Planning Proposal

Proposed amendment to
Fairfield Local Environmental Plan 2013

17-21 Longfield Street, Cabramatta
Rezoning from B5 Business Development to R4 High Density Residential

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1 Introduction

1.1 General

This report has been prepared to support a proposed amendment to Fairfield Local Environmental Plan (LEP) 2013 to allow for an innovative, multi-generational living precinct at 17 – 21 Longfield Street, Cabramatta. The project, identified by the applicant as 'The Circle', is proposed to accommodate residential, aged-care services, independent living units for seniors, child care, community facility, with associated indoor recreation facilities (gym) and takeaway food and drink premises supporting the development.

This report comprises a planning proposal that has been prepared in accordance with:

- Section 55 of the *Environmental Planning and Assessment Act 1979* (EP&A Act)
- A Guide to Preparing Planning Proposals and A Guide to Preparing Local Environmental Plans (Department of Planning and Infrastructure, 2012).

It represents the first stage of the gateway plan making process, which initially seeks Council's support to forward the proposed LEP amendment outlined in the planning proposal to the Department of Planning and Environment (DPE) for a review and gateway determination. The gateway determination will:

- identify if there is sufficient justification for the planning proposal to proceed
- confirm the technical investigations and consultation required
- establish the process and timeframe for continuing the assessment of the proposal.

As outlined in *A Guide to Preparing Planning Proposals*, the planning proposal is the first step in preparing the LEP amendment. The planning proposal will evolve throughout the process as relevant sections will be updated and amended in response to the outcomes of any further technical investigations required by the gateway determination and during consultation.

1.2 Purpose

The purpose of this report is to demonstrate that there is sufficient planning justification to amend Fairfield LEP 2013 as it relates to the land at 17 – 21 Longfield Street, Cabramatta. Specifically, this report:

- details the proposed provisions of the LEP amendment
- describes the vision for the site that underpins the LEP amendment, including a concept plan demonstrating the desired ultimate development outcome for the site
- provides evidence to support the proposed LEP amendment based on technical planning, economic, urban design and traffic assessment
- justifies the proposed LEP amendment against all relevant statutory and strategic planning matters
- addresses the requirements for the preparation and lodgement of a planning proposal in the accordance with the EP&A Act and associated guides.

1.3 Structure

Section 55(2) of the EP&A Act and A Guide to Preparing Planning Proposals sets out the content and structure required for planning proposals. This report is structured in accordance with these provisions. However, it also includes introductory information about the site location and context. As such, this report is structured as follows:

- **Section 1** provides an introduction to the report and articulates its purpose
- **Section 2** describes the site's location and context
- **Section 3** provides a background to the planning proposal
- **Section 4** provides an overview of the urban design report which has informed the preparation of planning proposal
- **Section 5** contains the Planning Proposal in the format required by the EP&A Act and A Guide to Preparing Planning Proposals, comprising:
    - **Part 1** – Objectives and intended outcomes
    - **Part 2** – Explanation of provisions
    - **Part 3** – Justification
    - **Part 4** – Maps
    - **Part 5** – Community consultation
    - **Part 6** – Project timeline.

1.4 Supporting documentation

A Council report (**Appendix A.1**) was prepared detailing the review and analysis of the planning proposal and applicants supporting documentation. A range of supporting studies addressing relevant planning and technical issues have been prepared by the applicant to support this planning proposal including the following:

- Urban Design Report by Antoniades Architects (**Appendix B.1**)
- Economic Assessment by Location IQ (**Appendix B.2**)
- Feasibility Study by Location IQ (**Appendix B.3**)
- Traffic and Transport Study by Thompson Stanbury Associates (**Appendix B.4**)
- Flood Study by Integrated Group Services (**Appendix B.5**)
- Preliminary Contamination Assessment by Aargus Pty Ltd (**Appendix B.6**)

These supporting studies have subsequently been reviewed and assessed by Council officers.

2 Site location and context

2.1 Regional context

The site is located in Cabramatta, within the south eastern portion of the Fairfield Local Government Area (LGA). The site is approximately 28km south-west of the Sydney CBD. Fairfield falls within the South West subregion. The subregion also includes the LGAs of Camden, Campbelltown, Liverpool and Wollondilly. It is one of the largest and most populated LGAs within the subregion. Covering 102 square kilometres (km2) Fairfield estimated resident population in 2014 is 203,109 (as per the ABS Census). Fairfield is also one of the most ethnically diverse areas in Australia, with a large number of recent migrants.

Cabramatta is the second largest centre within Fairfield LGA with a population of 20,639 in 2011 (as per the ABS Census). It is an established residential area, with a large commercial centre around the railway station and industrial land uses along the Hume Highway at its eastern end. Cabramatta is a unique multi-cultural town centre. From an urban design and planning perspective it is a fine-grained retail and commercial centre, often with a specialist flavour such as textile retailing. There are approximately 4,500 dwellings within 800 metres of the Cabramatta railway station at present.

The locality is well serviced by public transport and has good links to surrounding centres. The subject site is located outside of the Cabramatta town centre catchment, approximately 1.5 km east of the Cabramatta railway station (see Figure 1). The subject site is also approximately 250 metres to the North West of the Lansvale Neighbourhood Centre. This centre contains a post office, small convenience store, chemist, newsagent and other retail and commercial uses.

Rail services provide easy access to the Sydney Metropolitan region via the following lines:

- T2 Inner West & South Line / Campbelltown to City via Granville
- T5 Cumberland Line / Schofields to Campbelltown service
- T3 Bankstown Line / Liverpool or Lidcombe to City via Bankstown service

There are also regular local bus services along Longfield Street to the Cabramatta town centre, Fairfield and Liverpool to connect with rail services. In addition, there are bus services along the Hume Highway to Liverpool, the major regional centre, and Fairfield (see Figure 1 and 2).

