiss and ride facility and on-site car park are compliant with Australian Standard and Newcastle City Council requirements therefore is suitable for use by the development however they will need the approval of Newcastle City Council.
- A Construction Traffic and Pedestrian Management Plan will need to be implemented during construction works to mitigate adverse impacts of construction traffic on the local road network and in regard to the operation and amenity of the school and nearby residents. Strategies to mitigate the impacts for which prior approval is required include the use of remote parking for non-essential vehicles off-site, provision of a Construction Zone on Union or Corlette Street along the school frontage during different stages of construction, marshalling and protection of pedestrian movements through the construction zone and programming of as much of the construction works during the extended school break periods as possible. Overall however it is reasonable to conclude that with the implementation of the Construction Traffic and Pedestrian Management Plan the construction works will not adversely impact on the local road network, the school or nearby residents.
- The existing concrete footpath network, with crossing facilities, which already exists within the area, is considered suitable for the level of additional pedestrian traffic resulting from this development and no nexus exists for additional pedestrian facilities in the area.
- The development is unlikely to generate any significant increase in cycle traffic even with the proposed improved end of trip facilities for cyclists. Therefore no nexus exists for the provision of additional cycle ways in the vicinity of the site.
- The existing public transport services and infrastructure in the vicinity of the site is suitable for the development. Changes to the existing public transport system or additional infrastructure are therefore not required however, the school is adopting and implementing a Green Travel Plan to encourage more use of public transport by staff and students.

17.0 RECOMMENDATION

Having carried out this traffic and parking assessment for the proposed masterplan and stage 1 construction works for the future development of Newcastle Grammar School – Park Campus at 127 Union Street, Cooks Hill, it is recommended that the proposal can be supported from a traffic impact perspective as the development complies with all relevant requirements of Newcastle City Council, Australian Standards and TfNSW.

JR Garry BE (Civil), Masters of Traffic
Director
Intersect Traffic Pty Ltd

ATTACHMENT A
DEVELOPMENT PLANS



Newcastle Grammar SCHOOL

Concept Design

1. Dimensions are in millimeters unless otherwise shown.
2. Work to given dimensions. Do not scale from drawing.
3. Check all dimensions on site prior to construction and fabrication.
4. Bring any discrepancies to the attention of the proprietor & architect.

LEGEND

- EXISTING PERMANENT BUILDINGS
- ROAD
- BUILDINGS TO BE DEMOLISHED
- PROPOSED BUILDING FOOTPRINT
- EXISTING BUILDINGS TO BE REFURBISHED
- ONSITE VEHICULAR CIRUCLATION
- ONSITE PEDESTRIAN CIRCULATION
- HARDSTAND PLAY
- SCHOOL ENTRY POINTS
- EXISTING SITE TREES
- PROPOSED SCREEN PLANTING
- ADMINISTRATION / VISITOR ENTRY POINT

FULL MASTERPLAN

Function	Required Area (sqm)	Area (sqm)
Admin	170	222
Canteen	55	38
Communal Hall	272	626
Learning Space	(21) 2,096	(24 + 10 spec)2,390
Library & ISTEM	425	334
OOSH		289
PE	34	15
Peripatetic Studios		41
Staff	125	385
Stores & Services	54	59
Student Amenities	196	212
	3,427 m²	**4,611 m²**

NEW CONSTRUCTION

CORLETTE ST	Learning Space	1,135
	OOSH	289
	Staff	44
	Student Amenities	32
		1,500 m²
UNION ST	Learning Space	1,255
	Car Park	1,227
	Staff	66
	Student Amenities	32
		1,353 m²
		2,853 m²
	External Covered Play	1,579

REFURBISHMENT

Admin	222
Circulation	150
Library & ISTEM	334
PE	15
Peripatetic Studios	8
Staff	275
Stores & Services	31
	1,035 m²

4293
3.01
RevC 14.12.20

Proposed Masterplan
Newcastle Grammar School - Park Campus Stage 1
Parkway Avenue, Cooks Hill NSW

0m 5 10 15 20 25 1:500 @A3

SHAC
Nominated Architect Justin Hamilton (6160) | ABN 32 131 584 846

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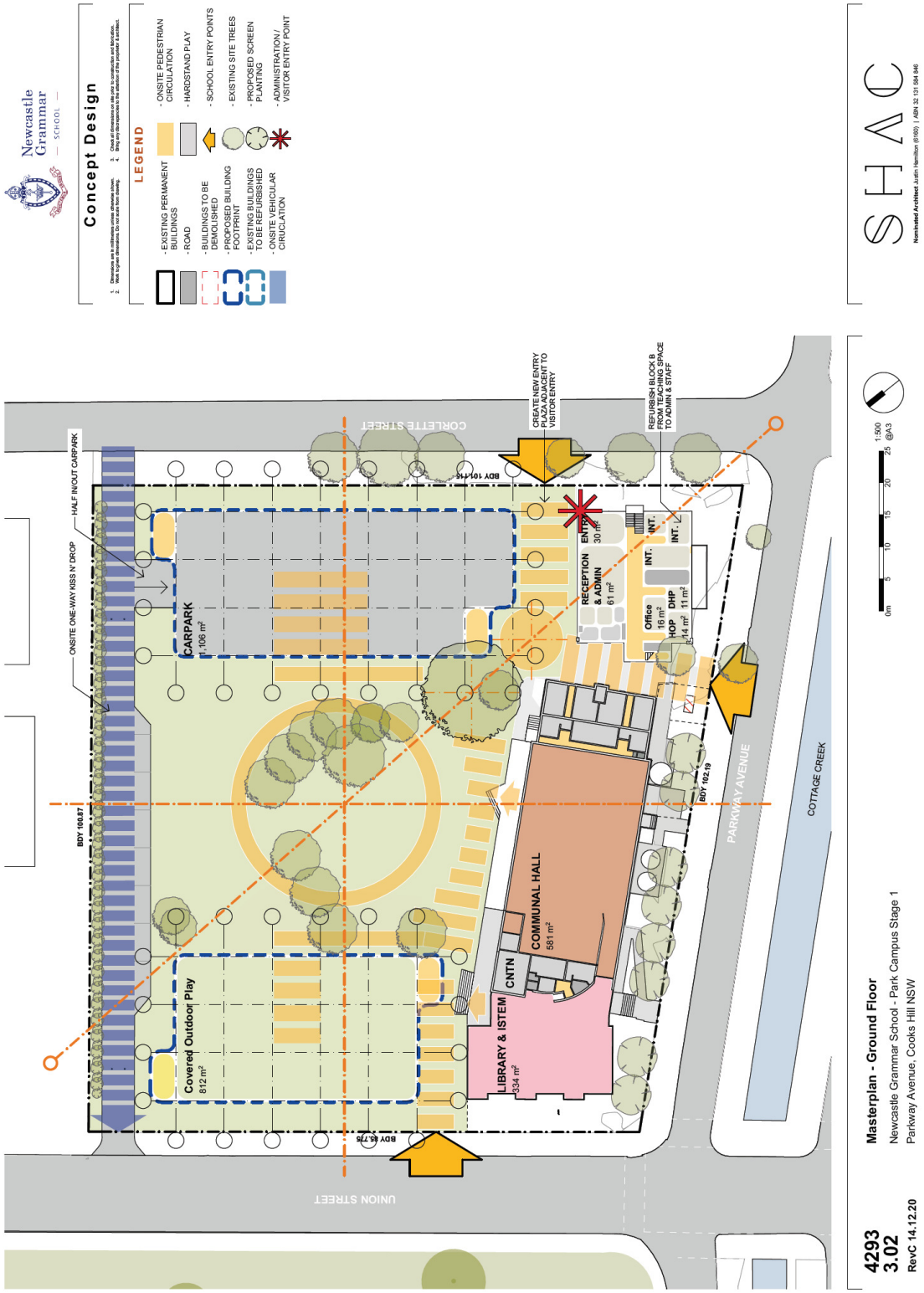
Newcastle Grammar SCHOOL
Concept Design
1. Dimensions are in millimetres unless otherwise shown.
2. Do not scale drawings. Do not scale from drawing.
3. Check all dimensions on site prior to construction and fabrication.
4. Report any discrepancies to the architect. Use only as specified & architect.
LEGEND
- EXISTING PERMANENT BUILDINGS
- ROAD
- BUILDINGS TO BE DEMOLISHED
- PROPOSED BUILDING FOOTPRINT
- EXISTING BUILDINGS TO BE REFURBISHED
- ONSITE VEHICULAR CIRCULATION
- ONSITE PEDESTRIAN CIRCULATION
- HARDSTAND PLAY
- SCHOOL ENTRY POINTS
- EXISTING SITE TREES
- PROPOSED SCREEN PLANTING
- ADMINISTRATION / VISITOR ENTRY POINT
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UNION STREET
CORLETTE STREET
PARKWAY AVENUE
COTTAGE CREEK
ONSITE ONE-WAY KISS N' DROP
HALF IN/OUT CARPARK
CARPARK
1,106 m²
Covered Outdoor Play
812 m²
LIBRARY & ISTEM
334 m²
CNTN
COMMUNAL HALL
581 m²
RECEPTION & ADMIN
61 m²
ENTRY
30 m²
Office
16 m²
HOP
14 m²
DHP
11 m²
INT.
INT.
INT.
CREATE NEW ENTRY PLAZA ADJACENT TO VISITOR ENTRY
REFURBISH BLOCK B FROM TEACHING SPACE TO ADMIN & STAFF
BDY 100.87
BDY 101.44
BDY 102.19
BDY 98.775
1:500 @A3
0m 5 10 15 20 25
4293
3.02
RevC 14.12.20
Masterplan - Ground Floor
Newcastle Grammar School - Park Campus Stage 1
Parkway Avenue, Cooks Hill NSW

Newcastle Grammar
SCHOOL
Concept Design
1. Dimensions are in millimeters unless otherwise shown.
2. Work not specified on this drawing is not to be undertaken.
3. Check all dimensions on site prior to construction and fabrication.
4. Report any discrepancies to the architect. Do not scale this drawing.
LEGEND
- EXISTING PERMANENT BUILDINGS
- ROAD
- BUILDINGS TO BE DEMOLISHED
- PROPOSED BUILDING FOOTPRINT
- EXISTING BUILDINGS TO BE REFURBISHED
- ONSITE VEHICULAR CIRCULATION
- ONSITE PEDESTRIAN CIRCULATION
- HARDSTAND PLAY
- SCHOOL ENTRY POINTS
- EXISTING SITE TREES
- PROPOSED SCREEN PLANTING
- ADMINISTRATION / VISITOR ENTRY POINT
SHAC
Nominated Architect Justin Hamilton (6160) | ABN 32 131 584 846
UNION STREET
T/S 47 m²
PAA 100 m²
SPEC 47 m²
CAMPFIRE 200 m²
CAMPFIRE 100 m²
WCSTF 31 m²
STF WC 31 m²
OOSH 98 m²
WC 33 m²
KITCH 35 m²
STF 55 m²
STDY 55 m²
STAFFROOM 47 m²
HALL BELOW
ISTEM BELOW
0m 5 10 15 20 25
1:500 @A3
4293
3.03
RevC 14.12.20
Masterplan - First Floor
Newcastle Grammar School - Park Campus Stage 1
Parkway Avenue, Cooks Hill NSW

Newcastle Grammar
SCHOOL
Concept Design
LEGEND
- EXISTING PERMANENT BUILDINGS
- ROAD
- BUILDINGS TO BE DEMOLISHED
- PROPOSED BUILDING FOOTPRINT
- EXISTING BUILDINGS TO BE REFURBISHED
- ONSITE VEHICULAR CIRCULATION
- ONSITE PEDESTRIAN CIRCULATION
- HARDSTAND PLAY
- SCHOOL ENTRY POINTS
- EXISTING SITE TREES
- PROPOSED SCREEN PLANTING
- ADMINISTRATION / VISITOR ENTRY POINT
SHAC
Nominated Architect Justin Hamilton (6160) | ABN 32 131 984 846
T/S 47 m²
PAA 100 m²
SPEC 47 m²
CAMPFIRE 200 m²
WCSTF 31 m²
ISTEM 47 m²
STF 31 m²
WC 31 m²
CAMPFIRE 100 m²
0m 5 10 15 20 25
1:500 @A3
Masterplan - Second Floor
Newcastle Grammar School - Park Campus Stage 1
Parkway Avenue, Cooks Hill NSW
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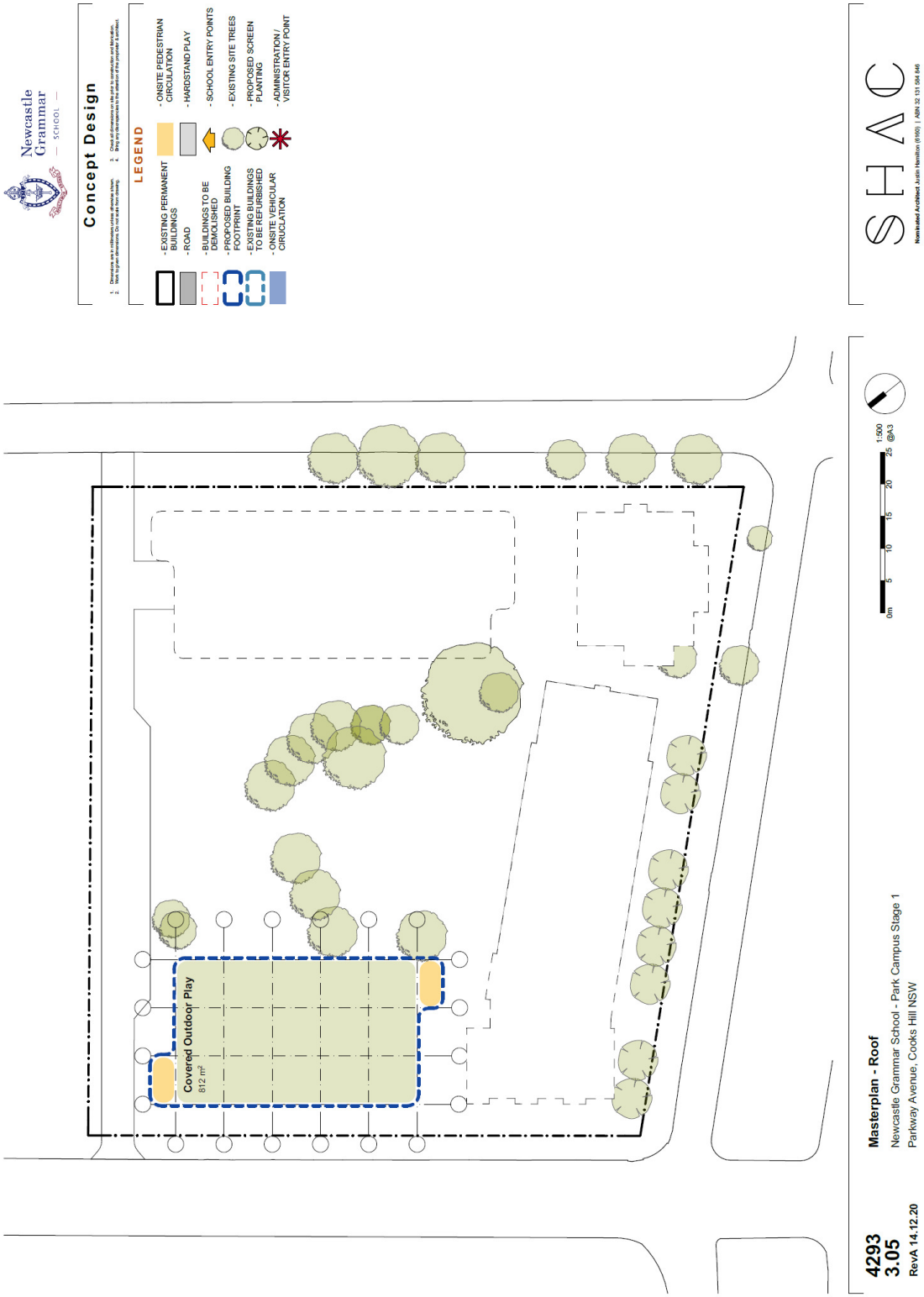
3.04
RevC 14.12.20


Newcastle Grammar
SCHOOL
Concept Design
1. Dimensions are in millimetres, unless otherwise shown.
Note that dimensions do not include finishes.
2. Check all dimensions on site prior to construction and fabrication.
Note that dimensions to be verified on the commencement of fabrication.
LEGEND
- EXISTING PERMANENT BUILDINGS
- ROAD
- BUILDINGS TO BE DEMOLISHED
- PROPOSED BUILDING FOOTPRINT
- EXISTING BUILDINGS TO BE RETAINED
- ONSITE VEHICULAR CIRCULATION
- ONSITE PEDESTRIAN CIRCULATION
- HARDSTAND PLAY
- SCHOOL ENTRY POINTS
- EXISTING SITE TREES
- PROPOSED SCREEN PLANTING
- ADMINISTRATION / VISITOR ENTRY POINT
SHAC
Nominated Architect Justin Hamilton (6160) | ABN 32 131 584 846
Covered Outdoor Play
812 m²
0m 5 10 15 20 25
1:500 @A3
Masterplan - Roof
Newcastle Grammar School - Park Campus Stage 1
Parkway Avenue, Cooks Hill NSW
4293
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RevA 14.12.20

Newcastle Grammar — SCHOOL —

Concept Design

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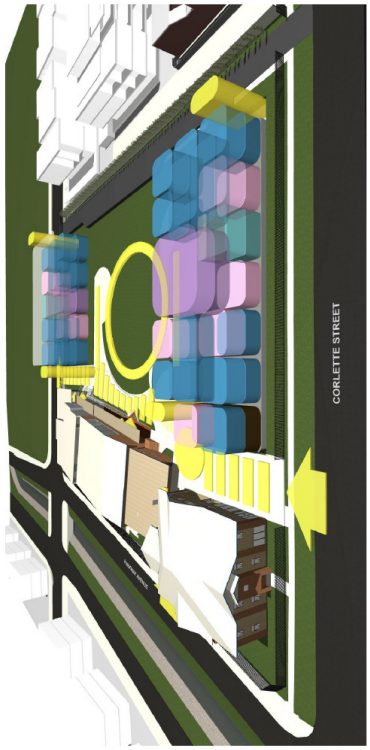

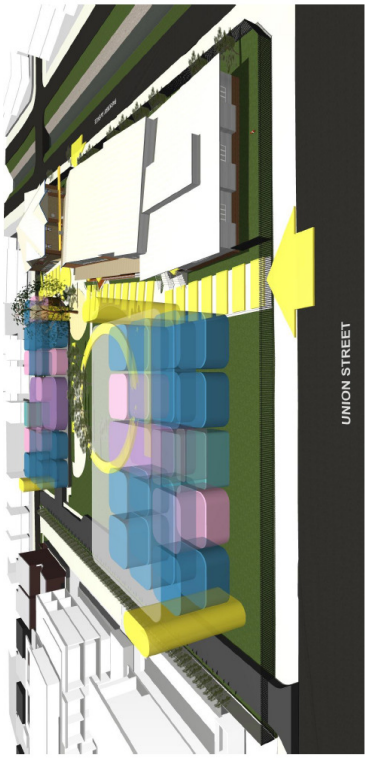

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NTS @A3

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RevC 14.12.20

Masterplan - Blocking & Stacking

Newcastle Grammar School - Park Campus Stage 1

Parkway Avenue, Cooks Hill NSW

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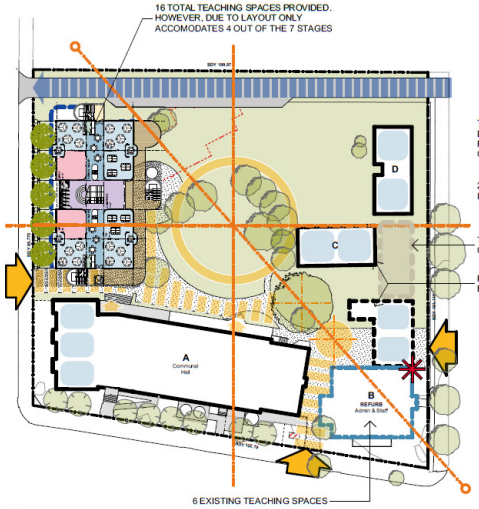

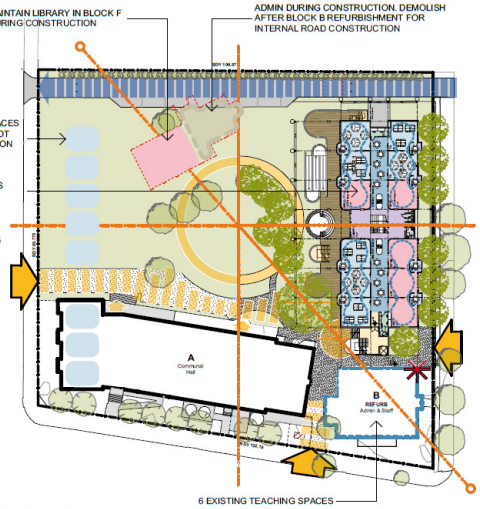

Union Street

- 14 teaching spaces currently being used
- 3 stream K - 6 school requires 21 teaching spaces

- **During construction**: must provide 14 teaching spaces to maintain current numbers
  - +3 existing teaching spaces (Block A)
  - +2 existing teaching spaces (Block C)
  - +8 existing teaching spaces (Block B)
  - +2 refurbished teaching spaces (Block D)
  - =15 permanent teaching spaces available, 1 surplus

- **After construction**: 3 stream K - 6 = 21 teaching spaces required

The new building will have a total of 16 teaching spaces. However, due to the quad layout, it will only be able to accommodate 4 stages if year levels are to remain together. Therefore, 4 of these teaching spaces could be specialist spaces.

Alternatively, the year levels & stages could split & utilise all the new teaching spaces for general learning until the completion of Stage 02. This would allow the demolition of Block C & the annex of Block B.

The two storey portion of Block B will be refurbished for staff & admin.

If year levels/stages stay together:
+12 new teaching spaces (not including 4 specialist teaching spaces)
+3 existing teaching spaces (Block A)
+2 existing teaching spaces (Block D)
+2 existing teaching spaces (Block C)
+2 existing teaching spaces (Block B)
= 21 total, the required number of teaching spaces for a 3 stream K-6 school
+ 4 specialist teaching spaces

If year levels/stages are split:
+16 new teaching spaces (including 4 specialist spaces to be general spaces until Stage 02)
+3 existing teaching spaces (Block A)
+2 existing teaching spaces (Block D)
= 21 total, the required number of teaching spaces for a 3 stream K-6 school
With no specialist teaching spaces

Note that this allows Block C & the annex of Block B to be demolished.

Corlette Street

- 14 teaching spaces currently being used
- 3 stream K - 6 school requires 21 teaching spaces

- **During construction**: must provide 14 teaching spaces to maintain current numbers
  - +3 existing teaching spaces (Block A)
  - +6 existing teaching spaces (Block B)
  - = 9 permanent teaching spaces available; 6 space defecit

5 temporary learning spaces required during construction during Stage 01.

- **After construction**: 3 stream K - 6 = 21 teaching spaces required
The Corlette Street building will be able to accommodate the full K-6, 3 stream enrollment with 3 additional specialist teaching spaces.

