

Transport Impact Assessment

New Catherine Field Primary School
O'Keefe Drive, Oran Park

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1 Introduction

1.1 Overview

Ason Group has been engaged by Hansen Yuncken on behalf of the NSW Department of Education (DoE) to prepare a Transport Impact Assessment (TIA) in regard to State Significant Development Application 9477 (the SSDA) for the proposed New Catherine Field Primary School (the School), located in O’Keefe Drive, Oran Park (the Site). The SSDA provides for:

- The construction of new classroom buildings and associated facilities and infrastructure;
- Outdoor playgrounds and learning spaces; and
- A future School population of 1,012 students from Kindergarten to Year 6, and 56 full-time equivalent staff.

1.2 Transport Impact Assessment Tasks

This TIA provides an assessment of the relevant access, traffic and parking characteristics of the School, and the potential impacts of the School on the local road, parking and active transport environment. This has included a detailed assessment of:

- Existing local road network operations and on-street parking conditions;
- Public and active transport services and infrastructure, and available sustainable transport strategies to reduce the future (vehicular) trip generation of the School;
- The peak period trip generation and distribution of the School, and the potential impact of those trips on the local road network;
- Drop-off / pick-up (DOPU) infrastructure;
- Parking requirements and provision; and
- The design of access driveways; parking aisles and spaces; and servicing areas.

This scope of work specifically references the Secretary’s Environmental Assessment Requirements (SEARs) prepared by the [then] Department of Planning and Environment (DPE) dated 6 August 2018 relating to the SSDA. In this regard, **Table 1** provides a summary of the SEARs; a summary response to each; and a reference to the section of this TIA which provides a more detailed response to each assessment request.

Table 1: Secretary's Environmental Assessment Requirements

SEARS	Summary Response	TIA
<p>Include a transport and accessibility impact assessment, which details, but is not limited to the following:</p>		
<ul style="list-style-type: none"> accurate details of the current daily and peak hour vehicles, existing and future public transport networks and pedestrian and cycle movement provided on the road network located adjacent to the proposed development 	<p>Details in regard to each of these existing and future Site and broader transport characteristics of the School catchment are provided in this TIA.</p>	<p>Section 3.1 Section 5.4 Section 6.1</p>
<ul style="list-style-type: none"> details of estimated total daily and peak hour trips generated by the proposal based on surveys of the existing and similar schools within the local area based on surveys of the existing and similar schools within the local area 	<p>The daily and peak hour trip generation of the School references RMS surveys of schools across Metropolitan Sydney, as well as recent Ason Group school assessments. It is estimated that the School will generate some 630 vehicle trips per hour (vph) in the AM School peak and 520vph in the PM School peak.</p>	<p>Section 5.4</p>
<ul style="list-style-type: none"> the adequacy of existing public transport or any future public transport infrastructure within the vicinity of the site, pedestrian and bicycle networks and associated infrastructure to meet the likely future demand of the proposed development 	<p>The Catherine Field (Part) Precinct (CFPP) will provide an excellent level of public and active transport services and infrastructure. Given that the student population will be drawn almost exclusively from the local area, it is expected that there will be a very high use of public and active transport by students.</p>	<p>Section 4</p>
<ul style="list-style-type: none"> measures to integrate the development with the existing/future public transport network 	<p>The School is located on the designated bus route along O'Keefe Drive, in turn providing direct or interchange access to the broader CFPP. Bus stops are to be provided directly adjacent to the School in O'Keefe Drive.</p>	<p>Section 4.2 Section 5.2</p>
<ul style="list-style-type: none"> the impact of trips generated by the development on nearby intersections, with consideration of the cumulative impacts from other approved developments in the vicinity, and the need/associated funding for, and details of, upgrades or road improvement works, if required (Traffic modelling is to be undertaken using SIDRA network modelling for current and future years) 	<p>Forecast (2036) traffic flows for O'Keefe Drive and key local roads and intersections in the vicinity of the School indicate that the trip generation of the School can be appropriately accommodated by the existing and proposed (for the final CFPP) road network infrastructure.</p>	<p>Section 3.1 Section 6.1</p>
<ul style="list-style-type: none"> the identification of infrastructure required to ameliorate any impacts on traffic efficiency and road safety impacts associated with the proposed development, including details on improvements required to affected intersections, additional school bus routes along bus capable roads (i.e. minimum 3.5 m wide travel lanes), additional bus stops or bus bays 	<p>Forecast traffic flows for O'Keefe Drive and key local roads and intersections in the vicinity of the School indicate that the trip generation of the School can be appropriately accommodated by the existing and proposed (for the final CFPP) road network infrastructure. O'Keefe Drive has been designated as a bus route corridor and as such has been / will be designed in accordance with the appropriate bus standards, including the provision of minimum 3.5m travel lanes and indented bus stops.</p>	<p>Section 4.2</p>
<ul style="list-style-type: none"> assessment of the travel needs for teachers and students on each mode of transport and associated parking / pick-up and set down areas 	<p>Staff parking will be provided on-site in accordance with the school parking requirements detailed in the Campbelltown Growth Centre Precinct DCP (CGCP DCP), noting that the Camden Growth Centres DCP does not include such rates. In this regard, a total of 68 parking spaces will be provided, which provides compliance with the CGCP DCP requirements. Drop-off and pick-up (DOPU) zones will be provided in adjacent roads to meet the peak student DOPU demand.</p>	<p>Section 5.4 Section 5.7</p>

SEARS	Summary Response	TIA
<ul style="list-style-type: none"> • details of travel demand management measures to minimise the impact on general traffic and bus operations, including details of a location specific sustainable travel plan (Green Travel Plan and specific Workplace travel plan) and the provision of facilities to increase the non-car mode share for travel to and from the sit 	<p>Along with the substantial public and active transport available to the Site, Sustainable Travel Planning strategies have been prepared as part of this TIA.</p>	<p>Section 7.1 Appendix A</p>
<ul style="list-style-type: none"> • the proposed walking and cycling access arrangements and connections to public transport services 	<p>The CFPP will provide an excellent level of public and active transport services and infrastructure, including bus stops, shared paths and pedestrian crossings immediately adjacent to the School.</p>	<p>Section 4 Section 5.3</p>
<ul style="list-style-type: none"> • the proposed access arrangements, including car and bus pick off facilities, and measures to mitigate any associated traffic impacts and impacts on public transport, pedestrian and bicycle networks, including pedestrian crossings and refuges and speed control devices and zones 	<p>Drop-off and pick-up (DOPU) zones will be provided in adjacent roads to meet the peak student DOPU demand and be clearly signposted to provide short term stay provisions during School peak periods. Pedestrian crossings and the like are provided immediately adjacent to the School and along key active transport routes within the CFPP to and from the School. Indented bus bays are also provided immediately adjacent to the School to allow safe and efficient student access to bus services.</p>	<p>Section 5.2 Section 6.2</p>
<ul style="list-style-type: none"> • proposed bicycle parking provision, including end of trip facilities, in secure, convenient, accessible areas close to main entries incorporating lighting and passive surveillance 	<p>Bicycle racks and parking spaces are to be provided on-site for students and staff respectively. End of journey facilities, including showers and lockers, will also be provided for staff.</p>	<p>Section 5.8</p>
<ul style="list-style-type: none"> • proposed number of on-site car parking spaces for teaching staff and visitors and corresponding compliance with existing parking codes and justification for the level of car parking provided on-site 	<p>A total of 68 parking spaces will be provided on-site, which provides full compliance with the CGCP DCP.</p>	<p>Section 5.7</p>
<ul style="list-style-type: none"> • an assessment of the cumulative on-street parking impacts of cars and bus pick-up/drop-off, staff parking and any other parking demands associated with the development. The assessment must consider the impacts of any mandatory parking restrictions associated with proposed pedestrian safety facilities (such as pedestrian crossing, school crossing or similar) 	<p>An assessment of the cumulative potential impacts of the School on the local traffic, public and active transport network is provided in this TIA.</p>	<p>Section 6.1</p>
<ul style="list-style-type: none"> • an assessment of road and pedestrian safety to / from the school and adjacent to the proposed development and the details of required road safety measures and personal safety in line with CPTED 	<p>A detailed assessment of vehicle and pedestrian access is provided in this TIA, while more details in regard to CPTED are provided elsewhere in the Environmental Impact Assessment which this TIA accompanies.</p>	<p>EIS TIA</p>
<ul style="list-style-type: none"> • emergency vehicle access, service vehicle access, delivery and loading arrangements and estimated service vehicle movements (including vehicle type and the likely arrival and departure times) 	<p>Emergency and service vehicle access will be provided via the staff car park, and design to provide compliance with the relevant Australian Standards and emergency vehicle access guidelines. Service vehicle movements will be scheduled to occur outside of School peak periods.</p>	<p>Section 5.2</p>
<ul style="list-style-type: none"> • details of the future Secondary Road 610 and 3301 including design, responsible delivery party(ies), expected completion date and interim accessibility measures (if required) 	<p>It is expected that both these local roads will be constructed prior to the opening of the School and be designed in accordance with the Camden Growth Centre Precincts Development Control Plan, including the provision of indented parking lanes which would be utilised for DOPU and local parking. The parties responsible for the construction are discussed in the broader EIS which this TIA accompanies.</p>	<p>Section 3.1 EIS</p>

