

PYMBLE LADIES COLLEGE

TRANSPORT AND ACCESSIBILITY
IMPACT ASSESSMENT FOR PYMBLE
LADIES COLLEGE PHASE 2
MASTERPLAN, AVON ROAD, PYMBLE

AUGUST 2012

COLSTON BUDD HUNT & KAFES PTY LTD
ACN 002 334 296
Level 18 Tower A
Zenith Centre
821 Pacific Highway
CHATSWOOD NSW 2067

Telephone: (02) 9411 2411
Facsimile: (02) 9411 2422
Email: cbhk@cbhk.com.au

REF: 8531

TABLE OF CONTENTS

1. INTRODUCTION 1

2. EXISTING CONDITIONS 5

3. TRANSPORT AND ACCESSIBILITY IMPACT ASSESSMENT 14

I. INTRODUCTION

I.1 Colston Budd Hunt & Kafes Pty Ltd has been commissioned by Pymble Ladies College to prepare the transport and accessibility impact assessment for the proposed staged Phase 2 Masterplan for Pymble Ladies College. Pymble Ladies College is located on Avon Road, west of the Pacific Highway, as shown in Figure I.

I.2 The Phase 2 Masterplan relates to works at the southern end of the College and includes:-

- Stage 1 - new aquatic and fitness centre, relocation of Mollie Dive sports field west of the existing location (to accommodate the aquatic centre facility), associated landscaping, provision of service paths and minor upgrade to Jeanette Buckham PE Centre;
 - Stage 2 - raise the Mollie Dive sports field to provide car parking under for some 230 vehicles, provision of terrace to aquatic and fitness centre, new piazza and connection avenue between the existing Lang House and Goodlet House;
 - Stage 3 - new dining facility (north of Molly Dive sports field), associated landscaping works and upgrade of boarding courtyards and service areas;
 - Stage 4 - new health care centre and associated landscaping.
-
-

-
-
- I.3 The new aquatic and fitness centre will replace the existing outdoor pool facility. The facility will include a 50 metre pool, a learn to swim pool, new seating, associated administration and staff facilities and a new fitness centre.
- I.4 The new raised sports field with underground parking will replace the existing Mollie Dive sports field.
- I.5 The new dining facility will cater for up to 600 people and will replace existing facilities within the college. The dining facility will provide for functions which are currently held in the college hall.
- I.6 The new health and well being centre will consolidate the college's counselling and supporting services into one area.
- I.7 These alterations and additions to the college are shown on plans prepared by PMDL Architects and Design. The proposed works will not result in an increase in student numbers and staff numbers at the college. The works will provide new and improved facilities for existing students and improved vehicular access and car parking arrangements.
- I.8 The Director-General's Requirements with regards to transport and accessibility are as follows:

"7. Transport and Accessibility

Construction

- **Detail access arrangements at all stages of construction and measures to mitigate any associated pedestrian, cycleway or traffic impacts.**
-
-

- **Details regarding car parking arrangements during construction, including the displacement of visitor and staff car parking. Alternative off-site arrangements should be made for staff and construction workers.**

Operational

- **Detail how the development has taken into consideration, and contributes to the achievement of, travel choices and transport objectives contained in NSW 2021, Metropolitan Plan for Sydney 2036 and the North Subregional Strategy.**
 - **Assess the implications of the proposed development for non-car travel modes (including public transport use, walking and cycling), including the potential for implementing a location-specific sustainable travel plan (eg. 'Travelsmart' or other travel behaviour change initiatives), and the provision of facilities to increase non-car mode share for travel to and from the site. This will entail an assessment of the accessibility of the site by public transport.**
 - **Provide details of the daily and peak hour vehicle movements likely to be generated by the development including the impact on nearby intersections and the need/associated funding for upgrading or road improvement works (if requires). Key intersections to be examined/modelled include:**
 - **Pacific Highway and Beechworth Road; and**
 - **Pacific Highway and Livingstone Avenue.**
-
-

-
-
- **Detail the proposed access and parking provisions associated with the proposed development, including compliance with the requirements of the relevant Australian Standards (ie. Turning paths, sight distance requirements, aisle widths, etc).**
 - **Detail the proposed number of car parking spaces and compliance with appropriate parking codes.**
 - **Detail the proposed service vehicle movements (including vehicle type and the likely arrival and departure times).**

1.9 Our assessment is set down through the following chapters:-

- Chapter 2 - describing the existing conditions; and
- Chapter 3 - assessing the transport and accessibility impact assessment, including addressing the Director-General's Requirements.

2. EXISTING CONDITIONS

- 2.1. Pymble Ladies College is located on Avon Road, west of the Pacific Highway, Pymble, as shown on Figure 1. The campus has extensive frontage to Avon Road and occupies the majority of the block bounded by Avon Road, Pymble Avenue and Avondale Golf Course. Land-use in the vicinity of the school is primarily residential with the golf course located to the south-west of the site.
- 2.2. Vehicular access to the college is available from Avon Road via three separate driveways. The main college entrance off Avon Road is located to the north-east of the site, midway between Pymble Avenue and the north-west corner of Avon Road. This driveway provides access to the formalised set-down and pick-up areas within the site as well as on-site parking for staff and visitors. The second vehicular access to the college is available from Avon Road, in the vicinity of Avondale Golf Course. This southern access driveway incorporates separate entry and exit driveways. It is primarily available for staff, delivery vehicles and for parent/carers setting down and picking up students at the Mollie Dive sports field and swimming pool facility.
- 2.3. The third vehicular access to the college is located to the north-west of the site. This combined entry and exit driveway provides access to the at-grade car park and on-site coach set-down/pick-up area located adjacent to the James Kelso Pavilion.
- 2.4. Pedestrian access to the school is available from Avon Road at the north-eastern corner of the site (linking the school campus to Pymble Railway Station), from Avon Road via the southern access driveway and from Pymble Avenue via Grey House Walkway.
-
-

-
-
- 2.5. There are substantial movements of students within the college campus and across Avon Road, particularly during the morning and afternoon periods at the start and end of the school day. Pedestrian facilities are provided on the internal circulation roads and on Avon Road. Pedestrian movements are generally concentrated on the main pedestrian walkways within the school grounds linking to Avon Road and along the northern footpath of Avon Road linking to Pymble Station. Pedestrian movements are required to mix with both college traffic and local traffic movements, particularly on the north-east section of Avon Road at the existing raised pedestrian threshold and at crossings on the internal access roads within the school campus. These crossing points, including the raised threshold on Avon Road, are supervised during the morning and afternoon peak periods.
- 2.6. Internal access is provided via a one-way internal circulation road that provides access to the main set-down/pick-up areas. Two formalised student set-down/pick-up areas are located within the college campus. These areas are provided at the following locations:-
- on the southern side of the preparatory/junior school lower access road; and
 - on the western end of the middle and senior school upper access road, in the vicinity of the flagpole area.
- 2.7. Internal access within the southern part of the college is provided via a two-way circulation road that provides access to car parking areas located adjacent to Mollie Dive sports field and the senior learning centre.
- 2.8. Pymble Ladies College provides classes for students from Kindergarten through to Year 12 and has an enrolment of some 2,120 students, comprising some 2,000 day girls and some 120 boarders. The College has a total of some 300 staff,
-
-

comprising permanent/part-time teaching staff and administration/ ancillary staff, present on any given day.

Road Network

- 2.4 The main road network in the vicinity of the site is made up of the Pacific Highway, Avon Road, Beechworth Road, Arilla Road, Pymble Avenue, Everton Street and Livingstone Avenue. The Pacific Highway is located to the north-east and provides a major link in Sydney's arterial road network. It generally provides a four to six lane divided carriageway with two or three traffic lanes in each direction. Major intersections are signalised with additional lanes for turning traffic. Clearways operate during peak periods in the direction of peak traffic flow. In the vicinity of the site, the Pacific Highway provides access through Pymble to Wahroonga and Hornsby in the north and Gordon and Chatswood to the south. The intersections of the Pacific Highway with Livingstone Avenue and Beechworth Road are controlled by traffic signals.
- 2.5 Beechworth Road is located to the north of the site and provides a north south traffic route linking to residential areas to the south of the Pacific Highway. It provides one traffic lane and one parking lane in each direction, clear of intersections.
- 2.6 Avon Road largely encompasses the college. It runs parallel with the north-west boundary of the college before a sharp bend has it also bounding the college to the north-east. Avon Road provides one traffic lane and one parking lane in each direction. Kerbside parking is generally permitted clear of intersections, though parking restrictions have been imposed at some locations, in the vicinity of Pymble Railway Station.
-
-

-
-
- 2.7 Pymble Avenue is located adjacent to the south-eastern boundary of the site and generally provides one traffic lane and one parking lane in each direction, clear of intersections. Parking restrictions have been imposed on the western side of Pymble Avenue, in the vicinity of Pymble Railway Station. Pymble Avenue intersects with Avon Road and Everton Street at a roundabout controlled intersection.
- 2.8 Everton Street is located to the south-east of the site and combines with Livingstone Avenue to provide the main access to the college to/from the Pacific Highway. It provides one traffic lane and one parking lane in each direction, clear of intersections.
- 2.9 Arilla Road combines with Mayfield Avenue to provide access to residential areas to the north. They connect with Avon Road to the north of the college, accessing the Pacific Highway via Beechworth Road. Arilla Road and Mayfield Avenue generally provide one traffic lane and one parking lane in each direction, clear of intersections.