Newcastle Grammar — SCHOOL —

Concept Design

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LEGEND

- EXISTING PERMANENT BUILDINGS
- ROAD
- BUILDINGS TO BE DEMOLISHED
- PROPOSED BUILDING FOOTPRINT
- EXISTING BUILDINGS TO BE REFURBISHED
- ONSITE VEHICULAR CIRUCLATION
- ONSITE PEDESTRIAN CIRCULATION
- HARDSTAND PLAY
- SCHOOL ENTRY POINTS
- EXISTING SITE TREES
- PROPOSED SCREEN PLANTING
- ADMINISTRATION / VISITOR ENTRY POINT

SUMMARY

Union Street
- 16 new teaching spaces
- Total of 21 teaching spaces
- Option to break up year levels & utilise all new teaching spaces for general learning - allowing the demolition of Block C & the annex of Block B
- Option to keep year levels together in the new building & utilise the additional 4 teaching spaces for specialist teaching - Block C, D, & the annex of Block B would be required to remain & would result in the other year levels being separated & accomodated in the end of life buildings
- This option is 2 bays smaller than the Corlette Street option
- Retaining Block C & D impacts on the outdoor space available, but provides undercroft & rooftop play options
- This option does not address the parking issues
- This option does not allow universal access to the first floor of Block B

Corlette Street
- 24 new teaching spaces, 21 for general teaching & 3 for specialist Accommodating the entire 3 stream K-6 school in the new building
- This option is 2 bays larger than the Union Street option
- The layout of the building allows the year levels & stages to remain together, supporting the school's teaching methods
- There is less impact on the outdoor play space compared to the Union Street option as it replaces the existing, end of life buildings
- This option immediately ameliorates the parking issues
- This option allows universal access to the first floor of Block B via a walkway

4293
3.07
RevB 16.12.20

Masterplan - Staging
Newcastle Grammar School - Park Campus Stage 1
Parkway Avenue, Cooks Hill NSW

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Nominated Architect Justin Hamilton (6160) | ABN 32 131 584 846

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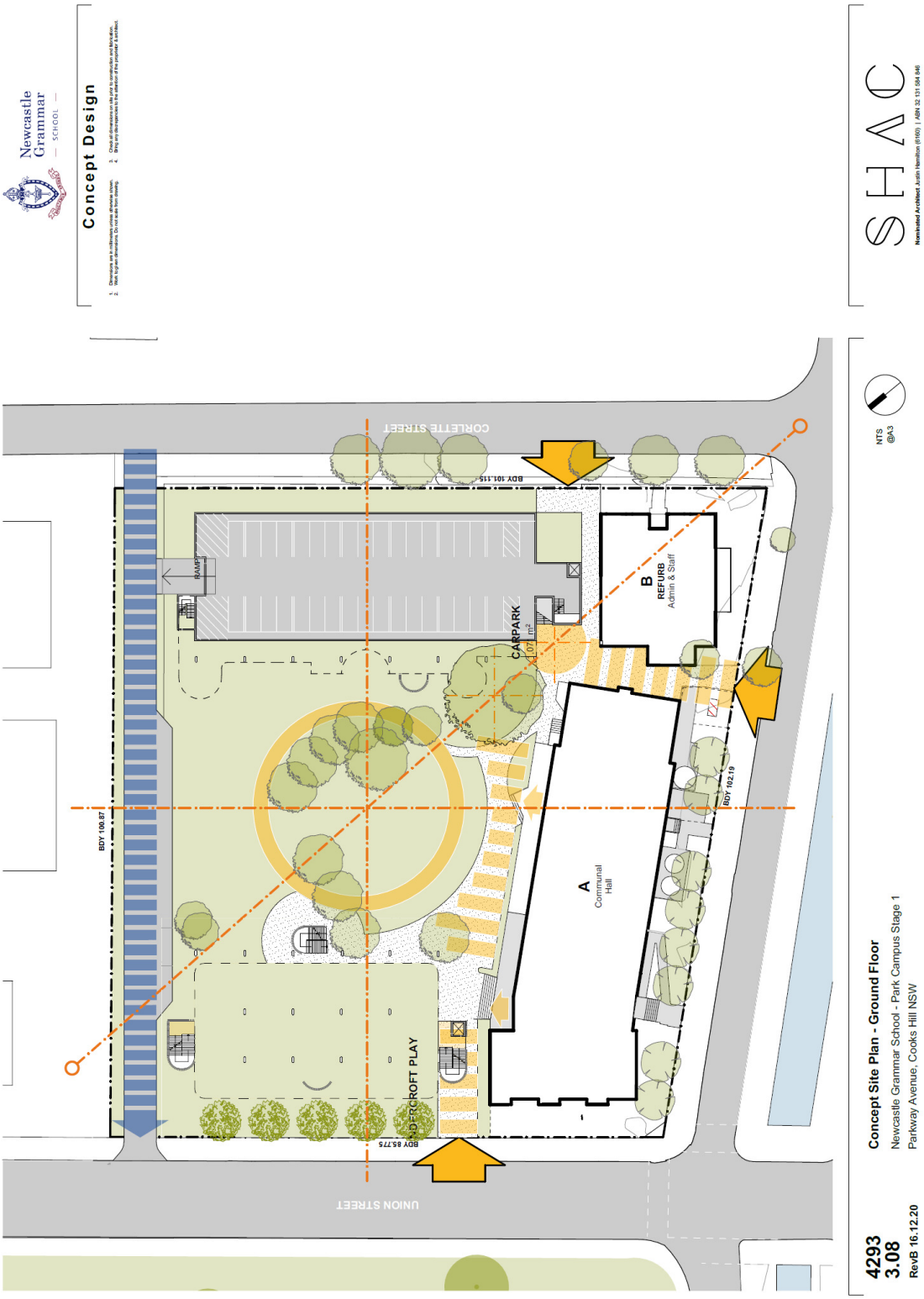
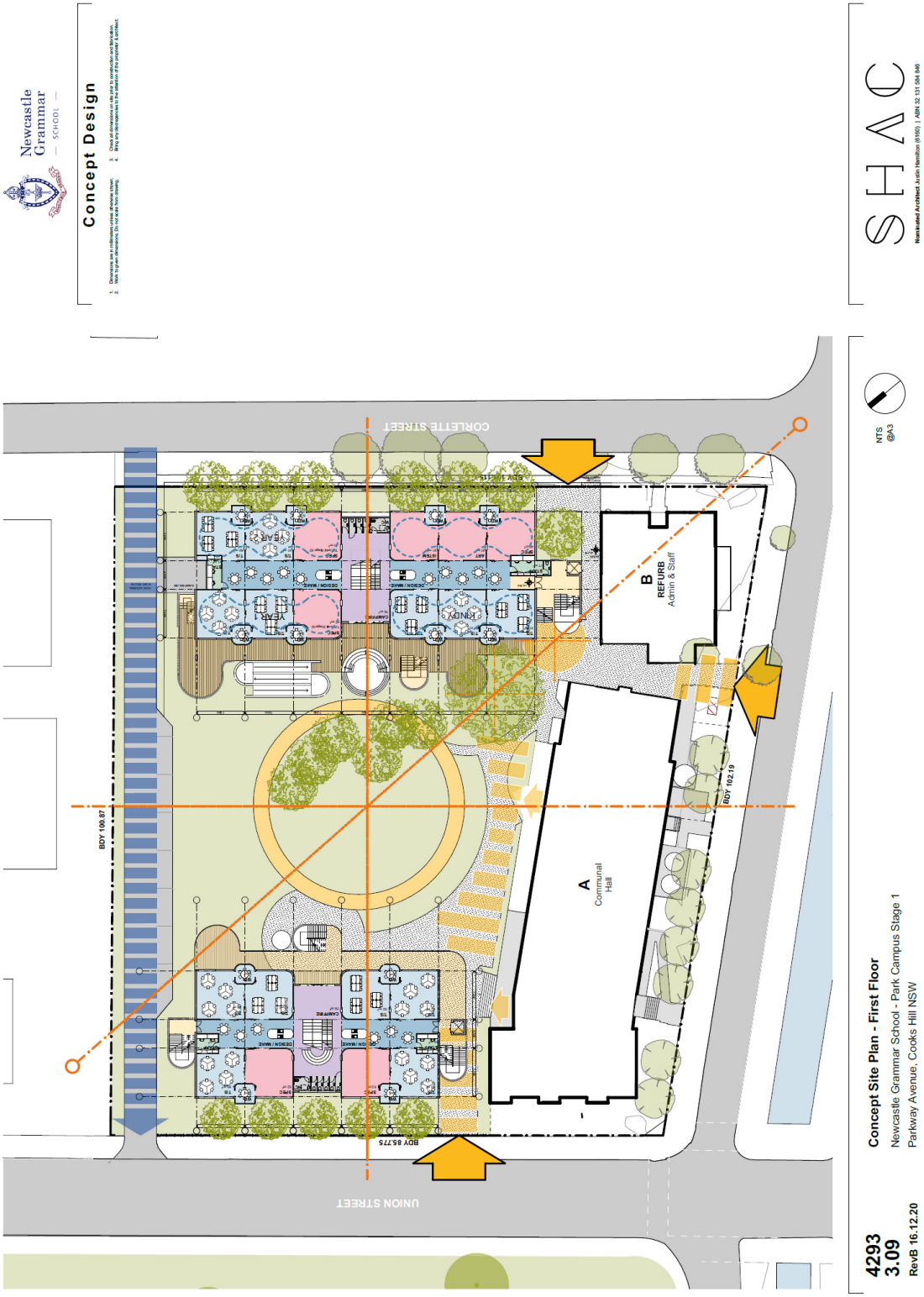
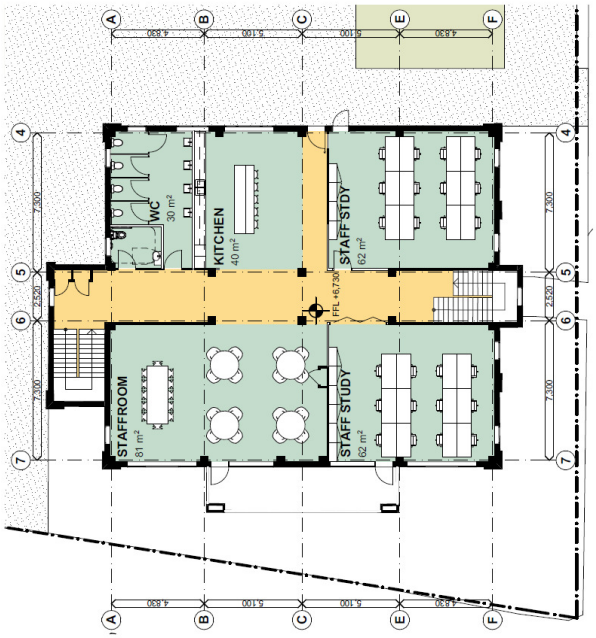

Newcastle Grammar SCHOOL
Concept Design
1. Dimensions are in millimeters unless otherwise shown.
2. Refer to general dimensions. Do not scale from drawing.
3. Check all dimensions on site prior to construction and fabrication.
4. Report any discrepancies to the architect. Work not to proceed until resolved.
SHAC
Nominated Architect Justin Hamilton (6160) | ABN 32 131 584 846
NTS @A3
CORLETTE STREET
BDY 101.115
RAMP
CARPARK
B
REFURB
Admin & Staff
BDY 102.19
BDY 100.87
A
Communal Hall
UNDERCROFT PLAY
BDY 85.775
UNION STREET
Concept Site Plan - Ground Floor
Newcastle Grammar School - Park Campus Stage 1
Parkway Avenue, Cooks Hill NSW
4293
3.08
RevB 16.12.20


Newcastle Grammar SCHOOL
Concept Design
1. Dimensions are in millimetres unless otherwise shown.
2. Check all dimensions on site prior to construction and fabrication.
1. Do not scale drawings. Only use dimensions shown.
2. Refer to Specifications for further information and instructions.
SHAC
Nominated Architect Justin Hamilton (6160) | ABN 32 131 584 846
CORLETTE STREET
UNION STREET
BDY 100.97
BDY 85.775
BDY 102.19
A
Communal Hall
B
REFURB
Admin & Staff
NTS @A3
Concept Site Plan - First Floor
Newcastle Grammar School - Park Campus Stage 1
Parkway Avenue, Cooks Hill NSW
4293
3.09
RevB 16.12.20

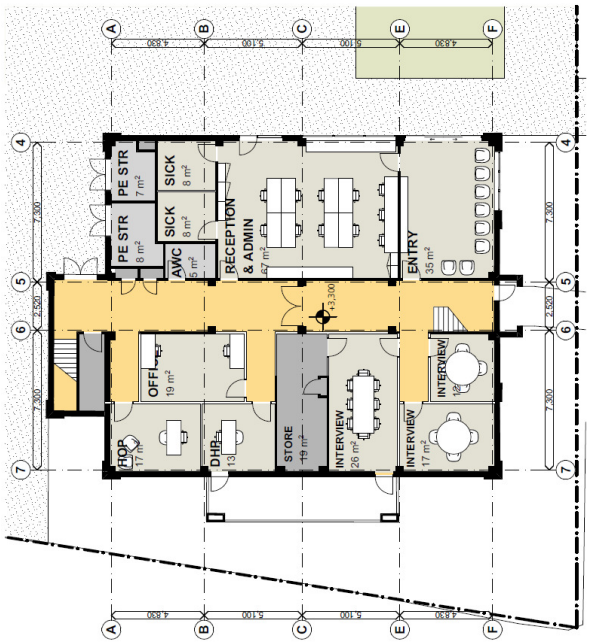
Newcastle Grammar — SCHOOL —

Concept Design

1. Dimensions are in millimetres unless otherwise noted.
2. Work to given dimensions. Do not scale from drawing.
3. Digital information is only to be used for reference and information.
4. Bring any discrepancies to the attention of the principal architect.



FIRST FLOOR



GROUND FLOOR

BLOCK B REFURB AREA SUMMARY

Function	Area (sqm)
Admin	222
Circulation	150
PE	15
Staff	275
Stores & Services	31
	693 m²

SHAC

Nominated Architect Justin Hamilton (6160) | ABN 32 131 594 946

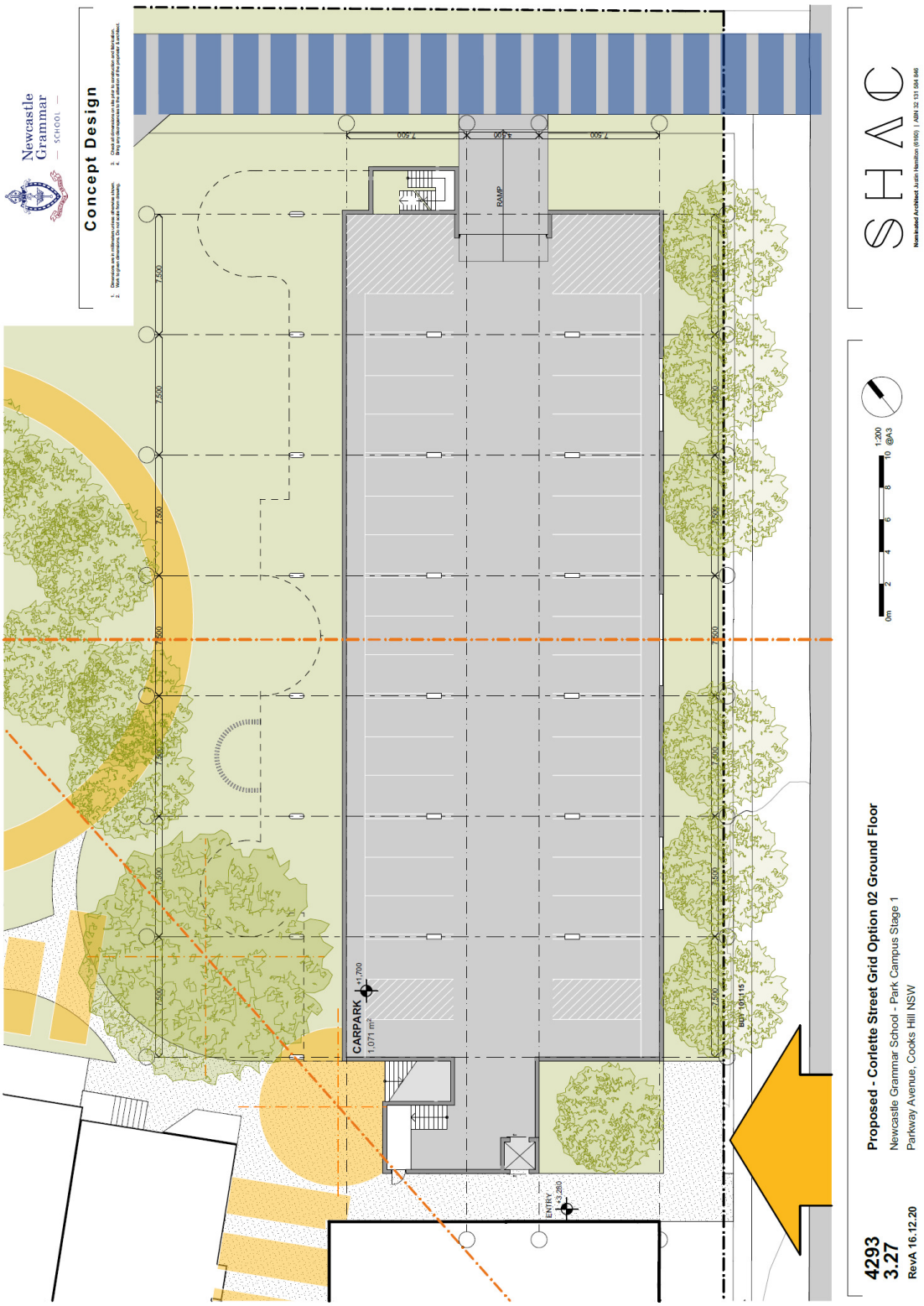
1:200 @A3

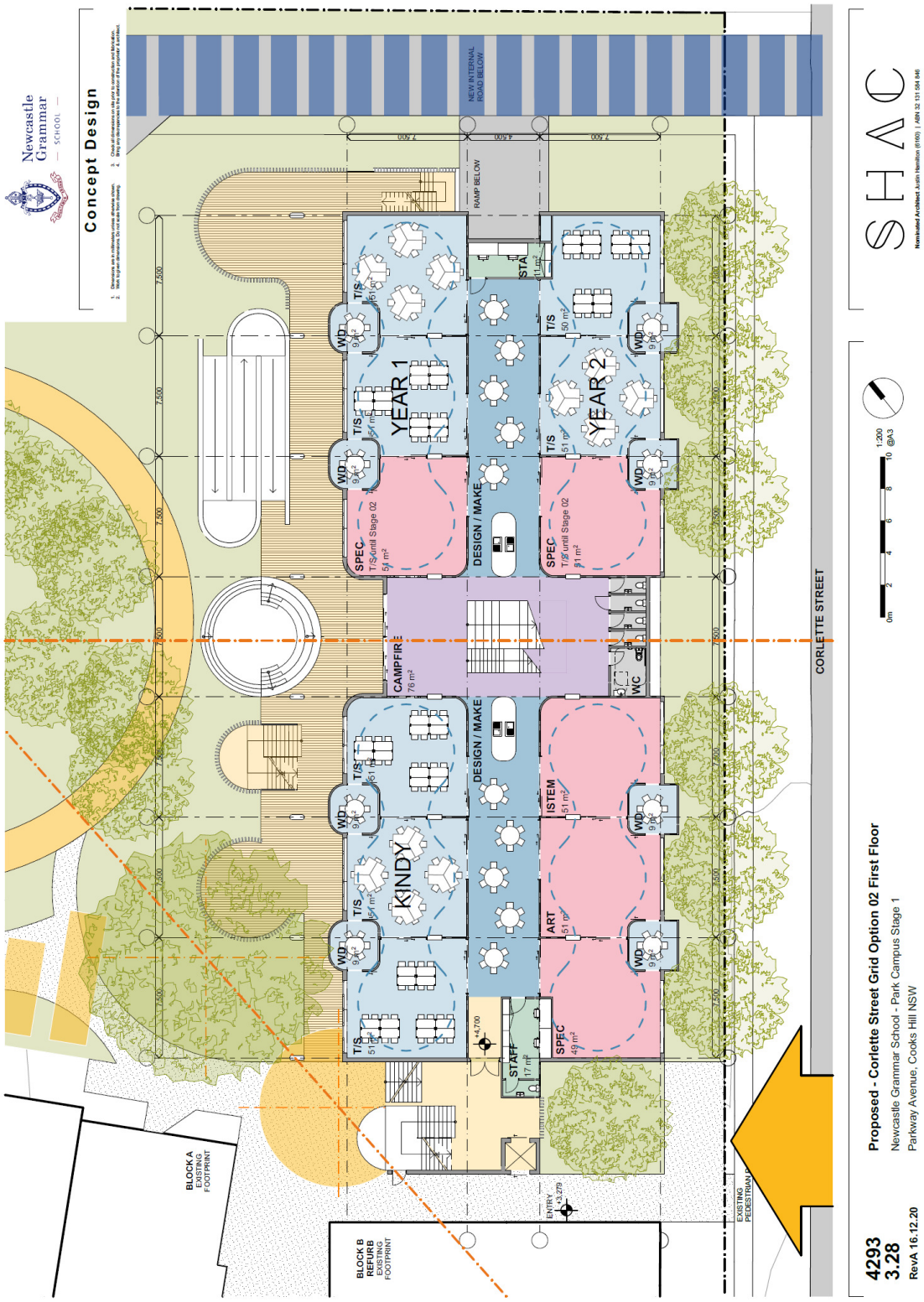
0m 2 4 6 8 10

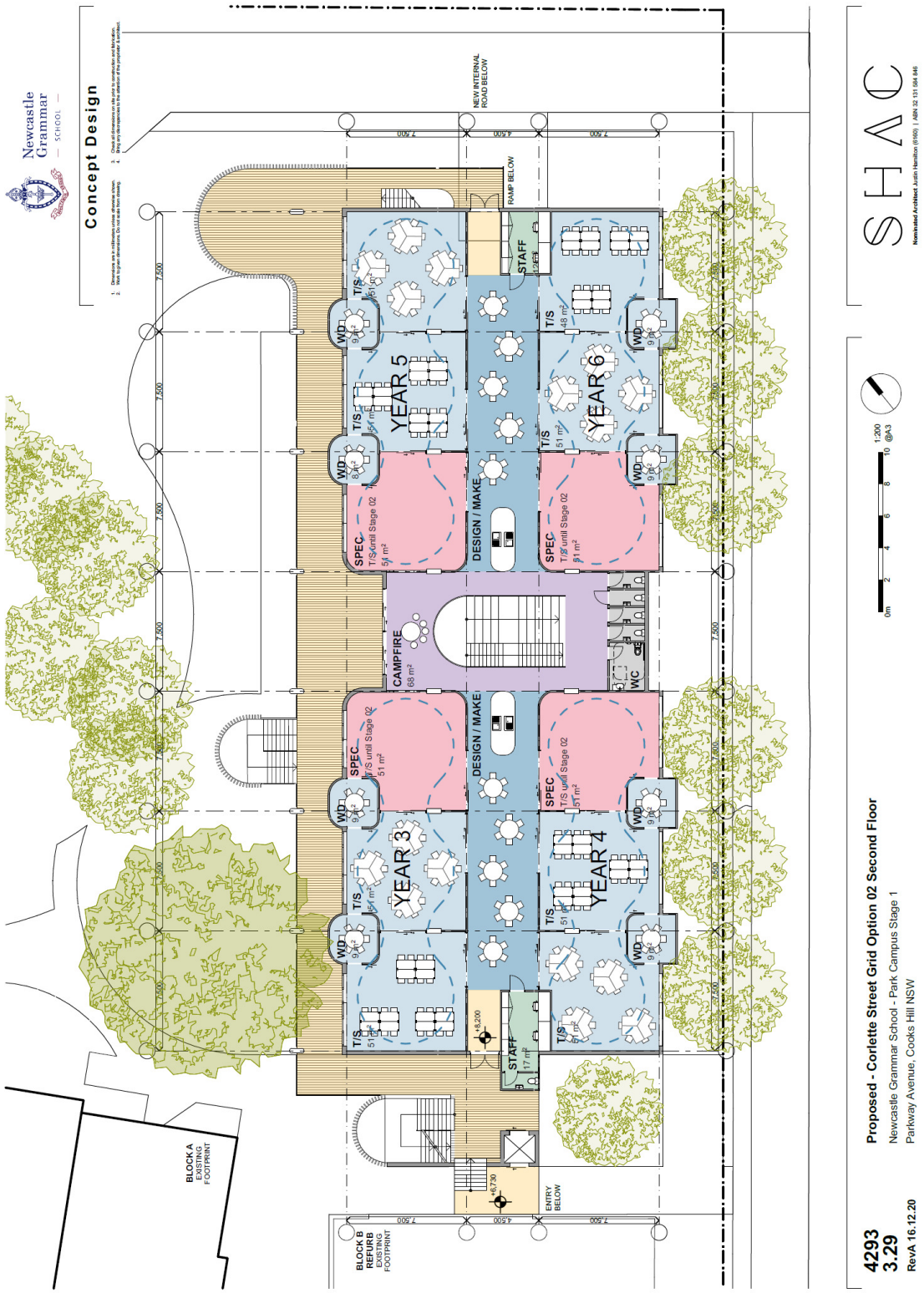
4293
3.13
RevC 16.12.20

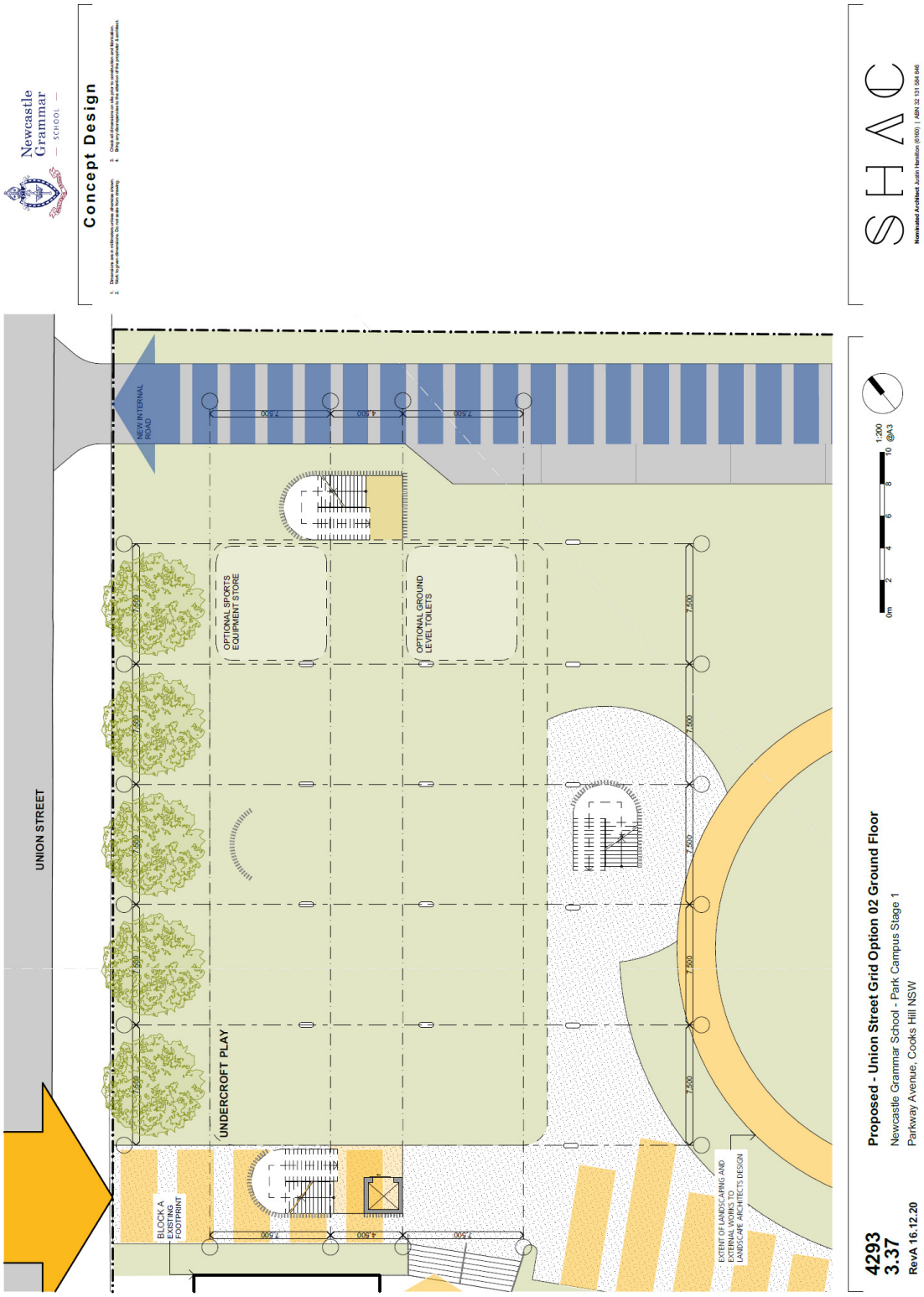
Block B Proposed Floor Plans
Newcastle Grammar School - Park Campus Stage 1
Parkway Avenue, Cooks Hill NSW

