Narrabeen Education Precinct - Narrabeen Sports High School

Transport Assessment

10 Namona St, North Narrabeen
16/09/2022
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1 Introduction

Overview

Ason Group have been engaged by School Infrastructure NSW to prepare a Transport Assessment (TA) in relation to a Development Without Consent (REF) for proposed upgrades (the Proposal) at Narrabeen Sports High School (NSHS) located at 10 Namona Street, North Narrabeen.

1.1

Site Description

The subject sites are located at 6 and 10 Namona Street, North Narrabeen (referred to as the Narrabeen Education Precinct) and falls within the local government area of Northern Beaches Council. The Narrabeen Education Precinct has a total area of 9.84 hectares.

1.2

Narrabeen North Primary School (NNPS) is located on the northern side of Namona Street, North Narrabeen and is legally described as Lot 3 Deposited Plan (DP) 1018621. NNPS is surrounded by residential dwellings to the east, grassed sporting fields (Warriewood Valley Sportsground) to the north and Northern Beaches Indoor Sports Centre to the west. NNPS contains two (2) Binishell domes (Block A and Block B) which are identified as a local heritage item under the Pittwater Local Environmental Plan 2014. The two (2) Binishell Domes are listed as State significant on DoE's Section 170 Heritage and Conservation Register. The Double Binishell Dome (Block B) is listed on the State Heritage Register (SHR).

Narrabeen Sports High School (NSHS) is located on the southern side of Namona Street and is legally described as Lot 12 DP 1119562. NSHS is surrounded by Pittwater Road to the east, Pittwater Sports Centre to the south and Mullet Creek to the west. See site aerial map in **Figure 1**.

Figure 1: Site Aerial Map (Source: Nearmap)

The School

The proposed Narrabeen Education Precinct development includes redevelopment of Narrabeen North Public School (NNPS) and Narrabeen Sports High School (NSHS). The Public School and High School have been identified by the NSW Department of Education (DoE) as requiring upgrade works.

1.3 The works at NNPS upgrade the school including demolition of existing buildings (Blocks H and J), construction of three (3) new buildings with refurbishment of three (3) existing buildings (Blocks B, K and V).

The works at NSHS upgrade the school including addition of new two (2) storey extension to Building A, construction of new single storey amenities building and refurbishment of four (4) existing buildings (Buildings A, B, C and K).

This Development Without Consent (REF) will seek consent for the following works at NNPS & NSHS:

The works the subject of the Development Without Consent (REF) at NNPS comprise:

- Demolition of Blocks H, J and amphitheatre;
- Refurbishment of block K to provide three (3) x special programs rooms;
- Refurbishment of Block V to provide four (4) x general learning spaces (GLS);
- Construction of new two (2) storey building containing seven (7) GLS and amenities on the ground floor and eight (8) GLS on the first floor (Block E)

The works the subject of the Development Without Consent (REF) at NSHS comprise:

- Refurbishment and upgrades to Buildings A, C and K.

Other development works are occurring on the site under separate planning pathways including:

- Development Application (DA);
- Designated Development Application (DD); and
- Exempt development

The proposed development does not seek to increase staff or student numbers.

Reference should be made to the reduced plans for NSHS provided in **Figure 2.**

Figure 2: Site Plan (received 16 September 2022)

1.4

Key References

The TA references several key strategic, design and planning documents in assessment of the traffic and transport related elements of the project. These documents include:

- Pittwater Development Control Plan 2004, amended 18 January 2021;
- Pittwater Local Environmental Plan 2014
- Move – Northern Beaches Transport Strategy 2038, adopted November 2018;
- Northern Beaches Walking Plan, Draft
- Northern Beaches Bike Plan, adopted July 2020;
- NSW Department of Education, Master planning guidelines for schools, October 2020
- NSW Department of Education, SINSW Community of Practice Architects + Transport Planners, 29th October 2020
- NSW Department of Education, Educational Facilities Standards and Guidelines (EFSG Guide)
- NSW Government, Planning Guidelines for Walking and Cycling, November 2019;
- Transport for NSW, NSW Movement and Place Framework
- NSW Government, Practitioner's Guide to Movement and Place, March 2020

- NSW Planning Guidelines for Walking and Cycling (December 2004);
- Pittwater 21 Development Control Plan 2004 (Pittwater DCP)
- Pittwater Local Environmental Plan 2014 (Pittwater LEP)

This TA also references general access, traffic and parking guidelines, including:

- Roads and Maritime Services, Guide to Traffic Generating Developments, v2.02, 2002 (RMS Guide)
- Roads and Maritime Services, Trip Generation Surveys Schools Analysis Report (Prepared by GTA for RMS, Issue A dated 25/08/2014);
- Australian Standard 2890.1:2004 Parking Facilities – Off-Street Car Parking (AS 2890.1: 2004)
- Australian Standard 2890.2:2018 Parking Facilities – Off Street Commercial Vehicle Facilities (AS 2890.2:2018)
- Australian Standard 2890.3:2015 Parking Facilities – Bicycle Parking (AS 2890.3:2015)
- Australian Standard 2890.5:2018 Parking Facilities – On-Street Parking (AS 2890.5:2018)
- Australian Standard 2890.6:2009 Parking Facilities – Off-Street Parking for People with Disabilities (AS 2890.6:2009)
- Transport for NSW, Supplement to Australian Standard AS 1742.10-2009, Manual of Uniform Traffic Control Devices – Part 10: Pedestrian Control and Protection Version 3.1 March 2021
- EIS Guidelines – Road and Related Facilities (Department of Urban Affairs and Planning (DUAP), 1996)
- Cycling Aspects of Austroads Guides
- Guide to Traffic Management Part 12: Integrated Transport Assessments for Development (Austroads, 2020)

2 Strategic Context

Movement and Place Framework

The Movement and Place is a cross-government framework for planning and managing roads and streets across NSW. The framework delivers on NSW policy and strategy directions to create successful streets and roads by balancing the movement of people and goods with the amenity and quality of places.

2.1 The below provides a brief summary of how Movement and Place is relevant for the school development.

Place Analysis

The place analysis makes reference to the importance of the location in its physical form, the activity and generates and how its meaning is characterised for the community.

2.1.1

With reference to the movement impacts on place, the framework recognises the need to provide safe, direct, and comfortable walking and cycling routes as the backbone of active travel, including to schools and linking local activities to local recreation, giving priority to car-free arrival points and providing minimal parking. Of relevance to the proposal, built environment indicators for Primary Schools extracted from the Practitioner's Guide to Movement and Place is presented in **Figure 3.**

USER OUTCOME	INDICATOR	MEASURE	DESIRED OUTCOME	DATA SOURCE
Amenity and Uses				
Convenient facilities	Primary schools	Walkable access to primary schools	Positive indicates increase in catchment	GIS network analysis

Figure 3: Built Environment Indicators

2.1.2

Movement Analysis

The concept of movement as characterised by the Framework describes the demand to, from and through the activity centres, and describes the series of modal networks interlinking them. With reference to the schools location, it is interlinked by the road network, which is of adequate width to provide for bus services, as well as pedestrian footpaths and a dedicated cycling routes.

2.1.3

Built Environment Indicators

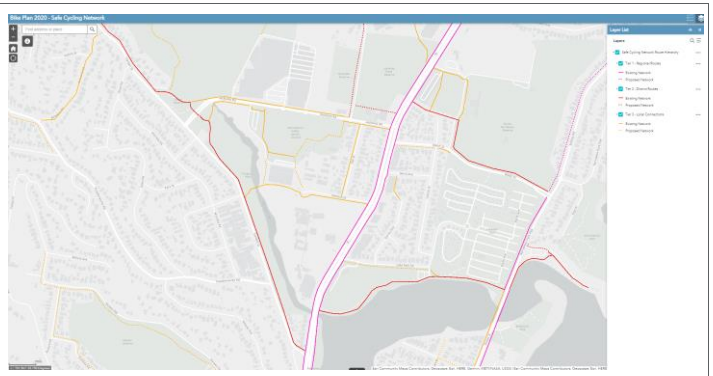
Furthermore, the Movement and Place Framework has established a set of 36 Built Environment Performance Indicators to evaluate projects based on qualities that contribute to a well-designed built environment and are grouped under five themes relating to user outcomes. The user outcomes reflect what a person may reasonably expect as an outcome of good performance related to that theme.

Nine core indicators are analysed as the minimum data inputs for each relevant theme for all projects to report against, ensuring the focus on both movement and place outcomes. Supplementary and project-specific indicators are not required for every project or plan but can be adopted where the context and objectives cannot be addressed using the core indicators.

Table 1 below provides the nine core indicators and three supplementary indicators which are considered relevant for the project.

TABLE 1 MOVEMENT AND PLACE - PERFORMANCE INDICATOR

Indicator Name	Indicator Number	Indicator Type	Objective	Classification	Ason Group Notes
Mode share	1	Core	To measure the proportion of sustainable travel mode usage by transport customers.	% of sustainable trips: 13% Category – between 5% and 20%	With reference to Movement and Place Built Environment Indicator Map, 13% sustainable trips are observed for sustainable trips to work. Detailed mode share analysis as well as school catchment analysis are conducted in **Section 2.7.2** and **6** of this report.
Public transport accessibility	4	Core	To measure the level of interaction between land use and transport services in terms of how well people are served by public transport.	PTAL – Level 6: very high	Public Transport Accessibility Level has been assessed based on the AM Peak between 6:00am to 10:00am and PM Peak between 2:00pm to 6:00pm. Public transport access to primary schools is analysed within **Section 6** of this report.
Permeability	29	Core	To measure the walking and cycling permeability of the road network, reflecting the walkability and connectivity of an area	Intersection Density: 21-40 intersections per km^2	With reference to Movement and Place Built Environment Indicator Map, intersection density of 21 to 40 km^2 is observed within proximity of the school site.
Public space	9	Core	To measure walking access to public spaces and the proportion of land that is reserved for public space	Population within 10min walk to a public space: 0% Proportion of public space: 40%	With reference to Movement and Place Built Environment Indicator Map, population within 10min walk to a public space is 0% and proportion of public space is 40% around the school site.
Road safety	23	Core	To measure and identify road safety risks and trends in crashes over time on NSW roads		Refer to **Section 4.2** for crash stat analysis
Primary School	24	Supplementary	To measure the walkable access to primary schools and nearby public transport	Walkable access to primary school has been assessed for 400m, 800m, 1200m, 1600m, 2000m and 2300m on-path walking distance.	Refer to **Section 6.4** of this report.
Cycling Accessibility	3	Supplementary	To measure the connectivity, access, and quality of cycling infrastructure across the State	Hierarchy (desirability of cycling facility) – Shared Path – Non-Directional	With reference to Northern Beaches Council Bike Plan 2020, access to non-directional shared path network is along the site frontage to Namona Street.

2.2 Move – Northern Beaches Transport Strategy

The *Move – Northern Beaches Transport Strategy 2038* (NBTS) was prepared by Council to present the vision for '*a safe, sustainable and smart transport network'*. The NBTS outlines the key strategies and direction of the Council to deliver '*an efficient, innovative and reliable transport network'* by 2038.

The NBTS seeks to increase the modal share of all trips to a quarter for public transport, and to double the number of active travel trips in all households with a focus on commuters and students. Furthermore, the NBTS is targeting a reduction in private vehicle trips by 30%, thus also lowering carbon emissions and improving traffic congestion.

Of relevance to the school, the NBTS notes the need to prioritise improvements to the active travel network from homes to work and education facilities; upgrades to footpath and cycling paths and bike parking facilities are needed to support more active travel.

The NBTS provides the following themes and key directions for Northern Beaches LGA, as shown in **Figure 4**.

Theme		Key Directions
1	Accessible and Liveable Places	• Create and enhance "Places for People" that are integrated with public transport, creating vibrant, connected places with wide footpaths, safe cycling options and where the car is not the first option.
2	Active Travel	• Prioritise smart, active travel network improvements (through technology, end of trip facilities and way-finding signage). Expand footpath and shared path networks to improve connectivity and safety, making walking and cycling attractive alternatives to the car.
3	Public Transport	• Partner with the NSW Government to implement a Bus Rapid Transit service by 2020 between Dee Why, Frenchs Forest and Chatswood; followed by services between Mona Vale and Macquarie Park. • Plan for a high frequency mass transit service on the Northern Beaches in the longer term.
4	Efficient Road Network	• Support the delivery of the Beaches Link Tunnel subject to the inclusion of public transport and minimise overall impact on our local residents.
5	Smart Parking Management	• Develop local parking management plans for town and village centres including higher turnover parking in areas of high demand.

Figure 4: Key themes and directions for Northern Beaches Council[1]

2.3 Northern Beaches Bike Plan

The Northern Beaches Bike Plan (NBBP) was adopted in July 2020 by Council to assist with increasing the number of cyclists in the Northern Beaches LGA for both recreational and travel purposes.

The NBBP outlines the following key objectives:

- Safe cycling network – to provide a safe and well-connected cycling network which is separated from traffic for the purpose of short trips

[1] *Northern Beaches Transport Strategy*

- Road cycling network – to provide a safe on-road cycling network which provides excellent connectivity for long distance commuting

As part of the plan, community feedback showed that many people are not cycling due to concerns with safety and connectivity. It is intended to promote and increase numbers in cycling by providing end-of-trip facilities and a safe and well-connected network which '*focuses on providing better connection for short trips to destinations such as shops, public transport, beaches, sports-fields, schools and workplaces as well as connections between strategic and local centres.*'

Council also intends to provide mapping, programs and events to further encourage cycling, such as Ride to Workday, Ride to School Day and NSW Bike Week.

2.4 Draft Northern Beaches Walking Plan

The Northern Beaches Walking Plan (NBWP) is currently in draft and is being prepared by Council to create and maintain a safe and well-connected walking network for all pedestrians, including for walking, running and mobility impaired. Ultimately, the plan is to achieve an uptake in active travel in line with the NBTS.

The NBWP provides the following 5 key directions:

- Connecting the network
- Delivering the network
- Making walking safe
- Creating walking neighbourhoods
- Encourage walking

Council will also work closely with the NSW Government to promote walking programs and initiatives, such as 'Walk Safely to School Day', Safe Routes TO School Programs, Active to Schools Program and support for local walking groups.

2.5 Road Safety Education Program

The Road Safety Education Program is a long-term integrated education initiative funded by the Centre for Road Safety in government and non-government schools. The aim of the program is to increase road safety knowledge, understanding and skills.

Road safety education specialists in the government, Catholic and independent school sectors provide professional learning and advice to teachers and schools about teaching road safety and how to address road safety issues through the curriculum.

The teaching and learning focus is on pedestrian, passenger and wheels safety, as well as on future drivers. The Centre for Road Safety leads the development of quality teaching and learning resources for teachers to use in schools.

The education sectors provide professional learning to teachers to equip them with the knowledge and skills to teach quality road safety education. Teachers are also shown how to use the resources in the classroom to create effective teaching and learning programs.