SEARS	Summary Response	TIA
<ul style="list-style-type: none"> • the preparation of a preliminary Construction Traffic and Pedestrian Management Plan to demonstrate the proposed management of the impact in relation to construction traffic addressing the following: <ul style="list-style-type: none"> o assessment of cumulative impacts associated with other construction activities (if any) 	<p>A Draft Construction Traffic & Pedestrian Management Plan (Draft CTPMP) has been prepared as part of this TIA based on all available information in regard to future construction requirements. The Draft CTPMP will be updated further to consultation with the key consent authorities as more details become available in regard to the construction program and would necessarily require compliance with Council and RMS guidelines.</p>	<p>Section 7.4 Appendix B</p>
<ul style="list-style-type: none"> o an assessment of road safety at key intersection and locations subject to heavy vehicle construction traffic movements and high pedestrian activity 		
<ul style="list-style-type: none"> o details of construction program detailing the anticipated construction duration and highlighting significant and milestone stages and events during the construction process 		
<ul style="list-style-type: none"> o details of anticipated peak hour and daily construction vehicle movements to and from the site 		
<ul style="list-style-type: none"> o details of on construction vehicles, construction workers to and from the site, emergency vehicles and service vehicle and 		
<ul style="list-style-type: none"> o details of temporary cycling and pedestrian access during construction 		

1.3 Planning Controls

The Site lies within the Camden Council (Council) Local Government Area (LGA), as well as lying within the broader South West Growth Area (SWGA); as such, key references in preparing this TIA include:

- Camden Local Environmental Plan 2010 (LEP 2010);
- Camden Development Control Plan 2011 (DCP 2011);
- Camden Growth Centre Precincts Development Control Plan 2017 (Camden GCP DCP);
- Campbelltown Growth Centre Precinct Development Control Plan 2016 (Campbelltown GCP DCP);
- State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (SEPP SRGC);

- Peer Review of Social Infrastructure and Demographic Assessment for Catherine Fields (Part) Precinct 2013, Elton Consulting (CFPP Social);
- Growth Centres Development Code, 2006 (GCD Code);
- South West Sector Bus Servicing Strategy, 2009 (SWSBS Strategy); and
- Various reports and controls supporting the development of the broader SWGA.

1.4 Traffic and Transport Guidelines and Standards

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

- Guide to Traffic Generating Developments 2002, Roads and Maritime Services (RMS Guide);
- Guide to Traffic Generating Developments – Updated Traffic Surveys 2013, RMS (RMS Guide Update);
- Roads and Maritime Services Trip Generation Surveys Schools Analysis Report, GTA Consultants (RMS Schools Report);
- Australian Standard 2890.1: Parking Facilities – Off-Street Car Parking (AS 2890.1);
- Australian Standard 2890.2: Parking Facilities – Off-Street Commercial Vehicle Facilities (AS 2890.2);
- Australian Standard 2890.3: Parking Facilities – Bicycle Parking (AS 2890.3);
- Australian Standard 2890.6: Parking Facilities – Off-Street Parking for People with a Disability (AS 2890.6);
- Department of Education Educational Facilities Standards & Guidelines (EFSG);
- Design Guide for Schools, NSW Government Architects (DGS);
- Department of Planning & Environment Environmental Impact Statement Guidelines, Department of Planning & Environment;
- Transport for NSW Guide to Transport Impact Assessment;
- Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development;
- Planning Guidelines for Walking and Cycling 2004, NSW State Government; and
- Relevant Austroads walking and cycling guidelines.

1.5 Background Reports

Given the significant (primarily residential) growth anticipated in the vicinity of the Site, and indeed previous investigations of the Site itself, Ason Group has also specifically referenced the following reports in preparing this TIA:

- Catherine Field (Part) Precinct Plan Post-Exhibition Planning Report, 2013 Department of Planning & Infrastructure (CFPP PEP);

- Catherine Field (Part) Precinct Transport and Access Strategy May 2012, Aecom (CFPP TAS);
- Catherine Field (Part) Precinct Post-Exhibition Transport and Access Review (Addendum) Aecom 2013 (CFPP TAR); and
- Lot 1001 in DP1234527 O'Keefe Drive, Oran Park (Proposed Primary School) Traffic & Transport Impact Assessment 2018 prepared by TSA (Site TIA 2018).

1.6 Consultation

In preparing this report, Ason Group has had the opportunity to discuss key local and sub-regional transport issues with officers of Council and RMS. Ason Group acknowledges the insights in regard to existing and future local traffic and transport conditions provided by these officers.

2 The Site

2.1 Location

The Site is legally referenced as Lot 1001 in DP1234527, with a street address of O'Keefe Drive, Oran Park. The Site has an area of approximately 2 hectares and is currently zoned SP2 - Education Establishment under SEPP SRGC.

The Site lies within the Catherine Field (Part) Precinct (CFPP) and is currently bordered by O'Keefe Drive to the west; in the future, local roads will form the eastern and southern borders of the Site, while sporting fields and a cycle path will border the Site to the north.

The Site is shown in its local context in **Figure 1**, which also indicates the key roads providing Site access; and in its broader context within the CFPP in **Figure 2**.

2.2 Current Use

The Site is currently unused, having been specifically set aside in the SEPP SRGC planning of the CFPP for a future public school; in this regard, the CFPP PEP Report provides the following:

The school site will continue to be co-located with a Council local park to provide passive open space for both the school and nearby residents. DEC advised post-exhibition that it requires at least two hectares of space for the school and 0.8ha of open space for use during school hours (previously one hectare of open space). At the same time, Council requires a portion of the site to be accessible to the public at all times.