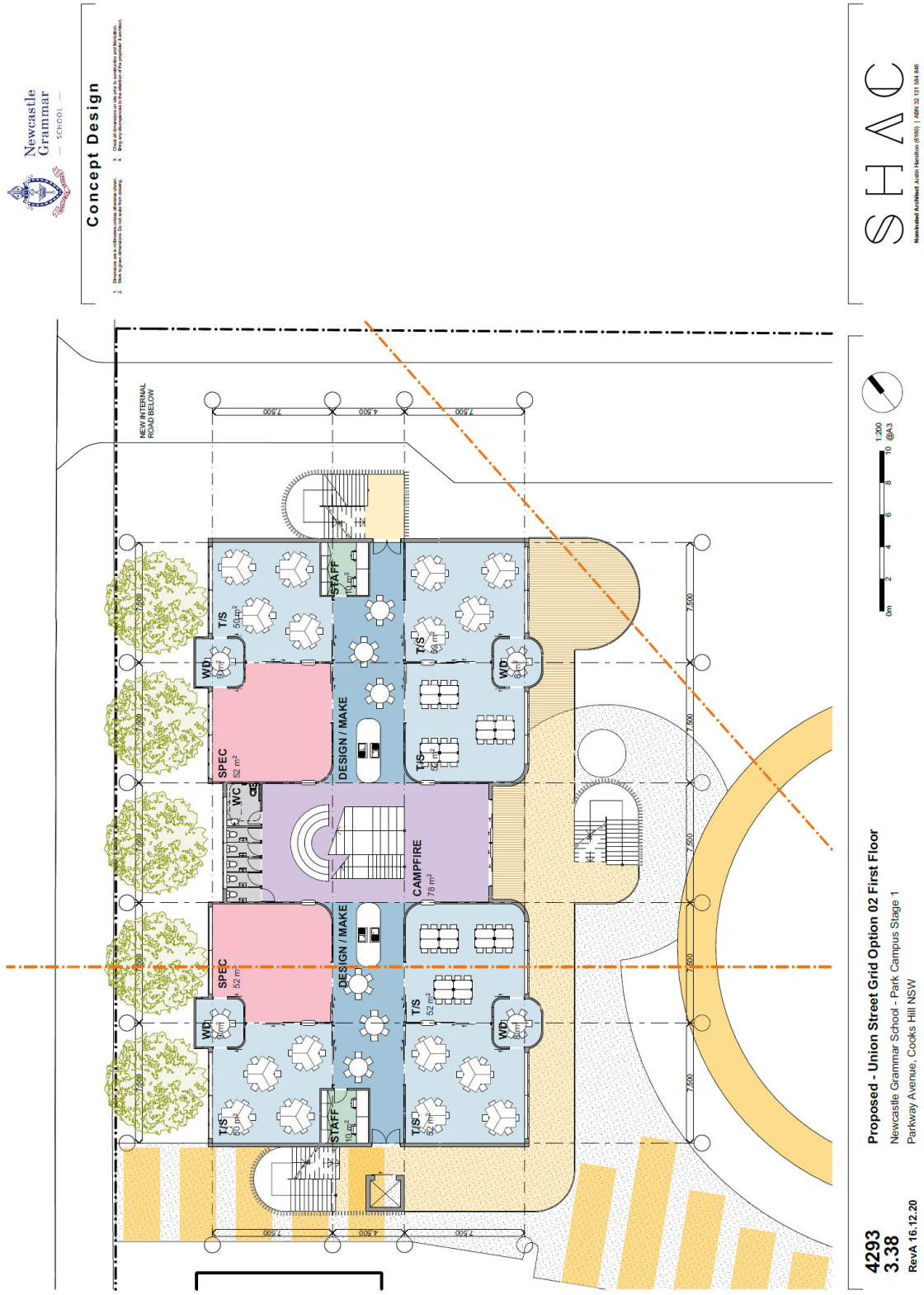
Drawing and design © SHAC Pty Ltd 2016. The signed control copy of this drawing is held by SHAC Pty Ltd. | file: BMasbod: BMSBEVBEGA - BMasbod Basic fx ARCHICAD 24-4293 N GS Park Campus Stage 1 4293 3.15 04 NGS Park Campus Stage 1 date:18/12/2020 time: 9:52 AM

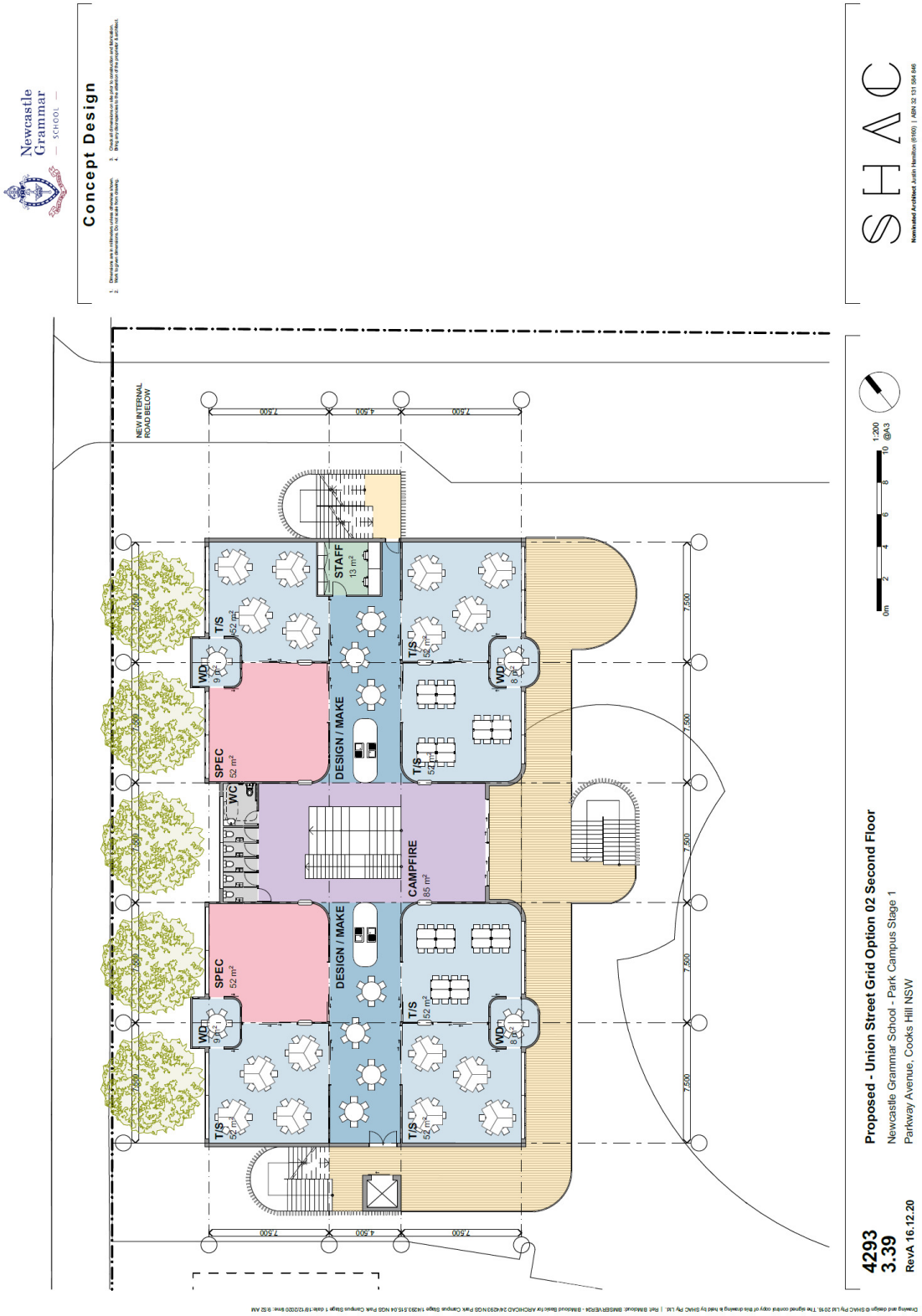

Newcastle Grammar
SCHOOL
Concept Design
1. Dimensions are in millimeters unless otherwise shown.
Write dimensions in preference to scaling.
2. Check all dimensions on site prior to construction and fabrication.
Report discrepancies to the Architect. Do not scale drawings.
SHAC
Nominated Architect Justin Hamilton (6160) | ABN 32 131 584 846
RAMP
7,500
4,500
CARPARK
+1,700
1,071 m²
ENTRY
+3,280
BOM 100-115°
0m 2 4 6 8 10
1:200 @A3
4293
3.27
RevA 16.12.20
Proposed - Corlette Street Grid Option 02 Ground Floor
Newcastle Grammar School - Park Campus Stage 1
Parkway Avenue, Cooks Hill NSW

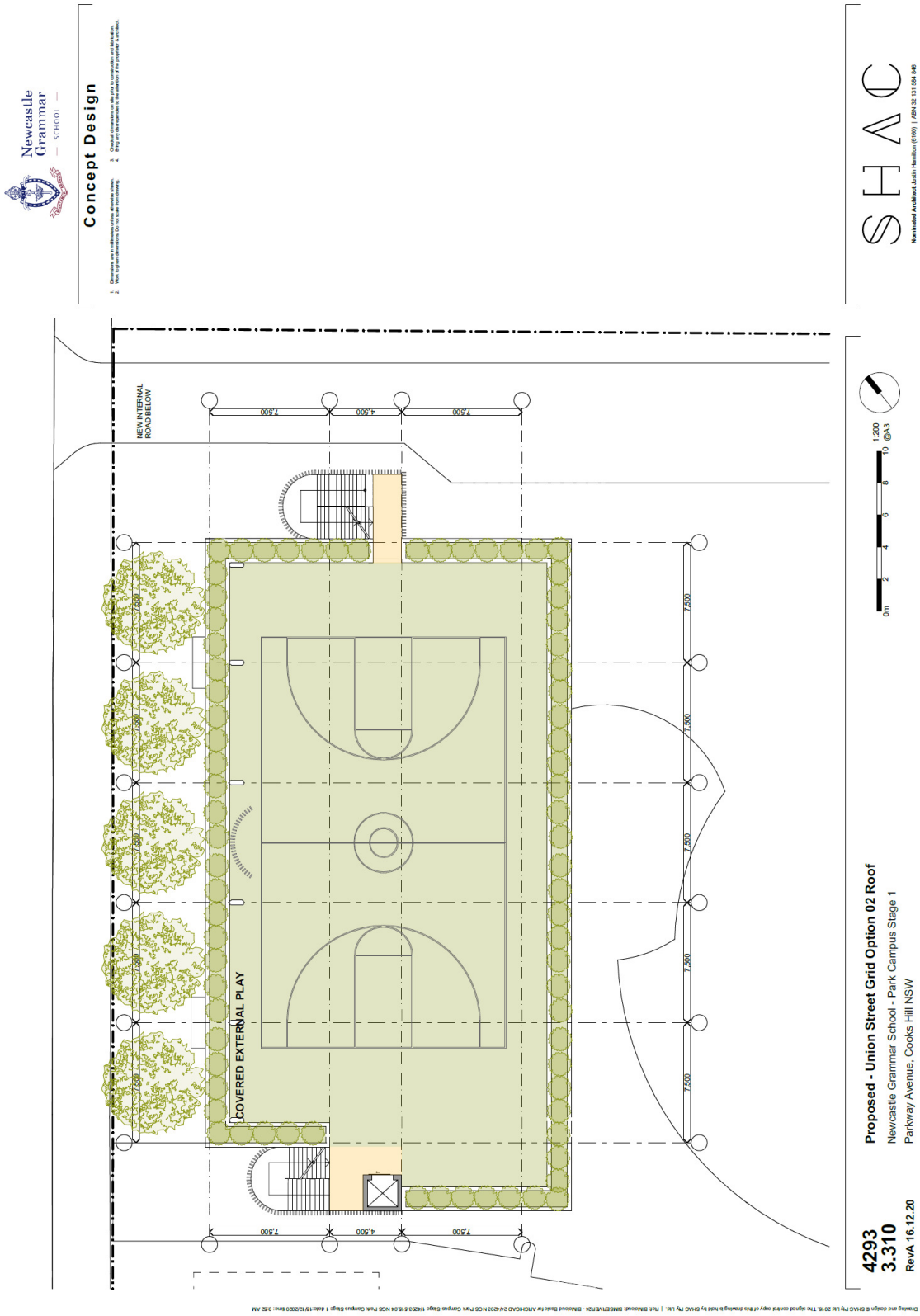

Newcastle Grammar SCHOOL
Concept Design
NEW INTERNAL ROAD BELOW
RAMP BELOW
YEAR 1
YEAR 2
KINDY
DESIGN / MAKE
CAMPFIRE
76 m²
SPEC
T/S until Stage 02
54 m²
51 m²
T/S
WD
STA
11 m²
ISTEM
ART
STAFF
17 m²
SPEC
49 m²
WC
BLOCK A EXISTING FOOTPRINT
BLOCK B REFURB EXISTING FOOTPRINT
ENTRY
EXISTING PEDESTRIAN
CORLETTE STREET
SHAC
Nominated Architect Justin Hamilton (6160) | ABN 32 131 584 846
1:200 @A3
Proposed - Corlette Street Grid Option 02 First Floor
Newcastle Grammar School - Park Campus Stage 1
Parkway Avenue, Cooks Hill NSW
4293
3.28
RevA 16.12.20


Newcastle Grammar SCHOOL
Concept Design
YEAR 3
YEAR 4
YEAR 5
YEAR 6
DESIGN / MAKE
CAMPFIRE
68 m²
SPEC
T/S until Stage 02
51 m²
T/S
WD
STAFF
17 m²
WC
NEW INTERNAL ROAD BELOW
RAMP BELOW
ENTRY BELOW
BLOCK A EXISTING FOOTPRINT
BLOCK B REFURB EXISTING FOOTPRINT
SHAC
Nominated Architect Justin Hamilton (6169) | ABN 32 131 984 846
1:200 @A3
Proposed - Corlette Street Grid Option 02 Second Floor
Newcastle Grammar School - Park Campus Stage 1
Parkway Avenue, Cooks Hill NSW
4293
3.29
RevA 16.12.20


Newcastle Grammar SCHOOL
Concept Design
1. Dimensions are in millimetres unless otherwise shown.
2. Check all dimensions on site prior to construction and fabrication.
Write-up dimensions in the event of discrepancy between scaled and written dimensions.
SHAC
Nominated Architect: Justin Hamilton (6160) | ABN 32 131 584 646
UNION STREET
NEW INTERNAL ROAD
7,500
4,500
7,500
OPTIONAL SPORTS EQUIPMENT STORE
OPTIONAL GROUND LEVEL TOILETS
UNDERCROFT PLAY
BLOCK A EXISTING FOOTPRINT
EXTENT OF LANDSCAPING AND EXTERNAL WORKS TO LANDSCAPE ARCHITECTS DESIGN
0m 2 4 6 8 10
1:200 @A3
4293
3.37
RevA 16.12.20
Proposed - Union Street Grid Option 02 Ground Floor
Newcastle Grammar School - Park Campus Stage 1
Parkway Avenue, Cooks Hill NSW


Newcastle Grammar
SCHOOL
Concept Design
1. Dimensions are in millimetres, unless otherwise shown.
Do not scale drawings. Check all dimensions.
2. Check all dimensions on site prior to construction and fabrication.
Report any discrepancies to the Architect. If in doubt, ask.
SHAC
Nominated Architect Justin Hamilton (6150) | ABN 32 131 584 846
NEW INTERNAL ROAD BELOW
7,500
4,500
7,500
T/S
50 m²
WD
9 m²
SPEC
52 m²
WC
DESIGN / MAKE
STAFF
10 m²
CAMPFIRE
78 m²
T/S
52 m²
1:200 @A3
0m
2
4
6
8
10
4293
3.38
RevA 16.12.20
Proposed - Union Street Grid Option 02 First Floor
Newcastle Grammar School - Park Campus Stage 1
Parkway Avenue, Cooks Hill NSW


Newcastle Grammar SCHOOL
Concept Design
1. Dimensions are in millimetres unless otherwise shown.
2. Do not scale drawings. Only use dimensions shown.
1. Check all dimensions on site prior to construction and fabrication.
2. Report any discrepancies, errors or omissions to the Nominated Architect.
SHAC
Nominated Architect Justin Hamilton (6160) | ABN 32 131 564 846
NEW INTERNAL ROAD BELOW
STAFF
13 m²
T/S
52 m²
WD
9 m²
8 m²
SPEC
52 m²
WC
DESIGN / MAKE
CAMPFIRE
85 m²
7,500
4,500
0m
2
4
6
8
10
1:200 @A3
4293
3.39
RevA 16.12.20
Proposed - Union Street Grid Option 02 Second Floor
Newcastle Grammar School - Park Campus Stage 1
Parkway Avenue, Cooks Hill NSW


Newcastle Grammar SCHOOL
Concept Design
1. Dimensions are in millimeters unless otherwise shown.
2. Check all dimensions on site prior to construction and fabrication.
Note: Figured dimensions to be adhered to. Do not scale off drawing.
3. Report any discrepancies to the architect. If in doubt ask.
SHAC
Nominated Architect Justin Hamilton (6160) | ABN 32 131 084 846
NEW INTERNAL ROAD BELOW
COVERED EXTERNAL PLAY
7,500
4,500
0m 2 4 6 8 10
1:200 @A3
Proposed - Union Street Grid Option 02 Roof
Newcastle Grammar School - Park Campus Stage 1
Parkway Avenue, Cooks Hill NSW
4293
3.310
RevA 16.12.20

ATTACHMENT B
GREEN TRAVEL PLAN

NEWCASTLE GRAMMAR SCHOOL
THE HILL CAMPUS

Green Travel Plan

127 Union Street, Cooks Hill

4th February 2021

Prepared for:

NSW Department of Planning, Industry & Environment

By Intersect Traffic Pty Ltd
PO Box 268
EAST MAITLAND NSW 2323

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Introduction
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Aims 5

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The Site 5
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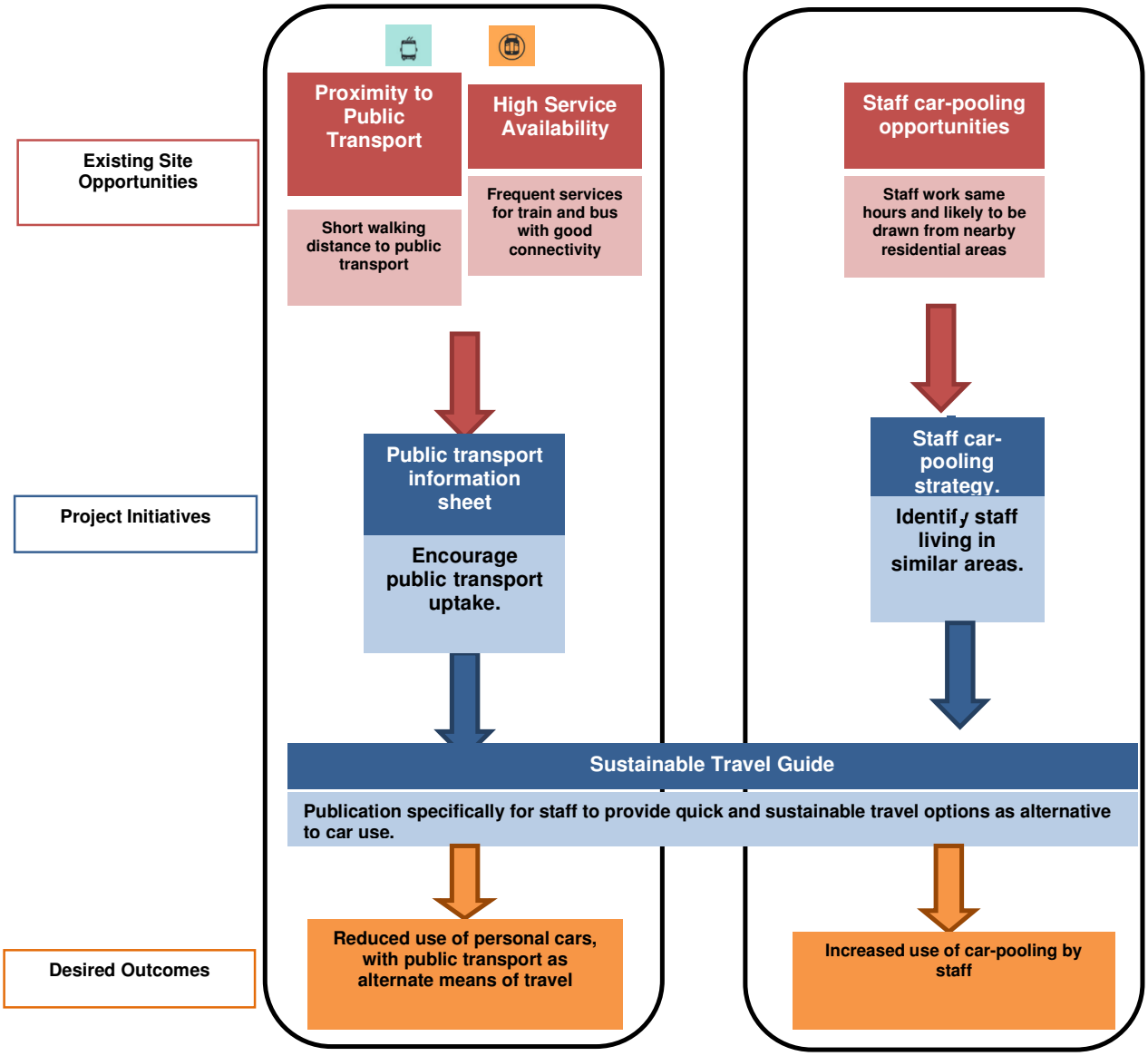
Plan Overview

The Green Travel Plan for Newcastle Grammar School Park Campus at 127 Union Street, Cooks Hill has been developed to encourage adoption of more sustainable forms of transport as opposed to personal vehicle use by staff /students and/or to encourage car-pooling within the staff. The existing site and business opportunities (e.g.: proximity to public transport services, staff work same hours and car-sharing opportunities) have been used to develop suitability initiative that the project is committing to. The desired outcomes include reduced use of personal vehicles by staff, with public transport use and car-pooling encouraged within the staff culture.



Introduction

Scope

This green travel plan has been produced as part of the planning submission for a development consent application for the future development of the Newcastle Grammar School Park Campus and stage1 works which will increase student and staff numbers at the School as the school develops to a 4 stream school catering for students from Kindergarten to Year 6. This document outlines the strategies and actions the school is taking to encourage the use of more sustainable modes of transport by staff and students.

However, as part of the environmental commitments outlined in this report, a 'Sustainable Travel Plan' (Separate to this Green Travel Plan) will be developed particularly for the staff to provide easily and quickly accessible information on public transport and other travel mode options in the area.

Further the school will be developing and implementing active travel plans for students to encourage them to walk, cycle or catch public transport to school. These active travel plans will complement this Green Travel Plan.

Aims

The overall aim of the strategies in this plan is to reduce the number of single-occupancy car trips and promote alternative options such as walking and cycling for shorter trips and public transport or carpooling for longer trips. The benefits include:

- Reduced greenhouse gas emissions
- Improved health from reduced exposure to vehicle fumes
- Reduced contribution to photochemical smog
- Relieving stress on local road networks (congestion, parking availability etc.)
- Encouraging a reduced personal dependence on finite fossil fuel resources

The plan will require that achievable targets for sustainable travel be developed once initial survey data is available and it will be the responsibility of the Green Travel Plan Co-ordinator / School Principal to set these targets. Newcastle Grammar School as an elite private school draws students from all over the Newcastle and Lower Hunter area therefore targets for walking and cycling will be lower than for state high schools therefore emphasis will need to be on improvements to car-pooling, public transport and school bus services to reduce the reliance on single vehicle trips to the school.

Site Location and Land Use

The Site

Newcastle Grammar School's Park campus is located at 127 Union Street, Cooks Hill between Union Street and Corlette Street immediately north of Parkway Avenue. The school site is shown in the figure

below. The school is within convenient walking distance to bus stops / bus services to the Newcastle CBD area and the Newcastle Transport interchange at Wickham where connection to other bus, heavy rail and light rail services is available.

Local Amenities and Facilities

The area around the school in Newcastle is diverse with residential, recreational, legal, business and retail land-uses all within walking distance of the site. It therefore has excellent accessibility to public transport facilities, public parking facilities and shops.

Existing Sustainable Transport Options

Pedestrian and Cyclist Network

An excellent concrete and asphalt pedestrian footpath network exist around the school connecting to the nearby public transport facilities and commercial areas. The adjoining Corlette Street is marked as an on-road cycleway and is part of the Newcastle Cycleways network.

Therefore it is considered there is sufficient infrastructure in place around the school site to encourage pedestrian and cycle trip making by staff and students. The school will be upgrading end of trip facilities at the school as part of this development to encourage more staff and students to cycle to school. This will include provision of additional secure bicycle storage facilities and additional staff and student showers and lockers. The use of and demand for this facilities will be monitored regularly over

the school year by the Green Travel Plan Co-ordinator to determine if planning for additional facilities in the future is required.

Rail Service

Heavy rail services commence from the Newcastle Transport Interchange at Wickham with bus routes along Hunter Street and the Newcastle Light Rail providing access to the school site from the Wickham railway interchange.

Bus Service

All the bus routes operated by Newcastle Transport as well as other limited routes run by private companies Hunter Valley Buses, Rover Coaches and Port Stephens Coaches (including Newcastle Airport Services) connect to the Newcastle Transport Interchange at Wickham. This means that a bus service to nearly every residential suburb in the lower Hunter area would stop at the intersection. Further a connection to Newcastle Transport Route 12 – Maryland to Merewether Beach via Wallsend and Newcastle would allow commuters to be dropped off in Union Street adjacent to the school. Therefore it is considered there is a suitable public transport (bus) service in place that could be used to encourage all staff and some students to utilise the service in their trip making to and from the school. A local bus route map and timetable is provided in ***Appendix A.***

Car Pooling

The school will employ a total of approximately 60 staff and whilst some staff working hours may be different there will be a significant core of staff working the same hours throughout the day. An opportunity therefore exists to connect staff living in similar areas and encourage car-pooling as a measure to reduce vehicle trips to and from the site.

Sustainable Transport Initiatives

A number of sustainable transport initiatives are being incorporated into the management of the school to complement the existing transport options and provide a holistic strategy to positively influence staff and student travel behaviour.

The major project initiatives within the plan are detailed below. It should be noted that in each case, the initiatives outlined below are not soft targets, rather, the school management will commit to their implementation should the application to increase staff and student numbers be successful.

School Student Transport Scheme (SSTS)

The school will promote the school student transport scheme within its regular communications to parents and students i.e. newsletters, parent / teacher nights etc as well as hold a special information session at the commencement of each year. The SSTS provides eligible school students free or subsidised public transport from home to school.