2.6 Safety Around Schools Program

TfNSW continues to have a strong focus on improving the visibility of school zones to increase driver awareness and compliance. Schools aim to address road safety issues around their school to create a safer environment for the whole school community by:

- Teaching students about the local road safety conditions contributes significantly to improving their own safety.
- Reminding parents and carers about safe road user behaviours outside the school also contributes significantly to the safety of our students
- Working with agencies to improve local safety issues in the school zone through planning, enforcement, engineering or environmental changes.

2.7 Community Profile

2.7.1 Population

A review of Profile ID was undertaken to establish population contexts for the North Narrabeen community profile. Profile ID sources data from Australian Bureau of Statistics (ABS) Census - accordingly, it should be noted that this data includes the wider extents of the LGA. Interpretation should account for minor variance in available statistical information.

Estimated Resident Population (ERP) in 2021 was 6,441 which was an increase of approximately 0.56% from the previous year. Figure 5 presents the data from 2012 to 2021 to highlight the growth over trend over the seven years.

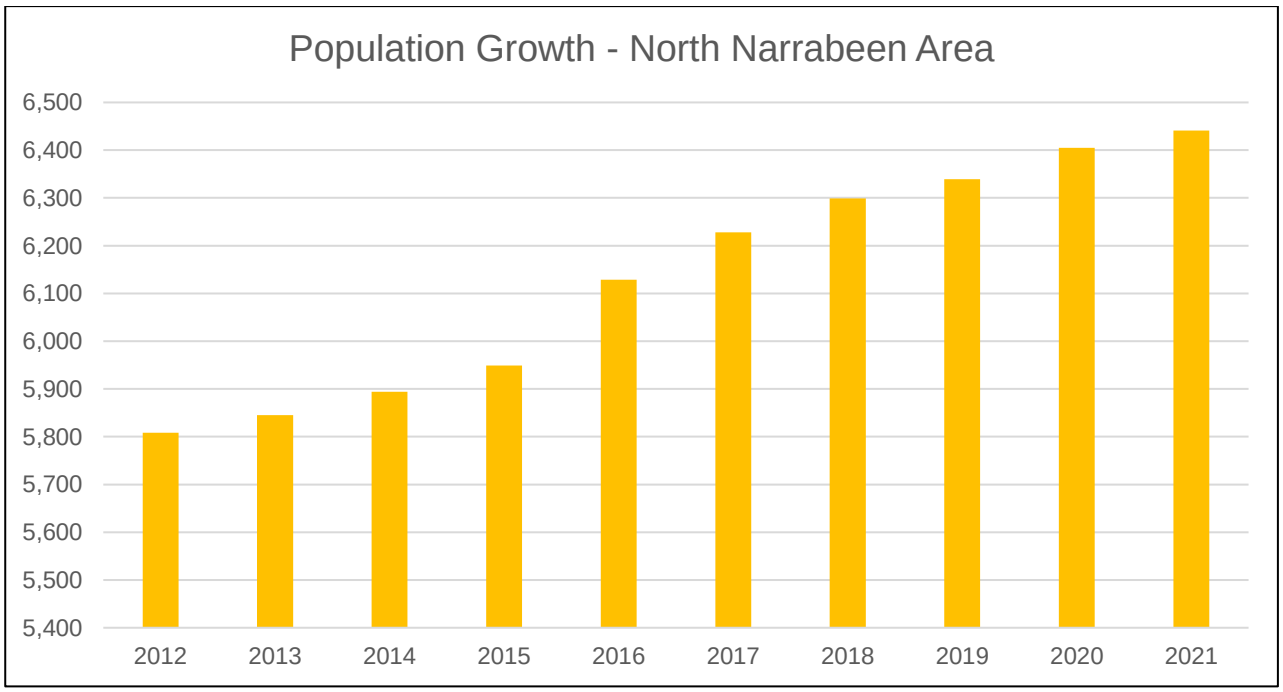


Figure 5: Estimated Resident Population[2]

[2] Australian Bureau of Statistics, Regional Population Growth, Australia (3218.0). Compiled and presented by .id (informed decisions)

2.7.2 Travel Mode Share

An analysis of the ABS 2016 Census Data was undertaken to determine the existing travel mode share of residents residing in Destination Zone (DZN) 114232773, where the School is located. The results are presented in **Table 2.**

TABLE 2 EXISTING MODE SHARE

Travel Mode[1]	% of total trips
Car (as driver)	76%
Car (as passenger)	9%
Train	2%
Bus	10%
Truck	1%
Motorbike / Scooter	1%
Cycling	2%
Walked only	3%
Other	0%

Note: 1. Excludes people who worked from home or do not work

The above table demonstrates a predominant modal dependency on private vehicle usage of 85%, comprising 76% as driver and 9% as passenger. Notably, there are lower dependencies on public transport modes being approximately 2% for cycling and 3% for walking.

It is considered that this data is also representative of the general travel mode choice such as shopping and recreational trips.

At the time of preparation of this report, the ABS 2021 Census Data has not been released. The ABS 2021 Census Data will be released in a staged approach between 28 June 2022 and early to mid-2023.

3 Existing Conditions

3.1 Site & Location

The subject site, Narrabeen Sports High School (NSHS) is located at 10 Namona Street, North Narrabeen and falls within the local government area of Northern Beaches Council. A description of the School is provided below:

TABLE 3: SITE DESCRIPTION

School	Title	Approximate Area (Ha)
NSHS	Lot 2 / DP 1119562	7.4

The school is located approximately 21km to the northeast of the Sydney CBD, surrounded by local businesses and low-density residential dwellings. The Warriewood Square Shopping Centre is located within 750m walking distance of north of the School.

Narrabeen Sports High School is currently a high school and includes the following building and facilities:

- Eleven (11) GLS hubs
- One (1) hall
- One (1) canteen
- One (1) gym;
- One (1) library;
- One (1) health and PE hub;
- One (1) performing arts hub;
- Fourteen (14) metal, wood, art and science hubs;
- A number of outdoor spaces, including tennis courts and oval;
- At-grade car parking accommodating 44 formal car parking spaces, inclusive of 1 accessible car space accessed via Namona Street;
- Three (3) pedestrian accesses as follows:
  - One (1) pedestrian access point from Warriewood Valley Sportsground
  - One (1) pedestrian access point from the Namona Street; and
  - One (1) pedestrian access point from the Northern Beaches Indoor Sports Centre (NBISC) car park.
- 91 on-site bicycle parking spaces

The Site and surrounding context is demonstrated in **Figure 6** below.

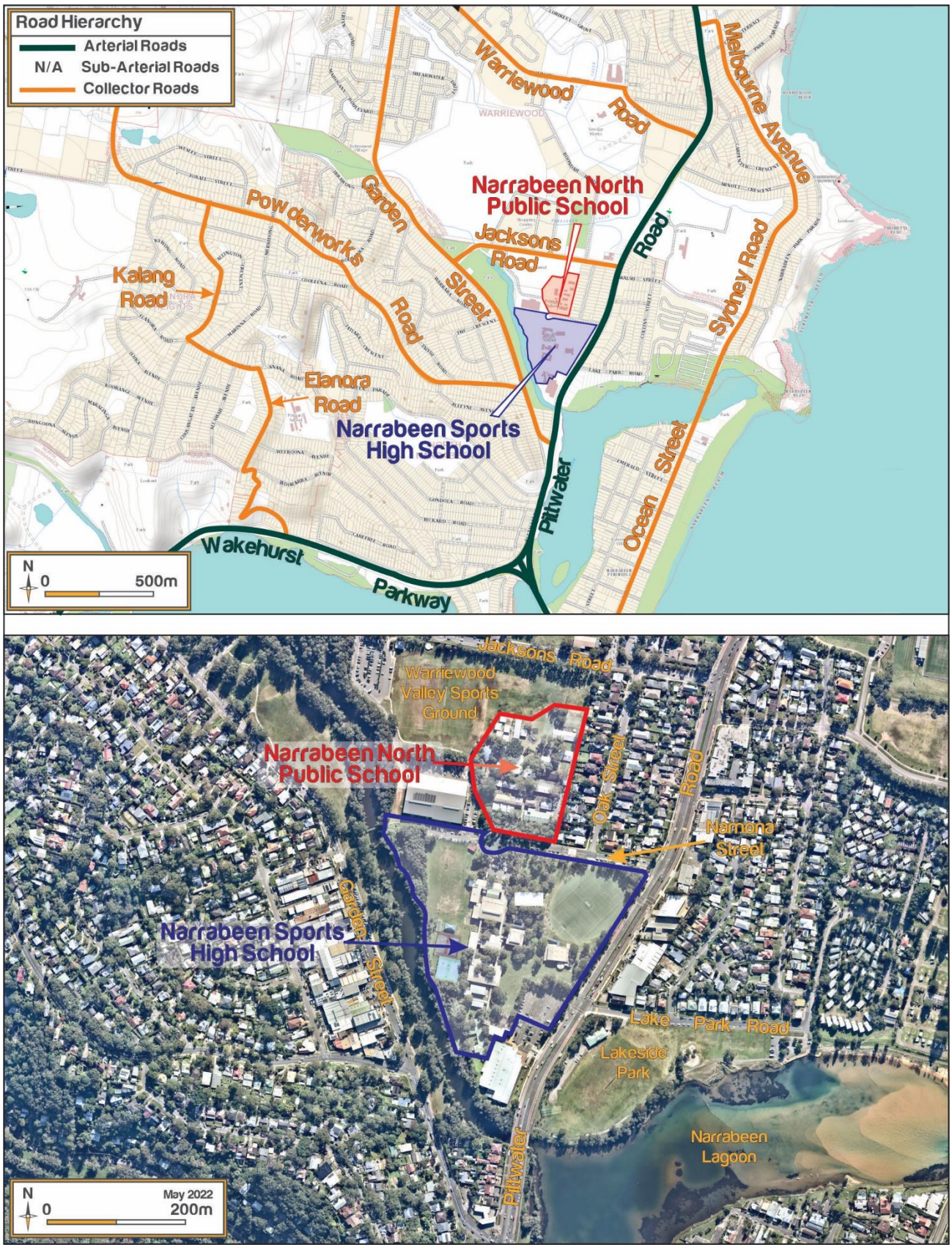


Figure 6: Site Location, Context and Road Hierarchy

3.1.1 Existing Site Transport Facilities

As it relates to travel planning, the School and immediate surroundings of the school provide the following transport facilities:

- On-site bicycle parking rails (91 spaces)
- On-site car parking spaces for staff (44 spaces);
- Constructed concrete footpaths along the Namona Street and Pittwater Road frontages
- A bus zone on either side of Namona Street fronting both Sports High School and Narrabeen North Public School two bus zones on Pittwater Road.
- Existing pedestrian crossing on Namona Street
- Existing signalised crossings on Pittwater Road

The existing arrangements are presented in **Figure 7**, **Figure 8** and **Figure 9.**

Figure 7: Existing Transport Facilities

Figure 8: Existing Parking Restrictions

Figure 9: Existing Pedestrian Facilities

4 Road Network

4.1 Road Hierarchy

The key roads in proximity of the site are summarised in **Figure 10** with reference to the site plan and road hierarchy in **Table 4.**

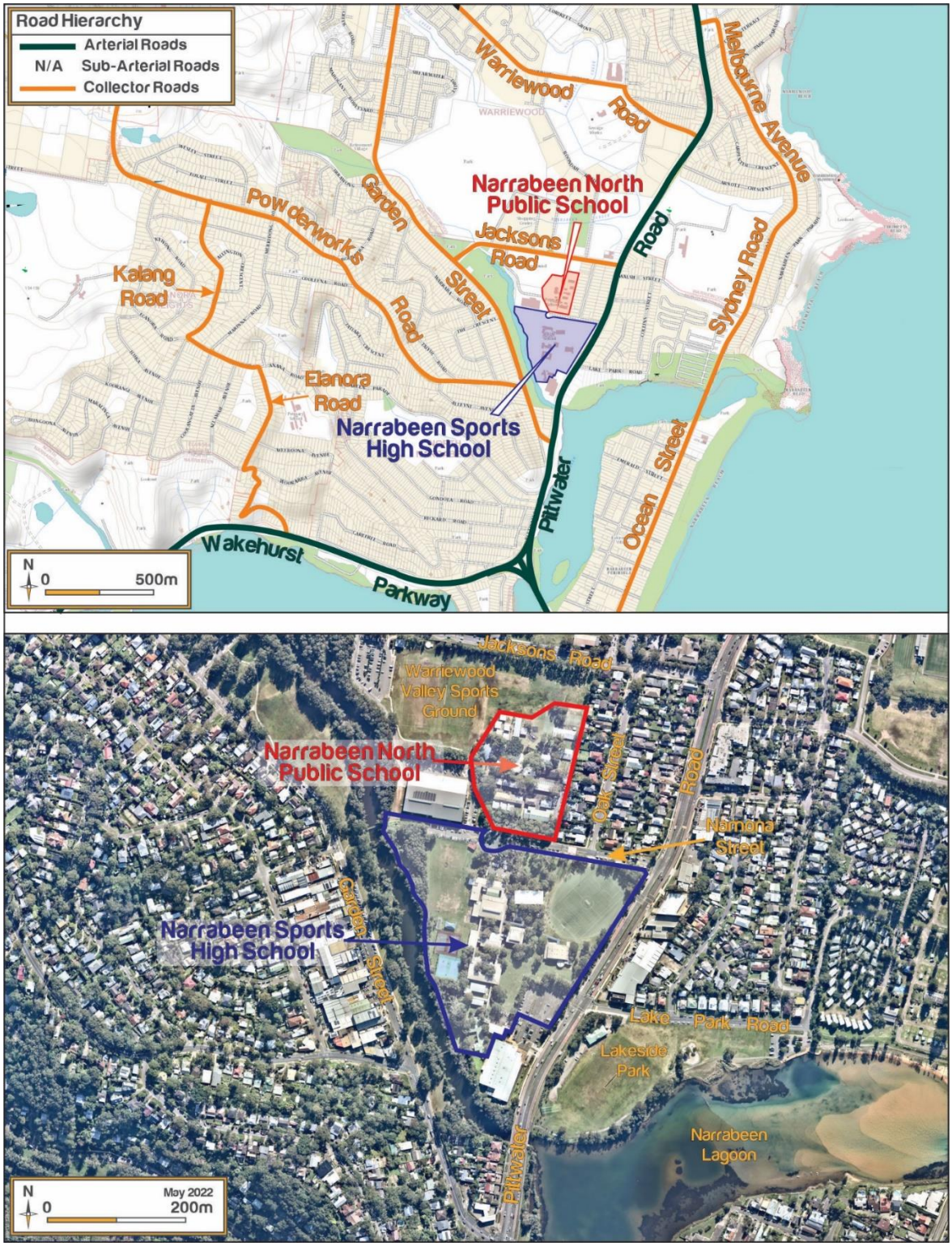


Figure 10: Site Context and Road Hierarchy

TABLE 4: KEY ROADS			
Road Name	**Road Classification**	**AADT[1] (vpd)[2]**	**Speed Limit[3]**
Pittwater Road	State Road	16,165	70 km/h
Namona Street	Local Road	530	50 km/h
Jacksons Road	Local Road	5,355	50 km/h
Oak Street	Local Road	TBC	50 km/h
Garden Street	Regional Road	TBC	50 km/h

4.1.1 Traffic Volumes

Ason Group commissioned traffic volume movement counts which were conducted at the above intersections on Thursday 02 June 2022 between the hours of 6:30 am to 10:30 am and 2:00 pm to 6:00 pm.