The solution adopted in the final ILP is to make available to DEC a two hectare school site, co-located with 1.2 hectares of Council open space. It is anticipated that 0.8 hectares of this open space will be publicly inaccessible during school hours, while the remaining 0.4 hectares will be accessible to the public at all times. The final operational and design outcomes will be determined when the school and park are developed.



Figure 1: Site Location

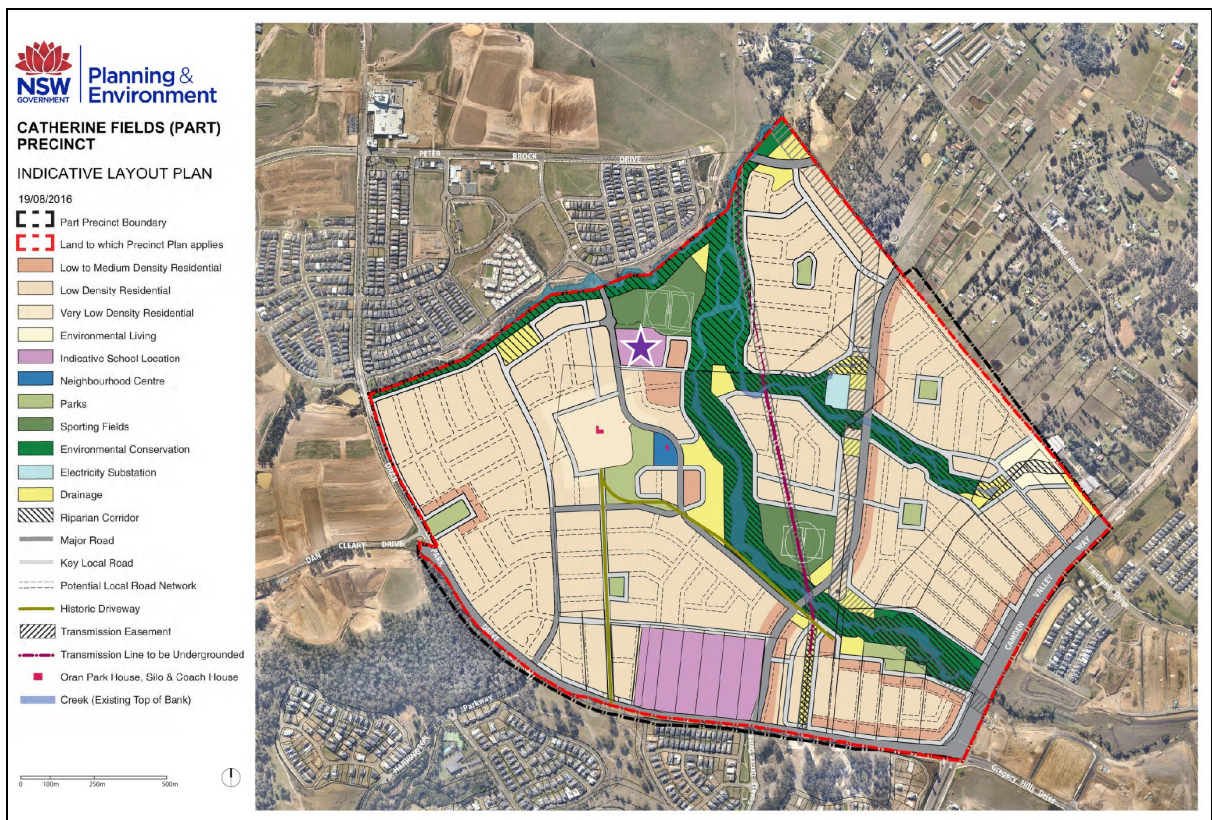


Figure 2: The Catherine Field (Part) Precinct

3 The Road Network

Key roads and intersections in the vicinity of the Site are shown in **Figure 1**, and described further in sections below.

3.1 Key Roads

3.1.1 O'Keefe Drive

O'Keefe Drive is a collector road that currently runs in a generally north-south direction between South Circuit (as Fifth Avenue) to the north and a terminus just south of the Site; however, in the future O'Keefe Drive will be extended further south to connect to Seidler Parade and then (as O'Keefe Drive) to Catherine Park Drive. In the vicinity of the Site, it provides 2 wide traffic lanes for two-way flows, as well as indented parking lanes on both sides of the road, and has a posted speed limit of 60km/h. A shared path will be provided on both the eastern and western sides of the road, i.e. a shared path will be provided directly adjacent to the Site.

With reference to the CFPP TTIA, by 2036 O'Keefe Drive will accommodate peak period flows of some 1,000 vehicle trips per hour (vph) in the AM peak and 800vph in the PM peak (noting that the PM peak does not coincide with the PM School peak hour). The flows in both peak periods are significantly tidal, with approximately 80% of AM peak flows being northbound, and 70% of PM peak flows being southbound.

3.1.2 Banfield Drive

Banfield Drive is a local road that runs in a generally east-west and then south direction between O'Keefe Drive to the east and Stoneham Circuit to the south. It provides 2 traffic lanes for two-way flows, as well as indented parking lanes on both sides of the road, and has a nominal speed limit of 50km/h. Footpaths are provided on sides of the road.

While the CFPP TTIA does not provide future traffic flow estimates for Banfield Drive, a first principles assessment suggests it would generate no more than 100vph in the AM and PM School peak periods.

3.1.3 Perkins Drive

Perkins Drive is a local road that runs in a generally east-west direction between Peter Brock Drive to the north-east and O'Keefe Drive / Fifth Avenue to the west. It provides 2 traffic lanes for two-way flows, as well as indented parking lanes on both sides of the road, and has a posted speed limit of 50km/h. A shared path and footpath are provided on the southern and northern sides of the road respectively.

With reference to the CFPP TTIA, by 2036 Perkins Drive will accommodate peak period flows of some 280vph in the AM peak and 400vph in the PM peak. Like O'Keefe Drive, these flows are primarily northbound in the AM peak and southbound in the PM peak.

3.1.4 South Circuit

South Circuit is a collector road that runs from Civic Way north of the Site to the south and the west to an intersection with Oran Park Road, and then north again to an intersection with Holden Drive. It provides 2 traffic lanes for two-way flows, as well as indented parking lanes on both sides of the road, and has a posted speed limit of 60km/h. In the vicinity of the Site, it provides shared path on one side of the road and a footpath on the other side of the road.

With reference to the CFPP TTIA, by 2036 South Circuit (east of Fifth Avenue) will accommodate peak period flows of some 600vph in the AM peak and 350vph in the PM peak.

3.1.5 Local Roads

Given the internalisation of future School trips within the CFPP, the majority of trips are expected to be generated to and from local roads intersecting with the key roads identified in sections above. The roads all have the same general profile, with 2 traffic lanes for two-way flows; indented parking lanes on both sides of the road; and local speed limits of 50km/h. In addition, all local roads provide as a minimum a footpath or shared path on at least one side of the road.

This same design will be provided for the future local roads adjacent to the School, including Road 3301 (to the east of the Site) and Road 610 (to the south of the Site)

3.2 Key Intersections

3.2.1 O'Keefe Drive & Banfield Drive

A roundabout intersection which provides a single approach and departure lane and a median pedestrian refuge on each approach leg. With reference to the CFPP TAR and a first principles assignment of trips, it is anticipated that this intersection will operate at a good Level of Service (LoS), with moderate delays and queues, further to the completion of the CFPP.

