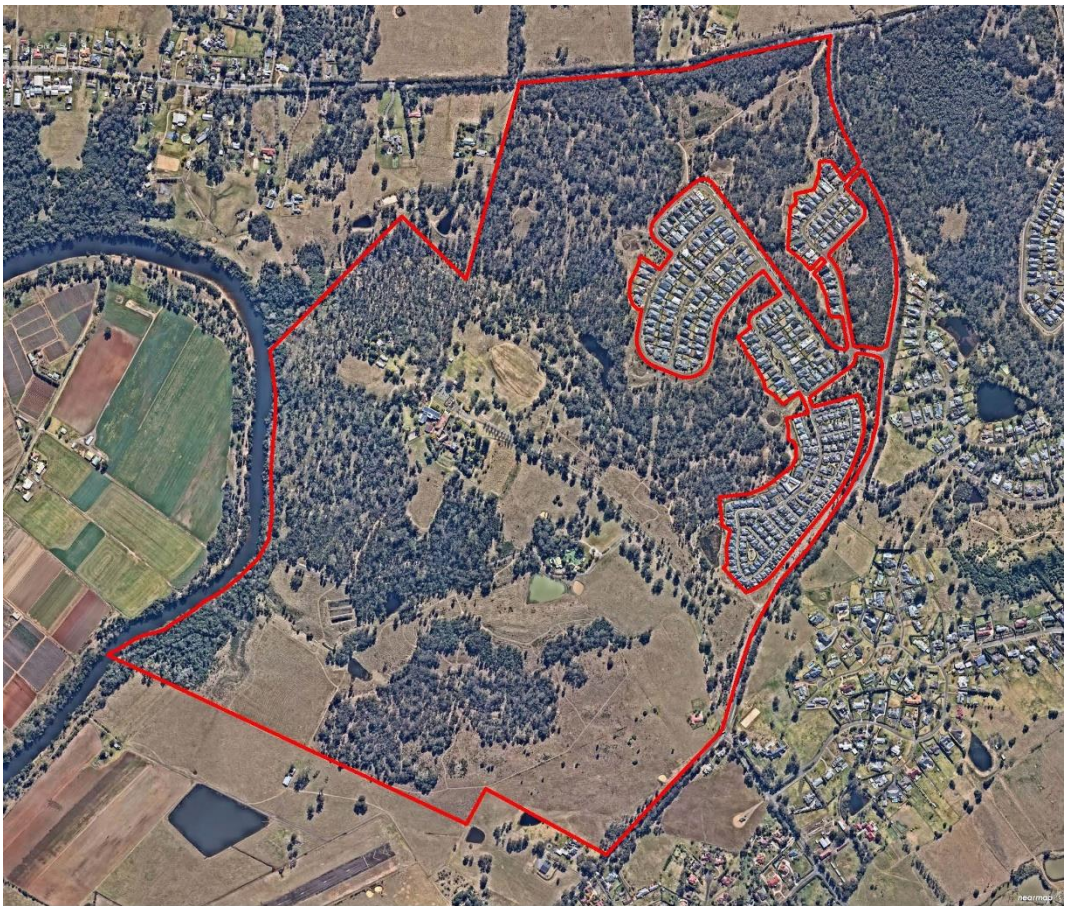
PLANNING PROPOSAL REQUEST

No. 229 Macquarie Grove Road, Cobbitty

(Camden Council)



Prepared For:
Trustees of the Sisters
Of the Good Samaritan
Prepared By:

PPS PASCOE PLANNING SOLUTIONS

Volume 2
Annexure "I"
Transport Assessment
(Transport Planning Partnership)

October 2021

"Wivenhoe" Planning Proposal Request
229 Macquarie Grove Road, Cobbitty

Preliminary Transport Assessment

Prepared for:

Pascoe Planning Solutions

13 September 2021

The Transport Planning Partnership

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"Wivenhoe" Planning Proposal Request
229 Macquarie Grove Road, Cobbitty

Preliminary Transport Assessment

Client: Pascoe Planning Solutions

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V01	20/08/21	CH/SR	JR	JR	
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V03	13/09/21	SR	R	Jr	

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1 Introduction

The Trustees of the Sisters of the Good Samaritan as owners of the "Wivenhoe" property at 229 Macquarie Road Cobbitty, are seeking to prepare a Planning Proposal Request (PPR) for the Wivenhoe site.

The Wivenhoe site currently provides a range of existing educational and environmental land uses including the special needs Mater Dei School and Autism Spectrum Australia school.

The purpose of the PPR is to rationalise the existing land uses on the site, namely education and environmental uses to create a residual parcel of land and to amend the zoning provisions under the Camden Local Environmental Plan that would allow alternate or complementary land uses to be provided on the site.

The Transport Planning Partnership (TTPP) has prepared this report to assess and understand the impacts of existing and limited development land use precincts comprising the site on the existing road network and any consequential implications for road and access infrastructure.

1.1 Report Structure

The report is structured as follows:

- Section 2 outlines the existing transport conditions for the site
- Section 3 provides a summary of the transport planning context for the site
- Section 4 provides a preliminary analysis and assessment of traffic generating scenarios for the site, implications to vehicle access and road network improvements
- Section 5 summarises the findings of the study.

1.2 Limitations

This assessment has been prepared under the lock down conditions as part of the Covid-19 Pandemic. We therefore have not been able to collect comprehensive existing traffic data to facilitate detailed traffic modelling for the potential land use scenarios for the site.

The conclusions from the analysis undertaken are however, deemed to suitably robust for a planning proposal.

2 Existing Conditions

2.1 Site Context

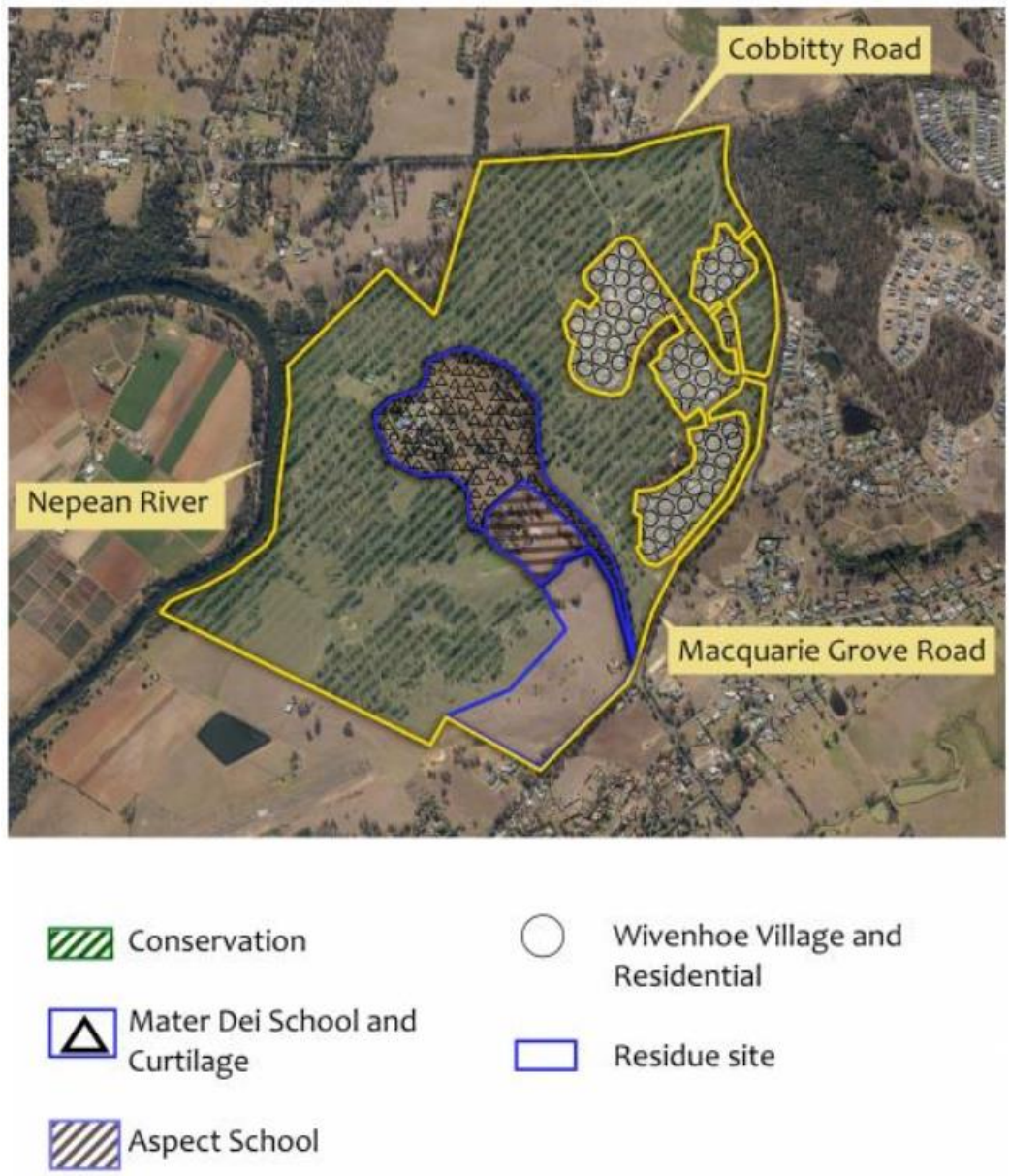
The site comprises approximately 250 hectares and is located at 229 Macquarie Road, Cobbitty, approximately 49 km southwest of the Sydney CBD. Figure 2.1 shows the location of the site on a map.

Figure 2.1: Site Location

Base Map Source: Carto Voyager

The existing site currently includes extensive natural environment conservation lands, educational precincts and vacant rural land (residue) sites. The Wivenhoe Village and residential estate does not comprise part of the site under consideration (refer to Figure 2.2).

Figure 2.2: Site Context



Source: Pascoe Planning Solutions

2.2 Road Network

2.2.1 Macquarie Grove Road

Macquarie Grove Road is a two-way two-lane local road which runs along the east and southern boundaries of the site. The road has a posted speed limit of 70 km/h which is reduced to a school zone speed limit of 40 km/h within the vicinity of the Mater Dei school. The road provides a connection between Cobbitty in the north and Camden in the south. Macquarie Grove Road intersects with Cobbitty Road in the north and is the minor road of this intersection, governed by a STOP sign control.

2.2.2 Cobbitty Road

Cobbitty Road is a two-way, two-lane local road which runs in an east-west direction within the vicinity of the site. The road runs along the northern boundary of the site. Cobbitty Road has a posted speed limit of 80 km/h. The road provides a connection between Harrington Park and Brownlow Hill.