The traffic count data has been assessed to define natural peak periods associated with the schools' bell times, specifically during the AM and PM Peaks. Accordingly, background peaks formed during the following hours and thus form the basis of assessment:

- AM School Peak: 8:00am to 9:00am
- PM School Peak: 2:30pm to 3:30pm
- PM Network Peak: 4:00pm to 5:00pm

The figure below captures background movements for the critical intersections in proximity of the Site.

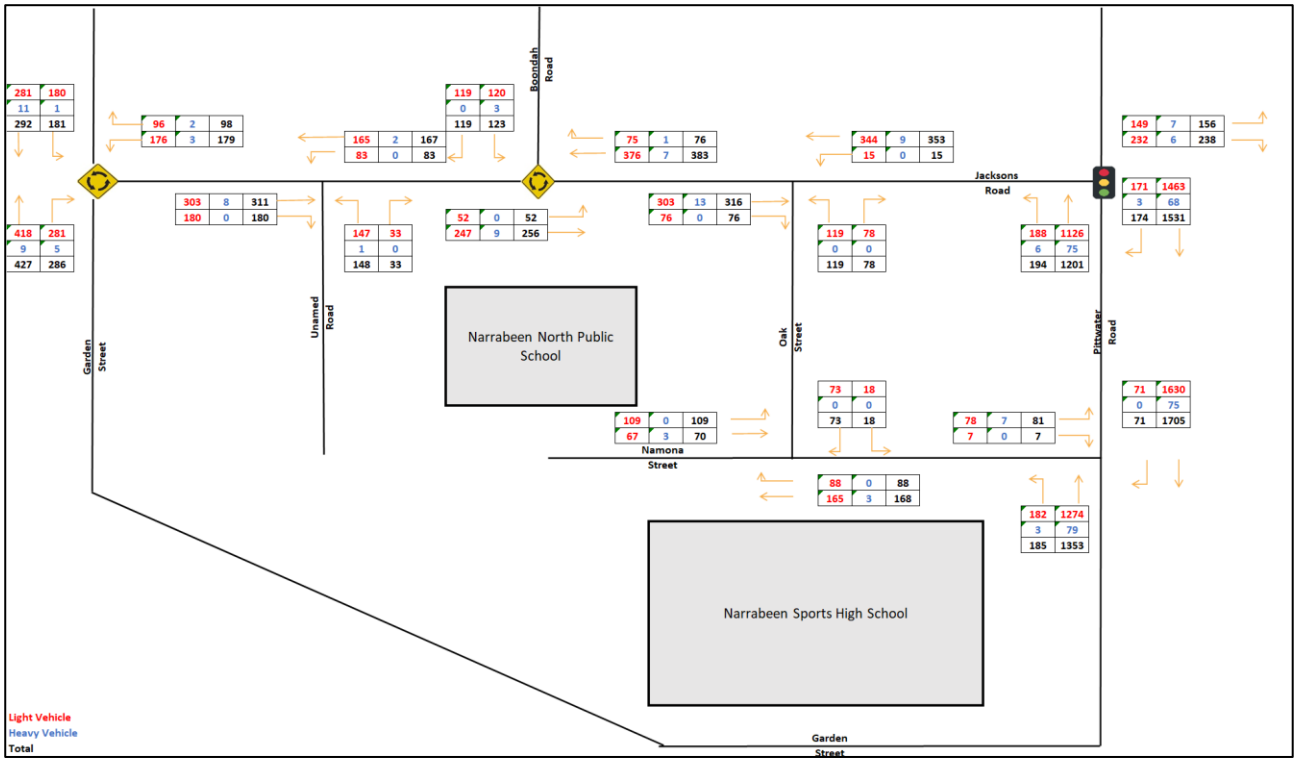


Figure 11: Existing AM School Traffic Volumes – June 2022

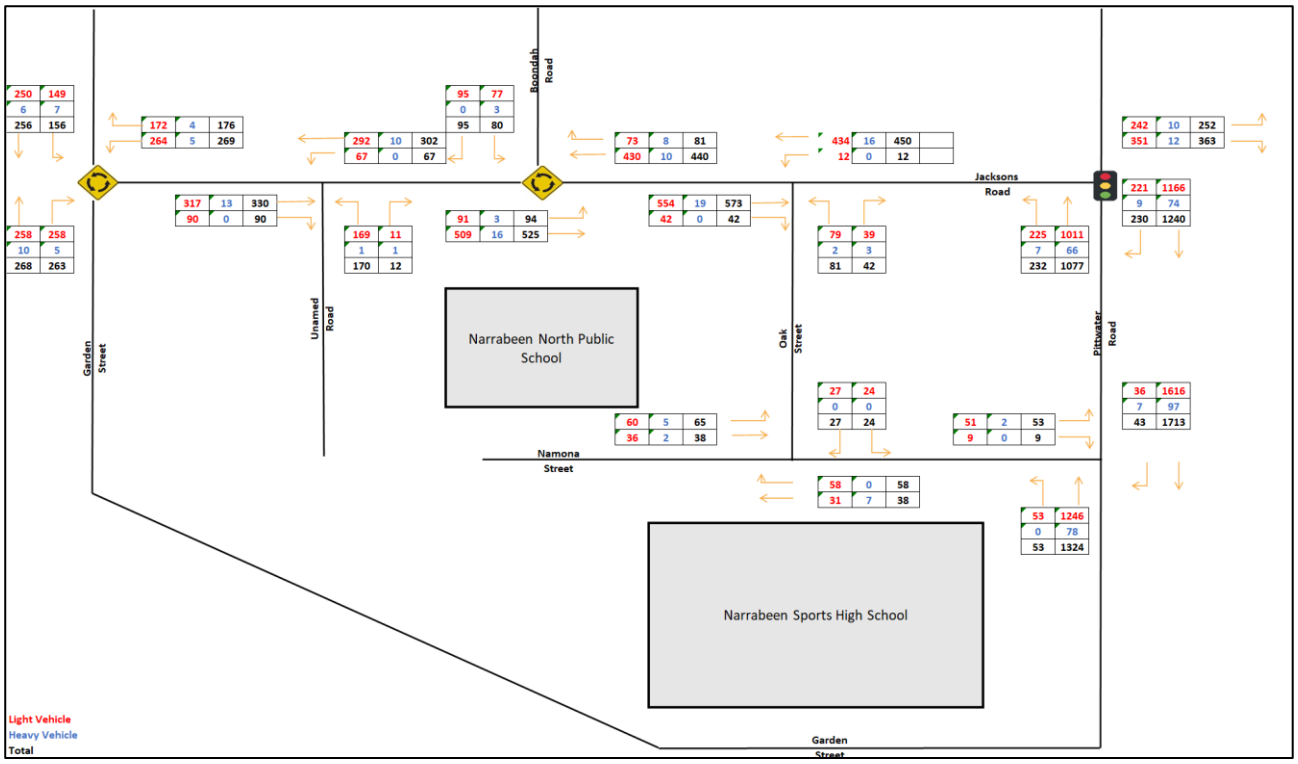


Figure 12: Existing PM School Traffic Volumes – June 2022

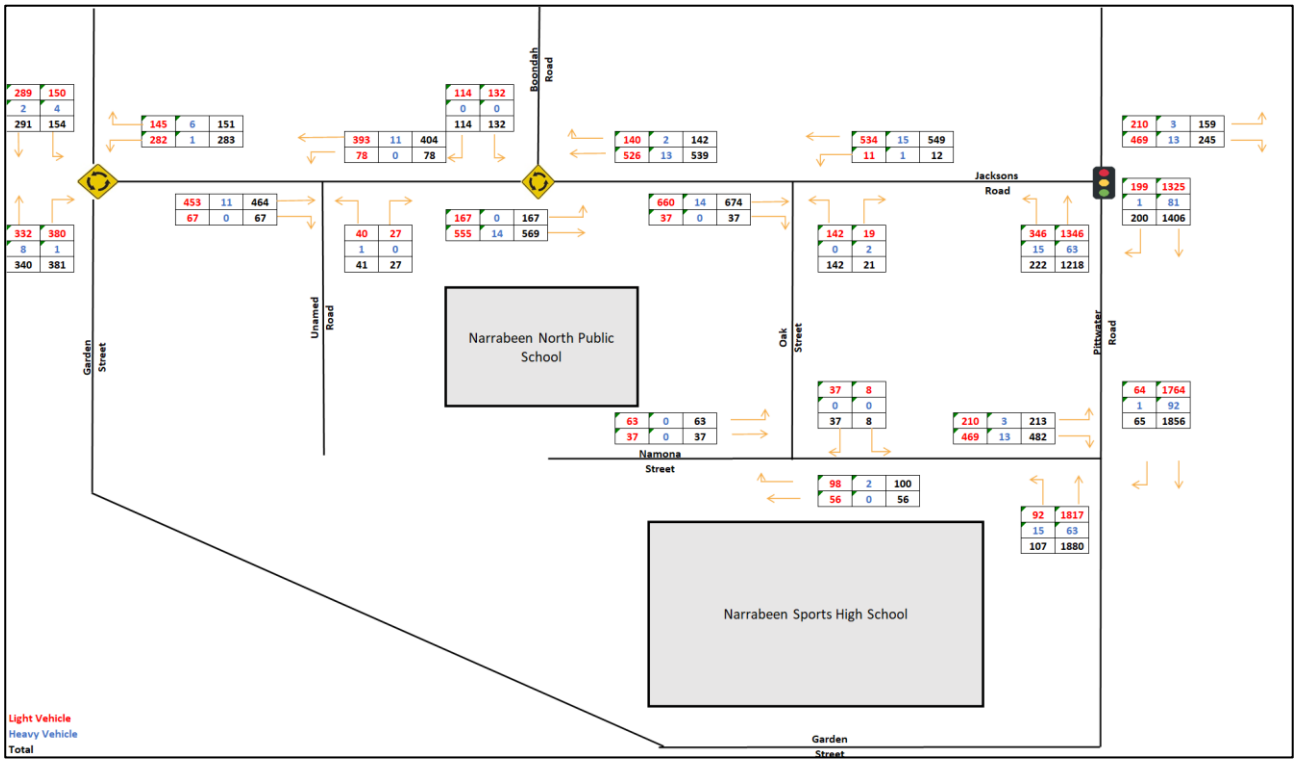


Figure 13: Existing PM Network Traffic Volumes – June 2022

4.2 Road Safety

A review of the TfNSW *Centre for Road Safety* database has been undertaken to establish the crash history within the immediate vicinity of the Site. The results are based on crashes over a five-year period between 2016 and 2020. Locations of recorded crashes are shown in **Figure 14** and details summarised in **Table 5**.

A review of the crashes indicate that the majority of crashes occurred along the Pittwater Road, with three crashes occurring at the Pittwater Road/Berry Avenue intersection, five crashes occurring at the Pittwater Road/Namona Street intersection, two crashes occurring at the Pittwater Road/Lake Park Road signalised intersection and three crashes occurring at the Pittwater Road/Garden Street signalised intersection. The data indicates a majority of the crashes were attributed to "Right Through" RUM Descriptions, comprising approximately 62% of all recorded crashes.

Figure 14: Crash Locations[3]

TABLE 5: CRASH TYPOLOGY

Reporting Year	Lighting	RUM Description	Location	Injury
2016	Daylight	21-Right through	Pittwater Road/Berry Avenue	Non-Casualty
	Daylight	21-Right through	Pittwater Road/Garden Road	Minor/Other Injury
2017	Daylight	21-Right through	Pittwater Road/Berry Avenue	Non-Casualty
	Daylight	21-Right through	Pittwater Road/Namona Street	Minor/Other Injury
	Daylight	21-Right through	Pittwater Road/Namona Street	Serious Injury
	Daylight	21-Right through	Pittwater Road/Namona Street	Minor/Other Injury

[3] *https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats/lga_stats.html?tablga=4*

	Daylight	21-Right through	Pittwater Road/Namona Street	Non-Casualty
	Darkness	0-Ped nearside	Pittwater Road/Garden Road	Serious Injury
	Daylight	30-Rear end	Pittwater Road/Lake Park Road	Serious Injury
2018	Daylight	30-Rear end	Pittwater Road/Lake Park Road	Non-Casualty
2019	Daylight	37-Left turn sideswipe	Pittwater Road/Berry Avenue	Serious Injury
2020	Daylight	30-Rear end	Pittwater Road/Namona Street	Moderate Injury
	Darkness	21-Right through	Pittwater Road/Garden Road	Moderate Injury

With consideration to the table above, it is noted that there were 4 x 'right through' crashes (RUM code 21) which occurred at the intersection of Pittwater Road and Namona Street in 2017, indicating that this intersection is a 'black spot.' A rear end (RUM code 30) incident also occurred at this intersection in 2020.

Furthermore, the crash data shows that there were 3 crashes at the intersection of Pittwater Road and Garden Road with 2 x 'right through' (RUM code 21) crashes and 1 x 'left turn sideswipe' (RUM code 37) crash.

There were also 3 accidents at the Pittwater Road / Berry Avenue, being 2 x 'right through' (RUM code 21) crashes and 1 x 'pedestrian nearside' (RUM code 0) crash.

5 Public and Active Transport

5.1 Public Transport

The school is currently serviced by bus services which operate along Pittwater Road, Namona Street and Jacksons Road, which provide transport links between the Northern Beaches and Chatswood or Sydney CBD.