Figure 1 – Regional context (Source: Nearmap)

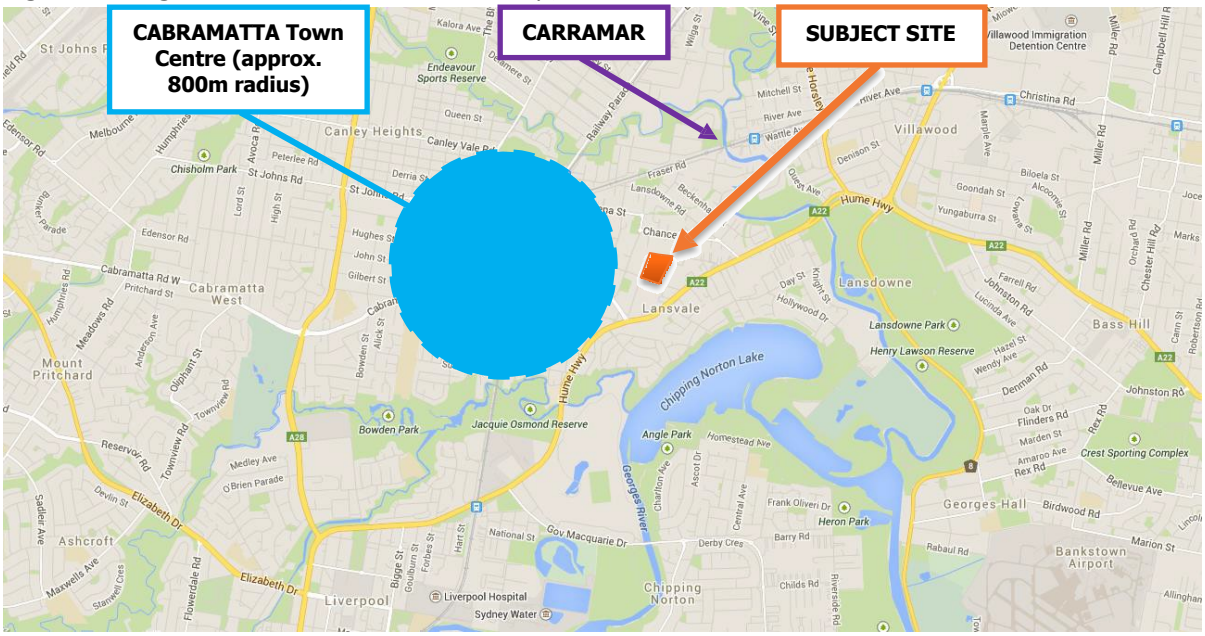
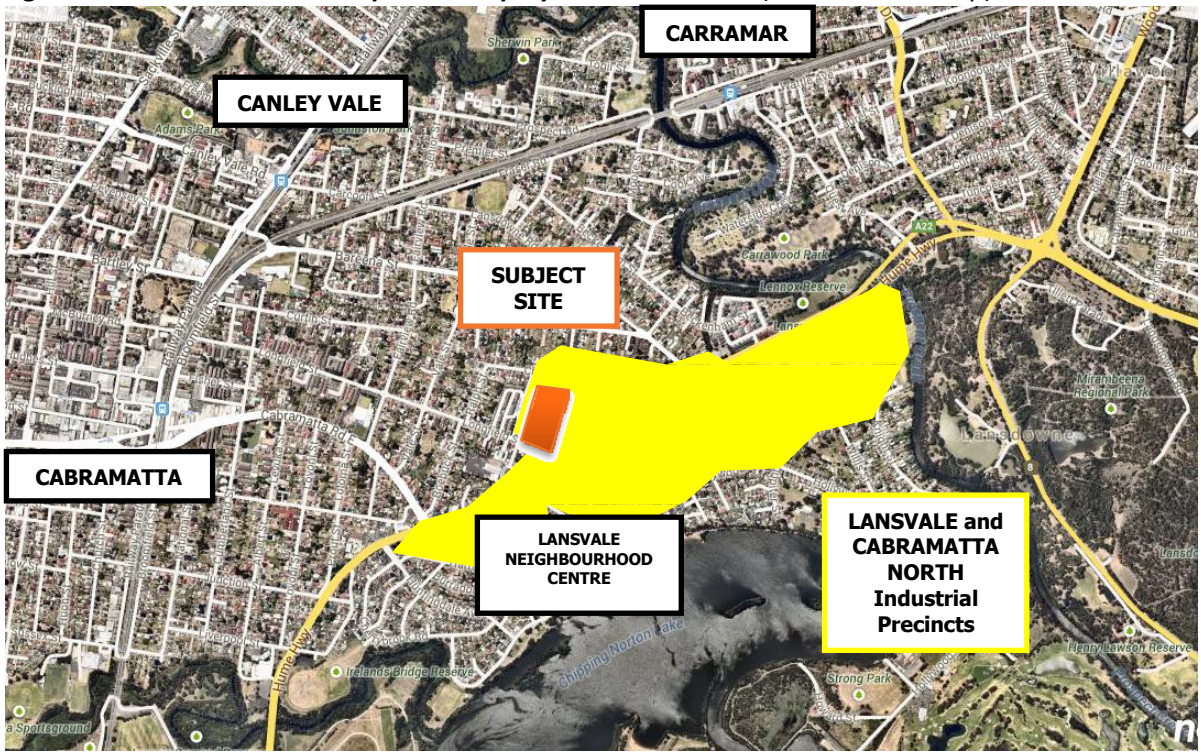


Figure 2 – Site context with respect to employment zoned land (Source: Near Map)



2.2 The site

2.2.1 Location

The site is located at 17 – 21 Longfield Street, Cabramatta. It is situated on the northern side of Longfield Street, between the intersections of the Hume Highway and Ralph Street, and has dual street frontage (Longfield and Chadderton Streets).

The site comprises two lots described as Lot 34 and 35 in DP 456221. The site has an area of 39,679sqm (or approximately 4 hectares). It is a regular shaped allotment with diagonal frontage

to Chadderton Street and has the following boundary characteristics:

- Southern boundary of 161m adjacent to Longfield Street
- Northern boundary of 164m adjacent to Chadderton Street
- Western boundary of 239m adjacent to existing residential development
- Eastern boundary of 263m adjacent to existing commercial and other non-residential development.

The land is relatively level, however there is a gentle slope from the Longfield Street frontage to the Chadderton Street frontage.

Vehicle access to the property is via Chadderton Street to the north or Longfield Street to the south. The principal access point for the site is from Chadderton Street which intersects directly with the Hume Highway approximately 350 metres to the north. Left-hand only turns are permitted from Longfield Street onto the Hume Highway.

A number of easements exist on the land.

An aerial view of the subject site is shown in Figure 3 and Figure 4.