2.2.3 Kirkham Lane

Kirkham Lane is a two-way, two-lane local road which runs in a northwest-southeast direction within the vicinity of the site. The road has a posted speed limit of 70 km/h which is reduced to a school zone speed limit of 40 km/h within the vicinity of the Mater Dei school. Kirkham Lane intersects with Macquarie Grove Road southeast of the site. Kirkham lane is the minor road at this intersection and is governed by a 'STOP' sign control.

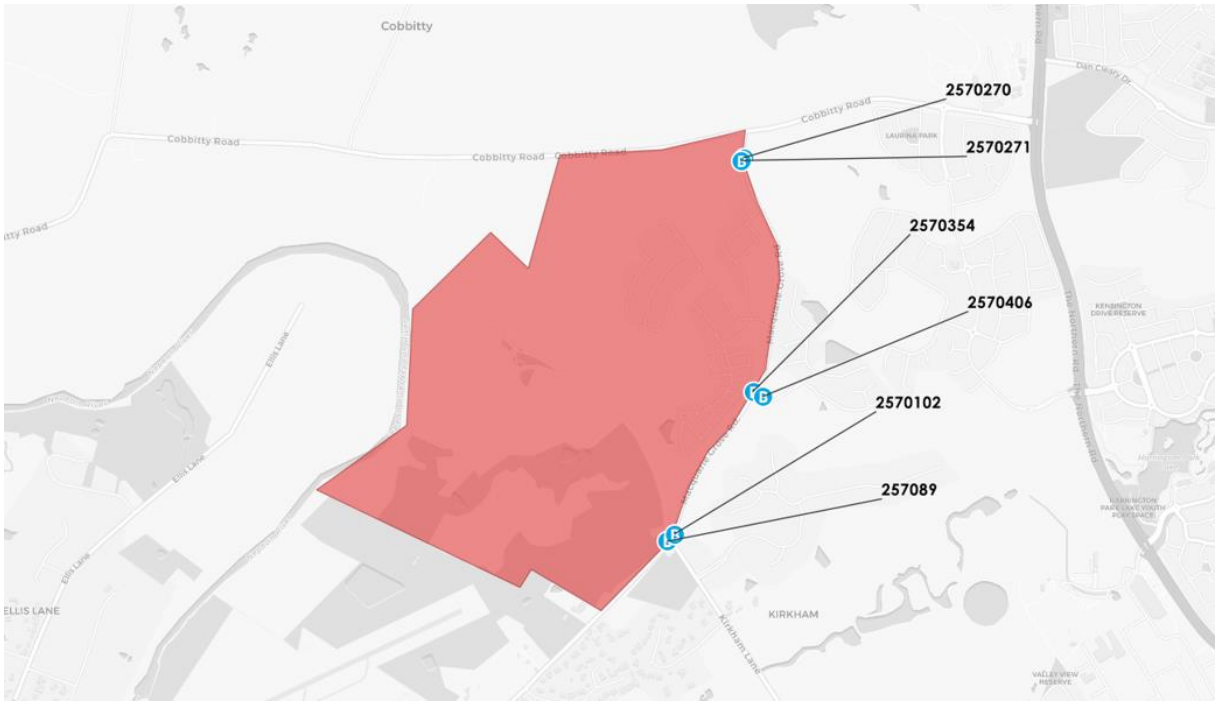
2.2.4 Mater Dei Accessway

Mater Dei accessway is a two-way two-lane private road which runs through the site. The accessway has a posted speed limit of 40 km/h. Mater Dei Road intersects with Macquarie Grove Road at the southern end of the site and is the minor road at this intersection. Vehicles on Mater Dei accessway are required to give way to vehicles along Macquarie Grove Road when leaving the site. The accessway has no kerb and gutters, unformed shoulders and does not have a formal pedestrian path.

2.3 Public Transport

The site has limited access to buses with Figure 2.3 indicating the location of nearby bus stops which service the site. These bus stops are unmarked and have no defined waiting areas.

Figure 2.3: Bus Stops (Stop IDs) along boundary of Subject Site



Base Map Source: Carto Voyager

Most of the bus routes that operate on Macquarie Grove Road are school buses. Public buses that use Macquarie Grove Road are route 31 and 32 which operate limited services in the morning and evening peak periods. These services are presented in Table 2.1. Bus routes were confirmed with Busabout to be still operational however changes to regular services due to Covid-19 may have affected some services.

Table 2.1: Bus Services within vicinity of Subject Site

Route Number	Route Direction	Bus Type	Bus Provider
6007	Elderslie HS to Magdalene HS	School Bus	Busabout
6008	Belgenny & Kelloway to St Benedicts College	School Bus	Busabout
6045	Camden to Mater Dei	School Bus	Busabout
6051	Arcadian Hill Estate to Cobbitty PS	School Bus	Busabout
6505	Magdalene HS to Camden	School Bus	Busabout
6517	St Benedicts College to Cowper Dr	School Bus	Busabout
6540	Elderslie HS to Silverdale Rd	School Bus	Busabout
6541	Elderslie HS to Warragamba PS	School Bus	Busabout
6545	Camden South PS to Tramway Dr	School Bus	Busabout

6565	Mater Dei to Camden	School Bus	Busabout
6570	Cobbitty PS to Arcadian Hills Estate	School Bus	Busabout
31	Cut Hill Rd, Cobbitty to Camden via Coates Park Rd	Public Bus	Busabout
31	Camden to Cut Hill Rd, Cobbitty via Coates Park Rd	Public Bus	Busabout
32	Warragamba to Camden via Werombi & Theresa Park	Public Bus	Busabout
32	Camden to Warragamba via Theresa Park & Werombi	Public Bus	Busabout

Reference: TTPP Reference

2.4 Pedestrian Infrastructure

The pedestrian network surrounding the site is limited with neither of the roads fronting the site providing any pedestrian infrastructure.

2.5 Cyclist Infrastructure

The cyclist network surrounding the site is limited with neither of the roads fronting the site allowing for any off- or on-road cycleways or routes.

2.6 School Traffic Generation

The site is currently used by both Mater Dei School and Autism Spectrum Australia (ASPECT). Both these schools are considered to be special needs schools.

Through discussions with the schools' representative, it has been identified that both schools operate very differently to typical schools in terms of vehicle access and traffic generation associated with student arrival and departure arrangements.

It is noted that there are currently no public coaches or large school bus services to or from the site.

Each student is either transported directly to the school by private car or by small commuter buses (taxis) owned by the relevant school.

2.6.1 Mater Dei School

It is understood that students and staff arrive at the school as follows:

- 115 students in taxis, spread over 15 taxis

- 30 students transported in family cars
- 3 mini buses for post school program
- Another 10 family cars for the post school program
- 20 family cars bringing early childhood clients per day

In addition, there would be:

- 80 family cars per day bringing therapy clients.
- 80 staff cars.

2.6.2 Aspect School

It is understood that on a normal day there are 65 people on-site in relation to the APECT school. It is assumed that this would generate in the order of 50 vehicles per hour in the morning peak including staff and students.

2.6.3 Existing Traffic Generation

Based on information provided the estimated traffic generation for the site is shown in Table 2.2. A vehicle trip is defined movement in or out of the school so that a parent dropping off a student is counted as two trips.

Table 2.2: Morning Peak Estimated Traffic Generation

	Morning Peak Trips	In	Out
Mater Dei School	246	168	88
Aspect School	50	30	20
Total	**296**	**198**	**108**

The site is estimated to generate some 296 vehicles per hour of which 108 are estimated to travel in and out in the peak hour. The afternoon peak is assumed to be close to the reciprocal although staff typically stagger their exits, and the peak occurs outside the normal road network commuter peak.

2.7 Vehicular Access

Vehicular access to the site is provided via Mater Dei accessway which intersects with Macquarie Grove Road along the southern boundary of the site. Figure 2.4 shows said access.

Figure 2.4: Site Access off Macquarie Grove Road

Source: Google Maps Street View (facing north from Macquarie Grove Drive)

2.8 Crash History Data

Crash history data in the immediate vicinity of the site for a period of five years, between 2015 and 2019 has been reviewed. A total of ten crashes were recorded throughout the five-year crash period, the breakdown of crashes has occurred as follows:

- 2019 – 0 crashes
- 2018 – 5 crashes (0 casualties, 1 injured)
- 2017 – 3 crashes (0 casualties, 0 injured)
- 2016 – 2 crashes (0 casualties, 1 injured)
- 2015 – 0 crashes

A summary of the crash types between 2015 and 2019 is shown in Table 2.3, with the associated crash data map illustrated in Table 2.3.

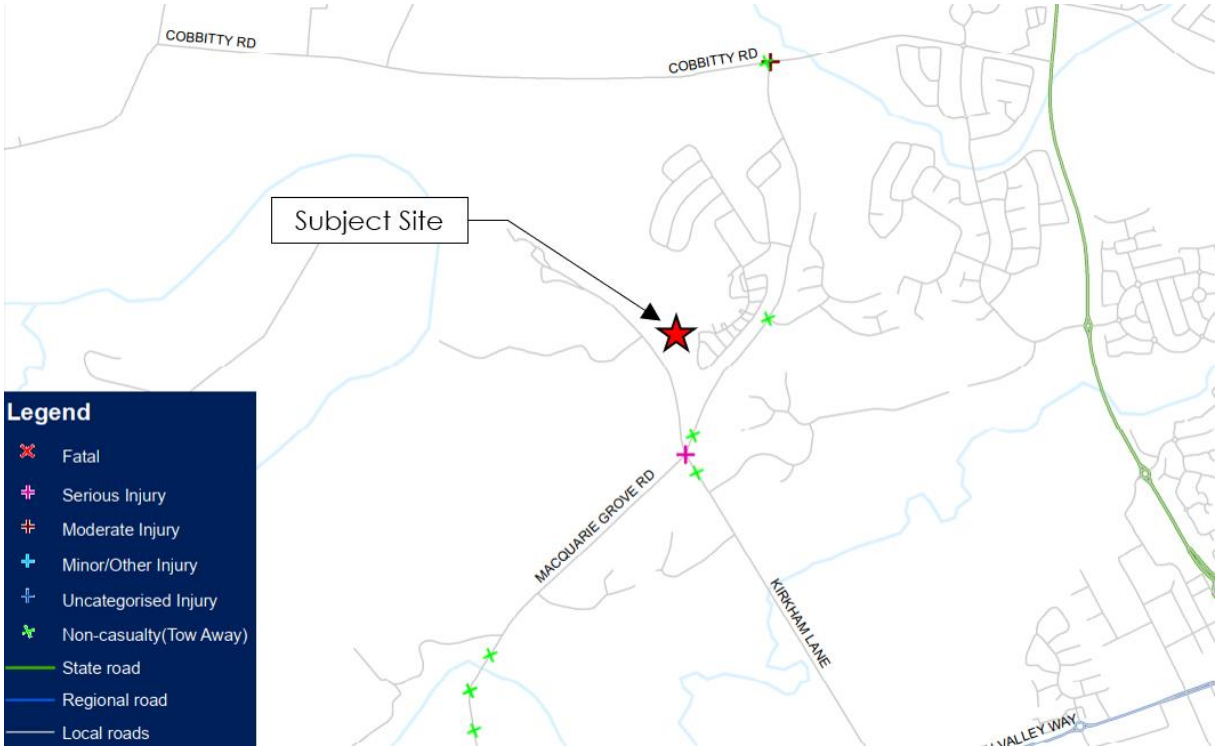
Table 2.3: Summary of Crash Data

Crash Type	No. of recorded crashes
Vehicles from adjacent direction	1
Vehicles from opposing direction	2

Crash Type	No. of recorded crashes
Vehicles from same direction	1
Manoeuvring	1
On path	1
Off path, on straight	2
Off path, on curve or turning	2
Total	**10**

There were no crashes related to pedestrians. Half the crashes involved single vehicle indicating both speed and road geometry as a factor. Figure 2.5 presents the locations of the abovementioned crashes on a map.

