



Grey House Precinct Transport Impact Assessment

PREPARED FOR PYMBLE LADIES' COLLEGE | FEBRUARY 2022

We design with community in mind



Revision Schedule

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Table of Contents

1.0	INTRODUCTION.....	1
1.1	BACKGROUND.....	1
1.2	LOCAL CONTEXT.....	1
1.3	SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS (SEAR).....	2
1.4	AIM OF THIS TRANSPORT IMPACT ASSESSMENT.....	4
2.0	RESPONSE TO COMMENTS ON SSDA.....	5
3.0	PYMBLE LADIES' COLLEGE	6
3.1	EXISTING USE AND POPULATION	6
3.2	EXISTING ACCESSES	6
3.3	COMMUNITY USES OF THE COLLEGE	9
4.0	PROPOSED DEVELOPMENT	10
5.0	EXISTING ROAD NETWORK.....	11
5.1	SURROUNDING ROAD CHARACTERISTICS	11
5.2	CRASH HISTORY	11
6.0	EXISTING PARKING CONDITIONS	13
6.1	ON-SITE PARKING.....	13
6.2	ON-STREET PARKING.....	13
7.0	EXISTING DROP-OFF & PICK-UP	15
8.0	EXISTING SUSTAINABLE TRANSPORT NETWORK	18
8.1	TRAIN	18
8.2	BUS.....	19
8.2.1	Private Bus Services	19
8.2.2	Public Bus Services	20
8.3	PEDESTRIAN INFRASTRUCTURE	21
8.4	CYCLING INFRASTRUCTURE.....	21
9.0	POST-DEVELOPMENT PARKING IMPACT.....	23
9.1	PARKING REQUIREMENT	23
9.2	PROPOSED PARKING PROVISION.....	23
9.3	PROPOSED ACCESS	24
9.4	OVERALL PARKING IMPACT.....	24
10.0	POST-DEVELOPMENT TRAFFIC IMPACT.....	25
10.1	TRAFFIC GENERATION.....	25
10.2	TRAFFIC DISTRIBUTION	26
10.3	SIDRA ASSESSMENT	27
10.3.1	Scenario 1 – Base case	28
10.3.2	Scenario 2 – Post-development	28
10.3.3	10-Year Horizon	29
10.4	OVERALL TRAFFIC IMPACT	29



11.0	RECOMMENDATIONS TO REDUCE IMPACT ON PYMBLE AVENUE	30
12.0	GREEN TRAVEL PLAN.....	31
13.0	PRELIMINARY OPERATIONAL TRANSPORT & ACCESS MANAGEMENT PLAN	32
14.0	PRELIMINARY CONSTRUCTION TRAFFIC AND PEDESTRIAN MANAGEMENT PLAN.....	33
15.0	CONCLUSION	34

LIST OF TABLES

Table 1: Surrounding road characteristics	11
Table 2: Existing on-site parking supply	13
Table 3: On-street parking summary	13
Table 4: ELC Parking Requirements	23
Table 5: Development Traffic Generation.....	25
Table 6: Reduced Development Traffic Generation.....	25
Table 7: Approach routes to PLC	26
Table 8: Departure routes from PLC	27
Table 9: Scenario 1 SIDRA Results	28
Table 10: Scenario 2 SIDRA Results	28

LIST OF FIGURES

Figure 1: GHP location (Source: BVN 2021)	1
Figure 2: Local Context (Source: ePlanning Spatial Viewer)	1
Figure 3: Surrounding features (Source: SIX Maps 2021)	2
Figure 4: Existing College Access	6
Figure 5: Gate 1 (Source: Google Maps).....	7
Figure 6: Gate 2 (Source: Google Maps).....	7
Figure 7: Gate 3 (Source: Google Maps).....	8
Figure 8: Main pedestrian access (Source: Google Maps)	8
Figure 9: Grey House Walk (Source: Google Maps).....	9
Figure 10: Crashes on surrounding roads (Source: TfNSW Centre for Road Safety)	12
Figure 11: Existing drop-off and pick-up arrangement.....	15
Figure 12: Drop-off and pick-up queue around frontage oval.....	16
Figure 13: Kindergarten drop-off and pick-up queue	16
Figure 14: On-site bus zones	17
Figure 15: Walking distance to Pymble Train Station (Source: Google Maps).....	18
Figure 16: Sydney train network (Source: TfNSW).....	18
Figure 17: PLC bus routes	19
Figure 18: Route 575 (Source: TfNSW).....	20
Figure 19: Route 579 (Source: TfNSW).....	20
Figure 20: Pedestrian access locations.....	21
Figure 21: Surrounding cycle network (Source: TfNSW Cycleway Finder)	22
Figure 22: Distribution for Arrival	26
Figure 23: Distribution for Departure	27



LIST OF APPENDICES

APPENDIX A	ARCHITECTURAL PLANS.....	A.1
APPENDIX B	STAFF SURVEY RESULTS - ELC	B.2
APPENDIX C	ON-SITE PARKING LOCATIONS	C.3
APPENDIX D	GUIDELINES FOR EVALUATION OF INTERSECTION CAPACITY	D.4
APPENDIX E	TFNSW CONSULTATION	E.5
APPENDIX F	2012 TRAFFIC COUNTS.....	F.6
APPENDIX G	SCENARIO 1 SIDRA RESULTS.....	G.7
APPENDIX H	SCENARIO 2 SIDRA RESULTS.....	H.8
APPENDIX I	RESPONSE TO DPIE COMMENTS	I.9
APPENDIX J	RESPONSE TO COUNCIL COMMENTS.....	J.10



1.0 INTRODUCTION

1.1 BACKGROUND

Stantec has been engaged by Pymble Ladies' College (PLC), herein referred to as 'the College', to prepare a Transport Impact Assessment (TIA) for a proposed development of new learning spaces as part of the Grey House Precinct (GHP) within the College grounds.

The location of the GHP in relation to the overall College is shown in Figure 1.



Figure 1: GHP location (Source: BVN 2021)

1.2 LOCAL CONTEXT

The site is located in the Ku-ring-gai Local Government Area (LGA) and the surrounding land uses are predominantly low density residential, as shown in Figure 2.

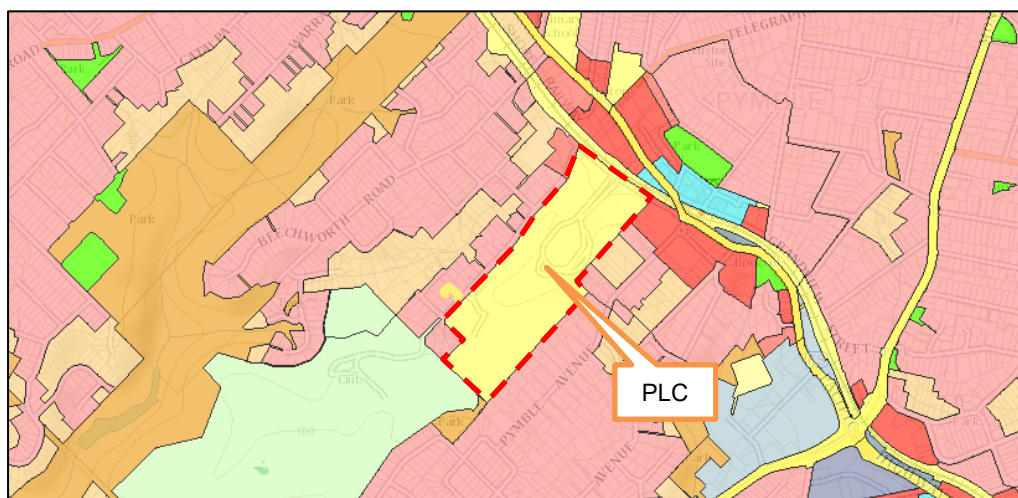


Figure 2: Local Context (Source: ePlanning Spatial Viewer)

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The following key features of the surrounds are as follows:

- Pymble Train Station is located approximately 350m walking distance to the south-east;
- Pymble Town Centre is located approximately 400m walking distance to the east; and
- Avondale Golf Course is located approximately 500m walking distance to the south-west.

This is shown in Figure 3.

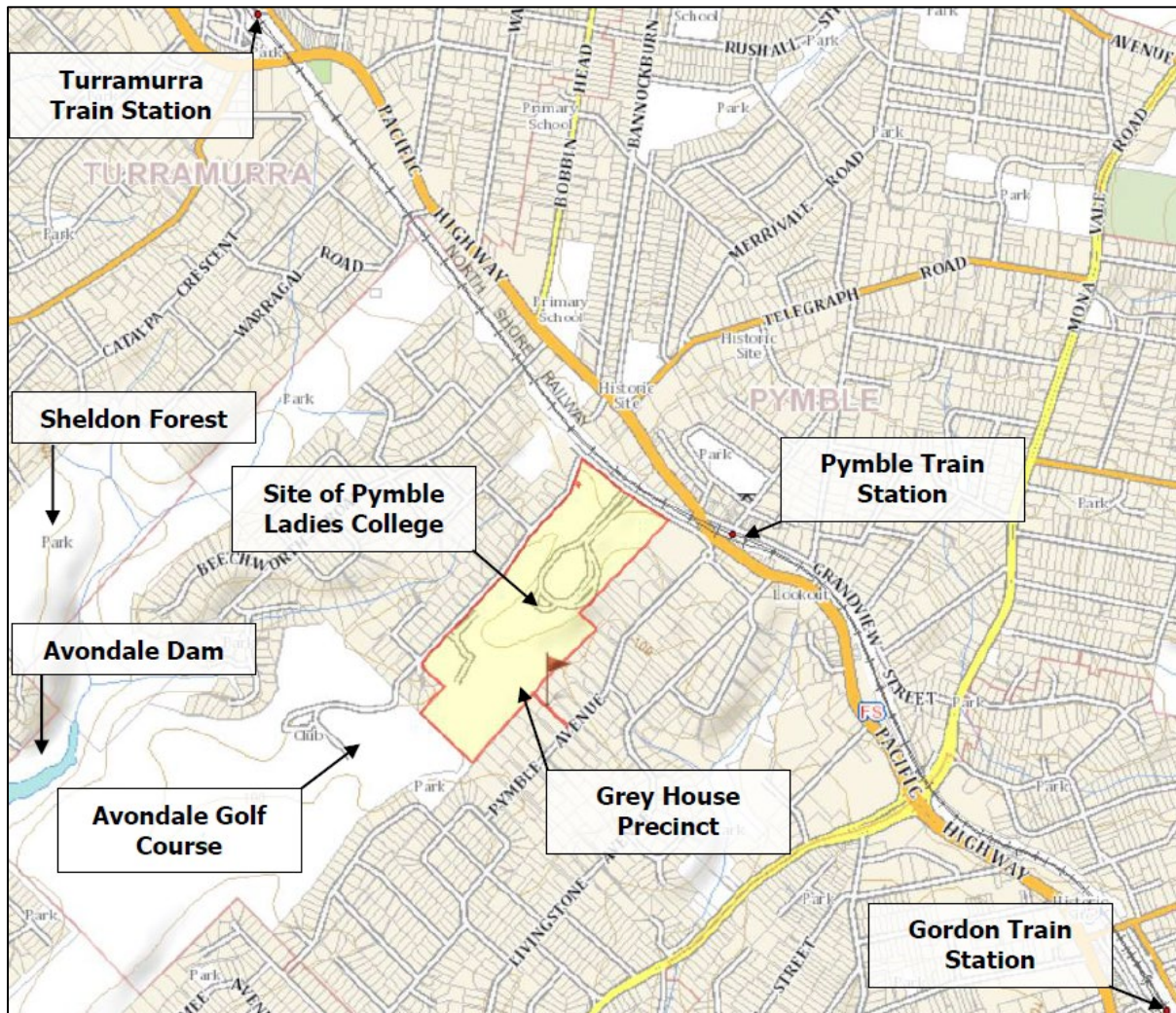


Figure 3: Surrounding features (Source: SIX Maps 2021)

1.3 SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS (SEAR)

This TIA has been prepared in response to the Secretary's Environmental Assessment Requirements (SEARs) issued for this State Significant Development Application (SSDA-17424905), dated 17 May 2021. The requirements pertaining to this TIA are repeated below:

Provide a transport and accessibility impact assessment, which includes, but is not limited to the following:

- *Analysis of the existing transport network to at least the existing or proposed enrolment boundary, including:*
 - *Road hierarchy*
 - *Pedestrian, cycle and public transport infrastructure*



**PYMBLE LADIES' COLLEGE – GREY HOUSE PRECINCT
TRANSPORT IMPACT ASSESSMENT**

- *Details of current daily and peak hour vehicle movements based on traffic surveys and/ or existing traffic studies relevant to the locality*
- *Existing transport operation for 1hr before and after (existing or proposed) bell times such as span of service, frequency for public transport and school buses, pedestrian phasing for signals*
- *Existing performance levels of nearby intersections utilising appropriate traffic modelling methods (such as SIDRA network modelling).*
- *Details of the proposed development, including:*
 - *A map of the proposed access which identifies public roads, bus routes, footpaths and cycleways.*
 - *Pedestrian site access and vehicular access arrangements, including for service and emergency vehicles and loading/unloading, including swept path analysis demonstrating the largest design vehicle entering and leaving the site and moving in each direction through intersections along the proposed transport routes*
 - *Car and motorcycle parking, bicycle parking and end-of-trip facilities*
 - *Drop-off/ pick-up zone(s) and arrival/departure bus bay(s)*
 - *Pedestrian, public transport or road infrastructure improvements or safety measures*
- *Analysis of the impacts due to the operation of the proposed development, including:*
 - *Proposed modal split for all users of the development including vehicle, pedestrian, bicycle riders, public transport, school buses and other sustainable travel modes*
 - *Estimate total daily and peak hour vehicular trip generation*
 - *A clear explanation and justification of the:*
 - *Assumed growth rate applied*
 - *Volume and distribution of proposed trips to be generated*
 - *Type and frequency of design vehicles accessing the site:*
 - *An assessment of the forecast impacts on traffic volume generated on road safety and capacity of road network including consideration of cumulative traffic impacts at key intersections using SIDRA or similar traffic model as prescribed by TfNSW. The traffic modelling should consider the ultimate development year plus 10 year growth of at least the following intersections (but not limited to): Pacific Highway/ Livingstone Avenue and Pacific Highway/ Beechwood Road.*
 - *Details of performance of nearby intersections and/ or level crossings with the additional traffic generated by the development both at the commencement of operation and in a 10-year time period (using SIDRA network modelling).*
 - *Cumulative traffic impacts from any surrounding approved development(s).*
 - *Adequacy of pedestrian, bicycle and public transport infrastructure and operations to accommodate the development.*
 - *Adequacy of car and motorcycle parking and bicycle parking provisions when assessed against the relevant car/ bicycle parking codes and standards.*
 - *Adequacy of the drop-off/ pick-up zone(s) and bus bay(s), including assessment of any related queuing during peak-hour access.*
 - *Adequacy of the existing/ proposed pedestrian infrastructure to enable convenient and safe access to and from the site for all users*
- *Measures to ameliorate any adverse traffic and transport impacts due to the development based on the above analysis, including:*



- *Travel demand management programs to increase sustainable transport (such as a Green Travel Plan/ School Travel Plan)*
- *Arrangements for the Travel Coordinator roles*
- *Governance arrangements or relationships with state and local government transport providers to update roads safety*
- *Infrastructure improvements or protection measures, including details of timing and method of delivery*
- *A preliminary school transport plan detailing a operational traffic and access management plan for the site, pedestrian entries, the drop-off/ pick-up zone(s) and bus bay(s)*
- *Analysis of the impacts of the traffic generated during construction of the proposed development, including:*
 - *Construction vehicle routes, types and volumes*
 - *Construction program (duration and milestones)*
 - *On-site car parking and access arrangements for construction, emergency and construction worker vehicles*
 - *Cumulative impacts associated with other construction activities in the locality (if any)*
 - *Road safety at identified intersections and level crossings near the site due to the conflicts between construction vehicles and existing traffic in the locality*
 - *Measures to mitigate impacts, including to ensure the safety of pedestrian and cyclists during construction*
- *Analysis of the impacts of construction works on the adjoining rail corridor prepared in consultation with the relevant rail infrastructure authority*
- *A preliminary Construction Traffic and Pedestrian Management Plan*

1.4 AIM OF THIS TRANSPORT IMPACT ASSESSMENT

The primary objectives of this Transport Impact Assessment (TIA) are as follows:

- Ensure the safety of students, parents and staff during the College's hours of operation;
- Ensure that surrounding road users are aware of any proposed changed traffic conditions and that risks are identified and mitigated; and
- Ensure that the impact on the local road network can be minimised through efficient and safe management.



2.0 RESPONSE TO COMMENTS ON SSDA

The Department of Planning Industry & Environment (DPIE) provided comments on the SSDA in a letter to the College dated 13 December 2021. This also included Ku-ring-gai Council's comments addressed to DPIE in a letter dated 6 December 2021.

Stantec's response to these comments are provided in Appendix I and Appendix J.



3.0 PYMBLE LADIES' COLLEGE

3.1 EXISTING USE AND POPULATION

The College is a non-selective, independent school for girls from Kindergarten to Year 12, with Boarding available from Year 7.

The College currently accommodates a population of 2,259 students, 120 boarders and 400 staff.

The standard operating hours of the College are 7:30am to 5:30pm Monday to Friday, and standard teaching hours are 8:15am to 3:20pm Monday to Friday.

Co-curricular activities within the College grounds take place between 6:30am to 8:00am and 3:00pm to 6:30pm Monday to Friday and 7:00am – 12:00pm Saturdays, with no activities on Sundays. Examples of co-curricular activities include band, instrument lessons, choir, drama, art, robotics, dance, rowing, tennis, athletics, swimming, diving, gymnastics, and over 50 choices of activities in addition to seasonal sports including hockey, netball, basketball, rugby and soccer.

Boarding occurs on a 24/7 basis.

3.2 EXISTING ACCESSSES

General vehicle, bus, service vehicle and emergency vehicle access is via Gates 1 (Marden Gates), 2 and 3, as shown in Figure 4 and the street view imagery shown in Figure 5 to Figure 7.

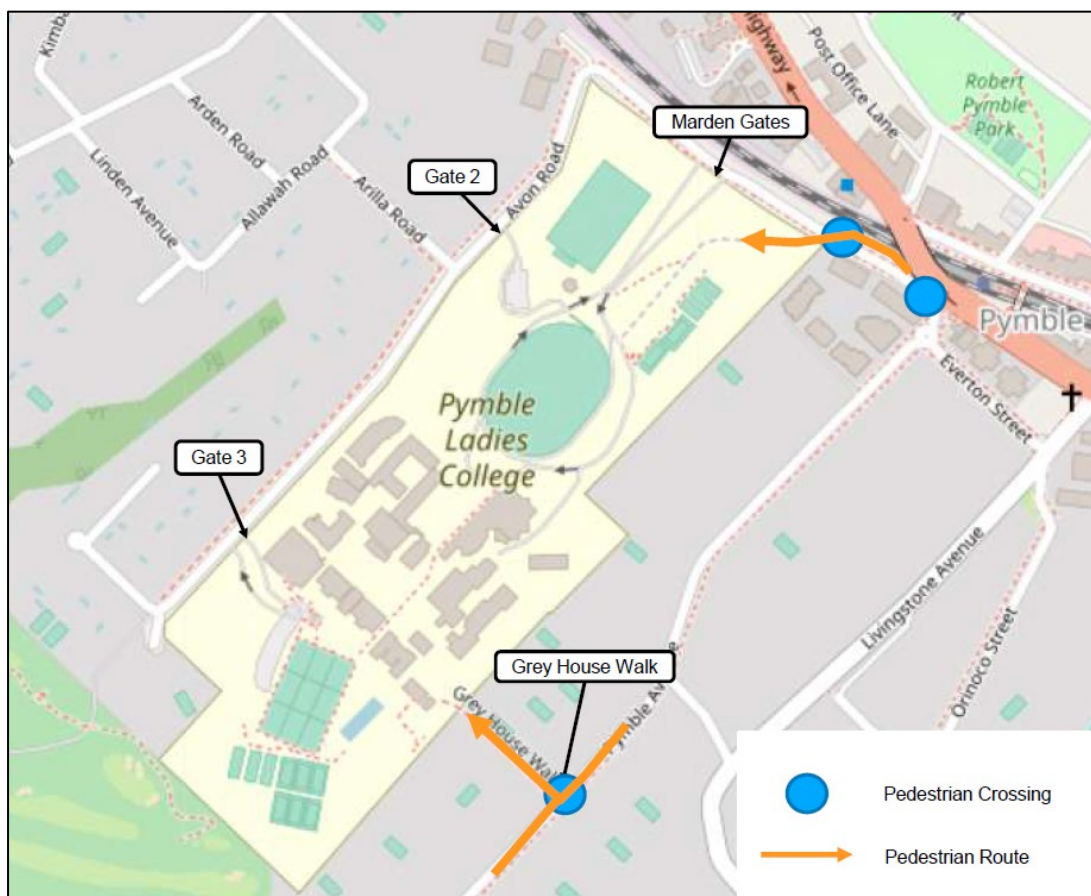


Figure 4: Existing College Access

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TRANSPORT IMPACT ASSESSMENT**



Figure 5: Gate 1 (Source: Google Maps)

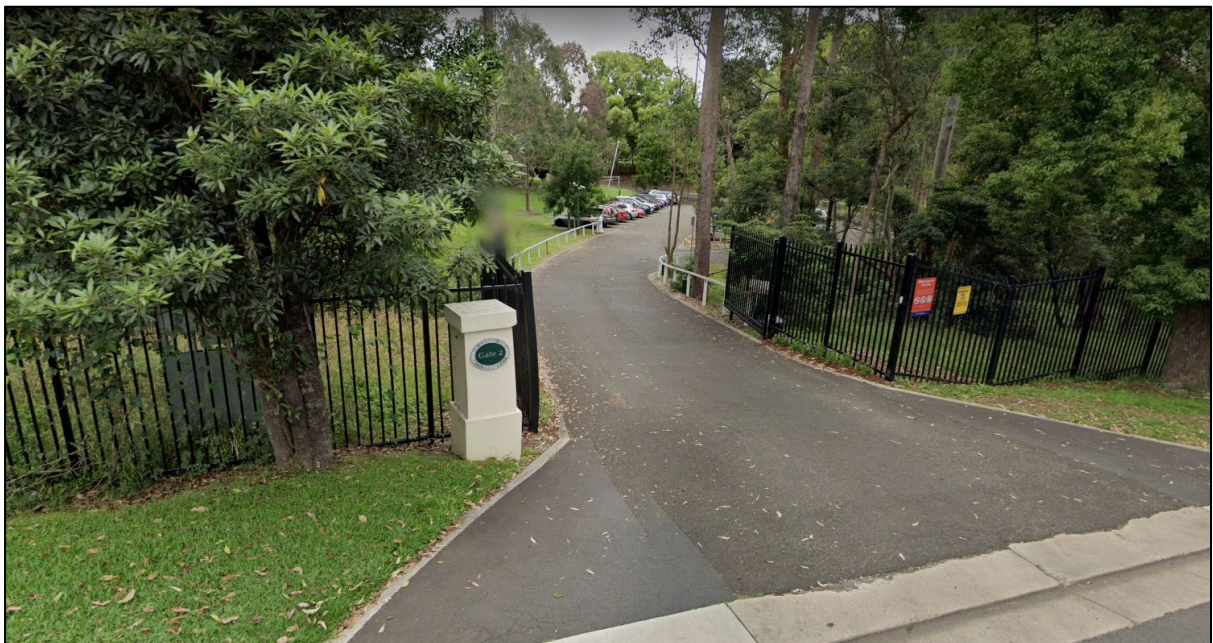


Figure 6: Gate 2 (Source: Google Maps)



Figure 7: Gate 3 (Source: Google Maps)

Pedestrian access is through the main pedestrian entry along Avon Road, adjacent to Gate 1 (Marden Gates). This access is directly off the raised pedestrian crossing along Avon Road, as shown in Figure 8, and provides connection between the College and the pedestrian tunnel leading to Pymble Train Station.



Figure 8: Main pedestrian access (Source: Google Maps)

A pedestrian access, called the Grey House Walk, is also provided along Pymble Avenue which is located between 57 and 59 Pymble Avenue. This pathway is also directly off a raised pedestrian crossing.





Figure 9: Grey House Walk (Source: Google Maps)

3.3 COMMUNITY USES OF THE COLLEGE

As well as providing academic and co-curricular activities for students and boarders, the College includes facilities and services that are accessible to the broader community. These include the following:

- Swimming centre, including swimming carnivals for other local school, learn-to-swim for the broader community, and water polo competitions;
- Sports facilities for local sports groups, including the gymnasium for indoor netball and basketball;
- Sports fields;
- Chapel, for special services;
- Theatre, extended to the local community for events; and
- The College also serves as a host venue for a number of interschool competitions such as debating.

4.0 PROPOSED DEVELOPMENT

The proposal includes the redevelopment of the GHP within the grounds of the established College. The GHP is proposed to incorporate the following:

- Junior School classrooms (Years 5 and 6)
- Science, Technology Engineering and Mathematics (STEM) labs;
- Health and wellbeing facilities (consulting rooms and wards);
- Dance academy;
- Out of School Hours Care (OSHC) facilities;
- Early Learning Centre (ELC); and
- Outdoor learning spaces.

The architectural plans can be seen in Appendix A.

The proposed development would replace existing temporary (demountable) teaching spaces, providing a better environment for both students and teachers.

The facilities will primarily be utilised by the **existing** students and staff, however, the intention would be for the ELC to be available for enrolment by the broader community. The dance academy and the OSHC holiday care program will also be available for use by the broader community.

This SSDA is not seeking to increase the existing student or staff numbers for Kindergarten to Year 12.

The proposed ELC will, however, accommodate a new pre-Kindergarten stream with capacity for 90 children. The OSHC size will also increase by a further 30 places (from 120 to 150 places), but these new places would be used during the school holiday period and will not increase enrolments.

The intention of the ELC is to provide a pre-Kindergarten stream of children who will ultimately proceed onto joining the Kindergarten stream and continue as students at the College. The primary objective of the ELC stemmed from the College's desire to provide an early learning/child care service for its staff members, particularly for those who would find it difficult to return to work after maternity/ parental leave. A staff survey was undertaken by the College in June 2021 to collect data on the staff's desire for an ELC. The results are summarised as follows:

- 32 staff members would enroll their children in the ELC, if available, with a further 42 staff members who would consider enrolling their children; and
- 64 staff members have indicated that an ELC on campus, would make it easier for them to return to work after maternity/ parental leave.

Detailed survey results can be seen in Appendix B.



5.0 EXISTING ROAD NETWORK

5.1 SURROUNDING ROAD CHARACTERISTICS

The following table summarises the characteristics of the roads surrounding the College.