Figure 3 – Aerial view of subject site with lot boundary identified (Source: Spatial Information Exchange)

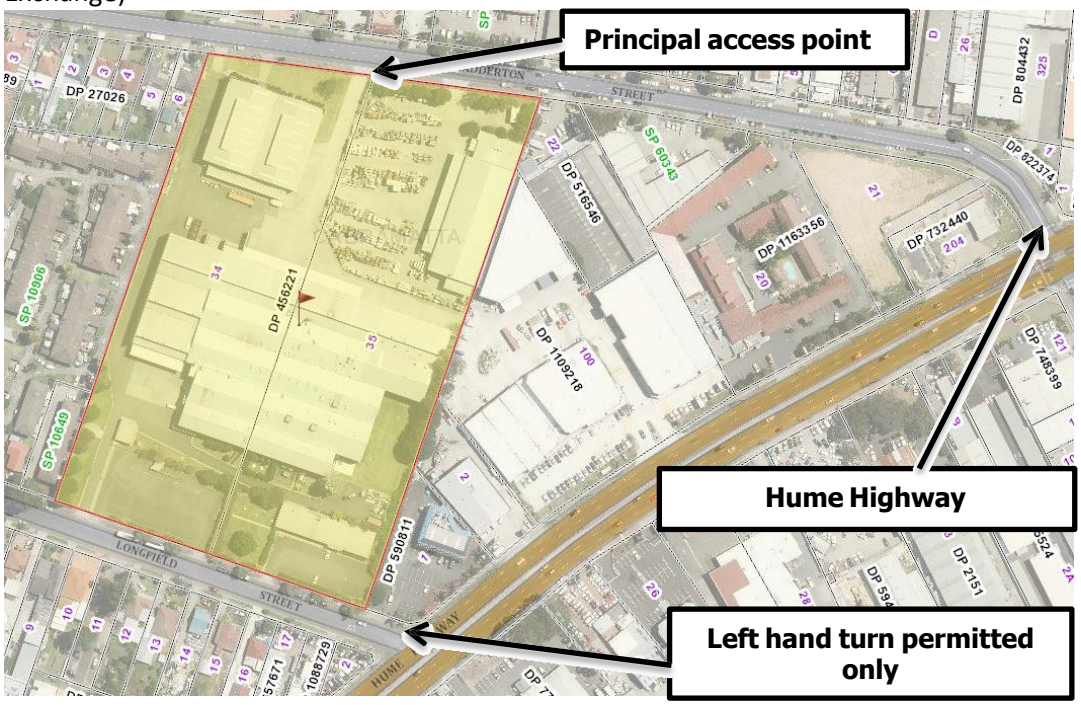


Figure 4 – Aerial view of subject site (Source: Nearmap)

2.2.2 Current zoning

The site is currently zoned B5 Business Development under Fairfield LEP 2013 (see Figure 5). Under the LEP there is no height or FSR controls currently identified for the site (see Figure 6-7). Table 1 outlines the land use table for Zone B5 Business Development.

Table 1 – Land use table – Zone B5 Business Development (Source: NSW Legislation)

Zone B5 Business Development	
Objectives	• *To enable a mix of business and warehouse uses, and bulky goods premises that require a large floor area, in locations that are close to, and that support the viability of, centres.* • *To encourage the establishment of light industrial uses that are compatible with nearby residential areas, generate employment and contribute to the economic development of Fairfield.*
Permitted without consent	*Environmental protection works*
Permitted with consent	*Bulky goods premises; **Child care centres**; Funeral homes; Garden centres; Hardware and building supplies; Kiosks; Landscaping material supplies; Light industries; Passenger transport facilities; Plant nurseries; **Respite day care centres**; **Roads**; Take away food and drink premises; Timber yards; Vehicle sales or hire premises; Warehouse or distribution centres; **Any other development not specified in item 2 or 4***
Prohibited	*Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Biosolids treatment facilities; Boat building and repair facilities; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; **Commercial premises**; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Entertainment facilities; Environmental facilities; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Function centres; Heavy industrial storage establishments; Helipads; Home-based child care; Home businesses; Home industries; Home occupations; Home occupations (sex services); Industries; Jetties; Marinas; Mooring pens; Moorings; Open cut mining; Recreation facilities (major); Research stations; **Residential accommodation**; Resource recovery facilities; Restricted premises; Rural industries; Sewage treatment plants; Sex services premises; Tourist and visitor accommodation; Transport depots; Truck depots; Vehicle body repair workshops; Waste disposal facilities; Water recreation structures; Water recycling facilities; Water supply systems; Wharf or boating facilities*

The B5 zone continues along both sides of the Hume Highway in the general vicinity of the site supporting a range of business and residential uses. The B5 Zone also extends to land to the south of the site between Longfield Street and the Hume Highway. Land to the west, north-west and south west of the site is predominantly zoned R2 Low Density Residential.
Figure 5 shows the zoning of the site and surrounding area.

Figure 5 – Current zoning of the site (Source: NSW Legislation)

