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**TRANSPORT, TRAFFIC & PARKING ASSESSMENT
PROPOSED PRIMARY SCHOOL
MARIST PLACE
PARRAMATTA**

15-198-1

SEPTEMBER 2016

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1. INTRODUCTION

The Practice of Thompson Stanbury Associates has been engaged by the Department of Education and Communities (DEC) to prepare a traffic and parking impact assessment for a proposed primary school to be located within land providing frontages to O'Connell Street and Marsden Street / Marist Place, Parramatta.

The proposal involves the adaptive reuse of a significant majority of existing buildings within the site, known as the Old Kings School site, and the construction of new infrastructure to accommodate a population of up 1,000 students, between Kindergarten and Year 6.

The proposal is defined as being of State Significance and is therefore required to be submitted to the Department of Planning and Environment and is subject to the Secretary's Environmental Assessment Requirements. The purpose of this report is to address these Requirements through an assessment and documentation of the likely alterations to existing traffic and parking demand associated with the proposal and to recommend where appropriate, treatments to ameliorate such impacts. In particular this study assesses the following:

- Existing road network conditions within the vicinity of the site including traffic volumes and general traffic safety;
- Identify likely traffic to be generated by the proposal;
- Assess the ability of the surrounding road network to accommodate additional traffic movements;
- Existing sustainable transport infrastructure including pedestrian, cycle, bus, train and ferry travel modes within the vicinity of the site;
- Identify likely additional demands on surrounding pedestrian, cycle, bus, train and ferry infrastructure as a result of the proposal and the ability of existing (and proposed) infrastructure to accommodate additional demand;
- Accessibility to and from the site from the frontage roads under existing and projected conditions;
- Suitability and safety of the internal circulation, manoeuvring, queuing and parking arrangements as relevant to the site and local conditions; and
- Preliminary assessment of the traffic and transport impacts during construction and the primary items to be incorporated into a Construction Traffic & Pedestrian Management Plan.

Reference is made in this report to the following:

- The Australian Standard for *Parking Facilities Part 1: Off-Street Car Parking* (AS2890.1-2004), *Part 2: Off-Street Commercial Vehicle Facilities*

(AS2890.2-2002), *Part 3: Bicycle Parking Facilities* (AS2890.3-1993) and *Part 6: Off-Street People for People with Disabilities* (AS2890.6-2009); and

- Parramatta City Council's *Parramatta Development Control Plan 2011* (DCP 2011) and *Parramatta Local Environmental Plan 2011* (LEP 2011).

The report should be read in conjunction site plans prepared by Tonkin Zulaikha Greer Architects.

2. SITE DETAILS

2.1 Site Location

The subject site provides eastern and western frontages to Marden Street / Marist Place and O'Connell Street, respectively in the suburb of Parramatta. This location is shown within neighbourhood and aerial contexts by **Figure 1** and **2** respectively overleaf.

2.2 Site Description

The site comprises two allotments being Lot 1 DP 1112822 and Lot 6 DP 1182647. The parcel of land collectively forms an irregularly shaped site, providing approximate frontages of 80m and 160m to Marist Place / Marsden Street and O'Connell Street, respectively. The site extends between these street frontages some 180m, facilitating a total site area in the order of 2.47 hectares.

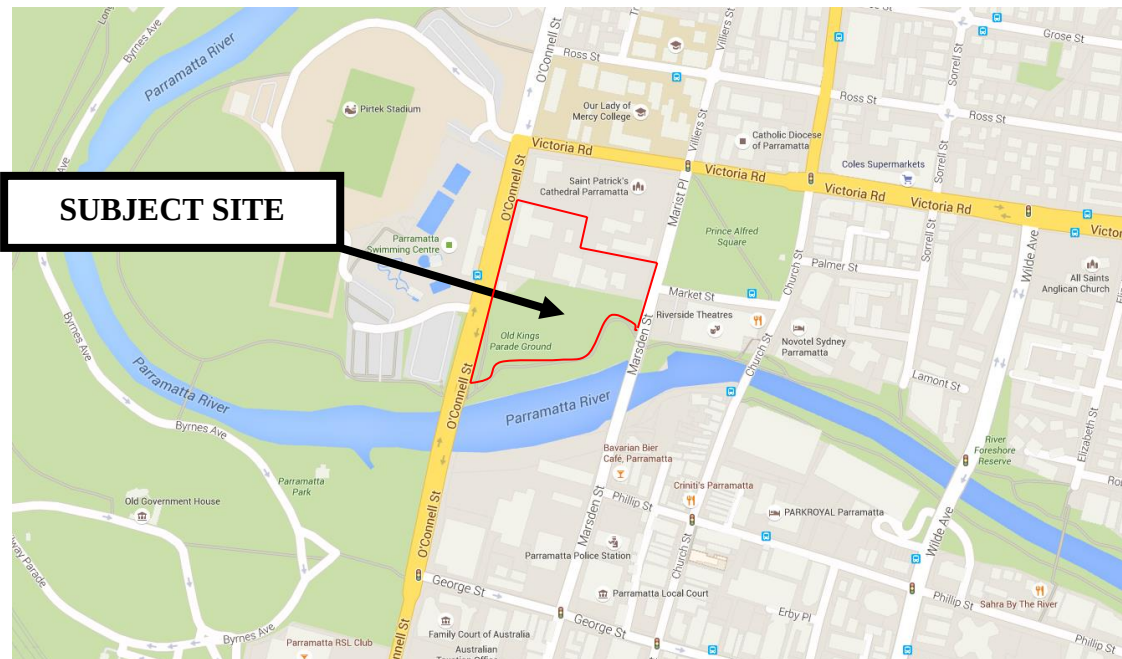
2.3 Previous / Existing Use

The site was originally utilised as a school between approximately 1834 and 1938 and thence subsequently as a training centre for the mentally retarded until 2002. Since 2003, only a small number of buildings accommodate an administration function for the Heritage Division, NSW Office of Environment and Heritage and other private professional offices, with the remaining buildings on-site being unoccupied.

The site currently accommodates five buildings generally located within the central northern portions of the site, with the southern portion of the site currently accommodating an oval, abutting Parramatta River. The following provides a summary of the existing and former building uses:

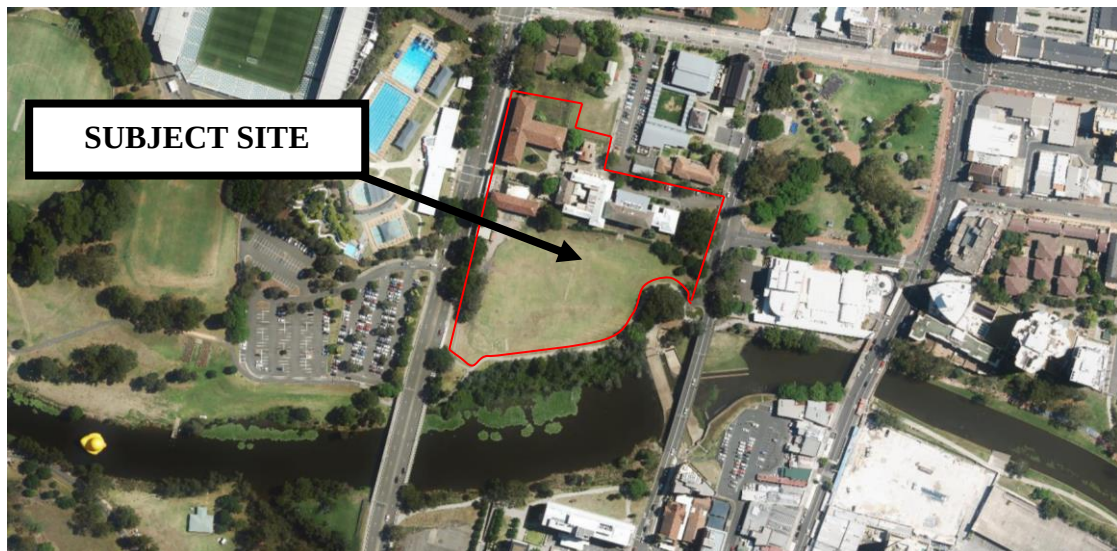
- Building A, formally the original school headmaster's residence, currently accommodates a professional office use;
- Building B, formally the original school building, currently accommodates NSW Government Heritage Division offices;
- Building C, formally the original school class buildings, is currently unoccupied;
- Building D, formally the original male dormitory, is currently unoccupied; and
- Building F, formally the original female dormitory, is currently unoccupied.

FIGURE 1
SITE LOCATION WITHIN A NEIGHBOURHOOD CONTEXT



Source: Google Maps

FIGURE 2
SITE LOCATION WITHIN AN AERIAL CONTEXT



Source: Six Maps

The existing site buildings are currently serviced by a single vehicular access driveway connecting with Marist Place, to the north of Market Street. This driveway provides connectivity to 14 existing formalised parking spaces. Further a single vehicular access driveway connecting with the southbound O'Connell Street carriageway, approximately 120m to the north of Parramatta River, provides connectivity to an existing informal passenger vehicle parking area along the western site boundary capable of accommodating in the order of 20 passenger vehicles.