3.2.2 Fifth Avenue & South Circuit

A roundabout intersection which provides a single approach and departure lane on each approach leg, and a pedestrian refuge within the South Circuit north approach median. With reference to the CFPP TTIA and a first principles assignment of trips, it is anticipated that this intersection will operate at a good LoS, with moderate delays and queues, further to the completion of the CFPP.

3.2.3 O'Keefe Drive & Secondary Road 610

A priority (nominally Give Way) intersection with priority to O'Keefe Drive, this intersection will provide single lane approaches on all approach legs. With reference to a first principles assignment of trips, it is anticipated that this intersection will operate at a good LoS, with very minor delays and queues, further to the completion of the CFPP.

3.2.4 Local Intersections

Like the intersection of O'Keefe Drive & Secondary Road 610, the majority of local intersections are provided as simple priority (predominantly Give Way) intersections with priority to the high order road. All available information suggests that these intersections will operate with good LoS, with very minor delays and queues, further to the completion of the CFPP.

4 Public and Active Transport

4.1 Rail

The Site is located some 8km south of Leppington Station, and 9km north-west of Campbelltown Station. Access to Leppington Station will be provided by buses running along the future Rickard Road Transit Boulevard, while buses running along both O’Keefe Drive and Oran Park Road are expected to provide access to Campbelltown Station, likely via the new Gregory Hills Drive connection (see below).

4.2 Bus Services

4.2.1 Regional Services

As discussed above, Rickard Road will be developed as a Transit Boulevard to provide a key link through the SWGC between Oran Park and Leppington Station. Dickson Road will also provide bus connections between Oran Park and Leppington in 2036, while Oran Park Drive and Gregory Hills Drive have also been designated as Transit Boulevards. In addition, the SWSBS Strategy provides for regional services along Camden Valley Way and Oran Park Drive around the precinct.

More broadly, the SWSBS Strategy’s long-term 7 regional, 6 district and 3 peak hour only bus routes forming a network linking the CFPP with regional centres including Liverpool, Campbelltown, Parramatta and Leppington). The SWSBS Strategy’s bus network plan is shown in **Figure 3**.

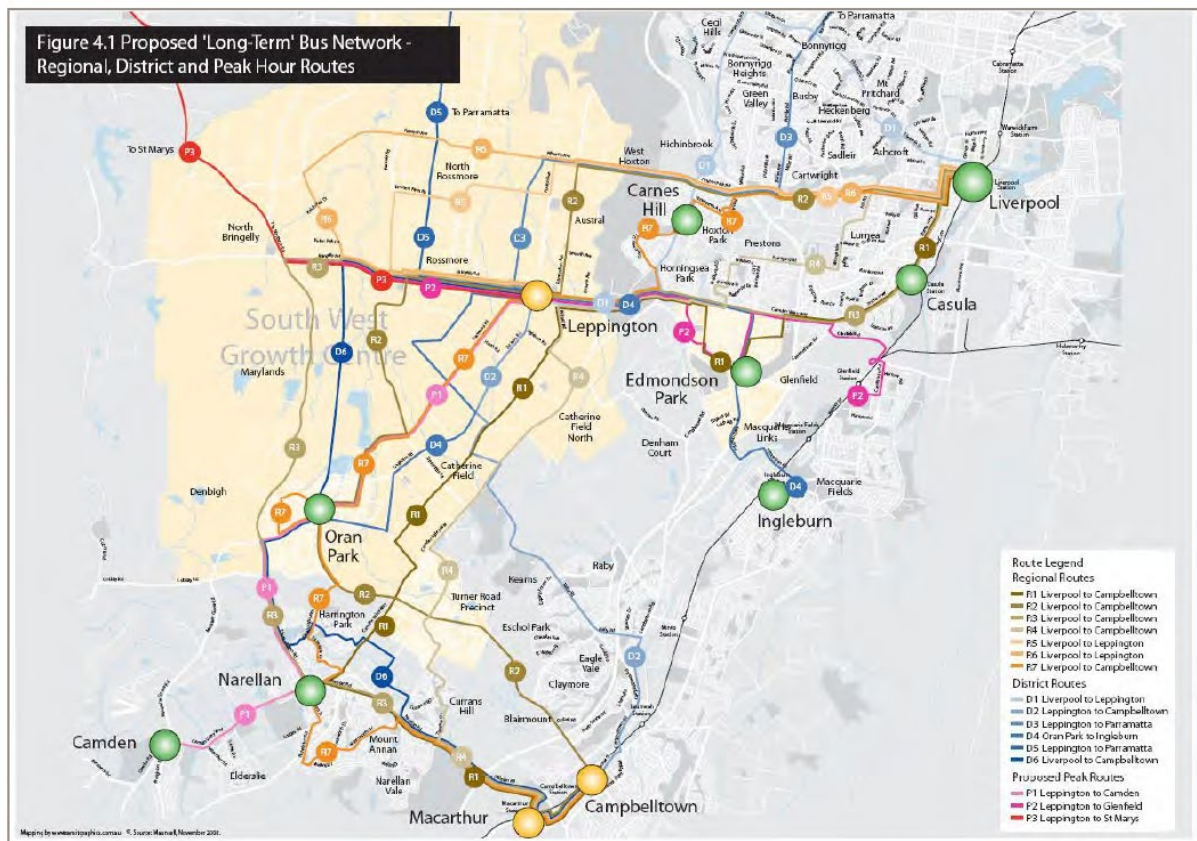


Figure 3: Regional Bus Services

4.2.2 Local Services

The CFPP bus network includes the regional routes as detailed above, as well as district and local to provide maximum coverage across the CFPP, in turn maximising public transport access and travel choice. While the district services will also primarily operate along arterial roads and the Transit Boulevards, local routes will operate along the collector road network (where minimum 3.5m travel lanes are available), focusing on the Oran Park Town Centre.

The coverage achieved by the proposed regional, district and local routes provides immediate (i.e. within 400m) access to all local centres, schools, medium density housing and some 90% of the remaining CFPP.

These routes are shown in **Figure 4**.