Figure 2.5: Historical Crash Locations



There was one serious crash that occurred at the intersection of Kirkham Lane and Macquarie Grove Road where a vehicle turning right from Kirkham Lane to Macquarie Grove Road was struck by a car travelling north in Macquarie Grove Road.

There was only one moderate injury crash at Macquarie Grove Road and Cobbitty Road when a vehicle turning right from Cobbitty Road was struck by a vehicle head on. The remaining crashes were minor crashes reported to police.

The crash record does not identify significant trends with most crashes being relatively minor and only one serious crash in the last five (5) years. It was also noted that a 40km/h school zone is in place in the morning and afternoon school periods.

Notwithstanding a site inspection was undertaken on 27 July 2021, where road safety of the access road was considered. The following road safety issues were identified.

- It was noted that sight distance to the intersection of Kirkham Lane and Macquarie Grove Road was restricted by crests from the southern (Macquarie Grove Road) and eastern (Kirkham Lane) approaches. (see Figure 2.6 and Figure 2.7)
- There are mature trees located in the clear zone. The clear zone is an area beside the road that is supposed to be maintained free from hazards. (see Figure 2.8)
- Utility poles located in the clear zone on Kirkham Lane. (see Figure 2.9)
- The Mater Dei School access driveway is slightly offset from Kirkham Lane which creates geometry of closely spaced intersections. Closely spaced intersections generally increase the rate of crashes.

Figure 2.6: Kirkham Lane (looking west 100m east of Macquarie Grove Road)

Figure 2.7: Macquarie Grove Road (looking north 150m south of Kirkham Lane)

Figure 2.8: Mature Trees in Macquarie Grove Road (200m south of Kirkham Lane)

Figure 2.9: Utility Poles in Kirkham Lane

The intersection of Macquarie Grove Road and Cobbitty Road was also investigated. This intersection has a right turn bay. There are sight distance restrictions at this location due to the vegetation and trees. A lack of shoulder or left turn lane from Cobbitty Road may increase the risk of rear end type crashes.

Figure 2.10: Cobbitty Road at Macquarie Grove Road (looking east)

3 Strategic Planning Context

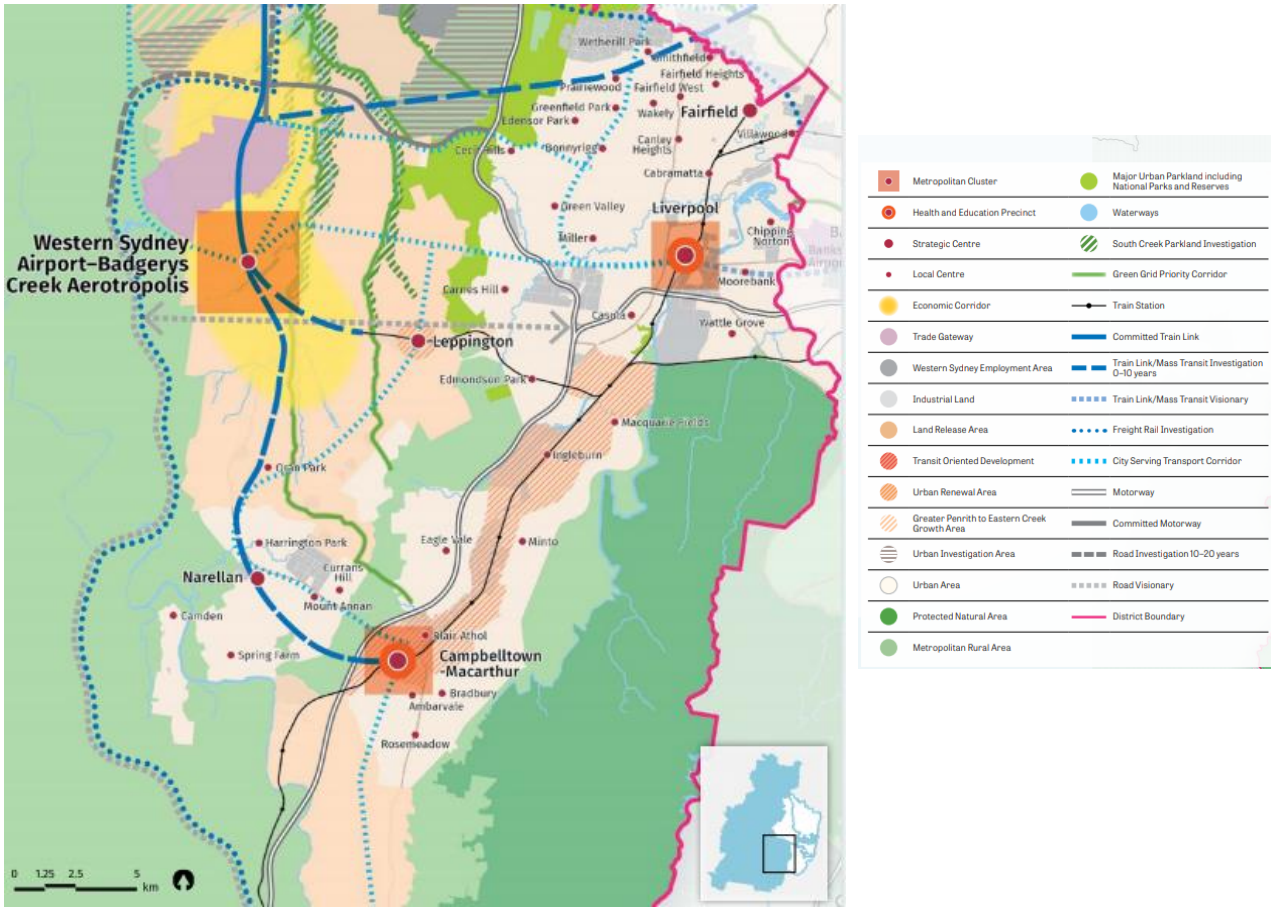
The site is located in an area that is expected to rapidly develop over the next 10 to 20 years. The following section reviews the location with respect to the various strategic transport plans in the area.

3.1 Western City District Plan

The Western City District Plan is part of the Greater Sydney Commission's plan for the greater Sydney Area. The commission has identified three cities within Greater Sydney including the Western City.

The Western City encompasses a large area west of Liverpool that includes the Western Sydney Airport 'aerotropolis. The proposed infrastructure is shown in Figure 3.1.

Figure 3.1: Western City District Plan



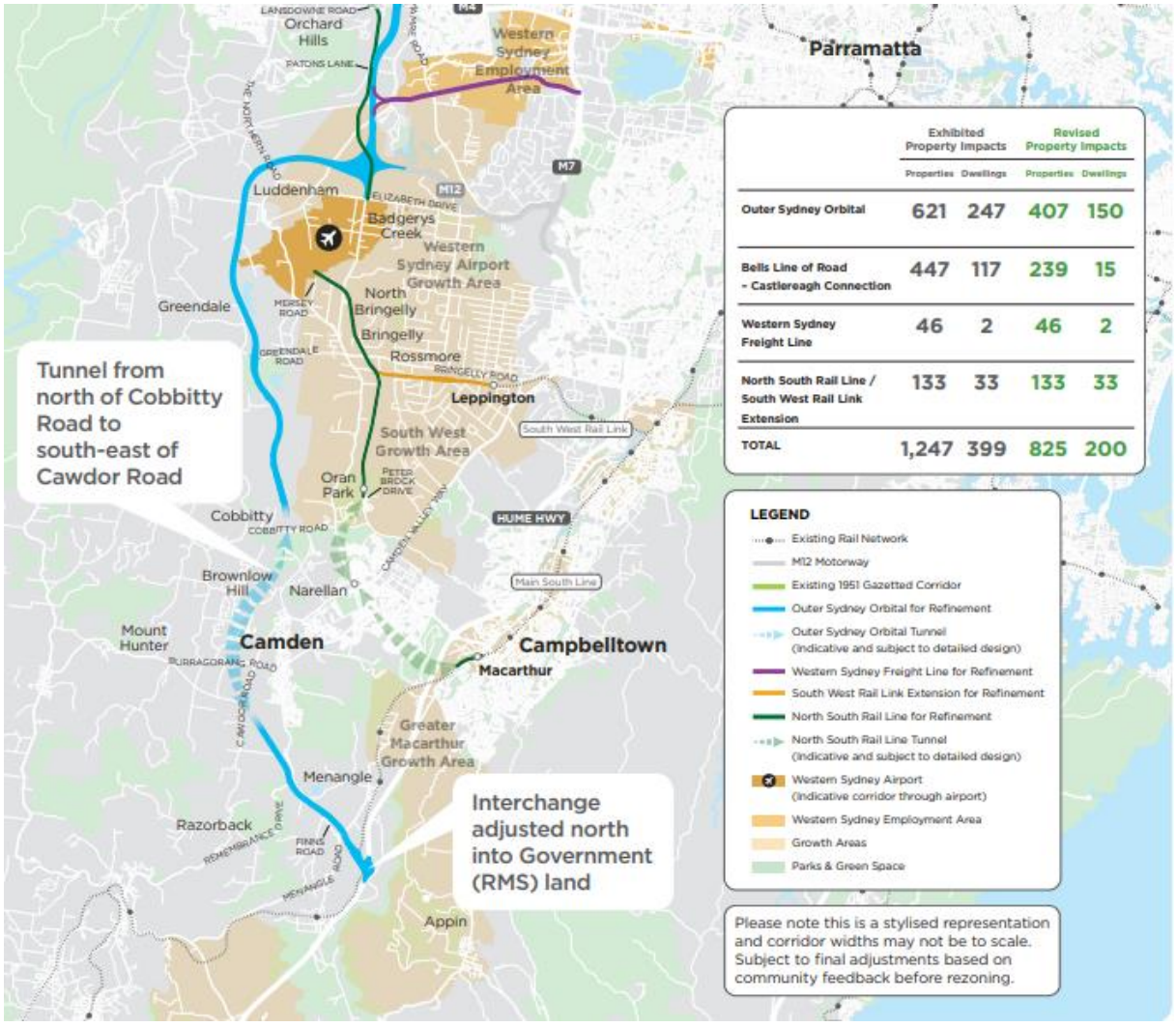
The plan shows the Outer Sydney Orbital Road for which the Government is reserving the corridor that would run to the north of the site. The plan also shows urban land release areas to the north-east of the site.