Pedestrian access is provided via a formal pedestrian gate to Marist Place, immediately opposite Market Street. An informal pedestrian access is also provided to an existing shared pathway running in an east-west alignment along the southern site boundary abutting the northern Parramatta River foreshore. This path provides grade separated crossings of both O'Connell Street and Marist Place / Marsden Street to the west and east of the site respectively.

A number of existing mature trees are located within the subject site, primarily located along the O'Connell Street and Marist Place frontages.

2.4 Surrounding Land Uses

The site is surrounded by a mix of land-uses as follows:

- St Patricks Catholic Cathedral and Chapel as well as a number of Parish buildings occupy a parcel of land immediately adjoining to the north-east;
- Land immediately adjoining to the north-west is currently vacant however development approval has recently been granted for a mixed use development within this land comprising approximately 75 residential apartments and a three storey commercial building providing an approximately office floor space of 7,000m²;
- Our Lady of Mercy College and associated buildings are located further to the north on the northern side of Victoria Road;
- Parramatta Park containing Parramatta (Pirtek) Stadium, Parramatta War Memorial Swimming Centre and associated passenger vehicle parking areas, is located to the west on the opposite side of O'Connell Street;
- Prince Alfred Park is located to the north-east, on the opposite side of Marist Place; and
- Parramatta River is located to the south.

3. PROPOSED DEVELOPMENT

3.1 Introductory Statement and Proposal Methodology

The Parramatta City Centre is a significant growth area and accordingly, it is anticipated that the number of dwellings in the CBD, Parramatta North and Westmead areas will increase in the near future, placing additional pressure on existing schools which are already approaching full capacity. The DEC proposes to develop a new primary school on the site as a key project strategy to meet projected increases in student enrolments and demand for additional teaching facilities into the future. The site's proximity to the Parramatta CBD and surrounding residential areas ensures it is ideally placed to provide a new primary school that is integral to the local and wider community.

Following a masterplan process, site constraints and opportunities have been identified and a development design has been formulated. This process has identified that there are inherent limitations within the existing site components, largely due to heritage restrictions, that result in some compromises with respect to the ability of the site to accommodate certain infrastructure which would be desirable within a greenfield site. Such constraints are however common to CBD locations and all reasonable efforts have been made during the development design to provide a safe and efficient school environment, without unreasonably impacting on the surrounding land-uses and infrastructure.

3.2 Internal Built Form

The proposal involves the adaptive reuse of a significant majority of existing buildings within the site, known as the Old Kings School site, and the construction of new infrastructure to accommodate a population of up to 1,000 students, between Kindergarten and Year 6 and 60 staff.

The following provides a summary of the proposed built form:

- Alterations and additions to Buildings A and B including the connection of the two buildings to accommodate school class room and administration facilities;
- Alterations and additions to Building C to accommodate school learning facilities;
- Alterations and additions to Building D to accommodate school learning facilities;
- The construction of a new hall, capable of accommodating up to 450 seats / people to the south-west of Building C;
- The construction of new sports courts to the immediate north and east of Buildings C and D respectively;

- The creation of an assembly area between Building D and the new hall. Building F, formally the original female dormitory, is currently unoccupied; and
- The creation of a combination of covered and uncovered paths providing connectivity between the abovementioned primary site components.

The southern portion of the site is proposed to remain as an oval, accommodating a passive recreational and formalised sporting functions.

On-site vehicular parking is proposed to be provided in two locations as follows:

- A staff only parking area is proposed to be constructed within the south-western corner of the site containing 27 passenger vehicle parking spaces, accessed via the existing vehicular access driveway connecting with the southbound O'Connell Street carriageway approximately 50m to the south of the existing pedestrian signals; and
- A visitor parking area is proposed to be constructed within the north-eastern corner of the site containing 16 passenger vehicle parking spaces, accessed via the existing vehicular access driveway connecting with Marist Place, approximately 10m to the north of Market Street.

Primary pedestrian access is proposed via the existing formalised gate connecting with the western Marist Place footpath approximately opposite Market Street.

3.3 External Infrastructure

3.3.1 Bus Servicing

Bus servicing of the site is proposed to occur along the western Marist Place kerb alignment, between the southern site boundary and the existing / proposed vehicular access driveway. This is proposed to be achieved through the following modifications to existing sign posted restrictions governing kerb side parking in Marist Place:

- A 30m section of kerb space between an existing 'Mail Zone' (to the north of Parramatta River) and an existing 'No Parking' zone commencing opposite Market Street currently governed by '4P Ticket 8.00am – 8.00pm Monday – Saturday' is to be supplemented with 'Bus Zone 8.00am – 9.30am and 2.30pm – 4.00pm School Days' restrictions; and
- A 30m section of kerb space between the abovementioned existing '4P Ticket' zone and the existing / proposed vehicular access driveway currently governed by 'No Parking' is to be supplemented with 'Bus Zone 8.00am – 9.30am and 2.30pm – 4.00pm School Days' restrictions.

These alterations to existing on-street parking restrictions will result in the provision of a 60m long 'Bus Zone' during school start and finish periods, which is capable of accommodating up to three buses at any one time.

It is acknowledged that the abovementioned conversion of the existing 'No Parking' restrictions approximately opposite and to the north of Market Street will result in the removal of the existing pseudo passing lane provided within the northbound kerb-side Marist Street lane which allows trailing through vehicles to pass stationary vehicles waiting to turn right into Market Street. The impacts of this are assessed and reported upon in subsequent sections of this report.

3.3.2 Student Set-Down / Pick-Up

All student set-down / pick-up activity is proposed to occur off-site. Formalised on-street set-down / pick-up areas are proposed to be provided within Marist Place and Market Street through the following amendments to existing sign posted parking restrictions:

- A 50m section of kerb space on the western side of Marist Street to the north of Market Street currently governed by '4P Ticket 8.00am – 8.00pm Monday – Saturday' is to be supplemented with 'No Parking 8.00am – 9.30am and 2.30pm – 4.00pm School Days' restrictions;
- A 30m section of kerb space on the eastern side of Marist Place to the north of Market Street currently governed by '4P Ticket 8.00am – 8.00pm Monday – Saturday' is to be supplemented with 'No Parking 8.00am – 9.30am and 2.30pm – 4.00pm School Days' restrictions;
- A 55m section of kerb space on the eastern side of Marist Place to the north of abovementioned '4P Ticket' area currently governed by '2P Ticket 6.00pm – 8.00pm Monday – Friday and No Parking 8.00am – 6.00pm Monday – Saturday, Coaches Excepted' is to be supplemented with 'No Parking 8.00am – 9.30am and 2.30pm – 4.00pm School Days' restrictions;
- A 60m section of kerb space on the northern side of Market Street to the east of Marist Place currently governed by '2P Ticket 6.00pm – 8.00pm Monday – Friday and No Parking 8.00am – 6.00pm Monday – Saturday, Buses / Coaches Excepted' is to be supplemented with 'No Parking 8.00am – 9.30am and 2.30pm – 4.00pm School Days' restrictions; and
- A 20m section of kerb space on the northern side of Market Street to the east of the abovementioned '2P Ticket' area currently governed by 'No Parking, Buses / Coaches Excepted' is to be supplemented with 'No Parking 8.00am – 9.30am and 2.30pm – 4.00pm School Days' restrictions.

These alterations to existing on-street parking restrictions will result in the provision of 205m of formalised student set-down / pick-up area within Marist Place and Market Street, as follows:

- 45m (capable of accommodating up to 7 passenger vehicles) along the western side of Marist Place;
- 80m (capable of accommodating up to 13 passenger Vehicles) along the eastern side of Marist Place; and
- 80m (capable of accommodating up to 13 passenger vehicles) along the northern side of Market Street.

It is noted as part of this assessment, the RMS' TD 2002/12c guidelines was applied for the minimum "No-Stopping" distance (7.5m) on approach to and departure from intersections where kerb extensions are provided. In consideration of this and the above, the proposed instantaneous on-street set-down / pick-up capacity within Marist Place and Market Street is therefore proposed to be 33 vehicles.

3.3.3 Pedestrian Infrastructure

The abovementioned formalised student set-down / pick-up activity on both sides of Marist Place and on the northern side of Market Street, as well as the general operation of the school, is expected to result in notable pedestrian crossing demand over Marist Place. It is accordingly proposed to seek Council Traffic Committee support for a formalised school threshold type pedestrian crossing to be provided over Marist Place to the immediate north of Market Street and over Market Street at Marist Place end. These crossings will provide safe and efficient connectivity between the school grounds and the formalised student set-down / pick-up areas on the eastern side of Marist Place as well as the northern side of Market Street. The crossing will also provide a safe and efficient crossing facility to provide connectivity between the school grounds and the greater Parramatta CBD to the south-east, accessed via Church Street.

3.3.4 School Zone Speed Limit

The Roads & Maritime Services design and implement 40km/h school zone speed limit signage within public roads adjacent to and in the vicinity of schools. This Practice understands that under normal circumstances, a 40km/h school zone speed limit is applied to any public road which provides publically accessible vehicular and / or pedestrian access to a school.