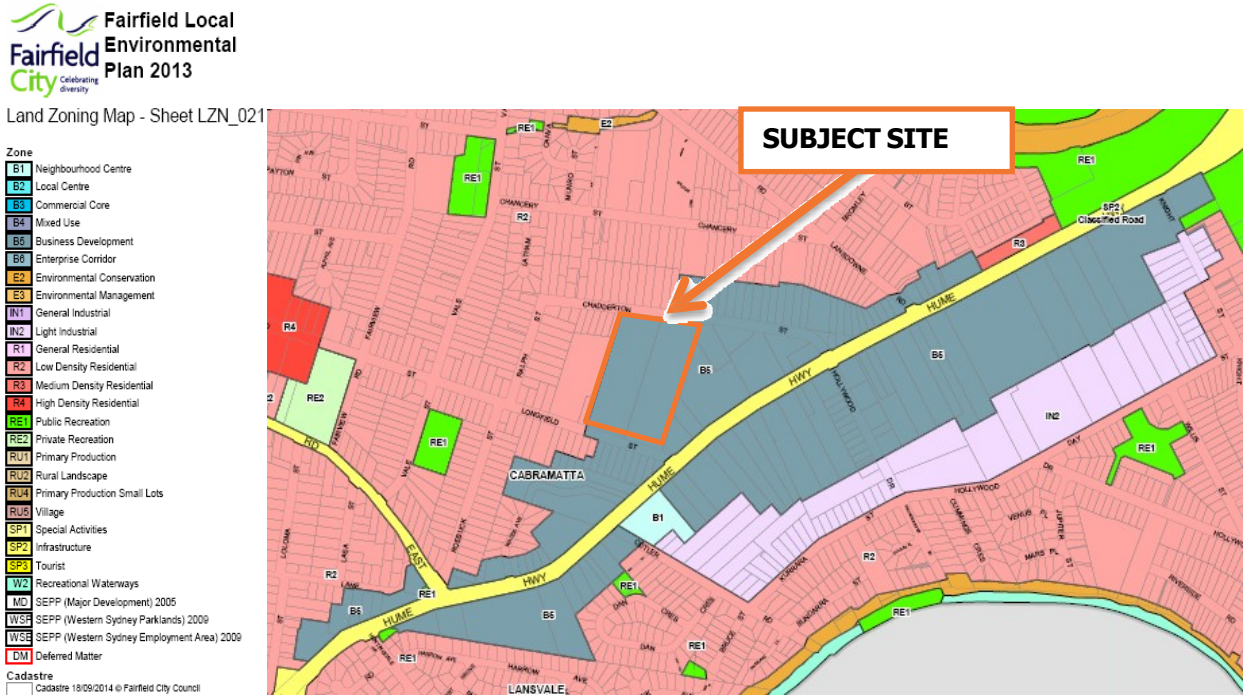


Figure 6 – Current FSR control for the site (Source: NSW Legislation)

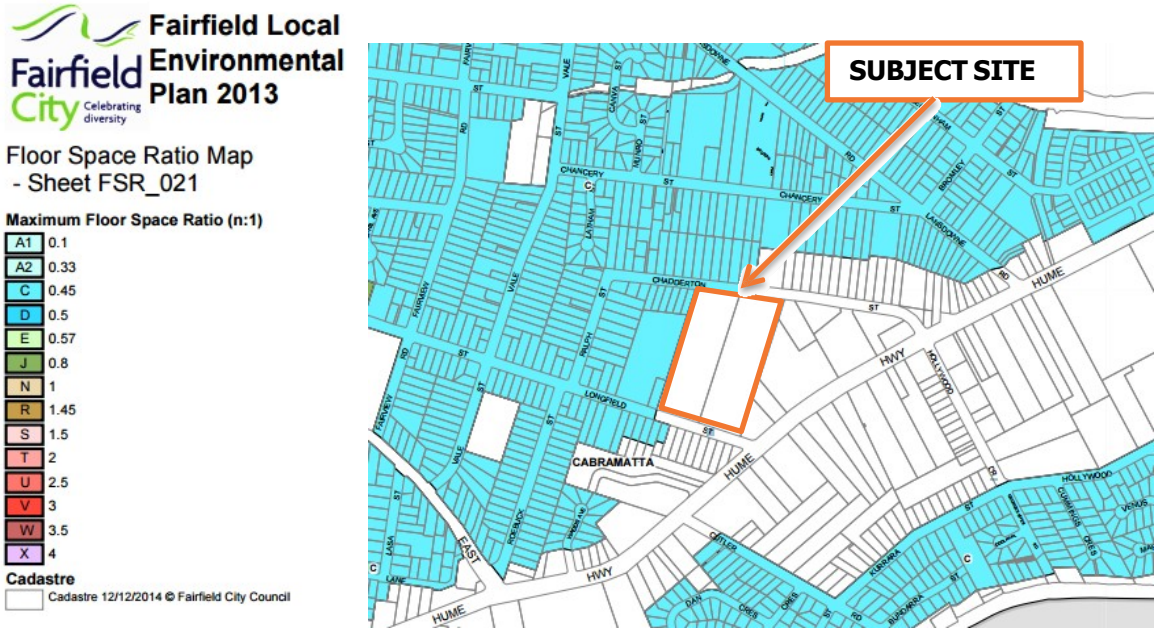
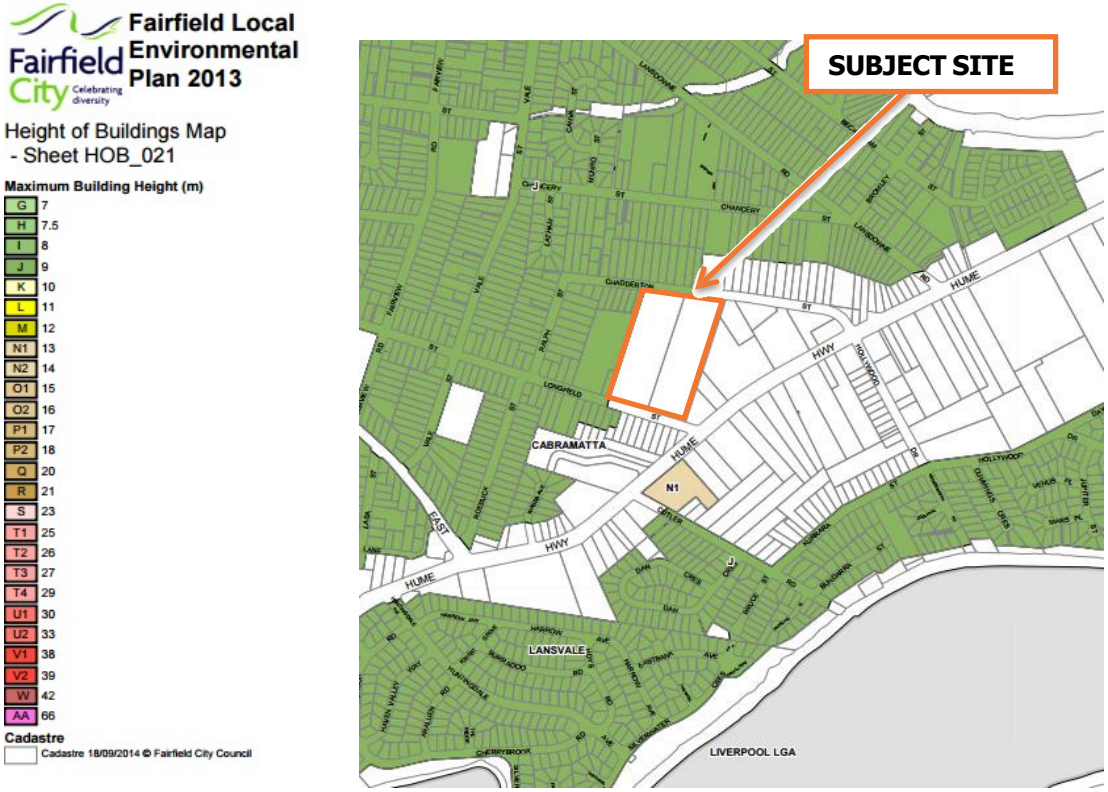


Figure 7 – Current building height control for the site (Source: NSW Legislation)



2.2.3 Current use

The site currently contains two older style industrial buildings, constructed during the1960's, and a modern warehouse building with ancillary offices, constructed around 2004. In total, the site currently provides 14,603 square metres (sqm) of gross building area.