Car-pooling initiative

The school has opportunity to encourage and implement a car pooling strategy within its staff into its management operations. The main opportunities are;

1. A committed and stable workforce of over 60 employees.
2. The majority of employees will work the same or similar hours;
3. Employees are likely to be drawn from nearby or similar residential areas or along travel paths to the site.

Therefore the car-pooling initiative will involve the School Principal or designated representative undertaking / managing the following and is a continuation of an existing system currently in place;

1. Regularly review staff residential addresses to identify groups of staff who could benefit from a car pooling system;
2. Encourage car-pooling by looking to ensure these groups of staff remain on regular and equivalent shifts / hours;
3. Provide a reward scheme (term prizes) or fuel vouchers for those involved in the car pooling scheme.

Sustainable Travel Guide

A sustainable travel guide will be developed for the School's staff to provide information and recommendations on sustainable travel options to and from the school. The guide will be readily available and structured in a manner that provides concise, relevant and easily understood information for the staff. Topics to be covered in the Sustainable Travel Guide will include;

- Access to public transport infrastructure, including
- Directions
- Walking distances and times
- Services provided by local public transport, covering
- Availability of train, light rail and bus services
- Routes covered by local services, including connections to other services
- Ticketing information for public transport, including:
- Prices and coverage of zones
- Locations of Opal Card top-up stations / machines
- Location of local facilities and amenities within walking distance and cycling distance
- Overview of cyclist provisions (bicycle storage etc.)
- Details of car-pooling benefits and strategy as well as eligibility / value for fuel voucher and rewards scheme.

Administration of Plan

This green travel plan is to be administered by the School Principal or his/her designated representative (Green Travel Plan Co-ordinator). The representative will be responsible for the following tasks to be undertaken during a school year;

- Implementation of the plan;
- Monitoring the plan;
- Amending the plan annually with modal trip changes and public transport changes.

The plan requires a champion of the plan committed to sustainable travel to fully implement the plan and make it effective. In monitoring and reviewing the plan the plan co-ordinator will be required annually to do the following;

- Update public transport routes and timetables including school bus services;
- Undertake travel mode surveys of staff and students to determine transport modal trip percentages for the school for the year;
- Compare achieved transport modal split results with desired targets and adjust targets as required;
- Introduce new strategies to achieve targets if necessary; and
- Update the Green Travel Plan in accordance with any changes annually.

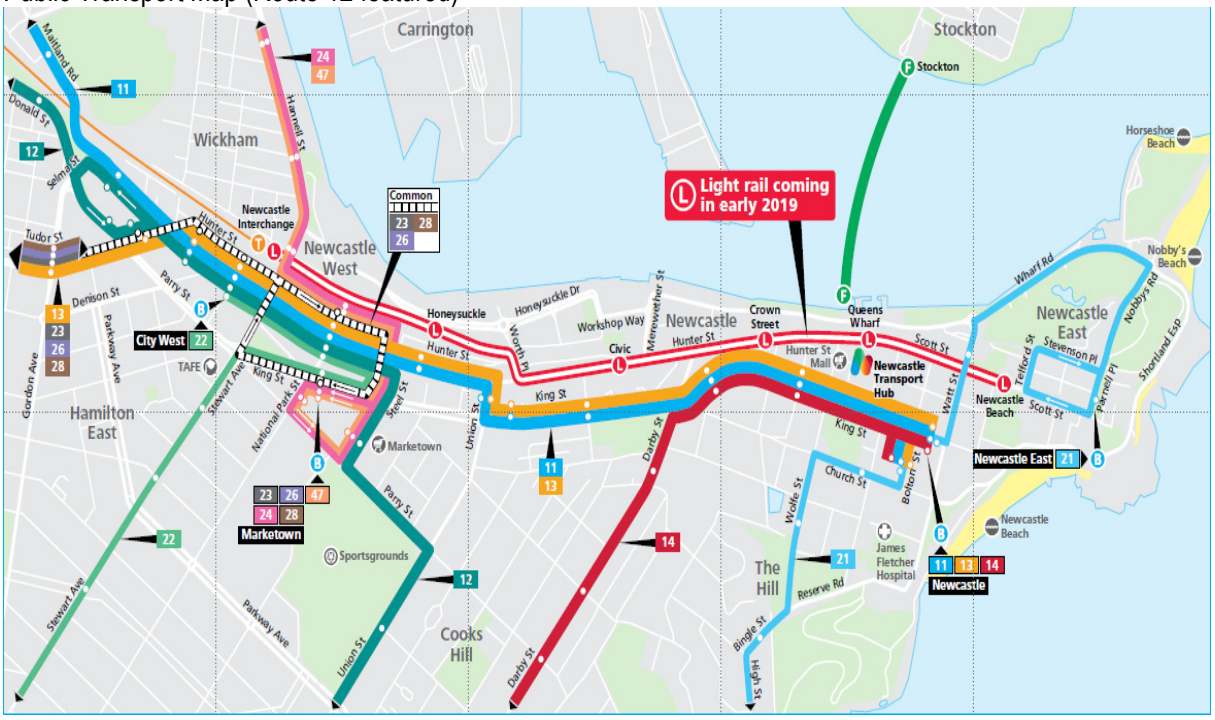
Summary

This Green Travel Plan has been developed to encourage the adoption of more sustainable forms of transport as opposed to personal vehicle use for staff and students. The existing site opportunities have been used to develop viable initiatives that enable and motivate staff and students to consider these alternatives.

The school management team is committed to embedding the principles of social responsibility across its activities and the implementation of this Green Travel Plan is, therefore, a significant element in the fulfilment of this commitment to social responsibility.

Appendix A – Bus Route Map and Timetable

Public Transport Map (Route 12 featured)



12 Maryland to Merewether Beach via Wallsend and Newcastle Interchange B

How to use this timetable

This timetable provides a snapshot of service information in 24-hour time (e.g. 5am = 05:00, 5pm = 17:00). Information contained in this timetable is subject to change without notice. Please note that timetables do not include minor stops, additional trips for special events, short term changes, holiday timetable changes, real-time information or any disruption alerts.

For the most up-to-date times, use the Trip Planner or Departures at **transportnsw.info**

Real-time planning

You can plan your trip with real-time information using the Trip Planner or Departures at **transportnsw.info** or by downloading travel apps on your smartphone or tablet.

The Trip Planner, Departures and travel apps offer various features:

- favourite your regular trips
- see where your service is on the route
- get estimated pick-up and arrival times
- receive service updates
- find nearby stations, stops, wharves and routes
- check accessibility information.

Find the latest apps at **transportnsw.info/apps**

Accessible services

All new buses are wheelchair-accessible with low-level floors and space for wheelchairs, prams or strollers. Look for the ♿ symbol in this timetable. Some older buses may not have all the features you need. There will be more accessible services as older buses are replaced.

Who is providing my bus services?

The bus services shown in this timetable are run by Newcastle Transport.

Fares

In Sydney and surrounding regions, fares are based on:

- the distance you travel from tap on to tap off
- the mode of transport you choose
- whether you're eligible for a concession fare or free travel
- any Opal benefits such as discounts and capped fares that apply.

You can use an Opal card or a contactless payment to pay for your travel.

Opal cards

An Opal card is a smartcard you keep and reuse. Add value before you travel, and tap on and tap off to pay your fares throughout Sydney, the Blue Mountains, the Central Coast, the Hunter and the Illawarra.

Which Opal card is right for you?

Adult – Customers 16 years or older who are not entitled to any concessions and normally pay full fare.

Child/Youth – For customers aged 4-15 (inclusive), or customers 16 years or older who hold a NSW/ACT Senior Secondary Student Concession Card.

Gold Senior/Pensioner – For eligible NSW and interstate seniors, pensioners, war widows/ers and asylum seekers.

Concession – For eligible tertiary students, job seekers, apprentices and trainees.

How to get an Opal card

You can get an Adult or Child/Youth Opal card over the counter at Opal retailers that display the Opal sign. To find your nearest retailer visit **transportnsw.info/opal**.

If you are eligible to travel with concession fares, you can apply for a Gold Senior/Pensioner or Concession Opal card online. Visit **transportnsw.info/opal** for more information.

Contactless payments

If you have an American Express, Mastercard, Visa card or linked device, you can use it to pay for all public transport on the Opal network. Just make sure to tap on and tap off at Opal readers at the beginning and end of your trip.

Always separate your cards when you tap on and tap off so your preferred card is charged.

You will receive the same travel benefits of an Adult Opal card when you tap on and tap off consistently with the same credit card, debit card or linked device. This includes daily, weekly and weekend travel caps, and a $2 transfer discount when you change between metro/train, ferry, bus and light rail services within 60 minutes. Adult Opal fare pricing applies.

Find out more at **transportnsw.info/contactless**

Explanation of definitions and symbols

♿	Wheelchair Accessible
F	Friday only
L	Diverts Via Denison & Beaumont Sts Operates Early Saturday Morning Only
C	Operates Early Saturday morning only

NSW GOVERNMENT | Transport

12 Merewether Beach to Maryland via Wallsend and Newcastle Interchange B

Valid from: 19 April 2021

Creation date: 15 April 2021
NOTE: Information is correct on date of download.

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Watkins St near John Pde, Merewether	05:30	06:00	06:25	06:55	07:10	07:25	07:40	07:55	08:10
Marketown Shopping Centre, Steel St, Newcastle West	05:38	06:08	06:33	07:04	07:19	07:34	07:49	08:04	08:19
Hunter St opp Cooper St, Newcastle West	05:41	06:11	06:36	07:07	07:22	07:38	07:54	08:09	08:24
Donald St at Beaumont St, Hamilton	05:45	06:15	06:40	07:11	07:26	07:42	07:59	08:14	08:29
Georgetown Rd at Bowker St, Georgetown	05:52	06:22	06:47	07:18	07:33	07:49	08:07	08:22	08:37
Newcastle Rd at Chalmers Rd, Wallsend	05:59	06:29	06:54	07:25	07:40	07:57	08:15	08:30	08:45
Cowper St at Murnin St, Wallsend	06:03	06:33	06:58	07:30	07:45	08:02	08:20	08:35	08:50
Wallsend District Library, Bunn St, Wallsend	06:05	06:35	07:00	07:32	07:47	08:04	08:22	08:37	08:52
Maryland Shopping Centre Boundary Rd, Maryland	06:14	-	07:09	-	07:56	-	08:31	-	09:01

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Watkins St near John Pde, Merewether	08:25	08:40	08:55	09:10	09:25	09:40	09:55	10:10	10:25
Marketown Shopping Centre, Steel St, Newcastle West	08:34	08:49	09:04	09:19	09:34	09:49	10:04	10:19	10:34
Hunter St opp Cooper St, Newcastle West	08:39	08:54	09:09	09:24	09:38	09:53	10:08	10:23	10:38
Donald St at Beaumont St, Hamilton	08:44	08:59	09:14	09:28	09:42	09:57	10:12	10:27	10:42
Georgetown Rd at Bowker St, Georgetown	08:52	09:07	09:21	09:35	09:50	10:05	10:20	10:35	10:50
Newcastle Rd at Chalmers Rd, Wallsend	09:00	09:15	09:28	09:43	09:58	10:13	10:28	10:43	10:58
Cowper St at Murnin St, Wallsend	09:05	09:20	09:33	09:47	10:02	10:17	10:32	10:47	11:02
Wallsend District Library, Bunn St, Wallsend	09:07	09:22	09:35	09:49	10:04	10:19	10:34	10:49	11:04
Maryland Shopping Centre Boundary Rd, Maryland	-	09:31	-	09:58	-	10:28	-	10:58	-

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Watkins St near John Pde, Merewether	10:40	10:55	11:10	11:25	11:40	11:55	12:10	12:25	12:40
Marketown Shopping Centre, Steel St, Newcastle West	10:49	11:04	11:19	11:34	11:49	12:04	12:19	12:34	12:49
Hunter St opp Cooper St, Newcastle West	10:53	11:08	11:23	11:38	11:53	12:08	12:23	12:38	12:53
Donald St at Beaumont St, Hamilton	10:57	11:12	11:27	11:42	11:57	12:12	12:27	12:42	12:57
Georgetown Rd at Bowker St, Georgetown	11:05	11:20	11:35	11:50	12:05	12:20	12:35	12:50	13:05
Newcastle Rd at Chalmers Rd, Wallsend	11:13	11:28	11:43	11:58	12:13	12:28	12:43	12:58	13:13
Cowper St at Murnin St, Wallsend	11:17	11:32	11:47	12:02	12:17	12:32	12:47	13:02	13:17
Wallsend District Library, Bunn St, Wallsend	11:19	11:34	11:49	12:04	12:19	12:34	12:49	13:04	13:19
Maryland Shopping Centre Boundary Rd, Maryland	11:28	-	11:58	-	12:28	-	12:58	-	13:28

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Watkins St near John Pde, Merewether	12:55	13:10	13:25	13:40	13:55	14:10	14:25	14:35	14:50
Marketown Shopping Centre, Steel St, Newcastle West	13:04	13:19	13:34	13:49	14:04	14:19	14:34	14:44	14:59
Hunter St opp Cooper St, Newcastle West	13:08	13:23	13:38	13:53	14:08	14:23	14:38	14:48	15:03
Donald St at Beaumont St, Hamilton	13:12	13:27	13:42	13:57	14:12	14:27	14:42	14:53	15:08
Georgetown Rd at Bowker St, Georgetown	13:20	13:35	13:50	14:05	14:20	14:35	14:50	15:02	15:17
Newcastle Rd at Chalmers Rd, Wallsend	13:28	13:43	13:58	14:13	14:28	14:43	14:58	15:13	15:28
Cowper St at Murnin St, Wallsend	13:32	13:47	14:02	14:17	14:32	14:47	15:03	15:18	15:33
Wallsend District Library, Bunn St, Wallsend	13:34	13:49	14:04	14:19	14:34	14:49	15:05	15:20	15:35
Maryland Shopping Centre Boundary Rd, Maryland	-	13:58	-	14:28	-	14:58	-	15:29	-

12 Merewether Beach to Maryland via Wallsend and Newcastle Interchange B

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Watkins St near John Pde, Merewether	15:05	15:20	15:35	15:50	16:05	16:20	16:35	16:50	17:05
Marketown Shopping Centre, Steel St, Newcastle West	15:14	15:29	15:44	15:59	16:14	16:29	16:44	16:59	17:14
Hunter St opp Cooper St, Newcastle West	15:18	15:33	15:48	16:03	16:18	16:33	16:48	17:04	17:19
Donald St at Beaumont St, Hamilton	15:23	15:38	15:53	16:07	16:22	16:37	16:52	17:09	17:24
Georgetown Rd at Bowker St, Georgetown	15:32	15:47	16:02	16:16	16:31	16:46	17:01	17:18	17:33
Newcastle Rd at Chalmers Rd, Wallsend	15:43	15:56	16:11	16:25	16:40	16:55	17:10	17:27	17:42
Cowper St at Murnin St, Wallsend	15:48	16:01	16:16	16:30	16:45	17:00	17:15	17:32	17:47
Wallsend District Library, Bunn St, Wallsend	15:50	16:03	16:18	16:32	16:47	17:02	17:17	17:34	17:49
Maryland Shopping Centre Boundary Rd, Maryland	15:59	-	16:27	-	16:57	-	17:27	-	17:58

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Watkins St near John Pde, Merewether	17:20	17:35	17:50	18:05	18:20	18:35	18:50	19:05	19:25
Marketown Shopping Centre, Steel St, Newcastle West	17:29	17:44	17:59	18:14	18:29	18:44	18:59	19:14	19:34
Hunter St opp Cooper St, Newcastle West	17:33	17:48	18:03	18:18	18:33	18:48	19:02	19:17	19:37
Donald St at Beaumont St, Hamilton	17:37	17:52	18:07	18:22	18:37	18:52	19:06	19:21	19:41
Georgetown Rd at Bowker St, Georgetown	17:45	18:00	18:14	18:29	18:44	18:59	19:13	19:28	19:48
Newcastle Rd at Chalmers Rd, Wallsend	17:53	18:08	18:21	18:36	18:51	19:06	19:20	19:35	19:55
Cowper St at Murnin St, Wallsend	17:58	18:13	18:26	18:41	18:56	19:10	19:24	19:39	19:59
Wallsend District Library, Bunn St, Wallsend	18:00	18:15	18:28	18:43	18:58	19:12	19:26	19:41	20:01
Maryland Shopping Centre Boundary Rd, Maryland	-	18:24	-	18:52	-	19:21	-	19:50	-

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Day Restrictions							F	F	F
Watkins St near John Pde, Merewether	19:55	20:25	20:55	21:55	22:55	23:55	00:55	01:55	02:55
Marketown Shopping Centre, Steel St, Newcastle West	20:03	20:33	21:03	22:03	23:03	00:03	01:03	02:03	03:03
Hunter St opp Cooper St, Newcastle West	20:06	20:36	21:06	22:06	23:06	00:06	**L**01:06	**L**02:06	**L**03:06
Donald St at Beaumont St, Hamilton	20:10	20:40	21:10	22:10	23:10	00:10	**C**01:11	**C**02:11	**C**03:11
Georgetown Rd at Bowker St, Georgetown	20:17	20:47	21:17	22:17	23:17	00:17	**C**01:16	**C**02:16	**C**03:16
Newcastle Rd at Chalmers Rd, Wallsend	20:24	20:54	21:24	22:24	23:24	00:24	**C**01:21	**C**02:21	**C**03:21
Cowper St at Murnin St, Wallsend	20:28	20:58	21:28	22:28	23:28	00:28	**C**01:25	**C**02:25	**C**03:25
Wallsend District Library, Bunn St, Wallsend	20:30	21:00	21:30	22:30	23:30	00:30	**C**01:27	**C**02:27	**C**03:27
Maryland Shopping Centre Boundary Rd, Maryland	20:39	-	21:39	22:39	23:39	00:39	**C**01:35	**C**02:35	**C**03:35

Saturday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Watkins St near John Pde, Merewether	05:47	06:17	06:47	07:17	07:47	08:17	08:47	09:17	09:47
Marketown Shopping Centre, Steel St, Newcastle West	05:55	06:25	06:55	07:25	07:55	08:25	08:55	09:25	09:55
Hunter St opp Cooper St, Newcastle West	05:58	06:28	06:58	07:28	07:58	08:28	08:58	09:28	09:58
Donald St at Beaumont St, Hamilton	06:02	06:32	07:02	07:32	08:02	08:32	09:02	09:32	10:02
Georgetown Rd at Bowker St, Georgetown	06:08	06:38	07:08	07:39	08:09	08:39	09:09	09:39	10:09
Newcastle Rd at Chalmers Rd, Wallsend	06:14	06:44	07:14	07:46	08:16	08:46	09:16	09:46	10:16
Cowper St at Murnin St, Wallsend	06:18	06:48	07:18	07:51	08:21	08:51	09:21	09:51	10:21
Wallsend District Library, Bunn St, Wallsend	06:20	06:50	07:20	07:53	08:23	08:53	09:23	09:53	10:23
Maryland Shopping Centre Boundary Rd, Maryland	06:29	-	07:29	-	08:32	-	09:32	-	10:32

12 Merewether Beach to Maryland via Wallsend and Newcastle Interchange B

Saturday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Watkins St near John Pde, Merewether	10:17	10:47	11:17	11:47	12:17	12:47	13:17	13:47	14:17
Marketown Shopping Centre, Steel St, Newcastle West	10:25	10:55	11:25	11:55	12:25	12:55	13:25	13:55	14:25
Hunter St opp Cooper St, Newcastle West	10:28	10:58	11:28	11:58	12:28	12:58	13:28	13:58	14:28
Donald St at Beaumont St, Hamilton	10:32	11:02	11:32	12:02	12:32	13:02	13:32	14:02	14:32
Georgetown Rd at Bowker St, Georgetown	10:39	11:09	11:39	12:09	12:39	13:09	13:39	14:09	14:39
Newcastle Rd at Chalmers Rd, Wallsend	10:46	11:16	11:46	12:16	12:46	13:16	13:46	14:16	14:46
Cowper St at Murnin St, Wallsend	10:51	11:21	11:51	12:21	12:51	13:21	13:51	14:21	14:51
Wallsend District Library, Bunn St, Wallsend	10:53	11:23	11:53	12:23	12:53	13:23	13:53	14:23	14:53
Maryland Shopping Centre Boundary Rd, Maryland	-	11:32	-	12:32	-	13:32	-	14:32	-

Saturday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Watkins St near John Pde, Merewether	14:47	15:17	15:47	16:17	16:47	17:17	17:47	18:17	18:56
Marketown Shopping Centre, Steel St, Newcastle West	14:55	15:25	15:55	16:25	16:55	17:25	17:55	18:25	19:04
Hunter St opp Cooper St, Newcastle West	14:58	15:28	15:58	16:28	16:58	17:28	17:58	18:28	19:07
Donald St at Beaumont St, Hamilton	15:02	15:32	16:02	16:32	17:02	17:32	18:02	18:32	19:11
Georgetown Rd at Bowker St, Georgetown	15:09	15:39	16:09	16:39	17:09	17:39	18:09	18:39	19:17
Newcastle Rd at Chalmers Rd, Wallsend	15:16	15:46	16:16	16:46	17:16	17:46	18:16	18:46	19:23
Cowper St at Murnin St, Wallsend	15:21	15:51	16:21	16:51	17:21	17:51	18:21	18:51	19:27
Wallsend District Library, Bunn St, Wallsend	15:23	15:53	16:23	16:53	17:23	17:53	18:23	18:53	19:29
Maryland Shopping Centre Boundary Rd, Maryland	15:32	-	16:32	-	17:32	-	18:32	-	19:38

Saturday	♿	♿	♿	♿	♿	♿	♿	♿
Watkins St near John Pde, Merewether	19:56	20:56	21:56	22:56	23:56	00:55	01:55	02:55
Marketown Shopping Centre, Steel St, Newcastle West	20:04	21:04	22:04	23:04	00:04	01:03	02:03	03:03
Hunter St opp Cooper St, Newcastle West	20:07	21:07	22:07	23:07	00:07	**L**01:06	**L**02:06	**L**03:06
Donald St at Beaumont St, Hamilton	20:11	21:11	22:11	23:11	00:11	**C**01:11	**C**02:11	**C**03:11
Georgetown Rd at Bowker St, Georgetown	20:17	21:17	22:17	23:17	00:17	**C**01:16	**C**02:16	**C**03:16
Newcastle Rd at Chalmers Rd, Wallsend	20:23	21:23	22:23	23:23	00:23	**C**01:21	**C**02:21	**C**03:21
Cowper St at Murnin St, Wallsend	20:27	21:27	22:27	23:27	00:27	**C**01:25	**C**02:25	**C**03:25
Wallsend District Library, Bunn St, Wallsend	20:29	21:29	22:29	23:29	00:29	**C**01:27	**C**02:27	**C**03:27
Maryland Shopping Centre Boundary Rd, Maryland	20:38	21:38	22:38	23:38	00:38	**C**01:35	**C**02:35	**C**03:35

Sunday & Public Holidays	♿	♿	♿	♿	♿	♿	♿	♿	♿
Watkins St near John Pde, Merewether	05:47	06:47	07:17	07:47	08:17	08:47	09:17	09:47	10:17
Marketown Shopping Centre, Steel St, Newcastle West	05:55	06:55	07:25	07:55	08:25	08:55	09:25	09:55	10:25
Hunter St opp Cooper St, Newcastle West	05:58	06:58	07:28	07:58	08:28	08:58	09:28	09:58	10:28
Donald St at Beaumont St, Hamilton	06:02	07:02	07:32	08:02	08:32	09:02	09:32	10:02	10:32
Georgetown Rd at Bowker St, Georgetown	06:08	07:08	07:38	08:09	08:39	09:09	09:39	10:09	10:39
Newcastle Rd at Chalmers Rd, Wallsend	06:14	07:14	07:44	08:16	08:46	09:16	09:46	10:16	10:46
Cowper St at Murnin St, Wallsend	06:18	07:18	07:48	08:20	08:50	09:20	09:50	10:20	10:50
Wallsend District Library, Bunn St, Wallsend	06:20	07:20	07:50	08:22	08:52	09:22	09:52	10:22	10:52
Maryland Shopping Centre Boundary Rd, Maryland	06:29	07:29	-	08:31	-	09:31	-	10:31	-

12 Merewether Beach to Maryland via Wallsend and Newcastle Interchange B

Sunday & Public Holidays	♿	♿	♿	♿	♿	♿	♿	♿	♿
Watkins St near John Pde, Merewether	10:47	11:17	11:47	12:17	12:47	13:17	13:47	14:17	14:47
Marketown Shopping Centre, Steel St, Newcastle West	10:55	11:25	11:55	12:25	12:55	13:25	13:55	14:25	14:55
Hunter St opp Cooper St, Newcastle West	10:58	11:28	11:58	12:28	12:58	13:28	13:58	14:28	14:58
Donald St at Beaumont St, Hamilton	11:02	11:32	12:02	12:32	13:02	13:32	14:02	14:32	15:02
Georgetown Rd at Bowker St, Georgetown	11:09	11:39	12:09	12:39	13:09	13:39	14:09	14:39	15:09
Newcastle Rd at Chalmers Rd, Wallsend	11:16	11:46	12:16	12:46	13:16	13:46	14:16	14:46	15:16
Cowper St at Murnin St, Wallsend	11:20	11:50	12:20	12:50	13:20	13:50	14:20	14:50	15:20
Wallsend District Library, Bunn St, Wallsend	11:22	11:52	12:22	12:52	13:22	13:52	14:22	14:52	15:22
Maryland Shopping Centre Boundary Rd, Maryland	11:31	-	12:31	-	13:31	-	14:31	-	15:31

Sunday & Public Holidays	♿	♿	♿	♿	♿	♿	♿	♿	♿
Watkins St near John Pde, Merewether	15:17	15:47	16:17	16:47	17:17	17:47	18:17	18:56	19:56
Marketown Shopping Centre, Steel St, Newcastle West	15:25	15:55	16:25	16:55	17:25	17:55	18:25	19:04	20:04
Hunter St opp Cooper St, Newcastle West	15:28	15:58	16:28	16:58	17:28	17:58	18:28	19:07	20:07
Donald St at Beaumont St, Hamilton	15:32	16:02	16:32	17:02	17:32	18:02	18:32	19:11	20:11
Georgetown Rd at Bowker St, Georgetown	15:39	16:09	16:39	17:09	17:39	18:09	18:39	19:17	20:17
Newcastle Rd at Chalmers Rd, Wallsend	15:46	16:16	16:46	17:16	17:46	18:16	18:46	19:23	20:23
Cowper St at Murnin St, Wallsend	15:50	16:20	16:50	17:20	17:50	18:20	18:50	19:27	20:27
Wallsend District Library, Bunn St, Wallsend	15:52	16:22	16:52	17:22	17:52	18:22	18:52	19:29	20:29
Maryland Shopping Centre Boundary Rd, Maryland	-	16:31	-	17:31	-	18:31	-	19:38	20:38