Liaison with Roads & Maritime Services Speed Management staff with respect to the subject proposal has indicated that it will not support the implementation of a school zone speed limit within O'Connell Street, given the sub-arterial functional order of the frontage road and the likely impacts on peak hour traffic flow efficiency past the site. It is accordingly proposed that all vehicular and pedestrian access to O'Connell Street be limited to staff vehicular only use. In this regard, a site operational management plan is to be implemented which effectively enforces this access limitation which is to include both the exiting vehicular and pedestrian accesses being governed by access controls prohibiting public and / or student utilisation.

Notwithstanding the above, the Roads & Maritime Services have indicated that there would be no objection to the extension of the existing 40km/h school zone speed limit within Marist Place on approach to Victoria Road to the south to encompass the site frontage to Marist Place / Marsden Street and within Market Street as considered necessary.

4. SITE ACCESS & INTERNAL CONSIDERATIONS

4.1 Access Arrangements

4.1.1 Passenger Vehicle Access

The site is proposed to be serviced by two access driveways as follows:

- An existing 6m wide combined ingress / egress driveway connecting with the southbound O'Connell Street carriageway (located approximately 50m to the south of the existing signalised pedestrian crossing) is to service a formalised staff only car parking area containing 27 passenger vehicle parking spaces; and
- An existing 6m wide combined ingress / egress driveway connecting with Marist Place approximately 10m to the north of Market Street is to service a visitor parking area containing 16 passenger vehicle parking spaces.

In order to undertake an assessment of the suitability of such a driveway design, reference is made to AS2890.1-2004. This Standard provides driveway design specifications based on a number of site characteristics such as the functional hierarchy of the frontage road in conjunction with the number and type of vehicles proposed to be accommodated on-site.

The minor capacity of both parking areas results in AS2890.1-2004 specifying a minimum a Category 1 type driveway be provided in both instances, despite the sub-arterial functional order of O'Connell Street, comprising a combined ingress / egress driveway of between 3.0 – 5.5m in width. The existing (and proposed) 6m wide combined ingress / egress driveways exceed the minimum specification of AS2890.1-2004 and are accordingly, considered to be satisfactory.

The consistent horizontal and vertical alignment of both O'Connell Street and Marist Place is such that sight distance between the frontage roads and the site access driveways is extensive, suitably complying with established criteria provided by AS2890.1-2004, based on the sign posted speed limits applicable.

4.1.2 Pedestrian Access

Student and staff pedestrian access is to be obtained via an existing gate connecting with the western Marist Place footpath, approximately opposite Market Street.

4.2 Parking Provision

Parramatta City Council does not provide vehicular parking requirements for schools within LEP 2011 or DCP 2011. An assessment of the proposed parking provision is therefore required to be undertaken on merits. In this regard, it is the experience of this Practice that parking demand for schools is split into three categories as follows:

- Long term staff parking;

- Short term visitor parking, largely associated with parents visiting the school (not associated with student set-down / pick-up activities); and
- Short term parent parking associated with student set-down / pick-up activities.

The following provides a discussion on the proposed on and off-site parking provision with respect to likely demand associated with the subject development.

4.2.1 Vehicular Parking

4.2.1.1 Staff Parking

On-site staff parking demand is proposed to be accommodated within a single staff only vehicle parking area located within the western portion of the site containing 27 spaces.

Primary factors resulting in staff parking demand are the number of staff employed by the school and the level of public transport available to staff travelling to and from the school. It has previously been presented that the school is anticipated to generate employment for up to 60 staff on-site at any one time (including both full and part time employees). The subject development therefore provides capacity for almost one in two staff to drive themselves to and from the site on a daily basis.

It is therefore required that approximately 50% of staff will travel to and from the site by means other than a private vehicle on a daily basis. Section 5.4 of this report presents that the subject site is currently provided with extremely good connectivity to various forms of public transport infrastructure including bus, rail and ferry services.

By means of comparison, LEP 2011 provides a maximum parking provision of 1 space per 100m² gross floor area for commercial premises within the Parramatta City Centre. The Roads & Maritime Services' *Guide to Traffic Generating Developments* specifies that the average employee rate for offices is less than five staff per 100m². Application of Council's maximum parking rate of 1 space per 100m² suggests that a maximum of one in five staff members of commercial development within the Parramatta City Centre are provided with an on-site parking space, thereby indicating that the remaining four in five staff are required to travel by means other than a private vehicle on a daily basis.

The proposed staff parking provision of 27 spaces for 60 staff indicates a more conservative rate of approximately one in two staff members being provided with an on-site parking space. It is therefore considered that the proposed staff parking provision of 27 spaces will accommodate the likely projected peak operational parking demand and is reasonably in accordance with current planning principles for the Parramatta City Centre with respect to limiting private vehicle use for staff.

Notwithstanding the above assessment, this Practice notes that Parramatta Council normally requires developments which generate in excess of 50 employees to prepare

a Green Travel Plan. In conjunction with striving to provide more efficient environmental outcomes, providing a range of travel choices with a focus on walking, cycling and public transport will result in major public health advantages to the school staff and the surrounding precinct.

The provision of limited on-site passenger vehicle parking, in conjunction with bicycle parking forms a major part of the initiatives to encourage reductions in vehicle transport use for school. Notwithstanding this, a site specific Green Travel Plan will however ensure that the transport infrastructure, services and policies within and outside the site are tailored to the future site users, being coordinated to achieve sustainable outcomes. It is considered reasonable that the requirement for a Green Travel Plan can reasonably be imposed as a condition of development consent.

4.2.1.2 Visitor Parking

Further to the previously presented long term parking demand associated with staff, the proposed school can be expected to generate short term parking demand associated with visitors. These visitors may be parents of students with appointments with school staff or other visitors associated with the normal operation of the school. The Department of Education has advised this Practice that the school could be expected to generate up to 10 visitors per day.

The proposed visitor parking provision of 16 spaces, contained within a specifically allocated parking area accessed via Marist Place, is therefore considered to be satisfactory.

4.2.1.3 Student Set-Down / Pick-Up

The school is expected to generate short term parking demand associated with the setting-down / picking-up of students by parents / guardians prior to the commencement and following the completion of the school day.

Section 3.3.2 of this report presents that alterations to existing on-street parking restrictions are proposed to result in the provision of 215m of formalised student set-down / pick-up area within Marist Place and Market Street, resulting in an instantaneous on-street set-down / pick-up capacity of 33 vehicles.

The above set-down / pick-up capacities have been based on an instantaneous demand rate of 1 vehicle per 30 students enrolled at the school, which has been developed by this Practice based on experience observing and assessing other educational establishments as well as other Local Government requirements. Based on this rate, it is estimated that the instantaneous short term parent parking demand will be approximately 33 vehicles during peak set-down / pick-up periods. The proposed formalised on-street set-down / pick-up capacity is therefore considered to be satisfactory.

4.2.2 Bicycle Parking

Further to the passenger vehicle parking spaces, a total of 20 bicycle parking racks, capable of accommodating up to 40 bicycles are proposed to be provided for use by staff and students, being provided at-grade within the school campus.

Parramatta City Council does not provide bicycle parking requirements for schools within LEP 2011 or DCP 2011.

The proposed bicycle parking provision of 40 spaces, equates to a rate of 1 space per 25 students is however consistent with this Practice's experience of other educational facilities.

4.3 Internal Circulation

The passenger vehicle parking areas has been designed to comprise a combination of standard 90 degree and parallel parking rows being serviced by a single central parking aisle. The internal circulation areas have been designed in accordance with the relevant specifications of AS2890.1-2004 and AS2890.6-2009 providing the following base design dimensions:

- Standard 90 degree angled vehicle parking space width = 2.5m;
- Disabled 90 degree angled vehicle parking space width = 2.4m (plus 2.4m wide shared area);
- 90 degree angled vehicle parking space length = 5.4m;
- Parking aisle width servicing 90 degree angled parking row/s = 5.8m;
- One-way roadway width = 3.0m;
- Two-way roadway width = 5.5m; and
- Minimum clearance throughout parking area = unlimited.

Whilst the visitor parking areas form dead end aisles, specifically allocated turning bays are proposed to ensure that all vehicles can enter and exit the parking areas in a forward direction.

Further to the above, the following minimum design characteristics apply to the bicycle parking racks in accordance with AS2890.3-2015:

- Parking rack spacing = 1.0m;
- Bicycle rack length = 1.8m; and
- Adjoining aisle width = 1.5m.

In consideration of the abovementioned compliance of the internal circulation and parking arrangements with AS2890.1-2004, AS2890.3-1993 and AS2890.6-2009, this Practice is satisfied that internal parking and circulation arrangements are satisfactory.

4.4 Site Servicing

It is acknowledged that the school will be required to be servicing by heavy vehicles associated with the regular collection of refuse and occasional deliveries. It is expected that the largest vehicle to service the site will be a Medium Rigid Vehicle (MRV).

All site servicing is proposed to occur via a formalised loading dock located adjacent to the western site boundary, accessed via the staff car parking area connecting with O'Connell Street.

In order to assess the ability of the site design to service the abovementioned vehicles, this Practice has undertaken a desktop swept path analysis of the architectural plans for Medium Rigid Vehicles (MRVs) in accordance with as provided by AS2890.2-2002. This analysis has indicated that such vehicles can access the site in a forward direction, manoeuvre into the loading area and thence exit the site in a forward direction. In consideration of this and the above discussion, the proposed servicing arrangements are therefore considered to be satisfactory.