5.1.1 Bus Connectivity

The bus stops servicing school bus and public routes in closest proximity to the school are located to the immediate east and northeast, along Pittwater Road, to the immediate north of the school, along Jacksons Road, and along Namona Street. Route details for the bus routes are provided below in **Table 6, Table 7** and **Figure 15.**

TABLE 6: EXISTING PUBLIC BUS CONNECTIVITY

ROUTE	DESCRIPTION	BUS STOP LOCATION	SERVICE FREQUENCY
182	Mona Vale to Narrabeen	• Pittwater Road • Jacksons Road • Namona Street	AM Peak = 2 services PM Peak = 2 services Off Peak = 1 service
185	Mona Vale to Narrabeen via Warriewood Valle	• Pittwater Road • Jacksons Road	AM Peak = 2 services PM Peak = 2 services Off Peak = 2 services
190X	Avalon Beach to City Wynyard (Express Service)	• Pittwater Road	AM Peak = 3 services PM Peak = 0 services Off Peak = 6 services
199	Palm Beach to Manly via Mona Vale & Dee Why	• Pittwater Road	AM Peak = 6 services PM Peak = 7 services Off Peak = 6 services
B1	B-Line Mona Vale to City Wynyard	• Pittwater Road	AM Peak = 5 services PM Peak = 6 services Off Peak = 6 services
BN1	B-Line Mona Vale to City QVB (Night Service)	• Pittwater Road	Off Peak = 2 services

TABLE 7: EXISTING SCHOOL BUS CONNECTIVITY

ROUTE	DESCRIPTION	BUS STOP LOCATION	SERVICE
574N	Narrabeen High to Wynyard Station	• Pittwater Road • Jacksons Road	After School Service (Single service at 3:12pm)

		• Namona Street	
632N	Pittwater High School to Warringah Mall	• Pittwater Road • Jacksons Road	After School Service (Single service at 3:12pm)
665N	Narrabeen High School to Neutral Bay Junction	• Namona Street • Pittwater Road	After School Service (Two services at 2:50pm and 3:10pm)

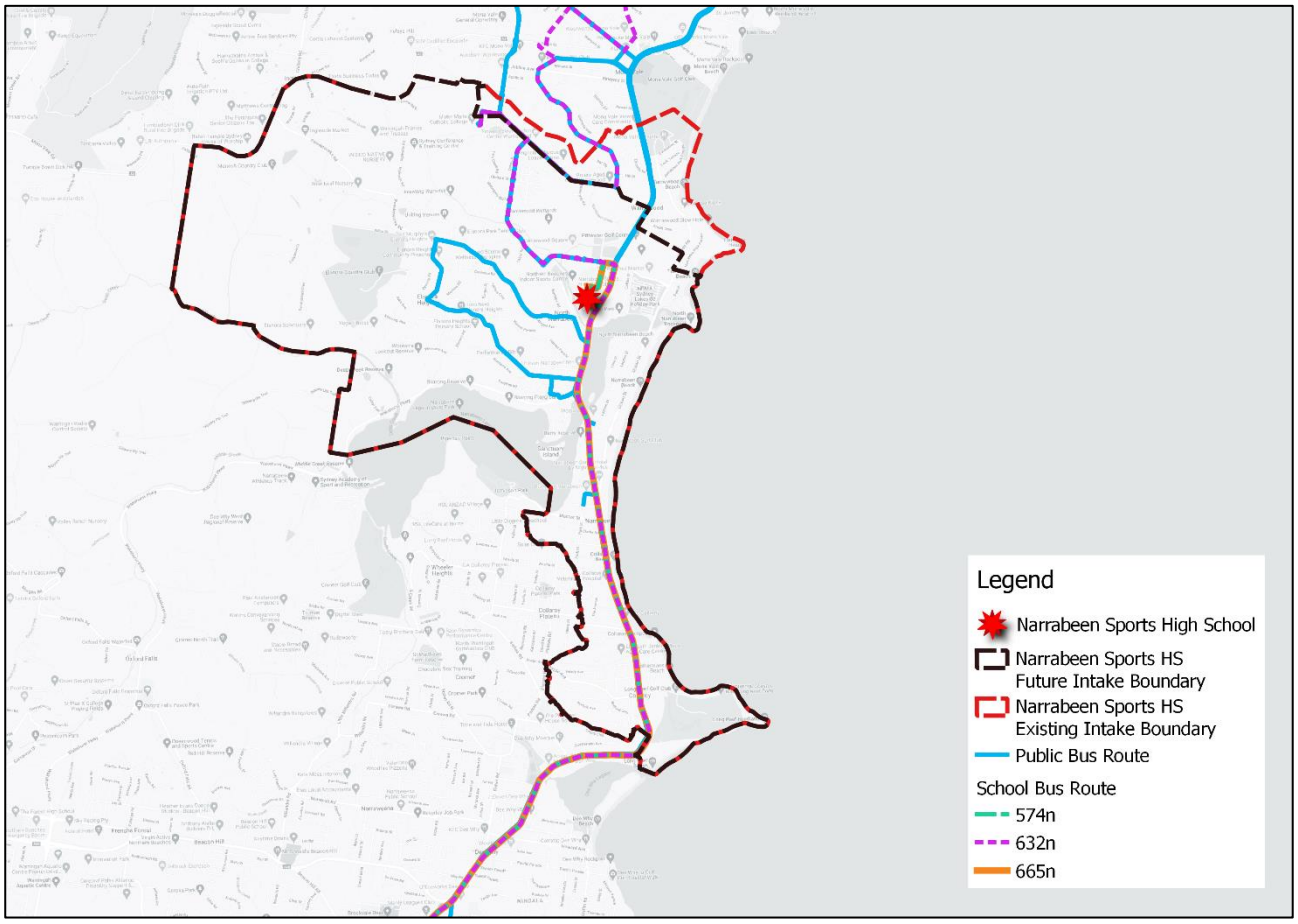


Figure 15: Bus Routes

5.1.2 Future Opportunities for Services

As demonstrated above, the Site demonstrates adequate and broad serviceability by public transport and accordingly, is not anticipated to require the identification of additional bus services.

5.2 Active Transport

5.2.1 Pedestrian Network & Connectivity

The Site is situated within a suburb with an established pedestrian network, desktop studies confirm that the broader road network is accompanied by pedestrian footpaths, either on one or both sides of all streets.

It is noted the school is surrounded by a number of major roads, which need to be crossed by school pedestrian and bicycle movements. As such, pedestrian crossings located within the vicinity of the school are provided at the following locations:

- Pittwater Road:
  - Traffic signals at Jackson Road with pedestrian crossing on northern side and western approaches at the intersection
  - Mid-block signalised pedestrian crossing south of Namona Street
  - Traffic signals at Lake Park Road with pedestrian crossing on all approaches
  - Traffic signal at Garden Street with pedestrian crossing on northern side and western approaches at the intersection
- Garden Street
  - Traffic signals at Powderworks Road with pedestrian crossing on northern side and western approaches at the intersection - this crossing links to pedestrian crossing of Mullet Creek and to the NSHS campus
  - Marked pedestrian crossing with refuges south of The Crescent - this crossing links to pedestrian crossing of Mullet Creek and t the NSHS campus
  - Central road pedestrian refuge to the south of Natuna Street – this links to pedestrian / cycle paths through Progress Park and linkages across Mullet Creek
- Jacksons Street
  - Marked pedestrian crossing with refuges east of Garden Road
  - Marked pedestrian crossing with refuges east of the Warriewood Valley Sportsground and Northern Beaches Indoor Sports Centre (NBISC) car parks access.
  - Marked pedestrian crossings on the western and northern approaches to the Boondah Road roundabout.

5.2.2 Cycling Network

Figure 16 below captures the extents of the cycling network in proximity of the schools using the Service NSW Cycleway Finder Map. There are off-road shared paths along Pittwater Road, Namona Street, Oak Street, Jacksons Road and Garden Street.

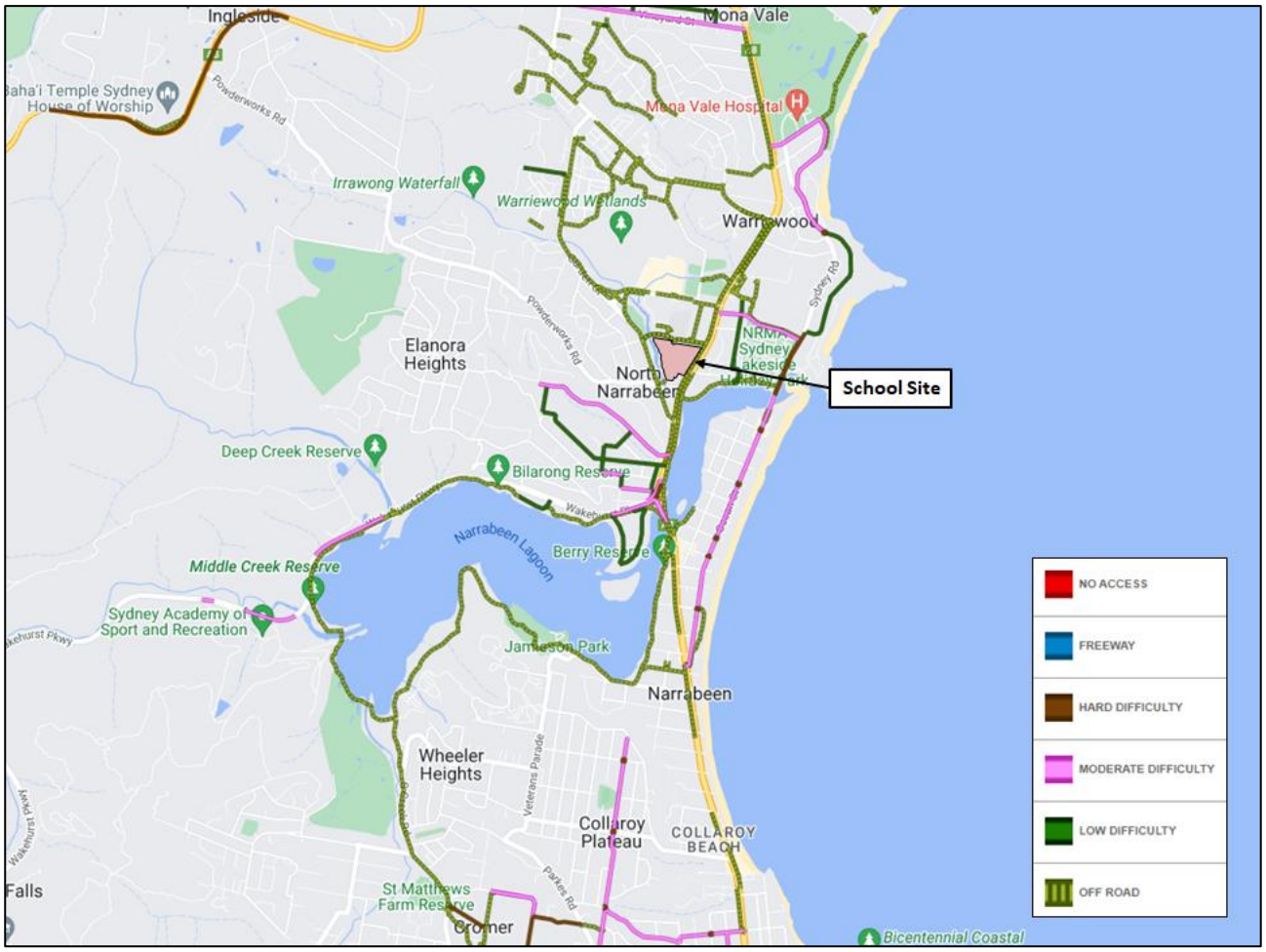


Figure 16: North Narrabeen Cycleway Finder Map

6 Existing School Travel Characteristics

6.1 Catchment Analysis

The map below illustrates the existing and future Narrabeen Sports High School student enrolment intake catchment area, which shares catchment borders with Pittwater High School, Davidson High School, The Forest High School and Northern Beaches Secondary College Cromer Campus, amongst more distant catchment zones.

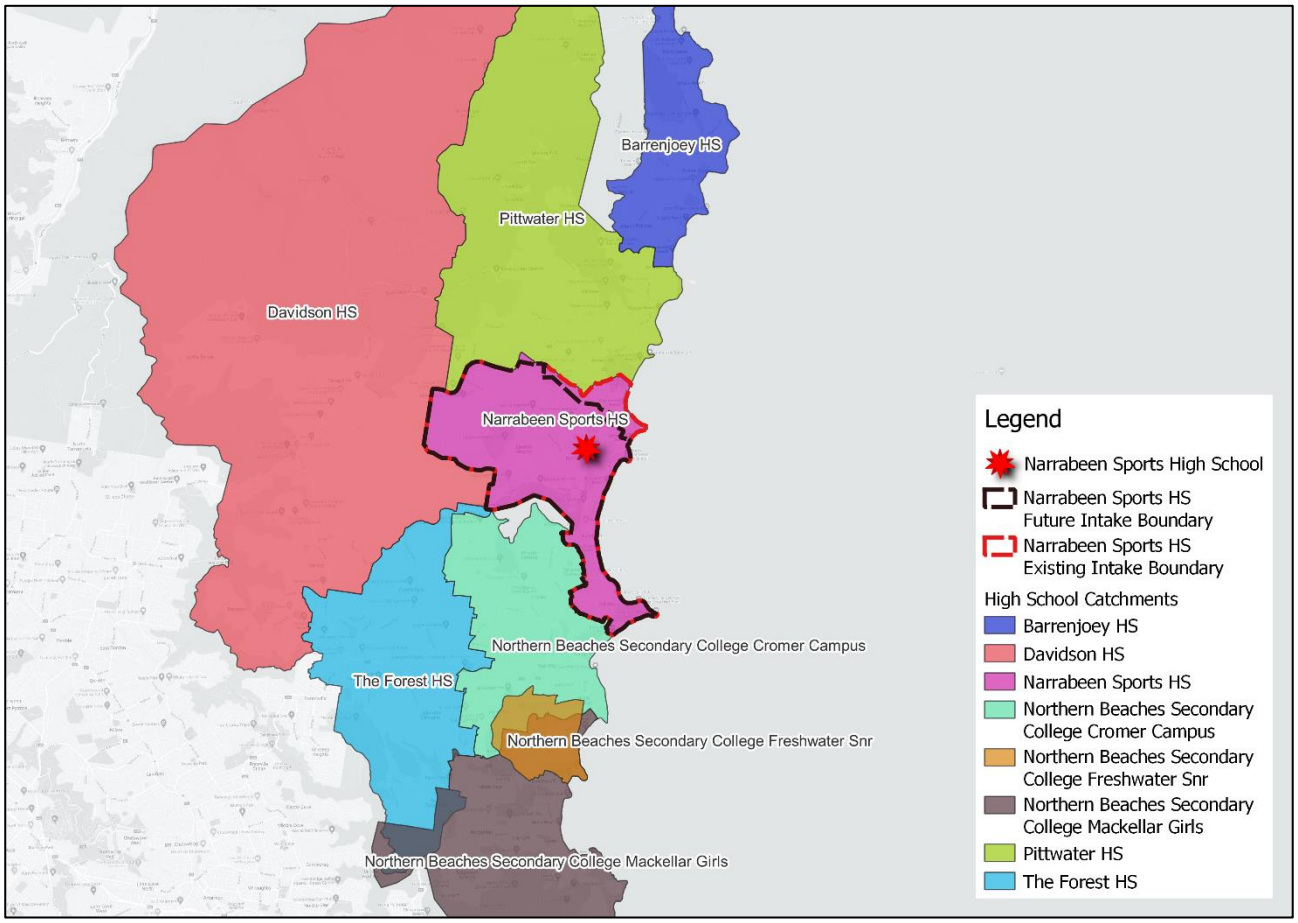


Figure 17: High School Catchment Areas

It is anticipated that there will be some minor increase in demand for student capacity for Narrabeen Sports High School.