Sunday & Public Holidays	♿	♿	♿
Watkins St near John Pde, Merewether	20:56	21:56	22:56
Marketown Shopping Centre, Steel St, Newcastle West	21:04	22:04	23:04
Hunter St opp Cooper St, Newcastle West	21:07	22:07	23:07
Donald St at Beaumont St, Hamilton	21:11	22:11	23:11
Georgetown Rd at Bowker St, Georgetown	21:17	22:17	23:17
Newcastle Rd at Chalmers Rd, Wallsend	21:23	22:23	23:23
Cowper St at Murnin St, Wallsend	21:27	22:27	23:27
Wallsend District Library, Bunn St, Wallsend	21:29	22:29	23:29
Maryland Shopping Centre Boundary Rd, Maryland	21:38	22:38	23:38

12 Maryland to Merewether Beach via Wallsend and Newcastle Interchange B

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Maryland Shopping Centre Boundary Rd, Maryland	-	05:30	-	06:25	-	06:50	-	07:19	-
Wallsend District Library, Bunn St, Wallsend	05:15	05:40	06:05	06:35	06:50	07:00	07:15	07:30	07:45
Newcastle Rd at Blue Gum Rd, Jesmond	05:21	05:46	06:11	06:41	06:56	07:06	07:23	07:38	07:53
Christo Rd near Turton Rd, Waratah	05:27	05:52	06:17	06:47	07:02	07:13	07:30	07:47	08:03
Donald St at Bennett St, Hamilton	05:34	05:59	06:24	06:54	07:09	07:21	07:38	07:56	08:13
Hunter St at Florence St, Newcastle West	05:37	06:02	06:27	06:57	07:12	07:25	07:42	08:00	08:17
Marketown Shopping Centre, Steel St, Newcastle West	05:41	06:06	06:31	07:01	07:17	07:29	07:46	08:04	08:21
Watkins St near John Pde, Merewether	05:50	06:15	06:40	07:10	07:26	07:38	07:55	08:13	08:30

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Maryland Shopping Centre Boundary Rd, Maryland	07:44	-	08:10	-	08:40	-	09:10	-	09:40
Wallsend District Library, Bunn St, Wallsend	07:55	08:05	08:20	08:35	08:50	09:05	09:20	09:35	09:50
Newcastle Rd at Blue Gum Rd, Jesmond	08:03	08:12	08:27	08:41	08:56	09:11	09:26	09:41	09:56
Christo Rd near Turton Rd, Waratah	08:13	08:20	08:35	08:48	09:03	09:18	09:33	09:48	10:03
Donald St at Bennett St, Hamilton	08:23	08:29	08:44	08:56	09:11	09:26	09:41	09:56	10:11
Hunter St at Florence St, Newcastle West	08:27	08:33	08:48	09:00	09:15	09:30	09:45	10:00	10:15
Marketown Shopping Centre, Steel St, Newcastle West	08:31	08:37	08:52	09:04	09:19	09:34	09:49	10:04	10:19
Watkins St near John Pde, Merewether	08:40	08:46	09:01	09:13	09:28	09:43	09:58	10:13	10:28

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Maryland Shopping Centre Boundary Rd, Maryland	-	10:10	-	10:40	-	11:10	-	11:40	-
Wallsend District Library, Bunn St, Wallsend	10:05	10:20	10:35	10:50	11:05	11:20	11:35	11:50	12:05
Newcastle Rd at Blue Gum Rd, Jesmond	10:11	10:26	10:41	10:56	11:11	11:26	11:41	11:56	12:11
Christo Rd near Turton Rd, Waratah	10:18	10:33	10:48	11:03	11:18	11:33	11:48	12:03	12:18
Donald St at Bennett St, Hamilton	10:26	10:41	10:56	11:11	11:26	11:41	11:56	12:11	12:26
Hunter St at Florence St, Newcastle West	10:30	10:45	11:00	11:15	11:30	11:45	12:00	12:15	12:30
Marketown Shopping Centre, Steel St, Newcastle West	10:34	10:49	11:04	11:19	11:34	11:49	12:04	12:19	12:34
Watkins St near John Pde, Merewether	10:43	10:58	11:13	11:28	11:43	11:58	12:13	12:28	12:43

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Maryland Shopping Centre Boundary Rd, Maryland	12:10	-	12:40	-	13:10	-	13:40	-	14:10
Wallsend District Library, Bunn St, Wallsend	12:20	12:35	12:50	13:05	13:20	13:35	13:50	14:05	14:20
Newcastle Rd at Blue Gum Rd, Jesmond	12:26	12:41	12:56	13:11	13:26	13:41	13:56	14:11	14:26
Christo Rd near Turton Rd, Waratah	12:33	12:48	13:03	13:18	13:33	13:48	14:03	14:18	14:33
Donald St at Bennett St, Hamilton	12:41	12:56	13:11	13:26	13:41	13:56	14:11	14:26	14:41
Hunter St at Florence St, Newcastle West	12:45	13:00	13:15	13:30	13:45	14:00	14:15	14:30	14:45
Marketown Shopping Centre, Steel St, Newcastle West	12:49	13:04	13:19	13:34	13:49	14:04	14:19	14:34	14:49
Watkins St near John Pde, Merewether	12:58	13:13	13:28	13:43	13:58	14:13	14:28	14:43	14:58

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Maryland Shopping Centre Boundary Rd, Maryland	-	14:40	-	15:10	-	15:40	-	16:10	-
Wallsend District Library, Bunn St, Wallsend	14:35	14:50	15:05	15:20	15:36	15:50	16:05	16:20	16:35
Newcastle Rd at Blue Gum Rd, Jesmond	14:41	14:56	15:11	15:26	15:42	15:56	16:11	16:26	16:41
Christo Rd near Turton Rd, Waratah	14:48	15:03	15:18	15:33	15:49	16:03	16:18	16:33	16:48
Donald St at Bennett St, Hamilton	14:56	15:11	15:26	15:41	15:57	16:11	16:26	16:41	16:56
Hunter St at Florence St, Newcastle West	15:00	15:15	15:30	15:45	16:01	16:15	16:30	16:45	17:00
Marketown Shopping Centre, Steel St, Newcastle West	15:04	15:19	15:34	15:49	16:05	16:19	16:34	16:49	17:04
Watkins St near John Pde, Merewether	15:13	15:28	15:43	15:58	16:14	16:28	16:43	16:58	17:13

12 Maryland to Merewether Beach via Wallsend and Newcastle Interchange B

Monday to Friday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Maryland Shopping Centre Boundary Rd, Maryland	16:40	-	17:10	-	17:40	-	18:10	-	18:40
Wallsend District Library, Bunn St, Wallsend	16:50	17:05	17:20	17:35	17:50	18:05	18:20	18:35	18:50
Newcastle Rd at Blue Gum Rd, Jesmond	16:56	17:12	17:26	17:41	17:56	18:11	18:26	18:41	18:56
Christo Rd near Turton Rd, Waratah	17:03	17:19	17:32	17:47	18:02	18:17	18:32	18:47	19:02
Donald St at Bennett St, Hamilton	17:11	17:27	17:40	17:55	18:10	18:25	18:40	18:55	19:09
Hunter St at Florence St, Newcastle West	17:15	17:30	17:43	17:58	18:13	18:28	18:43	18:58	19:12
Marketown Shopping Centre, Steel St, Newcastle West	17:19	17:34	17:47	18:02	18:17	18:32	18:47	19:02	19:16
Watkins St near John Pde, Merewether	17:28	17:43	17:56	18:11	18:26	18:40	18:55	19:10	19:24

Monday to Friday	♿	♿	♿	♿	♿	♿
Maryland Shopping Centre Boundary Rd, Maryland	-	19:40	-	20:50	21:50	22:50
Wallsend District Library, Bunn St, Wallsend	19:20	19:50	20:20	21:00	22:00	23:00
Newcastle Rd at Blue Gum Rd, Jesmond	19:26	19:56	20:26	21:06	22:06	23:06
Christo Rd near Turton Rd, Waratah	19:32	20:02	20:32	21:12	22:12	23:12
Donald St at Bennett St, Hamilton	19:39	20:09	20:39	21:19	22:18	23:18
Hunter St at Florence St, Newcastle West	19:42	20:12	20:42	21:22	22:22	23:22
Marketown Shopping Centre, Steel St, Newcastle West	19:46	20:16	20:46	21:26	22:26	23:26
Watkins St near John Pde, Merewether	19:54	20:24	20:54	21:34	22:34	23:34

Saturday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Maryland Shopping Centre Boundary Rd, Maryland	-	-	06:42	-	07:42	-	08:42	-	09:42
Wallsend District Library, Bunn St, Wallsend	05:52	06:22	06:52	07:22	07:52	08:22	08:52	09:22	09:52
Newcastle Rd at Blue Gum Rd, Jesmond	05:58	06:28	06:58	07:28	07:58	08:28	08:58	09:28	09:58
Christo Rd near Turton Rd, Waratah	06:04	06:34	07:03	07:33	08:05	08:34	09:04	09:34	10:04
Donald St at Bennett St, Hamilton	06:11	06:41	07:11	07:41	08:12	08:42	09:12	09:42	10:12
Hunter St at Florence St, Newcastle West	06:13	06:43	07:13	07:43	08:15	08:45	09:15	09:45	10:15
Marketown Shopping Centre, Steel St, Newcastle West	06:17	06:47	07:17	07:47	08:19	08:49	09:19	09:49	10:19
Watkins St near John Pde, Merewether	06:25	06:55	07:26	07:56	08:28	08:58	09:28	09:58	10:28

Saturday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Maryland Shopping Centre Boundary Rd, Maryland	-	10:42	-	11:42	-	12:42	-	13:42	-
Wallsend District Library, Bunn St, Wallsend	10:22	10:52	11:22	11:52	12:22	12:52	13:22	13:52	14:22
Newcastle Rd at Blue Gum Rd, Jesmond	10:28	10:58	11:28	11:58	12:28	12:58	13:28	13:58	14:28
Christo Rd near Turton Rd, Waratah	10:34	11:04	11:34	12:04	12:34	13:04	13:34	14:04	14:34
Donald St at Bennett St, Hamilton	10:42	11:12	11:42	12:12	12:42	13:12	13:42	14:12	14:42
Hunter St at Florence St, Newcastle West	10:45	11:15	11:45	12:15	12:45	13:15	13:45	14:15	14:45
Marketown Shopping Centre, Steel St, Newcastle West	10:49	11:19	11:49	12:19	12:49	13:19	13:49	14:19	14:49
Watkins St near John Pde, Merewether	10:58	11:28	11:58	12:28	12:58	13:28	13:58	14:28	14:58

Saturday	♿	♿	♿	♿	♿	♿	♿	♿	♿
Maryland Shopping Centre Boundary Rd, Maryland	14:42	-	15:42	-	16:42	-	17:42	-	18:47
Wallsend District Library, Bunn St, Wallsend	14:52	15:22	15:52	16:22	16:52	17:22	17:52	18:22	18:57
Newcastle Rd at Blue Gum Rd, Jesmond	14:58	15:28	15:58	16:28	16:58	17:28	17:58	18:28	19:03
Christo Rd near Turton Rd, Waratah	15:04	15:34	16:04	16:34	17:04	17:34	18:04	18:34	19:09
Donald St at Bennett St, Hamilton	15:12	15:42	16:12	16:42	17:12	17:42	18:12	18:42	19:16
Hunter St at Florence St, Newcastle West	15:15	15:45	16:15	16:45	17:15	17:45	18:15	18:45	19:18
Marketown Shopping Centre, Steel St, Newcastle West	15:19	15:49	16:19	16:49	17:19	17:49	18:19	18:49	19:22
Watkins St near John Pde, Merewether	15:28	15:58	16:28	16:58	17:28	17:58	18:27	18:57	19:30

12 Maryland to Merewether Beach via Wallsend and Newcastle Interchange B

Saturday	♿	♿	♿	♿	♿
Maryland Shopping Centre Boundary Rd, Maryland	19:50	20:50	21:50	22:50	23:50
Wallsend District Library, Bunn St, Wallsend	20:00	21:00	22:00	23:00	00:00
Newcastle Rd at Blue Gum Rd, Jesmond	20:06	21:06	22:06	23:06	00:06
Christo Rd near Turton Rd, Waratah	20:12	21:12	22:12	23:12	00:12
Donald St at Bennett St, Hamilton	20:19	21:19	22:19	23:19	00:19
Hunter St at Florence St, Newcastle West	20:21	21:21	22:21	23:21	00:21
Marketown Shopping Centre, Steel St, Newcastle West	20:25	21:25	22:25	23:25	00:25
Watkins St near John Pde, Merewether	20:33	21:33	22:33	23:33	00:33

Sunday & Public Holidays	♿	♿	♿	♿	♿	♿	♿	♿	♿
Maryland Shopping Centre Boundary Rd, Maryland	-	06:42	-	07:42	-	08:42	-	09:42	-
Wallsend District Library, Bunn St, Wallsend	05:52	06:52	07:22	07:52	08:22	08:52	09:22	09:52	10:22
Newcastle Rd at Blue Gum Rd, Jesmond	05:58	06:58	07:28	07:58	08:28	08:58	09:28	09:58	10:28
Christo Rd near Turton Rd, Waratah	06:04	07:02	07:34	08:05	08:35	09:04	09:34	10:04	10:34
Donald St at Bennett St, Hamilton	06:11	07:11	07:41	08:12	08:42	09:12	09:42	10:12	10:42
Hunter St at Florence St, Newcastle West	06:13	07:13	07:43	08:15	08:45	09:15	09:45	10:15	10:45
Marketown Shopping Centre, Steel St, Newcastle West	06:17	07:17	07:47	08:19	08:49	09:19	09:49	10:19	10:49
Watkins St near John Pde, Merewether	06:26	07:26	07:56	08:28	08:58	09:28	09:58	10:28	10:58

Sunday & Public Holidays	♿	♿	♿	♿	♿	♿	♿	♿	♿
Maryland Shopping Centre Boundary Rd, Maryland	10:42	-	11:42	-	12:42	-	13:42	-	14:42
Wallsend District Library, Bunn St, Wallsend	10:52	11:22	11:52	12:22	12:52	13:22	13:52	14:22	14:52
Newcastle Rd at Blue Gum Rd, Jesmond	10:58	11:28	11:58	12:28	12:58	13:28	13:58	14:28	14:58
Christo Rd near Turton Rd, Waratah	11:04	11:34	12:04	12:34	13:04	13:34	14:04	14:34	15:04
Donald St at Bennett St, Hamilton	11:12	11:42	12:12	12:42	13:12	13:42	14:12	14:42	15:12
Hunter St at Florence St, Newcastle West	11:15	11:45	12:15	12:45	13:15	13:45	14:15	14:45	15:15
Marketown Shopping Centre, Steel St, Newcastle West	11:19	11:49	12:19	12:49	13:19	13:49	14:19	14:49	15:19
Watkins St near John Pde, Merewether	11:28	11:58	12:28	12:58	13:28	13:58	14:28	14:58	15:28

Sunday & Public Holidays	♿	♿	♿	♿	♿	♿	♿	♿	♿
Maryland Shopping Centre Boundary Rd, Maryland	-	15:42	-	16:42	-	17:42	-	18:47	19:50
Wallsend District Library, Bunn St, Wallsend	15:22	15:52	16:22	16:52	17:22	17:52	18:22	18:57	20:00
Newcastle Rd at Blue Gum Rd, Jesmond	15:28	15:58	16:28	16:58	17:28	17:58	18:28	19:03	20:06
Christo Rd near Turton Rd, Waratah	15:34	16:04	16:34	17:04	17:34	18:04	18:34	19:09	20:12
Donald St at Bennett St, Hamilton	15:42	16:12	16:42	17:12	17:42	18:12	18:42	19:16	20:19
Hunter St at Florence St, Newcastle West	15:45	16:15	16:45	17:15	17:45	18:15	18:45	19:18	20:21
Marketown Shopping Centre, Steel St, Newcastle West	15:49	16:19	16:49	17:19	17:49	18:19	18:49	19:22	20:25
Watkins St near John Pde, Merewether	15:58	16:28	16:58	17:28	17:58	18:27	18:57	19:30	20:33

Sunday & Public Holidays	♿	♿	♿
Maryland Shopping Centre Boundary Rd, Maryland	20:50	21:50	22:50
Wallsend District Library, Bunn St, Wallsend	21:00	22:00	23:00
Newcastle Rd at Blue Gum Rd, Jesmond	21:06	22:06	23:06
Christo Rd near Turton Rd, Waratah	21:12	22:12	23:12
Donald St at Bennett St, Hamilton	21:19	22:19	23:19
Hunter St at Florence St, Newcastle West	21:21	22:21	23:21
Marketown Shopping Centre, Steel St, Newcastle West	21:25	22:25	23:25
Watkins St near John Pde, Merewether	21:33	22:33	23:33

Appendix B – Travel Mode Survey

Newcastle Grammar School – Park Campus
Staff and Student Travel Mode Survey
Year: - _____

Tick appropriate boxes

Name : - _____ Staff ☐ Student ☐

If Student School Year : - _____

What is your most frequent method of travel to and from school each week ?

Car as driver ☐ Car as passenger ☐ Public Transport ☐

School Bus Service by NGS ☐ School Bus Service by other provider ☐

Ride Bicycle ☐ Walk ☐ Other ☐

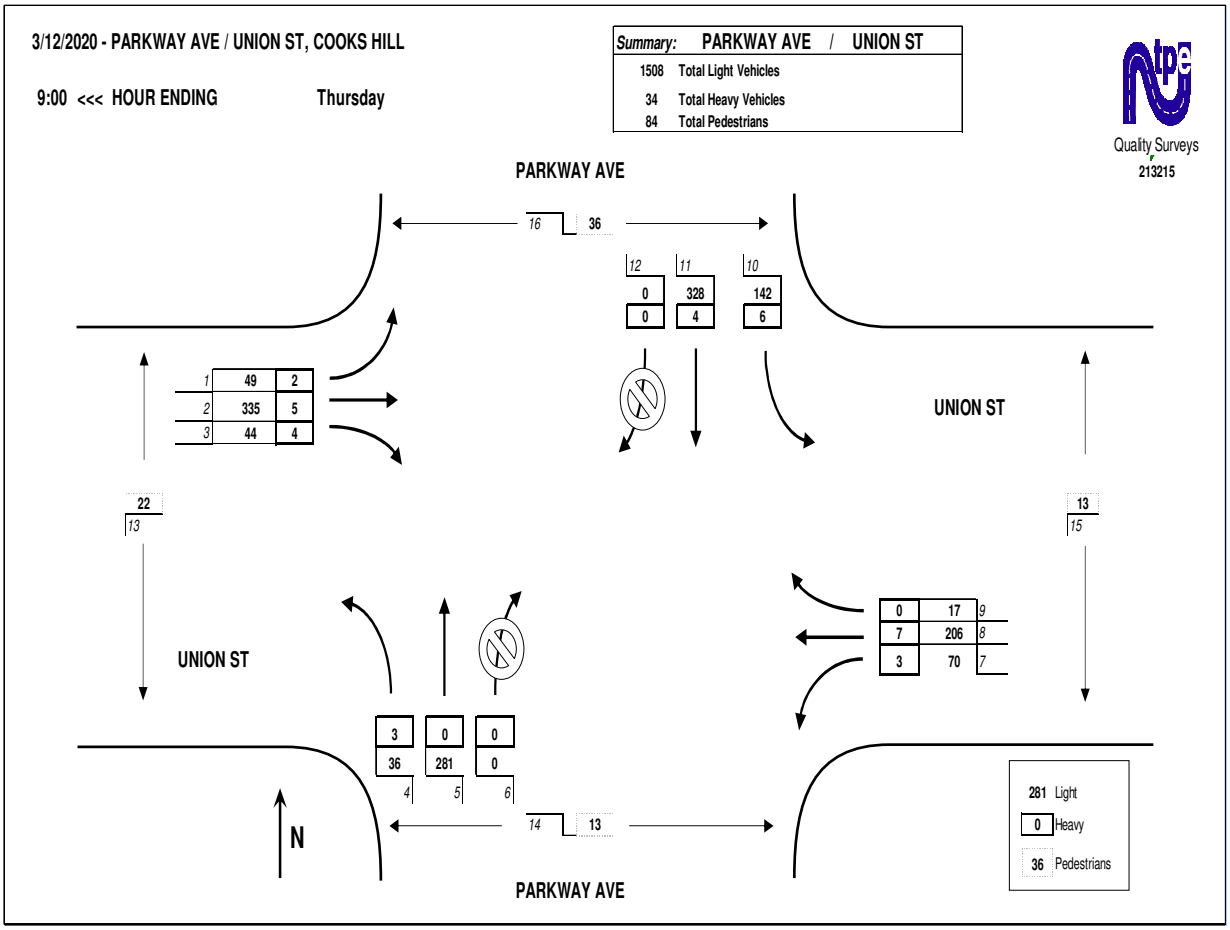
If Other please Specify:- _____

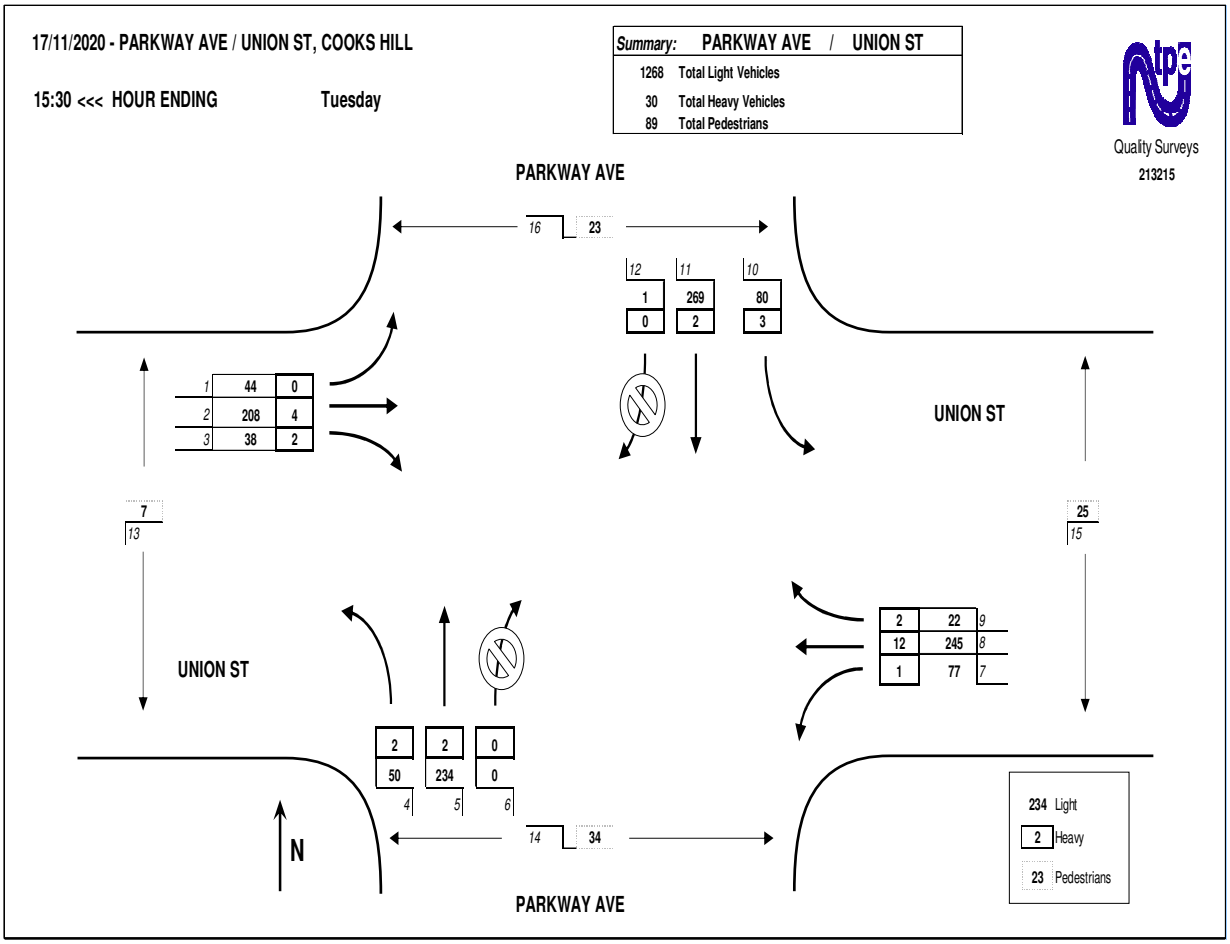
If you travel to and from school in cars what prevents you from considering alternative transport modes as described above?