The current businesses operating from the site as of October 2015 include:

- Fairfax provides employment for thirty (30) workers
- RMD is a scaffolding supplier providing employment for twenty (20) workers
- T&D is a distributor providing employment for ten (10) workers
- Timber warehouse storage company providing employment for twenty five (25) workers.

Figures 8 and 9 illustrate the nature of the site and the view from various street frontages.

Figure 8 – Existing development at the subject site (view from Longfield Street)

Figure 9 – View of the subject site from Chadderton Street

Figure 10 – Existing development at the subject site (view from within the site)

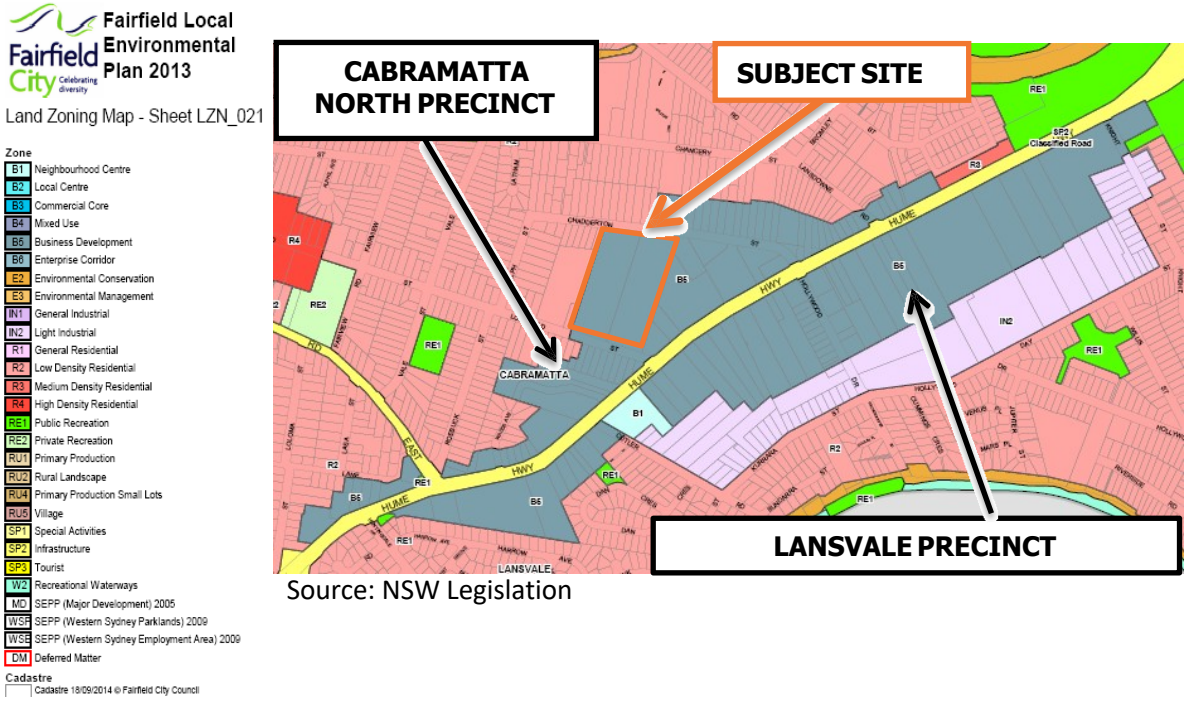
2.3 Surrounding land uses

Surrounding development generally comprises a mixture of land uses. There are two industrial/business precincts as outlined in Table 2 and illustrated in Figure 11.
A detailed description of development surrounding the site is provided in Table 3 below, and illustrated in Figure 12 to Figure 24.

Table 2 – Description of Lansvale and Cabramatta North Industrial Precincts

Area	Description
Lansvale Precinct	The Lansvale Precinct, across the Hume Highway, is a significant sized employment generating precinct that accommodates a range of light industrial activities as well as mixed uses such as Lansvale Neighbourhood Centre zoned B1 which includes a post office, take away Chinese restaurant, hairdresser, McDonalds, bakery, Porters Liquor, TAB, Lansvale supermarket, pharmacy and medical centre. Covering an area of 41.5 hectares, it is located within a cluster of light industrial land uses on flat land to the east and south-east of the subject site. The Lansvale Industrial Precinct has good accessibility off the Hume Highway, intact industrial land uses and reasonable separation from residential areas and has no significant land-use conflicts.
Cabramatta North Hume Highway Precinct	The Cabramatta North Hume Highway Precinct is located along the northern side of the Hume Highway, extending from Boundary Lane in the southwest to Lansdowne Road in the northeast. The defining features include: » predominately local light industry and urban support uses – largely occupied by small auto repair shops and other automotive related industry together with some food manufacturing and dispersed activities » some residential properties are accommodated within the precinct » has good access via a major arterial road – the Hume Highway.

Figure 11 – Overview of surrounding development



Source: NSW Legislation

Table 3 – Surrounding land uses

Area	Description
East (Triangle)	The B5 zone in which the site is located extends east to the Hume Highway. The land uses that are located within this area referred to as the "triangle" include a mix of traditional industrial uses as well as other uses not typical to employment lands. The area includes number commercial and warehouse buildings, the majority of which have direct frontage to the Highway. They include warehousing combined with bulky goods (such as hardware, tiles, beauty supplies and a baby warehouse). Other development includes: the Ibis Hotel, a gym, a new service station on the corner of Chadderton Street and Hume Highway; a restaurant and car sales yard on the corner of Longfield Street and Hume Highway. See Figure 12, Figure 14 to Figure 18.
West	Land to the west of the site is zoned residential and contains low to medium density residential dwellings. Dwellings are generally older style 2-storey villas/townhouses, as well as detached dwellings and 3-4 storey apartments. See Figure 18 to Figure 21. The apartment buildings are present to the west of Fairview Road, which is a north-south road that intersects Longfield Street approximately 400m to the west of the subject site. A small local neighbourhood shop known as "Longfield Supermarket" is located at the corner of Longfield and Vale Streets, approximately 250m to the west of the site (Figure 22). This shop is not zoned for Neighbourhood Shop use; however it appears to benefit from existing use rights.
North	Chadderton Street forms the northern boundary of the site. Development consists of: » a mix of older industrial / warehouse buildings to the west zoned B5 » a Buddhist Temple located directly opposite the site (see Figure 23) zoned B5, acts as a transition between industrial and residential land uses » to the west of temple is 1–2 storey residential dwellings zoned R2 Low Density Residential. (See Figure 23 to Figure 25).
South	Longfield Street forms the southern boundary of the site. Development on the south side of Longfield Street consists of mainly detached residential dwellings and some townhouse developments. A car yard is located at the eastern end on the corner of the Hume Highway. The car yard and dwellings adjacent to the subject site are zoned B5 Business Development. See Figure 12 and Figure 19.