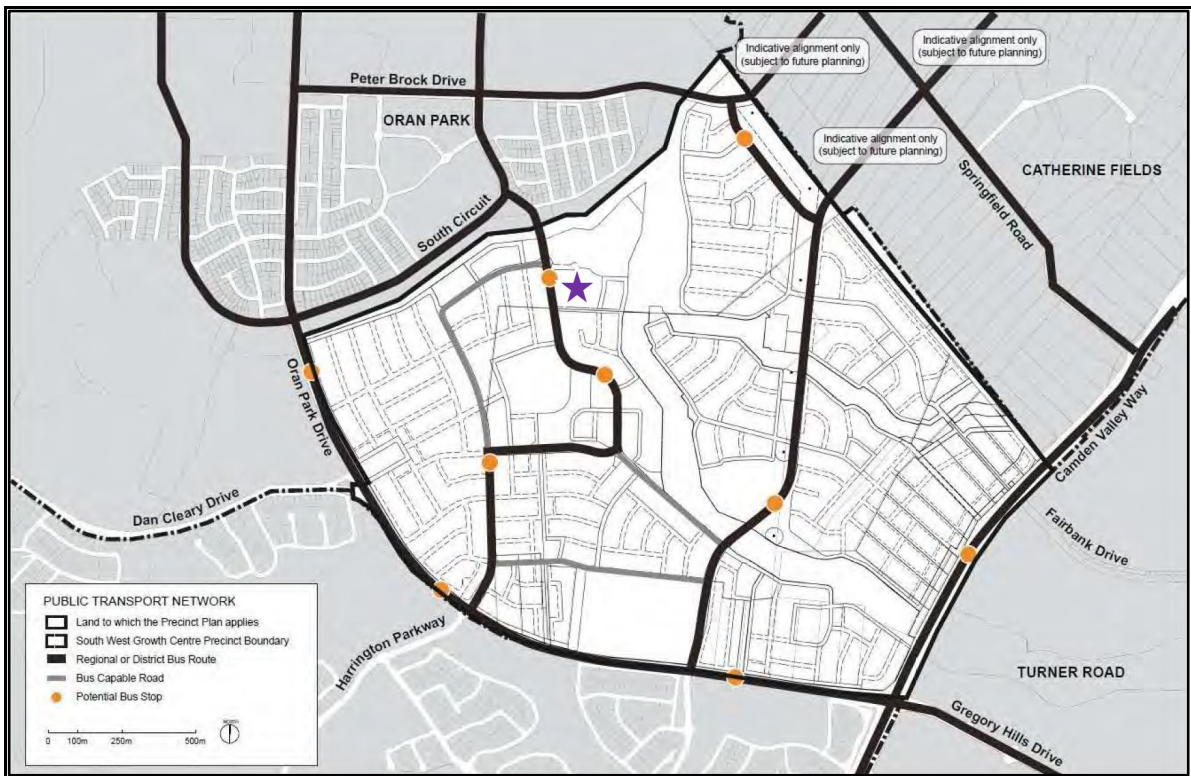


Figure 4: District and Local Bus Services

4.2.3 School Bus

While there is an expectation that the local and district bus services will provide the coverage and capacity required to accommodate student travel to and from the School, dedicated school bus services could be introduced should demand exceed public bus capacity. However, in general students would be encouraged to travel on scheduled public transport routes.

O'Keefe Drive has been designated as a bus route corridor and as such has been / will be designed in accordance with the appropriate bus standards, including the provision of minimum 3.5m travel lanes and indented bus bays in the vicinity of the Site.

4.2.4 Bus stops

Bus stops are expected to be provided approximately every 400m along all bus routes, noting that bus stops are proposed directly adjacent to the School in O'Keefe Drive.

4.3 Active Transport

4.3.1 Bicycle network

A comprehensive bicycle network is proposed for the SFPP linking all local centres, schools, and residential areas internally, and then with sub-regional and regional cycle network and public transport

interchanges. The bicycle network will include a mixture of dedicated bicycle facilities including (off-road) shared paths and on-road cycle lanes. There is also the opportunity to provide additional recreational cycle along the adjacent South Creek riparian corridors, though this will require further future investigation.

In the vicinity of the Site, shared paths are provided directly adjacent to the School in O’Keefe Drive and Secondary Road 610, while a future off-road cycle path is proposed along the northern boundary of the School linking from O’Keefe Drive to the neighbouring sporting fields and then the residential areas to the east of the School.

The proposed bicycle (and pedestrian) network is shown in **Figure 5**.

4.3.2 Pedestrian network

All roads within the CFPP will provide as a minimum a dedicated pedestrian path on one side of the road, though in general most roads in the immediate vicinity of the School, and those routes providing access from the surrounding residential area, provide a footpath on one side of the road and a shared path on the other.

As with bicycle paths, the potential exists to provide recreational footpaths along the adjacent South Creek riparian corridor.



Figure 5: Active Transport Network

5 The Proposal

5.1 The School

As discussed, the SSDA provides for the construction and operation of a new primary school on the Site, including:

- 44 new permanent teaching spaces for 1,012 students (in line with EFSG Standards);
- Core facilities including a Library, Administration Centre, Canteen and general Student and Staff amenities;
- Outdoor playgrounds and learning spaces; and
- Off-street parking for 68 vehicles

Full details of the proposed School are provided in the EIS which this TIA accompanies; a Site Plan is provided for reference in **Figure 6**.

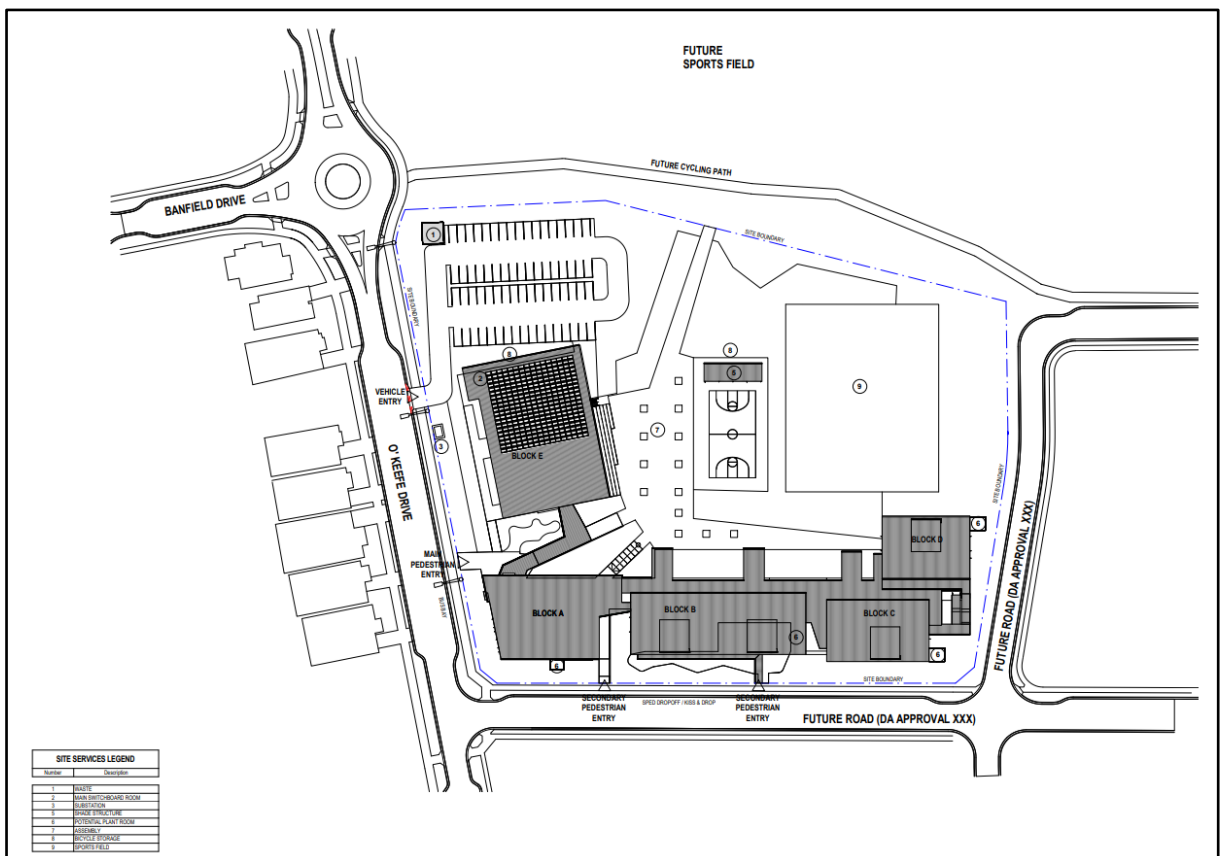


Figure 6: The Catherine Field Public School

5.2 Vehicle Access

5.2.1 Staff Car Park

Access to the staff car park will be provided from O'Keefe Drive south of the Banfield Drive roundabout via a two-way driveway. Parking within this car park will be restricted to staff and students with accessible set down requirements only.