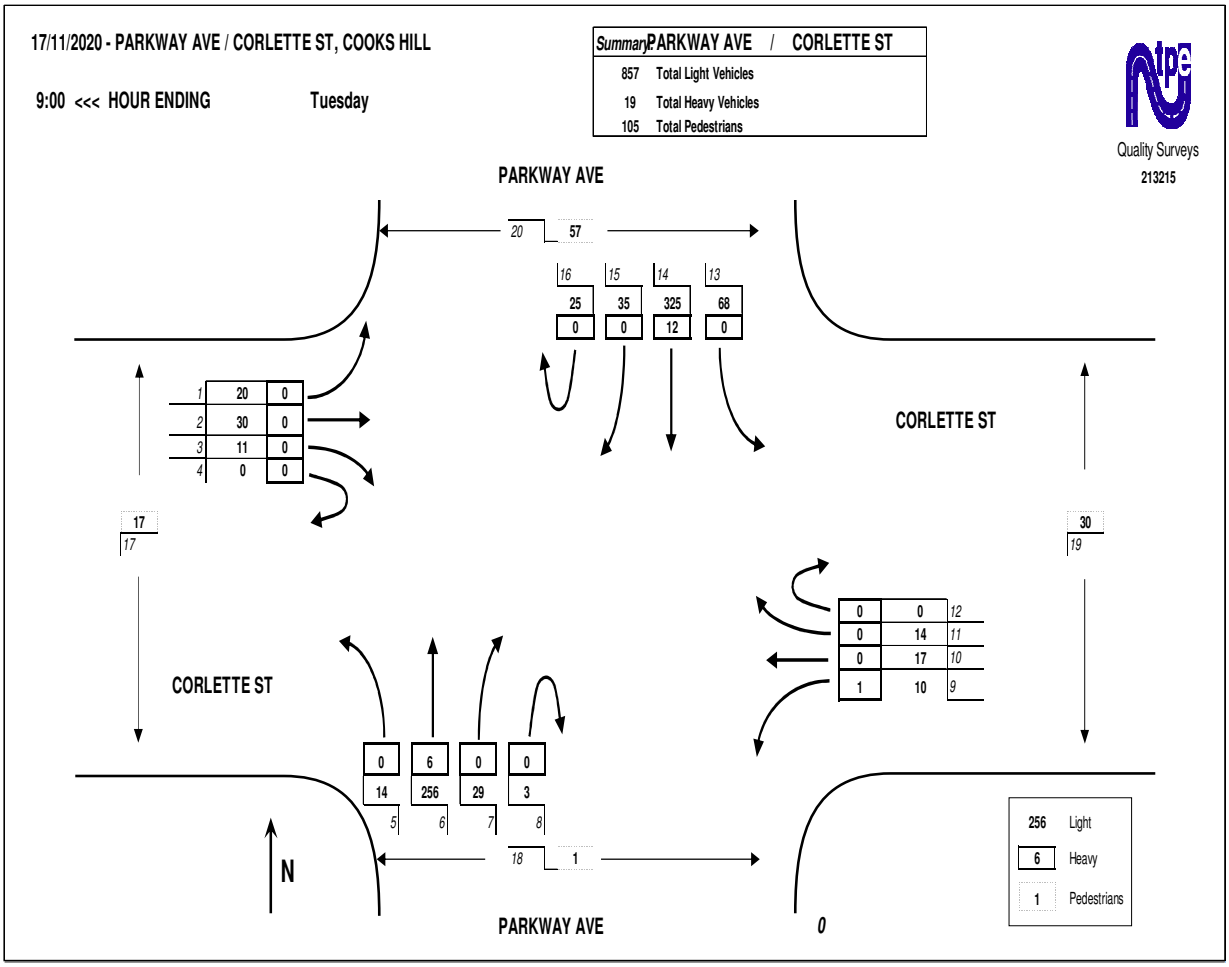
_____

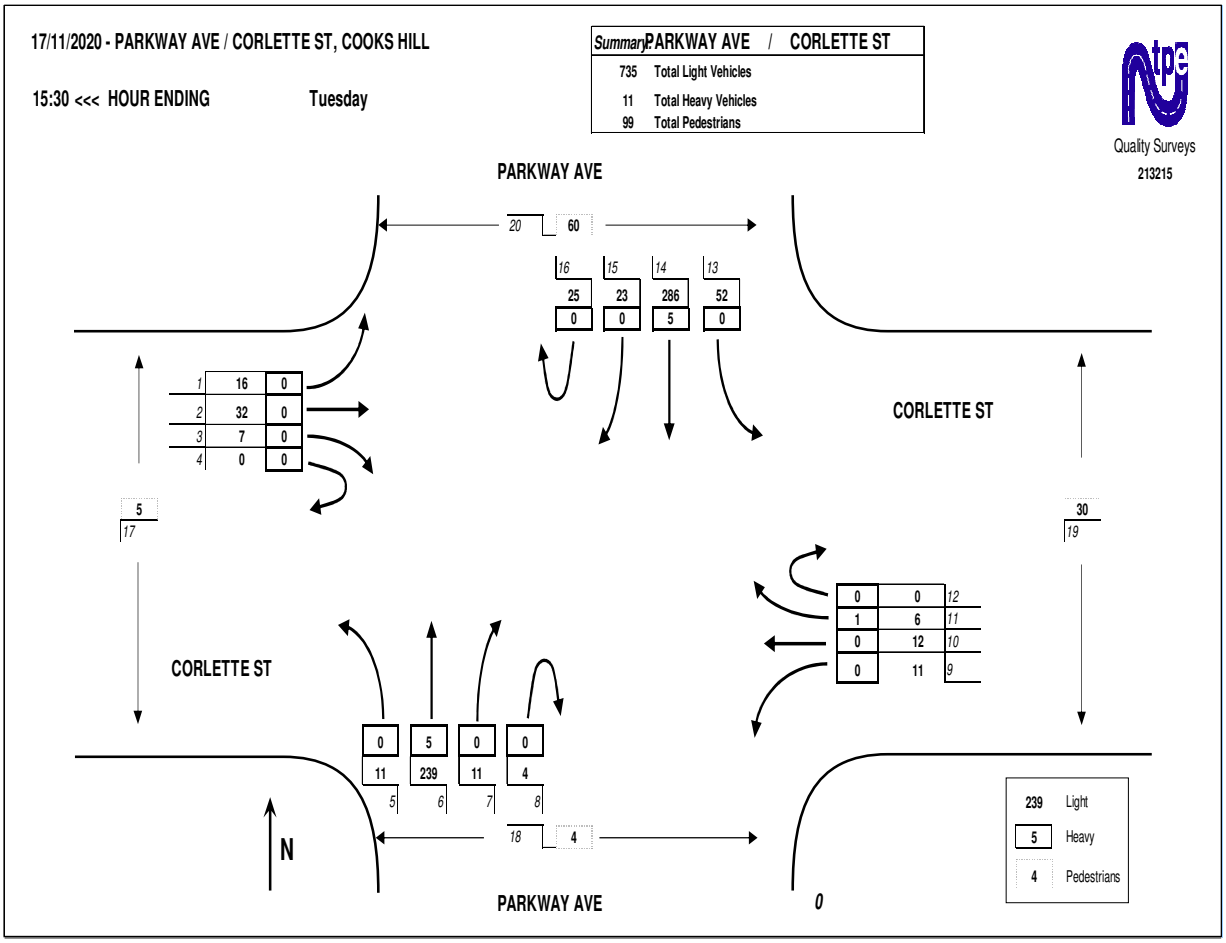
_____

ATTACHMENT C
TRAFFIC COUNT DATA


3/12/2020 - PARKWAY AVE / UNION ST, COOKS HILL
9:00 <<< HOUR ENDING
Thursday
Summary: PARKWAY AVE / UNION ST
1508 Total Light Vehicles
34 Total Heavy Vehicles
84 Total Pedestrians
Quality Surveys
213215
PARKWAY AVE
16
36
12
11
10
0
328
142
0
4
6
1
49
2
2
335
5
3
44
4
UNION ST
22
13
13
15
UNION ST
0
17
9
7
206
8
3
70
7
3
0
0
36
281
0
4
5
6
N
14
13
PARKWAY AVE
281 Light
0 Heavy
36 Pedestrians


17/11/2020 - PARKWAY AVE / UNION ST, COOKS HILL
15:30 <<< HOUR ENDING
Tuesday
Summary: PARKWAY AVE / UNION ST
1268 Total Light Vehicles
30 Total Heavy Vehicles
89 Total Pedestrians
Quality Surveys
213215
PARKWAY AVE
16
23
12
11
10
1
269
80
0
2
3
1
44
0
2
208
4
3
38
2
UNION ST
7
13
25
15
UNION ST
2
22
9
12
245
8
1
77
7
2
2
0
50
234
0
4
5
6
N
14
34
PARKWAY AVE
234 Light
2 Heavy
23 Pedestrians


17/11/2020 - PARKWAY AVE / CORLETTE ST, COOKS HILL
9:00 <<< HOUR ENDING
Tuesday
Summary
PARKWAY AVE / CORLETTE ST
857 Total Light Vehicles
19 Total Heavy Vehicles
105 Total Pedestrians
Quality Surveys
213215
PARKWAY AVE
CORLETTE ST
CORLETTE ST
PARKWAY AVE
N
256 Light
6 Heavy
1 Pedestrians


17/11/2020 - PARKWAY AVE / CORLETTE ST, COOKS HILL
15:30 <<< HOUR ENDING
Tuesday
Summary: PARKWAY AVE / CORLETTE ST
735 Total Light Vehicles
11 Total Heavy Vehicles
99 Total Pedestrians
Quality Surveys
213215
PARKWAY AVE
CORLETTE ST
CORLETTE ST
PARKWAY AVE
N
239 Light
5 Heavy
4 Pedestrians

ATTACHMENT D
SIDRA SUMMARY TABLES

MOVEMENT SUMMARY

Site: 101 [Union Street 2021AM (Site Folder: General)]

Network: N101 [2021AM (Network Folder: General)]

Union Street / Parkway Avenue traffic signals
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Union Street														
1	L2	54	3.9	54	3.9	0.059	15.7	LOS B	0.7	4.7	0.53	0.68	0.53	46.6
2	T1	358	1.5	358	1.5	* 0.909	72.5	LOS F	20.2	144.0	1.00	1.04	1.23	27.3
3	R2	51	8.3	51	8.3	0.909	78.1	LOS F	20.2	144.0	1.00	1.04	1.23	17.9
Approach		462	2.5	462	2.5	0.909	66.5	LOS E	20.2	144.0	0.95	1.00	1.15	27.8
East: Parkway Avenue														
4	L2	41	7.7	41	7.7	0.125	60.1	LOS E	1.5	11.4	0.87	0.73	0.87	22.4
5	T1	296	0.0	296	0.0	* 0.908	79.0	LOS F	14.3	100.0	1.00	1.04	1.28	19.1
Approach		337	0.9	337	0.9	0.908	76.7	LOS F	14.3	100.0	0.98	1.00	1.23	19.5
North: Union Street														
7	L2	77	4.1	77	4.1	0.181	30.0	LOS C	1.7	12.1	0.82	0.74	0.82	30.7
8	T1	224	3.3	224	3.3	* 0.906	80.7	LOS F	11.8	85.1	0.99	1.02	1.30	25.7
9	R2	18	0.0	18	0.0	0.906	88.1	LOS F	11.8	85.1	1.00	1.03	1.32	25.1
Approach		319	3.3	319	3.3	0.906	68.9	LOS E	11.8	85.1	0.95	0.96	1.19	26.3
West: Parkway Avenue														
10	L2	156	4.1	156	4.1	0.350	56.2	LOS D	5.7	41.6	0.87	0.79	0.87	30.9
11	T1	349	1.2	349	1.2	* 0.926	78.0	LOS F	17.6	124.5	0.98	1.07	1.29	17.1
Approach		505	2.1	505	2.1	0.926	71.3	LOS F	17.6	124.5	0.95	0.98	1.16	21.6
All Vehicles		1623	2.2	1623	2.2	0.926	70.6	LOS F	20.2	144.0	0.96	0.99	1.18	24.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Union Street											
P1	Full	23	69.2	LOS F	0.1	0.1	0.96	0.96	232.2	211.9	0.91
East: Parkway Avenue											
P2	Full	14	69.2	LOS F	0.1	0.1	0.96	0.96	245.2	228.9	0.93
North: Union Street											
P3	Full	14	69.2	LOS F	0.1	0.1	0.96	0.96	234.7	215.2	0.92
West: Parkway Avenue											
P4	Full	38	69.2	LOS F	0.2	0.2	0.96	0.96	247.8	232.2	0.94

MOVEMENT SUMMARY

Site: 101 [Union Street 2021AM + dev (Site Folder: General)] **Network: N101 [2021AM + dev (Network Folder: General)]**

Union Street / Parkway Avenue traffic signals
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Union Street														
1	L2	54	3.9	54	3.9	0.059	15.9	LOS B	0.6	4.6	0.54	0.68	0.54	46.5
2	T1	358	1.5	358	1.5	* 0.967	92.9	LOS F	23.2	165.0	1.00	1.16	1.39	23.7
3	R2	56	3.8	56	3.8	0.967	98.4	LOS F	23.2	165.0	1.00	1.16	1.39	14.9
Approach		467	2.0	467	2.0	0.967	84.7	LOS F	23.2	165.0	0.95	1.11	1.29	24.2
East: Parkway Avenue														
4	L2	41	7.7	41	7.7	0.130	61.1	LOS E	1.5	11.5	0.88	0.73	0.88	22.1
5	T1	296	0.0	296	0.0	* 0.942	88.3	LOS F	14.3	100.0	1.00	1.10	1.37	17.7
Approach		337	0.9	337	0.9	0.942	85.0	LOS F	14.3	100.0	0.98	1.05	1.31	18.2
North: Union Street														
7	L2	105	3.0	105	3.0	0.192	26.5	LOS B	1.9	13.6	0.78	0.74	0.78	32.4
8	T1	235	3.1	235	3.1	* 0.960	95.3	LOS F	14.4	102.9	1.00	1.12	1.44	23.3
9	R2	29	0.0	29	0.0	0.960	102.1	LOS F	14.4	102.9	1.00	1.13	1.45	22.9
Approach		369	2.8	369	2.8	0.960	76.2	LOS F	14.4	102.9	0.93	1.02	1.25	24.4
West: Parkway Avenue														
10	L2	156	4.1	156	4.1	0.341	55.3	LOS D	5.7	41.2	0.86	0.79	0.86	31.1
11	T1	367	1.1	367	1.1	* 0.946	83.9	LOS F	19.3	136.3	0.98	1.11	1.34	16.2
Approach		523	2.0	523	2.0	0.946	75.3	LOS F	19.3	136.3	0.95	1.01	1.20	20.7
All Vehicles		1697	2.0	1697	2.0	0.967	80.0	LOS F	23.2	165.0	0.95	1.05	1.26	22.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Union Street											
P1	Full	23	69.2	LOS F	0.1	0.1	0.96	0.96	232.2	211.9	0.91
East: Parkway Avenue											
P2	Full	14	69.2	LOS F	0.1	0.1	0.96	0.96	245.2	228.9	0.93
North: Union Street											
P3	Full	14	69.2	LOS F	0.1	0.1	0.96	0.96	234.7	215.2	0.92
West: Parkway Avenue											
P4	Full	38	69.2	LOS F	0.2	0.2	0.96	0.96	247.8	232.2	0.94

MOVEMENT SUMMARY

Site: 101 [Union Street 2031AM - 30 min peak (Site Folder: General)]

Network: N101 [2031 AM (Network Folder: General)]

Union Street / Parkway Avenue traffic signals
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)
Design Life Analysis (Final Year): Results for 10 years

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Union Street														
1	L2	62	3.9	62	3.9	0.068	16.0	LOS B	0.8	5.5	0.54	0.69	0.54	46.4
2	T1	412	1.5	412	1.5	* 1.076	158.7	LOS F[11]	35.1	250.4	1.00	1.45	1.77	16.3
3	R2	58	8.3	58	8.3	1.076	164.3	LOS F[11]	35.1	250.4	1.00	1.45	1.77	9.6
Approach		531	2.5	531	2.5	1.076	142.8	LOS F[11]	35.1	250.4	0.95	1.37	1.63	16.9
East: Parkway Avenue														
4	L2	47	7.7	47	7.7	0.144	60.4	LOS E[11]	1.8	13.2	0.87	0.74	0.87	22.3
5	T1	340	0.0	340	0.0	* 1.048	142.2	LOS F[11]	14.3	100.0	1.00	1.34	1.71	12.2
Approach		387	0.9	387	0.9	1.048	132.2	LOS F[11]	14.3	100.0	0.98	1.27	1.61	12.9
North: Union Street														
7	L2	88	4.1	88	4.1	0.207	29.2	LOS C	1.9	13.4	0.81	0.74	0.81	31.1
8	T1	258	3.3	258	3.3	* 1.035	132.3	LOS F[11]	18.0	129.5	0.99	1.27	1.67	18.7
9	R2	21	0.0	21	0.0	1.035	140.8	LOS F[11]	18.0	129.5	1.00	1.29	1.70	18.2
Approach		367	3.3	367	3.3	1.035	107.9	LOS F[11]	18.0	129.5	0.95	1.14	1.47	19.7
West: Parkway Avenue														
10	L2	179	4.1	179	4.1	0.408	57.0	LOS E[11]	6.7	48.6	0.89	0.80	0.89	30.7
11	T1	402	1.2	402	1.2	* 1.079	163.7	LOS F[11]	30.4	215.2	1.00	1.46	1.82	9.3
Approach		581	2.1	581	2.1	1.079	130.8	LOS F[11]	30.4	215.2	0.96	1.26	1.53	13.8
All Vehicles		1867	2.2	1867	2.2	1.079	130.0	LOS F[11]	35.1	250.4	0.96	1.27	1.56	15.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Union Street											
P1	Full	28	69.2	LOS F[12]	0.1	0.1	0.96	0.96	232.2	211.9	0.91
East: Parkway Avenue											
P2	Full	16	69.2	LOS F[12]	0.1	0.1	0.96	0.96	245.2	228.9	0.93
North: Union Street											
P3	Full	16	69.2	LOS F[12]	0.1	0.1	0.96	0.96	234.7	215.2	0.92
West: Parkway Avenue											

MOVEMENT SUMMARY

Site: 101 [Union Street 2031AM + dev (Site Folder: General)] **Network: N101 [2031AM + dev (Network Folder: General)]**

Union Street / Parkway Avenue traffic signals
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Union Street														
1	L2	62	3.4	62	3.4	0.068	15.9	LOS B	0.7	5.3	0.54	0.69	0.54	46.4
2	T1	416	1.3	416	1.3	* 1.110	184.2	LOS F	39.3	278.8	1.00	1.55	1.90	14.5
3	R2	73	2.9	73	2.9	1.110	189.7	LOS F	39.3	278.8	1.00	1.55	1.90	8.4
Approach		551	1.7	551	1.7	1.110	165.9	LOS F	39.3	278.8	0.95	1.45	1.75	15.0
East: Parkway Avenue														
4	L2	47	6.7	47	6.7	0.148	61.3	LOS E	1.8	13.2	0.88	0.74	0.88	22.1
5	T1	343	0.0	343	0.0	* 1.094	174.3	LOS F	14.3	100.0	1.00	1.46	1.89	10.2
Approach		391	0.8	391	0.8	1.094	160.6	LOS F	14.3	100.0	0.99	1.37	1.76	10.9
North: Union Street														
7	L2	118	2.7	118	2.7	0.221	27.2	LOS B	2.2	16.0	0.79	0.75	0.79	32.1
8	T1	271	2.7	271	2.7	* 1.106	181.2	LOS F	23.4	167.0	1.00	1.44	1.93	14.7
9	R2	33	0.0	33	0.0	1.106	189.9	LOS F	23.4	167.0	1.00	1.46	1.95	14.4
Approach		421	2.5	421	2.5	1.106	138.7	LOS F	23.4	167.0	0.94	1.25	1.61	16.1
West: Parkway Avenue														
10	L2	181	3.5	181	3.5	0.418	57.0	LOS E	6.8	48.9	0.89	0.80	0.89	30.7
11	T1	423	1.0	423	1.0	* 1.126	198.2	LOS F	35.3	249.2	1.00	1.59	1.99	7.9
Approach		604	1.7	604	1.7	1.126	155.9	LOS F	35.3	249.2	0.97	1.36	1.66	11.9
All Vehicles		1966	1.7	1966	1.7	1.126	156.0	LOS F	39.3	278.8	0.96	1.36	1.70	13.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Union Street											
P1	Full	23	69.2	LOS F	0.1	0.1	0.96	0.96	232.2	211.9	0.91
East: Parkway Avenue											
P2	Full	14	69.2	LOS F	0.1	0.1	0.96	0.96	245.2	228.9	0.93
North: Union Street											
P3	Full	14	69.2	LOS F	0.1	0.1	0.96	0.96	234.7	215.2	0.92
West: Parkway Avenue											
P4	Full	38	69.2	LOS F	0.2	0.2	0.96	0.96	247.8	232.2	0.94

MOVEMENT SUMMARY

Site: 101 [Union Street 2021PM (Site Folder: General)]

Network: N101 [2021PM (Network Folder: General)]

Union Street / Parkway Avenue traffic signals
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Union Street														
1	L2	46	0.0	46	0.0	0.076	14.6	LOS B	0.4	2.5	0.72	0.70	0.72	47.4
2	T1	223	1.9	223	1.9	* 0.914	45.4	LOS D	7.0	50.0	1.00	1.12	1.60	34.1
3	R2	42	5.0	42	5.0	0.914	50.9	LOS D	7.0	50.0	1.00	1.12	1.60	24.1
Approach		312	2.0	312	2.0	0.914	41.5	LOS C	7.0	50.0	0.96	1.06	1.47	34.6
East: Parkway Avenue														
4	L2	55	3.8	55	3.8	0.193	34.3	LOS C	1.0	7.5	0.91	0.74	0.91	30.3
5	T1	248	0.8	248	0.8	* 0.892	42.2	LOS C	6.3	44.1	1.00	1.07	1.53	28.0
Approach		303	1.4	303	1.4	0.892	40.8	LOS C	6.3	44.1	0.98	1.01	1.42	28.4
North: Union Street														
7	L2	82	1.3	82	1.3	0.177	16.2	LOS B	0.8	5.6	0.79	0.72	0.79	39.9
8	T1	271	4.7	271	4.7	* 0.885	39.9	LOS C	7.2	52.3	0.99	1.06	1.44	36.0
9	R2	25	8.3	25	8.3	0.885	46.7	LOS D	7.2	52.3	1.00	1.07	1.47	34.9
Approach		378	4.2	378	4.2	0.885	35.2	LOS C	7.2	52.3	0.95	0.98	1.30	36.4
West: Parkway Avenue														
10	L2	87	3.6	87	3.6	0.281	34.2	LOS C	1.7	12.0	0.91	0.76	0.91	37.8
11	T1	286	0.7	286	0.7	* 0.861	38.6	LOS C	6.9	48.8	1.00	1.03	1.38	26.7
Approach		374	1.4	374	1.4	0.861	37.6	LOS C	6.9	48.8	0.98	0.96	1.27	30.0
All Vehicles		1366	2.3	1366	2.3	0.914	38.5	LOS C	7.2	52.3	0.97	1.00	1.36	32.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Union Street											
P1	Full	7	29.3	LOS C	0.0	0.0	0.91	0.91	192.3	211.9	1.10
East: Parkway Avenue											
P2	Full	36	29.3	LOS C	0.1	0.1	0.92	0.92	205.4	228.9	1.11
North: Union Street											
P3	Full	26	29.3	LOS C	0.0	0.0	0.92	0.92	194.8	215.2	1.10
West: Parkway Avenue											
P4	Full	24	29.3	LOS C	0.0	0.0	0.92	0.92	207.9	232.2	1.12

MOVEMENT SUMMARY

Site: 101 [Union Street 2021PM + dev (Site Folder: General)]

Network: N101 [2021PM+dev (Network Folder: General)]

Union Street / Parkway Avenue traffic signals
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Union Street														
1	L2	46	0.0	46	0.0	0.071	15.1	LOS B	0.4	2.8	0.69	0.70	0.69	47.0
2	T1	223	1.9	223	1.9	* 0.863	43.3	LOS D	7.5	53.2	1.00	1.02	1.36	34.7
3	R2	51	4.2	51	4.2	0.863	48.8	LOS D	7.5	53.2	1.00	1.02	1.36	24.7
Approach		320	2.0	320	2.0	0.863	40.1	LOS C	7.5	53.2	0.96	0.98	1.26	34.9
East: Parkway Avenue														
4	L2	55	3.8	55	3.8	0.186	37.7	LOS C	1.2	8.4	0.90	0.74	0.90	29.0
5	T1	248	0.8	248	0.8	* 0.877	45.0	LOS D	6.9	48.3	1.00	1.04	1.42	27.1
Approach		303	1.4	303	1.4	0.877	43.7	LOS D	6.9	48.3	0.98	0.98	1.33	27.4
North: Union Street														
7	L2	112	0.9	112	0.9	0.184	15.6	LOS B	1.0	7.0	0.73	0.73	0.73	40.0
8	T1	288	4.4	288	4.4	* 0.918	49.8	LOS D	9.8	71.0	1.00	1.13	1.50	32.8
9	R2	39	5.4	39	5.4	0.918	55.8	LOS D	9.8	71.0	1.00	1.13	1.51	32.1
Approach		439	3.6	439	3.6	0.918	41.6	LOS C	9.8	71.0	0.93	1.03	1.31	33.6
West: Parkway Avenue														
10	L2	87	3.6	87	3.6	0.276	37.7	LOS C	1.9	13.5	0.91	0.76	0.91	36.5
11	T1	297	0.7	297	0.7	* 0.875	44.4	LOS D	8.2	58.1	1.00	1.04	1.38	24.7
Approach		384	1.4	384	1.4	0.875	42.9	LOS D	8.2	58.1	0.98	0.98	1.27	28.0
All Vehicles		1446	2.2	1446	2.2	0.918	42.1	LOS C	9.8	71.0	0.96	0.99	1.29	31.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Union Street											
P1	Full	7	34.2	LOS D	0.0	0.0	0.93	0.93	197.2	211.9	1.07
East: Parkway Avenue											
P2	Full	36	34.3	LOS D	0.1	0.1	0.93	0.93	210.4	228.9	1.09
North: Union Street											
P3	Full	26	34.3	LOS D	0.1	0.1	0.93	0.93	199.8	215.2	1.08
West: Parkway Avenue											
P4	Full	24	34.3	LOS D	0.1	0.1	0.93	0.93	212.9	232.2	1.09

MOVEMENT SUMMARY

Site: 101 [Union Street 2031PM + dev (Site Folder: General)]

Network: N101 [2031PM + dev (Network Folder: General)]