Additionally, the plan also shows an aspirational public transport link from the Western Sydney Airport to Campbelltown which is not committed. This would form an extension of the proposed Aerotropolis metro line.

3.2 Outer Sydney Orbital

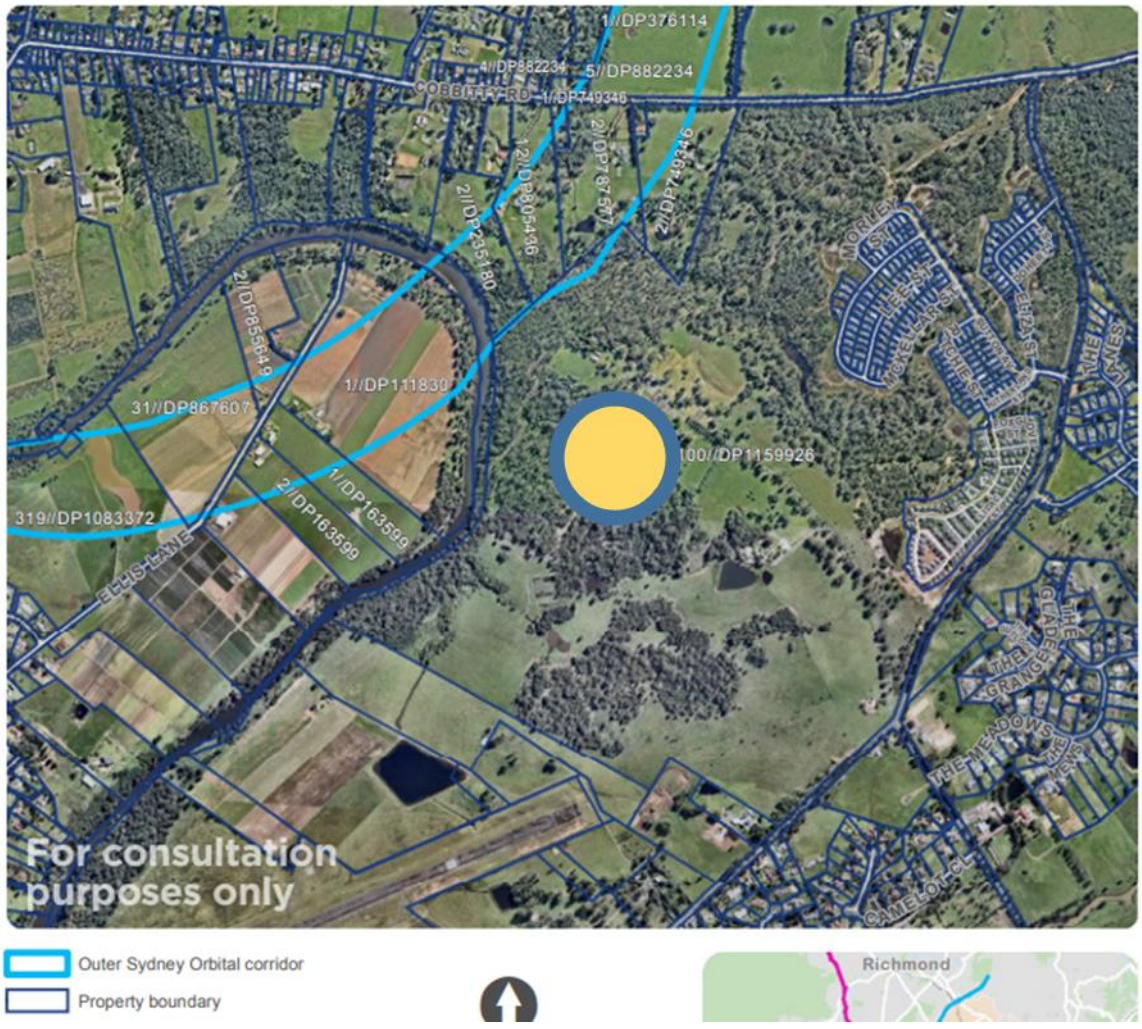
The Outer Sydney Orbital Road is a planned future road in the early stages of planning. The Outer Sydney Orbital would link the Greater Macarthur Area to the Western Sydney Airport and then north to Windsor Road. The latest plans show a tunnel that starts around the Cobbitty area and would travel under Camden.

Figure 3.2: Outer Sydney Orbital



The proposed corridor would travel to the north of the site and is likely to be in a tunnel at this section. The proposed corridor reservation is shown in Figure 3.3 and depicts bordering the northern property boundary of the site.

Figure 3.3: OSO Corridor Reservation



3.3 South-West Growth Area

The South-West Growth Area along with the North-West Growth Area is an area within Sydney that has been identified for development of population and employment centres. The area is substantially development planned on 'green fields' sites and allows for planning of the structure and infrastructure requirements for the area. The subject site is just outside the south-western corner of the area.

Figure 3.4: South West Growth Area

The south-west growth area is focussed on development of Leppington which is the outer terminus of the south-west rail link. The south-west growth area is likely to see a significant amount of urban development in the Oran Park area that is already seen the creation of new residential subdivisions.

Oran Park development in relation to the site is shown in Figure 3.5 and the structure plan is shown in Figure 3.6.

The structure plan shows that there will be development north of Cobbitty Road. In addition, the plan shows there would be a road that would extend north that connects to the Northern Road.

Figure 3.5: Oran Park Relative to the Site

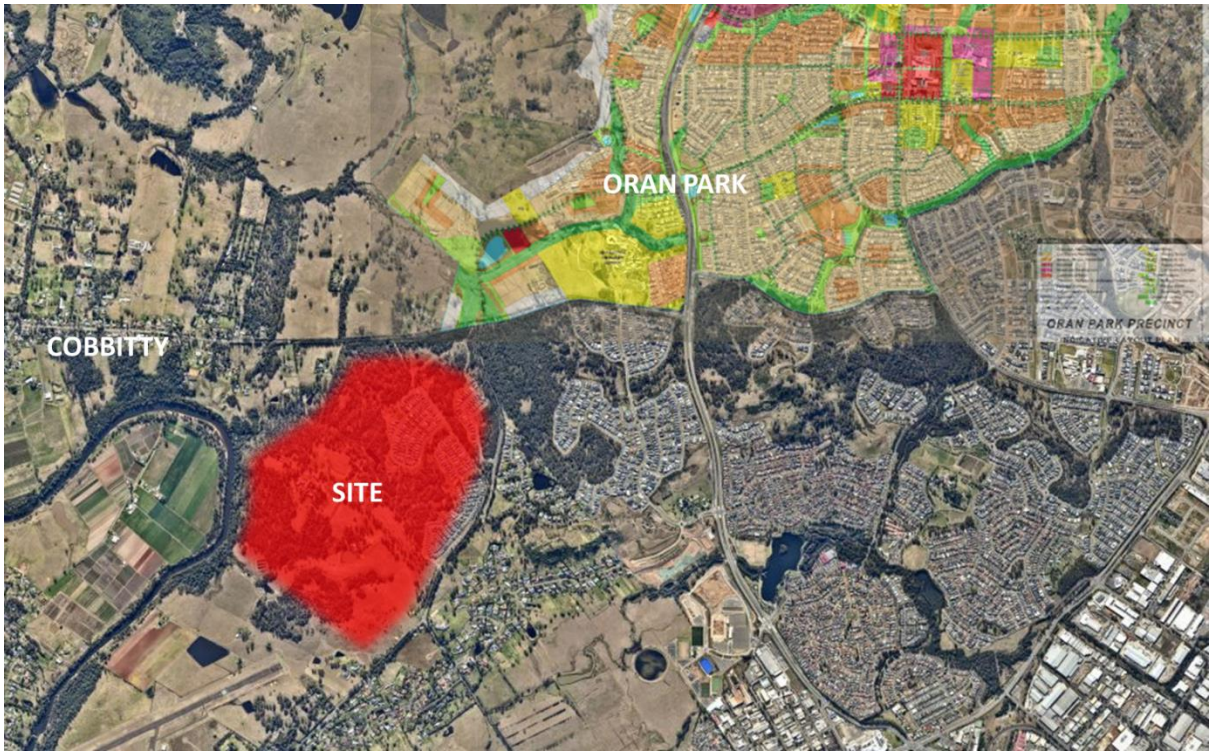
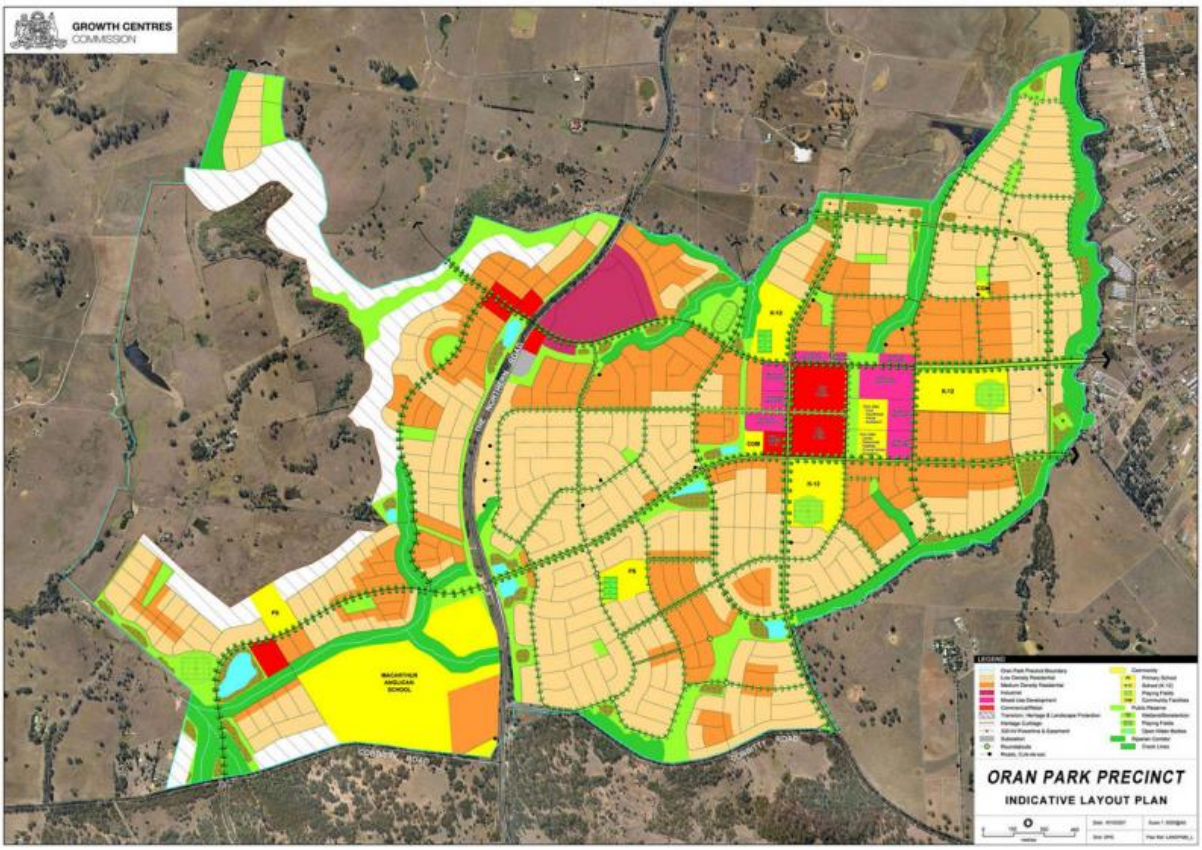