Accordingly, SINSW have provided student location data based on the above catchment areas, which in turn provide spatial indication for where additional growth to the high school may be originating from.

6.2 Student Enrolment Map

The following figure demonstrates an anonymised distribution for the existing student population of Narrabeen Sports High School its current form. Whilst additional students are anticipated to come from adjacent catchments, it is anticipated that the school still will consolidate the locality of its existing population, predominantly within the areas west of the school as demonstrated below.

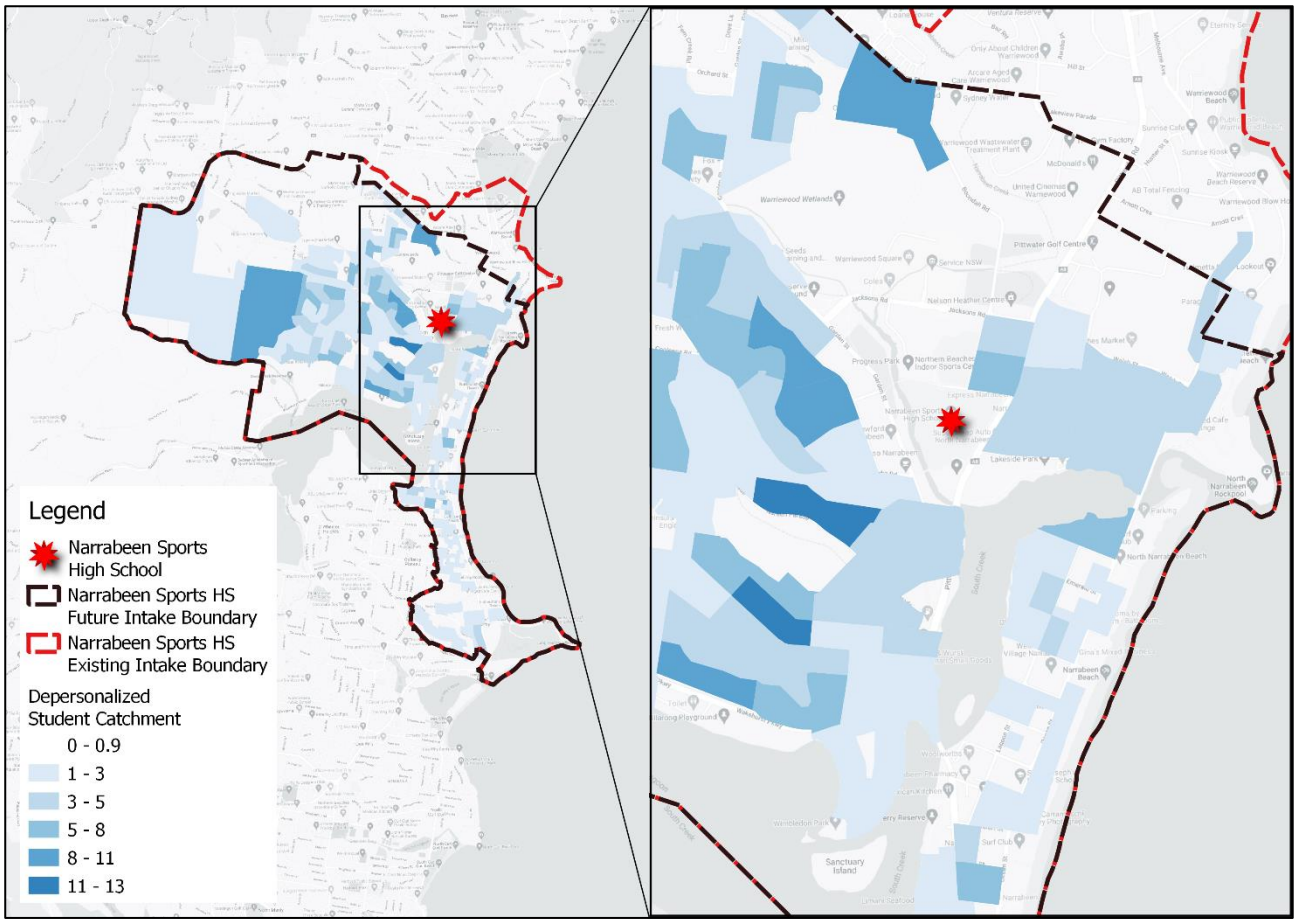


Figure 18: Narrabeen Sports High School (Grade 7 – 12)

The figure above demonstrates the following:

- There is a low degree of student density residing to the north, south and east of the school.
- There is a moderate to high degree of students to the west of the school living in Elanora Heights.

When considered in conjunction with the catchment map in Figure 17 above, it can be deduced that potential growth centres for the Narrabeen Sports High School are likely to originate from the suburbs of North Narrabeen and Elanora Heights.

6.3 Public Transport Catchment

In line with guidelines published by the NSW Government and TfNSW, the School Student Transport Scheme (SSTS) provide guidelines in relation to eligibility for free school public transport.

For grades 7-12, the following eligibility criteria applies:

- They are a resident of NSW, or an overseas student eligible for free government education.
- The straight line (notional) distance from their home address to school is more than 2.0 km.
- The walking distance from home to school is 2.9 km or further.

As defined above, **Figure 19** below demonstrates the catchment exclusion zones for Grades 7-12 with reference to the Schools' location.

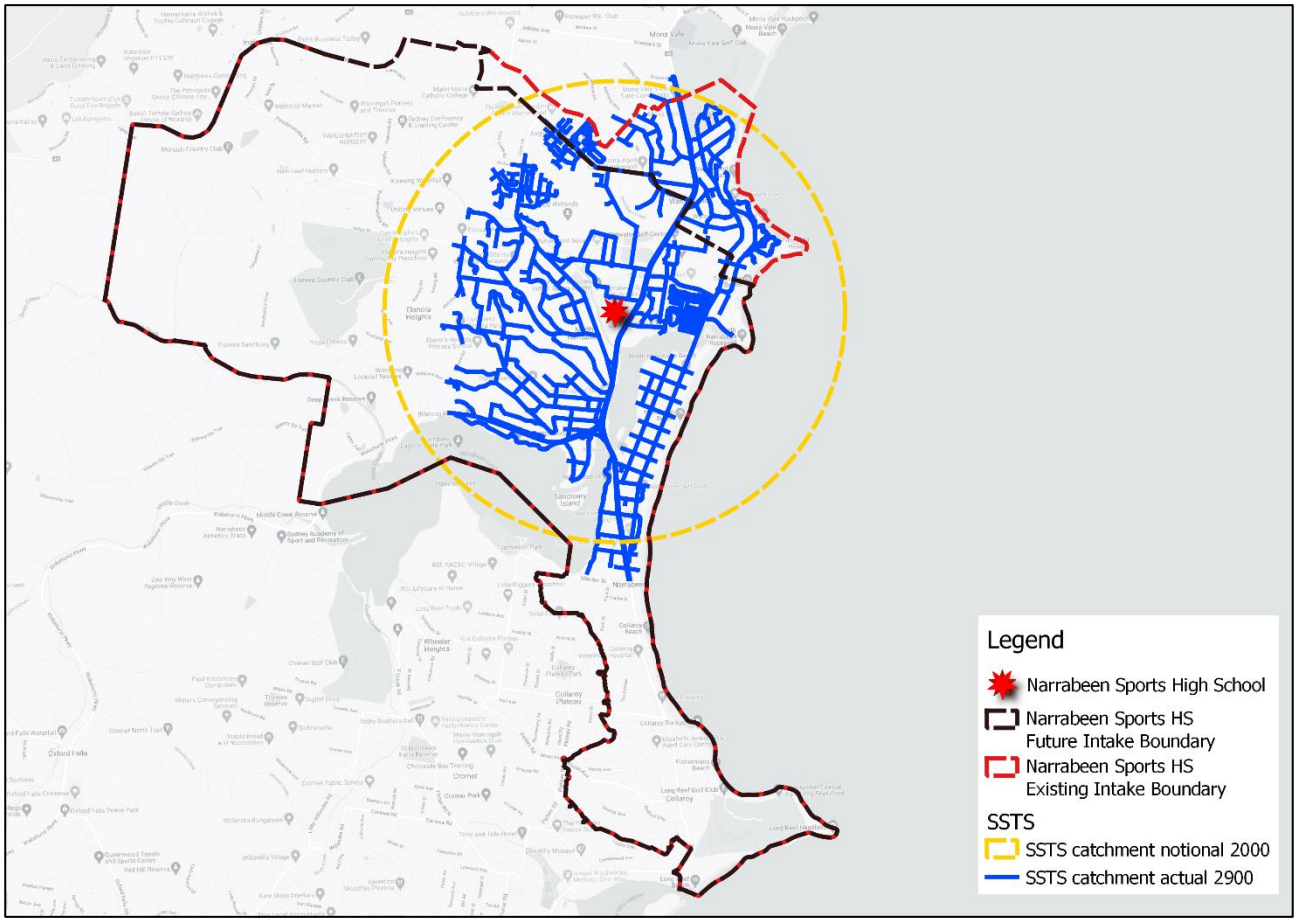


Figure 19: SSTS Exclusion Zones

The exclusion zones above demonstrate that both the 2.0km radius and 2.9km distance capture the wider proportion of the local area to which the majority of the student population are currently residing.

6.4 Active Transport Catchment

6.4.1 Pedestrian Catchment

SINSW have characterised the walking catchment of a school within 5, 10 and 15-minute walking distance increments (approximately 400m increments) of the school, representing desirability for the catchment area. **Figure 20** demonstrates the walking distances relative to the Site.

In its existing form, the pedestrian network for the North Narrabeen area exhibits a good degree of pedestrian connectivity, with adequate provision of footpaths on either one or both sides of all roads. The span of Pittwater Road additionally provides adequate and safe crossing opportunities for pedestrians, approximately every 200m-300m.

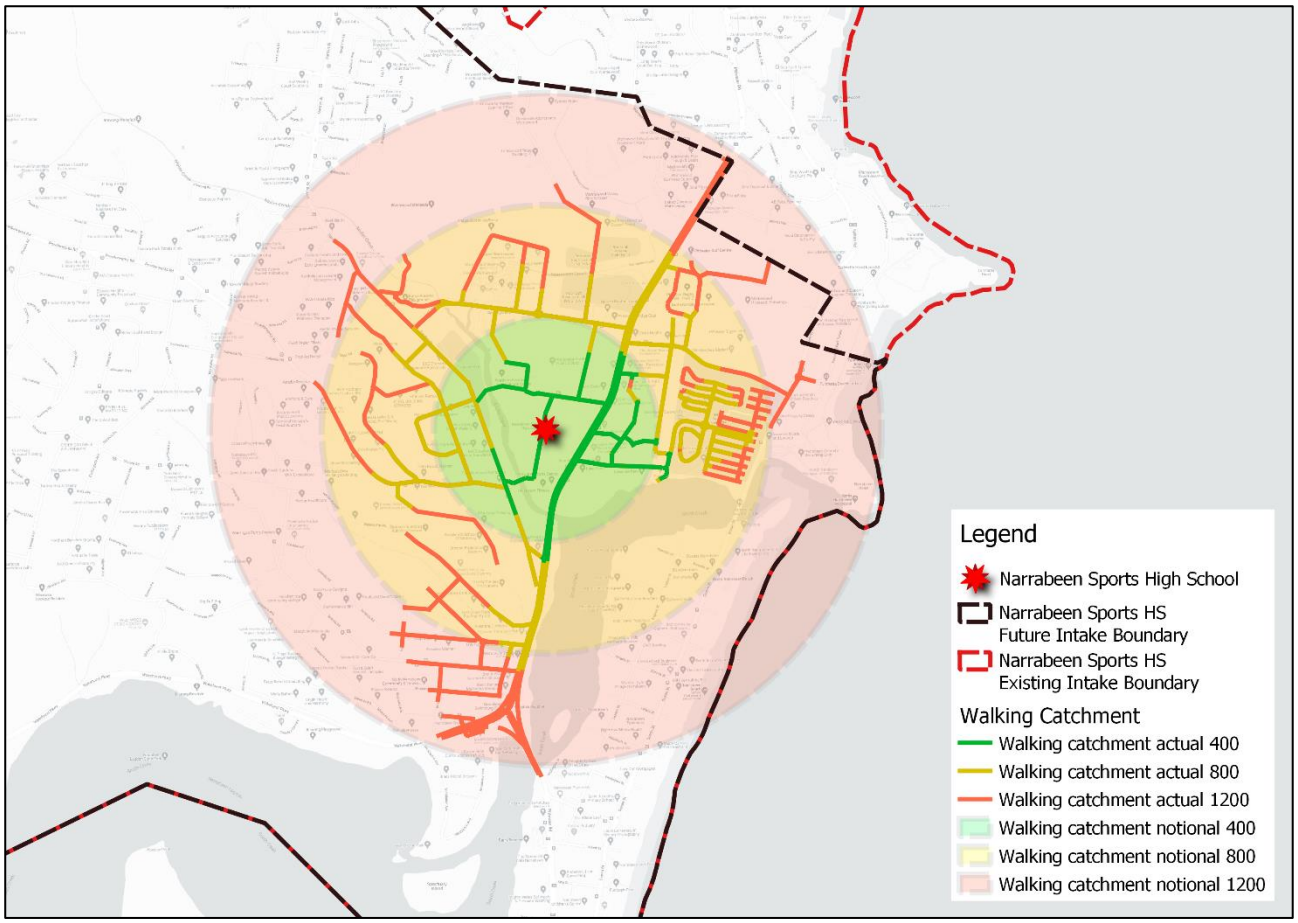


Figure 20: Pedestrian Catchment Zone

6.4.2 Cycling Catchment

In addition to the pedestrian catchment guidelines described by SINSW, the catchment areas for cycling are defined in a similar format based on 5-minute increments (approximately 1.2km increments). **Figure 21** illustrates the maximum extents of the cycling catchment zone.