Traffic Flows

- 2.10 In order to gauge the traffic conditions in the vicinity of the site, traffic counts were undertaken during the morning (before school) and afternoon (after school) periods, at the following locations:-
- ❑ Pacific Highway/Livingstone Avenue;
 - ❑ Pacific Highway/Beechworth Road;
 - ❑ Pymble Avenue/Everton Street/Avon Road; and
 - ❑ Avon Road/Arilla Road.
-
-

- 2.11 The college was found to have a peak traffic generation at the start of the school day (7.30am to 8.30am) and at the end of the school day (3.00pm to 4.00pm).
- 2.12 The results of the surveys are shown on Figures 2 and 3 and summarised in Table 2.1.

Table 2.1: Existing Two-Way (Sum of Both Directions) Peak Hour Traffic Flows		
Road/Location	Morning (Vehicles/Hour)	Afternoon (Vehicles/Hour)
Pacific Highway		
- north of Beechworth Road	5330	4495
- south of Beechworth Road	5675	4620
- north of Livingstone Avenue	5295	4650
- south of Livingstone Avenue	5455	4700
Beechworth Road		
- west of Pacific Highway	705	335
Livingstone Avenue		
- west of Pacific Highway	1260	570
Avon Road		
- north of Pymble Avenue	1075	485
- east of Arilla Road	690	330
- west of Arilla Road	280	275
Everton Street		
- south of Pymble Avenue	870	490
Pymble Avenue		
- west of Avon Road	425	235
Arilla Road		
- north of Avon Road	680	295

- 2.13 The results in Table 2.1 reveal the following:-
- the Pacific Highway carried traffic flows of some 5300 to 5700 vehicles per hour two-way during the morning and some 4500 4700 vehicles per hour two-way during the afternoon peak hour period;

-
-
- ❑ Avon Road in the vicinity of the main college access carried traffic flows in the range of 700 to 1100 vehicles per hour two-way during the morning peak period. Peak hour traffic flows during the afternoon were some 300 to 500 vehicles per hour two-way;
 - ❑ traffic flow in Avon Road west of Arilla Road were lower at some 250 to 300 vehicles per hour two-way during peak periods;
 - ❑ Livingstone Avenue carried some 1200 to 1300 vehicles per hour two-way during the morning and some 500 to 600 vehicles per hour two-way during the afternoon peak periods;
 - ❑ peak hour traffic flows on Beechworth Road were some 300 to 700 vehicles per hour two-way during peak periods;
 - ❑ peak hour traffic flows on Everton Street and Arilla Road were some 300 to 900 vehicles per hour two-way;
 - ❑ Pymble Avenue carried traffic flows of some 250 to 450 vehicles per hour two-way during the morning and afternoon peak periods.

2.14 In addition to the intersection counts, traffic counts were undertaken at the three college access driveways on Avon Road. The traffic counts found that the college generates some 1360 vehicles per hour two-way during the morning and some 605 vehicles per hour two-way during the afternoon peak hour period.

Intersection Operation

2.15 The capacity of the road network is largely determined by the capacity of its intersections to cater for peak period traffic flows. The surveyed intersections shown in Figures 2 and 3 have been analysed using the SIDRA computer program.

2.16 The SIDRA program simulates the operations of the intersections to provide a number of performance measures. The most useful measure provided is average delay per vehicle expressed in seconds per vehicle. Based on average delay per vehicle, SIDRA estimates the following levels of service (LOS):-

- For traffic signals, the average delay per vehicle in seconds is calculated as delay/(all vehicles), for roundabouts the average delay per vehicle in seconds is selected for the movement with the highest average delay per vehicle, equivalent to the following LOS:-

0 to 14	=	"A"	Good
15 to 28	=	"B"	Good with minimal delays and spare capacity
29 to 42	=	"C"	Satisfactory with spare capacity
43 to 56	=	"D"	Satisfactory but operating near capacity
57 to 70	=	"E"	At capacity and incidents will cause excessive delays. Roundabouts require other control mode
>70	=	"F"	Unsatisfactory and requires additional capacity

- For give way and stop signs, the average delay per vehicle in seconds is selected from the movement with the highest average delay per vehicle, equivalent to the following LOS:-
-
-

0 to 14	=	“A”	Good
15 to 28	=	“B”	Acceptable delays and spare capacity
29 to 42	=	“C”	Satisfactory but accident study required
43 to 56	=	“D”	Near capacity and accident study required
57 to 70	=	“E”	At capacity and requires other control mode
>70	=	“F”	Unsatisfactory and requires other control mode

- 2.17 It should be noted that for roundabouts, give way and stop signs, in some circumstances, simply examining the highest individual average delay can be misleading. The size of the movement with the highest average delay per vehicle should also be taken into account. Thus, for example, an intersection where all movements are operating at a level of service A, except one which is at level of service E, may not necessarily define the intersection level of service as E if that movement is very small. That is, longer delays to a small number of vehicles may not justify upgrading an intersection unless a safety issue was also involved.
- 2.18 The SIDRA analysis found that the signalised intersections of the Pacific Highway with Livingstone Avenue and Beechworth Road are operating with average delays of 40 seconds per vehicle during the morning and afternoon peak periods. This represents a level of service C, a satisfactory level of intersection operation.
- 2.19 The roundabout controlled intersection of Pymble Avenue/Everton Street/Avon Road is operating with average delays of less than 25 seconds per vehicle during the morning and afternoon peak periods. This represents a level of service B, a good level of intersection operation.
- 2.20 The unsignalised intersections of Avon Road/Arilla Road and the college access driveways on Avon Road are operating with average delays, for the movement
-
-

with the highest average delay, of less than 20 seconds per vehicle. This represents a level of service B, a satisfactory level of intersection operation.

Public Transport

- 2.21 The site is well located to public transport services. The college (main access on Avon Road) is within 400 metres walking distance of Pymble railway station. Pymble station is on the North Shore Line which connects north to Hornsby and Berowra, and west to Parramatta via the City. The North Shore Line also provides connections to other metropolitan lines serving the Eastern, Southern, Western and South-Western suburbs with transfers at Chatswood and at any of the major CBD railway stations. Passengers can transfer at Hornsby railway station, onto the main Northern Line, to access the Central Coast and northern New South Wales.
- 2.22 Services on the North Shore Line through Pymble railway station generally operate with headways of some five to 10 minutes in each direction during peak periods and 10 to 15 minutes in each direction outside of peaks.
- 2.23 Local bus services through the area are provided by Shorelink. In addition, the college operates a college bus service on school days during the morning and afternoon periods. The bus service operates to Lane Cove, Hunters Hill, Boronia Park, East Ryde, Ryde and Macquarie Park.
- 2.24 The site is therefore well located to public transport services.
-
-

3. TRANSPORT AND ACCESSIBILITY IMPACT ASSESSMENT

- 3.1. The proposed Phase 2 Masterplan works include a new indoor aquatic/fitness centre, a new sports field with some 230 parking spaces under the field, a new dining facility and a health and well being centre. The new aquatic and fitness centre will replace the existing outdoor pool facility. The facility will include a 50 mete pool, a learn to swim pool, new seating, associated administration and staff facilities and a new fitness centre.
- 3.2. The new raised sports field with underground parking will replace the existing Mollie Dive sports field.
- 3.3. The new dining facility will cater for up to 600 people and will replace existing facilities within the college. The dining facility will provide for functions which are currently held in the college hall.
- 3.4. The new health and well being centre will consolidate the college's counselling and supporting services into one area.
- 3.5. These alterations and additions to the college are shown on plans prepared by PMDL Architects and Design. The proposed works will not result in an increase in student numbers and staff numbers at the college. The works will provide new and improved facilities for existing students and improved vehicular access and car parking arrangements.
- 3.6. The implications of the proposed Phase 2 Masterplan works are assessed through the following sections:-
-
-

-
-
- ❑ policy context;
 - ❑ public transport, walking and cycling;
 - ❑ travel access guide;
 - ❑ parking provision;
 - ❑ access arrangements;
 - ❑ internal layout and circulation;
 - ❑ traffic generation and effects;
 - ❑ principles of construction traffic management;
 - ❑ Director-General's requirements; and
 - ❑ summary.