Union Street / Parkway Avenue traffic signals
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Union Street														
1	L2	54	0.0	54	0.0	0.070	19.9	LOS B	0.8	5.6	0.63	0.70	0.63	44.3
2	T1	259	1.6	259	1.6	* 0.958	93.3	LOS F	17.4	123.6	1.00	1.14	1.41	23.6
3	R2	57	3.7	57	3.7	0.958	98.8	LOS F	17.4	123.6	1.00	1.14	1.41	14.8
Approach		369	1.7	369	1.7	0.958	83.5	LOS F	17.4	123.6	0.95	1.07	1.30	24.1
East: Parkway Avenue														
4	L2	63	3.3	63	3.3	0.193	61.9	LOS E	2.4	17.3	0.89	0.75	0.89	22.0
5	T1	288	0.7	288	0.7	* 0.973	100.3	LOS F	14.2	100.0	1.00	1.16	1.48	16.2
Approach		352	1.2	352	1.2	0.973	93.4	LOS F	14.2	100.0	0.98	1.09	1.37	17.0
North: Union Street														
7	L2	125	0.8	125	0.8	0.190	22.4	LOS B	2.0	14.3	0.70	0.73	0.70	35.0
8	T1	334	3.8	334	3.8	* 0.949	84.5	LOS F	20.0	144.7	0.99	1.12	1.34	25.0
9	R2	47	4.4	47	4.4	0.949	91.5	LOS F	20.0	144.7	1.00	1.13	1.36	24.5
Approach		506	3.1	506	3.1	0.949	69.8	LOS E	20.0	144.7	0.92	1.03	1.19	26.0
West: Parkway Avenue														
10	L2	101	3.1	101	3.1	0.253	57.9	LOS E	3.7	26.8	0.87	0.77	0.87	30.4
11	T1	343	0.6	343	0.6	* 0.941	84.9	LOS F	18.1	127.1	1.00	1.11	1.35	16.0
Approach		444	1.2	444	1.2	0.941	78.7	LOS F	18.1	127.1	0.97	1.03	1.24	19.4
All Vehicles		1672	1.9	1672	1.9	0.973	80.2	LOS F	20.0	144.7	0.95	1.05	1.26	22.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Union Street											
P1	Full	7	69.1	LOS F	0.0	0.0	0.96	0.96	232.1	211.9	0.91
East: Parkway Avenue											
P2	Full	36	69.2	LOS F	0.1	0.1	0.96	0.96	245.3	228.9	0.93
North: Union Street											
P3	Full	26	69.2	LOS F	0.1	0.1	0.96	0.96	234.7	215.2	0.92
West: Parkway Avenue											
P4	Full	24	69.2	LOS F	0.1	0.1	0.96	0.96	247.8	232.2	0.94

MOVEMENT SUMMARY

Site: 101 [Union Street 2031PM - 30 min peak (Site Folder: General)]

Network: N101 [2031PM + dev (Network Folder: General)]

Union Street / Parkway Avenue traffic signals
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)
Design Life Analysis (Final Year): Results for 10 years

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Union Street														
1	L2	53	0.0	53	0.0	0.068	19.5	LOS B	0.7	5.2	0.62	0.70	0.62	44.5
2	T1	257	1.9	257	1.9	* 0.896	75.8	LOS F[11]	15.0	106.9	1.00	1.03	1.25	26.6
3	R2	48	5.0	48	5.0	0.896	81.3	LOS F[11]	15.0	106.9	1.00	1.03	1.25	17.3
Approach		358	2.0	358	2.0	0.896	68.1	LOS E[11]	15.0	106.9	0.94	0.98	1.16	27.3
East: Parkway Avenue														
4	L2	63	3.8	63	3.8	0.180	59.9	LOS E[11]	2.4	17.0	0.87	0.75	0.87	22.4
5	T1	286	0.8	286	0.8	* 0.898	76.5	LOS F[11]	14.0	98.6	1.00	1.03	1.27	19.6
Approach		349	1.4	349	1.4	0.898	73.5	LOS F[11]	14.0	98.6	0.98	0.98	1.20	20.0
North: Union Street														
7	L2	94	1.3	94	1.3	0.176	25.8	LOS B	1.9	13.5	0.76	0.73	0.76	33.0
8	T1	311	4.7	311	4.7	* 0.880	68.6	LOS E[11]	15.6	114.1	0.99	1.00	1.19	28.1
9	R2	29	8.3	29	8.3	0.880	76.0	LOS F[11]	15.6	114.1	1.00	1.01	1.20	27.3
Approach		435	4.2	435	4.2	0.880	59.8	LOS E[11]	15.6	114.1	0.94	0.94	1.10	28.6
West: Parkway Avenue														
10	L2	100	3.6	100	3.6	0.252	57.9	LOS E[11]	3.7	26.8	0.87	0.77	0.87	30.4
11	T1	329	0.7	329	0.7	* 0.903	74.8	LOS F[11]	16.1	113.6	1.00	1.04	1.25	17.6
Approach		430	1.4	430	1.4	0.903	70.8	LOS F[11]	16.1	113.6	0.97	0.98	1.16	20.9
All Vehicles		1571	2.3	1571	2.3	0.903	67.8	LOS E[11]	16.1	114.1	0.96	0.97	1.15	24.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Union Street											
P1	Full	9	69.1	LOS F[12]	0.0	0.0	0.96	0.96	232.1	211.9	0.91
East: Parkway Avenue											
P2	Full	43	69.2	LOS F[12]	0.2	0.2	0.96	0.96	245.3	228.9	0.93
North: Union Street											
P3	Full	32	69.2	LOS F[12]	0.1	0.1	0.96	0.96	234.7	215.2	0.92
West: Parkway Avenue											

MOVEMENT SUMMARY

Site: 101 [Corlette 2021AM (Site Folder: General)]

Network: N101 [2021AM (Network Folder: General)]

Parkway Avenue / Corlette Street, Cooks Hill
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Parkway Avenue														
1	L2	15	0.0	15	0.0	0.179	7.2	LOS A	0.4	3.1	0.16	0.09	0.16	46.9
2	T1	276	2.3	276	2.3	0.179	0.4	LOS A	0.4	3.1	0.16	0.09	0.16	57.1
3	R2	34	0.0	34	0.0	0.179	7.4	LOS A	0.4	3.1	0.16	0.09	0.16	56.3
Approach		324	1.9	324	1.9	0.179	1.4	NA	0.4	3.1	0.16	0.09	0.16	56.4
East: Corlette Street														
4	L2	12	9.1	12	9.1	0.109	10.1	LOS A	0.1	0.9	0.53	0.98	0.53	49.1
5	T1	18	0.0	18	0.0	0.109	12.9	LOS A	0.1	0.9	0.53	0.98	0.53	43.9
6	R2	15	0.0	15	0.0	0.109	14.2	LOS A	0.1	0.9	0.53	0.98	0.53	43.8
Approach		44	2.4	44	2.4	0.109	12.6	LOS A	0.1	0.9	0.53	0.98	0.53	45.8
North: Parkway Avenue														
7	L2	72	0.0	72	0.0	0.271	6.3	LOS A	0.3	1.8	0.12	0.16	0.12	54.4
8	T1	355	3.6	355	3.6	0.271	0.3	LOS A	0.3	1.8	0.12	0.16	0.12	56.8
9	R2	63	0.0	63	0.0	0.271	6.8	LOS A	0.3	1.8	0.12	0.16	0.12	18.3
Approach		489	2.6	489	2.6	0.271	2.0	NA	0.3	1.8	0.12	0.16	0.12	51.2
West: Corlette Street														
10	L2	21	0.0	21	0.0	0.144	9.2	LOS A	0.2	1.1	0.52	0.97	0.52	22.9
11	T1	32	0.0	32	0.0	0.144	13.3	LOS A	0.2	1.1	0.52	0.97	0.52	44.3
12	R2	12	0.0	12	0.0	0.144	13.7	LOS A	0.2	1.1	0.52	0.97	0.52	44.1
Approach		64	0.0	64	0.0	0.144	12.0	LOS A	0.2	1.1	0.52	0.97	0.52	41.1
All Vehicles		922	2.2	922	2.2	0.271	3.0	NA	0.4	3.1	0.18	0.23	0.18	51.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Corlette 2021AM +dev (Site Folder: General)]

Network: N101 [2021AM + dev (Network Folder: General)]

Parkway Avenue / Corlette Street, Cooks Hill
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Parkway Avenue														
1	L2	15	0.0	15	0.0	0.194	7.6	LOS A	1.3	8.9	0.24	0.11	0.24	46.4
2	T1	276	2.3	276	2.3	0.194	0.7	LOS A	1.3	8.9	0.24	0.11	0.24	56.2
3	R2	49	0.0	49	0.0	0.194	7.8	LOS A	1.3	8.9	0.24	0.11	0.24	55.9
Approach		340	1.9	340	1.9	0.194	2.0	NA	1.3	8.9	0.24	0.11	0.24	55.6
East: Corlette Street														
4	L2	12	9.1	12	9.1	0.117	10.2	LOS A	0.1	0.9	0.55	0.98	0.55	48.7
5	T1	18	0.0	18	0.0	0.117	13.5	LOS A	0.1	0.9	0.55	0.98	0.55	43.5
6	R2	15	0.0	15	0.0	0.117	15.1	LOS B	0.1	0.9	0.55	0.98	0.55	43.2
Approach		44	2.4	44	2.4	0.117	13.2	LOS A	0.1	0.9	0.55	0.98	0.55	45.3
North: Parkway Avenue														
7	L2	116	0.0	116	0.0	0.303	6.2	LOS A	0.3	2.1	0.12	0.19	0.12	54.0
8	T1	366	3.4	366	3.4	0.303	0.3	LOS A	0.3	2.1	0.12	0.19	0.12	56.3
9	R2	66	0.0	66	0.0	0.303	6.8	LOS A	0.3	2.1	0.12	0.19	0.12	18.2
Approach		548	2.3	548	2.3	0.303	2.3	NA	0.3	2.1	0.12	0.19	0.12	51.0
West: Corlette Street														
10	L2	21	0.0	21	0.0	0.165	9.2	LOS A	0.2	1.3	0.54	0.98	0.54	22.0
11	T1	36	0.0	36	0.0	0.165	14.4	LOS A	0.2	1.3	0.54	0.98	0.54	43.8
12	R2	12	0.0	12	0.0	0.165	14.2	LOS A	0.2	1.3	0.54	0.98	0.54	43.5
Approach		68	0.0	68	0.0	0.165	12.8	LOS A	0.2	1.3	0.54	0.98	0.54	40.7
All Vehicles		1001	2.0	1001	2.0	0.303	3.4	NA	1.3	8.9	0.21	0.25	0.21	51.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Corlette 2031AM - 30 minute peak (Site Folder: General)]

Network: N101 [2031 AM (Network Folder: General)]

Parkway Avenue / Corlette Street, Cooks Hill
Site Category: (None)
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Parkway Avenue														
1	L2	17	0.0	17	0.0	0.207	7.5	LOS A	8.1	57.9	0.18	0.09	0.18	46.9
2	T1	317	2.3	317	2.3	0.207	0.5	LOS A	8.1	57.9	0.18	0.09	0.18	57.0
3	R2	39	0.0	39	0.0	0.207	7.7	LOS A	8.1	57.9	0.18	0.09	0.18	56.3
Approach		373	1.9	373	1.9	0.207	1.5	NA	8.1	57.9	0.18	0.09	0.18	56.3
East: Corlette Street														
4	L2	13	9.1	13	9.1	0.140	10.3	LOS A	0.4	3.1	0.56	0.98	0.56	48.5
5	T1	21	0.0	21	0.0	0.140	13.9	LOS A	0.4	3.1	0.56	0.98	0.56	43.2
6	R2	17	0.0	17	0.0	0.140	15.7	LOS B	0.4	3.1	0.56	0.98	0.56	42.9
Approach		51	2.4	51	2.4	0.140	13.6	LOS A	0.4	3.1	0.56	0.98	0.56	45.0
North: Parkway Avenue														
7	L2	82	0.0	77	0.0	0.296	6.5	LOS A	0.3	2.1	0.14	0.16	0.14	54.2
8	T1	408	3.6	384	3.6	0.296	0.4	LOS A	0.3	2.1	0.14	0.16	0.14	56.6
9	R2	73	0.0	68	0.0	0.296	7.1	LOS A	0.3	2.1	0.14	0.16	0.14	18.3
Approach		563	2.6	529 [N1]	2.6	0.296	2.1	NA	0.3	2.1	0.14	0.16	0.14	51.0
West: Corlette Street														
10	L2	24	0.0	24	0.0	0.184	9.5	LOS A	0.6	4.3	0.56	0.98	0.56	21.8
11	T1	36	0.0	36	0.0	0.184	14.5	LOS B	0.6	4.3	0.56	0.98	0.56	43.6
12	R2	13	0.0	13	0.0	0.184	15.0	LOS B	0.6	4.3	0.56	0.98	0.56	43.3
Approach		74	0.0	74	0.0	0.184	13.0	LOS A	0.6	4.3	0.56	0.98	0.56	40.3
All Vehicles		1060	2.2	1027 [N1]	2.2	0.296	3.3	NA	8.1	57.9	0.21	0.23	0.21	51.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY

Site: 101 [Corlette 2031AM +dev (Site Folder: General)]

Network: N101 [2031AM + dev (Network Folder: General)]

Parkway Avenue / Corlette Street, Cooks Hill
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Parkway Avenue														
1	L2	17	0.0	17	0.0	0.224	7.9	LOS A	10.6	75.5	0.24	0.11	0.24	46.4
2	T1	320	2.0	320	2.0	0.224	0.7	LOS A	10.6	75.5	0.24	0.11	0.24	56.2
3	R2	55	0.0	55	0.0	0.224	8.0	LOS A	10.6	75.5	0.24	0.11	0.24	55.9
Approach		392	1.6	392	1.6	0.224	2.0	NA	10.6	75.5	0.24	0.11	0.24	55.6
East: Corlette Street														
4	L2	14	7.7	14	7.7	0.149	10.2	LOS A	0.6	4.0	0.57	0.98	0.57	48.2
5	T1	21	0.0	21	0.0	0.149	14.5	LOS B	0.6	4.0	0.57	0.98	0.57	42.8
6	R2	17	0.0	17	0.0	0.149	16.5	LOS B	0.6	4.0	0.57	0.98	0.57	42.4
Approach		52	2.0	52	2.0	0.149	14.0	LOS A	0.6	4.0	0.57	0.98	0.57	44.7
North: Parkway Avenue														
7	L2	127	0.0	116	0.0	0.319	6.4	LOS A	0.3	2.3	0.15	0.18	0.15	53.9
8	T1	423	3.0	387	3.1	0.319	0.4	LOS A	0.3	2.3	0.15	0.18	0.15	56.2
9	R2	77	0.0	70	0.0	0.319	7.2	LOS A	0.3	2.3	0.15	0.18	0.15	18.2
Approach		627	2.0	573 N1	2.1	0.319	2.4	NA	0.3	2.3	0.15	0.18	0.15	50.8
West: Corlette Street														
10	L2	24	0.0	24	0.0	0.209	9.5	LOS A	0.8	5.6	0.58	0.98	0.58	21.1
11	T1	41	0.0	41	0.0	0.209	15.5	LOS B	0.8	5.6	0.58	0.98	0.58	43.1
12	R2	14	0.0	14	0.0	0.209	15.4	LOS B	0.8	5.6	0.58	0.98	0.58	42.8
Approach		79	0.0	79	0.0	0.209	13.7	LOS A	0.8	5.6	0.58	0.98	0.58	39.9
All Vehicles		1149	1.7	1095 N1	1.8	0.319	3.6	NA	10.6	75.5	0.23	0.25	0.23	51.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY

Site: 101 [Corlette 2021PM (Site Folder: General)]

Network: N101 [2021PM (Network Folder: General)]

Parkway Avenue / Corlette Street, Cooks Hill
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Parkway Avenue														
1	L2	12	0.0	12	0.0	0.152	6.7	LOS A	0.1	0.6	0.08	0.06	0.08	47.6
2	T1	257	2.0	257	2.0	0.152	0.2	LOS A	0.1	0.6	0.08	0.06	0.08	58.3
3	R2	16	0.0	16	0.0	0.152	7.0	LOS A	0.1	0.6	0.08	0.06	0.08	56.9
Approach		284	1.9	284	1.9	0.152	0.8	NA	0.1	0.6	0.08	0.06	0.08	57.5
East: Corlette Street														
4	L2	12	0.0	12	0.0	0.049	9.3	LOS A	0.1	0.5	0.46	0.92	0.46	50.2
5	T1	13	0.0	13	0.0	0.049	11.6	LOS A	0.1	0.5	0.46	0.92	0.46	45.0
6	R2	7	14.3	7	14.3	0.049	14.1	LOS A	0.1	0.5	0.46	0.92	0.46	45.0
Approach		32	3.3	32	3.3	0.049	11.3	LOS A	0.1	0.5	0.46	0.92	0.46	47.5
North: Parkway Avenue														
7	L2	55	0.0	55	0.0	0.225	6.2	LOS A	0.2	1.3	0.10	0.15	0.10	54.7
8	T1	306	1.7	306	1.7	0.225	0.2	LOS A	0.2	1.3	0.10	0.15	0.10	57.1
9	R2	51	0.0	51	0.0	0.225	6.6	LOS A	0.2	1.3	0.10	0.15	0.10	18.4
Approach		412	1.3	412	1.3	0.225	1.8	NA	0.2	1.3	0.10	0.15	0.10	51.8
West: Corlette Street														
10	L2	17	0.0	17	0.0	0.087	9.1	LOS A	0.1	0.9	0.49	0.95	0.49	24.0
11	T1	34	0.0	34	0.0	0.087	12.0	LOS A	0.1	0.9	0.49	0.95	0.49	45.1
12	R2	7	0.0	7	0.0	0.087	12.3	LOS A	0.1	0.9	0.49	0.95	0.49	44.8
Approach		58	0.0	58	0.0	0.087	11.2	LOS A	0.1	0.9	0.49	0.95	0.49	42.4
All Vehicles		785	1.5	785	1.5	0.225	2.5	NA	0.2	1.3	0.14	0.21	0.14	52.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Corlette 2021PM + dev (Site Folder: General)]

Network: N101 [2021PM+dev (Network Folder: General)]

Parkway Avenue / Corlette Street, Cooks Hill
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Parkway Avenue														
1	L2	12	0.0	12	0.0	0.161	7.0	LOS A	0.1	1.0	0.14	0.08	0.14	47.2
2	T1	257	2.0	257	2.0	0.161	0.3	LOS A	0.1	1.0	0.14	0.08	0.14	57.5
3	R2	26	0.0	26	0.0	0.161	7.2	LOS A	0.1	1.0	0.14	0.08	0.14	56.6
Approach		295	1.8	295	1.8	0.161	1.2	NA	0.1	1.0	0.14	0.08	0.14	56.8
East: Corlette Street														
4	L2	12	0.0	12	0.0	0.052	9.4	LOS A	0.1	0.6	0.48	0.92	0.48	49.9
5	T1	13	0.0	13	0.0	0.052	12.0	LOS A	0.1	0.6	0.48	0.92	0.48	44.7
6	R2	7	14.3	7	14.3	0.052	14.8	LOS B	0.1	0.6	0.48	0.92	0.48	44.7
Approach		32	3.3	32	3.3	0.052	11.7	LOS A	0.1	0.6	0.48	0.92	0.48	47.2
North: Parkway Avenue														
7	L2	83	0.0	83	0.0	0.251	6.1	LOS A	0.2	1.5	0.10	0.17	0.10	54.4
8	T1	323	1.6	323	1.6	0.251	0.2	LOS A	0.2	1.5	0.10	0.17	0.10	56.7
9	R2	54	0.0	54	0.0	0.251	6.6	LOS A	0.2	1.5	0.10	0.17	0.10	18.3
Approach		460	1.1	460	1.1	0.251	2.0	NA	0.2	1.5	0.10	0.17	0.10	51.6
West: Corlette Street														
10	L2	17	0.0	17	0.0	0.098	9.1	LOS A	0.1	1.0	0.50	0.97	0.50	23.3
11	T1	37	0.0	37	0.0	0.098	12.6	LOS A	0.1	1.0	0.50	0.97	0.50	44.7
12	R2	7	0.0	7	0.0	0.098	12.7	LOS A	0.1	1.0	0.50	0.97	0.50	44.4
Approach		61	0.0	61	0.0	0.098	11.6	LOS A	0.1	1.0	0.50	0.97	0.50	42.1
All Vehicles		847	1.4	847	1.4	0.251	2.8	NA	0.2	1.5	0.16	0.22	0.16	52.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Corlette 2031PM - 30 min peak (Site Folder: General)]

Network: N101 [2031 PM (Network Folder: General)]

Parkway Avenue / Corlette Street, Cooks Hill
Site Category: (None)
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Parkway Avenue														
1	L2	13	0.0	13	0.0	0.326	6.9	LOS A	0.1	0.8	0.09	0.06	0.09	47.6
2	T1	295	2.0	295	2.0	0.326	0.2	LOS A	0.1	0.8	0.09	0.06	0.09	58.2
3	R2	18	0.0	18	0.0	0.326	7.3	LOS A	0.1	0.8	0.09	0.06	0.09	56.9
Approach		327	1.9	327	1.9	0.326	0.9	NA	0.1	0.8	0.09	0.06	0.09	57.5
East: Corlette Street														
4	L2	13	0.0	13	0.0	0.077	9.5	LOS A	0.1	0.7	0.50	0.94	0.50	49.6
5	T1	15	0.0	15	0.0	0.077	12.6	LOS A	0.1	0.7	0.50	0.94	0.50	44.2
6	R2	8	14.3	8	14.3	0.077	15.8	LOS B	0.1	0.7	0.50	0.94	0.50	44.2
Approach		36	3.3	36	3.3	0.077	12.2	LOS A	0.1	0.7	0.50	0.94	0.50	46.8
North: Parkway Avenue														
7	L2	63	0.0	63	0.0	0.261	6.4	LOS A	0.2	1.7	0.12	0.15	0.12	54.6
8	T1	352	1.7	352	1.7	0.261	0.3	LOS A	0.2	1.7	0.12	0.15	0.12	57.0
9	R2	58	0.0	58	0.0	0.261	6.9	LOS A	0.2	1.7	0.12	0.15	0.12	18.4
Approach		473	1.3	473	1.3	0.261	1.9	NA	0.2	1.7	0.12	0.15	0.12	51.6
West: Corlette Street														
10	L2	19	0.0	19	0.0	0.144	9.3	LOS A	0.2	1.1	0.53	0.98	0.53	22.9
11	T1	39	0.0	39	0.0	0.144	13.1	LOS A	0.2	1.1	0.53	0.98	0.53	44.4
12	R2	8	0.0	8	0.0	0.144	13.5	LOS A	0.2	1.1	0.53	0.98	0.53	44.1
Approach		67	0.0	67	0.0	0.144	12.1	LOS A	0.2	1.1	0.53	0.98	0.53	41.6
All Vehicles		903	1.5	903	1.5	0.326	2.7	NA	0.2	1.7	0.16	0.21	0.16	52.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Corlette 2031PM + dev (Site Folder: General)]

Network: N101 [2031PM + dev (Network Folder: General)]

Parkway Avenue / Corlette Street, Cooks Hill
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Parkway Avenue														
1	L2	14	0.0	14	0.0	0.186	7.3	LOS A	1.9	13.7	0.14	0.07	0.14	47.2
2	T1	298	1.8	298	1.8	0.186	0.3	LOS A	1.9	13.7	0.14	0.07	0.14	57.5
3	R2	28	0.0	28	0.0	0.186	7.6	LOS A	1.9	13.7	0.14	0.07	0.14	56.6
Approach		340	1.5	340	1.5	0.186	1.2	NA	1.9	13.7	0.14	0.07	0.14	56.8
East: Corlette Street														
4	L2	14	0.0	14	0.0	0.083	9.6	LOS A	0.1	0.7	0.52	0.95	0.52	49.4
5	T1	15	0.0	15	0.0	0.083	13.2	LOS A	0.1	0.7	0.52	0.95	0.52	43.9
6	R2	8	12.5	8	12.5	0.083	16.4	LOS B	0.1	0.7	0.52	0.95	0.52	43.8
Approach		37	2.9	37	2.9	0.083	12.6	LOS A	0.1	0.7	0.52	0.95	0.52	46.5
North: Parkway Avenue														
7	L2	92	0.0	92	0.0	0.286	6.3	LOS A	0.3	1.9	0.13	0.17	0.13	54.2
8	T1	366	1.4	366	1.4	0.286	0.3	LOS A	0.3	1.9	0.13	0.17	0.13	56.6
9	R2	62	0.0	62	0.0	0.286	6.9	LOS A	0.3	1.9	0.13	0.17	0.13	18.3
Approach		520	1.0	520	1.0	0.286	2.2	NA	0.3	1.9	0.13	0.17	0.13	51.4
West: Corlette Street														
10	L2	20	0.0	20	0.0	0.164	9.3	LOS A	0.2	1.3	0.55	0.98	0.55	22.2
11	T1	42	0.0	42	0.0	0.164	13.9	LOS A	0.2	1.3	0.55	0.98	0.55	43.9
12	R2	8	0.0	8	0.0	0.164	14.0	LOS A	0.2	1.3	0.55	0.98	0.55	43.6
Approach		71	0.0	71	0.0	0.164	12.6	LOS A	0.2	1.3	0.55	0.98	0.55	41.1
All Vehicles		967	1.2	967	1.2	0.286	3.0	NA	1.9	13.7	0.18	0.22	0.18	52.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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ATTACHMENT E
KISS AND RIDE TRAFFIC MANAGEMENT PLAN

TRAFFIC MANAGEMENT PLAN

NEWCASTLE GRAMMAR SCHOOL – PARK CAMPUS

LOT 102 DP861562
127 UNION STREET, COOKS HILL

PREPARED FOR: NEWCASTLE GRAMMAR SCHOOL

SEPTEMBER 2021

REF: 20/027

TRAFFIC MANAGEMENT PLAN
NEWCASTLE GRAMMAR SCHOOL – PARK CAMPUS
LOT 102 DP 861562
127 UNION STREET, COOKS HILL

Intersect Traffic Pty Ltd (ABN: 43 112 606 952)

Address:
16 Mount Harris Drive
Maitland Vale NSW 2320
PO Box 268
East Maitland NSW 2323

Contact:
(Mob) 0423 324 188
Email: jeff@intersecttraffic.com.au

QUALITY ASSURANCE

This document has been prepared, checked and released in accordance with the Quality Control Standards established by Intersect Traffic Pty Ltd.

Issue	Date	Description	By
A	19/04/21	Draft	JG
B	19/04/21	Edit	JG
C	03/09/21	Final Proof/ Client Comments	JG
D	03/09/21	Approved	JG

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This document has been authorised by

Date 3rd September 2021

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SCHOOL TRAFFIC MANAGEMENT PLAN

1. Traffic Management Plan Responsibility.

The preparation and implementation of the schools Traffic Management Plan will be the Principal of the school or nominated representative. The Principal or nominated representative will have the following responsibilities;

- Prepare, implement, review and modify the schools traffic management plan;
- Consult with and seek guidance from representatives of the City of Newcastle, Newcastle Transport (Keolis Downer), NSW Police and Department of Transport regarding the plan's modification and implementation;
- Ensure all school crossings are managed at all times utilising the full TfNSW requirements for a school crossing e.g. use of crossing flags, safety vests etc.
- Communicate the plan to staff, parents and students; and
- Ensure the actions within the plans are undertaken and enforced

2. Available On-street Parking Areas for set down and pick-up of children.

Figure 3 below identifies the available parking areas for the setting down and picking up of children within 200 metres of the school site noting the school will arrange students to be marshalled to the remote parking areas by teachers to ensure the safety of the children. The school is encouraged to liaise with Newcastle City Council to consider some on-street 5 minute kiss and ride parking areas to compliment the proposed on-site kiss and ride facility.