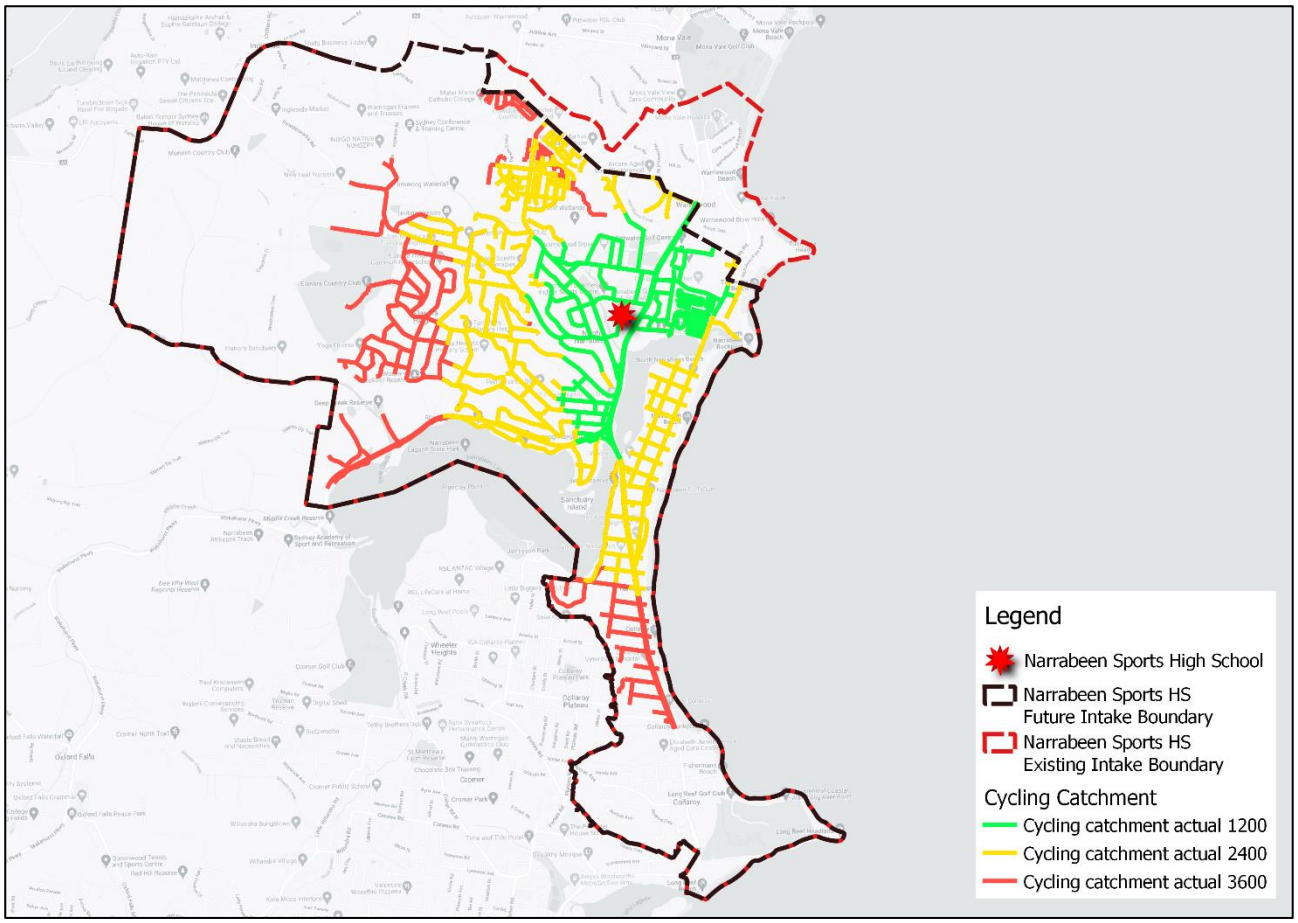


Figure 21: Cycling Catchment Zones

6.4.3 Active Travel Catchment Summary

An assessment of the student catchment information provided by SINSW in the context of public and active transport catchment areas has been conducted, with the assessment results summarised in **Table 8**. As with above assessments, the below information captures information of students located within the indicative enrolment intake boundary. As such, the results of the table can be considered 'indicative' for the School's catchment**.**

TABLE 8: CYCLING AND WALKING CATCHMENT SUMMARY

CATCHMENT ANALYSIS	NOTIONAL (WITHIN CROW FLIES)		ACTUAL (ON PATH / USING ROAD NETWORK AS A PROXY)	
1-400m (5-min walk)	25	4%	13	2.2%
401m-800m (10-min walk)	92	16%	36	6%
801m-120mm (15-min walk)	115	19%	54	9%
Total number of students within walking distance to school	232	39%	103	17%

1201m-1600m crow files / 2300m on path (excl from SSTS Primary)	190	32%	261	44%
Total number of students not eligible for free SSTS	422	71%	364	62%

6.5 Travel Mode Surveys

In consultation with the school, Ason Group has undertaken a travel mode survey for current staff and students of the School. The purpose of the survey is to determine key traffic and parking characteristics of existing school population, including:

- Travel mode for both the arrival and departure trips;
- Vehicle occupancy;
- Out of Hours School Care;
- Car Pooling, and
- Interest in different green travel strategies and initiatives.

In an operating capacity, the school period and bell times occurs between 09:00 and 15:00 during weekdays, with student arrival typically occurring between 08:30 and 08:45.

At this current time, a total 128 responses have been received for the issued student surveys, representing approximately 13% of the 1,024 enrolled students. It is envisioned as part of the maintenance of the future School Transport Plan as live document, this student survey information will be appropriately updated as responses to the surveys increase.

6.5.1 Student Travel Mode

As part of the undertaken student surveys, an appreciation for modal travel has been obtained to provide indicators for travel behaviour and interactions with the School. Accordingly, the figure below demonstrates the modal breakdown of student trips to the School.

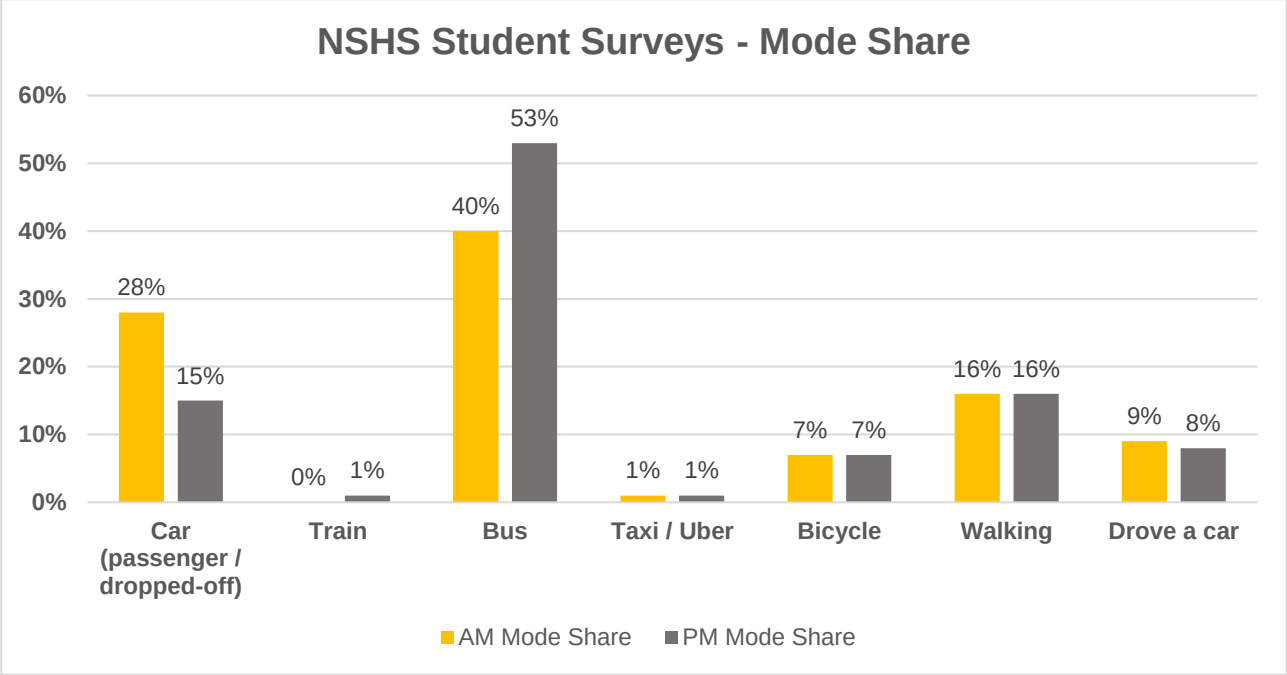


Figure 22: Student Survey Mode Share (NSHS)

Summarising the results, the following key points are deduced:

- The school demonstrates a high dependency on public transport (bus) modes with 40% (AM) - 53% (PM).
- Moderate number of students rely on private vehicles with 15% (PM) - 28% (AM) being car passengers and 8% (PM) - 9% (AM) drive to/from the School
- Active travel modes (accounting for cycling and walking) constitute approximately 23% of total trips to and from the school.

It is understood that previous travel mode surveys were undertaken in Nov 2021 which indicated 9% of students cycled to school. It is Ason Group's opinion that the decrease in cycling relate to the La Niña currently in Australia, which results in increased rainfall and a reduction in active travel modes.

6.5.2 Staff Travel Surveys

At this current time, a total of 55 responses have been received from staff, representing approximately 52% of the 106 staff members. As the STP is intended to be a live document, this staff survey information will be appropriately updated as responses to the surveys increase.

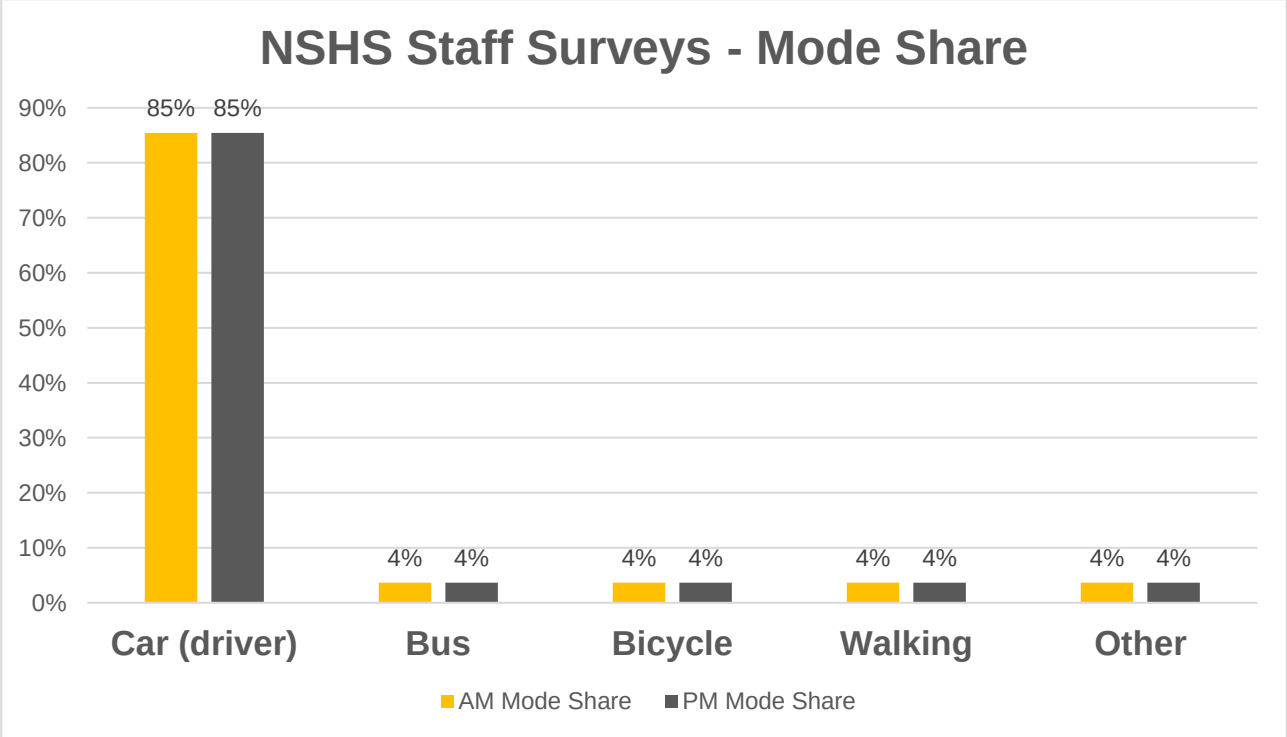


Figure 23: Staff Surveys Mode Share

The above figure demonstrates a very high reliance on the private vehicle (predominantly as driver which accounts for 85% of the mode share). In our experience, teachers within NSW exhibit lower dependency on public transport modes and private vehicle (as passenger) as they are generally required to bring equipment and materials to and from the workplace. As such, these factors are likely to impact the viability of modal shift towards public and active travel modes, which do not necessarily accommodate staff requirements.

The uptake of other modes of travel (bus, bicycle, walking and other) to/from the School have similar percentages.

The figure below identifies staff feedback regarding incentives to increase public transport usage.

6.6 School Traffic Generation

With reference to the travel survey information (detailed in **Section 6.5**), the existing traffic generation of the School has been assessed under a first principles analysis, which considers the following:

- Student drop-off/pick-up – generates both and arrival and departure trips in the AM peak and PM peak periods (i.e. 2 trips per peak period).
- For students travelling to the school by car, car occupancy (i.e., how many students per vehicle).
- Student car driver – generates an arrival trip in the AM peak period and a departure trip in the PM peak period.
- Staff car driver – generates an arrival trip in the AM peak period and a departure trip in the PM peak period.

The existing traffic generation for set down/pick-up activities of the School are indicated by the travel mode survey which was undertaken as part of this study are presented in **Table 9**.

TABLE 9: EXISTING TRAFFIC GENERATION

USER	MODE SHARE		TOTAL TRIPS	
	AM	PM	AM	PM
Car Driver (Staff)	85%	85%	91	91
Car Driver (Student)	9%	8%	93	82
Car Passenger (Student)				
1 Passenger	15.1%	8.1%	310	166
2 Passenger	9.7%	5.2%	100	54
3 Passenger	2.7%	1.4%	19	10
4 Passenger	0.5%	0.3%	3	2
Total			**616**	**405**

It should be noted that as the school is an existing development, traffic associated with the school has been captured as underlying volumes forming part of background traffic movements surveyed for the local area.

Application of first principles analysis results in the following traffic generation of the School:

- 616 total vehicle trips during the AM Peak; and
- 405 total vehicle trips during the PM Peak.

7 The Proposal

7.1 The School

7.1.1 Overall Works

This DA seeks consent for alterations and additions to the existing Narrabeen Sports High School. The proposal comprises the following works:

- Demolition of western part of existing Building A
- Construction of the following buildings:
  - 2 x GLS
  - 2 x Change rooms
  - Stage
  - Movement studio
  - WC
- Refurbishment works to the following buildings;
  - Building A1 (partial) and Building B2
  - Gymnasium (Building A3)
  - Science lab (Building B3)
  - GLS (Building C1 and C2)
- 100 bicycle spaces
- 1 end of trip facility
- Associated tree removal, landscaping and excavation.

The proposed upgrades focus is to:

- Upgrade the core facilities at both schools to support the delivery of modern pedagogy
- Address some of the key asset condition issues of learning spaces to allow for improved educational outcome

The proposal does not include any changes to the existing student and staff numbers, meaning the existing travel behaviours and traffic conditions around the site are not expected to be significantly impacted by the development.