Policy Context

Metropolitan Transport Plan

- 3.7 The Metropolitan Transport Plan – Connecting the City of Cities has four key policy objectives:
- ❑ commuting to work easily and quickly;
 - ❑ transport and services accessible to all members of the community;
 - ❑ an efficient, integrated and customer focused public transport system; and
 - ❑ revitalised neighbourhoods with improved transport hubs.
- 3.8 It includes a target of 28 per cent of trips to work in the Sydney Metropolitan Region to be undertaken by public transport by 2016, compared to some 22 per cent in 2006.
- 3.9 To help achieve these objectives, it identifies, in conjunction with the metropolitan strategy, key areas of future housing and employment growth in Sydney to 2020
-
-

and 2036. Additionally, it outlines a 10 year funding program to 2020 for the following transport projects:

- ❑ rail line extensions for more platforms at CBD stations;
- ❑ rail lines to north west and south west Sydney;
- ❑ light rail in the CBD and further extension to the Inner West;
- ❑ more air conditioned train carriages;
- ❑ 1,000 additional buses;
- ❑ completion of the 43 strategic bus corridors across Sydney;
- ❑ completion of the highest priority missing links in the Sydney Strategic Cycleway Network.

NSW 2021

3.10 NSW 2021: A Plan to Make NSW Number One sets targets to increase the proportion of commuter trips made by public transport for various areas within Sydney by 2016, including:

- ❑ 80 per cent in the Sydney CBD;
- ❑ 50 per cent in the Parramatta CBD;
- ❑ 20 per cent in the Liverpool CBD; and
- ❑ 25 per cent in the Penrith CBD.

3.11 It also has targets to:

- ❑ improve road safety and reduce fatalities to 4.3 per 100,000 population by 2016;
 - ❑ double the mode share of bicycle trips made in the metropolitan area by 2016; and
-
-

-
-
- increase the proportion of the population living within 30 minutes by public transport of a city or major centre in the metropolitan area.

Integrated Land Use and Transport Policy Package (ILUT)

3.12 These policies aim to ensure that urban structure, building forms, land use locations, development designs, subdivision locations and street layouts help achieve the following planning objectives:

- (a) improve accessibility for students and staff to public transport;
- (b) improve the choice of transport and reducing dependence solely on cars for travel purposes;
- (c) moderate growth in the demand for travel and the distances travelled, especially by car; and
- (d) support the efficient and viable operation of public transport services.

NSW Planning Guidelines for Walking and Cycling and the NSW Bike Plan

3.13 These guidelines provide a walking and cycling focus to the Integrating Land Use and Transport Policy Package. They provide for improved consideration of walking and cycling in land use planning, to assist in creating more opportunities for people to live and work in places with easy walking and cycling access to services and public transport.

3.14 The following sections discuss how the proposed alterations and additions to the college satisfy these objectives and the measures proposed to achieve them.

Public Transport, Walking and Cycling

- 3.15 As previously discussed, the site is well located to public transport services in the area. The college (main access on Avon Road) is within 400 metres walking distance of Pymble railway station. Pymble station is on the North Shore Line which connects north to Hornsby and Berowra, and west to Parramatta via the City.
- 3.16 In accordance with government policy and Ku-ring-gai Council's transport strategy to reduce traffic flow on the local road network, the college has introduced a school bus service. The service operates during the morning and afternoon periods transporting students and staff to and from the college. The service links surrounding areas currently not accessible to the college by public transport, including Lane Cove, Hunters Hill, Boronia Park, East Ryde, Ryde and Macquarie Park.
- 3.17. The introduction of the college bus service improves accessibility for students and staff to public transport and results in a reduction in the traffic generation of the college during the morning and afternoon peak periods.
- 3.18. The proposed development provides opportunities to strengthen demand for public transport services. Public transport services offer viable alternatives to travel by modes other than car.
- 3.19. The proposed development is located adjacent to existing pedestrian links in the area. The existing pedestrian links through the college campus provide convenient access to Pymble railway station and to the surrounding residential area. The proposed development will enhance and improve pedestrian accessibility within the college campus and to/from the surrounding area.
-
-

-
-
- 3.20. The proposed development is close to existing public transport services, and will therefore be readily accessible by public transport. To support accessibility by bicycles, appropriate bicycle parking and end-of-trip facilities will be provided in accordance with Council and DGR's requirements.
- 3.21. The proposed development will therefore satisfy the objectives of the Metropolitan Transport Plan, NSW 2021 and Integrated Land Use and Transport policy package as follows:
- ❑ enabling students and staff to readily access public transport services to and from the college (Metropolitan Transport Plan objectives);
 - ❑ providing pedestrian connections within and through the site, to improve accessibility for students and staff as well as visitors and guests to the college (Metropolitan Transport Plan objectives);
 - ❑ provide educational and sports facilities close to transport facilities to reduce dependence on travel by car (ILUT principle);
 - ❑ providing educational facilities close to residential areas and transport facilities to reduce the need for external travel (ILUT principle, NSW Planning Guidelines for Walking and Cycling);
 - ❑ being located close to employment centres, which are readily accessible by public transport (ILUT principle);
 - ❑ greater employment density will provide more potential customers for the existing public transport services and hence support their efficient and viable operation ((Metropolitan Transport Plan objectives); and
-
-

-
-
- ❑ providing appropriate bicycle parking on the site to increase the proportion of trips made by bicycle (NSW Planning Guidelines for Walking and Cycling and the NSW Bike Plan).

Travel Access Guide

- 3.22. To encourage travel modes other than private vehicle, a travel demand management approach will be adopted, through a travel access guide to meet the specific needs of the site, students, staff and visitors to the college. The specific requirements and needs of the student and staff will be incorporated in the work place travel plan and transport access guide to support the objectives of encouraging the use of public transport.
- 3.23. The principles of the travel access guide should be developed in consultation with college and other stakeholders. Principles would include the following:
- ❑ encourage the use of public transport, including rail services through Pymble railway station;
 - ❑ provide additional college bus services;
 - ❑ encourage public transport by student, staff and visitors through the provision of information, maps and timetables;
 - ❑ raise awareness of health benefits of walking (including maps showing walking and cycling routes, including through and adjacent to the college);
 - ❑ encourage cycling by providing safe and secure bicycle parking, including the provision of lockers and change facilities, located throughout the main campus and within the new aquatic and fitness centre;
-
-

-
-
- provide appropriate on-site parking provision, consistent with appropriate Council/RMS controls and the objective of reducing traffic generation.

3.24. The travel access guide should be developed in accordance with the principles identified by Transport NSW and RMS, and distributed to students and staff at the college. The travel access guide would assist in delivering sustainable transport objectives by considering the means available for reducing dependence solely on cars for travel purposes, encouraging the use of public transport and supporting the efficient and viable operation of public transport services.

Parking Provision

- 3.25. On-site parking is provided for a total of some 275 vehicles within a number of parking areas within the college campus, including staff parking areas and on-site parking adjacent to the upper and lower access roads, as shown on Figure 4.
- 3.26. Pymble Ladies College provides classes for students from Kindergarten through to Year 12 and has an enrolment of some 2,120 students, comprising some 2,000 day girls and some 120 boarders. There are some 250 students in Year 12. The College has a total of some 300 staff, comprising permanent/part-time teaching staff and administration/ ancillary staff, present on any given day.
- 3.27. The proposed Phase 2 Masterplan works will not result in an increase in student numbers and staff numbers at the college. The works will provide new and improved facilities for existing students and improved vehicular access and car parking arrangements.
- 3.28. The Ku-ring-gai Development Control Plan 43 Car Parking sets out the following minimum parking requirements for primary and secondary schools:
-
-

-
-
- ❑ one space per equivalent full-time employee; plus
 - ❑ one space per eight Year 12 students.