Notwithstanding the above, it is recommended that the site operational management plan incorporate the prohibition of site servicing activities during peak inbound and outbound travel periods of staff to ensure that there is no undesirable conflict between passenger and servicing heavy vehicles. This will also ensure that heavy vehicle site access and egress movements between the site and O'Connell Street are limited to periods outside of normal commuter travel peaks.

5. EXISTING TRAFFIC CONDITIONS

5.1 Surrounding Road Network

It is usual to classify roads according to road hierarchy in order to determine their functional role within the road network. Changes to traffic flows on the roads can then be assessed within the context of the road hierarchy. Roads are classified according to the role they fulfil and the volume of traffic they should appropriately carry. In this regard, the Roads & Maritime Services has set down the following guidelines for the functional classification of roads:

- **Arterial Road** – typically a main road carrying over 15,000 vehicles per day and fulfilling a role as a major inter-regional link (over 1,500 vehicles per peak hour);
- **Sub-Arterial Road** – defined as secondary inter-regional links, typically carrying volumes between 5,000 and 20,000 vehicles per day (500 to 2,000 vehicles per peak hour);
- **Collector Road** – provides a link between local roads and regional roads, typically carrying between 2,000 and 10,000 vehicles per day (250 to 1,000 vehicles per peak hour). At volumes greater than 5,000 vehicles per day, residential amenity begins to decline noticeably; and
- **Local Road** – provides access to individual allotments, carrying low volumes, typically less than 2,000 vehicles per day (250 vehicles per peak hour).

Peak hour volumes on most roads are typically eight to twelve percent of the daily volumes. In accordance with the above, the roads in the vicinity of the subject site are therefore described below:

- **O’Connell Street** performs a sub-arterial function under the care and control of Parramatta City Council, between Great Western Highway in the south and Albert Street to the north. In the vicinity of the site, it forms a four lane divided carriageway whereby traffic flow is governed by a sign posted speed limit of 60km/h. It intersects with Victoria Road, George Street and Macquarie Street / Hunter Street under traffic signal control in the vicinity of the site, whilst a signalised pedestrian crossing is also provided immediately adjoining the subject site.

O’Connell Street, to the south of Macquarie Street, provides a one-way southbound traffic function towards Great Western Highway, also intersecting under traffic signal control.

- **Victoria Road**, between Church Street and O’Connell Street, performs a collector road function under the care and control of Parramatta City Council. It provides a 13m wide pavement providing two lanes of traffic in each direction, also intersecting with Marist Place under traffic signal control. Traffic flow is governed by a sign posted speed limit of 60km/h, however a

40km/h school zone speed limit applies during the prescribed school start and finish times, associated with Our Lady of Mercy College.

Victoria Road, to the east of Church Street, performs a State Road function under the care and control of the Roads & Maritime Services. In this regard, it provides an arterial function connecting Parramatta to the City-West Link at Glebe Island, intersecting with numerous other important arterial routes in James Ruse Drive, Silverwater Road, Marsden Road, Lane Cove Road, Burns Bay Road, Lyons Road and Darling Street.

- **Marist Place / Marsden Street** performs a collector road function under the care and control of Parramatta City Council. In this regard, it provides a north-south connection between Victoria Road adjacent to the site and Macquarie Street in the south (however the section between Macquarie Street and George Street provides a one-way northbound only traffic function). It primarily provides one through lane of traffic in each direction, with parallel parking along both kerb alignments in parts. Traffic flow is governed by a sign posted speed limit of 50km/h whilst a 40km/h school zone speed limit applies on approach to Victoria Road.

Marist Place intersects with Victoria Road and Villiers Street under traffic signal control, approximately 100m to the north of the site. Kerb side parking restrictions facilitate the provision of two northbound lanes on approach to Victoria Road. Villiers Road provides a local access road function to the north, linking with Ross Street, Grose Street, Fennell Street and Harold Street.

Marist Place / Marsden Street forms a T-junction with Market Street immediately adjacent to the site, under a Give Way priority whereby Marist Place / Marsden Street forms the priority route. Market Street performs a local access function, providing an eastern connection to Church Street.

5.2 Traffic Volumes

This Practice has commissioned weekday traffic surveys in the immediate vicinity surrounding the subject site between 7.00am – 9.00am and 3.00pm – 4.00pm in November 2013 at the following intersections:

- O'Connell Street, Victoria Road and Parramatta Stadium Access Road;
- Victoria Road, Marist Place and Villiers Street; and
- Marist Place and Market Street.

Recent spot surveys indicate that in the preceding 24 months there has been little or no change in these peak hour flows.

Figure 3 illustrates the surveyed peak hour traffic flows at the subject intersections, whilst more detailed summaries are available upon request.

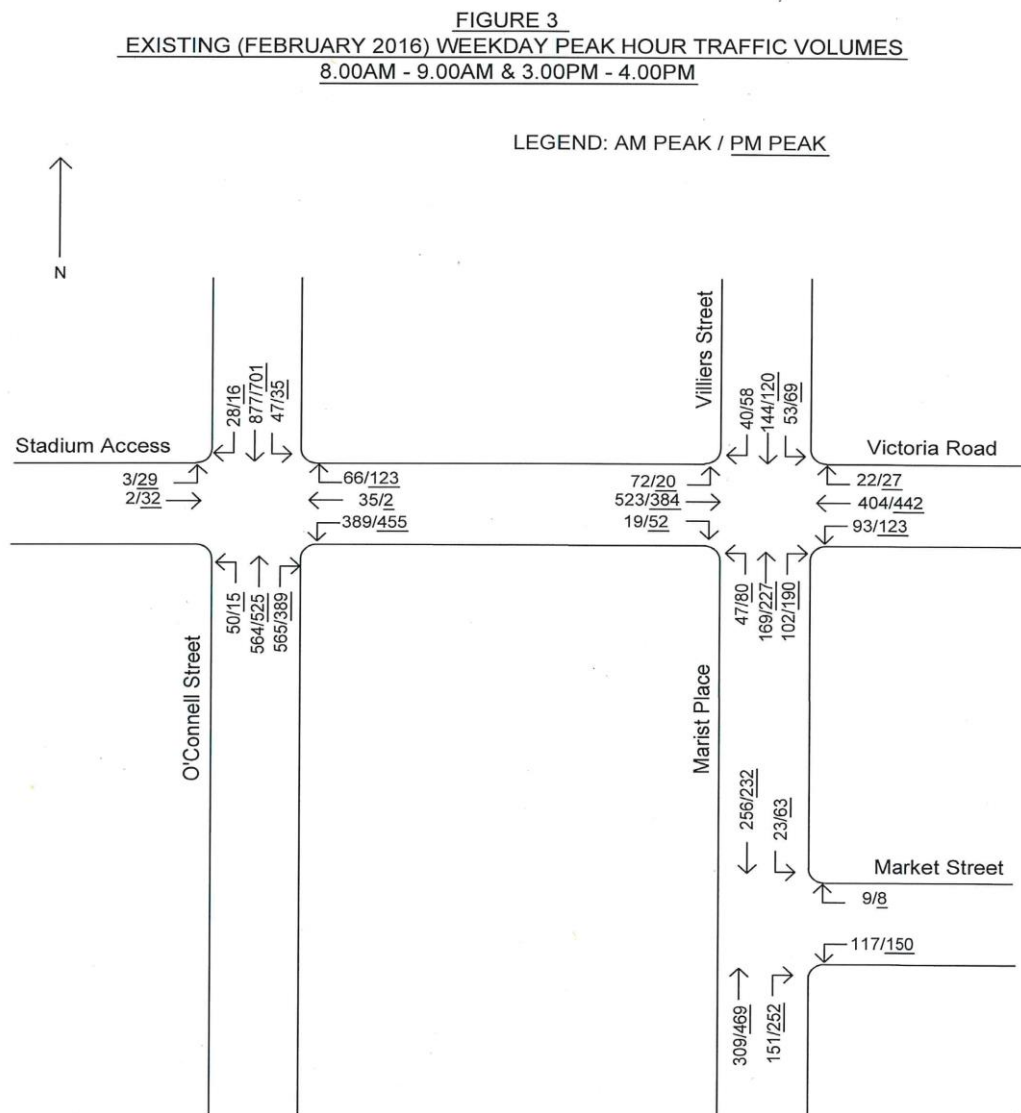


Figure 3 indicates the following:

- O'Connell Street accommodates directional traffic flows of between 1,000 – 1,200 vehicles per hour during peak periods;
- Victoria Road accommodates directional traffic flows of between 400 – 600 vehicles per hour during peak periods;
- Marist Place accommodates directional traffic flows of between 300 – 500 vehicles per hour during peak periods; and
- Market Street accommodates directional traffic flows of approximately 150 – 300 vehicles per hour during peak periods.

5.3 Existing Intersection Operation

In order to estimate the existing peak efficiency of the adjoining road network, a SIDRA computer intersection analysis has been undertaken. SIDRA is a computerised traffic arrangement program which, when volume and geometrical configurations of an intersection are imputed, provides an objective assessment of the operation efficiency under varying types of control (i.e. signs, signal and roundabouts). Key indicators of SIDRA include level of service where results are placed on a continuum from A to F, with A providing the greatest intersection efficiency and therefore being the most desirable by the Roads and Maritime Services.