Table 1: Surrounding road characteristics

Road Name	Speed Limit	Lanes	Road Type	Road Authority
Avon Road	<ul style="list-style-type: none"> 40km/h (school zone speed limit) 50m/h 	1 lane in each direction	Local	Ku-ring-gai Council
Pymble Avenue	<ul style="list-style-type: none"> 40km/h (school zone speed limit) 50km/h 	1 lane in each direction	Local	Ku-ring-gai Council
Everton Street	<ul style="list-style-type: none"> 40km/h (school zone speed limit) 50m/h 	1 lane in each direction	Local	Ku-ring-gai Council
Livingston Avenue (between Pacific Highway & Everton Street)	<ul style="list-style-type: none"> 50km/h 	2 lanes in each direction	Local	Ku-ring-gai Council
Beechworth Road (between Pacific Highway & Mayfield Avenue)	<ul style="list-style-type: none"> 50km/h 	1 lane in each direction	Local	Ku-ring-gai Council
Pacific Highway (between Livingston Avenue & Beechworth Road)	<ul style="list-style-type: none"> 60km/h 	2-3 lanes in each direction	State	TfNSW

5.2 CRASH HISTORY

Transport for New South Wales (TfNSW) Centre for Road Safety provides a database which records crashes for the most recent five-year period of available data (i.e. 2015 to 2019). Crash statistics are confined to crashes that conform to the national guidelines for reporting and classifying road vehicle crashes. The guidelines include crashes that meet the following criteria:

- Were reported to the police;
- Occurred on a road open to the general public;
- Involved at least one moving road vehicle; and
- Involved at least one person being injured, killed or at least one motor vehicle being towed away.

Figure 10 overleaf, shows the locations of the crashes that meet the above criteria.



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TRANSPORT IMPACT ASSESSMENT**

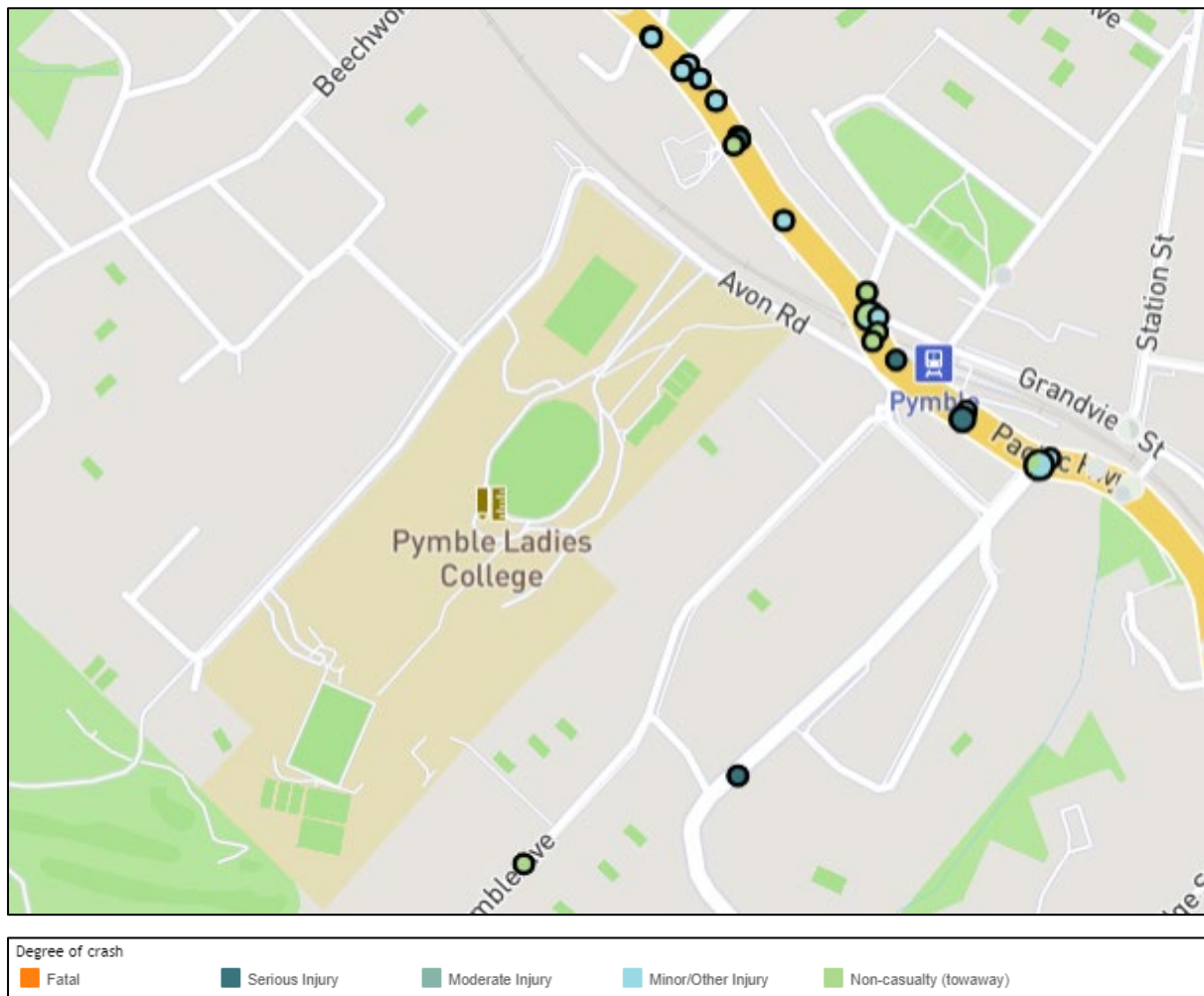


Figure 10: Crashes on surrounding roads (Source: TfNSW Centre for Road Safety)

A total of 48 crashes have been recorded along Pacific Highway between Livingston Avenue and Telegraph Road:

- No fatal crashes recorded;
- 13 crashes resulted in moderate to serious injuries;
- 2 crashes involved pedestrians; and
- Majority of crash types were 'same direction', with rear ending being the common cause of crashes.

A crash was identified along Pymble Avenue, near the entry into Grey House Walk. This crash occurred in 2019 and involved a vehicle veering off to the side of the road and crashing into an object or parked car. The crash did not result in injuries or casualties. The crash occurred in hours of darkness and there are no indications suggesting that the crash involved students or staff from the College.

6.0 EXISTING PARKING CONDITIONS

6.1 ON-SITE PARKING

Arup was engaged by the College in 2019 to prepare a Traffic, Transport and Parking Assessment Report to inform the new master plan for the College, and as part of the assessment undertook a parking audit of the site to verify the survey numbers reported by the College. The audit indicated that the College currently provides a total of 548 on-site parking spaces, distributed throughout the College grounds. These parking spaces are available for staff, visitors, contractors, and visitors attending the swim school. The College does not allow students to park within the College grounds. The breakdown is summarised in Table 2.

Table 2: Existing on-site parking supply

Category	No. of Spaces
Staff	255
Shared Visitor/Staff	239
Contractor	8
Accessible	8
Swim School	38
TOTAL	548*

** This includes 45 informal parking spaces in the area called 'Under the Pines' which does not meet the requirements of the Australian Standards.*

The College also provides an additional four (4) parking spaces for its private buses.

An indicative location of all on-site parking spaces can be seen in Appendix C.

6.2 ON-STREET PARKING

Table 3 summarises the parking controls that currently apply to roads around the College.

Table 3: On-street parking summary

Road Name	Parking
Avon Road along Gate 1	No Stopping Unrestricted Parking
Avon Road along Gate 2 & 3	No Stopping 8:00am-6:00pm School Days No Parking 8:00am-6:00pm School Days Unrestricted Parking
Pymble Avenue	No Parking 6:30am-9:30am School Days No Stopping 7:00-9:30am & 2:30-4:00pm School Days Unrestricted Parking



**PYMBLE LADIES' COLLEGE – GREY HOUSE PRECINCT
TRANSPORT IMPACT ASSESSMENT**

Road Name	Parking
Everton Street	No Stopping No Parking
Livingston Avenue (between Pacific Highway & Everton Street)	No Stopping 6:00am-9:00am 2P 9:00am-6:00pm Mon-Fri & 8:30am-12:30pm Sat



7.0 EXISTING DROP-OFF & PICK-UP

The majority of drop-off and pick-up activities occur within the College grounds, as shown in Figure 11.



Figure 11: Existing drop-off and pick-up arrangement

The majority of on-site drop-off and pick-ups occur via Gate 1 (Marden Gates) as shown in the figure above. Vehicles will queue along the internal roadway and make their way around the frontage oval and back out onto Avon Road through Gate 1. This is shown in Figure 12 overleaf.



Figure 12: Drop-off and pick-up queue around frontage oval

Vehicles dropping off or picking up kindergartens also enter via Gate 1, but veer off to the left, as shown in Figure 11 to a dedicated drop-off and pick-up zone for kindergartens (see Figure 13). These vehicles later join back up with the main traffic stream and make their way around the frontage oval and back towards Gate 1.



Figure 13: Kindergarten drop-off and pick-up queue

Some on-site drop-off and pick-up also occur via Gate 3 as shown in Figure 11.

PLC private bus drop-off and pick-up also occur on-site, with buses entering via Gate 2 and exiting onto Avon Road via Gate 1. Dedicated bus zones are provided on-site as shown in Figure 14.



Figure 14: On-site bus zones

Some drop-off and pick-up also occurs outside of College grounds, within the surrounding streets such as Avon Road and Pymble Avenue.

It is also noted that drop-off and pick-ups also occur on the other side of the rail line, near Pymble Train Station, in dedicated 'kiss and drop' car spaces. This allows reduction of College traffic in the immediate surrounding road network.

As aforementioned, the SSDA does not seek to change the existing operations of the College and will not alter the current drop-off and pick-up arrangements.

8.0 EXISTING SUSTAINABLE TRANSPORT NETWORK

8.1 TRAIN

Pymble Train Station is located approximately 350m walking distance from the front gates along Avon Road, as seen in Figure 15.

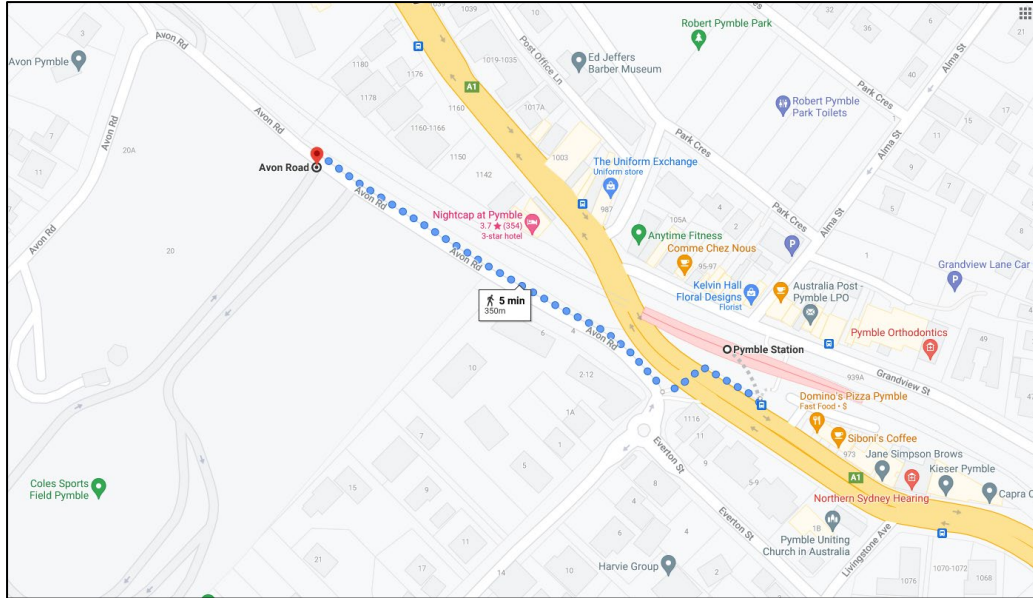


Figure 15: Walking distance to Pymble Train Station (Source: Google Maps)

This station is located on the T1 North Shore, Northern & Western Line which provides connection to Hornsby in the north and Central via Chatswood in the south, as shown in Figure 16.



Figure 16: Sydney train network (Source: TfNSW)



PYMBLE LADIES' COLLEGE – GREY HOUSE PRECINCT TRANSPORT IMPACT ASSESSMENT

Services through Pymble Train Station are frequent with approximately one service every 5-10 minutes during the typical commuter peak periods and one service every 15 minutes outside of commuter peak periods.

8.2 BUS

8.2.1 Private Bus Services

The College provides five privately operated bus services for students. The bus services drop off the students by 9:00am and depart in the afternoon at 3:30pm. The bus routes are shown in Figure 17 and include:

- **Route 1:** Hunters Hill via Lane Cove, Longueville, Gladesville, Ryde, Macquarie
- **Route 2:** Lower North Shore via Neutral Bay, Northbridge, Castlecrag, Castle Cove, Roseville, Killara
- **Route 3:** North West via Dural, Glenhaven, West Pennant Hills, Beecroft, Epping, Marsfield, Macquarie
- **Route 4:** Northern Beaches via Avalon, Newport, Mona Vale, Ingleside, Terrey Hills, St Ives
- **Route 5:** Lower Northern Beaches via North Curl Curl, South Curl Curl, Freshwater, Manly, Balgowlah, Seaforth, Wakehurst Parkway, Frenchs Forest, Belrose

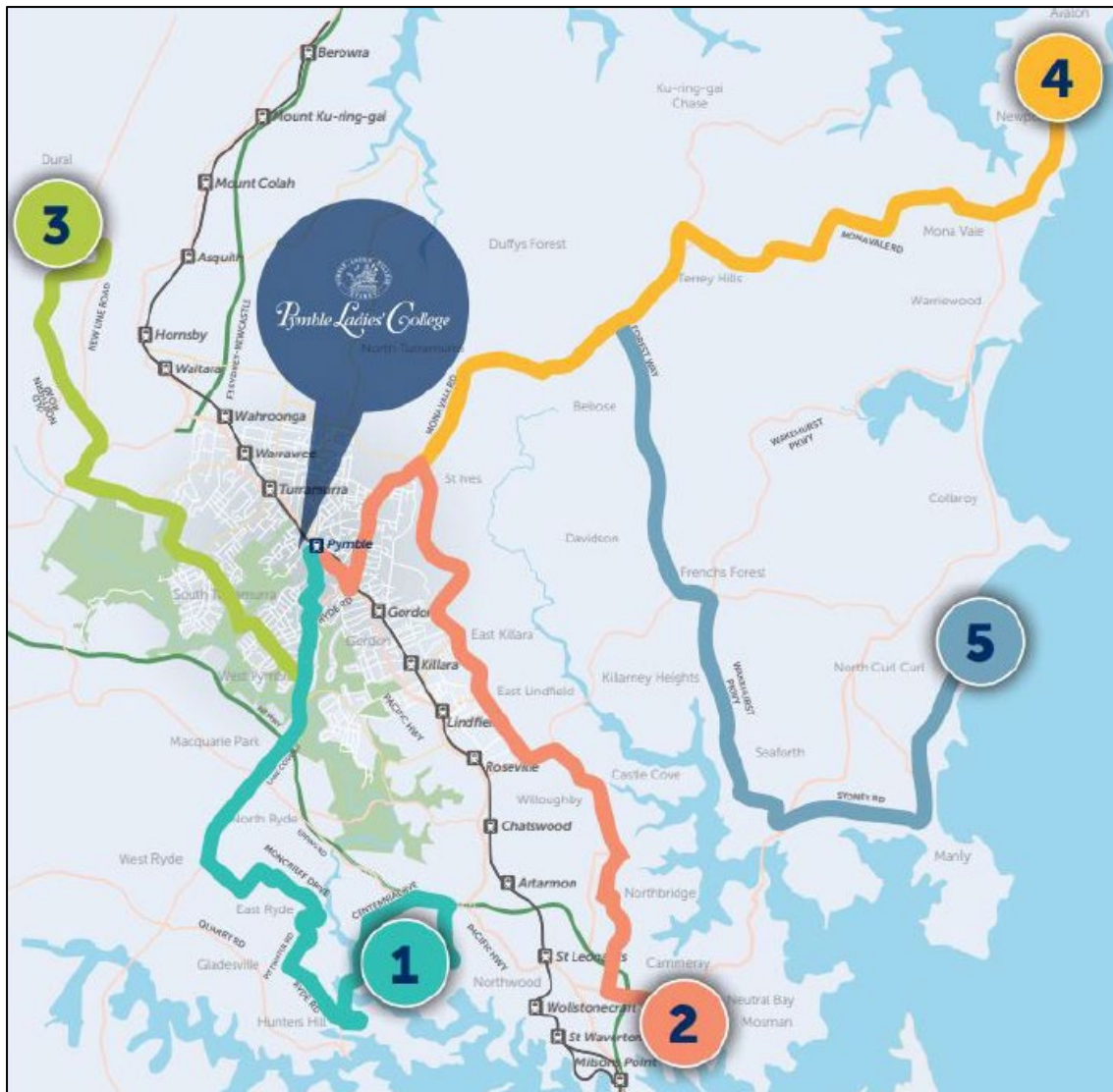


Figure 17: PLC bus routes



8.2.2 Public Bus Services

TransDev also operates routes 575 and 579 along Pacific Highway and provides opportunities for students to alight outside of Pymble Train Station.

- Route 575: Hornsby to Macquarie University – service runs approximately every half an hour on weekdays

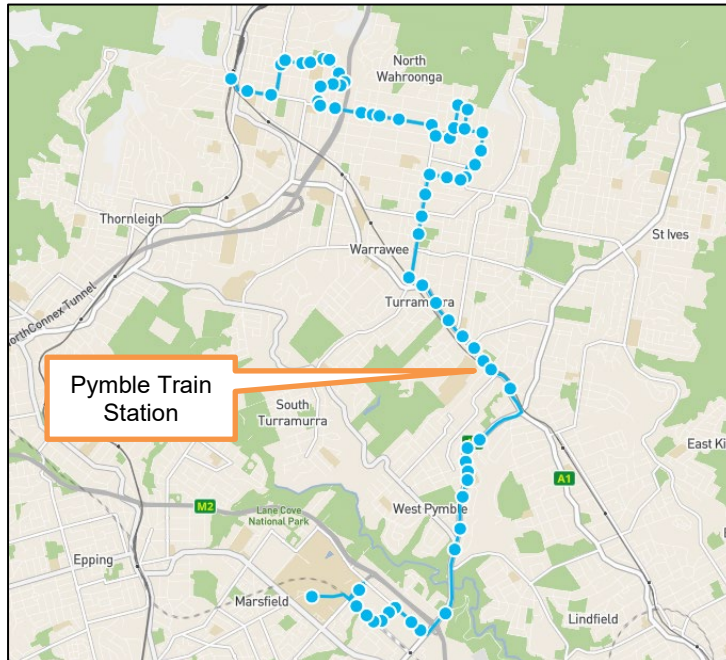


Figure 18: Route 575 (Source: TfNSW)

- Route 579: Pymble to East Turramurra – limited morning peak services with services approximately every half an hour in the afternoon peak

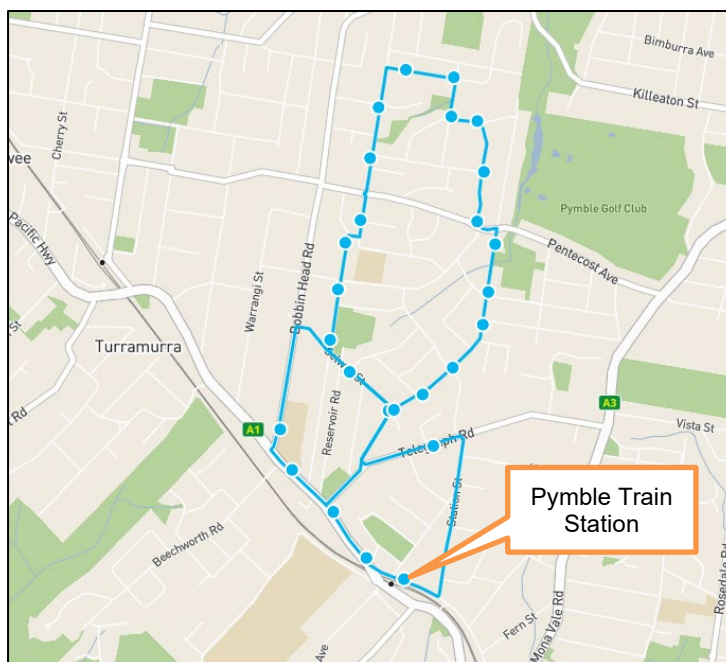


Figure 19: Route 579 (Source: TfNSW)

8.3 PEDESTRIAN INFRASTRUCTURE

There are several access points to the College grounds on foot. These access points have been identified in Figure 20.

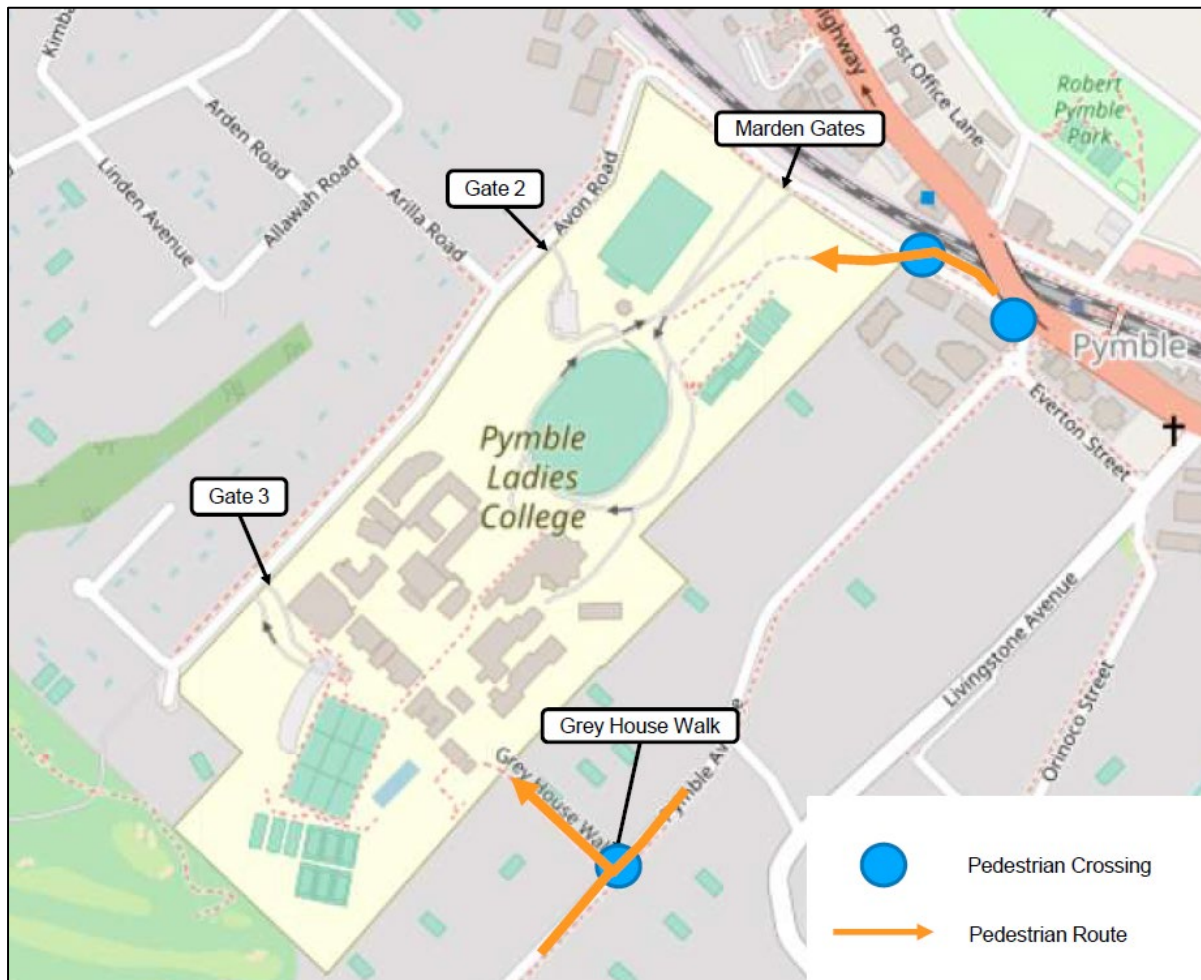


Figure 20: Pedestrian access locations

The primary walking route is to and from Pymble Train Station via the Marden Gates. There is a pedestrian tunnel near the roundabout between Avon Road, Pymble Avenue and Everton Street which provides connection under Pacific Highway and directly to Pymble Train Station.

A zebra crossing is provided in front of the pedestrian tunnel to provide a crossroad connection at Avon Road, and a raised pedestrian crossing is provided closer to Marden Gates. A traffic controller is stationed at the raised pedestrian crossing during drop-off and pick-up hours.

Pedestrian access is also available through the Grey House Walk via Pymble Avenue.

8.4 CYCLING INFRASTRUCTURE

TfNSW Cycleway Finder indicates that there are no cycleways within the vicinity of the College and no connections to the wider cycle network. This can be seen in Figure 21 overleaf.



**PYMBLE LADIES' COLLEGE – GREY HOUSE PRECINCT
TRANSPORT IMPACT ASSESSMENT**

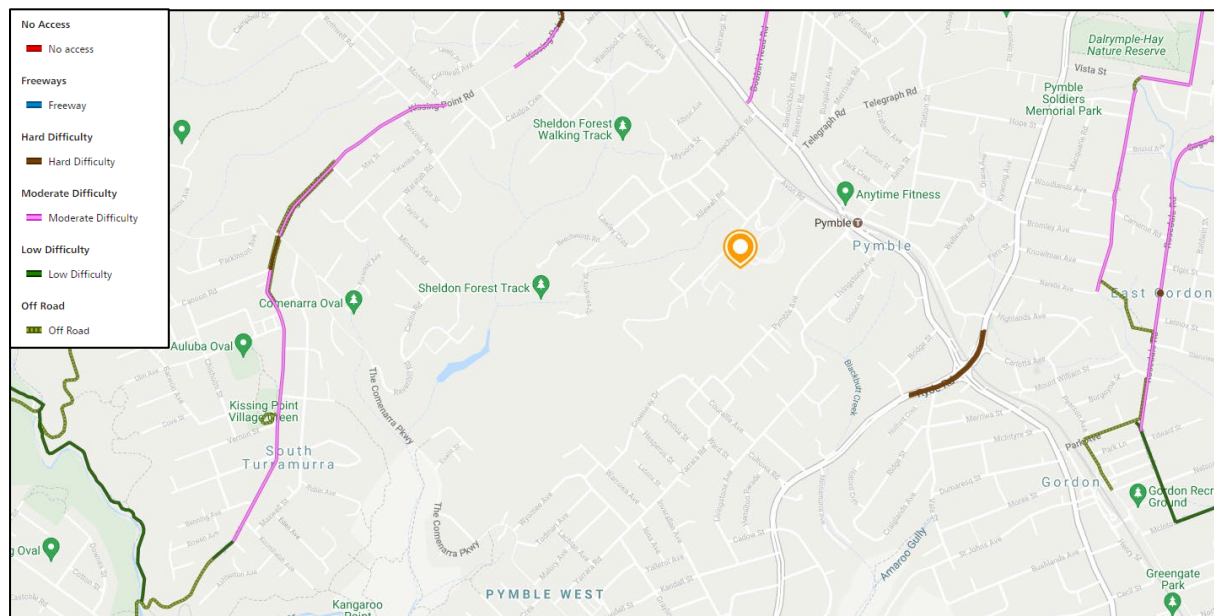


Figure 21: Surrounding cycle network (Source: TfNSW Cycleway Finder)

Currently, the College does not permit students to cycle to/from the College campus for safety reasons.