Figure 12 – Uses adjoin site to the east and north

Source: Nearmap

Figure 13 – Residential adjoining the western site boundary

Source: Nearmap

Figure 14 Bulky goods along the Hume Highway

Figure 15 Gym and bulky goods along the Hume Highway

Figure 16 Ibis Hotel along Hume Highway

Figure 17 Seafood Restaurant (corner of the Hume Highway and Longfield Street)

Figure 18 Residential adjoining the western site boundary

Figure 19 Residential development to the south

Figure 20 Older style 4 storey unit block located along Longfield Street

Figure 21 Residential development along Longfield Street (west of Fairview Road)

Figure 22 The small shop known and "Longfield" Supermarket

Figure 23 Buddhist Temple

Figure 24 Automotive repairs along Chadderton Street

Figure 25 Hardware supplies at Chadderton Street

2.4 Land Use Conflict

The site is located in a transition area where former industrial and business uses are being converted. It is understood that there has been a history of land use conflict between current uses on the site and the surrounding residential development. A majority of the complaints relate to: noise, odour and fumes emanating from the site, hours of operation, impacts on visual amenity, and traffic and truck movements generated by on-site uses.
A summary of the key issues raised with Council by adjoining landowners is provided in the following table.

Table 4 – Land use conflict summary pertaining to the site

Key issue	Issues raised to Council by the community
Continual traffic movement into and from the site	• Traffic entering / exiting is a hazard to children and elderly • Excessive fumes, noise, dust and vibration from trucks entering / existing the site • Excessive noise from loading and operation of the trucks within the site and other equipment associated with the industrial use • 25 tonne trucks operating in the local residential street is not suitable to the residential area • Trucks exiting the site from Longfield Street create excessive and unnecessary noise as they drive around the block to Chadderton Street in order to turn-right onto Hume Highway
Parking	• Employees park in the street and cause shortage of on-street parking in the area for the residential dwellings
Industrial use is incompatible with adjacent residential area	• The warehouse use is not suitable to the residential character of the area, in particular along Longfield Street • Warehousing and industrial uses have long operating hours (i.e. • Sundays and starting 5-6am weekdays) creating noise and disturbance • Trucks operating 22 hours a day cause noise and disturbance
Noise	• Noise from the operation and machinery on the site • Large amounts of hard standing area create noise and vibrations
Visual amenity loss	• Loss of visual amenity as warehouse buildings are very large and contain large blank concrete walls and aluminium doors which are visible from backyard's of adjacent residential dwellings

2.5 Opportunities and constraints

An assessment of the site and its context identified the following opportunities and constraints:

Table 5 – Site constraints and opportunities

Constraints	Opportunities
Vehicle entry to the Hume Highway is only available to the right (south) from Chadderton Street as Longfield Street has a no right-turn, meaning that trucks often need to navigate through residential streets to access the Hume Highway.	Located in close proximity to the Cabramatta town centre which provides convenient access to a range of shops and facilities offering a unique and appealing cultural atmosphere.
Located on the edge of residential zone which potentially places additional constraints on business uses due to noise and traffic impacts.	The site has easy access to the Hume Highway, a major arterial roadway within the region, and benefits from dual street frontage.
The site comprises a large area with no connectivity through the block from north to south. The site blocks any pedestrian or linkage connection.	A local bus route travels along Chadderton and Longfield Streets, providing convenient public transport access between Lansvale and Cabramatta, and Fairfield and Liverpool on Route 904 and S1.
The existing warehouse and office buildings are constructed with metal cladding or roller shutters, concrete blocks and large blank walls, which do not provide an attractive built form to adjacent residential.	Redevelopment of the site will provide a better built form and urban design outcome for properties to the east which currently overlook warehouse type uses and the service areas (e.g. car park manoeuvring areas) associated with businesses operating in these.
Noise and visual impacts experienced by neighbouring residential properties due to the operation of the existing industrial uses	Redevelopment of the site would be consistent with recent development to the west along Longfield Street where multi-unit dwellings up to 5 storeys in height have been developed.
There have been continuing and long-term land use conflicts between the industrial uses on the site and adjacent low scale residential dwellings due to the close proximity of the residential dwellings to the site boundary.	The proposed rezoning will significantly improve the amenity of the area, particularly in terms of visual impact, increased activity and opportunities for casual surveillance and in doing so will address the complaints from neighbouring properties.
As identified in the preliminary assessment there is a potential for contamination of low to moderate significance to be further investigated.	Cabramatta town centre is a walkable distance (1.5km) and offers relatively easy cycling to the centre in addition to public transport.
The site is located within Prospect Creek Floodplain and has the potential to be affected by a 1 in 100 year flood event. This risk is identified as low. Based on the preliminary results of the pre-development modelling, the	This is a unique site due to its large size, single ownership and location in a “transition area”, and therefore has the potential to deliver an outcome on the site in a timely manner.

Constraints	Opportunities
development of the site is feasible without major impacts on flooding behaviour elsewhere in the floodplain. This will however need to be confirmed through a detailed modelling and assessment of the post-development conditions.	Has the potential to meet two primary objectives of 'A Plan for Growing Sydney' by providing local housing diversity including opportunities for residents to 'age in place' as well as providing jobs closer to homes.
	Has the potential to provide for the needs of changing demographics in the Fairfield LGA – ethnically diverse, an ageing population and greater proportion of people needing care.
	A large site that provides an opportunity to achieve Council's objectives without the difficulty of amalgamating sites in fragmented ownership.

3 Background to the proposal

3.1 Overview

With increasing and ongoing complaints associated with the on-site industrial uses from adjacent residents, as well as the increasing difficulties finding tenants for existing on-site buildings the potential of the site to be rezoned for alternative uses has been discussed with Council on a number of previous occasions.

Below is a summary of the chronology of events demonstrating that for the past seven years the site's use for industrial purposes is not providing sustainable and best use of the land.