The capacity of the car park (68 spaces) is examined in further detail in **Section 5.7**.

5.2.2 Drop-Off / Pick-Up

Drop-off and pick-up facilities will be provided in both O'Keefe Drive and Road X; the operation of the DOPU facilities is examined in further detail in **Section 6.2**.

5.2.3 Bus Stops

As discussed, bus stops will be provided in O'Keefe Drive immediately adjacent to the School.

5.2.4 General Parking

On-street parking is available in all streets adjacent to the Site (though as described some sections of these roads will be set aside for either DOPU demand or bus zones). Notwithstanding, there is significant on-street capacity in the immediate adjacent local road network, providing simple access to parking from all directions within the CFPP.

5.2.5 Service Vehicles

Waste and other service vehicle access will be provided via (and through) the staff car park, which has been specifically design for larger vehicles. The path of service vehicles to, through and from the staff car park and service area is examined in further detail in **Section 7.3**.

5.2.6 Emergency Vehicles

Emergency vehicle access will be provided via the staff car park, and designed to provide compliance with the relevant Australian Standards and emergency vehicle access guidelines.

5.3 Pedestrian and Cycle Access

As discussed, the School is provided with excellent pedestrian and cycle accessibility. A shared path is provided in O'Keefe Drive immediate adjacent to the School, with immediate access to the School's primary and secondary access points (in O'Keefe Drive and Secondary Road 610 respectively).

5.4 Trip Generation

Ason Group has undertaken a detailed review of the RMS School Survey, specifically to identify schools with similar characteristics to the proposed School. In this regard, we have considered the following key characteristics:

- An immediately adjacent residential area of such as to utilise all of the school's capacity, i.e. generate no 'external' trip demand;
- No major roads in the vicinity of the school or that requiring crossing along key routes to or from the school;
- Local bus services; and
- A high quality active transport network, including pedestrian, cycle and crossing facilities;

In this regard, **Table 2** provides a summary of the RMS surveyed schools which provide the best comparative data for the assessment, noting that the trip rates also include staff and visitor trip generation.

Table 2: RMS School Survey Comparative Sites

Criterion	Grays Point Public School	Harrington Street Public School	Kurnell Public School
Region	Sydney	Sydney	Sydney
Suburb	Grays Point	Cabramatta	Kurnell
Students	383	1055	215
Staff	20	73	15
Staff/Student	0.05	0.07	0.07
On-Site Parking Spaces	20	43	14
OOSH	Yes	Yes	Yes
AM Vehicle Trips/Student	0.43	0.63	0.60
PM Vehicle Trips/Student	0.14	0.52	0.32

With reference to **Table 2**, the surveyed trip rates for the Harrington Street Public School have been adopted for the assessment. As such, it is estimated that the School will have following trip generation:

- AM School peak hour: 630 vehicle trips
- PM School peak hour 520 vehicle trips

5.5 Trip Distribution

5.5.1 Student Trip Distribution

As discussed previously, the School is centrally located within the CFPP, and the majority of students are expected to live within the CFPP; as such, student trips are expected to be distributed to the CFPP road network in accordance with residential densities (across the CFPP). This is entirely consistent with the analysis provided in the CFPP Social, Section 5.3.4 of which states:

the population of the Precinct will warrant the provision of one government primary school, based upon the Department of Education and Communities (DEC) guideline of one primary school per 2,000-2,500 dwellings. The report has not identified how the high school needs of the precinct will be addressed.

The DEC has confirmed that one primary school will be required in the precinct. This Precinct will provide a full catchment for a primary school (although it may take children from adjoining areas, as a holding school, until other new schools in the district are built). In the longer term, it is not intended that this school also meet demand from Oran Park or Gregory Hills, which will have their own primary schools.

Student vehicle trips are expected to be evenly divided in the School peak periods between inbound and outbound trips.

5.5.2 Staff Trip Distribution

Staff are expected to travel to / from the broader sub-region, with only a minority of trips generated within the CFPP. During the AM school peak period, all staff trips are expected to be arrival trips, while during the PM school peak period all staff trips are expected to be departure trips, though it is noted that the majority of departure trips would be later than the PM school peak period, i.e. coinciding more with the PM commuter peak period.

5.6 Trip Assignment

With reference to sections 5.5.1 and 5.5.2, the trip generation of the School during the school peak periods has been assigned to the key intersections of O'Keefe Drive & Banfield Drive, and O'Keefe Drive and Road 610. The results of this assignment are provided in **Figure 7**, while the total 2036 traffic flows at the intersections – using the base flows provided in the CFPP TAR – are shown in **Figure 8**.