9.0 POST-DEVELOPMENT PARKING IMPACT

9.1 PARKING REQUIREMENT

The parking requirements for the GHP have been determined based on the rates stipulated in Ku-ring-gai Development Control Plan (DCP) Section C Part 22 – General Access and Parking.

The ELC is the only component of the GHP that will generate additional parking demand.

The rates and requirements are summarised in Table 4.

Table 4: ELC Parking Requirements

Type	Rate	Minimum Requirement
General Car Parking	1 space per 4 children in care (rates include staff parking)	23 spaces
Accessible Parking (included in general car parking)	2-3% of total spaces	1 space (included in 23 spaces)
Bicycle Parking	No rates for bicycle parking	N/A
Motorcycle Parking	No rates for motorcycle parking	N/A
Service Vehicle Parking	No rates for service vehicle parking	Servicing demand for the ELC is expected to be minor. There are a number of loading docks and service bays within the College campus that can be used to accommodate the servicing demands of the ELC. No additional service vehicle bays are required.
Bus parking	No rates for bus parking	Children attending the ELC are not expected to travel to/from the College via buses No additional bus bays are required.

9.2 PROPOSED PARKING PROVISION

The College proposes to utilise the existing swim school spaces located in the Centenary Car Park. In order to accommodate an accessible space and its adjacent shared bay, two existing spaces will need to be replaced and result in a total of 37 parking spaces. This will provide 37 parking spaces (including one accessible space) for the ELC to be used during drop-off and pick-up.

Drop-off for the ELC is expected to be between 7:00-7:30am whilst pick-up will be between 6:00-6:30pm. This will allow the ELC to operate in parallel with the OSHC and allow for working parents to drop-off/ pick-up their children before/ after work. However, it is noted that drop-off and pick-up for ELCs are typically spread throughout several hours, particularly in the afternoon where there is an after-school and after-work peak.



The swim school will not require the use of these spaces during ELC drop-off and pick-up periods, and as such, the shared use of these spaces is considered appropriate and meets the minimum requirements. The Learn to Swim school is used from 9:30am in the morning so there will be no clash with use from the ELC and no impact on existing car spaces.

9.3 PROPOSED ACCESS

The 38 parking spaces in the Centenary Car Park will be accessible via Gate 3, along Avon Road. This access is separated into two separate gates: one for entry and the other for exit. A boom gate is currently installed to separate these swim school spaces from the rest of the car park, to restrict use. This boom gate will continue to operate which continues to allow the College to restrict these spaces to ELC use only.

9.4 OVERALL PARKING IMPACT

Considering that the proposed parking provision will adequately meet the requirements of the Council DCP, there are no concerns around the lack of parking on-site, as a result of the GHP development.

Concerns have been raised regarding the parking and traffic impact the development will have on the adjacent streets, particularly Pymble Avenue. It is noted that although the majority of parent drop-off and pick-up occurs within the College grounds, there are a number drop-off and pick-up activities occurring along the adjacent streets, including Pymble Avenue (largely due to the presence of Grey House Walk). It is also noted that students who drive to the College are not allowed to park within the College grounds, and therefore park along the adjacent streets. This has ultimately led to an increase in traffic and parking demand along Avon Road and Pymble Avenue.

Due to the direct connection between the GHP and Grey House Walk, concerns have been raised from residents that parents will opt to park their vehicles along Pymble Avenue and walk their children to the ELC using the Grey House Walk, rather than parking their vehicles in the Centenary Car Park. Although a valid concern, it is expected that majority of parents dropping off and picking up their children from the ELC will opt to use the Centenary Car Park due to the following reasons:

- The shortest walking distance from the Centenary Car Park entrance to the ELC has been measured to be approximately 73.3 metres and an alternative path around Goodlet House was also measured to be approximately 119.5 metres. This is considerably shorter than the 210 metres walking distance from Pymble Avenue to the ELC, via the Grey House Walk;
- The Grey House Walk is a narrow pathway which has sections with uneven surfaces and narrower widths due to overgrown vegetation. As such, it is not considered an ideal walking pathway for parents with young children or prams;
- Pymble Avenue, between Rand Avenue and Golfers Parade, is quite steep and will not be ideal for parents with prams;
- The Centenary Car Park is located below the aquatic centre, and as such, provides all-weather parking spaces for ELC drop-off and pick-up;
- The ELC parking area, within the Centenary Car Park, will be closed off with boom gates and access will only be given to ELC parents and staff. The ELC parking area will provide 37 dedicated parking spaces (including one accessible space);
- An accessible path is provided between the Centenary Car Park and the ELC. A lift is provided within the Centenary Car Park which will allow wheelchair/ pram users to travel to/from the car park level and the GHP level; and
- Parents will be informed of the Centenary Car Park location, through the orientation process, through information packages and the College website. The College will also encourage drop-off and pick-up to occur in the car park.

In light of the above, the ELC is not expected to have an adverse impact on the existing parking conditions along Pymble Avenue or other adjacent streets.



10.0 POST-DEVELOPMENT TRAFFIC IMPACT

10.1 TRAFFIC GENERATION

As aforementioned, the SSDA is not seeking to increase the existing enrolment capacity for Kindergarten to Year 12, and as such, the ELC is the only component of the GHP that will generate additional traffic volumes.

The operating hours of the ELC will be 7:00am to 6:30pm to parallel the operations of the OSHC and allow for working parents to drop-off and pick-up their children before/after work. Peak drop-off and pick-up for the ELC is expected to be between 7:00-7:30am and 6:00-6:30pm.

The RMS Guide to Traffic Generating Developments (2002) provides rates to estimate the traffic generated by a number of different land uses. Section 3.11.3 of the guide outlines rates for different child care centre types:

- Pre-school
- Long-day care; and
- Before/after care

The rates for a long-day care have been adopted:

Long-Day Care Trip Generation Rates:

- 7:00-9:00am: 0.8 trips/ child
- 2:00-4:00pm: 0.3 trips/ child
- 4:00-6:00pm: 0.7 trips/ child

Based on an enrolment number of 90 children, the estimated trip generation is summarised in Table 5.

Table 5: Development Traffic Generation

No of children	7:00-9:00am	2:00-4:00pm	4:00-6:00pm
90 children	72 trips	27 trips	63 trips

It is noted, however, the number of children enrolled at the ELC who would contribute to additional traffic is expected to be less than 90 children. This is due to the following reasons:

- The primary intention of the ELC is to provide an on-campus early learning/ child care centre for the staff members and allow the College to retain valuable staff members who would otherwise find it difficult to return to work after maternal/parental leave. As outlined in Section 4.0, the staff survey results indicated that approximately 32 staff would enrol their children in an on-campus ELC, whilst 42 staff members would consider enrolling their children in an on-campus ELC. Assuming that 32 staff members enrol their children at the ELC, this portion is not expected to contribute to generating additional traffic;
- Many children who enrol in ELCs which are associated with private schools such as PLC, typically have siblings attending the school. A survey result undertaken by the College in July 2021, found that approximately 18% of the parents who responded (total of 441 responses) had two or more children attending the College.

Based on the assumption above, the total number of children who would contribute to generating additional traffic is estimated to be approximately 42 children.

Table 6: Reduced Development Traffic Generation

No of children	7:00-9:00am	2:00-4:00pm	4:00-6:00pm
42	34 trips	13 trips	29 trips

Additionally, some trips made to the ELC by people not directly associated with the College will be drawn from existing traffic flows in the area, particularly on arterial routes. For example, people who commute along Pacific



Highway and call in to the ELC before and after work do not increase the demand on Pacific Highway. Nevertheless, it is acknowledged that this will vary each year, and as such, the additional trips in Table 5 have been adopted for the SIDRA analysis in Section 10.3.

10.2 TRAFFIC DISTRIBUTION

The College is located within a road network where there are a limited number of approach and departure routes. This is summarised in Table 7 and Table 8. It is noted that vehicles traveling to/from South Turramurra and West Pymble region will most likely travel via the residential streets. However this volume is expected to be minor. The travel survey also gathered postcode data of participants which provides an indication of the origin/destination for students and staff. This is also shown in the following tables.

Table 7: Approach routes to PLC

Approach Route	
From	Approach Route
North-West	Southbound along Pacific Highway and turn right into Livingstone Avenue
South-West	Northbound along Ryde Road, left into Cultowa Road and towards Livingstone Avenue or Pymble Avenue
North-East	Southbound along Mona Vale Road, right onto Pacific Highway and left into Livingstone Avenue
South-East	Northbound along Pacific Highway and left into Livingstone Avenue

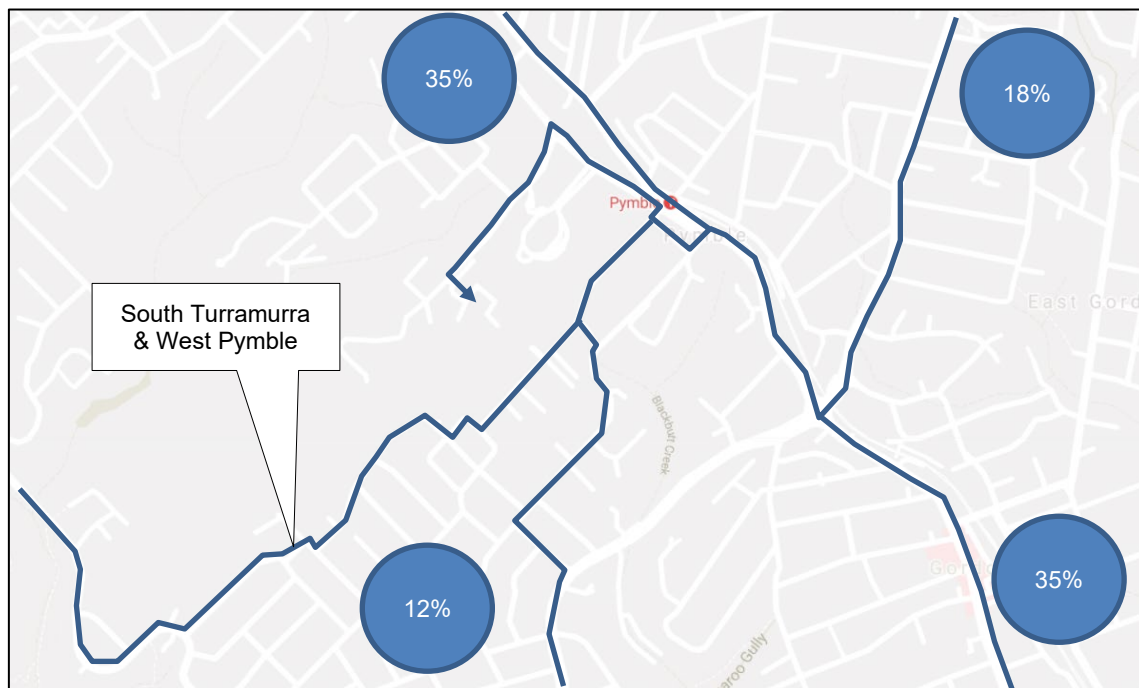


Figure 22: Distribution for Arrival

Table 8: Departure routes from PLC

Approach Route	
To	Approach Route
North-West	Northbound along Pacific Highway via Beechworth Road
South-West	Northbound along Ryde Road, left into Cultowa Road and towards Livingstone Avenue or Pymble Avenue
North-East	Southbound along Mona Vale Road, right onto Pacific Highway and left into Livingstone Avenue
South-East	Northbound along Pacific Highway and left into Livingstone Avenue

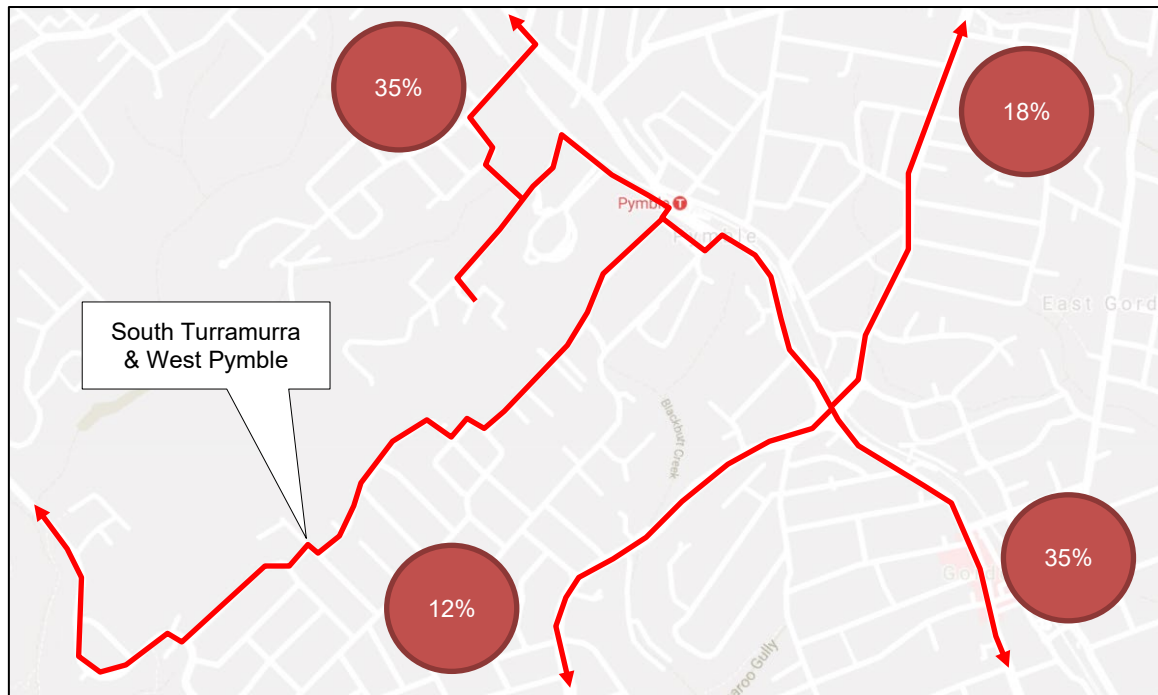


Figure 23: Distribution for Departure

10.3 SIDRA ASSESSMENT

The concepts of intersection capacity and Level of Service (LoS) as defined in the RMS Guidelines (2002), are described in Appendix D together with the criteria for their assessment. The assessment of the LoS of signalized intersections is based on the evaluation of the average delay (seconds/vehicle) of all approaches.

The following scenarios have been modelled using SIDRA 9.0:

- Scenario 1 – Base Case
- Scenario 2 – Post-development

The following intersections were modelled as part of the assessment:



- Pacific Highway & Livingstone Avenue (signalised)
- Pacific Highway & Beechworth Road (signalised)

10.3.1 Scenario 1 – Base case

During the preparation of this traffic assessment, the Greater Sydney Area was subjected to lockdown (due to the Covid-19 pandemic) and traffic counts were unable to be gathered as they will not accurately reflect normal peak hour traffic conditions.

As a result, the turning movements used for the base case scenario are based on the 2012 traffic counts (used in a previous SSDA submitted by PLC) which were factored up to the SCATS data provided by TfNSW. The 2012 traffic counts can be seen in Appendix F. The SCATS data used were the traffic volumes gathered on Tuesday 9th March 2021, which coincides with the same day the 2012 traffic counts were collected (Tuesday 17 July 2012), during a typical school day and outside any COVID-19 lockdowns.

The results from the model are shown in Table 9.

Detailed SIDRA results can be seen in Appendix G.

Table 9: Scenario 1 SIDRA Results

Intersection	AM Peak		PM Peak	
	Average Delay (seconds/vehicle)	Level of Service (LoS)	Average Delay (seconds/vehicle)	Level of Service (LoS)
Pacific Highway & Livingstone Avenue	18.4	B	>70	F
Pacific Highway & Beechworth Road	>70	F	>70	F

10.3.2 Scenario 2 – Post-development

The post-development scenario was modelled by adding the estimated development traffic onto the base case model.

The results from the model are shown in Table 10 overleaf. Detailed SIDRA results can be seen in Appendix H.

Table 10: Scenario 2 SIDRA Results

Intersection	AM Peak		PM Peak	
	Average Delay (seconds/vehicle)	Level of Service (LoS)	Average Delay (seconds/vehicle)	Level of Service (LoS)
Pacific Highway & Livingstone Avenue	19.4	B	>70	F
Pacific Highway & Beechworth Road	>70	F	>70	F

The comparison between the base case and post-development scenario indicates that the proposed development will have minor impact to the existing conditions of the two intersections.



The proposed ELC is expected to add 25 trips to the Pacific Highway/ Beechworth Road intersection and 63 trips to the Pacific Highway/ Livingstone Avenue intersection. This is equivalent to approximately 1 trip every 2.5 minutes and 1 trip every minute for each intersection which is considered a minor increment in the overall traffic.

10.3.3 10-Year Horizon

It is acknowledged that TfNSW have requested that the ultimate development year plus 10 years growth is modelled as part of the assessment. A meeting was held with TfNSW on Wednesday 7 July 2021, where the modelling requirements were discussed. It was agreed that the ultimate development year plus 10 years growth will not be modelled as part of the assessment as long as it was justifiable (see email correspondence in Appendix E). Justification for omitting this scenario is as follows:

- As indicated within Section 9.1, the ELC is expected to have a peak generation of approximately 72 trips. When factoring in the trip distribution, this will result in approximately 25 additional trips through the Pacific Highway/ Beechworth Road intersection and 63 additional trips through the Pacific Highway/ Livingstone Avenue intersection. This is equivalent to approximately 1 trip per 2.5 minutes and 1 trip per minute respectively which is considered a minor increment in traffic;
- Trips associated with ELCs are generally spread throughout the peak hours, particularly in the afternoon where some children may be picked up during the after-school peak, and others may be picked-up during after-work peak (i.e. working parents picking up their children). As such, due to the spreading out of trips, the overall impact that the ELC will have on the wider road network will not be as significant, when comparing additional trips generated by the increase in student numbers for Kindergarten-Year 12; and
- As mentioned in Section 10.1, the peak trips generated by the ELC is expected to be lower than 72 trips and is anticipated to reflect the volumes summarised in Table 6; and
- The SIDRA results indicates that the proposed ELC will not have any adverse impacts to the existing conditions along Pacific Highway. It is noted that the SIDRA models have adopted the additional traffic volumes calculated using RMS rates.

10.4 OVERALL TRAFFIC IMPACT

In summary, the overall traffic impact from the proposed development is expected to be minor based on the following considerations:

- The ELC is estimated to generate approximately 72 trips in the AM peak and 63 trips in the PM peak (when adopting RMS rates). However, in reality, the additional trips are expected to be less as many of the children enrolled in the ELC will have parents who are staff members at the College or have siblings already attending, and as such, will not contribute to generating additional trips; and
- As aforementioned, the ELC is expected to add, at its peak, 25 trips to the Pacific Highway/ Beechworth Road intersection and 63 trips to the Pacific Highway/ Livingstone Avenue intersection. This is equivalent to approximately 1 trip every 2.5 minutes and 1 trip every minute for each intersection which is considered a minor increment in the overall traffic and will not have an adverse impact to the existing conditions along Pacific Highway, as evident in the SIDRA results.

As aforementioned in Section 9.4, concerns have been raised by residents regarding the current traffic and parking conditions along Pymble Avenue. Similarly to the overall parking impact, the proposed GHP is not expected to have an adverse impact on the current conditions along Pymble Avenue, based on the considerations summarised in Section 9.4.



11.0 RECOMMENDATIONS TO REDUCE IMPACT ON PYMBLE AVENUE

As aforementioned, concerns have been raised regarding the current safety concerns along Pymble Avenue as a result of increased traffic during drop-off and pick-up hours.

It has been demonstrated that the proposed GHP will have a minor impact on the surrounding road network and will not have an adverse impact on the existing traffic and parking conditions along Pymble Avenue.

The following recommendations can be implemented by the College to reduce and alleviate the current parking and traffic conditions along Pymble Avenue:

- Install gate at Grey House Walk which can only be opened using a keycard, which can be distributed to local students (College to determine definition of 'local' students). This will reduce College traffic along Pymble Avenue;
- Investigate feasibility of providing remote drop-off and pick-up area (e.g. nearby park). It is understood that the College has worked closely with Ku-ring-gai Council to allow drop-off and pick-up of students along Grandview Street which has been effective and reduced traffic within the College's immediate surrounding road network;
- Work closely with Ku-ring-gai Council to implement timed parking along Pymble Avenue, with exception to permit holders. Permits can be made available to residents;
- Work closely with Ku-ring-gai Council and Hornsby Police Station to get rangers/ police to closely monitor operations along Pymble Avenue and Avon Road during peak drop-off and pick-up hours; and
- Encourage students and parents to use alternative modes of transport.

It is noted that to reduce overall traffic and parking impact in the long term, students and staff will need to make greater use of sustainable travel options (public and active transport). Measures to achieve this are discussed in the Green Travel Plan.



12.0 GREEN TRAVEL PLAN

A Green Travel Plan (GTP) has been prepared in response to the following item in the SEARs:

Measures to ameliorate any adverse traffic and transport impacts due to the development based on the above analysis, including:

- *Travel demand management programs to increase sustainable transport (such as a Green Travel Plan/ School Travel Plan)*
 - *Arrangements for the Travel Coordinator roles*
 - *Governance arrangements or relationships with state and local government transport providers to update roads safety*
 - *Infrastructure improvements or protection measures, including details of timing and method of delivery*

The GTP will be submitted with the TIA as part of the SSDA submission.



13.0 PRELIMINARY OPERATIONAL TRANSPORT & ACCESS MANAGEMENT PLAN

A preliminary Operational Transport & Access Management Plan (OTAMP) is to be prepared in response to the following items in the SEARs:

- *A preliminary school transport plan detailing a operational traffic and access management plan for the site, pedestrian entries, the drop-off/ pick-up zone(s) and bus bay(s)*

This SSDA will not be seeking to increase the existing student and staff numbers for Kindergarten – Year 12, and the GHP will not be altering the existing traffic operations of the College. As such, a separate preliminary OTAMP is not considered necessary at this stage as the development will not be changing the status quo. A detailed OTAMP can be prepared as part of the SSDA Conditions of Consent. Details of the existing pedestrian entries, drop-off/ pick-up zone(s) and bus bay(s) have already been detailed in this TIA.

In summary:

- The facilities within the GHP will largely be used by the existing students and staff, with the exception of the new ELC which will have an enrolment capacity of 90 children;
- Transport and access operations for the existing students and staff will not change as part of the GHP development;
- The operating hours of the ELC will be 7:00am to 6:30pm, to parallel with OHSC. As such, drop-off and pick-up hours will occur outside of general College drop-off and pick-up hours. This will also cater for parents who need to drop-off and pick-up their child before and after work;
- The College will provide 37 parking spaces in the existing Centenary Car Park which will be restricted by existing boomgates;
- An accessible path is provided from the Centenary Car Park to the ELC which has a total walking distance of approximately 73.3 metres, with an alternative path around Goodlet House which has a walking distance of approximately 119.3 metres;
- No changes are expected to the bus operations as part of this SSDA. Children dropped-off or picked-up at the ELC are not expected to use the private bus services; and
- Concerns have been raised by residents regarding the traffic and parking impacts the GHP will have on Pymble Avenue. These concerns have been addressed in Section 9.4, 10.4 and 11.0.

A detailed OTAMP can be prepared as part of the SSDA Conditions of Consent if required.



14.0 PRELIMINARY CONSTRUCTION TRAFFIC AND PEDESTRIAN MANAGEMENT PLAN

A preliminary Construction Traffic and Pedestrian Management Plan (CTPMP) has been prepared in response to the following items in the SEARs:

- *Analysis of the impacts of the traffic generated during construction of the proposed development, including:*
 - *Construction vehicle routes, types and volumes*
 - *Construction program (duration and milestones)*
 - *On-site car parking and access arrangements for construction, emergency and construction worker vehicles*
 - *Cumulative impacts associated with other construction activities in the locality (if any)*
 - *Road safety at identified intersections and level crossings near the site due to the conflicts between construction vehicles and existing traffic in the locality*
 - *Measures to mitigate impacts, including to ensure the safety of pedestrian and cyclists during construction*
- *Analysis of the impacts of construction works on the adjoining rail corridor prepared in consultation with the relevant rail infrastructure authority*
- *A preliminary Construction Traffic and Pedestrian Management Plan*

A Preliminary CTPMP will be submitted with the TIA as part of the SSDA submission.



15.0 CONCLUSION

Stantec has been engaged by Pymble Ladies' College (PLC) to prepare a Transport Impact Assessment (TIA), which will be submitted as part of the State Significant Development Application (SSDA), for the redevelopment of the Grey House Precinct (GHP).

The redevelopment will include the construction of a new building, which will replace existing demountables, and will provide new facilities such as Junior School classrooms, STEM labs, health and wellbeing facilities, dance academy, Out of School Hours Care, a new Early Learning Centre (ELC) and outdoor learning spaces.

The new facilities will be for the use of existing students and staff, and the SSDA will not be seeking to increase Kindergarten-Year 12 student numbers.

The new ELC, however, will have an enrolment capacity of 90 children.

The development proposes to provide 37 parking spaces within the Centenary Car Park, which satisfies the Council's Development Control Plan minimum requirements. These parking spaces will be shared with the aquatic centre which will not require the use of these spaces during ELC drop-off and pick-up hours.

Based on the long day care rates provided in the RMS Guidelines (2002), the ELC will generate approximately 72 trips in the AM peak and 63 trips in the PM peak. However, in reality, the additional traffic is expected to be lower considering that many of the children attending the ELC will have parents who are staff members of the College or have siblings who are already attending the College. As such, it is unlikely that all 90 children will contribute to generating additional traffic. Nevertheless, the additional traffic calculated based on the RMS rates have been adopted for the SIDRA model which indicates that the proposed development will have no adverse impact on the existing performance levels of Pacific Highway/ Livingstone Avenue and Pacific Highway/Beechworth Road intersections.