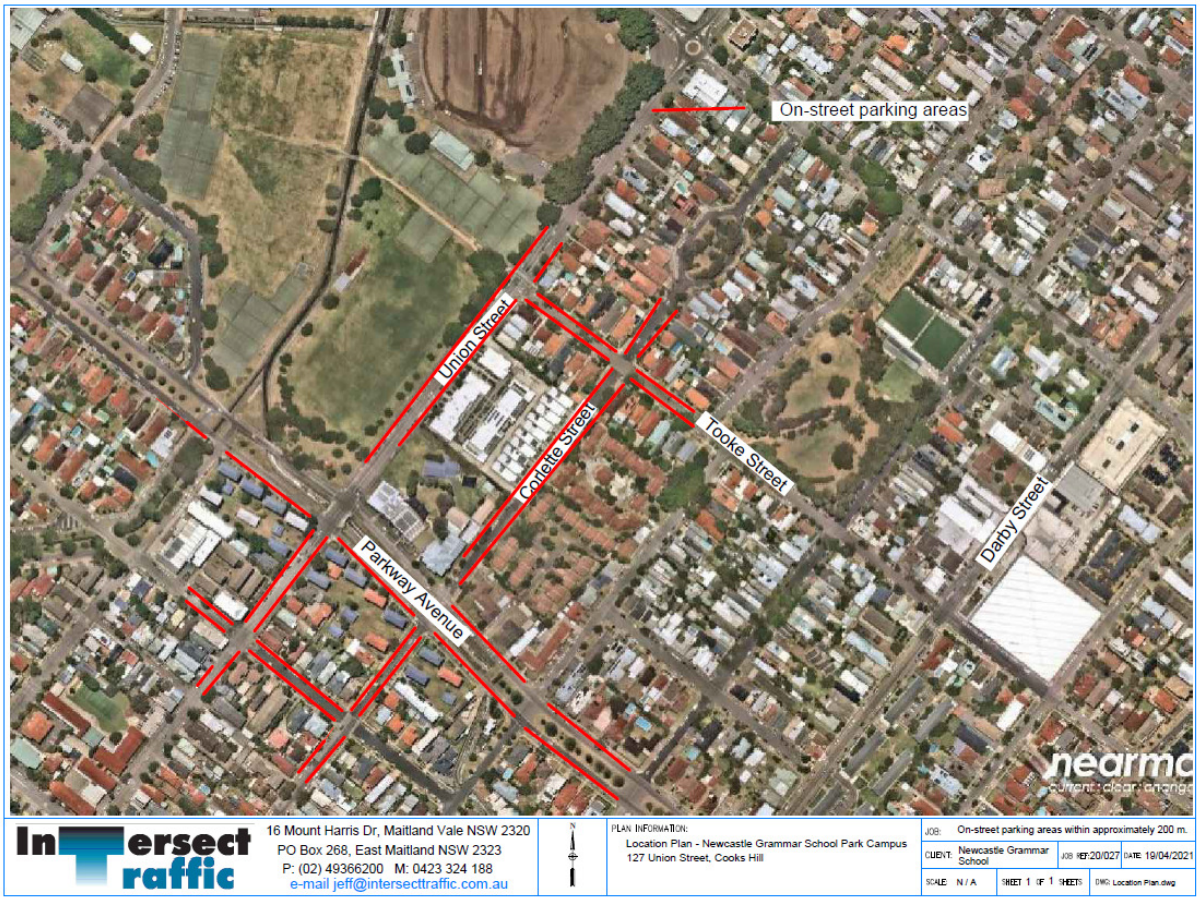


Figure 3 – Available Parking Areas – Set down & pick-up of children

3. Car Parking and Kiss and Ride

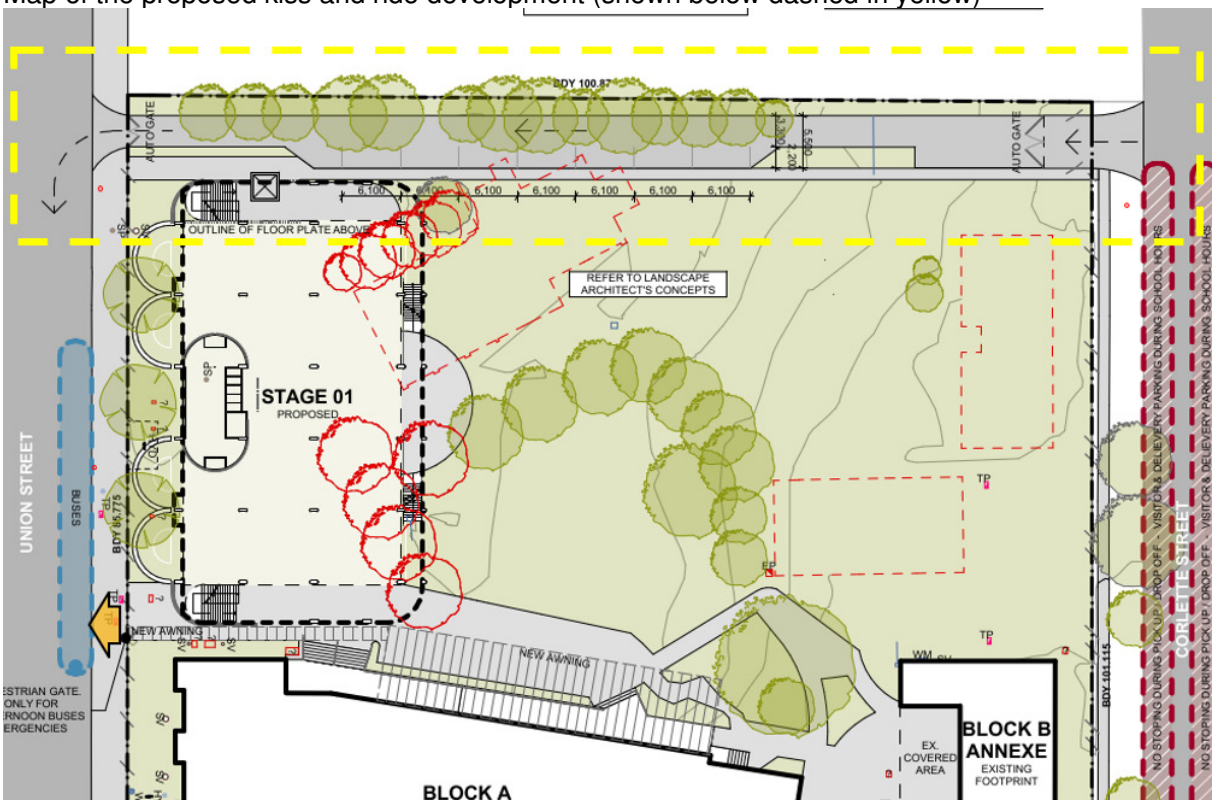
3.1 Need for the Kiss and Ride Development

With the current drop off/pick up arrangements, student drop off and pick up catalyses congestion on the surrounding streets. This creates delays not only for parents, but all road users on Union Street and Parkway Avenue.

Transport for NSW outline several advantages of implementing a kiss and ride initiative on site, these being:

- Provides a designated zone at a school access point for drivers to stop and drop off or pick up their children
- Relieves traffic congestion around the school by ensuring cars do not park illegally
- Provides adult supervision for students being dropped off and picked up from school by car
- Allows smaller children to remain secured in the car while school age children are dropped off and picked up from school
- Reinforces road safety messages and safe passenger behaviour to parents and children

Map of the proposed kiss and ride development (shown below dashed in yellow)



3.2 Rules

The kiss and ride access will operate between 7.15am – 9am in the morning and 3pm – 6pm in the afternoon. This range of hours ensures that this facility can accommodate users of the on site Before and After School Care. However Teacher Supervision will occur during peak use times, expected to be between 8 am to 9.30 am and 2.30 pm to 4.00 pm.

The rules for car parking when setting down and picking up children are;

- Do not park illegally within disabled car parking spaces,
- Do not park illegally in staff parking areas,
- Do not park illegally across local resident driveways;
- Do not park for longer than 2 minutes within the school's on-site kiss and ride facility during set-down and pick up times identified within the signposting within the facility;
- Do not park illegally contrary to parking regulation signage particularly near school pedestrian crossings;
- Do not queue on the road at the entry to the on-site school kiss and ride as this impedes traffic and is an illegal traffic manoeuvre;
- Driver must not leave vehicle, if this is not possible, staying within 3 metres of the vehicle;
- Driver must have the handbrake engaged when the vehicle is stationary;
- Do not overtake another vehicle within the kiss and ride;
- Ensure child gets in or out of the vehicle on the kerb side and that all children under the age of 13 years travel in the back seat;
- Ensure bags are ready prior to dropping off in the kiss and ride;
- Students being collected at the kiss and ride gather at the designated meeting point after school under teacher supervision;
- Students are to wait at the designated meeting area under teacher supervision;
- Students are not to play or walk around the kiss and ride zone;
- Students are instructed and reminded by teachers to watch for their collection car;
- When all cars are in position and have stopped, teachers will direct students to walk to their cars.

To facilitate the efficient use of the facility during afternoon collection, parents will be issued Visor name tags to be used on collection. These support the faster identification of family name to assist staff in having children meeting their carer's vehicle,

3.3 Setting up the initiative

To implement the initiative efficiently, Transport for NSW outline certain proforma for the school community to follow:

- Consider relevant insurance policies and child protection guidelines.
- Determine the operating times of the initiative.
- Develop a system for matching the child to the correct vehicle at pick-up times.
- Develop a roster of those adults approved by the school community to supervise students as they exit or enter a vehicle.
- Communicate details of the initiative's operation and safety procedures to drivers, students, supervising adults and the general school community

Certain types of signage are also to be enforced to create awareness and uniformity for drivers on site.

Further, the school provides staff for supervision of the kiss and ride area and undertakes regular education of staff and students as detailed in ***Section 5*** below.

4. Public Transport and Active Travel

This traffic management plan encourages the use of public transport and active travel for students to and from school. In this regard it is noted that;

- The school provides a free school bus service to and from most local areas. Details of the school bus services which are expanding each year are available from the Schools administration office. Further state funded school services are also available for travel to school with details available from Newcastle Transport (Keolis Downer).
- The school also encourages students to participate in the School Student Transport Scheme (SSTS) whereby students receive free or subsidised public transport for travel to and from School. Details are available from the school office.
- The adjoining Cooks Hill, Hamilton South and The Junction residential areas have an excellent network of pedestrian footpaths;
- The school will be providing upgraded end of trip facilities for bicycle travel with showers, amenities, lockers and secure bicycle storage facilities for staff and students; and
- The school would be willing to help any parents wishing to set up and implement walking school bus programs in the adjoining residential areas and in particular provide the services of teachers to marshal and direct groups of children walking from the school in the afternoon to designated meeting points within 100 metres of the school. More information for parents on walking school buses is available at www.walkingschoolbus.org.

More information on Public Transport and Active Travel to and from the school can be obtained by contacting the school's administration or the school principal and is contained in the staff and parent's handbooks provided each year.

The rules and procedures for public transport use are as follows;

- All school buses arrive and depart from the Parkway Avenue bus stop. Public Transport buses will utilise the Union Street bus stop adjacent to the site.
- In the morning buses arrive at the school between 8.15 am and 8.45 am and drop the children at the Parkway Avenue bus zone and children then enter the school grounds immediately via the Parkway Avenue school entry;
- Students using the public transport buses will utilise the Union Street entry to the school. In the afternoon the students will walk from the school to the appropriate Union Street bus stop accompanied by a teacher after meeting within the school at the designated meeting point;
- Children line up at the designated meeting point in the afternoon according to bus routes / numbers and are escorted to the Parkway Avenue bus zone as the buses arrive between 2.45 pm and 3.20 pm.

In regard to students walking and cycling to the school they are required to abide by the following rules;

Safety of students as they travel to and from school each day is important. It is expected that parents / carers, grandparents and family members will support the school through role modelling safe road use behaviours such as;

- Using designated footpaths or walking in areas away from the road;
- Holding the children's hand (for those up to 8 years of age) and actively supervising all children as they walk to and from school.
- Teaching children to stop, look, listen and think every time they cross the road;

- Walking with children to cross-roads (do not call children across the road);
- Crossing roads away from parked cars;
- Parking correctly in designated areas;
- Getting children in and out of the car on the footpath side;
- Using seatbelt restraints for all passengers before driving away;
- Waiting safely at bus stops and waiting until bus has gone and choosing a safe place to cross the road.

Parent / carers and family members are encouraged to walk with their child to school to reduce traffic congestion around the school, to promote physical activity and to teach children about correct road use behaviours.

There will be 3 points of entry into Newcastle Grammar School Park Campus for Kindergarten to Year 6 these are;

- Main Pedestrian access gate – Parkway Avenue – used as main entry for all students and parents and for bus arrivals and departures. This access gate is only supervised for departures.
- A pedestrian access gate on Union Street. This is access will only be used for walkers and riders as required by the school at peak times. Thie access gate is not intended to be used as a main entry to the site. and
- A pedestrian access gate on Corlette Street. This is restricted access for walkers and riders as well as for parents to use for “in-school pick up” at peak times only and only as required by the school. This access is not intended to be a main entry to the site.

Parents/carers, family members and students are expected to use the available pedestrian facilities around the school to cross the road. These include the signalised pedestrian crossings at the Union Street / Parkway Avenue intersection. Where no pedestrian crossing facilities are available parents/carers, family members and students should stop, look, listen, think before crossing the road and cross in an area away from parked cars and especially buses. Walk quickly and directly across the road.

To improve and encourage Active Travel the school commits to;

- Continuing to educate drivers who do not follow the road rules and parking restrictions around the school precinct. In this respect the local police assistance will continue to be sought.
- Encouraging students to ride or walk to school.; and
- Encourage students to use the School Student Transport Scheme (SSTS).

5. Action Plan

The following Action Plan has been developed to implement the schools Traffic Management Plan;

1. Ensure this traffic management plan is communicated to all parents and students through inclusion in all school information sessions and orientations.
2. Ensure the objectives of the plan are regularly reinforced to parents and students through information within regular school communications such as weekly or monthly newsletters and / or principal messages. This is to include details of any issues arising from the operation of the Traffic Management Plan as a means of enforcement of the plan.
3. Roster and train suitable numbers of teachers to duties such as marshalling students and parents within the kiss and ride facility within the street to ensure students are

set down or picked up in a timely and safe manner and that the 5-minute parking limit within the kiss and ride facility is strictly enforced.

4. Roster and train suitable numbers of teachers to lead and direct walking school buses from the school in the afternoon pick up period to suitable meeting points for parents within 100 metres of the school.
5. Ensure teachers undertaking marshalling and enforcement duties are suitable recognisable and provided with suitable personal protective gear. i.e. high visibility vests.
6. Should Council or the Police advise periodic enforcement of parking and driving regulations around the school is to occur the Principal is to advise the school community through a regular or special communication of this action being taken before the enforcement period commences.

6. Contacts

1. Emergency – Triple Zero (000) – Local police, ambulance and fire brigade;
2. School Principal (Mrs. Alicha Dyer) and Administration Office - (02) 49252121 or e-mail: office@ngs.nsw.edu.au.
3. Newcastle Police – (02) 4929 0999.
4. Newcastle City Council Traffic Co-ordinator – Jocelyn Cardona – (02) 497472666.
5. Newcastle Transport – 131500.
6. Walking School Buses - www.walkingschoolbus.org.

ATTACHMENT F
ITE TRAFFIC GENERATION RATES

INSTITUTE OF TRANSPORTATION ENGINEERS
COMMON TRIP GENERATION RATES (PM Peak Hour)

(Trip Generation Manual, 10th Edition)

Code	Description	Unit of Measure	Trips Per Unit	Setting/Location: General Urban/ Suburban	Setting/Location: Dense Multi-Use Urban
PORT AND TERMINAL					
30	Intermodal Truck Terminal	1,000 SF GFA	1.72		
90	Park-and-Ride Lot with Bus Service	Parking Spaces	0.43		
INDUSTRIAL					
110	General Light Industrial	1,000 SF GFA	0.63		
130	Industrial Park	1,000 SF GFA	0.40		
140	Manufacturing	1,000 SF GFA	0.67		
150	Warehousing	1,000 SF GFA	0.19		
151	Mini-Warehouse	1,000 SF GFA	0.17		
154	High-Cube Transload & Short-Term Storage Warehouse	1,000 SF GFA	0.10		
155	High-Cube Fulfillment Center Warehouse	1,000 SF GFA	1.37		
156	High-Cube Parcel Hub Warehouse	1,000 SF GFA	0.64		
157	High-Cube Cold Storage Warehouse	1,000 SF GFA	0.12		
160	Data Center	1,000 SF GFA	0.09		
170	Utilities	1,000 SF GFA	2.27		
180	Specialty Trade Contractor	1,000 SF GFA	1.97		
RESIDENTIAL					
210	Single-Family Detached Housing	Dwelling Units	0.99		
220	Multifamily Housing (Low-Rise)	Dwelling Units	0.56		
221	Multifamily Housing (Mid-Rise)	Dwelling Units	→	0.44	0.18
222	Multifamily Housing (High-Rise)	Dwelling Units	→	0.36	0.19
231	Mid-Rise Residential with 1st-Floor Commercial	Dwelling Units	0.36		
232	High-Rise Residential with 1st-Floor Commercial	Dwelling Units	0.21		
240	Mobile Home Park	Dwelling Units	0.46		
251	Senior Adult Housing - Detached	Dwelling Units	0.30		
252	Senior Adult Housing - Attached	Dwelling Units	0.26		
253	Congregate Care Facility	Dwelling Units	0.18		
254	Assisted Living	1,000 SF GFA	0.48		
255	Continuing Care Retirement Community	Units	0.16		
260	Recreation Homes	Dwelling Units	0.28		
265	Timeshare	Dwelling Units	0.63		
270	Residential Planned Unit Development	Dwelling Units	0.69		
LODGING					
310	Hotel	Rooms	0.60		
311	All Suites Hotel	Rooms	→	0.36	0.17
312	Business Hotel	Rooms	0.32		
320	Motel	Rooms	0.38		
330	Resort Hotel	Rooms	0.41		
RECREATIONAL					
411	Public Park	Acres	0.11		
416	Campground / Recreation Vehicle Park	Acres	0.98		
420	Marina	Berths	0.21		
430	Golf Course	Acres	0.28		
431	Miniature Golf Course	Holes	0.33		
432	Golf Driving Range	Tees/Driving Positions	1.25		
433	Batting Cages	Cages	2.22		
434	Rock Climbing Gym	1,000 SF GFA	1.64		
435	Multi-Purpose Recreational Facility	1,000 SF GFA	3.58		
436	Trampoline Park	1,000 SF GFA	1.50		
437	Bowling Alley	1,000 SF GFA	1.16		
440	Adult Cabaret	1,000 SF GFA	2.93		
444	Movie Theater	1,000 SF GFA	6.17		
445	Multiplex Movie Theater	1,000 SF GFA	4.91		
452	Horse Racetrack	Seats	0.06		
454	Dog Racetrack	Attendees	0.15		
460	Arena	1,000 SF GFA	0.47		
462	Professional Baseball Stadium	Attendees	0.15		
465	Ice Skating Rink	1,000 SF GFA	1.33		
466	Snow Ski Area	Slopes	26.00		
473	Casino/Video Lottery Establishment	1,000 SF GFA	13.49		
480	Amusement Park	Acres	3.95		
482	Water Slide Park	Parking Spaces	0.28		
488	Soccer Complex	Fields	16.43		
490	Tennis Courts	Courts	4.21		
491	Racquet/Tennis Club	Courts	3.82		
492	Health/Fitness Club	1,000 SF GFA	3.45		
493	Athletic Club	1,000 SF GFA	6.29		
495	Recreational Community Center	1,000 SF GFA	2.31		
INSTITUTIONAL					
520	Elementary School	1,000 SF GFA	1.37		
522	Middle School / Junior High School	1,000 SF GFA	1.19		
530	High School	1,000 SF GFA	0.97		
534	Private School (K-8)	Students	0.26		
536	Private School (K-12)	Students	0.17		
537	Charter Elementary School	Students	0.14		
538	School District Office	1,000 SF GFA	2.04		
540	Junior / Community College	1,000 SF GFA	1.86		
550	University/College	1,000 SF GFA	1.17		
560	Church	1,000 SF GFA	0.49		
561	Synagogue	1,000 SF GFA	2.92		
562	Mosque	1,000 SF GFA	4.22		
565	Daycare Center	1,000 SF GFA	11.12		
566	Cemetery	Acres	0.46		
571	Prison	1,000 SF GFA	2.91		
575	Fire and Rescue Station	1,000 SF GFA	0.48		
580	Museum	1,000 SF GFA	0.18		
590	Library	1,000 SF GFA	8.16		

ATTACHMENT G
CONCEPT CONSTRUCTION TRAFFIC AND PEDESTRIAN MANAGEMENT PLAN.

CONCEPT CONSTRUCTION TRAFFIC & PEDESTRIAN MANAGEMENT PLAN

NEWCASTLE GRAMMAR SCHOOL – PARK CAMPUS

127 UNION STREET, COOKS HILL

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INTRODUCTION

This document provides concept details of the management of traffic and pedestrian movements to be implemented during construction of the proposed additions to the Newcastle Grammar School – Park Campus. The project generally involves the site preparation including demolition of existing structures and construction of 2 new school buildings, associated car parking and landscaping.

- Site establishment
- Demolition of existing buildings
- Installation of driveway crossings and construction of 'Kiss and Ride' laneway.
- Earthworks
- Reinforced concrete pits and slabs
- Brickwork
- Metal roofing
- Storm water and civil drainage
- Pavement & landscaping
- Electrical installations
- Framing, linings
- Internal and external finishes

The plan covers the following areas:

- Ingress and egress of vehicles to the site.
- Details on loading and unloading zones.
- Onsite parking measures during construction.
- Pedestrian management strategies.

Normal working hours should be between the following:

1. Between 7:00 am and 6:00 pm, Mondays to Fridays inclusive;
2. 8:00 am and 1:00 pm, Saturdays,
3. No work on Sundays, public holidays or on a Saturday or Sunday adjacent to a public holiday.

If works are required to be undertaken outside these hours approval will be obtained from the Project Manager prior to the carrying out of the works.

The intention is to where possible undertake a large portion of the construction works either within the 7 week end of year school break (December / January) or the 3 week mid-year school break (June / July) to minimise the impact of the construction works on the operation of the school.

This plan seeks to have Newcastle City Council's Traffic Committee approve Construction Zones on Union Street along the school frontage (Parkway Avenue to a point 90 metres north of Parkway Avenue) for Stage 1 construction works and on Corlette Street along the school frontage (Parkway Avenue to a point 90 metres north of Parkway Avenue) for Stage 2 construction works. The Union Street construction zone will require the temporary relocation of a bus stop located within this zone to a point 90 metres north of the existing bus stop.

INGRESS AND EGRESS OF VEHICLES TO THE SITE

The factors that have been considered in preparing this Construction Traffic Management Plan are:*

- The work site has direct frontage to local roads (Union Street, Parkway Avenue and Corlette Street).
- There will be limited on site car parking provided.
- All deliveries and workers will approach the site via Union Street and Parkway Avenue.

The builder will employ the use of a professional traffic control crew when there will be impacts on the local traffic and pedestrian flow. As part of the pre-works setup, the professional traffic crew will develop and implement a traffic management plan specific to the task at hand, based on the parameters of the Construction Traffic Management Plan adopted in this document and approval from the relevant authorities.

DETAILS OF LOADING AND UNLOADING ZONES

Union Street will be the primary access for deliveries, loading and unloading, and heavy logistics associated with the construction work for Stage 1 while the primary access for Stage 2 will be Corlette Street. Wherever possible all loading / unloading will occur onsite via a temporary construction access via Corlette Street. Any loading / unloading on Union Street and Corlette Street will be carried out within an approved Construction Zone and under traffic control in non-peak traffic hours (before 8 am and between 9 am & 3 pm).

No unloading / loading will occur in Parkway Avenue in the vicinity of the school's bus set down and drop off zones and the major pedestrian access points to the school. No amendments are required to the school bus zones as a result of construction.

PEDESTRIAN TRAFFIC MANAGEMENT METHODS

Construction may interfere with pedestrian movements along the school frontage in Union Street (Stage 1) and Corlette Street (Stage 2) during loading and unloading of deliveries and waste within an approved Construction Zone. However with deliveries restricted to before 8 am and between 9 am and 3 pm the peak pedestrian traffic periods are avoided and the impact of the construction on pedestrian movements is minimised.

At all times however traffic marshals will monitor and restrict pedestrian movements through the construction zone when necessary to ensure the safety of pedestrians. The marshal's will guide pedestrians safely through or around the construction zone. Where necessary pedestrians will be protected by fencing or concrete barriers with a safe travel route identified with hi-vis bunting. Prior to commencement of construction a pedestrian movement management plan will be prepared by the building contractor for each stage of the works and implemented during construction.

The construction site itself will be suitable fenced off to prohibit unauthorised pedestrians from the road or within the school accessing the construction site.

PARKING MEASURES DURING CONSTRUCTION

The site is restricted in terms of area due to the requirement that the school still needs to operate during construction and there will be limited parking available on-site and within an approved construction zone in Union Street or Corlette Street. Only essential employee vehicles will be allowed to park in these areas i.e. tradesmen vehicles carrying tools and / or product. Non-essential employee vehicles will be required to park in the northern end of the Bar Beach public car park approximately 850 metres east of the construction site. Construction employees will be shuttled between the site and car park using available essential construction vehicles allowed to park within the construction zone. Site induction documentation will alert all construction employees and contractors of the parking restrictions to minimise the impact of construction on Union Street and Corlette Street residents.

TRAFFIC CONTROL SIGNS

During construction Parkway Avenue, Union Street and Corlette Street will be subject to construction traffic impacts and as such reduced daylight hours speed zones should be in place along the school frontage during construction. This will be included in a construction zone application to Newcastle City Council's traffic committee prior to commencement of construction activities on the site. Advance warning signs on Union Street, Corlette Street and Parkway Avenue will be required in accordance with a traffic control plan prepared for the building contractor as part of Construction Certificate documentation and implemented prior to the start of any construction works. Suitably accredited traffic marshals from professional Traffic Control companies will be employed to install and maintain the signage as well as monitor and control vehicle and pedestrian traffic through the construction zones during construction.