SIDRA uses detailed analytical traffic models coupled with an iterative approximation method to provide estimates of the abovementioned key indicators of capacity and performance statistics. Other key indicators provided by SIDRA are average vehicle delay, the number of stops per hour and the degree of saturation. Degree of saturation is the ratio of the arrival rate of vehicles to the capacity of the approach. Degree of saturation is a useful and professionally accepted measure of intersection performance.

SIDRA provides analysis of the operating conditions that can be compared to the performance criteria set out in **Table 1** overleaf (being the RMS NSW method of calculation of Level of Service).

TABLE 1		
LEVELS OF SERVICE CRITERIA FOR INTERSECTION		
Level of Service	Average Delay per Vehicle (secs/veh)	Expected Delay
SIGNALISED INTERSECTIONS AND ROUNDABOUTS		
A	Less than 14	Little or no delay
B	15 to 28	Minimal delay and spare capacity
C	29 to 42	Satisfactory delays with spare capacity
D	43 to 56	Satisfactory by near capacity
E	57 to 70	At capacity, incidents will cause excessive delays
F	> 70	Extreme delay, unsatisfactory
GIVE WAY & STOP SIGNS		
A	Less than 14	Good
B	15 to 28	Acceptable delays and spare capacity
C	29 to 42	Satisfactory
D	43 to 56	Near capacity
E	57 to 70	At capacity and requires other control mode
F	> 70	Unsatisfactory and requires other control mode

The existing conditions have been modelled utilising the peak hour traffic volumes presented within **Figure 3**. **Table 2** provides a summary of the SIDRA output data whilst full details are available upon request.

TABLE 2		
SIDRA OUTPUT – PEAK HOUR INTERSECTION PERFORMANCE		
	AM Peak	PM Peak
O'CONNELL STREET & VICTORIA ROAD		
Average Vehicle Delay (sec/veh)	30.0	25.8
Degree of Saturation	0.77	0.54
Level of Service	C	B
VICTORIA ROAD & MARIST PLACE		
Average Vehicle Delay (sec/veh)	39.0	43.2
Degree of Saturation	0.54	0.68
Level of Service	C	D
MARIST PLACE / MARSDEN STREET AND MARKET STREET		
Average Vehicle Delay (sec/veh)	9.4	12.8
Degree of Saturation	0.28	0.45
Level of Service	A	A

Table 2 indicates the following:

- The traffic signal control at the Victoria Road intersections with O'Connell Street and Marist Place provide motorists with a good to reasonable level of service during peak periods, being capable of accommodating additional demand; and
- The Give Way control at the junction of Marist Place and Market Street provides motorists with a level of service 'A' during peak periods, representing good conditions with spare capacity.

5.4 Public Transport & Non Car Travel

State Government metropolitan planning has, for many years, promoted Parramatta as Sydney's secondary commercial hub. An array of business activities are now located in the Parramatta CBD providing significant employment opportunities to Western Sydney residents. Land use and transport policy have been integrated, encouraging new commercial activities in an area where public transport services are intended to be the principal form of travel. In recent years, Parramatta Station has been upgraded and the bus interchange expanded, in the interest of achieving a greater proportion of journeys-to-work outside of the private vehicle.

5.4.1 Train

The site is located approximately 1km to the north-west of Parramatta Railway Station. Parramatta station is served by North Shore, Western, Cumberland and Blue Mountains Lines. There are good connecting services to Parramatta provided by the South Line (at Granville) and Northern Line (at Strathfield) as follows:

- The North Shore & Western Line connects Berowra, via Sydney to Emu Plains with a branch to Richmond;

- The Cumberland Line provides direct services from South Western Sydney (Liverpool) to Western Sydney (Blacktown) via Parramatta;
- The Blue Mountains Line service connects Lithgow and the Blue Mountains to Sydney offering fast services between Penrith, Blacktown, Parramatta, Granville, Strathfield and Sydney;
- The South Line service connects Macarthur to Sydney;
- The Carlingford branch line connects Carlingford to Clyde, where there are limited connections on the Western Line to Parramatta; and
- CountryLink provides two long distance rail services via Parramatta: a daily service to Dubbo via Orange and a weekly service to Broken Hill via Orange.

The *Parramatta City Centre Integrated Transport Plan* states that Parramatta railway station accommodates nearly 10,000 passengers during the morning peak.

Further to the above, the NSW Government has recently announced that a light rail route through Greater Parramatta connecting Westmead Hospital, Parramatta North, Parramatta CBD and Camellia will be the foundation for a wider light rail network that could be developed in stages to meet the emerging transport needs of the region. The preferred network also includes a branch to Olympic Park and on to Strathfield and another branch to Carlingford via Rydalmere and Telopea.

5.4.2 Bus

The *Parramatta City Centre Integrated Transport Plan* states that Parramatta city centre is serviced by approximately 40 bus routes provided by six bus operators (Transdev, Busways, Hillsbus, Sydney Buses and Transit Systems Sydney).

The Parramatta Transport Interchange integrates the bus and rail stations. All bus services (with a few minor exceptions) terminate at the interchange.

The Liverpool to Parramatta T-way was opened in 2003 and the North West T-way opened in March 2007. The North-West T-way comprises two sections: Parramatta to Rouse Hill and Blacktown to Parklea.

Further, “the Loop” free city bus service is provided by Transport for NSW and operated by Transdev. The Loop bus connects significant destinations and integrates with bus services as all services terminate at the interchange. The loop operates a one-way service on a 10 minute frequency with the closest stops located within O’Connell Street to the immediate west of the site

Route 549 (between Epping and Parramatta) and Route 829 (Parramatta to North Parramatta) also operates along O’Connell Street.

Further, the following routes operate along and provide stops within Marist Place and Market Street:

- Routes T60 and 62 – Castle Hill to Parramatta;
- Route T61 – Blacktown to Parramatta;
- Route T63 - T66 – Rouse Hill to Parramatta;
- M91 – Hurstville to Parramatta;
- Routes 546 – Epping to Parramatta;
- Route 804 and 806 – Parramatta to Liverpool; and
- Route 829 - Parramatta to North Parramatta

The following additional routes operate along and provide stops on Church Street, some 150m to the east of the site:

- Route M54 – Macquarie Park to Parramatta;
- Routes 546 and 549 – Epping to Parramatta;
- Routes M60 and 600 – Hornsby to Parramatta;
- Route 601 – Rouse Hill to Parramatta;
- Route 603 – Glenhaven to Parramatta;
- Route 604 – Castle Hill to Parramatta;
- Route 606 – Winston Hills to Parramatta;
- Route 609 – North Parramatta to Parramatta; and
- Route 625 – Pennant Hills to Parramatta.

5.4.3 Ferry

The subject site is located approximately 900m to the west of Parramatta Ferry Wharf. The wharf accommodates ferry services between Parramatta and Circular Quay along the Parramatta River and Sydney Harbour. Ferry services provide a 60 minute frequency during commuter peaks, business hours and on weekends.

5.4.4 Bicycle

The following are nominated on road bicycle routes to the south of the site:

- George Street to the west of Church Street;

- Church Street between George Street and Palmer Street; and
- Sorrell Street to the south of Palmer Street.

These routes provide connectivity to off-road cycle routes through Parramatta Park to the west and along the northern foreshore of the Parramatta River to the immediate south of the site and to the east.

The following are nominated on road bicycle routes to the north of the site:

- O'Connell Street between Grose Street and Fennell Street;
- Fennell Street to the west of O'Connell Street; and
- Reef Street.

These routes provide connectivity to off-road cycle routes through Parramatta Park to the west and Cumberland Hospital to the north.

5.5 Pedestrian Conditions / Infrastructure

Pedestrians are provided with footpaths along both sides of all surrounding streets. In addition, the following access and mobility infrastructure providing connectivity between the subject site and the previously presented public transport and non-car travel nodes:

- Signalised crossings are provided over all approaches at the intersection of O'Connell Street and Victoria Road;
- Signalised crossings are provided over all approaches at the intersection of Victoria Road and Marist Place;
- Signalised crossings are provided over all approaches at the intersection of Victoria Road and Church Street;
- A signalised pedestrian crossing is provided over O'Connell Street to the south of Victoria Road;
- Marked pedestrian crossings are provided over the western and southern approaches of the junction of Church Street and Market Street; and
- A grade separated pedestrian facility is provided beneath Marist Place / Marsden Street and O'Connell Street immediately adjacent to and to the north of Parramatta River.

5.6 Parking Considerations

5.6.1 On-Street

Kerb-side parking is prohibited along Victoria Road and O'Connell Street in the immediate vicinity of the site.

Section 3.3 of this report indicates that kerb-side parking within Marist Place and Market Street is governed by a combination of sign posted restrictions including 'No Parking' (some with Bus and Coach exceptions), '2 P Ticket', '4P Ticket' and 'Bus Zone'.

5.6.2 Off-Street

An off-street parking area is located within Parramatta Park immediately to the west of the site on the opposite side of O'Connell Street. This parking area contains the following:

- 136 parking spaces with 2 Hour restrictions between 8.00am and 9.00pm Monday to Friday and 8.00am – 8.00pm weekends and public holidays; and
- 211 parking spaces with '4P Ticket' restrictions, although parking is also available all day for a flat rate.