- 3.29. Application of these rates to the college results in a requirement of some 335 spaces. The proposed works, including the new car park beneath the sports field, will provide a total of some 470 car parking spaces over the college campus, as shown on Figure 5.
- 3.30. As can be seen from Figure 5, on-site parking will be distributed at the northern end of the college, adjacent to the upper and lower internal circulation roads, and at the southern end of the college adjacent to the new aquatic and fitness centre. Due to the distance between these parking areas and the location of existing buildings within the college, the extent and distribution of the proposed on-site parking is considered appropriate.
- 3.31. With regards to the new aquatic and fitness centre, this facility will generally only be available for use by students and staff at the college during the day time school period. However, the car park beneath the sports field will be available for use by other schools and the wider Ku-ring-gai community outside the normal school hours. At these times on-site parking within the college and in particular within the new car park beneath the sports field will be available.
- 3.32. With regards to the learn to swim facility, this will also be available for use by the general community. The college currently operates learn to swim classes during the summer period. With the new indoor facility, the college proposes to extend this same operation all year round with some 20 learn to swim classes per day, with some 3 to 5 children per class. Classes will be between 7.00am to 10.00am and 2.30pm to 5.00pm Monday to Friday. Learn to swim classes will also be held on Saturdays between 7.00am to 10.00am. The learn to swim classes could
-
-

generate a parking demand of some 20 to 25 additional cars during the morning and afternoon peak periods.

- 3.33. The new health and well being centre will consolidate the college's counselling and supporting services into one area. With no increase in staff numbers proposed for this facility, no additional parking provision is required.
- 3.34. With regard to the new dining facility for boarders and staff and for functions, this facility will replace existing facilities within the college. The dining facility will cater for up to 600 people and will provide for functions which are currently held in the main college hall. The proposed facility will not generate any additional activity during the weekday school period and hence no additional parking is required. The new dining facility however is planned for construction after the stage 2 car park is in place, which will provide convenient parking for the proposed facility.
- 3.35. The proposed parking provision for the Phase 2 Masterplan works is therefore considered appropriate.
- 3.36. In addition to car parking, bicycling parking will be provided in accordance with Council's requirements and the planning guidelines for walking and cycling.

Access Arrangements

- 3.37. Parking beneath the new sports field will be provided within a single level. The proposed new sports field and car park will form part of the Stage 2 works. Access to this parking area will be provided via internal circulation roads within the southern precinct of the college and via the main southern access driveway onto Avon Road. The proposed arrangements provide appropriate sight lines and will cater for the car park of the size and type proposed. The access
-
-

arrangements will be provided in accordance with Council's requirements and the Australian Standard for Off-street car parking facilities (AS2890.1-2004).

Internal Layout and Circulation

- 3.38. Car parking arrangements and circulation within the new on-site car park will be designed to comply with the Australian Standard AS2890.1-2004 with respect to car parking dimensions, aisle widths, internal circulation, height clearances and column locations.
- 3.39. Parking spaces will be a minimum of 2.5 metres wide by 5.4 metre long, with an additional 0.3 metres in width for spaces located adjacent to structure. Access to car parking spaces will be provided from 5.8 to 6.1 metre wide circulation aisle. Columns will be set back 0.75 metres from the front of spaces. Disabled parking spaces will be 2.4 metres wide, with an additional 2.4 metres adjacent to the space, by 5.4 metres long. Height clearance of 2.5 metres will be provided above disabled parking spaces, with 2.2 metres elsewhere in the car park. Appropriate clearances will be provided for building services within the car park. These dimensions are considered appropriate, being in accordance with AS2890.1-2004 and AS2890.6-2009.
- 3.40. On-site provision will be made for service and garbage vehicles. These vehicles will be accommodated on the internal circulation roads within the site and provision will be made to cater for vehicles ranging from small commercial vehicles to large rigid trucks. The service area will be designed to allow trucks to turn around on-site, with trucks entering and exiting the site in a forward direction.
-
-

-
-
- 3.41. The proposed car parking arrangements, internal circulation and servicing arrangements are considered appropriate and will be provided in accordance with the Australian Standards for off-street car parking facilities (AS2890.1-2004).

Traffic Generation and Effects

- 3.42. The proposed modifications will not result in an increase in student numbers. Therefore no increase in traffic generation would be expected as a result of the proposed modifications. However, the proposed new 230 space car park will result in a redistribution of traffic, including existing college traffic which currently uses on-street parking in Avon Road. Based on an existing traffic generation rate of 0.3 vehicles per hour per space, the proposed 230 space car park would generate some 70 vehicles per hour two-way during the morning and afternoon peak periods.
- 3.43. With regards to the new aquatic and fitness centre, this facility will only be available for use by students and staff at the college during the daytime school period. With no increase in student and staff numbers proposed for this facility, no additional traffic will be generated.
- 3.44. With regards to the learn to swim facility, this will be available for use by the general community. As previously discussed, the college currently operates learn to swim classes during the summer period. With the new indoor facility, the college proposes to continue this same operation all year round. With some 20 learn to swim classes per day and 3 to 5 children per class, the learn to swim operation could generate some 40 to 50 vehicles per hour two-way during the morning and afternoon peak periods during the winter period. The summer period will remain unchanged.
-
-

- 3.45. With regards to the new health and well being centre, this facility will consolidate the college's counselling and supporting services into one area. With no increase in student and staff numbers proposed, no additional traffic will be generated.
- 3.46. With regards to the new dining facility for boarders, staff and for functions, this facility will replace existing facilities within the college. With no increase in student and staff numbers proposed, no additional traffic will be generated.
- 3.47. The additional and redistributed traffic generated by the proposed alterations and additions to the college has been assigned to the road network as shown on Figures 6 and 7, and summarised in Table 3.1. The additional traffic generation and redistribution of traffic will only occur the stage 2 car park is in place.

Table 3.1: Redistributed Two-Way (Sum of Both Directions) Peak Hour Traffic Flows Plus Development Traffic				
Road/Location	Morning (Vehicles/Hour)		Afternoon (Vehicles/Hour)	
	Redistributed	Plus Development	Redistributed	Plus Development
Pacific Highway				
- north of Beechworth Road	5330	+20	4495	+20
- south of Beechworth Road	5675	+25	4620	+25
- north of Livingstone Avenue	5295	+15	4650	+15
- south of Livingstone Avenue	5455	+20	4700	+20
Beechworth Road				
- west of Pacific Highway	705	+25	335	+25
Livingstone Avenue				
- west of Pacific Highway	1260	+35	570	+35
Avon Road				
- north of Pymble Avenue	1075	+35	485	+35
- east of Arilla Road	710	+35	370	+35
- west of Arilla Road	340	+60	335	+60
Everton Street				
- south of Pymble Avenue	870	+35	490	+35
Pymble Avenue				
- west of Avon Road	425	-	235	-
Arilla Road				
- north of Avon Road	680	+25	295	+25

-
-
- 3.48. Table 3.1 shows that flows on the Pacific Highway would increase by some 15 to 25 vehicles per vehicle during the morning and afternoon peak periods. Traffic flows on Beechworth Road, Livingstone Avenue, Arilla Road and Everton Street would increase by some 25 to 35 vehicles per hour two-way during peak periods.
- 3.49. Traffic flows on Avon Road would increase by some 35 to 60 vehicles per hour two-way during the morning and afternoon peak periods.
- 3.50. The intersections previously analysed in Chapter 2 were re-analysed with the redistributed and additional traffic shown on Figures 6 and 7.
- 3.51. The SIDRA analysis of the proposed alterations and additions to the college found that the signalised intersections of the Pacific Highway with Livingstone Avenue and Beechworth Road would continue to operate with average delays of less than 40 seconds per vehicle during the morning and afternoon peak periods. This represents a level of service C, a satisfactory level of intersection operation.
- 3.52. The roundabout controlled intersection of Pymble Avenue/Everton Street/Avon Road would continue to operate with average delays for the movement with the highest average delay of less than 25 seconds per vehicle during the morning and afternoon peak periods. This represents a level of service B, a good level of intersection operation.
- 3.53. The unsignalised intersection of Avon Road/Arilla Road and the college access driveways on Avon Road would continue to operate at levels of service B, with similar average delays during peak periods. This represents a satisfactory level of intersection operation.
-
-

Principles of Construction Traffic Management

- 3.54. A construction management plan has been prepared by Grindley Constructions. The plan identifies the construction methodology, process and staging of the proposed Stage 1 work, associated with the construction of the new aquatic and fitness centre. Additional construction traffic management plans will be prepared by the builder for Stages 2 to 4, at the time of application for these works.
- 3.55. Construction of the Stage 1 work will commence with the demolition and excavation of the site. Construction access will be provided to/from Avon Road via the main southern access driveway. Construction and containment fencing will be erected around the perimeter of the site compound, with scaffolding and overhead protection provided where required.
- 3.56. Construction vehicles transporting material and unwanted spoil from the site will be loaded by excavators. Trucks will enter and exit the site in a forward direction. In order to minimize construction traffic on surrounding streets, trucks will approach and depart from the site along designated truck routes, including Avon Road, Everton Street, Livingstone Avenue and Pacific Highway. Construction vehicles will not be permitted to access the site via Beechworth Road, Mayfield Avenue and Arilla Road.
- 3.57. The loading and unloading of construction material from trucks, associated with the overall construction activity, will be carried on-site. Construction material will be stored on-site within designated material handling areas.
- 3.58. Vehicular access to adjacent properties will be maintained during the construction period. Pedestrian activity within the southern part of the campus will be
-
-

protected with the provision of a Class A construction fence around the perimeter of the site compound.