7.1.2 School Operations

The School is accessible from 7:30 AM – 6:30 PM weekdays with restricted access outside of these hours. The bell times are as follows:

- Start Time: 9:00 AM
- Finish Time: 3:00 PM

7.2 Vehicle Access

7.2.1 Staff Car Park

The proposal does not include any changes to the existing student and staff numbers, meaning the existing travel behaviours and traffic conditions around the site are not expected to be significantly impacted by the development. Therefore, parking activities will continue to operate as they currently do.

Similarly, there are no proposed changes to accessible parking availability. The existing accessible parking zones in the carpark will remain in use upon completion of the works. Access to the staff carpark remains unchanged, with access via Namona Street at the northern end of the site. The car park accommodates 44 parking spaces, including 1 accessible space.

The location of the staff car park and access is shown in **Figure 24.**

Figure 24: Staff Car Park Location

7.2.2 Bus Stops

Consistent with the current arrangements, the School shall utilise the existing bus stop along the Namona Street frontage and Jacksons Road for school services and Pittwater Road for express services, as shown in **Figure 25**.

Figure 25: Bus Stop Locations

Based on current discussion between the school and bus operators, the current bus stop design is sufficient to cater for the current and future bus requirements.

7.2.3 Service Vehicles

Consistent with the existing arrangements, servicing (deliveries, waste collection) will continue to occur within the staff car park.

Delivery times would be strictly managed, whereby regular services are subject to strict timelines to ensure the minimum movements possible, and these occur outside of the school peak periods.

The private waste collection vehicle (with a maximum travel and operational height of 3.5m) will arrive from Pittwater Road in a forward direction and reverse onto the carpark and stand temporarily next to the existing bin hold area (see **Figure 26**). On departure, the truck will drive forward out from the carpark onto Pittwater Road.

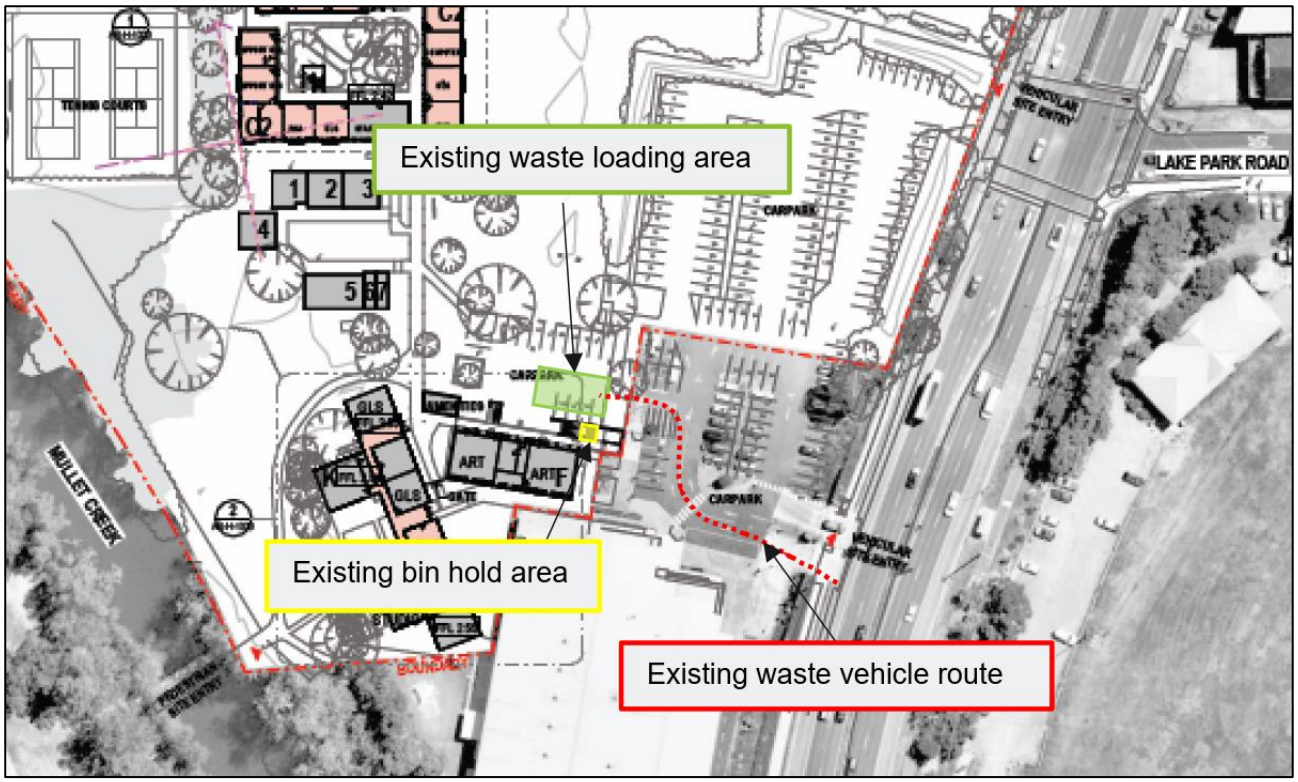


Figure 26: Waste Vehicle Route and Bin Collection Point (Source: Narrabeen Education Precinct-Narrabeen Sports High School: Waste Management Plan dated 10 August 2022)

Details of the waste collection arrangement are provided in the Waste Management Plan prepared by MRA Consulting Group (MRA) dated 10 August 2022.

7.3 Pedestrian Facilities

As discussed, the School currently provides for the following pedestrian access points:

- Three (3) pedestrian access points from Namona Street; and
- Two (2) pedestrian access points from Pittwater Road.

Traffic, pedestrian and cyclist volume surveys were commissioned by Ason Group and were undertaken on Thursday 02 June 2022. The survey results indicated the following peak hours:

- AM peak hour occurred from 8:00 AM to 9:00 AM
- Afternoon school peak hour occurred from 2:30 PM to 3:30 PM
- PM peak hour occurred from 4:00 PM to 5:00 PM

The pedestrian and cyclist volumes from the surveys for are presented in **Table 10**.

TABLE 10: EXISTING PEAK HOUR PEDESTRIAN AND CYCLIST MOVEMENTS

LOCATION	LOCATION TYPE	PERIOD	PEDESTRIANS	CYCLISTS
Pittwater Rd / Jacksons Rd	Signalised	AM	93	13
		School PM	84	4
		Network PM	111	19
Pittwater Rd / Namona St	Yield / Give Way	AM	8	38
		School PM	34	21
		Network PM	6	17
Namona St / Oak St	Yield / Give Way	AM	169	41
		School PM	150	21
		Network PM	39	8
Garden St / Jacksons Rd	Roundabout	AM	0	5
		School PM	0	1
		Network PM	0	0
Jacksons Rd / Oak St	Yield / Give Way	AM	50	7
		School PM	30	12
		Network PM	6	7
Jacksons Rd / Boondah Rd	Roundabout	AM	72	10
		School PM	72	15
		Network PM	103	14
Jacksons Rd / NBISC access driveway	Yield / Give Way	AM	7	10
		School PM	14	3
		Network PM	15	2
Mullet Creek footbridge	Pedestrian / cyclist footbridge	AM	83	20
		School PM	23	83
		Network PM	6	53
Garden Street pedestrian crossing (just south of The Crescent)	Wombat (raised) pedestrian crossing	AM	6	53
		School PM	10	43
		Network PM	6	10

7.4 Overall Transport and Connectivity

The overall transport and connectivity plan of the School, illustrating the existing and proposed traffic and transport elements is shown in **Figure 27**.

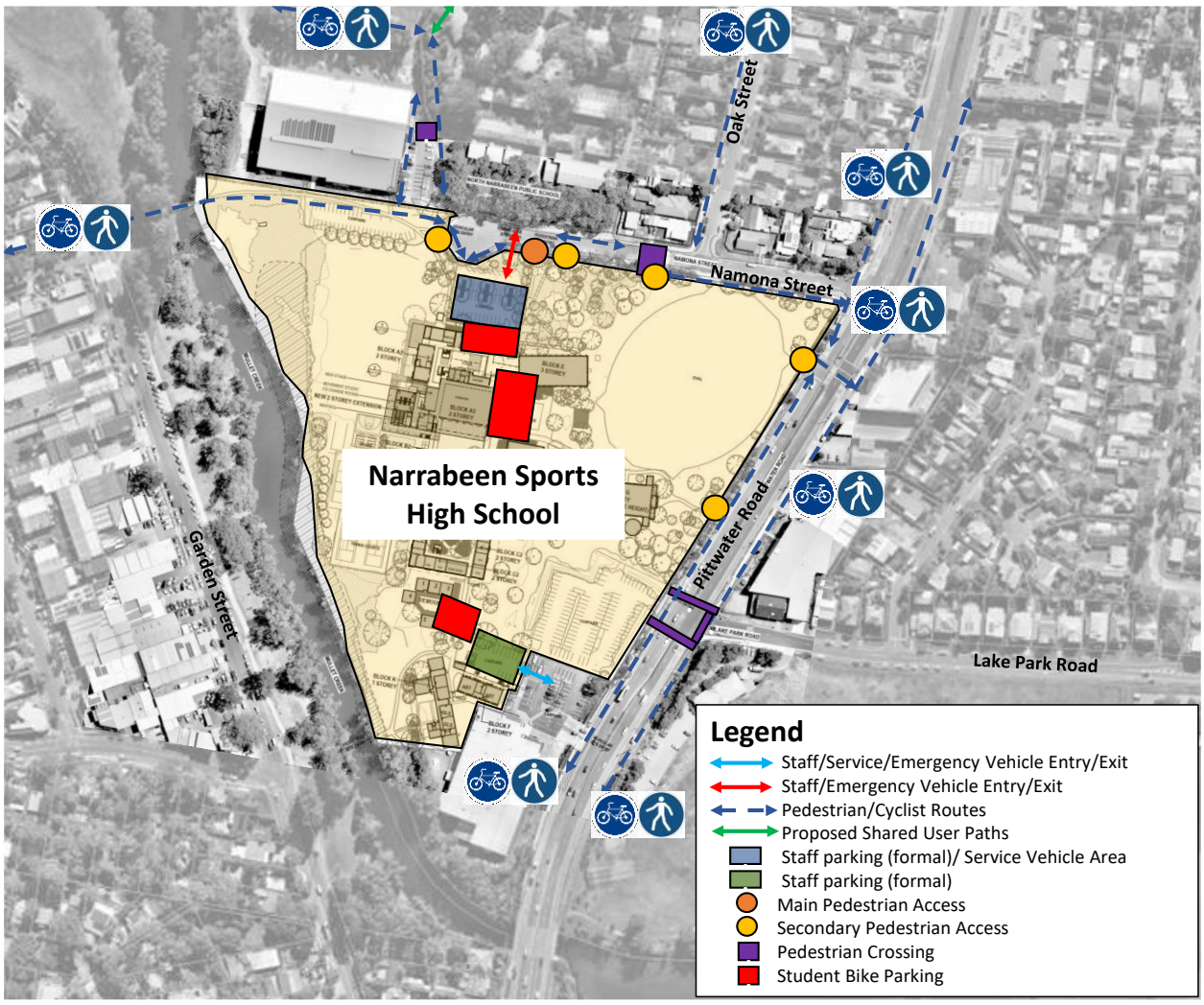


Figure 27: Transport and Connectivity Plan

8 Traffic Assessment

The proposed Narrabeen Education Precinct development includes the redevelopment of Narrabeen Sports High School (NSHS). The Public School has been identified by the NSW Department of Education (DoE) as requiring upgrade works. This development will provide upgraded facilities catering to current enrolment.

The design focus at NSHS is to upgrade the core facilities to support the delivery of modern pedagogy. Additionally, the design focus will address some of the key asset condition issues of learning spaces to allow for improved education outcomes.

With reference to the travel survey information (detailed in **Section 6.5**), the existing traffic generation of the School has been assessed under a first principles analysis, which considers the following:

- Student drop-off/pick-up – generates both and arrival and departure trips in the AM peak and PM peak periods (i.e. 2 trips per peak period).
- For students travelling to the school by car, car occupancy (i.e., how many students per vehicle).
- Student car driver – generates an arrival trip in the AM peak period and a departure trip in the PM peak period.
- Staff car driver – generates an arrival trip in the AM peak period and a departure trip in the PM peak period.

The existing traffic generation for set down/pick-up activities of the School are indicated by the travel mode survey which was undertaken as part of this study are presented in **Table 11Table 9**.

Table 11: Existing Traffic Generation

USER	MODE SHARE		TOTAL TRIPS	
	AM	PM	AM	PM
Car Driver (Staff)	85%	85%	91	91
Car Driver (Student)	9%	8%	93	82
Car Passenger (Student)				
1 Passenger	15.1%	8.1%	310	166
2 Passenger	9.7%	5.2%	100	54
3 Passenger	2.7%	1.4%	19	10
4 Passenger	0.5%	0.3%	3	2
Total			**616**	**405**

It should be noted that as the school is an existing development, traffic associated with the school has been captured as underlying volumes forming part of background traffic movements surveyed for the local area.

Application of first principles analysis results in the following traffic generation of the School:

- 616 total vehicle trips during the AM Peak; and
- 405 total vehicle trips during the PM Peak.

9 Parking Assessment

9.1 Car Parking Assessment

Pittwater DCP Section B6.3 Off-Street Vehicle Parking Requirements does not provide car parking rates for educational establishments. For developments with car parking rates, Pittwater DCP 2000 stipulates that:

'The minimum number of vehicle parking requirements must be determined using the appropriate guidelines for parking generation and servicing facilities based on development type comparison based on the Roads and Maritime Services Guide to Traffic Generating Development or analysis drawn from surveyed data for similar development uses. Provision must be made within the development site for access and parking of all service vehicles servicing the site, visitor parking and parking for people with disabilities.'

As such, the car parking demand has been assessed with consideration to the SurveyMonkey results undertaken by Ason Group discussed in **Section 6.5**.

It is understood that there are currently 106 staff, including full-time employees (FTE) and non-teaching staff. In our experience, the number of FTE would be approximately 75-80% of the total number of staff.

The surveys indicated that 85% of staff are driving to work; application of this rate to the existing staff (85 full time employees) results in a demand of 72 car parking spaces. The on-site staff car park currently provides 44 car spaces, resulting in a shortfall of 28 car spaces.