This parking area is serviced by a driveway connecting with O'Connell Street to the south of the pedestrian signals, whereby an exclusive right turn bay facilitates right turn ingress movements (right turn egress movements are prohibited).

It is understood that the State Government has recently announced the section of Parramatta Park encompassing the abovementioned off-street parking area is to be redeveloped as part of an upgrade to Parramatta (Pirtek) stadium. The retention or otherwise of this off-street parking area is however unknown at this point in time.

7. PROJECTED TRAFFIC CONDITIONS

7.1 Traffic Generation

The ultimate school population is projected to be 1,000 students and 60 staff.

In order to estimate the likely staged traffic generation of the school, an estimation of the following factors is required:

- The likely origin of the students; and
- The likely mode of travel of students.

The above two factors are somewhat interrelated as the closer the students live to the school the less likely those students are to be driven to and from the school. Consultation with representatives of the Department of Education has indicated a likely primary catchment area providing boundaries of Grose Street to the north, Parramatta River to the south and west and Macarthur Street to the east.

In regard to the above, the planned density of the residential development within the north Parramatta CBD is such that a significant portion of students residing in close proximity to the site are likely to walk or cycle to and from the school on a daily basis. In this regard, the Department of Education has indicated that it expects up to 40% of all students attending the school to reside within the nearby high density residential precinct that will walk or cycle to and from the school. This accounts for up to 400 students.

Notwithstanding the above, a portion of students may also be drawn from areas slightly further north, east and south whereby students currently already attending the existing Parramatta North Public School, Parramatta East Public School and Parramatta Public School may transfer to the subject site. Whilst it could be expected that those students currently attending Parramatta North Public School (assumed to comprise 10% of the total new school population) will reside within easy walking distance to the new school, those students attending Parramatta East Public School and Parramatta Public School (assumed to comprise 20% of the new school population) are expected to catch existing or proposed public bus services (utilising school bus passes) operating along Victoria Road, Church Street, Marist Street and / or Market Street. These students are projected to accommodate for a total of 20% of the ultimate school population.

Deducting the abovementioned students that will walk, cycle or catch buses to and from the school from the total school population, it can be calculated that approximately 30% of students will be driven to and from the school on a daily basis. Accounting for 60% sibling rate (based on information supplied by the Department of Education), on average, each private parent vehicle will transport 1.43 students to and from the site. In consideration of this, approximately 210 vehicles are projected to set-down / pick-up students during the school start and finish times following full occupation of the school.

Staff transport to and from the school will be somewhat governed by the ability of the on-site staff car park to accommodate staff vehicles. For the purposes of this assessment, it is expected that 27 employees will travel to the site via private vehicle (based on the capacity of the proposed staff car parking area accessed via O'Connell Street). The remainder of staff are expected to utilise the various public transport infrastructure servicing the Parramatta precinct to travel to and from the site.

Based on the school start and finish period occurring over a one and a half hour period (8.00am – 9.30am and 2.30pm – 4.00pm) the following peak hour traffic generation is projected:

- The school will generate in the order of 140 inbound and outbound passenger vehicle trips per hour associated with parent set-down / pick-up activities during both the morning and afternoon peak period, occurring via Marist Place and Market Street; and
- The school will generate up to 27 inbound passenger vehicle trips during the morning peak 27 outbound vehicle trips during afternoon peak period associated with staff journey to and from work trips, occurring via the proposed staff car park accessed via O'Connell Street.

Table 3 provides a summary of the traffic generating ability of the proposed school based on the previous discussion.

TABLE 3 SUMMARY OF PROPOSED ULTIMATE TRAFFIC GENERATING CAPABILITY OF THE SITE						
	AM PEAK			PM PEAK		
	Parent Vehicles	Staff Vehicles	Total	Parent Vehicles	Staff Vehicles	Total
Inbound	140	27	167	140	0	140
Outbound	140	0	140	140	27	167
Total	280	27	307	280	27	307

7.2 Trip Assignment

In order to gauge the impact of the traffic projected to be generated by the proposed development on the local road network, it is necessary to determine the impact on surrounding intersection efficiency. The objective of this section is to distribute the traffic generated by the proposed development along the major approach routes before it dissipates throughout the general road network.

Whilst it is acknowledged that the school is proposed to be located within the western portion of the total draw area, the high density nature of the planned residential precincts within the Parramatta CBD and North Parramatta precinct are such that it could be expected that a disproportionate number of students are expected to originate from the north, south and east. In this regard, it is assigned that up to 40% of traffic will originate from the south, 30% from the north whilst the remaining 30% will originate from the east.

Vehicles approaching from the south are most likely to access the site from Marsden Street and utilise the proposed formalised set-down / pick-up area on the western side of Marist Place. These vehicles will thence egress the precinct via a left turn into Victoria Road and thence a left turn into O'Connell Street to travel south.

Vehicles approaching from the north are most likely to access the site from O'Connell Street or Church Street, connecting with Marist Place via Victoria Road and utilise the proposed formalised set-down / pick-up area on the eastern side of Marist Place or the northern side of Market Street. These vehicles will thence egress the precinct via Church Street to travel north.

Vehicles approaching from the east are most likely to access the site from Victoria Road, connecting with Marist Place and utilise the proposed formalised set-down / pick-up area on the eastern side of Marist Place or the northern side of Market Street. These vehicles will thence egress the precinct via Victoria Road, via Church Street to travel east.

For the purposes of simplicity, it is assumed that all staff vehicles approach the site from the north via O'Connell Street and egress the site to the south via the same street.

7.3 Projected Traffic Volumes

The projected traffic volumes in the immediate vicinity of the subject site incorporating the subject development have been extrapolated by adding the previously presented trip assignment to the existing traffic volumes illustrated within **Figure 2**. **Figure 4** provides a graphical representation of the projected traffic volumes during the peak operational periods of the subject site.

FIGURE 4
PROJECTED WEEKDAY PEAK HOUR TRAFFIC VOLUMES
8.00AM - 9.00AM & 3.00PM - 4.00PM

LEGEND: AM PEAK / PM PEAK

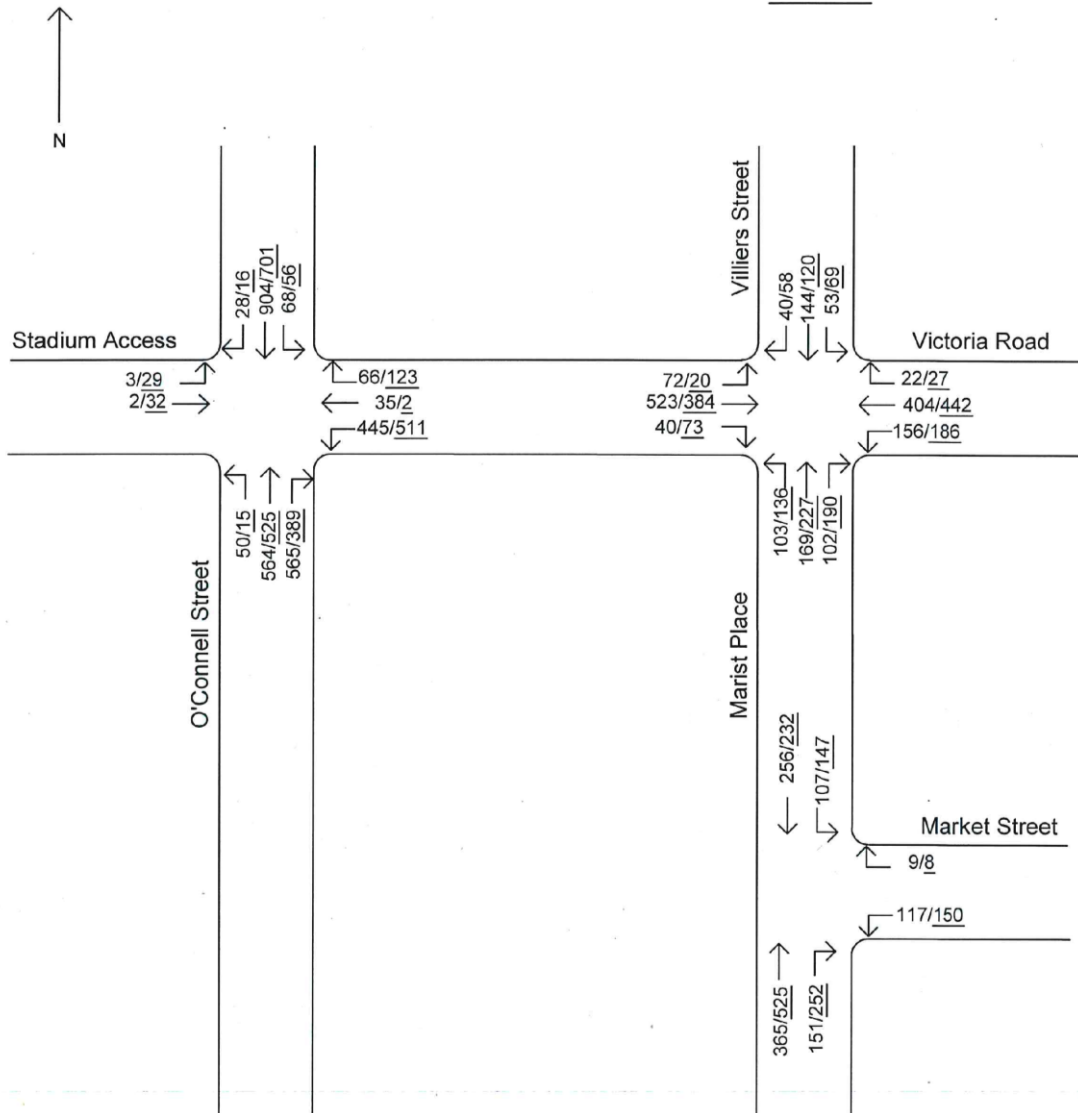


Table 4 below provides a summary of the existing and projected mid-block traffic volumes during peak periods.