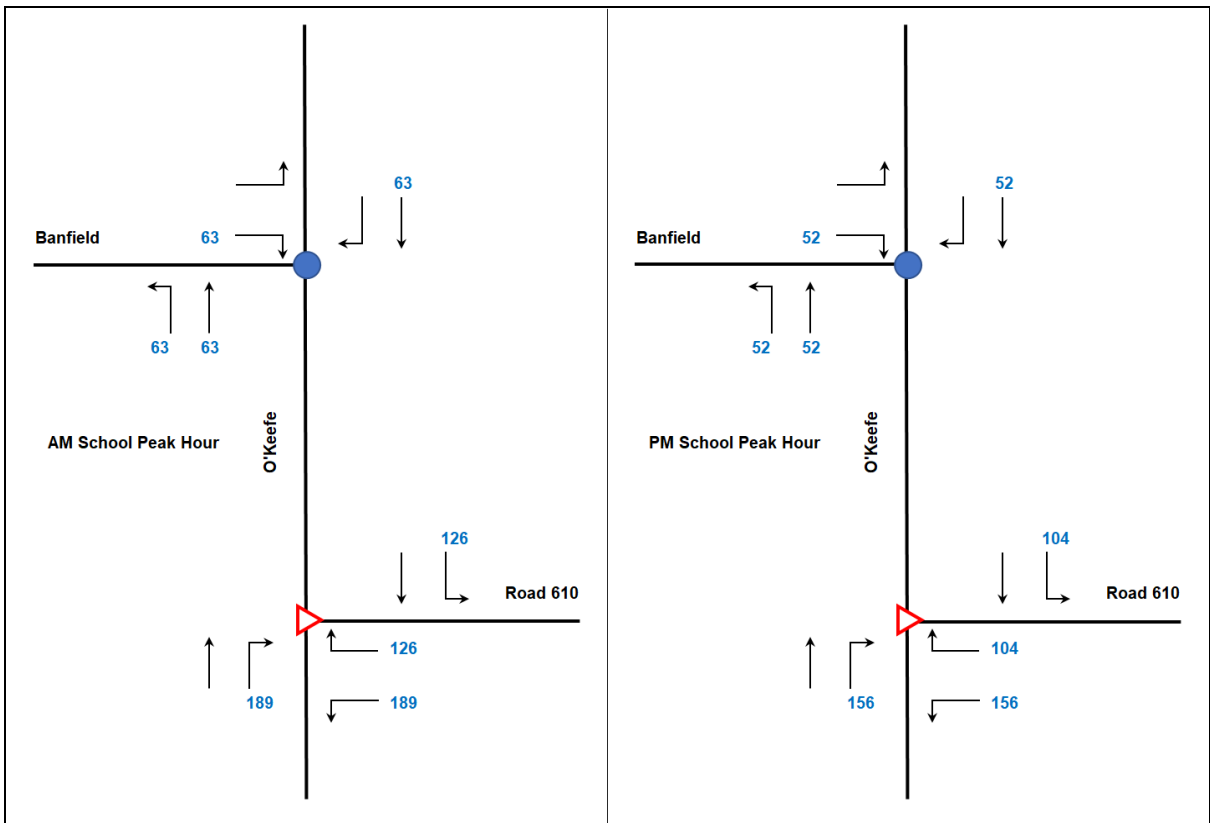


Figure 7: School Peak Period Traffic Generation

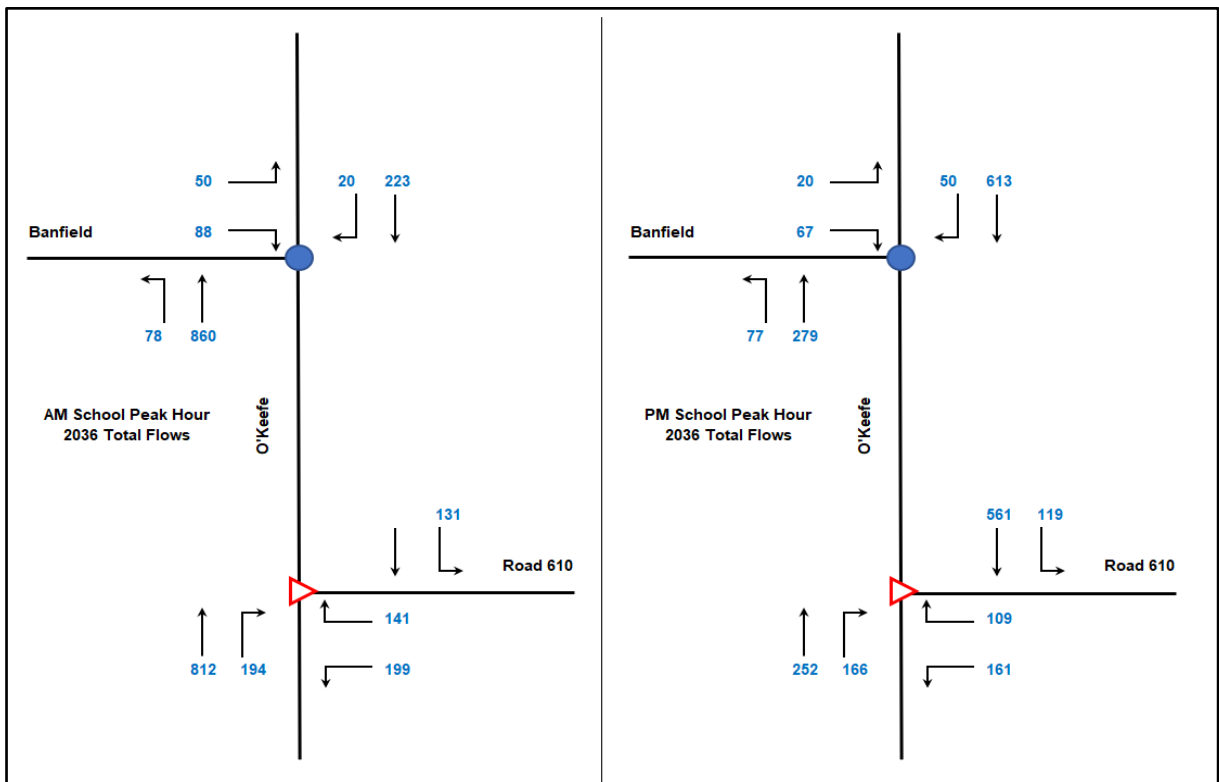


Figure 8: 2036 Total Traffic Flows

5.7 Parking

5.7.1 Parking Requirements

The Camden GCP DCP does not provide any details in regard to parking requirements for schools; however, the parking rates provided in Part B of the Camden DCP are the same as those provided in the Campbelltown GCP DCP, being:

- 1 space per staff member; plus
- 1 space per 100 students.

Based on these rates, the School would require 66 parking spaces.

5.7.2 Parking Provision

The School will provide a total of 68 off-street parking spaces, and therefore full compliance with both the Camden DCP and Campbelltown GCP DCP (which in our opinion would equally apply to the CFPP).

5.8 Bicycle Parking

Bicycle racks will be provided for students, while bicycle parking spaces will be provided for staff, along with end of journey facilities including showers and lockers.

5.9 Servicing

As discussed, servicing areas (deliveries, waste collection) are located off the staff car park. Waste vehicle trips are expected to be no more than 2 – 4 trips weekly (and as previously stated, be generated outside of School peak periods) while additional service vehicle demand would generate no more than a handful of vehicle trips each day at most.

6 Impact Assessment

6.1 Traffic

6.1.1 SIDRA

The future operation of the key intersections has been assessed using the RMS approved SIDRA intersection model. The SIDRA model provides a number of outputs by which to measure the performance of an intersection, including:

- **Average Vehicle Delay (AVD):** AVD (or average delay per vehicle in seconds) for intersections is used to determine an intersection's Level of Service (see below). For signalised intersections, the AVD reported relates to the average of all vehicle movements through the intersection.
- **Degree of Saturation (DOS):** DOS is defined as the ratio of demand (arrival) flow to capacity.
- **Level of Service (LOS):** LOS is a comparative measure that provides an indication of the operating performance, based on AVD.

Table 3 provides the SIDRA recommended criteria for the assessment of intersections which reference to the RMS Guide.

Table 3: SIDRA Level of Service Criteria

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

6.1.2 Future Intersection Performance

Table 4 provides a summary of the future performance of the key intersections further to the SIDRA analysis.

Table 4: 2036 Intersection Operations

Intersection	Level of Service		Average Delay (s)		Worst Delay (s)		Degree of Saturation		95th% Queue (m)	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
O'Keefe Drive & Banfield Drive	A	A	5.3	5.0	15.4	10.1	0.598	0.475	17.4	11.2
O'Keefe Drive & Road 610	D	B	9.0	5.1	46.0	17.7	0.854	0.502	26.1	7.4

With reference to **Table 4**, the key intersections generally operate at good levels of service during the school peak periods; the only exception is the intersection of O'Keefe Drive & Road 610 during the AM school peak, where the worst delay relates to the right turn movements, Road 610 north to O'Keefe Drive. It must be noted this delay is only just above the LoS threshold, and moreover that such a delay is not uncommon during a school peak period, particularly when considering the assessment is based on 2036 traffic flows. As such, it is our opinion that this is an acceptable LoS.

6.2 Drop-Off and Pick-Up

Student DOPU trips are expected to be concentrated over 30 – 45 minutes rather than a full hour in each School peak periods.

With reference to our past assessment of primary schools, schools are required to use DOPU areas under the same conditions as No Parking zones, i.e. a maximum stay of 2 minutes, remaining in or within 3 metres of the vehicle. As such, an individual DOPU space could effectively serve approximately 15 - 20 vehicles across a 30 – 45 minute period.

It is also important to consider the different characteristics of the drop-off trip against the pick-up trip. In the AM school peak, the drop-off trip generally takes less time, as the students are in the car and simply need to be dropped-off. Conversely, in the PM school peak parents / carers must wait for the students, which can increase the average standing time; in addition, many parents / carers will arrive prior to the end of school, and as such queues can form behind the vehicles waiting in the pick-up area.