Concerns have been raised by residents regarding the existing safety, traffic congestion and parking issues along Pymble Avenue, during peak drop-off and pick-up hours, and the impact the proposed development may have on the existing conditions. The proposed development is not expected to have an adverse impact on the existing conditions along Pymble Avenue based on the following considerations:

- The shortest walking distance from the Centenary Car Park entrance to the ELC has been measured to be approximately 73.3 metres and an alternative path around Goodlet House was also measured to be approximately 119.5 metres. This is considerably shorter than the 210 metres walking distance from Pymble Avenue to the ELC, via the Grey House Walk;
- The Grey House Walk is a narrow pathway which has sections with uneven surfaces and narrower widths due to overgrown vegetation. As such, it is not considered an ideal walking pathway for parents with young children or prams;
- Pymble Avenue, between Rand Avenue and Golfers Parade, is quite steep and will not be ideal for parents with prams;
- The Centenary Car Park is located below the aquatic centre, and as such, provides all-weather parking spaces for ELC drop-off and pick-up;
- The ELC parking area, within the Centenary Car Park, will be closed off with boom gates and access will only be given to ELC parents and staff. The ELC parking area will provide 37 dedicated parking spaces (including one accessible space);
- An accessible path is provided between the Centenary Car Park and the ELC. A lift is provided within the Centenary Car Park which will allow wheelchair/ pram users to travel to/from the car park level and the GHP level; and
- Parents will be informed of the Centenary Car Park location, through the orientation process, through information packages and the College website. The College will also encourage drop-off and pick-up to occur in the car park.

Whilst it is acknowledged that the proposed development is not expected to have any adverse impact on the existing conditions along Pymble Avenue, recommendations have been provided in Section 11.0 of this report, to alleviate the existing conditions along the roadway.



Appendices



Appendix A ARCHITECTURAL PLANS





ARCHITECTS REGISTRATION BOARD /
NOMINATED ARCHITECTS

NSW
9356 NINDSCHKA TITCHKOSKY
4937 JAMES GROSE
7115 JULIAN ASHTON
7033 MATTHEW BLAIR
7428 PETER THOMAS
10447 ALISON BOUNDS
QLD
5537 NEIL LOGAN
3708 BRIAN DONOVAN
1355 MARK GRIMMER
3533 DAVID KELLY
3517 CATHERINE SKINNER
3866 KEVIN O'BRIEN

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ISSUE	DATE	FOR
1	18/03/21	Issue to Town Planner
2	14/04/21	For Information
3	28/05/21	For Information
4	02/06/21	For Information
5	07/06/21	For Information
6	25/06/21	Issued for Schematic Design
7	07/07/21	For Information

CONSULTANT

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CONSULTANT

TTW
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CONSULTANT

PROCLUS ADVISORY

CONSULTANT

WILLOW TREE PLANNING
TEL 02 9929 6974
PROJECT MANAGER

KATE BIMSON
TEL 02 9855 7628
CLIENT

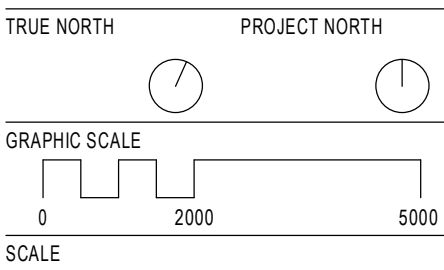
PYMBLE LADIES COLLEGE
PROJECT

PYMBLE LADIES COLLEGE
GREY HOUSE PRECINCT

BVM PROJECT NUMBER

2010018

DRAWING KEY



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STATUS

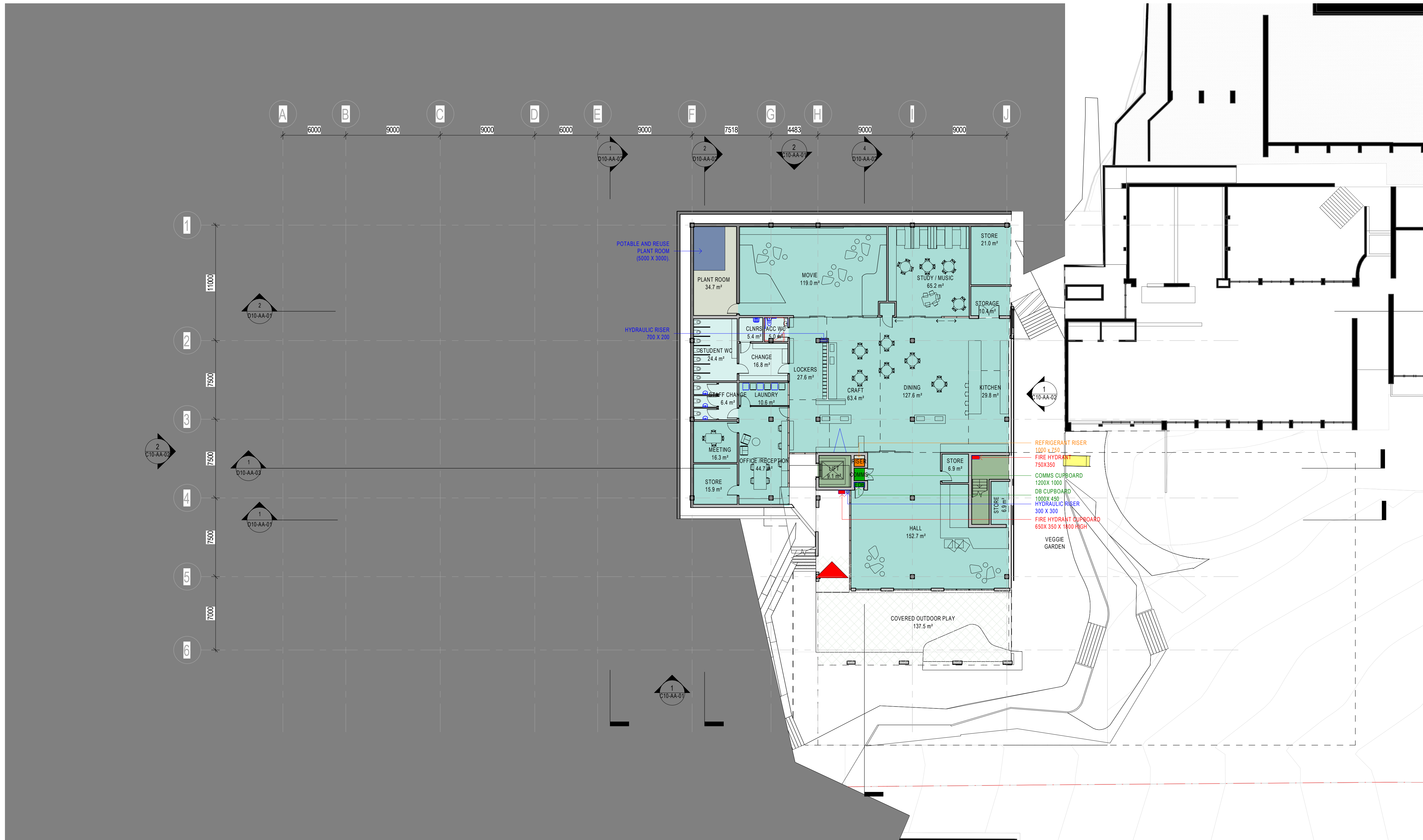
SCHEMATIC DESIGN
DRAWING

GENERAL ARRANGEMENT
PLAN - LEVEL 00

AR-B10-00-01

ISSUE

7



AMENITIES	ELC	OSHC	STEM
CIRC	HEALTH	OUTDOORS	
COLA	JUNIOR SCHOOL	SERVICES	
DANCE	JUNIOR SCHOOL BREAKOUT	STAFF	

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WILLOW TREE PLANNING
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PROJECT MANAGER

KATE BIMSON
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CLIENT

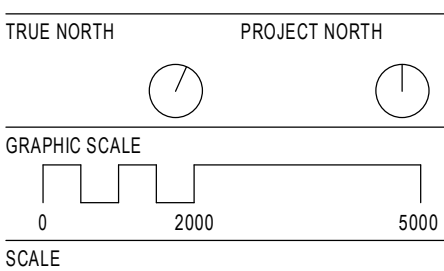
PYMBLE LADIES COLLEGE
PROJECT

PYMBLE LADIES COLLEGE
GREY HOUSE PRECINCT

BVN PROJECT NUMBER

2010018

DRAWING KEY



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STATUS

SCHEMATIC DESIGN
DRAWING

GENERAL ARRANGEMENT
PLAN - LEVEL 01

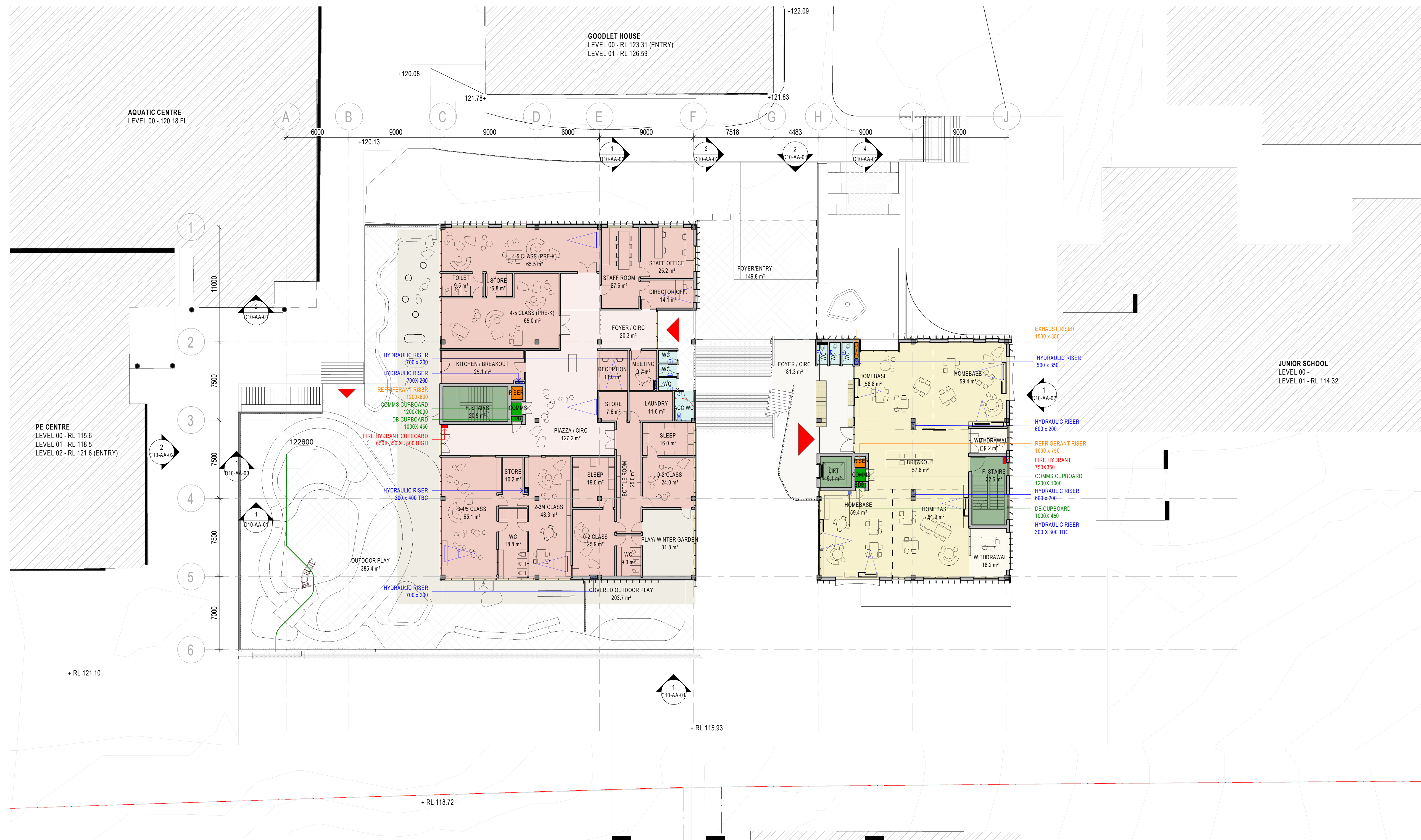
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









ISSUE
7



- AMENITIES
- CIRC
- COLA
- DANCE
- ELC
- HEALTH
- JUNIOR SCHOOL
- JUNIOR SCHOOL BREAKOUT
- OSHC
- OUTDOORS
- SERVICES
- STAFF
- STEM

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|---|-----------|---|---------------------------|---|-------|
|  | AMENITIES |  | JUNIOR SCHOOL |  | STAFF |
|  | CIRC |  | JUNIOR SCHOOL
BREAKOUT |  | STEM |
|  | COLA |  | OSHC | | |
|  | DANCE |  | OUTDOORS | | |
|  | ELC |  | SERVICES | | |
|  | HEALTH | | | | |



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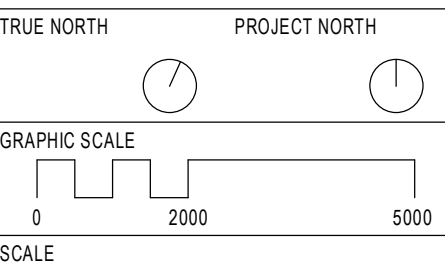
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PROJECT

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GREY HOUSE PRECINCT

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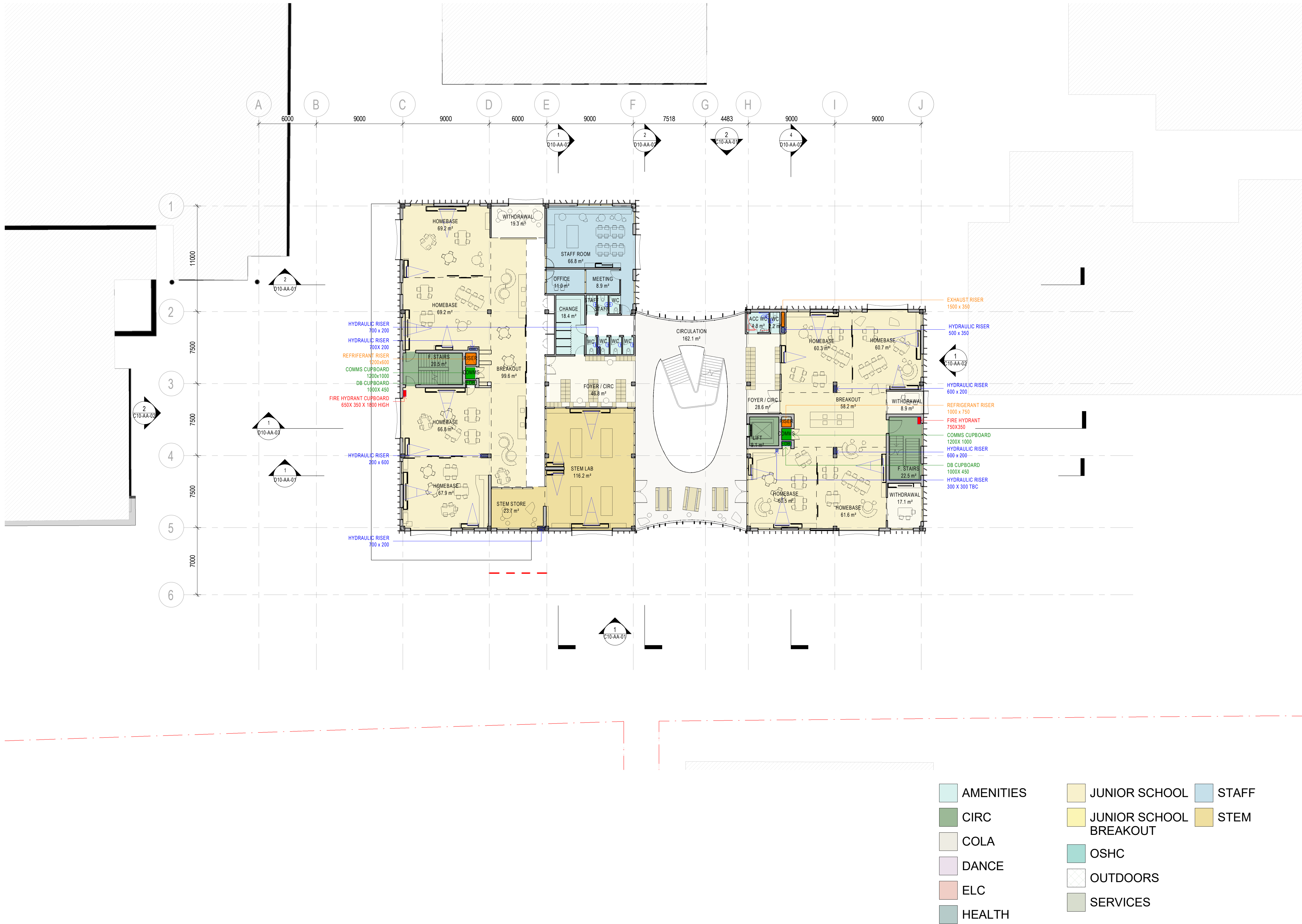


1 : 200@A1
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SCHEMATIC DESIGN
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GENERAL ARRANGEMENT
PLAN - LEVEL 03

ISSUE
AR-B10-03-01 7





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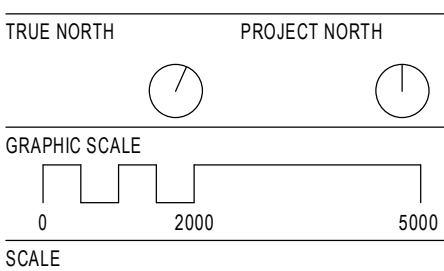
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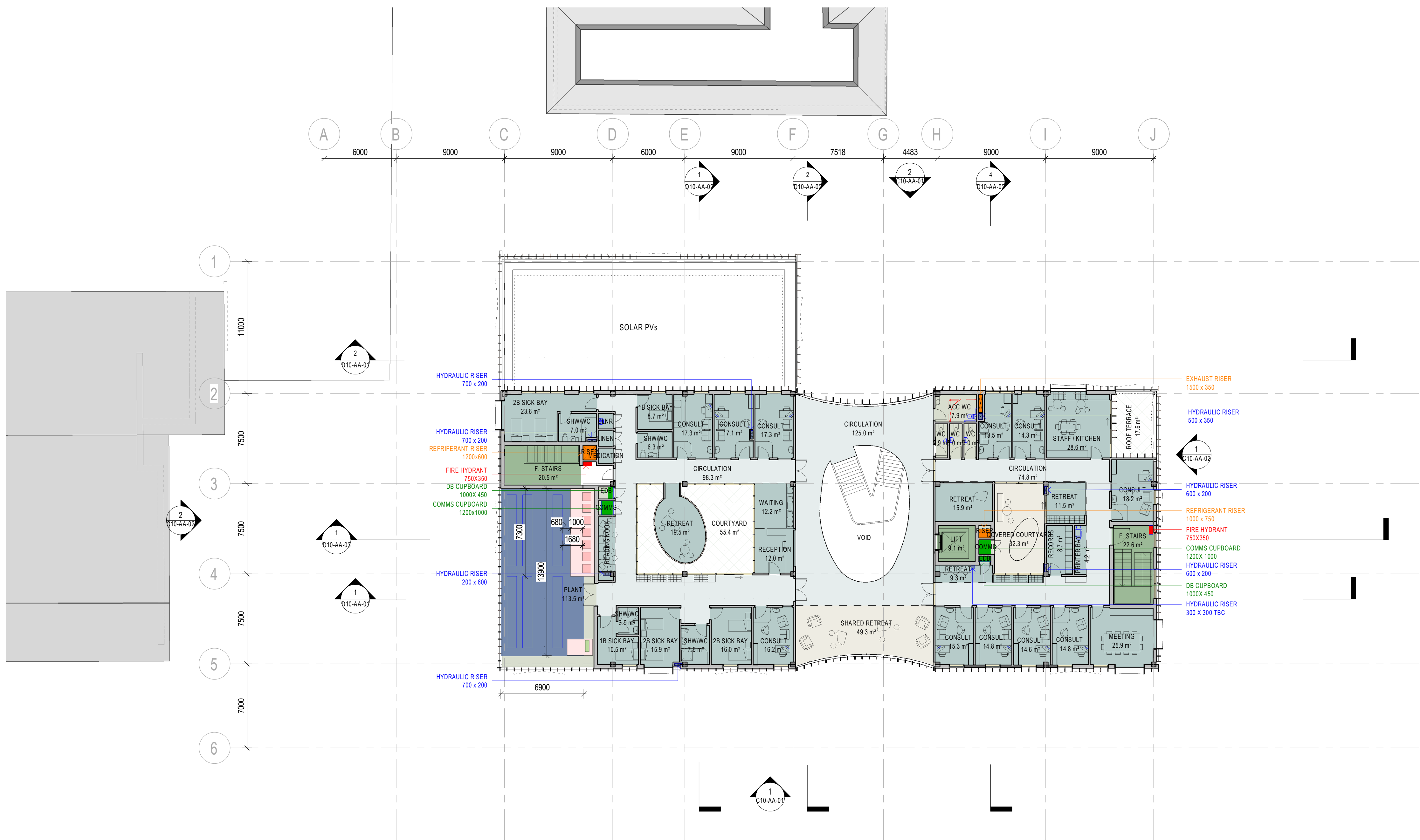
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GENERAL ARRANGEMENT
PLAN - LEVEL 04

AR-B10-04-01

ISSUE

7



- AMENITIES
- CIRC
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- ELC
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- JUNIOR SCHOOL
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- STAFF
- STEM

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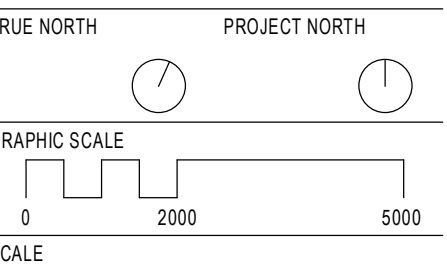
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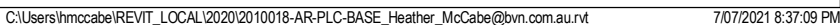


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GENERAL ARRANGEMENT PLAN - LEVEL 04

AR-B10-04-01	ISSUE 7
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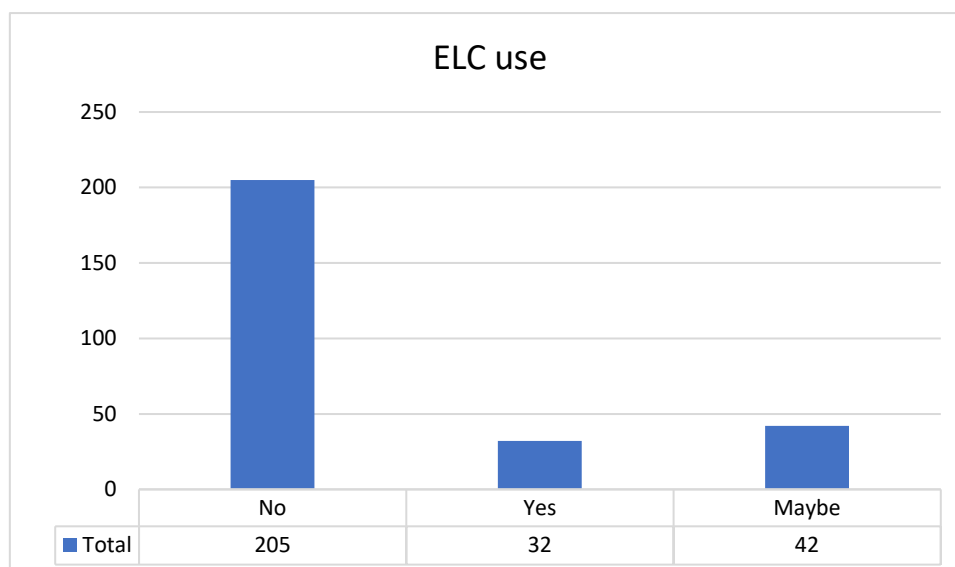
Appendix B STAFF SURVEY RESULTS - ELC



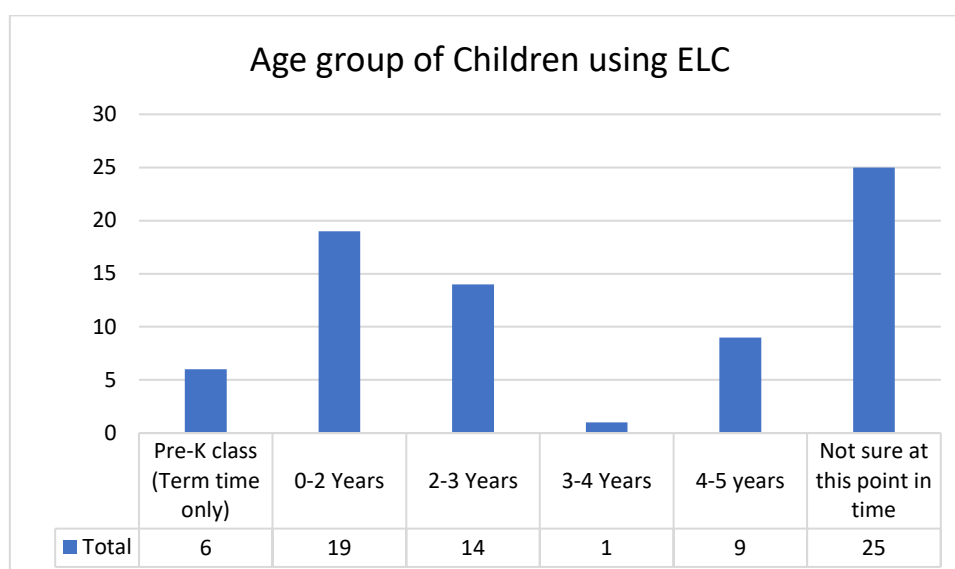
Staff Survey – Early Learning Centre (ELC) Responses (June 2021)

Questions 2 – 5 based on 74 responses.