- 3.59. Openings in the construction fencing and the construction access driveways will be managed and controlled by qualified site personnel. The movement of trucks entering and exiting the site compound will be managed and controlled by traffic controllers.
- 3.60. Work associate with the construction of the Stage I work will be carried out between the following hours of construction:
- Monday to Friday - 7.30am to 5.30pm;
 - Saturday - 7.30am to 12.30pm; and
 - Sunday/public holiday - No work.
- 3.61. The site contractor will be responsible to instruct and control sub-contractors regarding the hours of work. Any work outside the approved construction hours would be subject to prior approval from Ku-ring-gai Council.
- 3.62. The control of hours of operation avoids truck movements during the early morning and evening periods. To facilitate an efficient program, the arrival and departure of trucks associated with the construction works will be regulated and on-site works will be carefully managed and controlled by site personnel. Trucks will be called onto the site when required. Trucks will not be permitted to park on-street in Avon Road or within surrounding residential streets.
- 3.63. The temporary loss of on-site parking as a result of the construction activity, will be accommodated within temporary on-site car parks within the campus. These parking areas will be available for staff and visitors during the period of construction.
-
-

3.64. The overall principles for traffic management during construction will be:-

- ❑ provide a convenient and appropriate environment for students and pedestrians;
 - ❑ minimise effects on pedestrian movements and amenity;
 - ❑ provide appropriate safety fencing/hoardings around the perimeter of the site compound, with overhead protection where required;
 - ❑ management and control vehicular movements to and from the site;
 - ❑ maintain on-street parking in Avon Road in the vicinity of the site;
 - ❑ maintain traffic capacity at intersections and mid-block in the vicinity of the site;
 - ❑ maintain access to existing residential developments in the vicinity of the site;
 - ❑ restrict construction vehicle routes to/from the site to the main road network through the area;
 - ❑ construction vehicles to enter and exit the site in a forward direction;
 - ❑ construction activity to be carried out in accordance with approved hours of construction;
 - ❑ maintain safety for workers;
-
-

-
-
- manage and control vehicle activity in the vicinity of the site;
 - the preparation of the construction traffic management plan, signage detail, control of pedestrians and control and management of construction activity/vehicles in the vicinity of the site will be the responsibility of the appointed builder.

Director-General's Requirements

3.65. Requirement No. 7 is as follows:

“7. Transport and Accessibility

Construction

- **Detail access arrangements at all stages of construction and measures to mitigate any associated pedestrian, cycleway or traffic impacts.**
- **Details regarding car parking arrangements during construction, including the displacement of visitor and staff car parking. Alternative off-site arrangements should be made for staff and construction workers.**

3.66. The details of construction management for the Stage I works are outlined in the site specific management plan prepared by Grindley Construction. The principles of traffic management and traffic and parking effects during the period of construction are discussed in paragraphs 3.54 to 3.64.

Operational

- **Detail how the development has taken into consideration, and contributes to the achievement of, travel choices and transport objectives contained in NSW 2021, Metropolitan Plan for Sydney 2036 and the North Subregional Strategy.**

3.67. Reference to the transport policy documents to support the use of public transport and non- car transport modes are discussed in paragraphs 3.7 to 3.14.

- **Assess the implications of the proposed development for non-car travel modes (including public transport use, walking and cycling), including the potential for implementing a location-specific sustainable travel plan (eg. ‘Travelsmart’ or other travel behaviour change initiatives), and the provision of facilities to increase non-car mode share for travel to and from the site. This will entail an assessment of the accessibility of the site by public transport.**

3.68. Public transport is discussed in paragraphs 3.15 to 3.18. Pedestrian and cycling is discussed in paragraphs 3.19 to 3.21. The travel access guide is discussed in paragraphs 3.22 to 3.24.

- **Provide details of the daily and peak hour vehicle movements likely to be generated by the development including the impact on nearby intersections and the need/associated funding for upgrading or road improvement works (if requires). Key intersections to be examined/modelled include:**
-
-

-
-
- o **Pacific Highway and Beechworth Road; and**
 - o **Pacific Highway and Livingstone Avenue.**

3.69. Traffic generation and traffic effects of the proposed alterations and additions to the college are discussed in paragraphs 3.42 to 3.53.

- **Detail the proposed access and parking provisions associated with the proposed development, including compliance with the requirements of the relevant Australian Standards (ie. Turning paths, sight distance requirements, aisle widths, etc).**

3.70. Access arrangements are discussed in paragraph 3.37. Internal car park layout and circulation, including compliance with the requirements of the relevant Australian Standards are discussed in paragraphs 3.38 to 3.41.

- **Detail the proposed number of car parking spaces and compliance with appropriate parking codes.**

3.71. Parking provision and compliance with Ku-ring-gai Council's DCP 43 is discussed in paragraphs 3.25 to 3.36.

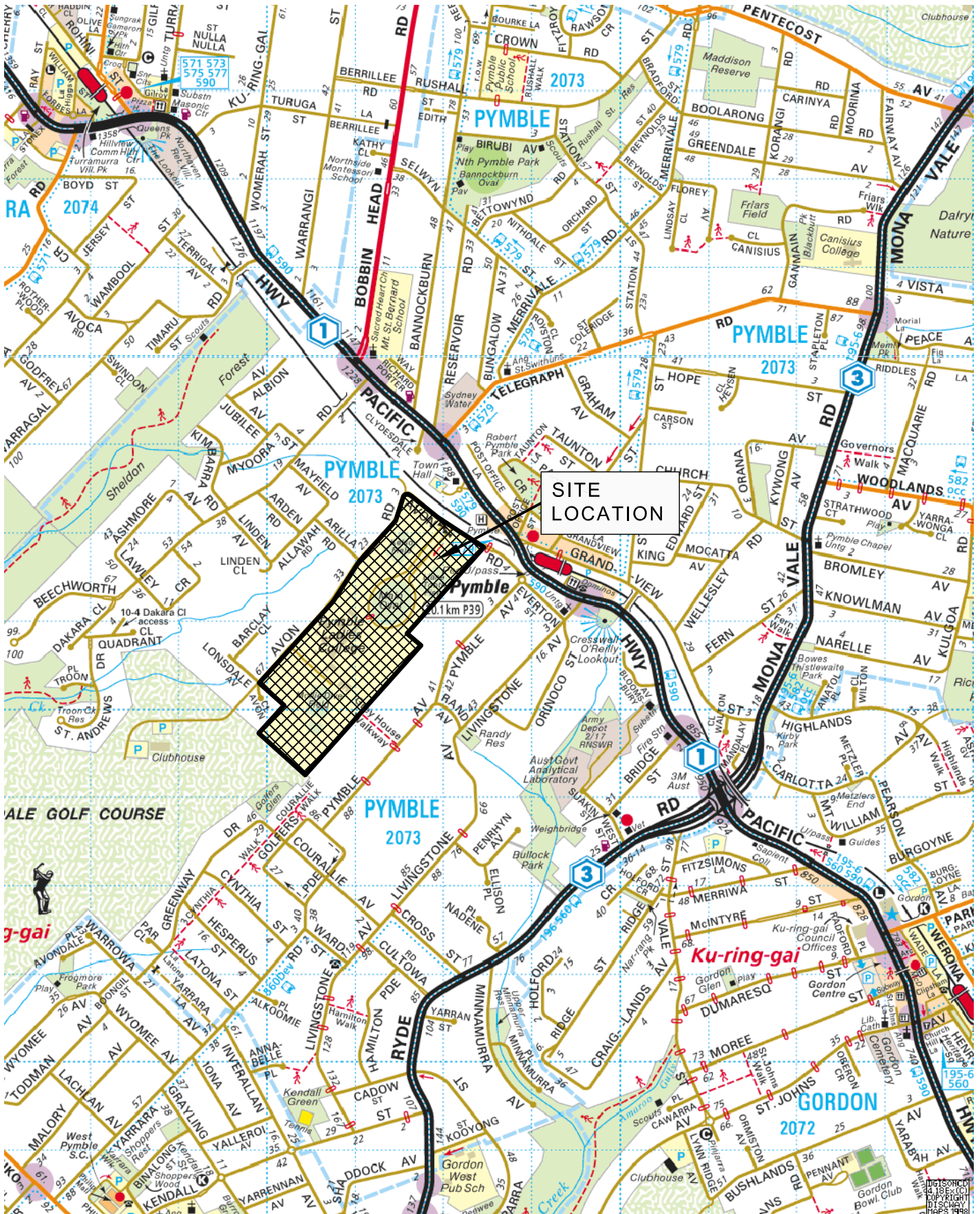
- **Detail the proposed service vehicle movements (including vehicle type and the likely arrival and departure times).**