There are 20 overflow car spaces located behind the NBISC, which is currently used by some non-permanent staff for parking. The proposed Kiss and Ride facility off Namona Street for the Narrabeen North Public School will result in the removal of the 20 parking spaces. The proposed Kiss & Ride design is presented in **Figure 28.**

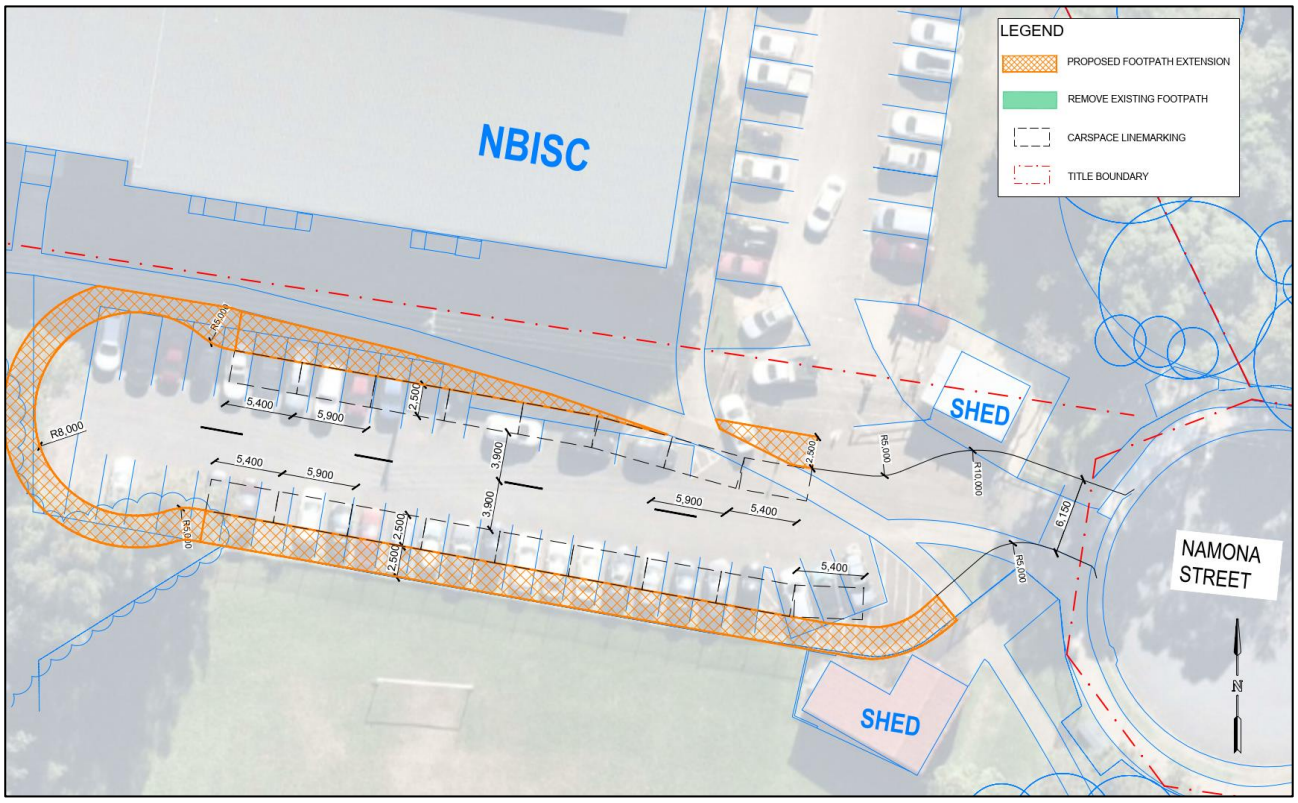


Figure 28: Kiss & Ride Design

With the removal of the overflow carpark, the balance of the car parking demand of 28 car spaces, can park on the grass north of the Pittwater car park, on the northern lawn or rely on the surrounding on-street parking.

While there are some surplus on-street parking spaces in the vicinity of the School site, staff will be encouraged to use On-Demand Shared Transport platform such as Liftango, use public transport to access the site given the site's proximity to high-frequency public transport services or to car pool wherever possible.

Furthermore, a Travel Access Guide (TAG) will be prepared for the School and alternate modes of transport (i.e., active transport and public transport) will be encouraged to decrease private vehicle usership.

9.1.1 Accessible Car Parking

Pittwater DCP Section B6.3 Off-Street Vehicle Parking Requirements does not provide accessible car parking rates for educational establishments.

Reference has therefore been made to the Disability (Access to Premises — Buildings) Standards 2010. Schools are classified as a Class 9b building which requires 1 accessible car space for every 100 carparking spaces or part thereof.

Application of this rate to the existing 44 car parking spaces results in a requirement of one space. The existing car park provides one accessible car parking spaces, thus satisfying this requirement.

9.1.2 Motorcycle Parking

Pittwater DCP requires motorcycle parking to be provided at a minimum rate of 1 motorcycle parking space per 100 motor vehicle spaces.

Given that the proposed upgrades do not propose to provide any additional on-site car parking, there is no strict requirement to provide any motorcycle parking as part of the upgraded school development.

9.1.3 Car Parking Summary

The upgrades to School do not include any changes to the existing on-site car park, which currently accommodates 44 on-site spaces, including one accessible car space.

The overall provision of car parking provision for the site is in compliance Pittwater DCP.

9.2 Bicycle Parking

9.2.1 Pittwater DCP

Pittwater DCP does not provide a specific rate for bicycle parking for educational establishments (primary schools). As such, reference has been made to cycling requirements of the Educational Facilities Standards and Guidelines (EFSG).

9.2.2 EFSG

The EFSG provides bicycle parking requirements based on school core size. The upgraded Narrabeen Sports High School is categorised as a 12 stream school, which has a requirement for at least 84 bicycle parking spaces.

9.2.3 Bicycle Parking Summary

Based on the bicycle parking requirements above and to actively encourage cycling as a primary mode of transport for students and staff travelling to and from the school, it is considered that the EFSG bicycle parking rates would provide the most appropriate bicycle parking requirements.

However, based on other schools Ason have worked on, 12-stream High School typically generate a combined demand of 100 bicycle / scooter spaces within established residential areas.

The proposal seeks to provide 100 new bicycle parking spaces (designed in accordance with AS 2890.3:2015) and replacing the existing 91 spaces on-site.

10 Design

10.1 Design Commentary

10.1.1 Staff Car park

The proposal does not include any changes to the existing student and staff numbers, meaning the existing travel behaviours and traffic conditions around the site are not expected to be significantly impacted by the development. Therefore, parking activities will continue to operate as they currently do.

Given that the upgrades to the school do not propose any changes to the on-site car parking arrangements for staff, and as such, no assessment has been conducted of the existing access arrangements and car parking layouts.

It is understood that the existing car parking arrangements comply with AS 2890.1:2004 Parking Facilities – Off Street Car Parking (AS 2890.1:2004) and/or the previous version of AS 2890.1. being AS 2890.1:1993.

Consistent with the existing arrangements, servicing (deliveries, waste collection) will continue to occur within the staff car park. Such servicing arrangement has operated safely and is expected to be adequate for the proposed School redevelopment.

10.2 Bicycle Parking Provision

10.2.1 Existing Provision

A total of 91 bicycle parking spaces are to be provided within the school grounds.

Based on photos provided to Ason Group, the design and layout of the bicycle parking spaces do not conform with the requirements of AS 2890.3:2015.

10.2.2 Proposed Provision

With reference to AS 2890.3:2015, bicycle parking associated with Schools are classified as Class B facility in accordance with Table 1.1, therefore requiring:

- A secure room or structure, protected from the weather
- Contains bicycle parking devices that allow users to lock the bicycle frame and both wheels
- Located within areas that are controlled by entrance gates
- Located in well-lit area
- Situated close to entrance / exits

Ason Group's experience with similar School projects demonstrated a direct connection between active transport usage and weather cover provision for outdoor bicycle / scooter parking facilities. Active transport usage was observed significantly lower when temperature exceeded 30 degrees for School bicycle parking facility with no weather protection, as students were unable to ride or push the bicycle due to the excessive heat of the seat and the handles.

As such, it is proposed to provide 100 new bicycle parking spaces in accordance with Class B facilities as per AS 2890.3:2015 and remove the existing 94 non-compliant spaces. The location of the proposed bicycle spaces is shown in **Figure 29**.

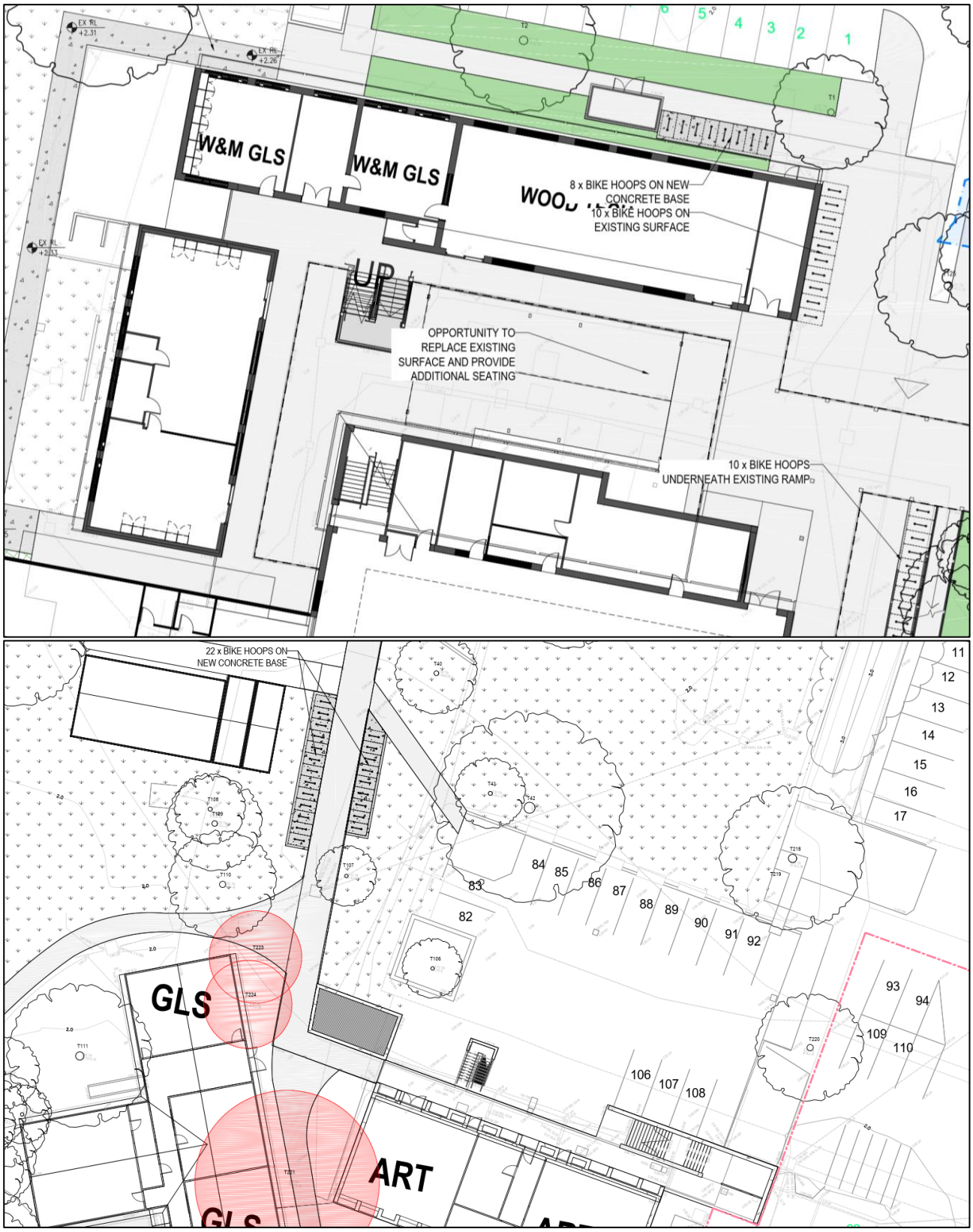


Figure 29: Proposed Bicycle Parking Locations

11 Summary and Conclusions

11.1 Summary

Ason Group have been engaged by School Infrastructure NSW to prepare a Transport Assessment (TA) in relation to a Development Without Consent (REF) for proposed upgrades (the Proposal) at Narrabeen Sports High School (NSHS) located at 10 Namona Street, North Narrabeen.

11.2 Key Findings

Further to a detailed assessment of the proposed development of the upgrades to Narrabeen Sports High School, we provide the following conclusions:

- The Proposal relates to upgrade and refurbishment works in the Narrabeen Sports High School, to significantly improve educational outcomes and support the delivery of modern pedagogical learning and increases capacity to meet projected demand. The site is located within the Northern Beaches Council LGA and is therefore subject to that Council's controls.
- Along with this Transport Assessment, a Preliminary Construction Traffic Management Plan and Preliminary School Travel Plan have been prepared which intends to address the traffic matters relating to traffic and transport elements of the proposed works.
- The School is situated within the Narrabeen Education Precinct, with connectivity to the surrounding public transport network via footpaths and/or shared paths within the walking catchment area. An assessment of the school bus network generally indicates adequate servicing availability to the student population.
- The existing school bus stop along the Namona Street frontage of the School will be retained and will continue to service the school.
- A School Travel Mode Survey undertaken by Ason Group via SurveyMonkey indicates that there is opportunity to cultivate a higher proportion of active travel modes (walking and cycling) for students within appropriate distance by improving or providing additional footpaths and/or shared path facilities.
- An assessment of the surveys indicates a high dependency on public transport as the primary mode of transport to and from the school for students, being 40% and 53% in the AM and PM peak hours, respectively.
- A moderate number of students rely on private vehicles, being 40% and 53% in the AM and PM peak hours, respectively as car passenger and 9% and 8% in the AM and PM peak hours, respectively for car drivers.
- Active travel modes (including cycling and walking) constituted approximately 23% of total trips to and from the School.
- The staff surveys demonstrate a high dependency on private vehicle (as driver) usage, being 85% of staff trips and is generally in line with observed education staff patterns throughout NSW. This is underpinned by the provision of on-site parking, as well as the requirements of bringing heavy material and equipment to and from the workplace, thus benefitting from private vehicle usage.
- The traffic generation of the School has been assessed using first principles analysis, which accounted for the following criteria:
  - Student drop-off/pick-up - generates both and arrival and departure trips in the AM peak and PM peak periods (i.e. 2 trips per peak period).
  - For students travelling to the school by car, car occupancy (i.e., how many students per vehicle).
  - Student car driver - generates an arrival trip in the AM peak period and a departure trip in the PM peak period.

  - Staff car driver - generates an arrival trip in the AM peak period and a departure trip in the PM peak period.
- Application of the first principles analysis to the existing student population of 1,024, the School currently generates the following during the school peak hours:
  - AM School peak hour: 616 vehicle trips
  - PM School peak hour: 405 vehicle trips
- 100 new bicycle parking spaces will be provided which are designed in accordance with Class B facilities of AS 2890.3:2015 and the existing 91 non-compliant spaces shall be removed.

In summary, the Proposal is supportable on traffic planning grounds and is not anticipated to result in any adverse impacts on the surrounding road network or the availability of on-street parking.