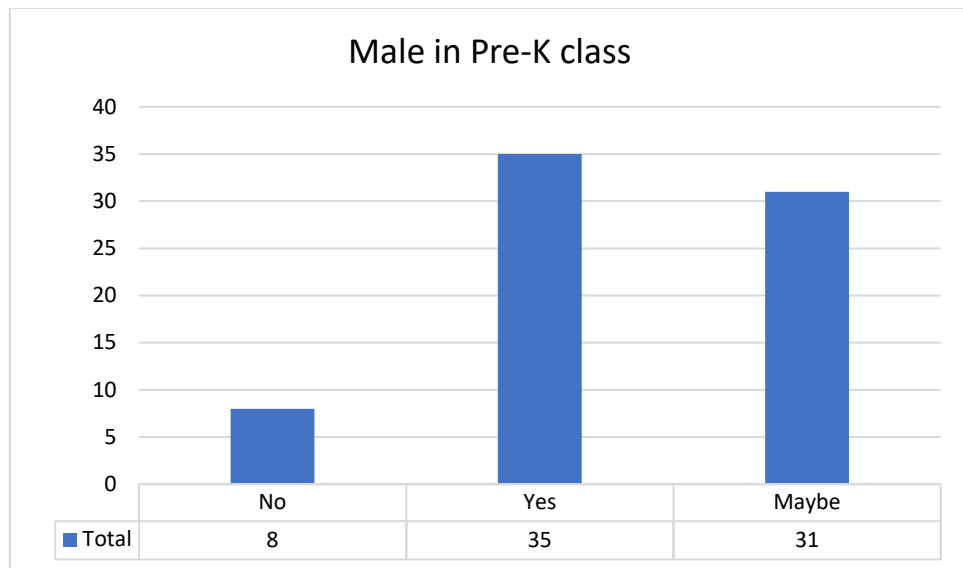
1. As a staff member, do you think that you will use the Early Learning Centre for your own Children in the near future? (being the next 5 years)



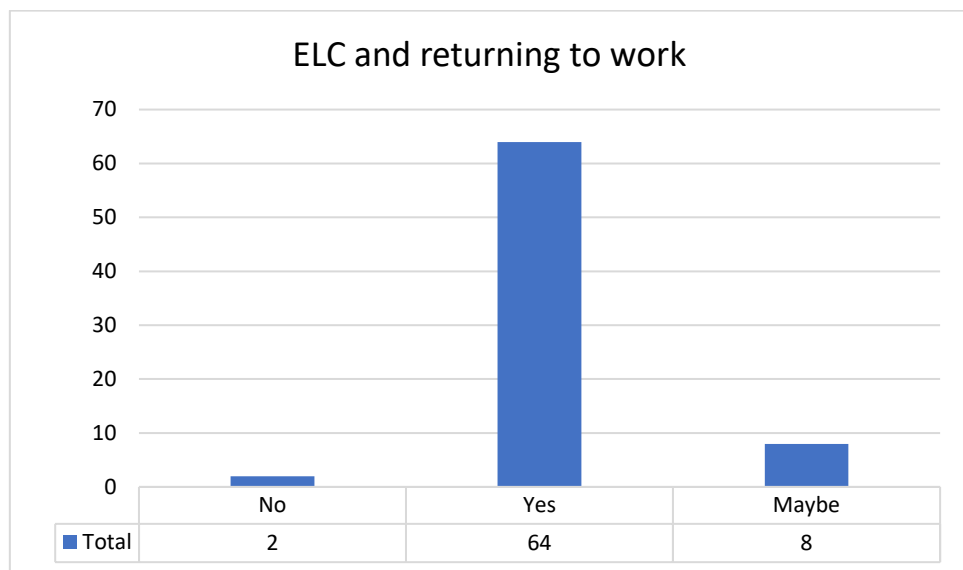
2. What age group would your children most probably be placed?



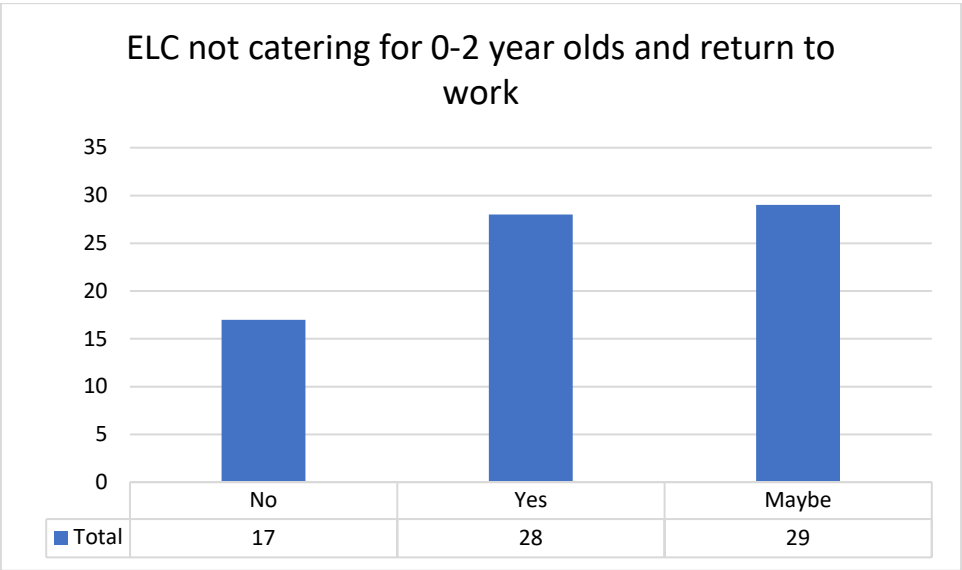
3. If your child is male, would you consider enrolling him in the Pre-K class?



4. Will having an ELC on Campus make it easier for you to return back to work after maternity/parental leave?



5. If the ELC did not cater for 0-2 year olds, would this significantly impact your return to work, i.e., would you look at work elsewhere that catered for this age group or was more conveniently located for you to access childcare?



Appendix C ON-SITE PARKING LOCATIONS





Appendix D GUIDELINES FOR EVALUATION OF INTERSECTION CAPACITY



Guidelines for Evaluation of Intersection Operation

The *RTA Guide to Traffic Generating Developments (October 2002, Issue 2.2)*, details the assessment of intersections. The assessment of the level of service of an intersection is based on the evaluation of the following Measures of Effectiveness:

- (a) Average delay (seconds/veh) (all forms of control)
- (b) Delay to critical movement (seconds/veh) (all forms of control)
- (c) Degree of saturation (traffic signals and roundabouts)
- (d) Cycle length (traffic signals)

SIDRA was used to calculate the relevant intersection parameters. The SIDRA software is an advanced lane-based micro-analytical tool for design and evaluation of individual intersections and networks of intersections including modelling of separate movement classes (light vehicles, heavy vehicles, buses, cyclists, large trucks, light rail / trams and so on). It provides estimates of capacity, level of service and a wide range of performance measures, including; delay, queue length and stops for vehicles and pedestrians, as well as fuel consumption, pollution emissions and operating costs.

It can be used to analyse signalised intersections (fixed-time / pretimed and actuated), signalised and unsignalised pedestrian crossings, roundabouts (unsignalised), roundabouts with metering signals, fully-signalised roundabouts, two-way stop sign and give-way / yield sign control, all-way stop sign control, single point interchanges (signalised), freeway diamond interchanges (signalised, roundabout, sign control), diverging diamond interchanges and other alternative intersections and interchanges. It can also be used for uninterrupted traffic flow conditions and merge analysis.

The best indicator of the level of service at an intersection is the average delay experienced by vehicles at that intersection. For traffic signals, the average delay over all movements should be taken. For roundabouts and priority control intersections (with Stop and Give Way signs or operating under the T-junction rule), the critical movement for level of service assessment should be that with the highest average delay.

With traffic signals, delays per approach tend to be equalised, subject to any over-riding requirements of signal co-ordination as well as to variations within individual movements. With roundabouts and priority-controlled intersections, the critical criterion for assessment is the movement with the highest delay per vehicle. With this type of control, the volume balance might be such that some movements suffer high levels of delay while other movements have minimal delay. An overall average delay for the intersection of 25 seconds might not be satisfactory if the average delay on one movement is 60 seconds.

The average delay for LoS 'E' should be no more than 70 seconds. The accepted maximum practical cycle length for traffic signals under saturated conditions is 120 - 140 seconds. Under these conditions 120 seconds is near maximum for two and three phase intersections and 140 seconds near maximum for more complex phase designs. Drivers and pedestrians expect cycle lengths of these magnitudes and their inherent delays in peak hours. A cycle length of 140 seconds for an intersection which is almost saturated has an average vehicle delay of about 70 seconds, although this can vary. If the average vehicle delay is more than 70 seconds, the intersection is assumed to be at LoS 'F'.

Table D3 sets out average delays for different levels of service. There is no consistent correlation between definitions of levels of service for road links as defined elsewhere in this section, and the ranges set out in **Table D3**. In assigning a level of service, the average delay to the motoring public needs to be considered, keeping in mind the location of the intersection. For example, drivers in inner urban areas of Sydney have a higher tolerance of delay than drivers in country areas. **Table C3** provides a recommended baseline for assessment.

Table D3: Level of Service Criteria for Intersections

Level of Service	Average Delay per Vehicle (sec/veh)	Traffic Signals	Priority Controlled
A	$0 < x < 14$	Good operation	Good operation
B	$14 < x < 28$	Good operation with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	$28 < x < 42$	Satisfactory operation	Satisfactory operation, but crash history study required
D	$42 < x < 56$	Operating near capacity	Operating near capacity and crash history study required
E	$56 < x < 70$	At capacity, incidents will cause excessive delays	At capacity, requires other control mode
F	$70 < x$	Requires further study	Requires other control mode

The figures in **Table D3** are intended as a guide only. Any particular assessment should take into account site-specific factors including 95th percentile queue lengths (and their effect on lane blocking), the influence of nearby intersections and the sensitivity of the location to delays. In many situations, a comparison of the current and future average delay provides a better appreciation of the impact of a proposal, and not simply the change in the level of service.

The intersection degree of saturation (DoS) can also be used to measure the performance of isolated intersections. The DoS value can be determined by computer-based assessment programs. At intersections controlled by traffic signals, both queue length and delays increase rapidly as DoS approaches 1.000. An upper limit of 0.900 is appropriate, however when DoS exceeds 0.850, overflow queues start to become a problem. Satisfactory intersection operation is generally achieved with a DoS of about 0.700 - 0.800. (Note that these figures are based on isolated signalised intersections with cycle lengths of 120 seconds. In coordinated signal systems DoS might be actively maximised at key intersections).

Although in some situations additional traffic does not alter the level of service, particularly where the level of service is 'E' or 'F', additional capacity may still be required. This is particularly appropriate for LoS 'F', where small increases in flow can cause disproportionately greater increases in delay. In this situation, it is advisable to consider means of control to maintain the existing level of absolute delay. Suggested criteria for the evaluation of the capacity of signalised intersections based on the DoS are summarised in **Table D4**.

Table D4: Criteria for Evaluating Capacity of Signalised Intersections

Level of Service	Optimum Cycle Length (seconds)	Movement Degree of Saturation (DoS)	Intersection Degree of Saturation (DoS)
A – Excellent	< 90	< 0.700	< 0.700
B – Very good	< 90	< 0.700	< 0.700
C – Good	90 - 120	0.700 – 0.800	0.700 – 0.850
D – Satisfactory	120 - 140	0.800 – 0.850	0.850 – 0.900
E – Poor	> 140	> 0.850	> 0.900
F – Extra capacity required	> 140	> 0.850	> 0.900

Appendix E TFNSW CONSULTATION



Hong, Sunny

From: Laura Van putten <Laura.VAN.PUTTEN@transport.nsw.gov.au>
Sent: Thursday, July 8, 2021 9:20 AM
To: Hong, Sunny; kbimson@pymblelc.nsw.edu.au
Cc: Solon Ghosh; Zhaleh Najari alamouti
Subject: FW: SSD-17424905 Pymble Ladies' College Grey House Precinct

Hi Sunny & Kate

As per discussion in the meeting, please find the meeting summary below:

- Sunny & Kate provided detail on the development proposal and the expected traffic generation from the site. Sunny raised the question as to whether the below requirements provided in TfNSW key issues were required due to the low numbers:
 - Modelling of key intersections using SIDRA and
 - Modelling of the ultimate development year plus 10 years growth.
- In order to understand the impacts to the surrounding network TfNSW informed that the following is to be provided (but not limited to):
 - Traffic assignment diagram
 - Base model + development outputs
 - Justification as to why the dev +10 years growth is not required.

I hope this has been of assistance.

Kind regards,

Laura van Putten

T 02 8849 2480 | M 0429 505 961

From: Hong, Sunny [<mailto:Sunny.Hong@stantec.com>]
Sent: Wednesday, 16 June 2021 11:00 AM
To: Development Sydney <Development.Sydney@transport.nsw.gov.au>
Cc: Pahee Rathan <Pahee.RATHAN@transport.nsw.gov.au>; Carlaw, Chris <Chris.Carlaw@stantec.com>; Mirabile, Theodore <theodore.mirabile@stantec.com>; Kate Bimson <kbimson@pymblelc.nsw.edu.au>
Subject: SSD-17424905 Pymble Ladies' College Grey House Precinct

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Good morning Laura,

We are assisting Pymble Ladies' College with the preparation of a Transport and Accessibility Impact Assessment which will be submitted as part of the SSDA for the proposed Grey House Precinct (GHP).

TfNSW provided details of key issues and assessment requirements within a letter dated 4 May 2021, for inclusion in the SEARs. We want to discuss TfNSW's request regarding:

- Modelling of key intersections using SIDRA and
- Modelling of the ultimate development year plus 10 years growth.

The development proposal will provide improved facilities for the College and support the existing staff and students. The SSDA is not seeking to increase the enrolment capacity for Kindergarten – Year 12. The only component of the GHP which will generate additional traffic will be the new Early Learning Centre (ELC) which will have an enrolment capacity of 90 children. The traffic generated by the ELC is expected to be low based on the following considerations:

- Many of the children enrolled at ELCs associated with private schools have siblings already attending the school
- Many of the children enrolled at ELCs associated with private schools have parents who are staff members at the school
- Not all children will be driven to the College

We will be providing data shortly supporting these assumptions. When considering the above, we do not believe that the trip numbers generated by the GHP will be high enough to require traffic modelling of key intersections or to assess the ultimate development year plus 10 years of growth. The impact the GHP will have on the surrounding road network is expected to be minor.

Based on the above comments and the review of data supporting our assumptions, would TfNSW be able to reconsider their request for SIDRA modelling at key intersections and the modelling of the ultimate development plus 10 years growth?

Regards,

Sunny Hong

Intermediate Traffic Engineer

Direct: +61 2 9493 9741

Sunny.Hong@stantec.com

Stantec

Level 4, 99 Walker Street

NORTH SYDNEY NSW 2060



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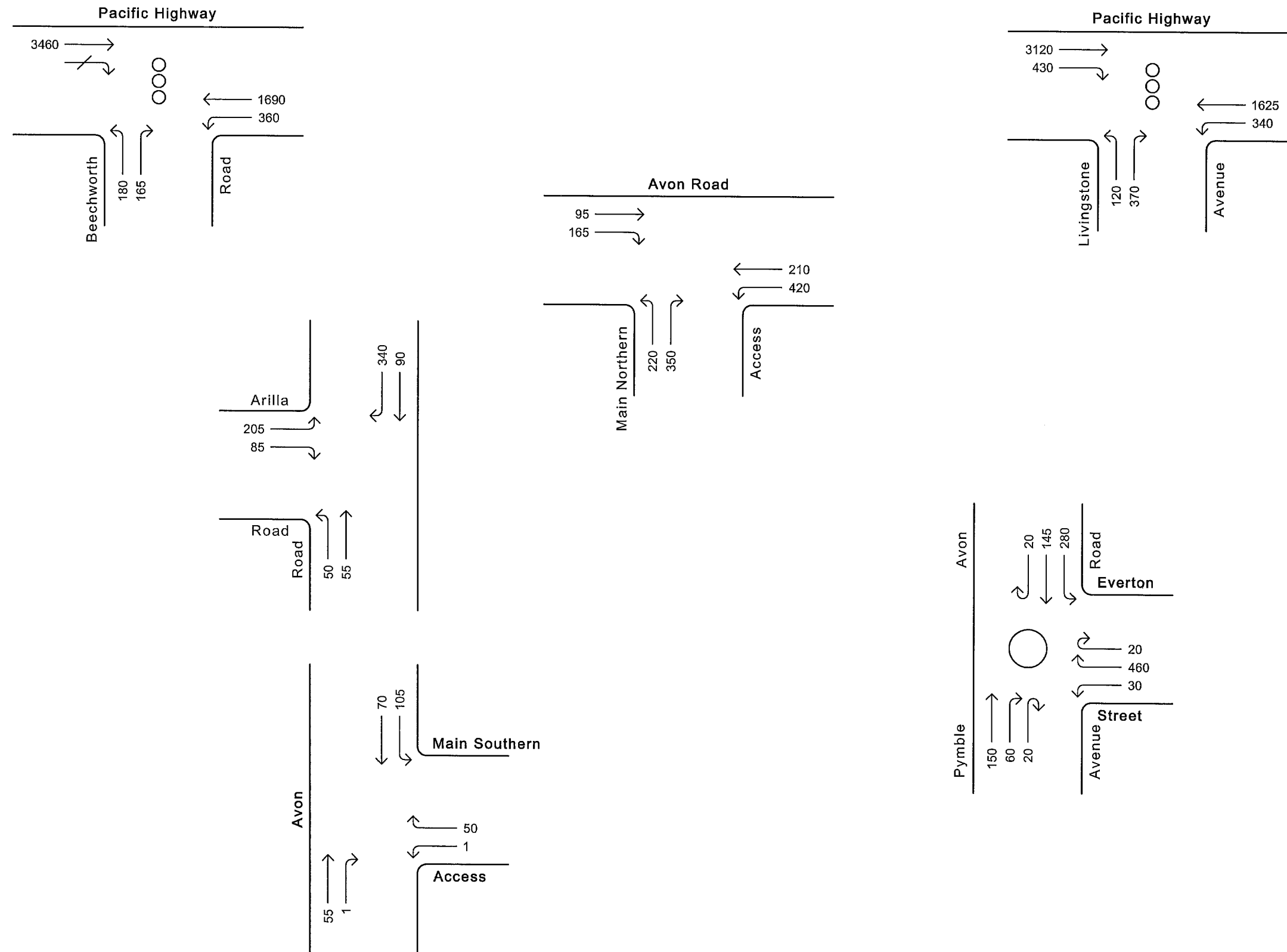
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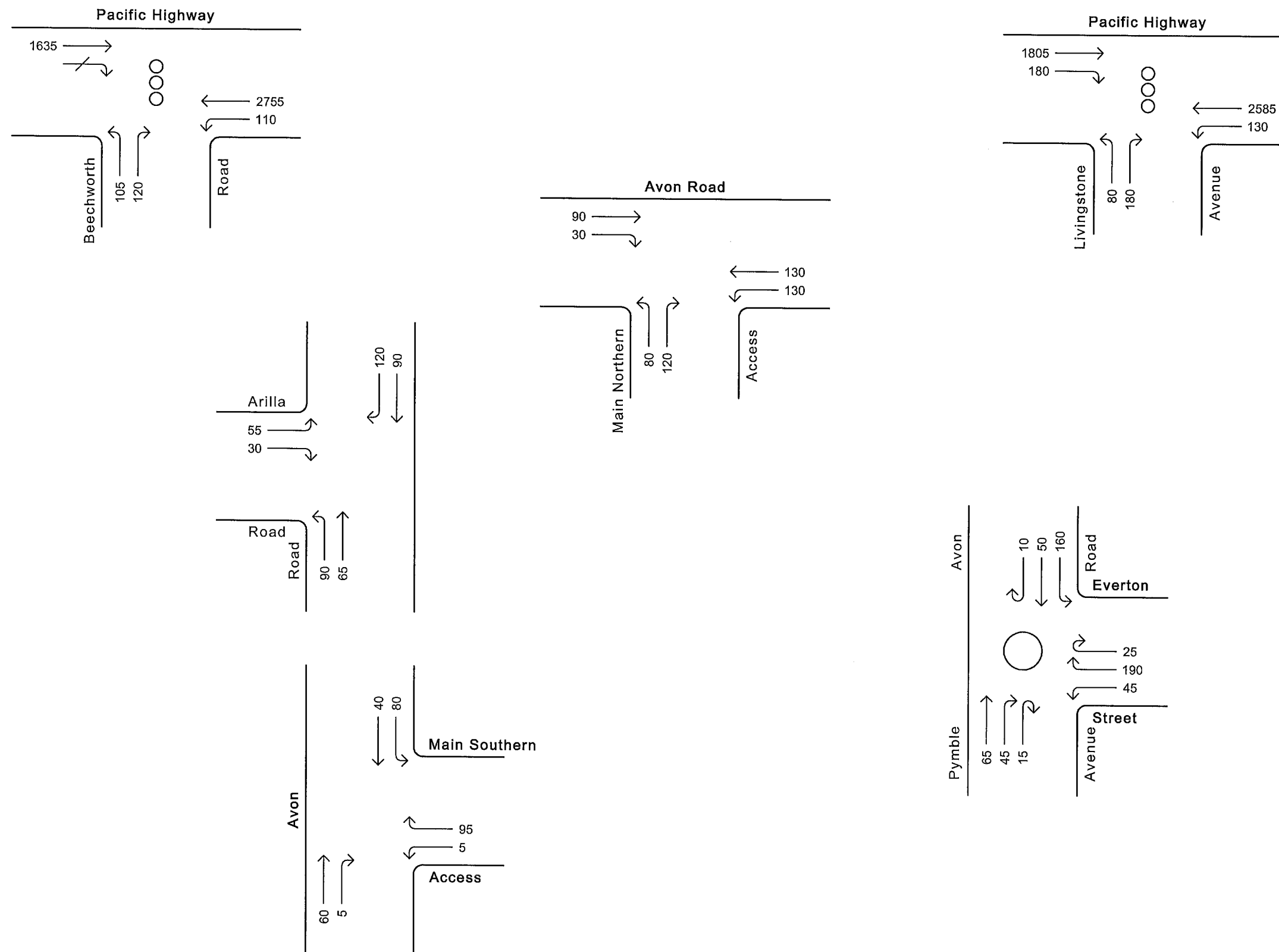
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Appendix F 2012 TRAFFIC COUNTS





Existing weekday morning peak
hour traffic flows



Existing afternoon morning
peak hour traffic flows

Appendix G SCENARIO 1 SIDRA RESULTS



CCG MOVEMENT SUMMARY

Common Control Group: CCG1 [TCS 914]

Network: N101A [Base Case
- Pacific Highway & Beechworth
Road & Bobbin Head Road AM
Peak (Network Folder: General)]

EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (CCG Practical Cycle Time)

Vehicle Movement Performance (CCG)														
Mov ID	Turn	DEMAND	FLOWs	ARRIVAL FLOWs		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total HV veh/h	%	v/c	sec		[Veh. veh	Dist] m				km/h
Site: 102A [Base Case - Pacific Highway & Bobbin Head Road AM Peak]														
SouthEast: Pacific Highway (SE)														
22	T1	1771	0.0	1077	0.0	0.467	6.1	LOS A	9.3	65.3	0.26	0.24	0.26	50.7
23	R2	293	0.0	178	0.0	* 0.958	59.6	LOS E	8.5	59.6	1.00	1.03	1.61	21.4
Approach		2063	0.0	1255 ^N ₁	0.0	0.958	13.7	LOS A	9.3	65.3	0.37	0.35	0.45	42.4
NorthEast: Bobbin Head Road														
24	L2	133	0.0	133	0.0	0.191	22.7	LOS B	4.2	29.3	0.58	0.72	0.58	34.6
26	R2	212	0.0	212	0.0	0.185	38.1	LOS C	4.5	31.6	0.77	0.75	0.77	36.3
Approach		344	0.0	344	0.0	0.191	32.1	LOS C	4.5	31.6	0.70	0.74	0.70	35.9
NorthWest: Pacific Highway (NW)														
27	L2	501	0.0	501	0.0	1.278	313.5	LOS F	134.2	939.7	1.00	1.96	2.84	9.6
28	T1	2281	0.0	2281	0.0	1.278	306.1	LOS F	156.9	1098.3	1.00	2.31	2.82	5.4
Approach		2782	0.0	2782	0.0	1.278	307.4	LOS F	156.9	1098.3	1.00	2.25	2.82	6.2
All Vehicles		5189	0.0	4381 ^N ₁	0.0	1.278	201.7	LOS F	156.9	1098.3	0.80	1.58	1.98	9.0
Site: 103A [Base Case - Pacific Highway & Beechworth Road AM Peak]														
SouthEast: Pacific Highway (SE)														
21	L2	435	0.0	435	0.0	* 1.675	657.4	LOS F	227.5	1592.3	1.00	2.58	4.16	4.9
22	T1	1982	0.0	1982	0.0	1.675	661.5	LOS F	227.5	1592.3	1.00	2.97	4.18	2.6
Approach		2417	0.0	2417	0.0	1.675	660.7	LOS F	227.5	1592.3	1.00	2.90	4.18	3.0
NorthWest: Pacific Highway (NW)														
28	T1	2414	0.0	1919	0.0	* 0.539	1.6	LOS A	7.2	50.6	0.14	0.12	0.14	57.3
Approach		2414	0.0	1919 ^N ₁	0.0	0.539	1.6	LOS A	7.2	50.6	0.14	0.12	0.14	57.3
SouthWest: Beechworth Road														
30	L2	94	0.0	94	0.0	0.247	31.0	LOS C	3.7	25.6	0.70	0.75	0.70	30.0
32	R2	107	0.0	107	0.0	* 0.302	33.6	LOS C	4.0	28.3	0.90	0.77	0.90	38.0
Approach		201	0.0	201	0.0	0.302	32.4	LOS C	4.0	28.3	0.80	0.76	0.80	35.1
All Vehicles		5032	0.0	4537 ^N ₁	0.0	1.675	354.1	LOS F	227.5	1592.3	0.63	1.63	2.32	5.3

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

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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)

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

Pedestrian Movement Performance (CCG)

Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
Site: 102A [Base Case - Pacific Highway & Bobbin Head Road AM Peak]											
NorthEast: Bobbin Head Road											
P6	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	219.8	215.2	0.98
All Pedestrians		53	54.3	LOS E	0.2	0.2	0.95	0.95	219.8	215.2	0.98
Site: 103A [Base Case - Pacific Highway & Beechworth Road AM Peak]											
SouthEast: Pacific Highway (SE)											
P5	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	225.7	222.8	0.99
SouthWest: Beechworth Road											
P8	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	217.3	211.9	0.98
All Pedestrians		105	54.3	LOS E	0.2	0.2	0.95	0.95	221.5	217.4	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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CCG MOVEMENT SUMMARY

Common Control Group: CCG1 [TCS 914]

Network: N101B [Base Case
- Pacific Highway & Beechworth
Road & Bobbin Head Road PM
Peak (Network Folder: General)]

EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (CCG Practical Cycle Time)

Vehicle Movement Performance (CCG)														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total HV] veh/h	%	v/c	sec		[Veh. veh	Dist] m				km/h
Site: 102B [Base Case - Pacific Highway & Bobbin Head Road PM Peak]														
SouthEast: Pacific Highway (SE)														
22	T1	2923	0.0	1655	0.0	0.697	7.1	LOS A	9.3	65.3	0.37	0.34	0.37	49.5
23	R2	121	0.0	69	0.0	* 0.369	33.5	LOS C	2.3	16.0	0.97	0.75	0.97	29.6
Approach		3044	0.0	1723 ^N ₁	0.0	0.697	8.2	LOS A	9.3	65.3	0.39	0.36	0.39	48.2
NorthEast: Bobbin Head Road														
24	L2	117	0.0	117	0.0	0.146	23.2	LOS B	3.7	25.8	0.58	0.72	0.58	34.3
26	R2	215	0.0	215	0.0	0.198	39.8	LOS C	4.7	32.9	0.79	0.76	0.79	35.7
Approach		332	0.0	332	0.0	0.198	33.9	LOS C	4.7	32.9	0.72	0.74	0.72	35.4
NorthWest: Pacific Highway (NW)														
27	L2	75	0.0	75	0.0	0.811	42.3	LOS C	31.0	217.2	0.95	0.90	1.00	36.5
28	T1	1787	0.0	1787	0.0	0.811	36.0	LOS C	34.4	241.1	0.95	0.89	0.99	27.7
Approach		1862	0.0	1862	0.0	0.811	36.2	LOS C	34.4	241.1	0.95	0.89	0.99	28.2
All Vehicles		5238	0.0	3917 ^N ₁	0.0	0.811	23.7	LOS B	34.4	241.1	0.69	0.64	0.71	35.4
Site: 103B [Base Case - Pacific Highway & Beechworth Road PM Peak]														
SouthEast: Pacific Highway (SE)														
21	L2	121	0.0	121	0.0	* 1.860	827.5	LOS F	242.8	1699.3	1.00	3.06	4.60	4.0
22	T1	2902	0.0	2902	0.0	1.860	826.9	LOS F	332.6	2328.4	1.00	3.47	4.60	2.1
Approach		3023	0.0	3023	0.0	1.860	826.9	LOS F	332.6	2328.4	1.00	3.46	4.60	2.2
NorthWest: Pacific Highway (NW)														
28	T1	1904	0.0	1904	0.0	* 0.535	1.6	LOS A	6.2	43.5	0.13	0.13	0.13	57.3
Approach		1904	0.0	1904	0.0	0.535	1.6	LOS A	6.2	43.5	0.13	0.13	0.13	57.3
SouthWest: Beechworth Road														
30	L2	148	0.0	148	0.0	0.408	34.5	LOS C	6.4	44.8	0.77	0.78	0.77	28.4
32	R2	112	0.0	112	0.0	* 0.313	34.6	LOS C	4.3	30.3	0.90	0.77	0.90	37.7
Approach		260	0.0	260	0.0	0.408	34.5	LOS C	6.4	44.8	0.83	0.78	0.83	33.3
All Vehicles		5187	0.0	5187	0.0	1.860	484.2	LOS F	332.6	2328.4	0.67	2.10	2.77	3.7

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.