3.72. Service vehicle arrangements are discussed in paragraphs 3.38 to 3.41.

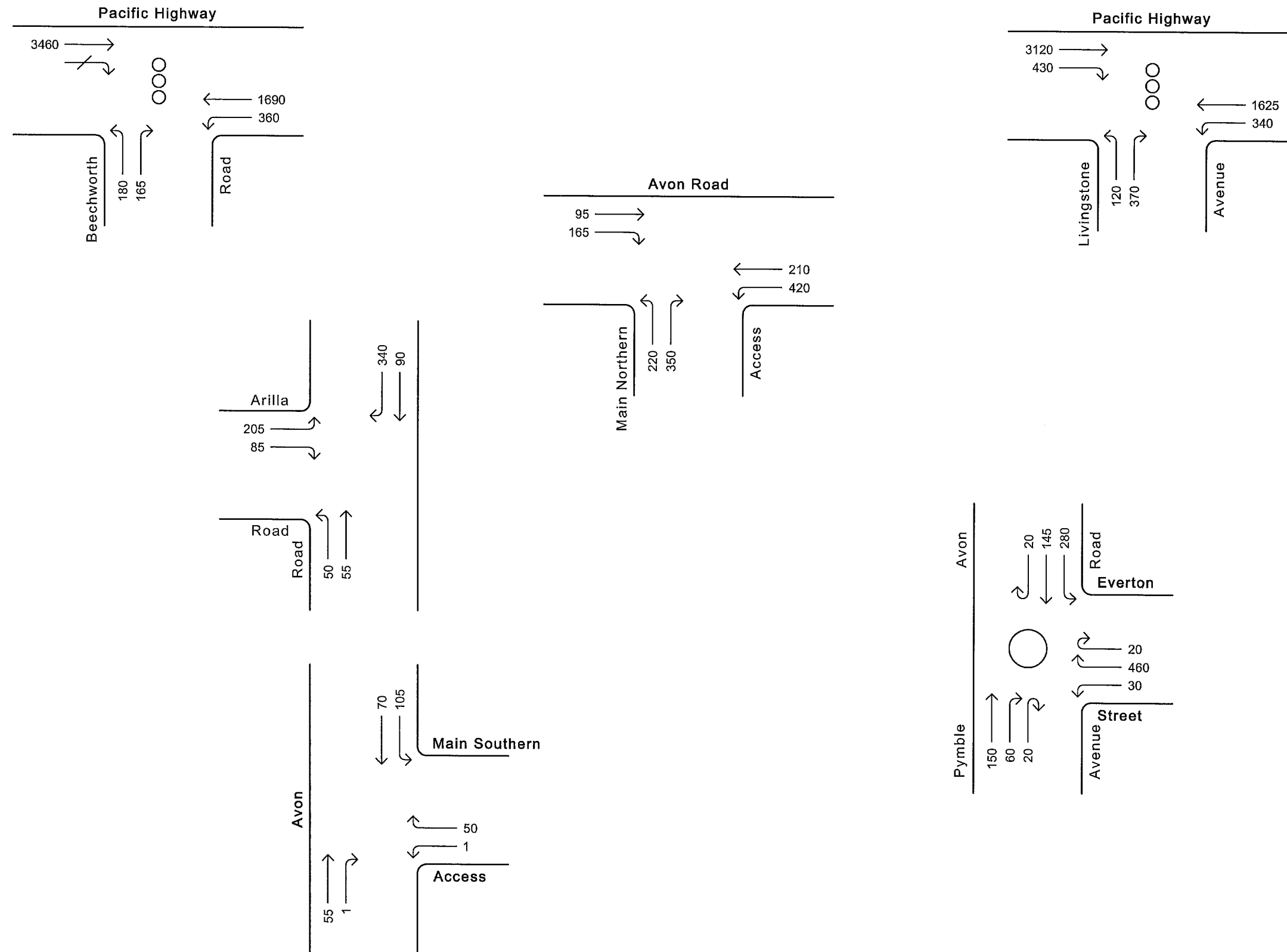
Summary

3.73. In summary, the main points relating to the implications of the Phase 2 Masterplan works are as follows:-

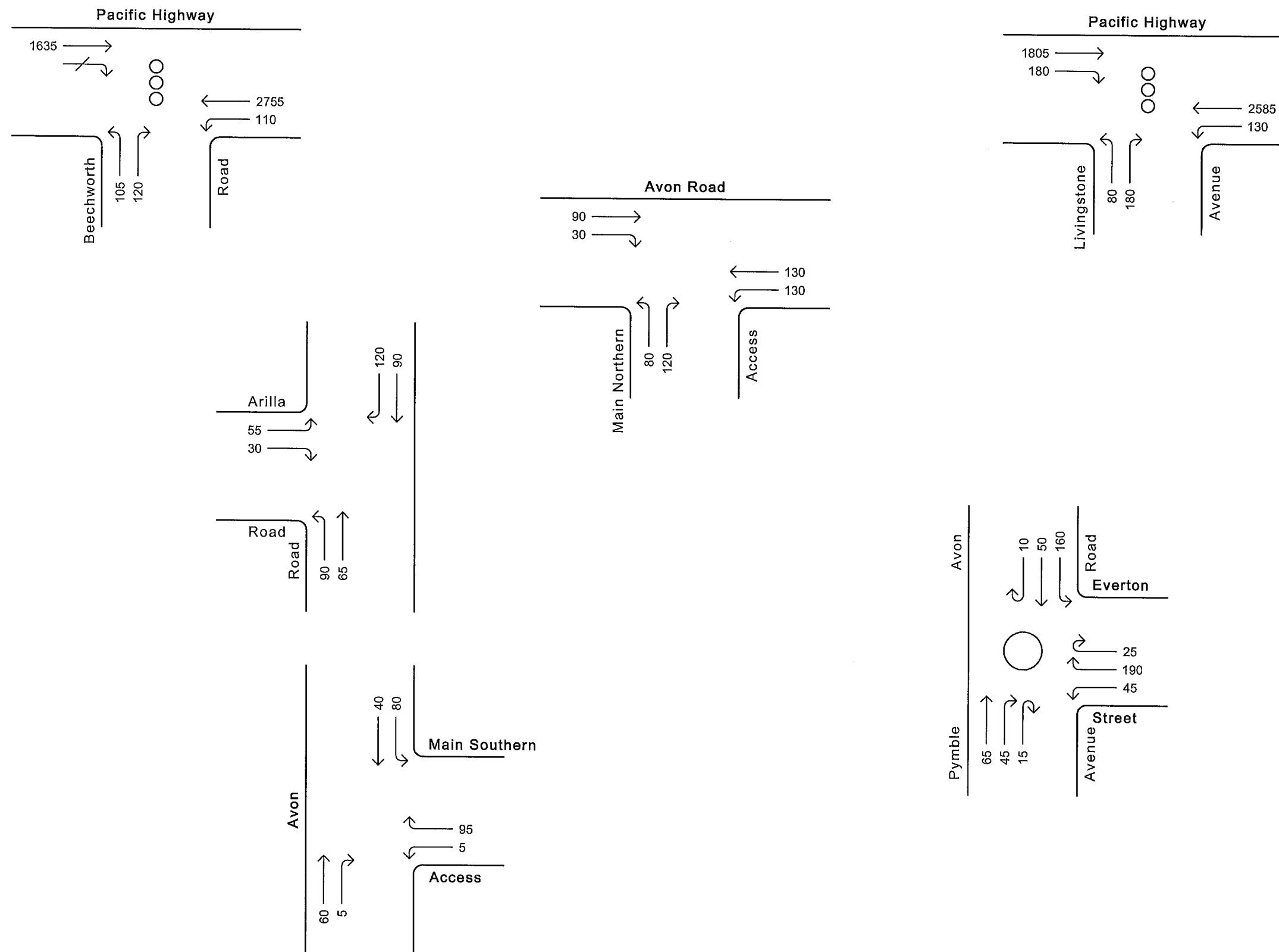
-
-
- i) no increase in student and staff numbers is proposed in association with the proposed alterations and additions to the college;
 - ii) the college is close to existing public transport services and is consistent with government policy objectives to reduce private car travel and encourage public transport;
 - iii) the college has introduced a college bus service during the morning and afternoon periods to reduce traffic flow on the local road network;
 - iv) a travel access guide will be implemented for the site;
 - v) parking provision is considered appropriate;
 - vi) access, internal layout and car parking arrangements will be provided in accordance with AS2890.1-2004;
 - vii) the road network will be able to cater for the additional traffic from the proposed development;
 - viii) the Director General's requirements are discussed in paragraphs 3.65 to 3.72.
-
-