TABLE 4 EXISTING AND PROJECTED LOCAL ROAD MID-BLOCK PEAK HOUR TRAFFIC DEMANDS				
	AM Peak		PM Peak	
	Existing	Projected	Existing	Projected
O'Connell Street (north of Victoria Road)				
Northbound	633	633	677	677
Southbound	952	1000	752	773
Total	1585	1633	1429	1450
O'Connell Street (south of Victoria Road)				
Northbound	1179	1179	929	929
Southbound	1266	1349	1156	1212
Total	2445	2528	2085	2141
Victoria Road (east of Marist Place)				
Eastbound	678	678	643	643
Westbound	519	582	592	655
Total	1197	1260	1235	1298
Victoria Road (west of Marist Place)				
Eastbound	614	634	456	477
Westbound	490	546	580	636
Total	1104	1180	1036	1113
Marist Place				
Northbound	318	374	497	553
Southbound	279	363	295	379
Total	597	737	792	932
Marsden Street				
Northbound	460	516	721	777
Southbound	373	373	382	382
Total	833	889	1103	1159
Market Street				
Eastbound	174	258	315	399
Westbound	126	126	158	158
Total	300	384	473	557

7.4 Projected Road Network Performance

7.4.1 Intersection Performance

In order to undertake an assessment of the likely impact of the subject development application on the adjoining road network, this Practice has undertaken a further SIDRA analysis of the surveyed intersections utilising the volumes illustrated in **Figure 4**. **Table 5** provides a summary of the most pertinent results whilst full details are available upon request.

TABLE 5 SIDRA OUTPUT – PEAK HOUR INTERSECTION PERFORMANCE				
	Existing Conditions		Projected Conditions	
	AM Peak	PM Peak	AM Peak	PM Peak
O'CONNELL STREET & VICTORIA ROAD				
Average Vehicle Delay (sec/veh)	30.0	25.8	30.8	26.1
Degree of Saturation	0.77	0.54	0.79	0.55

Level of Service	C	B	C	B
VICTORIA ROAD & MARIST PLACE				
Average Vehicle Delay (sec/veh)	39.0	43.2	39.0	43.0
Degree of Saturation	0.54	0.68	0.57	0.72
Level of Service	C	D	C	D
MARIST PLACE AND MARKET STREET				
Average Vehicle Delay (sec/veh)	9.4	12.8	10.5	14.6
Degree of Saturation	0.28	0.45	0.32	0.49
Level of Service	A	A	A	B

Table 5 indicates that the proposed development is likely to have some minor impacts on the efficiency of the survey intersections within the study area with average delay and the degree of saturation altering marginally. Notwithstanding this, all intersection levels of service are projected to remain unaltered, with the exception of the junction of Marist Place and Market Street, which is projected to reduce from 'A' to 'B', still representing good operation with spare capacity. The subject development is therefore unlikely to have any unreasonable impacts on the overall level of safety and efficiency of the road network.

7.4.2 Mid-Block Capacity

Table 4 indicates that the subject proposal is projected to increase traffic volume demands within the local roads abutting the subject development, comprising Marist Place, Marsden Street and Market Street. The existing mid-block directional level of service within these local roads is however not projected to be altered from that prevailing in accordance with indicative urban road peak hour criteria specified by the Roads & Maritime Services' *Guide to Traffic Generating Developments* (ranging between level of service 'B' and 'D'). These existing levels of service are considered to be commensurate with the existing functional orders of the local roads within a city centre context. The subject proposal is therefore not projected to result in any unreasonable impacts on the amenity of development abutting these roads.

Whilst traffic demands within O'Connell Street and Victoria Road are considerably higher commensurate with the sub-arterial and major collector functions respectively, the directional level of service within these roads is typically better ('B') than the abovementioned local roads given the multiple travel lanes provided, in accordance with the criteria specified within the *Guide to Traffic Generating Developments*. The additional traffic demands associated with the subject development are not projected to result in any noticeable impacts on the overall operational performance of O'Connell Street and Victoria Avenue.

7.4.3 Set-down / Pick-Up Activity Management

Section 4.2.1.3 of this report presented that the capacity of the formalised student set-down / pick-up arrangements adjoining the subject site has been based on this Practice's experience that an instantaneous set-down / pick-up capacity of 1 vehicle space per 30 students is required. Section 7.1 of this report presented that the school is expected to generate in the order of 140 vehicle trips per hour associated with parent set-down / pick-up activities during both the morning and afternoon peak periods.

Based on the set-down / pick-up arrangements providing a capacity of 33 vehicles, the maximum instantaneous set-down / pick-up capacity represents a minimum of approximately 25% of the total hourly demand. This means that each vehicle space within the set-down / pick-up areas will need to be turned over four times during any one single peak hour period (or once every 15 minutes) to ensure that demand does not exceed the capacity of the proposed formalised areas.

On face value, this would appear to be adequate, particularly during the morning school start period, when set-down occurs over an extended period. It is however anticipated that some operational management measures will be required to be implemented during the afternoon school finish period, when there is likely to be a concentrated period of arrival of parent vehicles during a short time.

In regard to the above, it is recommended that the school implement an Operational Management Plan (OMP). The OMP is to be formulated to address safety issues associated with the proposed normal daily school start and finish traffic operations. The primary objective of the OMP is to maximise the efficiency of the set-down / pick-up areas.

The OMP should address issues which are considered vital to the safety of school children as well as to the sound site and public road management as they relate to traffic and pedestrian safety. The following provides a draft OMP for consideration including general administration and operational items to assist in the accommodation of the proposed school.

OMP General Items

- A Management & Safety Committee is to be established to implement the OMP and to develop further guidelines in order to ensure that on and off-site vehicular and pedestrian safety is maximised. The committee shall comprise the school Principal or his / her senior representative, a parent's representative as well as an independent traffic consultant to provide initial assistance in the implementation of the OMP as well as subsequent periodic guidance in the ongoing review of the OMP;
- The OMP should also be subject to periodic review by Councils Traffic and Transport Planner to ensure that road safety issues as they relate to the public roads are both appropriately documented as well as being implemented in accordance with sound traffic engineering and road safety practices;
- The Management and Safety Committee shall undertake ongoing reviews of school student safety as necessary but initially ensure that the procedures contained within this OMP are put in place with respect to on and off-site traffic management and safety issues; and
- The Committee shall put in place measures which should ensure parent / guardian compliance with the OMP. These should take the form of specific instructions via the student newsletter and indications that such instructions are

to be observed as may be applicable to any private property and could therefore form part of the initial enrolment procedures.

Student Set-Down / Pick-Up

- All student set-down / pick-up is to occur via the formalised on-street 'No Parking' areas within Marist Place and Market Street;
- Vehicular entry / exit to the on-site visitor parking area accessed via Marist Place will be prohibited during peak student set-down / pick-up periods;
- During the initial stages of the implementation of this OMP, teachers will supervise the school set-down / pick-up areas during the morning prior to school start to ensure that students disembark parent vehicles in an efficient manner;
- Students disembarking parent vehicles will do so via the passenger side so that direct access to the adjoining footpath is obtained to ensure pedestrian safety;
- The student set-down / pick-up areas will employ the following operational management arrangements during the afternoon school finish period:
 - Students assemble under the supervision of a teacher at the end of the formalised pick-up areas following the completion of the school day;
 - Parents display the names of children to be picked-up on the windscreen of the vehicle when entering the internal pick-up area; and
 - The teacher supervising the student assembly area arranges for the relevant student/s to be brought to the front of the assembly area upon the arrival of the parent vehicle to the pick-up location.
- Parents picking-up / setting-down students must not exit their vehicle to assist in the loading / unloading of students. This is to be done under the supervision of teachers; and
- No student pick-up / set-down is to occur within the queue lane on approach to the assembly area.

Incorporating the satisfactory implementation of an OMP, it is anticipated that the proposed formalised on-site set-down / pick-up areas adjoining the site will satisfactorily accommodate the projected peak instantaneous demand generated by the school.

7.5 Impacts on Sustainable Travel Modes

Section 7.1 of this report presents the following:

- 50% of students are expected to walk or cycle to and from the school; and
- 20% of students are expected to utilise public transport to and from the school.