* Critical Movement (Signal Timing)

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

Pedestrian Movement Performance (CCG)									
Mov	Dem.	Aver.	Level of	AVERAGE BACK OF		Prop. Effective	Travel	Travel	Aver.

ID	Crossing	Flow	Delay	Service	QUEUE		Que	Stop	Time	Dist.	Speed
		ped/h	sec		[Ped	Dist]		Rate			
					ped	m			sec	m	m/sec
Site: 102B [Base Case - Pacific Highway & Bobbin Head Road PM Peak]											
NorthEast: Bobbin Head Road											
P6	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	219.8	215.2	0.98
All Pedestrians		53	54.3	LOS E	0.2	0.2	0.95	0.95	219.8	215.2	0.98
Site: 103B [Base Case - Pacific Highway & Beechworth Road PM Peak]											
SouthEast: Pacific Highway (SE)											
P5	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	225.7	222.8	0.99
SouthWest: Beechworth Road											
P8	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	217.3	211.9	0.98
All Pedestrians		105	54.3	LOS E	0.2	0.2	0.95	0.95	221.5	217.4	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

 **Site: 101A [Base Case - Pacific Highway & Livingstone Avenue AM Peak (Site Folder: Base Case)]**

Base Case AM Peak

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %	v/c	sec		[Veh. veh	Dist] m				km/h
SouthEast: Pacific Highway (SE)														
21	L2	343	0.0	361	0.0	0.369	21.7	LOS B	11.2	78.5	0.63	0.76	0.63	35.3
22	T1	1525	0.0	1605	0.0	* 0.868	30.0	LOS C	45.9	321.0	0.88	0.88	0.98	40.2
Approach		1868	0.0	1966	0.0	0.868	28.5	LOS B	45.9	321.0	0.84	0.86	0.91	39.6
NorthWest: Pacific Highway (NW)														
28	T1	2789	0.0	2936	0.0	0.673	7.6	LOS A	26.3	184.3	0.56	0.52	0.56	53.4
29	R2	89	0.0	94	0.0	* 0.462	37.3	LOS C	3.7	25.6	0.98	0.77	0.98	27.9
Approach		2878	0.0	3029	0.0	0.673	8.5	LOS A	26.3	184.3	0.57	0.53	0.57	52.5
SouthWest: Livingstone Avenue														
30	L2	77	0.0	81	0.0	0.543	49.3	LOS D	8.8	61.6	0.96	0.81	0.96	24.2
32	R2	230	0.0	242	0.0	* 0.543	51.3	LOS D	8.8	61.6	0.97	0.80	0.97	23.7
Approach		307	0.0	323	0.0	0.543	50.8	LOS D	8.8	61.6	0.97	0.81	0.97	23.8
All Vehicles		5053	0.0	5319	0.0	0.868	18.4	LOS B	45.9	321.0	0.69	0.67	0.72	45.1

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

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
NorthWest: Pacific Highway (NW)												
P7	Full	50	53	49.3	LOS E	0.2	0.2	0.95	0.95	220.7	222.8	1.01
SouthWest: Livingstone Avenue												
P8	Full	50	53	49.3	LOS E	0.2	0.2	0.95	0.95	212.3	211.9	1.00
All Pedestrians		100	105	49.3	LOS E	0.2	0.2	0.95	0.95	216.5	217.4	1.00

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

 **Site: 101B [Base Case - Pacific Highway & Livingstone Avenue PM Peak (Site Folder: Base Case)]**

Base Case PM Peak

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %	v/c	sec		[Veh. veh	Dist] m				km/h
SouthEast: Pacific Highway (SE)														
21	L2	360	0.0	379	0.0	0.365	21.1	LOS B	12.1	84.7	0.60	0.76	0.60	35.6
22	T1	2153	0.0	2266	0.0	* 1.160	200.9	LOS F	167.7	1173.6	1.00	1.93	2.25	13.7
Approach		2513	0.0	2645	0.0	1.160	175.1	LOS F	167.7	1173.6	0.94	1.76	2.01	14.5
NorthWest: Pacific Highway (NW)														
28	T1	1575	0.0	1658	0.0	0.374	5.1	LOS A	10.6	74.5	0.36	0.33	0.36	55.3
29	R2	62	0.0	65	0.0	* 0.351	41.1	LOS C	2.8	19.7	0.97	0.75	0.97	26.5
Approach		1637	0.0	1723	0.0	0.374	6.5	LOS A	10.6	74.5	0.39	0.34	0.39	54.0
SouthWest: Livingstone Avenue														
30	L2	90	0.0	95	0.0	0.512	51.9	LOS D	9.2	64.1	0.95	0.81	0.95	23.5
32	R2	201	0.0	212	0.0	* 0.512	55.1	LOS D	9.2	64.1	0.96	0.80	0.96	22.7
Approach		291	0.0	306	0.0	0.512	54.1	LOS D	9.2	64.1	0.96	0.80	0.96	23.0
All Vehicles		4441	0.0	4675	0.0	1.160	105.0	LOS F	167.7	1173.6	0.74	1.18	1.35	20.7

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

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
NorthWest: Pacific Highway (NW)												
P7	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	225.7	222.8	0.99
SouthWest: Livingstone Avenue												
P8	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	217.3	211.9	0.98
All Pedestrians		100	105	54.3	LOS E	0.2	0.2	0.95	0.95	221.5	217.4	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Project: P:\Projects__ Projects 2019 Onwards\300303185 - WGE Ad hoc Traffic work\PLC\SIDRA\SIDRA Model.sip9

Appendix H SCENARIO 2 SIDRA RESULTS



CCG MOVEMENT SUMMARY

Common Control Group: CCG1 [TCS 914]

Network: N101C [Post-development - Pacific Highway & Beechworth Road & Bobbin Head Road AM Peak (Network Folder: General)]

EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (CCG Practical Cycle Time)

Vehicle Movement Performance (CCG)														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total HV] veh/h	%	v/c	sec		[Veh. veh	Dist] m				km/h
Site: 102C [Post-development - Pacific Highway & Bobbin Head Road AM Peak]														
SouthEast: Pacific Highway (SE)														
22	T1	1797	0.0	1107	0.0	0.480	6.9	LOS A	9.3	65.3	0.30	0.27	0.30	49.8
23	R2	293	0.0	179	0.0	*0.962	60.9	LOS E	8.7	60.6	1.00	1.04	1.62	21.1
Approach		2089	0.0	1286 ^N ₁	0.0	0.962	14.4	LOS A	9.3	65.3	0.39	0.37	0.48	41.8
NorthEast: Bobbin Head Road														
24	L2	133	0.0	133	0.0	0.191	22.7	LOS B	4.2	29.3	0.58	0.72	0.58	34.6
26	R2	212	0.0	212	0.0	0.185	38.1	LOS C	4.5	31.6	0.77	0.75	0.77	36.3
Approach		344	0.0	344	0.0	0.191	32.1	LOS C	4.5	31.6	0.70	0.74	0.70	35.9
NorthWest: Pacific Highway (NW)														
27	L2	501	0.0	501	0.0	1.291	324.8	LOS F	137.8	964.7	1.00	2.00	2.89	9.3
28	T1	2307	0.0	2307	0.0	1.291	317.3	LOS F	161.5	1130.4	1.00	2.35	2.88	5.2
Approach		2808	0.0	2808	0.0	1.291	318.7	LOS F	161.5	1130.4	1.00	2.29	2.88	6.0
All Vehicles		5242	0.0	4438 ^N ₁	0.0	1.291	208.3	LOS F	161.5	1130.4	0.80	1.61	2.02	8.7
Site: 103C [Post-development - Pacific Highway & Beechworth Road AM Peak]														
SouthEast: Pacific Highway (SE)														
21	L2	435	0.0	435	0.0	*1.685	667.0	LOS F	230.1	1610.9	1.00	2.59	4.19	4.8
22	T1	1982	0.0	1982	0.0	1.685	671.0	LOS F	230.1	1610.9	1.00	2.98	4.21	2.6
Approach		2417	0.0	2417	0.0	1.685	670.3	LOS F	230.1	1610.9	1.00	2.91	4.20	3.0
NorthWest: Pacific Highway (NW)														
28	T1	2440	0.0	1926	0.0	*0.541	1.6	LOS A	7.2	50.7	0.14	0.12	0.14	57.3
Approach		2440	0.0	1926 ^N ₁	0.0	0.541	1.6	LOS A	7.2	50.7	0.14	0.12	0.14	57.3
SouthWest: Beechworth Road														
30	L2	120	0.0	120	0.0	0.316	31.9	LOS C	4.8	33.9	0.72	0.76	0.72	29.6
32	R2	107	0.0	107	0.0	*0.302	33.6	LOS C	4.0	28.3	0.90	0.77	0.90	38.0
Approach		227	0.0	227	0.0	0.316	32.7	LOS C	4.8	33.9	0.80	0.77	0.80	34.5
All Vehicles		5084	0.0	4570 ^N ₁	0.0	1.685	356.8	LOS F	230.1	1610.9	0.63	1.63	2.32	5.3

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

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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)

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

Pedestrian Movement Performance (CCG)											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped	Dist]			sec	m	m/sec
Site: 102C [Post-development - Pacific Highway & Bobbin Head Road AM Peak]											
NorthEast: Bobbin Head Road											
P6	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	219.8	215.2	0.98
All Pedestrians		53	54.3	LOS E	0.2	0.2	0.95	0.95	219.8	215.2	0.98
Site: 103C [Post-development - Pacific Highway & Beechworth Road AM Peak]											
SouthEast: Pacific Highway (SE)											
P5	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	225.7	222.8	0.99
SouthWest: Beechworth Road											
P8	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	217.3	211.9	0.98
All Pedestrians		105	54.3	LOS E	0.2	0.2	0.95	0.95	221.5	217.4	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
 Pedestrian movement LOS values are based on average delay per pedestrian movement.
 Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

CCG MOVEMENT SUMMARY

Common Control Group: CCG1 [TCS 914]

Network: N101D [Post-development - Pacific Highway & Beechworth Road & Bobbin Head Road PM Peak (Network Folder: General)]

EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (CCG Practical Cycle Time)

Vehicle Movement Performance (CCG)														
Mov ID	Turn	DEMAND FLOWS	ARRIVAL FLOWS	Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed		
		[Total veh/h	HV] %	[Total HV] veh/h	%	v/c	sec	[Veh. veh	Dist] m				km/h	
Site: 102D [Post-development - Pacific Highway & Bobbin Head Road PM Peak]														
SouthEast: Pacific Highway (SE)														
22	T1	2946	0.0	1673	0.0	0.705	7.7	LOS A	9.3	65.3	0.40	0.37	0.40	48.8
23	R2	121	0.0	68	0.0	* 0.368	33.5	LOS C	2.3	16.0	0.97	0.75	0.97	29.6
Approach		3067	0.0	1741 ^N ₁	0.0	0.705	8.7	LOS A	9.3	65.3	0.42	0.38	0.42	47.6
NorthEast: Bobbin Head Road														
24	L2	117	0.0	117	0.0	0.147	23.3	LOS B	3.7	25.8	0.58	0.72	0.58	34.3
26	R2	215	0.0	215	0.0	0.198	39.8	LOS C	4.7	32.9	0.79	0.76	0.79	35.7
Approach		332	0.0	332	0.0	0.198	33.9	LOS C	4.7	32.9	0.72	0.74	0.72	35.4
NorthWest: Pacific Highway (NW)														
27	L2	75	0.0	75	0.0	0.822	43.5	LOS D	31.9	223.6	0.96	0.91	1.02	36.1
28	T1	1811	0.0	1811	0.0	0.822	37.0	LOS C	35.6	249.1	0.96	0.90	1.01	27.3
Approach		1885	0.0	1885	0.0	0.822	37.2	LOS C	35.6	249.1	0.96	0.90	1.01	27.8
All Vehicles		5284	0.0	3958 ^N ₁	0.0	0.822	24.4	LOS B	35.6	249.1	0.70	0.66	0.73	35.0
Site: 103D [Post-development - Pacific Highway & Beechworth Road PM Peak]														
SouthEast: Pacific Highway (SE)														
21	L2	121	0.0	121	0.0	* 1.864	831.1	LOS F	243.7	1705.9	1.00	3.06	4.61	4.0
22	T1	2902	0.0	2902	0.0	1.864	830.5	LOS F	340.8	2385.6	1.00	3.47	4.60	2.1
Approach		3023	0.0	3023	0.0	1.864	830.5	LOS F	340.8	2385.6	1.00	3.46	4.60	2.2
NorthWest: Pacific Highway (NW)														
28	T1	1927	0.0	1927	0.0	* 0.542	1.6	LOS A	6.2	43.7	0.13	0.13	0.13	57.2
Approach		1927	0.0	1927	0.0	0.542	1.6	LOS A	6.2	43.7	0.13	0.13	0.13	57.2
SouthWest: Beechworth Road														
30	L2	172	0.0	172	0.0	0.472	35.4	LOS C	7.6	53.5	0.79	0.80	0.79	28.0
32	R2	112	0.0	112	0.0	* 0.313	34.6	LOS C	4.3	30.3	0.90	0.77	0.90	37.7
Approach		283	0.0	283	0.0	0.472	35.1	LOS C	7.6	53.5	0.84	0.79	0.84	32.7
All Vehicles		5234	0.0	5234	0.0	1.864	482.2	LOS F	340.8	2385.6	0.67	2.09	2.75	3.8

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)

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

Pedestrian Movement Performance (CCG)

Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
Site: 102D [Post-development - Pacific Highway & Bobbin Head Road PM Peak]											
NorthEast: Bobbin Head Road											
P6	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	219.8	215.2	0.98
All Pedestrians		53	54.3	LOS E	0.2	0.2	0.95	0.95	219.8	215.2	0.98
Site: 103D [Post-development - Pacific Highway & Beechworth Road PM Peak]											
SouthEast: Pacific Highway (SE)											
P5	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	225.7	222.8	0.99
SouthWest: Beechworth Road											
P8	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	217.3	211.9	0.98
All Pedestrians		105	54.3	LOS E	0.2	0.2	0.95	0.95	221.5	217.4	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

 **Site: 101C [Post-development - Pacific Highway & Livingstone Avenue AM Peak (Site Folder: Post-Development)]**

Post-development AM Peak

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
						v/c	sec							km/h
SouthEast: Pacific Highway (SE)														
21	L2	381	0	401	0.0	0.410	22.2	LOS B	12.8	89.7	0.65	0.77	0.65	35.0
22	T1	1525	0	1605	0.0	* 0.877	31.5	LOS C	47.6	333.1	0.89	0.90	1.00	39.5
Approach		1906	0	2006	0.0	0.877	29.7	LOS C	47.6	333.1	0.84	0.87	0.93	38.9
NorthWest: Pacific Highway (NW)														
28	T1	2789	0	2936	0.0	0.673	7.6	LOS A	26.3	184.3	0.56	0.52	0.56	53.4
29	R2	114	0	120	0.0	* 0.592	38.0	LOS C	4.8	33.5	1.00	0.78	1.01	27.6
Approach		2903	0	3056	0.0	0.673	8.8	LOS A	26.3	184.3	0.57	0.53	0.57	52.3
SouthWest: Livingstone Avenue														
30	L2	77	0	81	0.0	0.637	50.4	LOS D	10.2	71.6	0.98	0.82	0.98	23.9
32	R2	277	0	292	0.0	* 0.637	52.4	LOS D	10.2	71.6	0.99	0.82	1.00	23.4
Approach		354	0	373	0.0	0.637	51.9	LOS D	10.2	71.6	0.98	0.82	1.00	23.5
All Vehicles		5163	0	5435	0.0	0.877	19.4	LOS B	47.6	333.1	0.70	0.68	0.73	44.4

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

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
NorthWest: Pacific Highway (NW)												
P7	Full	50	53	49.3	LOS E	0.2	0.2	0.95	0.95	220.7	222.8	1.01
SouthWest: Livingstone Avenue												
P8	Full	50	53	49.3	LOS E	0.2	0.2	0.95	0.95	212.3	211.9	1.00
All Pedestrians		100	105	49.3	LOS E	0.2	0.2	0.95	0.95	216.5	217.4	1.00

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

 **Site: 101D [Post-development - Pacific Highway & Livingstone Avenue PM Peak (Site Folder: Post-Development)]**

Post-development PM Peak

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
						v/c	sec							km/h
SouthEast: Pacific Highway (SE)														
21	L2	393	0	414	0.0	0.399	21.5	LOS B	13.5	94.8	0.61	0.76	0.61	35.4
22	T1	2153	0	2266	0.0	* 1.170	209.1	LOS F	172.4	1206.7	1.00	1.97	2.30	13.3
Approach		2546	0	2680	0.0	1.170	180.2	LOS F	172.4	1206.7	0.94	1.78	2.04	14.1
NorthWest: Pacific Highway (NW)														
28	T1	1575	0	1658	0.0	0.374	5.1	LOS A	10.6	74.5	0.36	0.33	0.36	55.3
29	R2	84	0	88	0.0	* 0.476	41.7	LOS C	3.9	27.2	0.99	0.76	0.99	26.3
Approach		1659	0	1746	0.0	0.476	7.0	LOS A	10.6	74.5	0.40	0.35	0.40	53.6
SouthWest: Livingstone Avenue														
30	L2	90	0	95	0.0	0.599	54.4	LOS D	10.6	74.0	0.97	0.82	0.97	22.9
32	R2	242	0	255	0.0	* 0.599	56.5	LOS D	10.6	74.0	0.98	0.81	0.98	22.4
Approach		332	0	349	0.0	0.599	55.9	LOS D	10.6	74.0	0.98	0.81	0.98	22.5
All Vehicles		4537	0	4776	0.0	1.170	107.7	LOS F	172.4	1206.7	0.74	1.19	1.36	20.3

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

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
NorthWest: Pacific Highway (NW)												
P7	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	225.7	222.8	0.99
SouthWest: Livingstone Avenue												
P8	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	217.3	211.9	0.98
All Pedestrians		100	105	54.3	LOS E	0.2	0.2	0.95	0.95	221.5	217.4	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Appendix I RESPONSE TO DPIE COMMENTS



To: Kate Bimson
Pymble Ladies College
Project/File: SSD-17424905 Response to DPIE comments

From: Sunny Hong
Sydney
Date: 16 February 2022

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

Dear Kate,

Stantec was engaged by Pymble Ladies College, herein referred to as 'the College', to prepare a Transport Impact Assessment (TIA) for the Grey House Precinct.

The TIA has been submitted to the Department of Planning, Industry & Environment (DPIE) for review and approval. As part of the assessment, DPIE has provided comments and requested for additional information in a letter to the College dated 13 December 2021.

This memo is Stantec's response to DPIE's comments.

DPIE's comment:

The submitted Transport Impact Assessment Report (TAR) (section 9.3 SIDRA assessment) has considered only two signalised intersections (Pacific Highway/ Livingstone Avenue and Pacific Highway/ Beechworth Road). However, the Department notes that there are several intersections (not signalised) that are located closer to the site and would likely be impacted by increase in traffic movements along Pymble Avenue. These include (but not limited to) Pymble Avenue/ Rand Avenue and the roundabout at Avon Road/ Everton Road/ Pymble Avenue.

Several community submissions have raised significant concerns regarding the impacts of the development on these intersections and the surrounding road network in general. Noting the concerns in the submissions and the nature of the future traffic flow, the Department requires you to undertake SIDRA modelling of the other nearby intersections in close proximity to the location of the Grey House Precinct.

Stantec's response:

The roundabout between Avon Road/ Everton Road/ Pymble Avenue has been modelled using SIDRA 9.0.

Due to the Covid-19 pandemic and the Omicron variant which resulted in many people working from home and the school summer holiday period, collecting traffic counts at the roundabout was not considered appropriate as it would not reflect normal school peak conditions. As such, similarly to the assessment of the signalised intersections along Pacific Highway, the modelling had to rely on historical data gathered in 2012. In order to baseline the growth in traffic since 2012, an assessment of the historical data available from TfNSW's Traffic Volume Viewer was undertaken.

The assessment looked at four counters around the College as shown in the figure below. The historical average daily traffic volumes are summarised in Table 1. The comparison only assessed average daily traffic volume data from 2012 to 2019 as this would represent the pre-Covid trend in traffic.

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

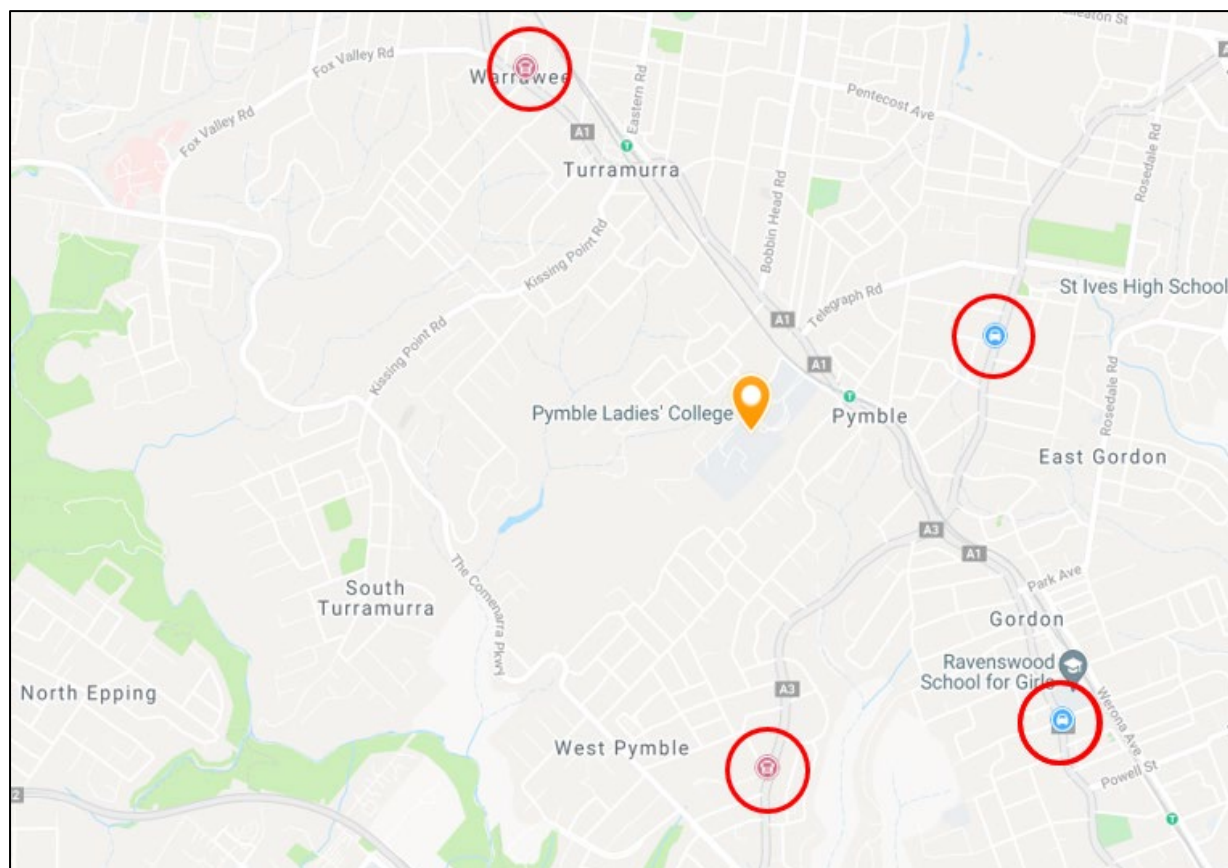


Figure 1: Surrounding Traffic Counters

Table 1: Summary of Total Average Daily Traffic Volumes

Year	Total Average Daily Traffic Volume	% Change
Pacific Highway 53198		
2012	64,240	-
2013	64,922	1.06%
2014	64,511	-0.63%
2015	65,561	1.63%
2016	62,901	-4.06%

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

Year	Total Average Daily Traffic Volume	% Change
2017	(No data available)	-
2018	65,792	-
2019	64,430	-2.07%
Average Change %		-0.81%
Pacific Highway 53003		
2012	49,915	-
2013	50,189	0.55%
2014	49,363	-1.65%
2015	49,145	-0.44%
2016	48,243	-1.84%
2017	46,925	-2.73%
2018	46,813	-0.24%
2019	44,941	-4.00%
Average Change %		-1.48%
Ryde Road 53005		
2012	54,600	
2013	52,849	-3.21%

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

Year	Total Average Daily Traffic Volume	% Change
2014	51,016	-3.47%
2015	59,364	16.36%
2016	61,046	2.83%
2017	64,252	5.25%
2018	63,534	-1.12%
2019	64,270	1.16%
Average Change %		2.54%
Mona Vale Road 53001		
2012	41,911	-
2013	42,124	0.51%
2014	42,340	0.51%
2015	(No data available)	-
2016	(No data available)	-
2017	46,069	-
2018	44,400	-3.62%
2019	44,981	1.31%
Average Change %		-0.32%

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

Based on the available data, there is no evidence to suggest that background traffic along the major roads, surrounding the College have been growing over time. Nevertheless, a 1% background traffic growth has been applied to the 2012 AM and PM peak traffic volumes which results in the following turning volumes at the roundabout and provides a base case for the SIDRA modelling.