Figure 3.6: Oran Park Structure Plan

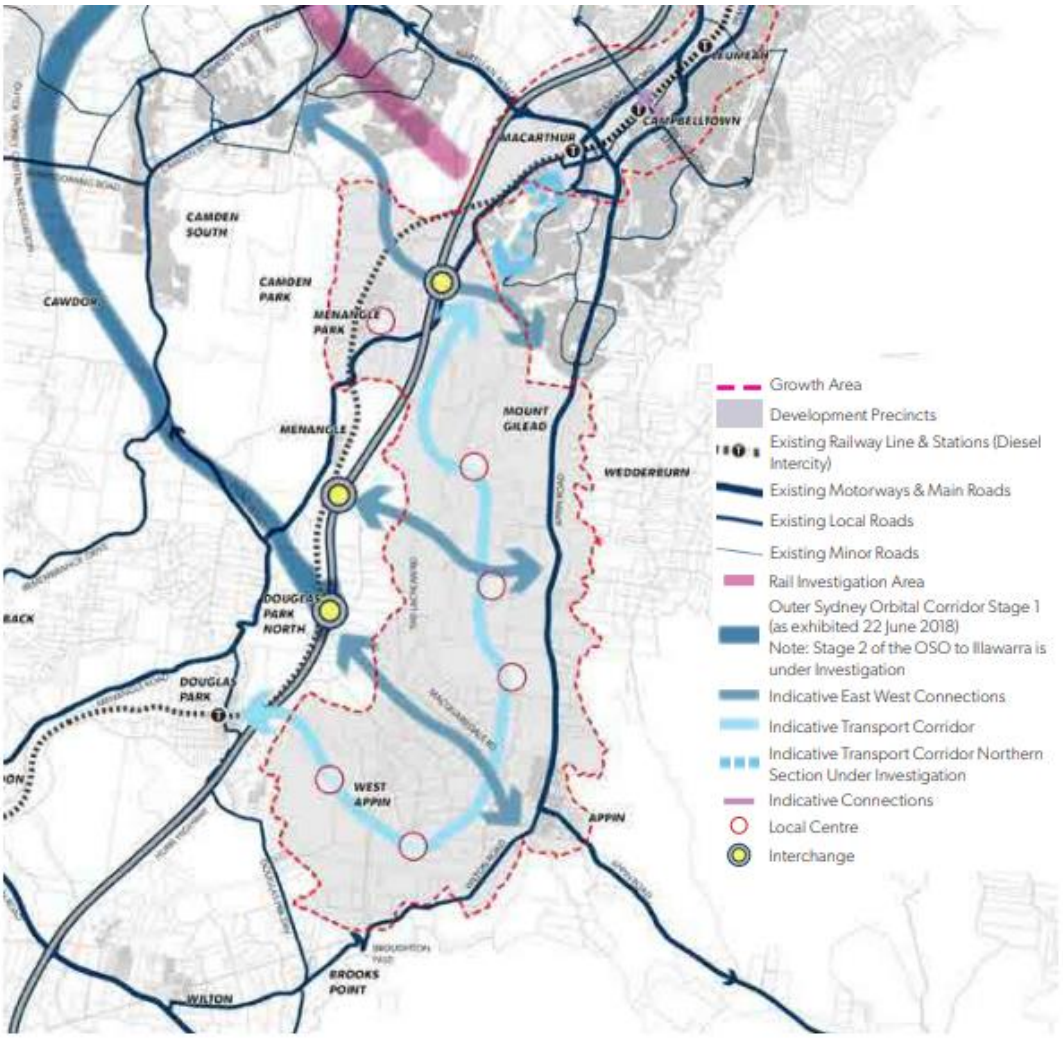


3.4 Greater Macarthur Investigation Area

The Greater Growth Area is an area south of Campbelltown that has been identified for significant land releases for urban development, that includes the West Appin, Mount Gilead and Wilton areas. The planning includes additional connections to the Hume Motorway including the Spring Farm Parkway and the Outer Sydney Orbital Road.

The Greater Macarthur Growth Area infrastructure structure plan is shown in Figure 3.7.

Figure 3.7: Greater Macarthur Growth Area



3.5 Spring Farm Parkway

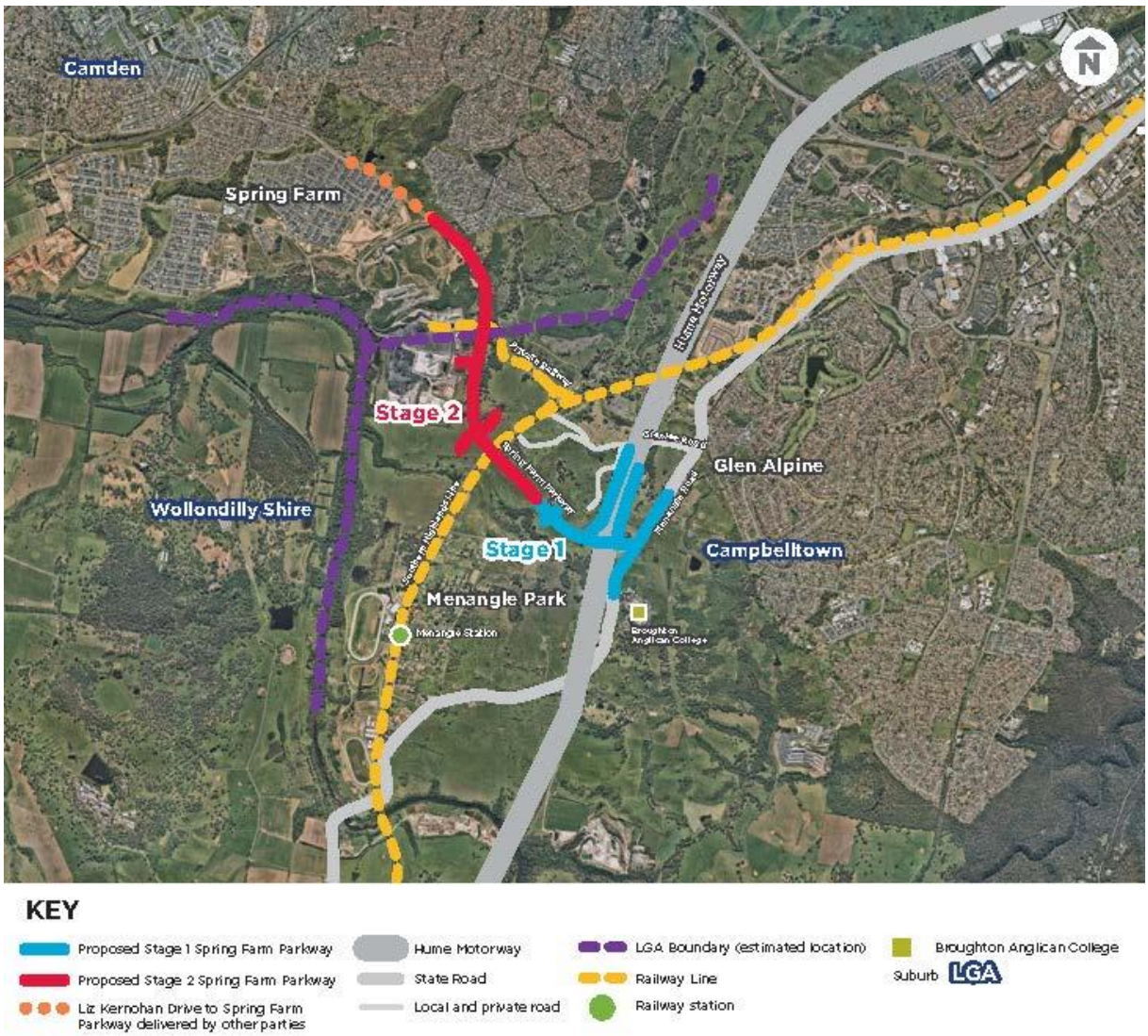
Spring Farm Parkway is a proposed east-west arterial road that would connect Camden to the Hume Motorway. Stage 2 of Spring Farm Parkway is about three kilometres long and would link Camden Bypass with Stage 1 of the Parkway. This would provide access to the

Hume Motorway and Menangle Road and would provide another east-west link in addition to Narellan Road.

Future planning as part of the Greater Macarthur Growth Area indicates that Spring Farm Parkway could be further extended through to Appin Road.

Stage 1 and 2 of the Spring Farm Parkway is shown in Figure 3.8.