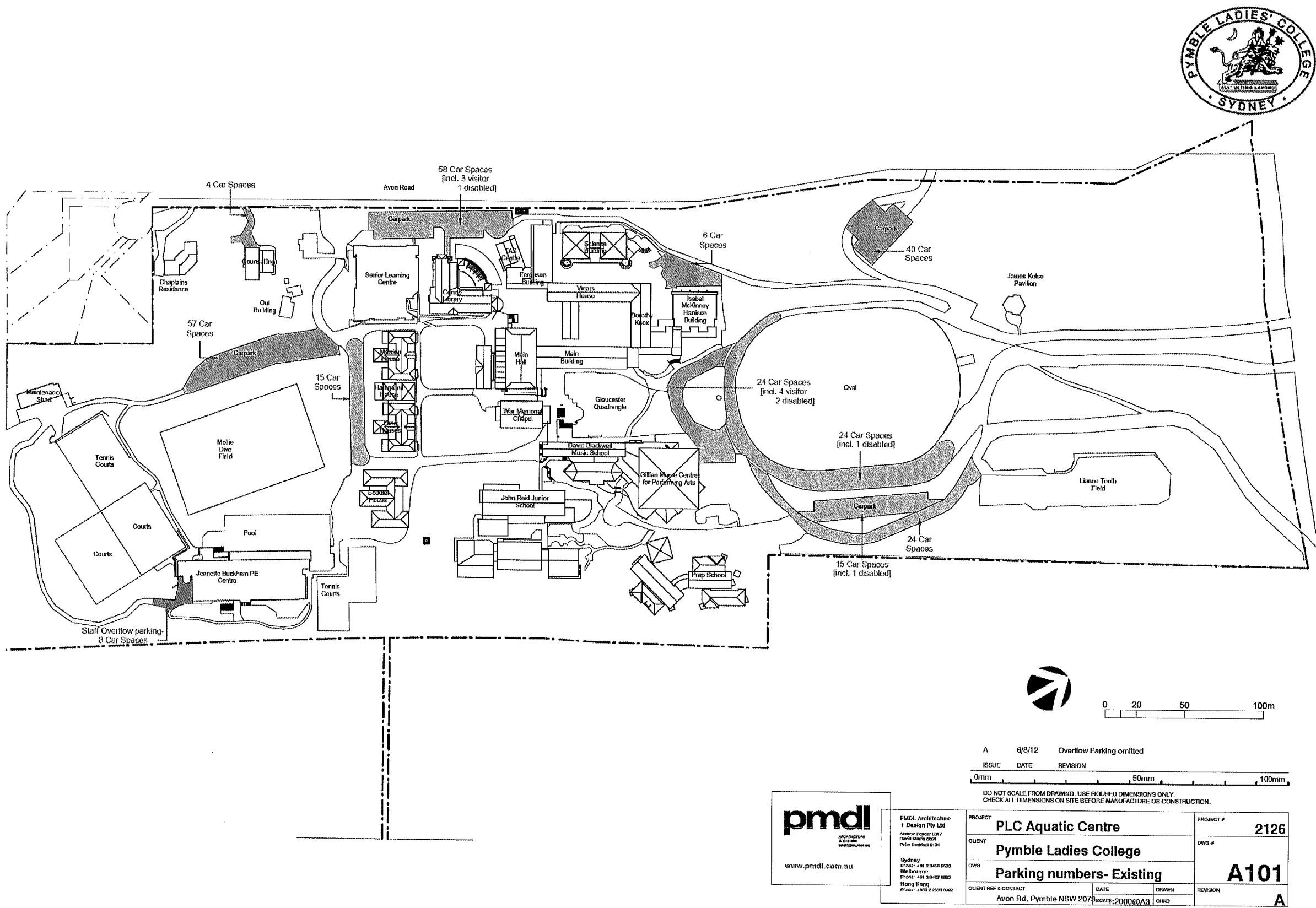
Location Plan



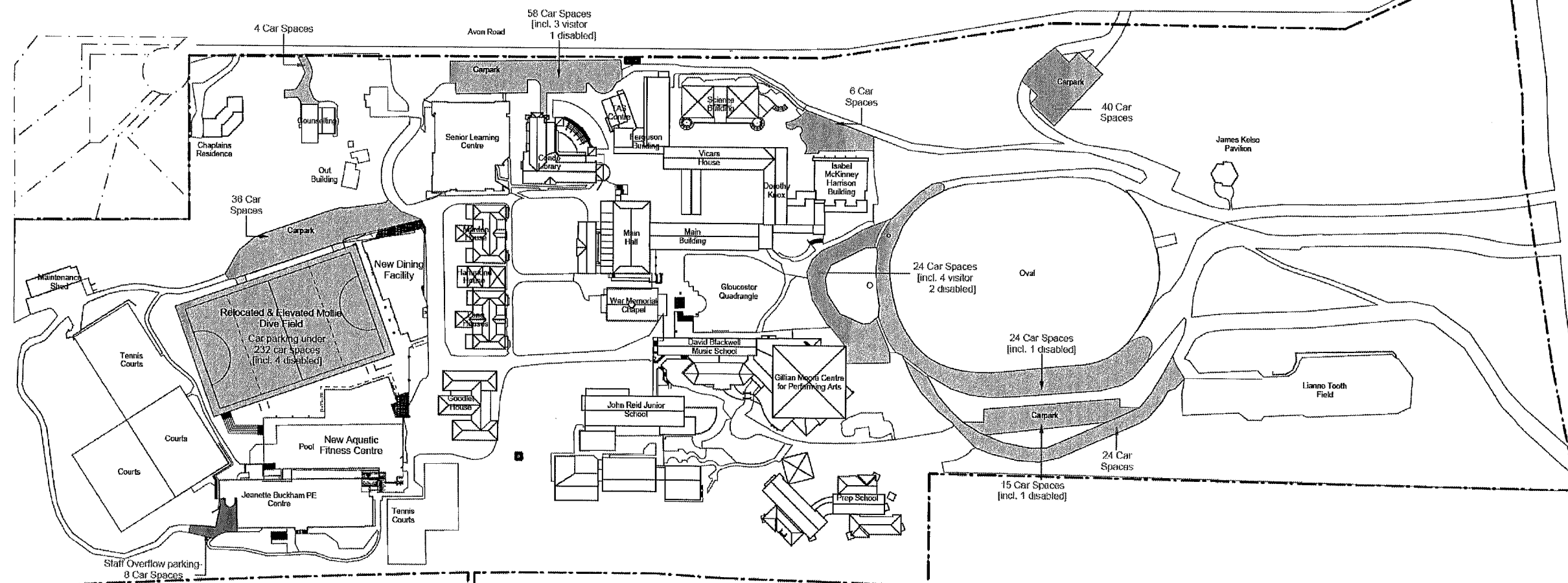
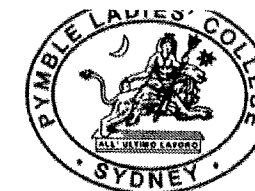
Existing weekday morning peak
hour traffic flows