Table 6 – Chronology of events

Date	Event
Prior to 2008	Discussion with Council's Strategic Planning Team who recommended that the site be rezoned for residential purposes.
2008	**Fairfield Employment Lands Study (ELS)** At its meeting on the 26 February 2008 Council resolved to adopt the ELS, applying to all industrial zoned land within Fairfield City and providing recommendations for land identified as part of the Western Sydney Employment Hub located directly south of the Sydney Water Pipeline at Horsley Park. The ELS provides the vision as well as the appropriate planning framework to attract employment generating uses into the City, having informed decisions on industrial land in the preparation of Fairfield LEP 2013. See Section B of this report for more information.
March 2012	**Submission to draft Fairfield LEP 2011** Elton Consulting, on behalf of the owner, made a submission requesting that Council and DPE strategically consider the broader benefits of rezoning the site. The submission sought to: • rezone the land from the 4(c) Special Industrial zone to the R4 High Density Residential zone • amend the Height of Buildings Map to apply a maximum building height of 18 metres (6 storeys), which is lower than the standard 20 metre maximum building height control applied to the R4 zone in Fairfield, Carramar and Villawood • amend the FSR Map to apply a higher FSR • include a mechanism within the LEP to ensure that appropriate local commercial and retail development to complement R4 zone uses on key redevelopment sites.
April 2012	**Redevelopment of out of centre sites** At its meeting on 17 April 2012, the Fairfield Council LEP Committee discussed a range of submissions made to the draft comprehensive LEP, Draft Fairfield LEP 2011. One issue raised was the potential zoning changes to allow higher density residential development. In response to this issue, the LEP Committee noted:

Date	Event
	A number of sites identified were relatively large sites located away from the town centres. While they were suitable for redevelopment because of their size they were not identified in the Draft Residential Strategy because the strategy is based on the direction set in the Metropolitan Strategy which is to encourage a centres based approach where density is encouraged within and in close proximity to existing or proposed centres. None of the sites identified met this criteria and this is the reason that the proposed changes in zoning have not been supported. However, Council Officers considered that a policy framework for large residential sites outside and away from town centres should be considered. Council indicated that once this policy was adopted and endorsed by Council individual owners could then lodge a planning proposal to demonstrate how they met the criteria in Council's policy. The results of the review would determine whether the policy should enable these sorts of developments or strongly limit them. On 24 April 2012, Council resolved that an issues paper should investigate whether Council should adopt a policy for redevelopment of large lots away from existing Town Centres be prepared and reported to Council for its consideration. *This is yet to be prepared*.
May 2012	**Residential Development Strategy (RDS) - East (Draft 2009)** In May 2012 Elton Consulting, on behalf of the land owner, made a submission to Council's draft RDS outlining a number of issues that warrant further consideration by Council in order to facilitate more positive outcomes for residential development. These included: • uncertainty about where the 40% of future growth would be accommodated • significant challenges to ensure sufficient housing is actually built • the fact that the RDS lacks any mechanism to enable redevelopment opportunities in out of centre locations where uses are well located • recommendation that the RDS focus on the north-east quadrant of Cabramatta (or Cabramatta East) as the location for viable and sustainable residential development opportunities. See Section B of this report for an assessment against the RDS.
May 2013	**Fairfield LEP 2013** On the 17 May 2013 the Fairfield LEP 2013 was published on the NSW Legislation website. It commenced 2 weeks after that date being the 31 May 2013. The new LEP zoned the site B5 Business Development.
August 2013	**Economic Rezoning Assessment** In August 2013, Location IQ completed an Economic Rezoning Assessment which recommended that the site be considered for alternative uses including residential. See Section B of this report for more information and **Appendix B.2** for a copy of this report.
September 2013	**Meeting with Council** Representatives from Elton Consulting and Location IQ met with Council to discuss the Economic Rezoning Assessment. Council subsequently sent a letter to Elton outlining matters discussed and further issues to be considered. See

Date	Event
	Section B of this report for more information.
May 2014	**Supplementary Economic Feasibility Study** An Economic Feasibility Study was prepared by Location IQ addressing issues raised by Council. See Section B of this report for more information and **Appendix B.3** for a copy of this report.
June 2015	**Submission of draft Planning Proposal** In June 2015 Elton Consulting submitted a draft planning proposal to Council requesting that the site be rezoned to B4 Mixed Use.
September/ October 2015	**Letter from Council** The planning proposal was presented to Council at a briefing on the 1 September 2015. On the 1 October 2015 Council wrote to Elton Consulting outlining that the B4 Mixed use Zone would is not supported and the reasons for this including inconsistency with the recent draft Centres Study. Council did however outline that they would provide in principle support for an amended planning proposal to R4 High Density Residential, pending further assessment and a revised planning proposal being reported to Council for consideration. The letter also requested additional information site specific development provisions, traffic, contamination, flooding and the fee. These issues have been addressed in this planning proposal and supplementary reports. A copy of this letter is attached to this planning proposal (**Appendix B.7**)

4 Urban Design Report

An Urban Design Report (**Appendix B.1**) was prepared in March 2012 by Antoniades Architects to demonstrate the future development on the site – the concept plan. The concept plan was developed around the following major guiding principles:

- through site link to promote connectivity and access
- land usage, to minimise land use conflicts and meet demands for the area
- height and setback, taking into consideration the adjacent residential land use
- massing and grain
- view and open space, which is lacking within the area, and provides benefits to the adjacent community

At the forefront of the concept plan is the intention to retain employment opportunities on the site, and critically increase the number of local jobs on the site. There is also a need to accommodate a mix of housing types, catering to a full range of demographics, provide employment-generating uses, and ensure an appropriate design outcome for the surrounding community.

The landowners and project team have undertaken an integrated approach to create a concept plan, informed by a number of technical investigations including:

- Urban Design Report by Antoniades Architects
- Economic Assessment by Location IQ
- Feasibility Study by Location IQ
- Traffic and Transport Study by Thompson Stanbury Associates
- Flood Study by Integrated Group Services
- Preliminary Contamination Assessment by Aargus Pty Ltd (Annexure F).

Further a Memorandum of Understanding (MOU) has been signed with Opal Aged Care (**Appendix B.8**), one of Australia's leading providers, to operate the aged care facilities subject to planning approval. An agreement has also been obtained from a child care provider.