Figure 3.8: Spring Farm Parkway

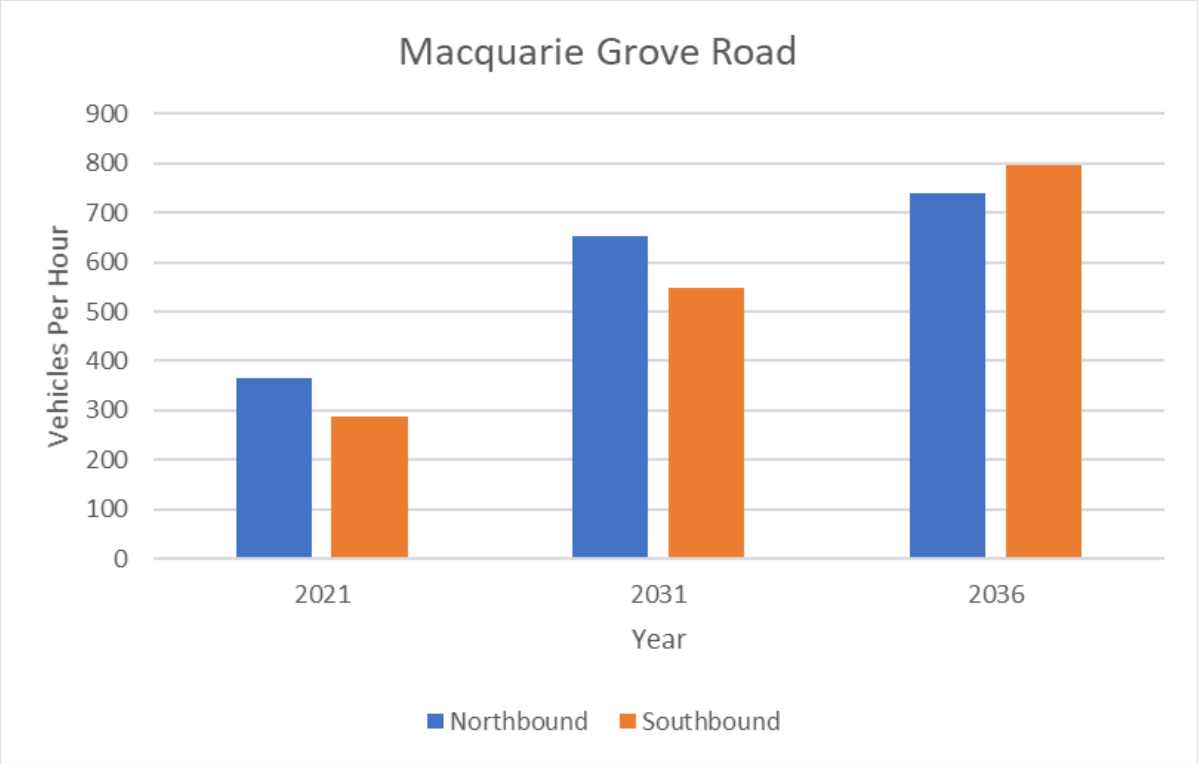


3.6 Traffic Forecasts

Traffic forecasts were requested from Transport for NSW (TfNSW). The traffic forecasts are from the STFM model which forecasts traffic volumes based on projected population and employment.

The model predicts that there would be a significant future increase in traffic on Macquarie Grove Road. Traffic flows are predicted to increase from 655 vehicles per hour to 1536 vehicles per hour in the 15 years from 2021 to 2036. This equates to an increase in traffic volumes of 9% per annum. The traffic forecasts are shown in Figure 3.9.

Figure 3.9: Forecast Traffic Volumes



Likewise, volumes in Kirkham Lane area also predicted to grow at a similar rate.

The rural land fronting Macquarie Grove Road forms part the metropolitan rural area with Council opposed to its future urbanisation. Pressure for upgrading Macquarie Grove Road occasioned by the traffic associated with the immediate urban release area and desired movements to the Camden and Narellan town centres in particular.

3.7 Strategic Implications to Subject Site

The planning context of the site has implications for how the site is currently used and how the site could potentially be used in the future.

Strategically, the broader development will have implications on how the site is accessed in the future and the need for infrastructure upgrades to accommodate the broader development.

The site is currently in a rural context but in the future would be in a more urban setting (Oran Park and Cobbitty urbanisation precincts), notwithstanding the natural environment reserve that currently occupies most of the site and would continue into the future.

The area is likely to see increased urbanisation especially to the north in Oran Park. Urbanisation would see the demand for supporting services such as schools and may drive demand for expanded schools in the area, including the special needs school.

The urbanisation would also increase the demand for public transport with the potential for increased bus services feeding into major centres such as the Oran Park Town Centre, Camden and Campbelltown. The creation of the Aerotropolis to the north is likely to lead to changed travel patterns with employment attractions to the north with establishment of Sydney's third city.

As these land uses (beyond the immediate precinct) intensify it is likely that the character of Macquarie Grove Road and Kirkham Lane will change. The roads are expected to change from being a two lane, two-way rural road and become an urban collector road or sub-arterial road. These changes will unlikely be occasioned by urbanisation of the Macquarie Grove Road / Kirkham Lane precinct as such forms of development are opposed by Council.

The character of the roads may change as the road is upgraded to include:

- Street lighting,
- Formalised bus stops.
- Footpaths and cycle paths.
- Speed limits along Macquarie Grove Road may also be decreased to 60km/h.

To support the forecast increases in traffic volumes it is likely that existing intersections would need upgrading to increase capacity and reduce delays that would occur with increasing traffic volumes. This may include intersection widening and inclusion of turning lanes. Ultimately capacity of Macquarie Grove Road may need to be increased with additional lanes.

The intersection of Macquarie Grove Road and Kirkham Lane may need to be upgraded to accommodate future traffic volumes. While the intersection of Macquarie Grove Road and Cobbitty Road would need to be upgraded to accommodate a road extension to the north into the broader Oran Park urbanisation release area. This may ultimately take the form of a signalised intersection or a large roundabout in the interim.

It is in this longer term context that the existing driveway access intersection may need to be upgraded to improve road safety.

4 Potential Site Development Scenarios

4.1 Overview

As noted previously in this report, the purpose of the PPR is to rationalise the existing land use provisions. It is envisaged that the natural environment conservation area will remain unchanged in perpetuity and the schools will experience limited incremental growth / diversification. Additionally, a residue site with limited development potential will be created.

With regard to the future traffic demands for the site, the existing educational and environmental uses will continue largely as per their existing traffic demands in the immediate future. Limited incremental growth in educational programs will create reflect in commensurate movement needs.

The existing and proposed zonings for the Wivenhoe site are presented in Figure 4.1 whilst the indicative superlot division is presented in Figure 4.2.

Figure 4.1 is noted to show the following proposed changes to the site's zoning:

- a significant proposed expansion of the existing E2 Environmental Conservation area within the site (201 ha)
- formalisation of the existing education precinct on the site with the introduction of the SP2 Education Establishment zoning (25 ha)
- creation of a residual parcel of land zoned RU2 Rural Landscape (25 ha).

As referenced above the site has been identified to comprise a number of land use precincts (refer to Figure 2.2 and Figure 4.1) and indicative superlots (refer Figure 4.2). Future immediate development potential under such planning regime has been identified by Project Planners and Client to comprise the following:

- Conservation Precinct
  - On-going conservation
  - Future potential interpretive facilities
- Special Education Precinct
  - Additional 100 pupils / children (including preschool and childcare)
  - Expansion of the Aspect School (or similar) 50 pupils
- Residue Rural Precinct
  - Rural allotment with dwelling house

The following section of this preliminary traffic assessment has estimated the traffic generation potential of precinct.

The assessment has considered the most probable future development potential of each precinct for the purpose of considering the intensity of traffic generation and the ability of the surrounding road network to accommodate such traffic in its current state or with potential improvements. It is noted that the development potential of each precinct is constrained by its inherent qualities and / or external impacts as is summarised below.

4.1.1 Conservation Precinct

Future development of this precinct (201ha) beyond interpretive and educational activities is severely constrained by the threatened species classification of the habitat present, bush fire hazard impact, the fixed affected nature of part, the commitment to Biodiversity Agreement and some airport related operational restrictions.

A maximum of ten (10) vehicle trips per day are likely to be associated with such precinct at times that generally not coinciding with peak school related traffic movements.

4.1.2 Special Purposes Education Precinct

The Mater Dei education precinct (proposed 23ha) is constrained by the presence of heritage listed stables, farmhouse and Wivenhoe Villa and their respective curtilage / setting requirements, sensitive ecological communities and bush fire hazard impacts and asset protection zone requirements.

Further educational premise is likely to be limited in such context and additional limited by the "special education" focus. Mater Dei School precinct may see an increase in the order of 100 maximum persons.

The Aspect School precinct (proposed 2ha) is constrained size, vegetation, typography bush fire hazard (associated asset protection zones) and relationship to the Wivenhoe heritage curtilage influence.

The Camden Airport also exerts certain limitations as detailed in the specialist NASF assessment aviation services report prepared by Rehbein Consulting.

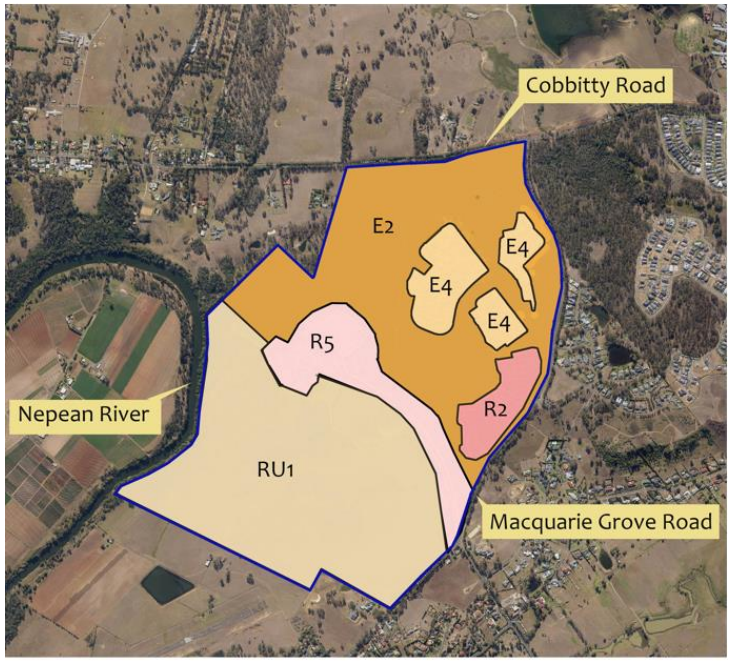
Enhanced specialised special education programs may see a maximum increase of 50 people in the foreseeable future, with associated transport reflecting current practices as previously described (refer to section 2.6.2)

4.1.3 Residual Rural Land Parcel

The residue parcel of land with a proposed area of 25 ha is intended to be zoned RU2 rural landscape, with a 20 ha minimum subdivision lot size. Such land is significantly constrained in terms of the range of permissible uses attached to the proposed zoning and the physical limitations of the site in respect of access, bush fire hazard management and the operational parameters of the Camden Airport.