Existing afternoon morning
peak hour traffic flows



Existing College Parking



0 20 50 100m

ISSUE	DATE	REVISION
A	6/8/12	Overflow Parking omitted

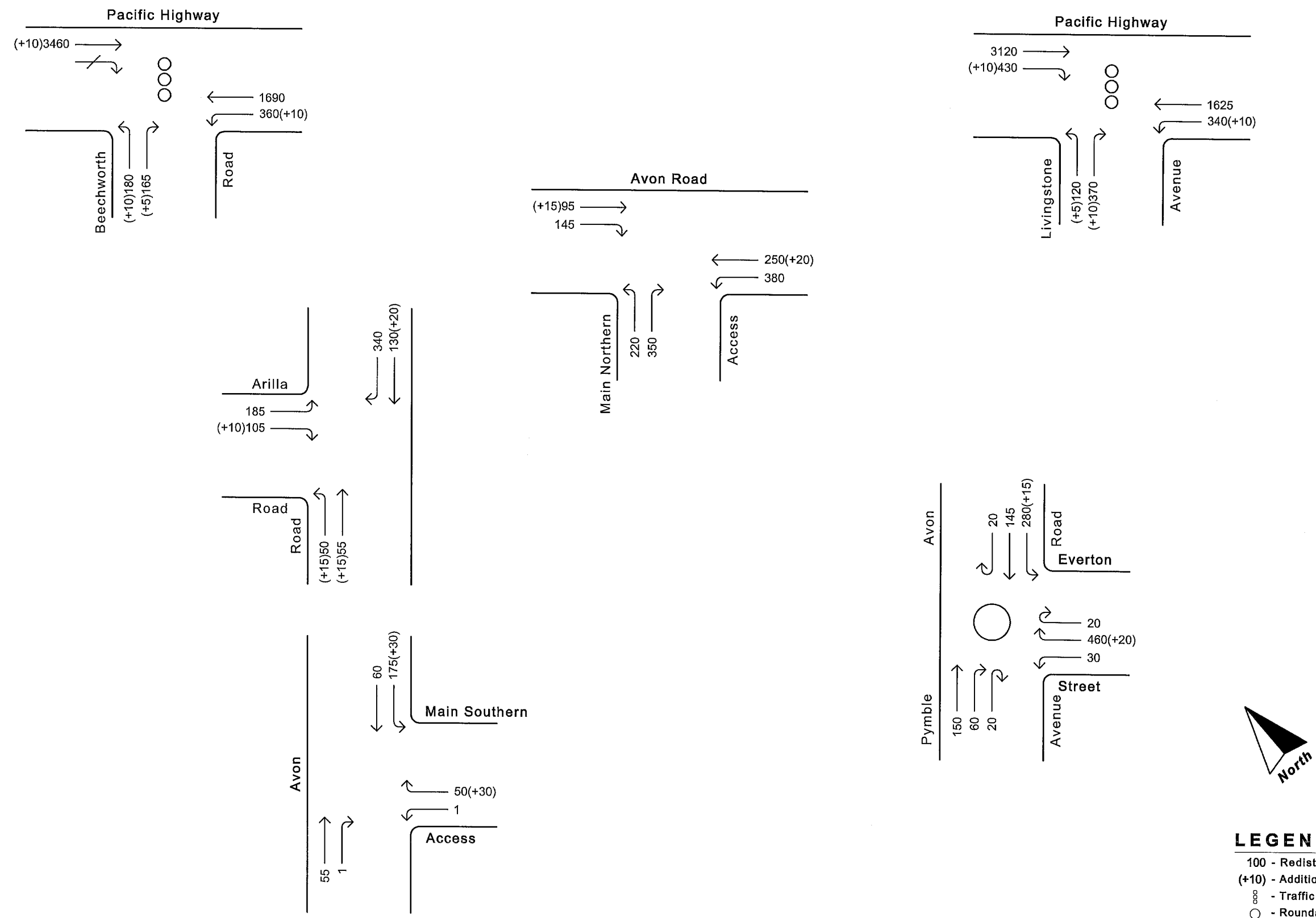
0mm 50mm 100mm

DO NOT SCALE FROM DRAWING. USE FIGURED DIMENSIONS ONLY. CHECK ALL DIMENSIONS ON SITE BEFORE MANUFACTURE OR CONSTRUCTION.

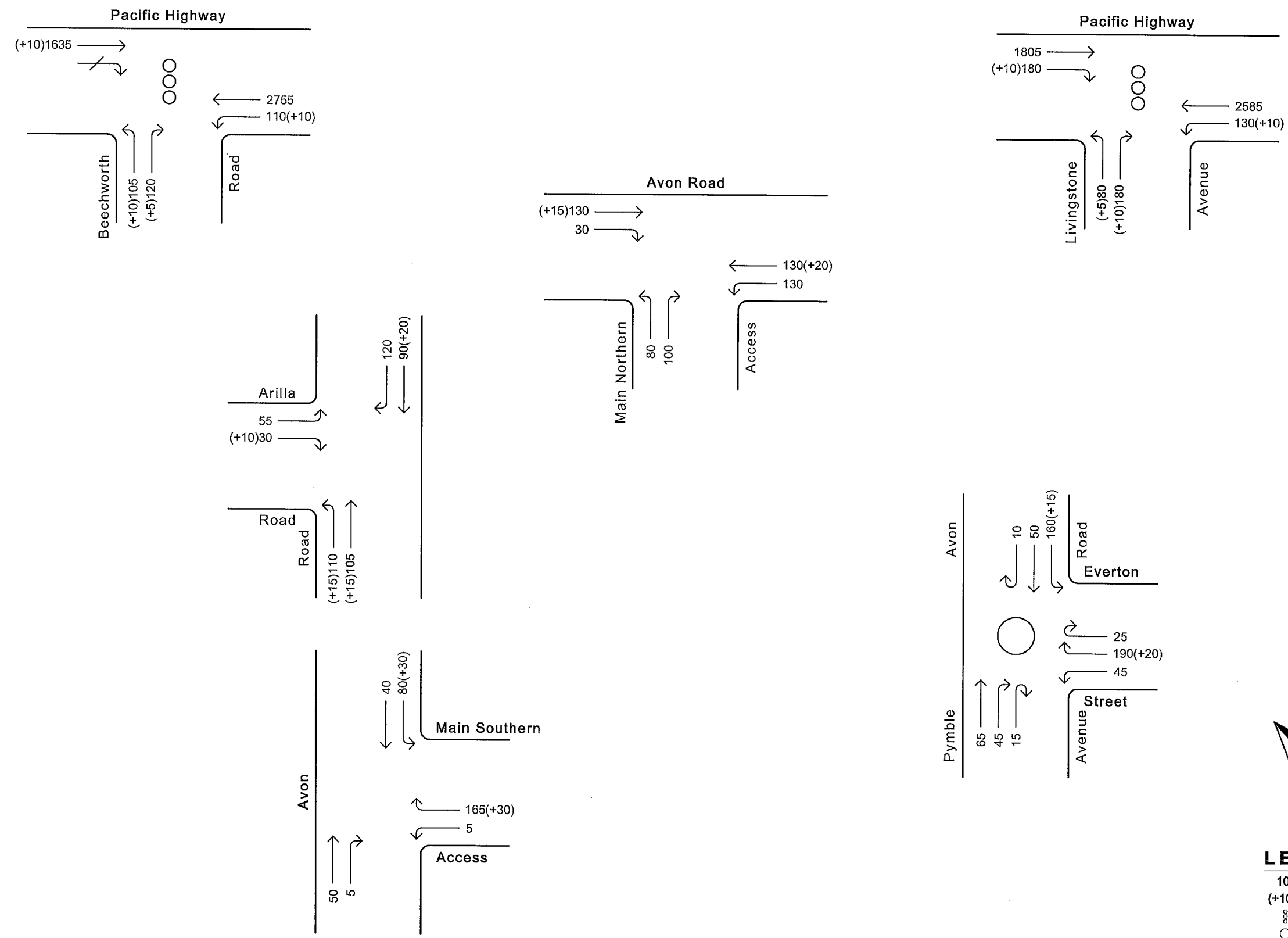


PROJECT PLC Aquatic Centre		PROJECT # 2126
CLIENT Pymble Ladies College		DWG # A102
DWG Parking numbers- Proposed		REVISION A
CLIENT REF & CONTACT Avon Rd, Pymble NSW 2071	DATE 20/08/12	DRAWN CHKD

Proposed College Parking



Redistributed weekday morning peak hour
traffic flows plus development traffic



Redistributed afternoon morning peak
hour traffic plus development traffic