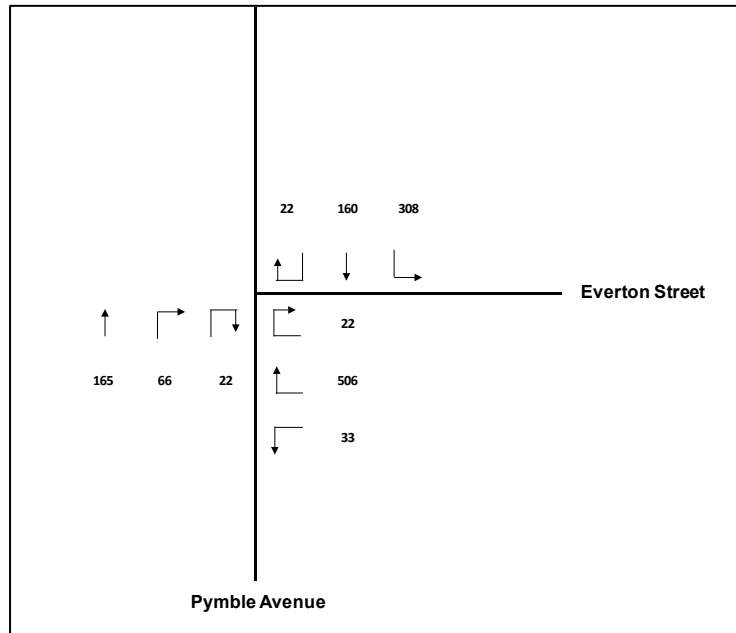


Figure 2: Estimated 2022 Traffic Volume AM Peak

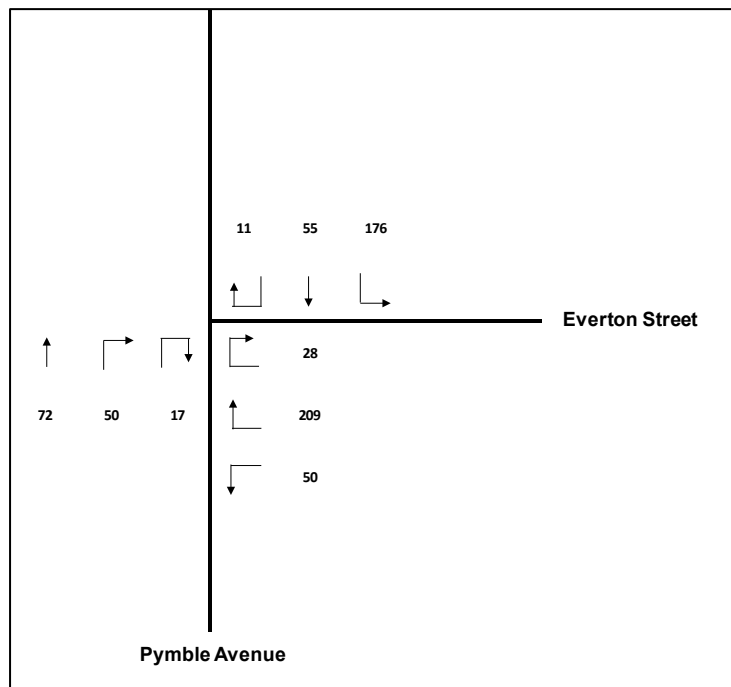


Figure 3: Estimated 2022 Traffic Volume PM Peak

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

The forecasted additional traffic generated by the proposed ELC has been applied to the base case and modelled using SIDRA 9.0. The results are shown in the table below. Detailed SIDRA results have been added to Appendix G and H of the TIA.

Table 2: Avon Road & Pymble Avenue & Everton Street Intersection SIDRA Results

Avon Road & Pymble Avenue & Everton Street				
Scenario	AM Peak		PM peak	
	Average Delay (secs/veh)	Level of Service (LoS)	Average Delay (secs/veh)	Level of Service (LoS)
Existing	15.4	B	11.1	A
Post-development	17.5	B	11.6	A

The SIDRA results indicate that the forecasted traffic generated from the ELC will have minor impact to the existing conditions of the roundabout with Level of Service (LoS) maintained and minor increments in average delays.

Stantec does not believe that a SIDRA assessment is necessary for the intersection between Pymble Avenue and Rand Avenue, when considering the small volume of additional traffic that will be travelling through the junction. As mentioned in the TIA and further within this memo, the Grey House Walk will only be accessible for local students who live along Pymble Avenue (currently permits are required to be shown to staff members who monitor the entrance). As such, the additional traffic along Pymble Avenue, as a result of the ELC, is expected to be made up of those travelling from the south such as South Turramurra & West Ryde.

When analysing the postcode data received by PLC approximately 12% of existing students live south of the College and may use Pymble Avenue to travel to/ from the campus. The ELC is estimated to generate 72 trips in the AM peak and 63 trips in the PM peak (based on RMS trip rates). This will equate to approximately 9 vehicles in the AM peak and 8 vehicles in the PM peak. An additional 9 vehicles is expected to have insignificant impact to the existing roadway conditions along Pymble Avenue and minor intersections along this roadway.

DPIE's comment:

The Department notes that the SIDRA analysis concludes that the delays at one of the signalised intersections is currently >70 secs and this would be maintained in the future. This is not considered an acceptable result as it does not provide any details of how much increase of delays at this intersection is expected due to the proposed increase in vehicular movements. You are requested to provide clear figures to indicate how much increase in delays (if any) is expected.

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

Stantec's response:

The SIDRA results have been updated to provide clear figures to indicate how much increase in delays is expected. See tables below.

Table 3: Pacific Highway & Livingstone Avenue Intersection SIDRA Results

Pacific Highway & Livingstone Avenue				
Scenario	AM Peak		PM peak	
	Average Delay (secs/veh)	Level of Service (LoS)	Average Delay (secs/veh)	Level of Service (LoS)
Existing	18.4	B	105.0	F
Post-development	19.4	B	107.7	F

Table 4: Pacific Highway & Beechworth Avenue SIDRA Results

Pacific Highway & Beechworth Avenue				
Scenario	AM Peak		PM peak	
	Average Delay (secs/veh)	Level of Service (LoS)	Average Delay (secs/veh)	Level of Service (LoS)
Existing	354.1	F	484.2	F
Post-development	356.8	F	482.2	F

As shown in the tables above, the proposed development will have minor impact to the existing conditions of the signalised intersections along Pacific Highway.

DPIE's comment:

The traffic modelling does not consider the ultimate development year plus 10-year background growth of the intersections. It is requested that the TAR should include background growth of the intersections in the 10-year horizon.

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

Stantec's response:

A meeting was held with TfNSW to discuss SIDRA modelling requirements and consideration for the ultimate development year plus 10-year background growth of the intersections.

Considering the minor traffic impact expected from the Grey House Precinct it was agreed with TfNSW that modelling for the additional 10-year background growth will not be required as long as justification is provided within the assessment. This is summarised in Section 9.3.3 of the TIA and repeated below. Refer to Appendix E for correspondence with TfNSW.

Stantec considers that the proposed development does not constitute the need to assess the 10-year horizon based on the following reasons:

- The ELC is expected to have a peak generation of approximately 72 trips. When factoring in the trip distribution, this will result in approximately 25 additional trips through the Pacific Highway/ Beechworth Road intersection and 63 additional trips through the Pacific Highway/ Livingstone Avenue intersection. This is equivalent to approximately 1 trip per 2.5 minutes and 1 trip per minute respectively which is considered a minor increment in traffic;
- Trips associated with ELCs are generally spread throughout the peak hours, particularly in the afternoon where some children may be picked up during the after-school peak, and others may be picked-up during after-work peak (i.e. working parents picking up their children). As such, due to the spreading out of trips, the overall impact that the ELC will have on the wider road network will not be as significant, when comparing additional trips generated by the increase in student numbers for Kindergarten-Year 12; and
- A peak traffic generation of 72 trips is also considered an overestimation, when reality, the traffic generated by the development is expected to be lower (estimated to be 34 trips in the AM peak and 29 trips in the PM peak¹). Primary reason for the ELC being set up is to allow the College to provide early learning services for staff who have children, which in turn, will allow the College to retain its staff members. As such, many of the children attending the ELC will have parents who are staff members of the College and will not contribute to generating additional traffic.

When considering the above, the proposed development is expected to have a minor impact to overall traffic conditions and an assessment of a 10-year horizon is not considered necessary.

DPIE's comment:

The proposed development does not include provisions for car parking. The EIS and the TAR state that the aquatic centre (outside of the subject precinct area) includes a number of car spaces, out of which 37 car parking spaces would be utilised for the purpose of the early learning centre (ELC).

Stantec's response:

This is correct. The proposed development does not include provision of any additional car parking spaces to what is currently provided within the College campus. The intention is for the 37 car parking

¹ Based on rates stipulated in the RMS Guide to Traffic Generating Developments (2002), the Grey House Precinct is expected to generate 72 trips in the AM peak and 63 trips in the PM peak. However, these values are considered conservative and realistic estimates are expected to be 34 trips in the AM peak and 29 trips in the PM peak, based on the reasons outlines in Section 9.1 of the TIA.

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

spaces, currently allocated to the aquatic centre and is not available to the rest of the staff as it is sectioned off via boom-gates, to be shared between the ELC and the aquatic centre.

DPIE's comment:

While the EIS notes that the ELC will operate from 7am to 6:30pm, the aquatic centre closing time has not been mentioned in the EIS (opening time being 9:30am). In the absence of this data, the Department cannot ascertain as to how 37 car spaces would be available for exclusive ELC use in the PM within this centre. Although, the Department acknowledges that 42 students of the ELC are expected to be children of staff and thus not generating the need for parking, this cannot be guaranteed in the future operationally.

You are requested to address this matter in detail and provide a detail profile of usage of the aquatic centre, the ELC and then explain how the proposed shared use of the car parking spaces would be managed in the future so that parents do not park on the nearby streets and then walk to the site.

Stantec's response:

The parking provision has been calculated based on Ku-ring-gai Council's requirements for Child Care Centres:

- 1 space per 4 children in care (Rate includes staff parking. Bulk of parking should be in a convenient location, allowing safe setdown/ pick-up and movement of children. Provision is also to be made for bus services).

Based on the rate above, the ELC is required to provide a minimum of 23 car parking spaces. The development proposes to provide 37 existing spaces in the Centenary Car Park, currently allocated for aquatic use, for ELC drop-off and pick-up.

The Learn to Swim operates in the morning from 9:00am to 12:00pm and in the afternoon from 3:30pm to 6:00pm Monday to Saturday. The morning learn to swim programme is open to the wider community whilst the afternoon programme is only open to College students, thus not requiring separate parking.

The ELC will open from 7am with peak drop-off expected to occur between 7:00am to 8:00am. As such, overlap between the ELC and Aquatic Centre use is not expected to be an issue in the morning.

In the afternoon, peak pick-up for the ELC is expected to occur between 4:30pm to 6:30pm. Seeing as the afternoon Learn to Swim programme is only open to College students, the parking demand is not expected to be significant, as most College students will already be on campus. However, there will be a demand for parking at the end of each Learn to Swim programme and students are being picked up by parents/ guardians. Nonetheless, normal school time will be over and majority of the spaces within the Centenary Car Park, which has a capacity of 212 parking spaces (excluding the 37 spaces within the boom-gated area proposed to be shared between the ELC and the aquatic centre in the morning periods), will be available for use.

A new accessible space (with associated shared bay) will also be provided within the boom-gated area which satisfies the Council DCP's minimum requirement of one accessible space.

DPIE's comment:

Additionally, the ELC staff would need parking for the entire day. This cannot be provided within the aquatic centre. Please specify the location of the parking spaces for the ELC staff.

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

Stantec's response:

37 parking spaces will be allocated to the ELC, which is 14 more spaces than what is required by the Ku-ring-gai Council DCP. It is also noted that the Council DCP requirements also includes staff parking.

20 parking spaces will be provided for drop-off and pick-up, whilst 17 parking spaces will be provided for staff. A parking space is currently provided for the Head of Early Learning which is located outside the boom-gated area.

DPIE's comment:

The location of the disabled car parking spaces is not clear in the submitted plans. The parking spaces would be located about 74m away from the proposed buildings, which is not conducive for the persons with disability. You are requested to address this issue.

Stantec's response:

Plan has been prepared by BVN which shows the locations of the accessible car parking space in relation to the Grey House Precinct. Refer to Attachment B of this memo.

Morris Goding Access Consulting have provided a markup of acceptable accessible path of travel from the parking spaces to the Grey House Precinct. The access consultant has indicated that the existing accessible path is longer than the non-accessible path due to the existing topography, ramps (length of the 1:20 ramp) and gradients. Refer to Attachment B of this memo and Memo prepared by Morris Goding Access Consulting.

DPIE's comment:

The pedestrian connection from Pymble Avenue, the Grey House walkway, would be used significantly during operation of the precinct. However, the walkway is very narrow. The TAR does not include an assessment of the pedestrian volume that would use this walkway and whether the current width is suitable for such use. You are requested to address this issue.

Stantec's response:

The number of people using the Grey House walkway will not increase during the operation of the precinct.

Permits are required to enter via the Grey House walkway with staff monitoring at the entrance. The ELC parents manual will also stipulate that the pick-up and drop-off is within the Aquatic Centre that has been designated for the ELC. All ELC parents will be given an access remote for the boomgate.

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

We trust that the information provided will assist with the assessment of the application. Should you require any further information or would like to discuss any issues, please do not hesitate to contact the undersigned.

Regards,

Sunny Hong
Transportation Engineer
sunny.hong@stantec.com

Attachment: **Attachment A – SIDRA Results**

Attachment B – Car Park & Accessible Path Plan

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

ATTACHMENT A

SIDRA RESULTS

MOVEMENT SUMMARY

 **Site: 103A [Base Case - Avon Road & Pymble Avenue & Everton Street AM Peak (Site Folder: Base Case)]**

Base Case AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Pymble Avenue														
2	T1	165	0.0	174	0.0	0.444	11.0	LOS A	3.1	22.0	0.81	0.93	0.89	49.3
3	R2	66	0.0	69	0.0	0.444	13.9	LOS A	3.1	22.0	0.81	0.93	0.89	44.7
3u	U	22	0.0	23	0.0	0.444	15.4	LOS B	3.1	22.0	0.81	0.93	0.89	49.4
Approach		253	0.0	266	0.0	0.444	12.2	LOS A	3.1	22.0	0.81	0.93	0.89	48.4
East: Everton Street														
4	L2	33	0.0	35	0.0	0.613	7.7	LOS A	5.5	38.3	0.68	0.73	0.70	45.9
6	R2	506	0.0	533	0.0	0.613	10.4	LOS A	5.5	38.3	0.68	0.73	0.70	46.4
6u	U	22	0.0	23	0.0	0.613	11.9	LOS A	5.5	38.3	0.68	0.73	0.70	37.9
Approach		561	0.0	591	0.0	0.613	10.3	LOS A	5.5	38.3	0.68	0.73	0.70	46.1
North: Avon Road														
7	L2	308	0.0	324	0.0	0.422	5.8	LOS A	3.3	23.2	0.42	0.56	0.42	49.1
8	T1	160	0.0	168	0.0	0.422	5.6	LOS A	3.3	23.2	0.42	0.56	0.42	53.1
9u	U	22	0.0	23	0.0	0.422	10.0	LOS A	3.3	23.2	0.42	0.56	0.42	53.2
Approach		490	0.0	516	0.0	0.422	5.9	LOS A	3.3	23.2	0.42	0.56	0.42	50.9
All Vehicles		1304	0.0	1373	0.0	0.613	9.0	LOS A	5.5	38.3	0.61	0.70	0.63	48.4

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

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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: 103B [Base Case - Avon Road & Pymble Avenue & Everton Street PM Peak (Site Folder: Base Case)]**

Base Case PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Pymble Avenue														
2	T1	72	0.0	76	0.0	0.169	6.7	LOS A	0.9	6.3	0.48	0.67	0.48	51.9
3	R2	50	0.0	53	0.0	0.169	9.6	LOS A	0.9	6.3	0.48	0.67	0.48	48.0
3u	U	17	0.0	18	0.0	0.169	11.1	LOS A	0.9	6.3	0.48	0.67	0.48	52.0
Approach		139	0.0	146	0.0	0.169	8.3	LOS A	0.9	6.3	0.48	0.67	0.48	50.8
East: Everton Street														
4	L2	50	0.0	53	0.0	0.268	5.6	LOS A	1.6	11.2	0.30	0.62	0.30	47.6
6	R2	209	0.0	220	0.0	0.268	8.3	LOS A	1.6	11.2	0.30	0.62	0.30	48.1
6u	U	28	0.0	29	0.0	0.268	9.8	LOS A	1.6	11.2	0.30	0.62	0.30	40.4
Approach		287	0.0	302	0.0	0.268	8.0	LOS A	1.6	11.2	0.30	0.62	0.30	47.6
North: Avon Road														
7	L2	176	0.0	185	0.0	0.210	5.5	LOS A	1.2	8.5	0.30	0.55	0.30	49.6
8	T1	55	0.0	58	0.0	0.210	5.4	LOS A	1.2	8.5	0.30	0.55	0.30	53.5
9u	U	11	0.0	12	0.0	0.210	9.8	LOS A	1.2	8.5	0.30	0.55	0.30	53.6
Approach		242	0.0	255	0.0	0.210	5.7	LOS A	1.2	8.5	0.30	0.55	0.30	51.0
All Vehicles		668	0.0	703	0.0	0.268	7.2	LOS A	1.6	11.2	0.33	0.60	0.33	49.6

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

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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: 103A [Post-development - Avon Road & Pymble Avenue & Everton Street AM Peak (Site Folder: Post-Development)]**

Base Case AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Pymble Avenue														
2	T1	174	0	183	0.0	0.505	13.1	LOS A	3.9	27.5	0.87	1.01	1.03	48.0
3	R2	66	0	69	0.0	0.505	16.0	LOS B	3.9	27.5	0.87	1.01	1.03	43.1
3u	U	22	0	23	0.0	0.505	17.5	LOS B	3.9	27.5	0.87	1.01	1.03	48.1
Approach		262	0	276	0.0	0.505	14.2	LOS A	3.9	27.5	0.87	1.01	1.03	47.1
East: Everton Street														
4	L2	33	0	35	0.0	0.677	8.5	LOS A	7.2	50.6	0.74	0.75	0.80	45.2
6	R2	569	0	599	0.0	0.677	11.3	LOS A	7.2	50.6	0.74	0.75	0.80	45.6
6u	U	22	0	23	0.0	0.677	12.8	LOS A	7.2	50.6	0.74	0.75	0.80	36.9
Approach		624	0	657	0.0	0.677	11.2	LOS A	7.2	50.6	0.74	0.75	0.80	45.4
North: Avon Road														
7	L2	355	0	374	0.0	0.461	5.8	LOS A	3.8	26.8	0.45	0.56	0.45	49.0
8	T1	160	0	168	0.0	0.461	5.7	LOS A	3.8	26.8	0.45	0.56	0.45	53.1
9u	U	22	0	23	0.0	0.461	10.1	LOS A	3.8	26.8	0.45	0.56	0.45	53.1
Approach		537	0	565	0.0	0.461	5.9	LOS A	3.8	26.8	0.45	0.56	0.45	50.7
All Vehicles		1423	0	1498	0.0	0.677	9.8	LOS A	7.2	50.6	0.65	0.73	0.71	47.7

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

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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: 103B [Post-development - Avon Road & Pymble Avenue & Everton Street PM Peak (Site Folder: Post-Development)]**

Base Case PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Pymble Avenue														
2	T1	80	0	84	0.0	0.190	7.2	LOS A	1.0	7.1	0.53	0.69	0.53	51.7
3	R2	50	0	53	0.0	0.190	10.1	LOS A	1.0	7.1	0.53	0.69	0.53	47.8
3u	U	17	0	18	0.0	0.190	11.6	LOS A	1.0	7.1	0.53	0.69	0.53	51.8
Approach		147	0	155	0.0	0.190	8.7	LOS A	1.0	7.1	0.53	0.69	0.53	50.7
East: Everton Street														
4	L2	50	0	53	0.0	0.316	5.6	LOS A	2.0	14.0	0.31	0.62	0.31	47.5
6	R2	264	0	278	0.0	0.316	8.4	LOS A	2.0	14.0	0.31	0.62	0.31	48.0
6u	U	28	0	29	0.0	0.316	9.9	LOS A	2.0	14.0	0.31	0.62	0.31	40.3
Approach		342	0	360	0.0	0.316	8.1	LOS A	2.0	14.0	0.31	0.62	0.31	47.6
North: Avon Road														
7	L2	217	0	228	0.0	0.244	5.5	LOS A	1.5	10.4	0.31	0.55	0.31	49.6
8	T1	55	0	58	0.0	0.244	5.4	LOS A	1.5	10.4	0.31	0.55	0.31	53.5
9u	U	11	0	12	0.0	0.244	9.8	LOS A	1.5	10.4	0.31	0.55	0.31	53.6
Approach		283	0	298	0.0	0.244	5.7	LOS A	1.5	10.4	0.31	0.55	0.31	50.8
All Vehicles		772	0	813	0.0	0.316	7.3	LOS A	2.0	14.0	0.35	0.61	0.35	49.4

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

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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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Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

ATTACHMENT B

CAR PARK & ACCESSIBLE PATH PLAN

Appendix J RESPONSE TO COUNCIL COMMENTS



To: Kate Bimson
Pymble Ladies College
Project/File: SSD-17424905 Response to Council comments
From: Sunny Hong
Sydney
Date: 16 February 2022

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

Dear Kate,

Stantec was engaged by Pymble Ladies College, herein referred to as 'the College', to prepare a Transport Impact Assessment (TIA) for the Grey House Precinct.

The TIA has been submitted to the Department of Planning, Industry & Environment (DPIE) for review and approval. As part of the assessment, Ku-ring-gai Council has provided comments and requested for additional information in a letter to DPIE dated 6 December 2021.

This memo is Stantec's response to Council's comments.

Council's comment:

Unclear why the crash history on Avon Road and intersection Avon/ Pymble/ Everton was not considered.

Stantec's response:

Publicly available data (TfNSW Centre for Road Safety) does not indicate any crashes along Avon Road and intersection between Avon Road/ Pymble Avenue and Everton Street from 2016 to 2020.

Crashes not included in TfNSW's data may be due to the following reasons:

- Crashes were not reported to the police
- Did not involve at least one person being injured, killed or at least one motor vehicle being towed away.

Council's comment:

"The College proposes to utilise the existing swim school spaces located in the Centenary Car Park. In order to accommodate an accessible space and its adjacent shared bay, two existing spaces will need to be replaced and result in a total of 37 parking spaces. This will provide 37 parking spaces (including one accessible space) for the ELC to be used during drop-off and pick-up.

Drop-off for the ELC is expected to be between 7:00-7:30am whilst pick-up will be between 6:00-6:30pm. This will allow the ELC to operate in parallel with the OSHC and allow for working parents to drop-off/ pick-up their children before/ after work. However it is noted that drop-off and pick-up for ELCs are typically spread throughout several hours, particularly in the afternoon where there is an after-school and after-work peak"

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

How does this work with co-curricular activities within the College grounds that take place between 6:30am to 8:00am and 3:00pm to 6:30pm Monday to Friday – is there a conflict, or are different areas used for the drop-off/ pick-up? Recent traffic counts in surrounding streets indicate that the AM peak occurs at 7am-8am, so there will likely be a cumulative impact to surrounding local roads by non-staff arrivals/ departures to the ELC. This issue needs to be addressed.

Stantec's response

The 37 parking spaces will be shared between the existing Learn to Swim programs and the ELC. These are existing parking spaces that are located in a boom-gated area within the Centenary Car Park and are currently used exclusively by the Learn to Swim users.

The Learn to Swim operates in the morning from 9:00am to 12:00pm and in the afternoon from 3:30pm to 6:00pm Monday to Saturday. The morning learn to swim programme is open to the wider community whilst the afternoon programme is only open to College students, thus not requiring separate parking.

The ELC will open from 7am with peak drop-off expected to occur between 7:00am to 8:00am. As such, overlap between the ELC and Aquatic Centre use is not expected to be an issue in the morning.

In the afternoon, peak pick-up for the ELC is expected to occur between 4:30pm to 6:30pm. Seeing as the afternoon Learn to Swim programme is only open to College students, the parking demand is not expected to be significant, as most College students will already be on campus. However, there will be a demand for parking at the end of each Learn to Swim programme where students are being picked up by parents/ guardians. Nonetheless, normal school time will be over and majority of the spaces within the Centenary Car Park, which has a capacity of 212 parking spaces (excluding the 37 spaces within the boom-gated area proposed to be shared between the ELC and the aquatic centre in the morning periods), will be available for use.

As such, Stantec does not foresee any major issues with the shared use of the parking spaces between the ELC and the aquatic centre and considers this a more appropriate proposal compared to the removal of vegetation/ green space or utilising space that otherwise can be used as practical learning spaces in order to provide more parking spaces.

Council's comment:

In Section 3, Proposed Development, it is indicated that staff demand for ELC places could be upwards of 60 children. In this section though the impression given is that the wider community will be the main users, by the fact that in this section of the traffic impact assessment staff are not mentioned as the users. Presumably staff could park in their allocated spaces and walk their children to the ELC without needing to use the Centenary Car Park.

This is later clarified in Section 9.1 (TRAFFIC GENERATION), where it is noted that the number of children enrolled at the ELC who would contribute to additional traffic is expected to be less than 90 children due to the premise that the main intention of the ELC is to provide an on-campus early learning/ child care centre for staff and based on staff survey results it is assumed that 42 children from staff members would be enrolled and would therefore not generate additional traffic.