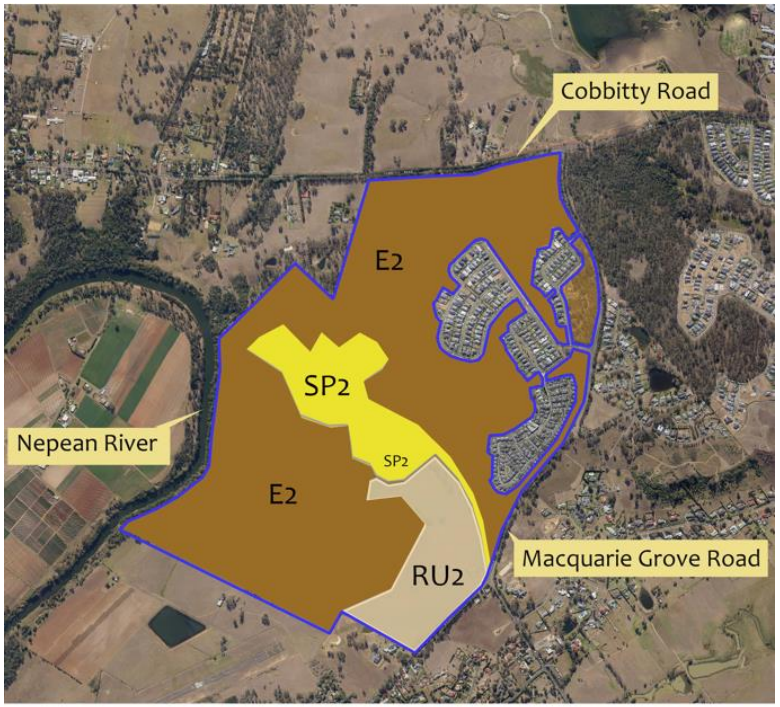
It is assumed that typical rural and limited occupancy of one dwelling on the site could generate a maximum of 10 daily vehicle movements.

Figure 4.1: Existing and Proposed Zoning of Wivenhoe Site



EXISTING ZONING

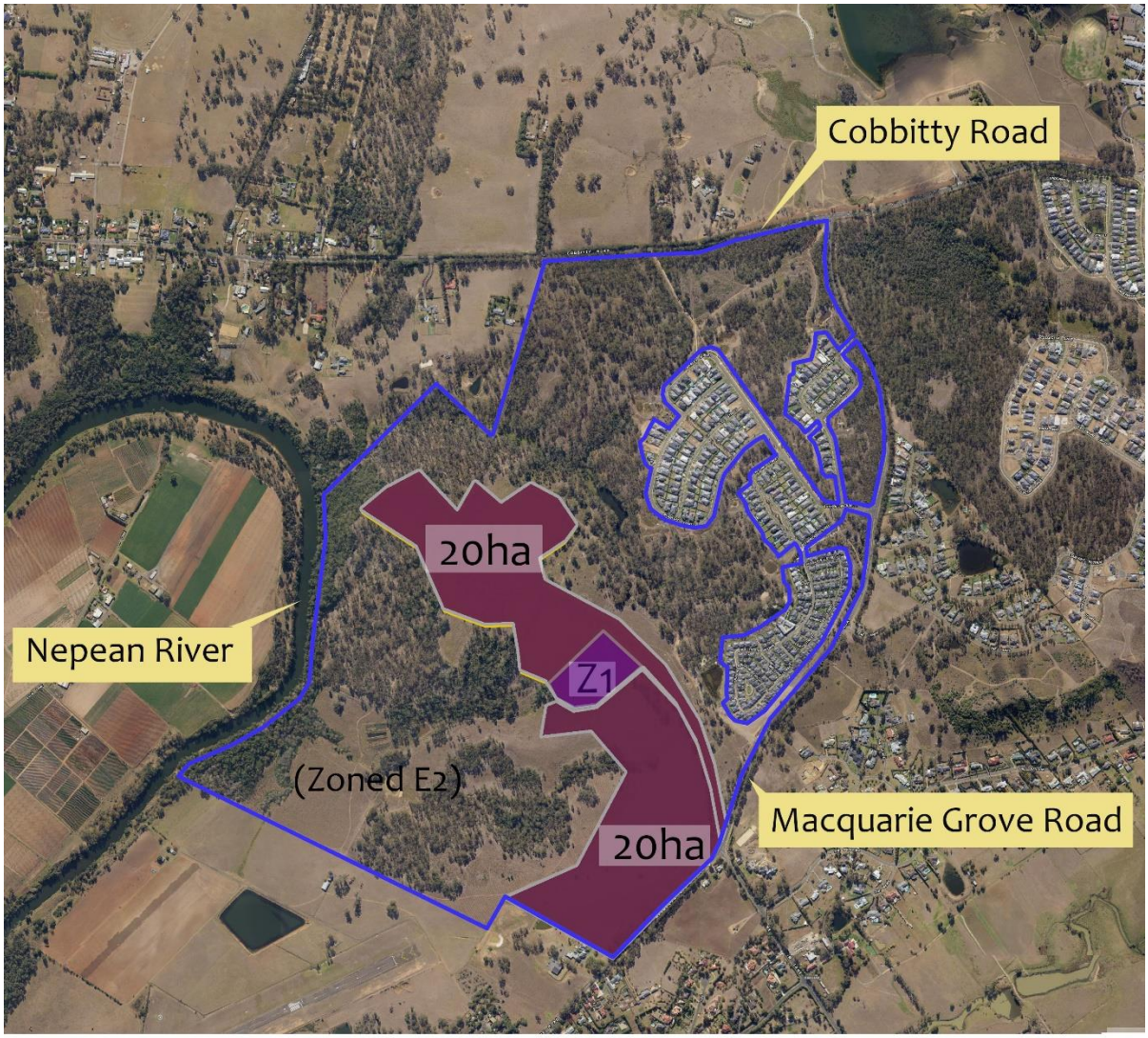
- E2 Environmental Conservation
- E4 Environmental Living
- R2 Low Density Residental
- R5 Large Lot Residential
- RU1 Primary Production



PROPOSED ZONING

- E2 Environmental Conservation
- SP2 Educational Establishment
- RU2 Rural Landscape

Figure 4.2: Indicative Superlot Subdivision



4.2 Potential Traffic Generation Associated with Proposed Planning Provisions

The following estimates the potential traffic generation characteristics of the development scenarios for each proposed precinct. Potential traffic generation has been estimated using published traffic generation rates from the Roads and Maritime Services technical direction (TD2013/04a) Guide to Traffic Generating Developments, Updated Traffic Surveys 2013.

4.2.1 Scenario 1 – Conservation Precinct

The conservation precinct is not expected to generate a significant amount of traffic. Possible educational and interpretive facilities are likely to generate traffic outside the peak periods. Notwithstanding, it has been assumed that 5 vehicle trips during the peak periods and a total of 10 movements per day.

4.2.2 Scenario 2 – Special Education Precinct

As described above it has been considered that the Mater Dei School could increase by 100 pupils and the Aspect School by another 50 people. The traffic generation associated with these schools is significantly different to typical schools therefore traffic generation has been assumed to be pro-rated at a rate of:

- 1.7 trips per student Mater Dei School
- 1 per student for the Aspect School

This is based on 296 trips for 141 students for the Mater Dei School and 50 trips per 50 students for the Aspect School.

4.2.3 Scenario 3 – Residual Rural Precinct

The residual rural precinct would be restricted to 1 low density dwelling. Based on the TfNSW Guide to Traffic Generating Developments (TDT 2013/04b) the trip rate for a low density dwelling would be 1.32 trips per dwelling would result in 2 additional trips allowing for rounding up.

4.3 Traffic Generation Scenarios

Trip generation has been estimated for each scenario based on published rates as follows:

- Conservation – 5 trips
- Special Education trips
  - 1.7 trips per student (Mater Dei School)
  - 1.0 trips per student (Aspect School)

- Residual Rural Precinct 2 trips per dwelling

A vehicle trip is defined as a movement to site or from site. For example, a vehicle dropping off a student is equivalent to two trips.

The morning distribution of trips has been assumed as follows:

- Conservation Precinct 100% in
- Special Education trips 60% to site and 40% from site
- Rural Residential 90% from site and 10% to site.

A comparison of the trip generation from each scenario is shown in Table 4.1.

Table 4.1: Morning Peak Indicative Traffic Generation

Scenario	Rate	Unit	Morning Peak Vehicle Trips (veh/hr)	In (veh/hr)	Out (veh/hr)
Existing	-	-	296	198	108
Conservation	-	-	5	5	0
Special Education	1.7 trips per student	100 students	170	102	68
Special Education	1 trip per student	50 students	50	30	20
Rural	2 per dwelling	1 dwelling	2	-	2
			523	335	198

In each scenario a single access (as currently provided) should be able to accommodate the modest increase in in traffic with limited implication for traffic the access entrance intersection. Improvements to the access entrance and immediate road network. The limited enhancements are likely to involve the rationalisation of the entrance internally on the Mater Dei Site including:

- Widening of the accessway to allow vehicles to pass, especially buses
- Improvement to pavements.

The need for the upgrade of the Macquarie Grove Road / Kirkham Lane intersection including a possible roundabout and related intersection enhancement would not be required (refer to section 4.4).

4.4 Road Network Implications for Foreshadowed Development

To assess the road network's ability to accommodate traffic volumes forecasts from Transport for NSW were obtained and compared to the Level of Service criteria from the RTA Guide to

Traffic Generating Developments for rural roads. Capacity for a rural road is generally considered to be in the order of 2500 vehicles per hour (combined directions) through for urban roads with interrupted flow it is 1800 vehicles per hour (two lane, two way). Level of Service is used to categorise traffic flow conditions. It is a scale from A to F with Level of Service A indicating free flowing traffic with no delays and Level F is slow moving traffic, long queues and frequent stopping. In general level of service C is considered an appropriate target though Level of Service D is commonly accepted in Sydney.

The forecast volumes on Macquarie Grove Road north of Kirkham Lane are shown in Table 4.2. The volumes are derived from the two hour STFM forecasts with the peak 1 hour flow assumed to be 60% of the two hour forecast and rounded to the nearest 50 vehicles per hour so that a greater level of accuracy is not implied.

Table 4.2: STFM Forecast Volumes on Macquarie Grove Road

Year	Northbound (veh/hr)	Southbound (veh/hr)	Combined (veh/hr)	Level of Service
2021	*350*	*300*	*650*	*C*
2031	650	550	1200	D
2036	750	750	1500	D

The forecasts indicate that Macquarie Grove Road would be level of service D by 2031 and remain at that level in 2036. Without any contribution of traffic from the site it likely that Macquarie Grove Road would require widening to increase capacity by 2036.

Traffic from further development on the site is likely to be particularly modest and not contribute to bringing the need to upgrade Macquarie Grove Road forward before the 2036 time horizon.