Section 5.5 of this report presents that pedestrians are currently provided with excellent access and mobility infrastructure in the immediate vicinity of the site commensurate with the city centre location. This existing infrastructure is proposed to be supplemented with an additional raised marked pedestrian crossing over Marist Place in the immediate vicinity of the primary student pedestrian access gate, to the north of Market Street. This crossing is anticipated to facilitate the safe and efficient connectivity of pedestrians between the school grounds and the adjoining formalised student set-down / pick-up areas within Marist Place and Market Street as well as the existing surrounding pedestrian infrastructure along desire lines to and from the site.

Section 5.4 of this presents that the site is particularly well serviced by various form of public transport. Further, it is proposed that a Bus Zone be provided within Marsden Street / Marist Place immediately adjacent to the site, capable of accommodating up to three buses at any one time. Accounting for special school bus services utilising this Bus Zone, the use of existing public transport services by school students is expected to be low to moderate. There is accordingly not anticipated to be any unreasonable impacts on the capacity of existing public transport infrastructure servicing the immediately surrounding precinct.

8. CONSTRUCTION ISSUES

8.1 Introductory Statement

This Section of the report constitutes a preliminary Construction Traffic Management Plan (CTMP) addressing the traffic access and safety issues associated with demolition and construction works associated with the proposal. CTMPs are generally prepared at Construction Certificate stage following the commissioning of a builder thereby allowing a greater appreciation of the likely construction methodology and therefore the required traffic management measures to be implemented.

The terms of the initiatives contained within the following subsections of this report are therefore somewhat generic and some modifications may be needed by or on behalf of the successful builder / civil contractor at Construction Certificate stage depending on their feasibility taking into consideration all project requirements.

8.2 Proposed Works and Traffic Management

The demolition and construction works are likely to be undertaken within four separate stages as follows:

- Stage 1 – demolition of the relevant site structures;
- Stage 2 – remediation of demolished areas;
- Stage 3 – construction of new site structures; and
- Stage 4 – construction of internal circulation, car parking and circulation areas.

During all stages, construction vehicles and personnel are to be contained wholly on-site within the existing passenger vehicle parking areas.

All areas of demolition / construction during the various stages including the construction compounds are to be fenced such that there will be no unreasonable interaction between the construction activities and the surrounding public roads.

No Works Zone/s will be required or sought along the street frontages and all construction activities are to be undertaken internally thereby not requiring occupation of the public roadway.

Traffic Control Plans (TCPs) illustrating the extent and location of the abovementioned driveway works will be required to be prepared prior to the undertaking of these works. The traffic control measures contained within the TCP are to be sensitive to the surrounding land uses and site access movements and be certified as being in accordance with AS 1742.3 and the Roads & Maritime Services' *Traffic Control at Work Sites*. In the case of the O'Connell Street driveway works, a Road Occupancy Application will be required to be submitted to and approved by the Roads & Maritime Services prior to the works being undertaken.

8.3 Safe Ingress and Egress of Construction Traffic

During all stages of demolition / construction, all construction vehicles will enter and exit the site in a forward direction via an existing / proposed driveway. Reversing manoeuvres to and from the site will be prohibited, unless specific approval is granted by Parramatta City Council.

Site access and egress manoeuvres may be controlled by appropriately qualified traffic controllers to ensure that all such movements are undertaken in a safe and efficient manner. Traffic controllers are not to stop traffic on the public street to allow construction vehicles to enter or leave the site. They must wait until a suitable gap in traffic flow allows them to assist construction vehicles to enter or exit the site. The Roads Act does not give any special treatment for trucks leaving a construction site – the vehicles already on the road have right of way.

The timing of access / egress by construction traffic will be sensitive to the surrounding land uses and traffic flow demands. In this regard, construction vehicle ingress and egress movements are to be minimised where possible during road network and school peak periods (7.00am – 9.30am and 2.30pm – 6.00pm).

8.4 Construction Vehicle Transport Routes

The frontage roads provide good connectivity to surrounding regional and arterial routes servicing the Sydney metropolitan area thereby indicating that construction vehicles are able to access and depart the site creating very little disturbance to surrounding local road traffic flow.

The multiple directional traffic lanes of the approach and departure routes are such that heavy vehicle manoeuvring is able to occur without any unreasonable encroachment on opposing travel lanes, kerbs and / or parking lanes. None of the abovementioned roads are light thoroughfares or are restricted by load limits.

8.5 Parking Control

At no time are construction worker / tradesperson vehicles or construction vehicles to be parked within the adjoining public road network.

In order to minimise the demand for parking associated with construction workers and thus the impact of the works on surrounding precinct amenity and parking provision, it is recommended that construction workers / tradespersons be encouraged to do either of the following when travelling to the site:

- Utilise public transport to the site (the site is well serviced by rail and bus routes); and / or
- Car pool with other construction workers.

The above transport options are to be made available to site workers and as such form part of any site induction process. Details of induction scheduling and procedures are

contained within the Occupational Health & Safety, Safe Work Method Statement and Induction Record Forms prepared by others are submitted as part of the Construction Certificate application.

8.6 Construction Traffic Generation

Construction materials are to be transported to and from the site by vehicles up to and including Medium Rigid Vehicles (MRVs). The number of vehicles needed at each stage of the construction works has been estimated based on this Practice's experience with developments of similar scale as follows:

- Stage 1 – demolition of the relevant site structures – 60 vehicles per day or 6 vehicles per hour
- Stage 2 – remediation of demolished areas – 30 vehicles per day or 3 vehicles per hour
- Stage 3 – construction of new site structures – 60 vehicles per day or 6 vehicles per hour; and
- Stage 4 – construction of internal circulation, car parking and circulation areas – 30 vehicles per day or 3 vehicles per hour.

The construction activities are projected to generate less traffic than the proposed future use, thereby indicating suggesting that impacts will be minimal. During periods of more heavy construction vehicle generation (i.e. a concrete pour), drivers are to be instructed by radio when to arrive at the site to ensure that there is no vehicle queuing or parking within the adjoining road network. This is to be strictly adhered to.

8.7 Traffic Impact

The recent traffic investigations of the adjoining road network and the analysis contained within previous sections of this report have indicated that motorists are provided with a reasonable level of service within the immediately adjoining public road network. It is therefore considered that the limited traffic generation associated with the construction activities can be accommodated without any unreasonable impacts on adjoining vehicle movements considering the previously mentioned maximum hourly traffic generation. Notwithstanding this, it has accordingly been recommended that construction vehicle movements to and from the site be minimised where possible during road network peak periods (7.00am – 9.30am and 2.30pm – 6.00pm).

8.8 Impacts on Pedestrians

It has previously been presented that all internal construction zones are to be fenced to prevent pedestrian access. Pedestrians are to be protected from dust and debris by full perimeter scaffolding around the staged construction compounds, combined with chain wire mesh and shade cloth.

Qualified traffic controllers are to assist all site access movements during vehicular ingress and egress. In addition, the reduction and / or elimination vehicular movements during peak commuter periods (when pedestrian movements within the adjoining road network are at their greatest) will limit the impact of the construction works on pedestrian accessibility and safety.

The driveway construction works will however involve the occupation of the Marist Place footpath. During these construction works, pedestrian movements within the footpath will be diverted either into the site or the road carriageway. Such movements will be suitably protected by construction fencing and or vehicle barriers. The extent of pedestrian (and traffic) management arrangement implemented during these works will be governed by a TCP according with AS 1742.3 and the Roads & Maritime Services' *Traffic Control at Work Sites* and subject to approval from the Roads & Maritime Services' Traffic Management Centre in the case of the O'Connell Street works.

8.9 Concurrent Construction Works and Cumulative Impacts

This Practice understands that other construction activity is planned to occur within the vicinity of the subject site as follows:

- Construction works associated with the recently approved redevelopment of the currently vacant land to the immediate north-west of the site (on the corner of O'Connell Street and Victoria Road) to accommodate a mixed use development comprising approximately 75 residential apartments and a three storey commercial building providing an approximately office floor space of 7,000m²; and
- Construction works associated with the redevelopment of the existing Parramatta (Pirtek) Stadium, Parramatta War Memorial Swimming Centre and associated passenger vehicle parking areas located on the western side of O'Connell Street.

Construction access associated with these works is to be sought via Victoria Road and O'Connell Street, being separate and clear of the influence of the construction site access and impacts associated with the subject development.

9. CONCLUSION & RECOMMENDATION

This study details our assessment of the parking and traffic demand expected to be generated by a proposed primary school to be located within land abutting Marist Place and O'Connell Street, Parramatta. Having regard to the contents of this report, the following conclusions are made:

- The proposed development provides adequate off-street parking to accommodate the long term parking demand associated with school staff as well as the minor short term demand associated with visitors;
- Incorporating the satisfactory implementation of an appropriate site Operational Management Plan, the proposed implementation of formalised on-street set-down / pick-up areas within Marsden Street / Marist Place and Market Street is envisaged to be capable of accommodating the peak instantaneous demand of parent vehicles during school start and finish periods;
- SIDRA modelling indicates that the surrounding local road network currently operates with a reasonable level of service with spare capacity;
- The school has been projected to ultimately generate in the order of 307 peak hour vehicle trips to and from the site during school start and finish periods; and
- The surrounding road network is projected to be capable of accommodating the additional traffic projected to be generated to and from the site in a safe and efficient manner.

Having regard to the conclusions abovementioned, this Practice is satisfied that the proposed development is worthy of the Department's support in relation to the traffic issues discussed.