Notionally, this should also reduce the parking demand in the Centenary Car Park as presumably staff could park in their allocated spaces and walk their children to the ELC without needing to use the Centenary Car Park. This has not been considered but should be clarified.

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

Stantec's response:

The primary reason for setting up the ELC is to allow the College to provide early learning services for staff members who have children. This will, in turn, allow the College to retain many of its staff members who, otherwise, would often leave their position to care for their children. As such, it is expected that many of the children enrolled within the ELC will have parents who are staff members of the College, and this is reflected in the survey undertaken by the College (refer to Appendix B of the TIA).

As such, the traffic and parking impact from the proposed ELC is expected to be minor and Stantec agrees with Council's notion that this will also reduce the parking demand in the Centenary Car Park as staff who will enrol their children in the ELC could park in their allocated spaces within the campus and walk their children to the ELC without needing to use the Centenary Car Park.

However, with that being said, the ELC will be open to wider community and it is difficult to forecast how many staff members will enrol their children in the ELC in the future. As such, the TIA assessed the traffic and parking impacts based on the worst case scenario (all children enrolled in the ELC do not have parents who are staff members of the College) and concluded that the impact will be minor to the existing conditions.

Council's comment:

The intersection of Avon Road/ Pymble Avenue/ Everton Road should have also been considered and assessed in the Signalised & Unsignalised Intersection Design and Research Aid (SIDRA assessment, particularly since there is a key pedestrian crossing and commuter drop-off/ pick-up areas in close proximity to the intersection. Also, consideration should be given to assessing impacts to the route between the site and the traffic signals on Pacific Highway and Beechworth Road (i.e. Avon Road/ Arilla Road/ Mayfield Avenue/ Allawah Road/ Beechworth Road), which has experienced gradual increases in traffic volumes over the years partly as a result of traffic movements from PLC.

Stantec's response:

The roundabout between Avon Road/ Everton Road/ Pymble Avenue has been modelled using SIDRA 9.0.

Due to the Covid-19 pandemic and the Omicron variant which resulted in many people working from home and the school summer holiday period, collecting traffic counts at the roundabout was not considered appropriate as it would not reflect normal school peak conditions. As such, similarly to the assessment of the signalised intersections along Pacific Highway, the modelling had to rely on historical data gathered in 2012. In order to baseline the growth in traffic since 2012, an assessment of the historical data available from TfNSW's Traffic Volume Viewer was undertaken.

The assessment looked at four counters around the College as shown in the figure below. The historical average daily traffic volumes are summarised in Table 1. The comparison only assessed average daily traffic volume data from 2012 to 2019 as this would represent the pre-Covid trend in traffic.

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

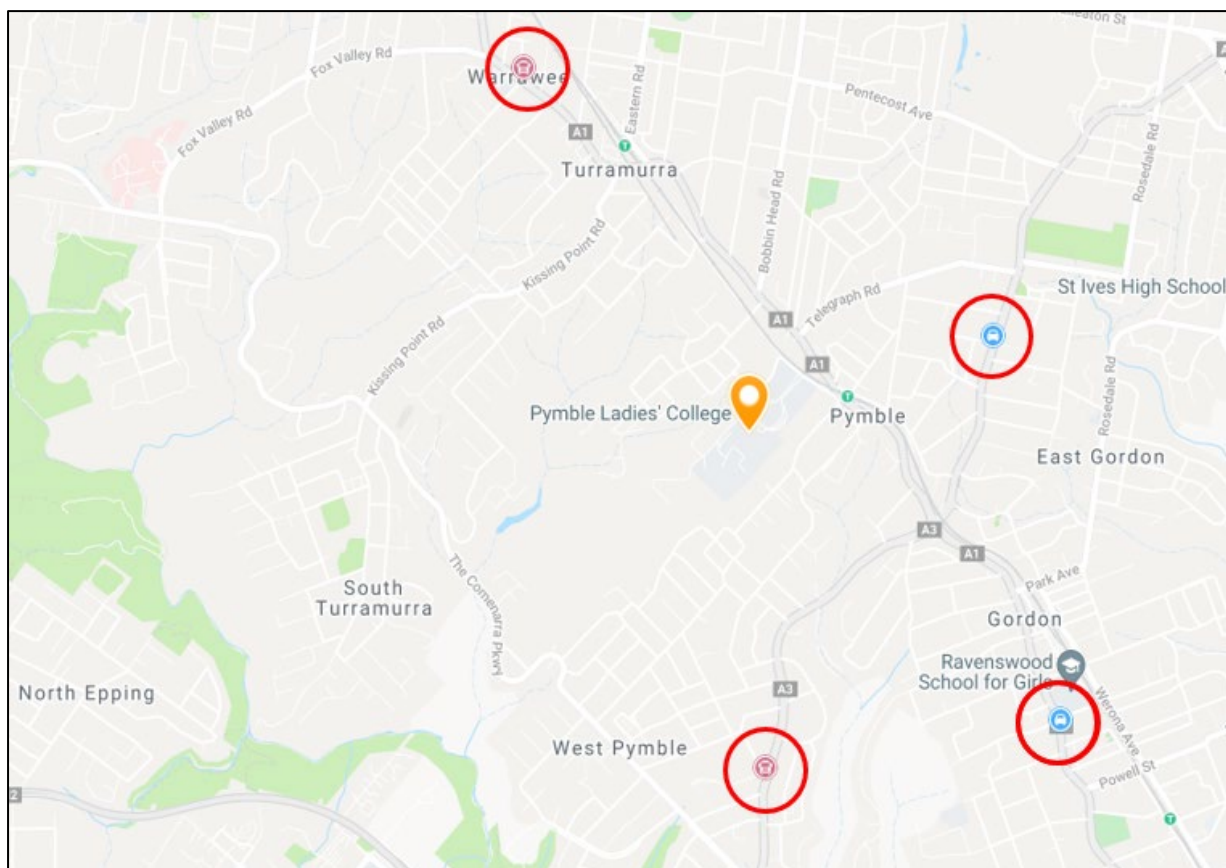


Figure 1: Surrounding Traffic Counters

Table 1: Summary of Total Average Daily Traffic Volumes

Year	Total Average Daily Traffic Volume	% Change
Pacific Highway 53198		
2012	64,240	-
2013	64,922	1.06%
2014	64,511	-0.63%
2015	65,561	1.63%
2016	62,901	-4.06%

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

Year	Total Average Daily Traffic Volume	% Change
2017	(No data available)	-
2018	65,792	-
2019	64,430	-2.07%
Average Change %		-0.81%
Pacific Highway 53003		
2012	49,915	-
2013	50,189	0.55%
2014	49,363	-1.65%
2015	49,145	-0.44%
2016	48,243	-1.84%
2017	46,925	-2.73%
2018	46,813	-0.24%
2019	44,941	-4.00%
Average Change %		-1.48%
Ryde Road 53005		
2012	54,600	
2013	52,849	-3.21%

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

Year	Total Average Daily Traffic Volume	% Change
2014	51,016	-3.47%
2015	59,364	16.36%
2016	61,046	2.83%
2017	64,252	5.25%
2018	63,534	-1.12%
2019	64,270	1.16%
Average Change %		2.54%
Mona Vale Road 53001		
2012	41,911	-
2013	42,124	0.51%
2014	42,340	0.51%
2015	(No data available)	-
2016	(No data available)	-
2017	46,069	-
2018	44,400	-3.62%
2019	44,981	1.31%
Average Change %		-0.32%

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

Based on the available data, there is no evidence to suggest that background traffic along the major roads, surrounding the College have been growing over time. Nevertheless, a 1% background traffic growth has been applied to the 2012 AM and PM peak traffic volumes which results in the following turning volumes at the roundabout and provides a base case for the SIDRA modelling.

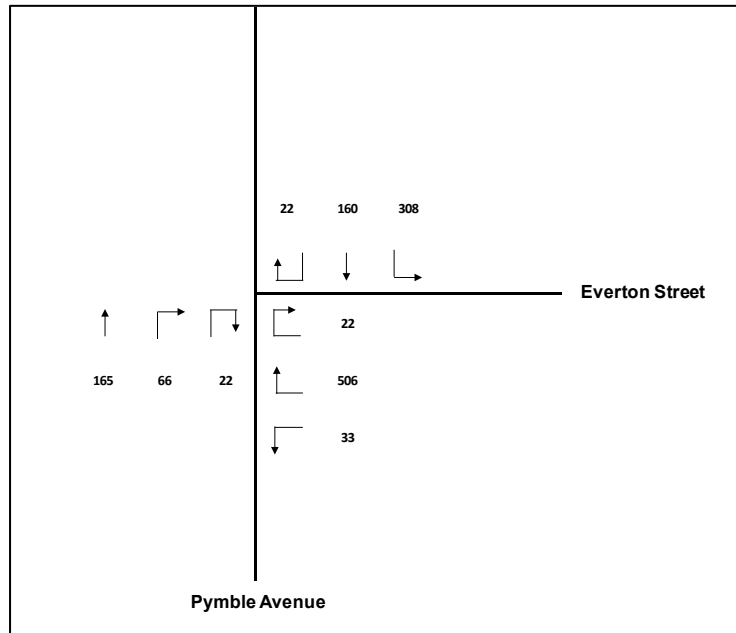


Figure 2: Estimated 2022 Traffic Volume AM Peak

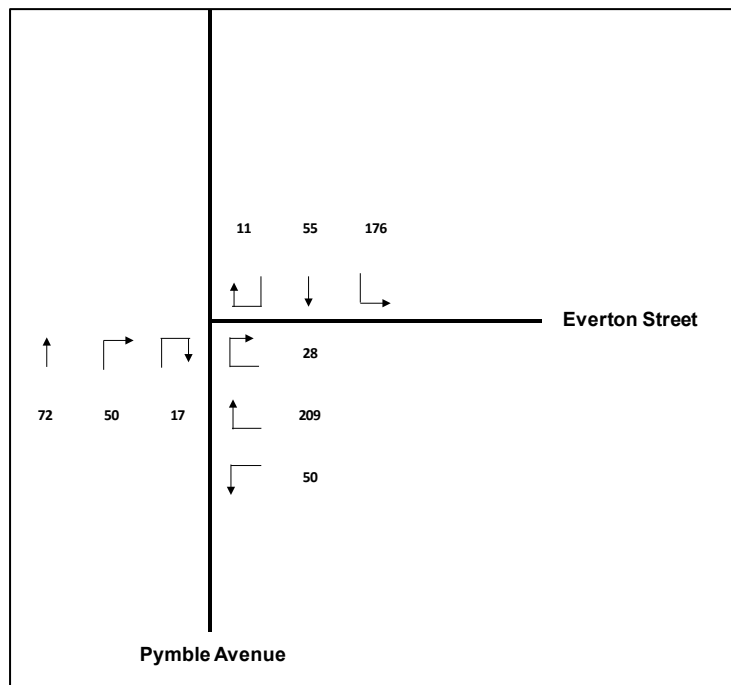


Figure 3: Estimated 2022 Traffic Volume PM Peak

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

The forecasted additional traffic generated by the proposed ELC has been applied to the base case and modelled using SIDRA 9.0. The results are shown in the table below. Refer to Attachment A for detailed results.

Table 2: Avon Road & Pymble Avenue & Everton Street Intersection SIDRA Results

Avon Road & Pymble Avenue & Everton Street				
Scenario	AM Peak		PM peak	
	Average Delay (secs/veh)	Level of Service (LoS)	Average Delay (secs/veh)	Level of Service (LoS)
Existing	15.4	B	11.1	A
Post-development	17.5	B	11.6	A

The SIDRA results indicate that the forecasted traffic generated from the ELC will have minor impact to the existing conditions of the roundabout with Level of Service (LoS) maintained and minor increments in average delays.

Stantec does not believe that SIDRA modelling is necessary to assess the impacts that the additional traffic generated by the proposed ELC will have on the intersections along the route between the College and the signalised intersection between Pacific Highway and Beechworth Road (i.e. via Arilla Road, Mayfield Avenue and Allawah Road).

Since right turn into Beechworth Road from Pacific Highway is currently not allowed, the only trips that are expected to use this route are outbound vehicles travelling towards the north. When analysing the postcode data received by PLC, approximately 35% of existing students live to the north of the College and may use this route. The ELC is estimated to generate 72 trips in the AM peak and 63 trips in the PM peak (based on RMS trip rates). This will equate to approximately additional 25 trips in the AM peak and 22 trips in the PM peak possibly utilising this route.

It is noted that the primary intention of the ELC is to provide an on-campus early learning/ child care centre for the staff members and allow the College to retain valuable staff members who would otherwise find it difficult to return to work after maternal/ parental leave. As such, in reality these trips are expected to be lower than what has been estimated.

Nevertheless, an additional 25 vehicles is expected to have minor impact to the existing roadway conditions along this route. The ELC will be opening from 7am each morning, with drop-off occurring between 7am-9am and peak pick-up occurring between 4:30pm-6:30pm. As such, these additional 25 trips will most likely be spread across the drop-off and pick-up periods and unlikely to be arriving/ departing all at the same time. This is typical traffic behaviour with long day care centres.

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

Council's comment:

"Install gate at Grey House Walk which can only be opened using a key card, which can be distributed to local students (College to determine definition of 'local students'). This will reduce College traffic along Pymble Avenue"

The recommendation to install a gate at the entry to Grey House Walk, with keycard entry to local students may discourage students from walking to school that way.

Stantec's response:

Currently, students are required permits to enter/ exit via the Grey House Walk with staff monitoring the gate. Following the College's co-curricular activities, the Grey House Walk is shut at 6:00pm. At times, the College has accommodated local families for events such as theatre events and other performances.

The intention of the Grey House Walk is to be used by local students who live along Pymble Avenue, not by the whole College.

This in turn, will reduce the number of students using the entrance and deter parents/ guardians from dropping off and picking up students along Pymble Avenue.

All ELC parents will be given access remote for the boom gate, which will allow access into the restricted parking area within the Centenary Car Park.

Council's comment:

"Work closely with Ku-ring-gai Council to implement timed parking along Pymble Avenue, with exception to permit holders. Permits can be made available to residents"

It should be noted that Council has a policy not to enter into Resident Parking Schemes or issue Resident Parking Permits.

The recommendation that Council consider timed parking restrictions on Pymble Avenue near Grey House Walk with permits for residents is not supported by Council's Traffic and Transport Team. This would encourage parents to use this area for drop-off/ pick-up instead of the designated car park within the school grounds.

Stantec's Response:

Noted. This has been removed from the recommendations list.

Council's comment:

"Investigate feasibility of providing remote drop-off and pick-up area (e.g. nearby park)"

With regard to a remote pick-up/ drop-off area, Council staff would require more information regarding possible locations to determine whether it would be feasible. There is also a possible issue with quarantining parking for the college in an area that is nowhere near the College.

Stantec's response:

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

Noted. This is to recommend that ongoing collaboration should take place between the College and Kuring-gai Council to reduce the school's traffic impact on the immediate surrounding road network. Further investigation and assessment would need to occur outside of this SSDA. This SSDA pertains to the proposed Grey House Precinct which will have minor impact to the existing traffic and parking conditions.

It is noted that the College has made arrangements with Council to allow drop-off and pick-up to occur on the other side of the rail line, along Grandview Street, which has proven to alleviate some traffic along Livingstone Avenue, Everton Street and Avon Road.

Council's comment:

"It is noted that to reduce overall traffic and parking impact in the long term, students and staff will need to make greater use of sustainable travel options (public and active transport). Measures to achieve this are discussed in the Green Travel Plan"

The ability for students to use active transport (cycling) is currently impacted by the fact that the College does not permit students to cycle to/ from the College campus for safety reasons. In reality though, the Road Rules state that children aged up to 16 years (i.e. the majority of students at PLC) are permitted to ride bicycles on footpaths, which are generally separated from traffic lanes on roads.

The Green Travel Plan sets targets for travel modes, with the objective to reduce the number of private vehicle trips and increase the uptake of alternative modes of transportation. One of the short term targets is to increase the use of public and active transport by students by 1% per year (i.e. increase public and active transport usage to approximately 30% of travel mode). To facilitate this, consideration should also be given to reviewing bicycle parking and bicycle support facilities (showers/ change rooms/ lockers etc), provision for students in this proposal, to encourage uptake of cycling. Also, a review of the access points into the site and the obstacles to cycling and walking (e.g. stairs, squeeze points etc.) should be undertaken, so as not to discourage walking or cycling for students living within walking or cycling range from the school.

With regards to improving footpaths, pedestrian facilities and cycling facilities around the college, these would be prioritised along with cycling and pedestrian facilities throughout the LGA.

Stantec's response:

Noted. Green Travel Plan has been amended to include implementation strategies to increase the use of active transportation by students. Refer to Section 7.3.1 of the GTP.

Council's comment:

The Green Travel Plan has only recommended a Travel plan Co-ordinator and a Bus Co-ordinator be key roles within the School Travel Plan Committee.

Council's Road Safety Officer suggested that an Active Travel Co-ordinator is also a key role as they would be responsible for creating/ implementing/ monitoring/ evaluating Active Travel Programs encouraging increased walking/ cycling/ scootering to and from school.

Stantec's response:

Noted. This has been added as a key role within the Travel Plan Committee. Refer to Section 7.1 of the GTP.

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

Council's comment:

"Increase the use of private bus services by 1% per year"

The school should consider investing more heavily in this area and 1% of the school population per year is not meaningful or impactful.

It equates to 22 students in a school population of 2,259 students plus 400 staff. This percentage should be reviewed/ increased.

Stantec's response:

It is noted that this is for the short-term (first 3 years of implementation) target which is to increase private bus usage to approximately 15% of the total travel mode) which is currently at 10-11% of the school population. This equates to an additional 66 students utilising the private bus services.

Nevertheless, the targets have been reviewed updated to be more ambitious. Refer to Section 6.0 of the GTP.

Council's comment:

The targets lacking in any reasonable level of ambition. More definitive actions are necessary, better benchmarking/ timeline requires more detail. Without target dates reasonable and meaningful outcomes will not be achieved.

Consideration in the table must include: Implement on-going school Active Travel initiatives/ programs

In the table, there is a lack of detailed College-led active travel initiatives/ programs regarding pedestrian/ bike/ scooter programs that could be implemented at the school. Raising road safety awareness, providing a TAG and only participating in one off events is not a sustainable way to increase regular active transport to and from school. There is no mention of community walking buses, incentivised student walking programs, weekly class/ grade pedometer challenges, external providers implementing road safety courses etc. These should be included in this section.

The expertise and knowledge regarding these programs should be driven/ conducted by the school's Active Travel Co-ordinator.

Stantec's response:

Noted. These have been included in Section 7.3.1 of the GTP.

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

We trust that the information provided will assist with the assessment of the application. Should you require any further information or would like to discuss any issues, please do not hesitate to contact the undersigned.

Regards,

Sunny Hong
Transportation Engineer
sunny.hong@stantec.com

Attachment: **Attachment A – SIDRA Results**

Reference: Pymble Ladies College - Grey House Precinct (SSD-17424905)

ATTACHMENT A

SIDRA RESULTS

MOVEMENT SUMMARY

 **Site: 103A [Base Case - Avon Road & Pymble Avenue & Everton Street AM Peak (Site Folder: Base Case)]**

Base Case AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Pymble Avenue														
2	T1	165	0.0	174	0.0	0.444	11.0	LOS A	3.1	22.0	0.81	0.93	0.89	49.3
3	R2	66	0.0	69	0.0	0.444	13.9	LOS A	3.1	22.0	0.81	0.93	0.89	44.7
3u	U	22	0.0	23	0.0	0.444	15.4	LOS B	3.1	22.0	0.81	0.93	0.89	49.4
Approach		253	0.0	266	0.0	0.444	12.2	LOS A	3.1	22.0	0.81	0.93	0.89	48.4
East: Everton Street														
4	L2	33	0.0	35	0.0	0.613	7.7	LOS A	5.5	38.3	0.68	0.73	0.70	45.9
6	R2	506	0.0	533	0.0	0.613	10.4	LOS A	5.5	38.3	0.68	0.73	0.70	46.4
6u	U	22	0.0	23	0.0	0.613	11.9	LOS A	5.5	38.3	0.68	0.73	0.70	37.9
Approach		561	0.0	591	0.0	0.613	10.3	LOS A	5.5	38.3	0.68	0.73	0.70	46.1
North: Avon Road														
7	L2	308	0.0	324	0.0	0.422	5.8	LOS A	3.3	23.2	0.42	0.56	0.42	49.1
8	T1	160	0.0	168	0.0	0.422	5.6	LOS A	3.3	23.2	0.42	0.56	0.42	53.1
9u	U	22	0.0	23	0.0	0.422	10.0	LOS A	3.3	23.2	0.42	0.56	0.42	53.2
Approach		490	0.0	516	0.0	0.422	5.9	LOS A	3.3	23.2	0.42	0.56	0.42	50.9
All Vehicles		1304	0.0	1373	0.0	0.613	9.0	LOS A	5.5	38.3	0.61	0.70	0.63	48.4

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

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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: 103B [Base Case - Avon Road & Pymble Avenue & Everton Street PM Peak (Site Folder: Base Case)]**

Base Case PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] veh/h %		DEMAND FLOWS [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh m		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Pymble Avenue														
2	T1	72	0.0	76	0.0	0.169	6.7	LOS A	0.9	6.3	0.48	0.67	0.48	51.9
3	R2	50	0.0	53	0.0	0.169	9.6	LOS A	0.9	6.3	0.48	0.67	0.48	48.0
3u	U	17	0.0	18	0.0	0.169	11.1	LOS A	0.9	6.3	0.48	0.67	0.48	52.0
Approach		139	0.0	146	0.0	0.169	8.3	LOS A	0.9	6.3	0.48	0.67	0.48	50.8
East: Everton Street														
4	L2	50	0.0	53	0.0	0.268	5.6	LOS A	1.6	11.2	0.30	0.62	0.30	47.6
6	R2	209	0.0	220	0.0	0.268	8.3	LOS A	1.6	11.2	0.30	0.62	0.30	48.1
6u	U	28	0.0	29	0.0	0.268	9.8	LOS A	1.6	11.2	0.30	0.62	0.30	40.4
Approach		287	0.0	302	0.0	0.268	8.0	LOS A	1.6	11.2	0.30	0.62	0.30	47.6
North: Avon Road														
7	L2	176	0.0	185	0.0	0.210	5.5	LOS A	1.2	8.5	0.30	0.55	0.30	49.6
8	T1	55	0.0	58	0.0	0.210	5.4	LOS A	1.2	8.5	0.30	0.55	0.30	53.5
9u	U	11	0.0	12	0.0	0.210	9.8	LOS A	1.2	8.5	0.30	0.55	0.30	53.6
Approach		242	0.0	255	0.0	0.210	5.7	LOS A	1.2	8.5	0.30	0.55	0.30	51.0
All Vehicles		668	0.0	703	0.0	0.268	7.2	LOS A	1.6	11.2	0.33	0.60	0.33	49.6

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

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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: 103A [Post-development - Avon Road & Pymble Avenue & Everton Street AM Peak (Site Folder: Post-Development)]**

Base Case AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Pymble Avenue														
2	T1	174	0	183	0.0	0.505	13.1	LOS A	3.9	27.5	0.87	1.01	1.03	48.0
3	R2	66	0	69	0.0	0.505	16.0	LOS B	3.9	27.5	0.87	1.01	1.03	43.1
3u	U	22	0	23	0.0	0.505	17.5	LOS B	3.9	27.5	0.87	1.01	1.03	48.1
Approach		262	0	276	0.0	0.505	14.2	LOS A	3.9	27.5	0.87	1.01	1.03	47.1
East: Everton Street														
4	L2	33	0	35	0.0	0.677	8.5	LOS A	7.2	50.6	0.74	0.75	0.80	45.2
6	R2	569	0	599	0.0	0.677	11.3	LOS A	7.2	50.6	0.74	0.75	0.80	45.6
6u	U	22	0	23	0.0	0.677	12.8	LOS A	7.2	50.6	0.74	0.75	0.80	36.9
Approach		624	0	657	0.0	0.677	11.2	LOS A	7.2	50.6	0.74	0.75	0.80	45.4
North: Avon Road														
7	L2	355	0	374	0.0	0.461	5.8	LOS A	3.8	26.8	0.45	0.56	0.45	49.0
8	T1	160	0	168	0.0	0.461	5.7	LOS A	3.8	26.8	0.45	0.56	0.45	53.1
9u	U	22	0	23	0.0	0.461	10.1	LOS A	3.8	26.8	0.45	0.56	0.45	53.1
Approach		537	0	565	0.0	0.461	5.9	LOS A	3.8	26.8	0.45	0.56	0.45	50.7
All Vehicles		1423	0	1498	0.0	0.677	9.8	LOS A	7.2	50.6	0.65	0.73	0.71	47.7

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

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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: 103B [Post-development - Avon Road & Pymble Avenue & Everton Street PM Peak (Site Folder: Post-Development)]**

Base Case PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] veh/h veh/h		DEMAND FLOWS [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh m		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Pymble Avenue														
2	T1	80	0	84	0.0	0.190	7.2	LOS A	1.0	7.1	0.53	0.69	0.53	51.7
3	R2	50	0	53	0.0	0.190	10.1	LOS A	1.0	7.1	0.53	0.69	0.53	47.8
3u	U	17	0	18	0.0	0.190	11.6	LOS A	1.0	7.1	0.53	0.69	0.53	51.8
Approach		147	0	155	0.0	0.190	8.7	LOS A	1.0	7.1	0.53	0.69	0.53	50.7
East: Everton Street														
4	L2	50	0	53	0.0	0.316	5.6	LOS A	2.0	14.0	0.31	0.62	0.31	47.5
6	R2	264	0	278	0.0	0.316	8.4	LOS A	2.0	14.0	0.31	0.62	0.31	48.0
6u	U	28	0	29	0.0	0.316	9.9	LOS A	2.0	14.0	0.31	0.62	0.31	40.3
Approach		342	0	360	0.0	0.316	8.1	LOS A	2.0	14.0	0.31	0.62	0.31	47.6
North: Avon Road														
7	L2	217	0	228	0.0	0.244	5.5	LOS A	1.5	10.4	0.31	0.55	0.31	49.6
8	T1	55	0	58	0.0	0.244	5.4	LOS A	1.5	10.4	0.31	0.55	0.31	53.5
9u	U	11	0	12	0.0	0.244	9.8	LOS A	1.5	10.4	0.31	0.55	0.31	53.6
Approach		283	0	298	0.0	0.244	5.7	LOS A	1.5	10.4	0.31	0.55	0.31	50.8
All Vehicles		772	0	813	0.0	0.316	7.3	LOS A	2.0	14.0	0.35	0.61	0.35	49.4

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

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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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