Improvements to the immediate road network occasioned by possible future development are likely to be limited to road shoulder enhancement including:

- Road widening
- Additional capacity at intersections
- Street lighting at intersections.

The need to reconfigure the entrance with a realignment of the Macquarie Grove Road / Kirkham Lane intersection is not warranted, nor would the need for a roundabout be triggered at such a point in time

4.5 Vehicle Site Access Arrangements

The site currently has a single access point to the school from Macquarie Grove Road. The access alignment is offset from Kirkham Lane which is not desirable from a road safety

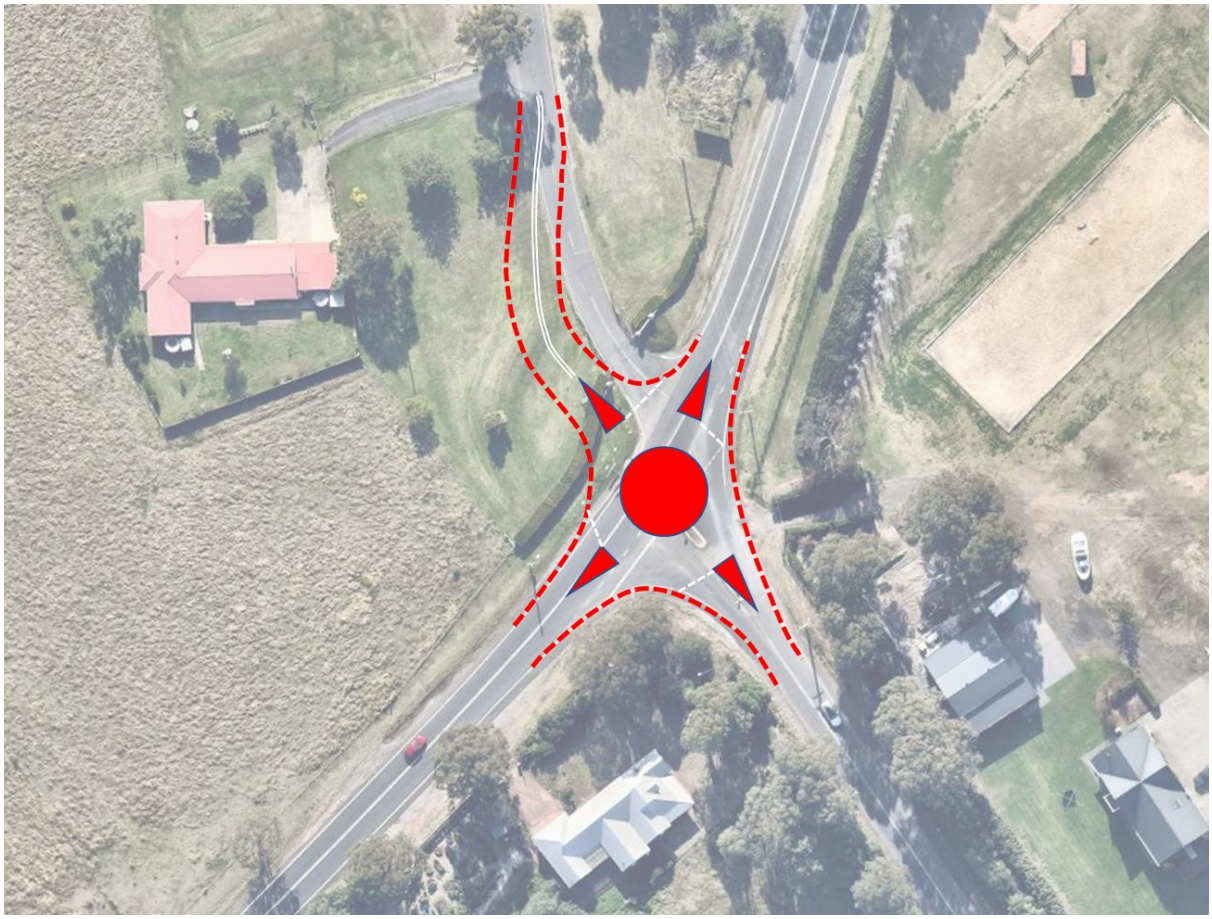
perspective. Together with predicted significant increases in local / district traffic movements and modest increases associated with further development of the site it may be that the access could be upgraded to improve road safety and capacity of the intersection.

Further development of the site would importantly be at scale that would likely catalyst for a major upgrade of the intersection. Both the local / district traffic level of traffic growth would, in years to come, likely trigger the need for an upgrade of the Macquarie Grove Road and Kirkham Lane intersection possibly in the form of a roundabout further a second access for bush fire and emergency situations generally removed from the existing school driveway. A second access is limited by the typography that restricts sight distance, if required.

Alterations to the current access could occur as part of such works with any monetary contribution limited to the traffic impact nexus.

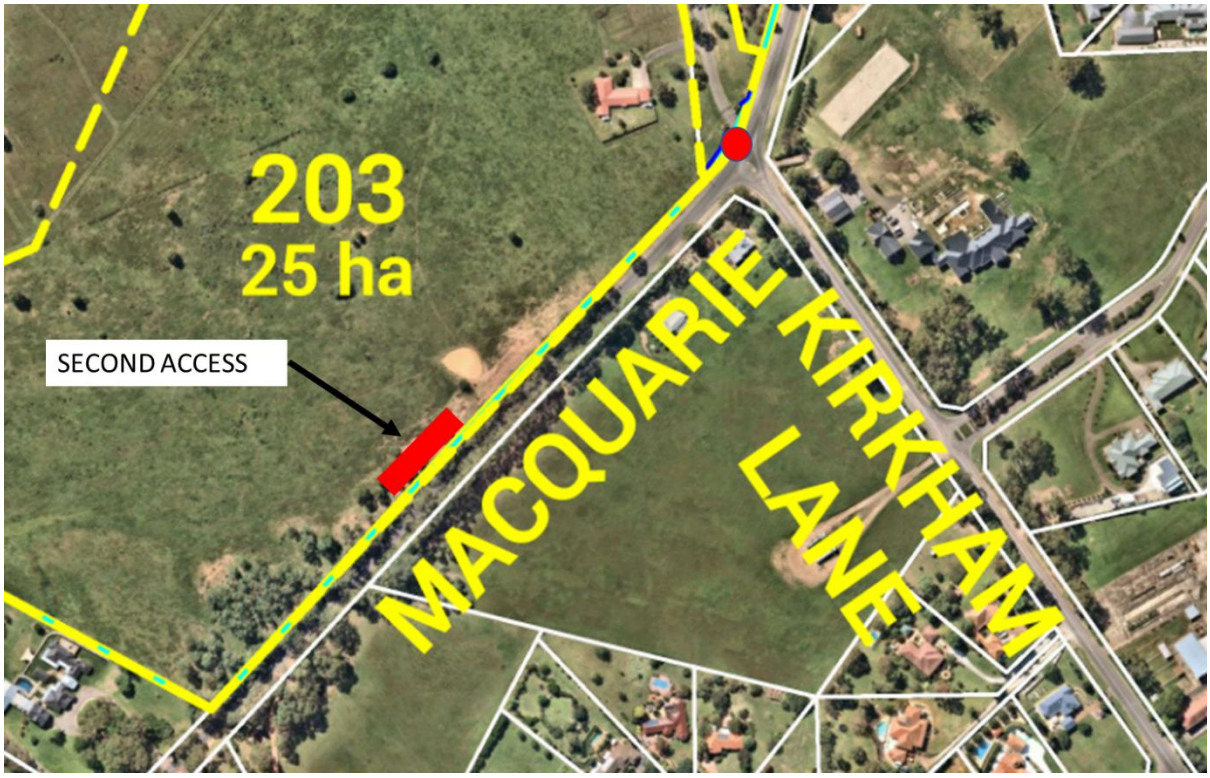
A suggested access could be a roundabout could be installed as shown in Figure 4.3. The layout shown partially include a realignment of the accessway so that the access aligns with Kirkham Lane. This would have the added advantage of performing a traffic calming function for the road network as well as access. This intersection modification would also reflect that the area is become increasingly urbanised.

Figure 4.3: Roundabout Access



It is recommended that a second access could be investigated at a location placed midway between the crests to allow for sight distance, if required.

Figure 4.4: Second Access Location



Additionally, a future reduction in speed limit from 70km/h to 60km/h may need to be considered to improve road safety generally in recognition of the increasing urbanisation of the broader area and escalation of local and district level of traffic movements on the immediate road network.

5 Conclusion

The Transport Planning Partnership has been commissioned to assess the traffic and transport impacts of a Planning Proposal Request (PPR) to rationalise the land use zoning and minimum lot size provisions under the Camden Local Environmental Plan 2010 and ultimately result in a "super lot" subdivision and further precinct related activities.

The key findings are:

- The site is located in an area of Sydney that is undergoing significant urbanisation being on the boundary of the South West Sydney Growth Area.
- The urbanisation of Oran Park along with the general uplift in population and employment is forecast to significantly increase traffic volumes on the surrounding road network with traffic volumes along Macquarie Grove Road and Kirkham Lane forecast to increase by 9% per year for the next 15 years.
- The development of Oran Park and the structure plan show development north of Cobbitty Road with an extension of Macquarie Grove Road beyond Cobbitty Road.
- A review of the 5 year crash history along Macquarie Grove Road identified that there was only one serious crash and no significant road safety trends. A road safety review identified that the access driveway for the school has restricted sight distance from the south and east that may contribute to crashes at the intersection of Macquarie Grove Road and Kirkham Lane.
- Three precinct limited development scenarios were considered:
  - Conservation Precinct (201 ha)
  - Special Education Precinct (25 ha)
  - Residual Precinct (25 ha).
- Traffic forecasts from STFM indicate that traffic volumes on Macquarie Grove Road would be approaching capacity by 2036. Traffic generation in the order of 250 vehicles per hour is likely to be able to be satisfactorily accommodated with minor works to the access on-site.
- Each scenario assessed is considered to be able to access through one access point, however access enhancement works should be evaluated at future development application stage and could include:
  - Widening of the accessway to allow for more two-way traffic.
  - Line marking
  - Raised Reflective Pavement Markers
  - Guide posts
- A second vehicular access principally for emergency events could be considered from Macquarie Grove Road in a limited location on Macquarie Grove Road, due to sight

distance limitations. No other locations on the perimeter of the site readily lend themselves to a supplementary point of limited access.

- Macquarie Grove Road / Kirkham Lane intersection will need to be upgraded in response to nearby urban growth and local / district level traffic impacts in the future. Any such upgrade is likely to lead to the installation of a roundabout and realignment of the intersection. In such scenario it would be expected that the Mater Dei access may be realigned and integrated with Mater Dei potentially contributing in a limited sense to the cost of such element.

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