The arrival and departure times of students (through the broader AM and PM school peaks) utilising the DOPU facilities has been surveyed and observed by Ason Group over many years, with almost all primary schools having a similar build-up of trips prior to school finishing, with the peak DOPU demand occurring approximately 10 minutes prior to the commencement of school. These observed profiles have been assigned to the School demand for the PM peak pick-up period, as shown in **Figure 9**.

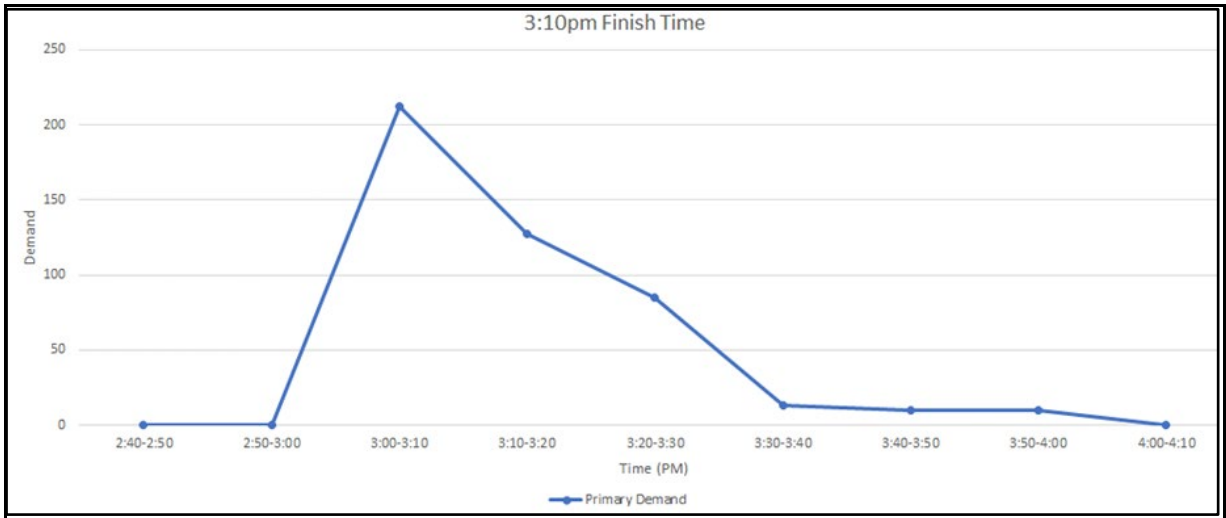


Figure 9: PM School Peak Pick-Up Peak Demand

Further to the above, the provision of DOPU spaces in Road 610 could provide the capacity required to accommodate this peak demand, with an estimated peak queue of some 33 vehicles, or a length of approximately 200m. This queue could be accommodated in Road 610 Street adjacent to the School, feeding DOPU spaces in the southern end of O’Keefe Drive adjacent to the School.

With reference to **Section 7.2**, it is recommended that a Traffic & Pedestrian Management Plan (TPM Plan) be developed by the DoE and the School, which would be reviewed on an annual basis to establish inefficiencies and areas for improvement, particularly in regard to the operation of the DOPU areas. Implementation of new strategies as required would then ensure that the demand for DOPU is accommodated while reducing impacts on the local road network. These future strategies may include staggering starting / finishing times to allow reduce the demand.

In addition, investigations into public transport provision and modal splits of students will also provide insight into potential methods at accommodating the DOPU demand.

7 Additional Considerations

7.1 Sustainable Transport Planning

It is proposed to prepare a Framework Travel Plan (FTP) to inform the future Green Travel Planning for the development in response to a suitable condition of consent. The primary objectives of the FTP will be to:

- Reduce the environmental footprint of the development;
- Promote the use of 'active transport' modes such walking and cycling, particularly for short-medium distance journeys;
- Reduce reliance on the use of private vehicles for all journeys; and
- Encourage a healthier, happier and more active social culture.

A Draft Sustainable Travel Plan is provided in **Appendix A**.

7.2 Traffic and Parking Management Plan

It is recommended that prior to opening, the DoE and the School prepare a TPM Plan to outline the strategies proposed to provide for safe and efficient operations on and off-site. The TPM Plan is expected to include operating strategies in regard to:

- The use of the staff car park;
- The use of the DOPU areas, including information in regard to length of stay and (for example) children's names on visors and staggered start and finish times to maximise the safety and efficiency of the DOPU areas;
- Bus loading and unloading; and
- Safe Routes to Schools measures, such as safe walking and cycle routes between the School and the surrounding residential areas.

The TPM Plan would then be reviewed annually by Council and updated as required.

7.3 Design

All access, parking and servicing areas have been designed with reference to the appropriate Australian Standards, and specifically AS 2890.1 (with regard to access driveways and parking modules) and AS 2890.2 (with regard to service vehicles). It is expected that a Condition of Consent in any future approval will require that the final design provide full compliance with the Australian Standards, which would provide for any minor design revisions that may arise through to construction commencing.

Existing and future off-site infrastructure such as on-street parking lanes and bus capable streets has/will necessarily be constructed in accordance with the requirements of the Camden GCP DCP.

7.4 Draft Construction Traffic and Pedestrian Management Plan

A Draft Construction Traffic and Pedestrian Management Plan (Draft CTPMP) is provided in **Appendix B**, which considers the strategies to be undertaken during the School construction to maximise safety while retaining the efficiency of the road and active transport network.

Ason Group notes that the Draft CTPMP will be revised in the future in consultation with Council and RMS further to receipt of additional details in regard to the construction program.

8 Conclusions and Recommendations

8.1 Conclusions

Further to a detailed assessment of the proposed development of the New Catherine Field Primary School, O'Keefe Drive, Oran Park, Ason Group provides the following conclusions:

- The Site was specifically identified as a future primary school site in planning for the SWGA and the CFPP in particular, and as such is appropriately zoned to provide for the School.
- The School will be centrally located within the CFPP, in which the overwhelming majority of students will reside; given the excellent active transport and future public transport accessibility within the CFPP, the School is expected to generate far fewer vehicle trips than a 'standard' public school.
- Based on what are considered to be very conservative trip rates in the context of Site within the CFPP, the School is estimated to generate up to 630vph in the AM school peak and 520vph in the PM school peak; the majority of these trips will be generated to and from the on-street set down areas. With specific regard to the potential impact of these trips:
 - The local intersections have significant spare capacity by which to accommodate these trips while continuing to operate with only moderate delays.
 - The on-street set down space available immediately adjacent to the School provides more than enough capacity to meet the peak drop-off and pick-up demand in both the AM and PM school peak periods.
- Parking is provided on-site in full compliance with the Camden DCP and Campbelltown GCP DCP school parking requirements, while there is additional on-street parking capacity to accommodate any additional before and after school demand.
- All access, parking and servicing areas have been specifically designed with reference to the appropriate Australian Standards. It is anticipated that any minor revisions to on-site demand could be accommodated through a Condition of Consent specifically requiring final design compliant with Australian Standards.

8.2 Recommendations

Further to the conclusions outlined above, Ason Group provides the following recommendations to further maximise the safety and efficiency of future School operations:

- That the NSW Department of Education consult with Council and RMS in regard to appropriate sign-posting of set down and bus zones adjacent to the Site.
- That the School implement and provide for future review of a Workplace Travel Plan to maximise public and active transport opportunities for staff.

- That a Final CTMP be prepared once full details of the construction task are available, and further to consultation with Council and RMS.

Appendix A

Green Travel Plan