It is noted that following public exhibition of the Planning Proposal and consultation with State Authorities, including NSW SES, the Residential Aged Care Facilities will not be included in this concept as there are overland flooding issues which may prohibit the development of this use. Accordingly, further discussion with Council officers and the NSW SES will be required if the applicant seeks to pursue a residential aged care facility in the future. This would also trigger a revised site specific Development Control Plan. Any reference to a residential aged care facility within the remainder of this document is superseded by the Post Exhibition Council Report and the notes within this Planning Proposal. However, it does not impact the ability to proceed with the rezoning of the site to R4 High Density Residential.

4.1 Concept Plan

The concept plan translates the vision and principles to a feasible development proposal i ncorporating proposed building footprints, areas of open space and pedestrian and cyclist connectivity.

The concept plan encompasses:

- Approximately 7 buildings across the site
- transition building heights in scale to adjacent residential properties whereby building height is concentrated in the centre of the site and scaled down to 3 storeys closer to the boundaries that interface with existing residential dwellings to the west
- a range of building heights and setbacks that work together to ensure excellent amenity, both within the site and for surrounding properties, including:

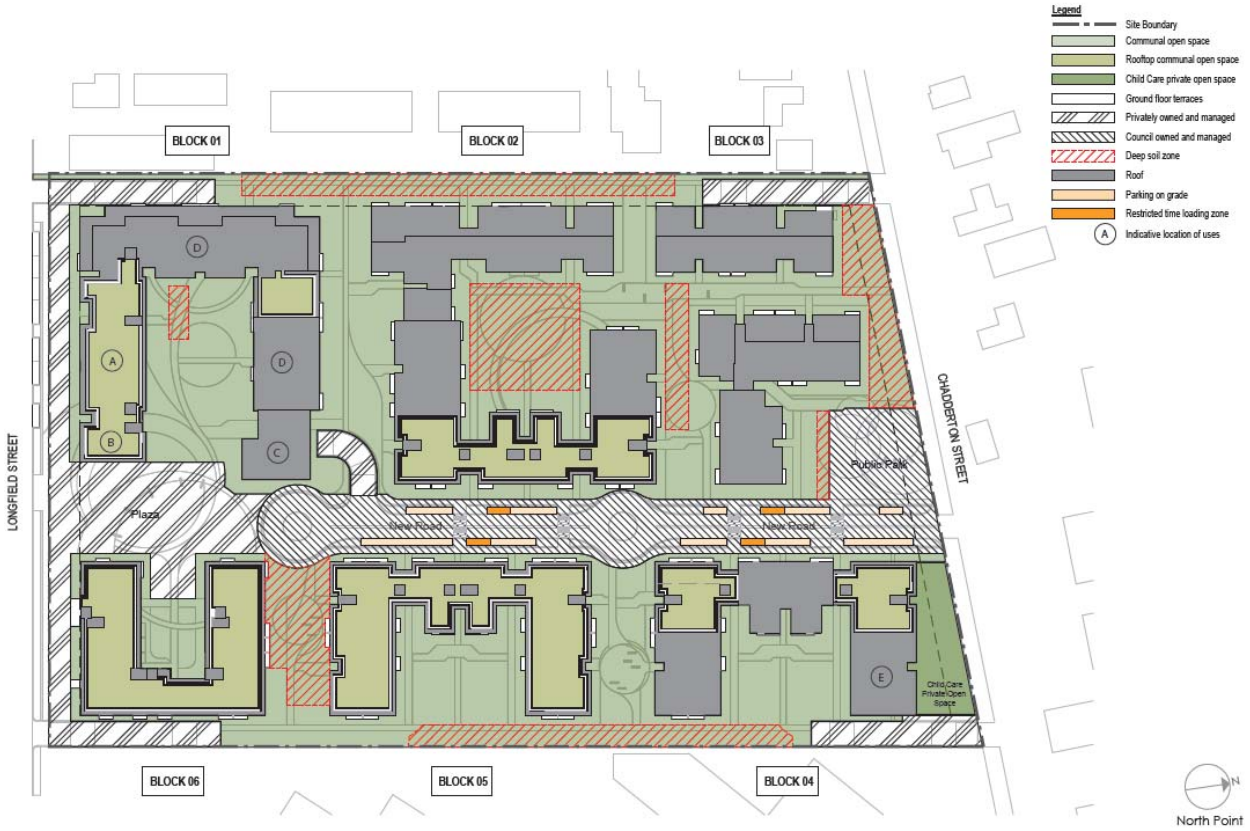
        - 3 storey buildings located along the western boundary
        - 5 to 6 storey apartment buildings centrally located on either side of the new proposed through-site thoroughfare
    - a central thoroughfare linking Chadderton and Longfield Streets to improve linkages to surrounding areas. The thoroughfare will be used as a shared pedestrian, cyclist and vehicle zone that provides a visual connection between the streets and access to the centre of the site.
    - building orientation is predominantly NS/EW to achieve excellent outlook and solar access for future occupants, as well as improve the amenity of existing residential development in terms of shadow and privacy impacts
    - public open space and a public plaza for all residents to enjoy and use, creates a local "hub" for the current and future community
    - on-street and off-street parking for the residents and an opportunity to set back the development from and create road widening along Chadderton Street to create additional street parking
    - private communal open space areas and courtyards protected from public areas for the residents, and secure outdoor areas dedicated to the Independent Living Units and seniors housing
    - landscaped buffer zones to the east and west boundaries will provide screening from neighbours and soften the appearance of the buildings
    - a new local "hub" that contains a variety of uses:
        - residential accommodation to provide a mix of studios, 1 – 3+ bedroom units to meet current and future demand
        - dedicated seniors housing that provides different levels of care for the ageing population
        - facilities to meet the needs of the community such as a child care centre, local gym and community facility (for example library or community building if Council identifies a need)
        - some local support opportunities such as a gym and takeaway food and drink premises.
    - the concept plan positions the various land-uses in locations across the site that will complement surrounding land uses and encourage the "transition" from east to west:
        - the nursing home is located in a discrete location away from the street to provide privacy and security for its residents
        - independent living units face Longfield Street to provide direct street access and street address

The concept plan also provides an opportunity to incorporate and celebrate the unique Indo-Chinese elements of the Fairfield LGA and in particular the Cabramatta community, into the proposed development.

The following figures (Figure 26–27) provide an overview of the proposed mix and location of land uses, building heights and open space and access. The revised benchmark images provided at Figure 29 and **Appendix B.9** illustrate the built form outcome that we are seeking to achieve at the site.

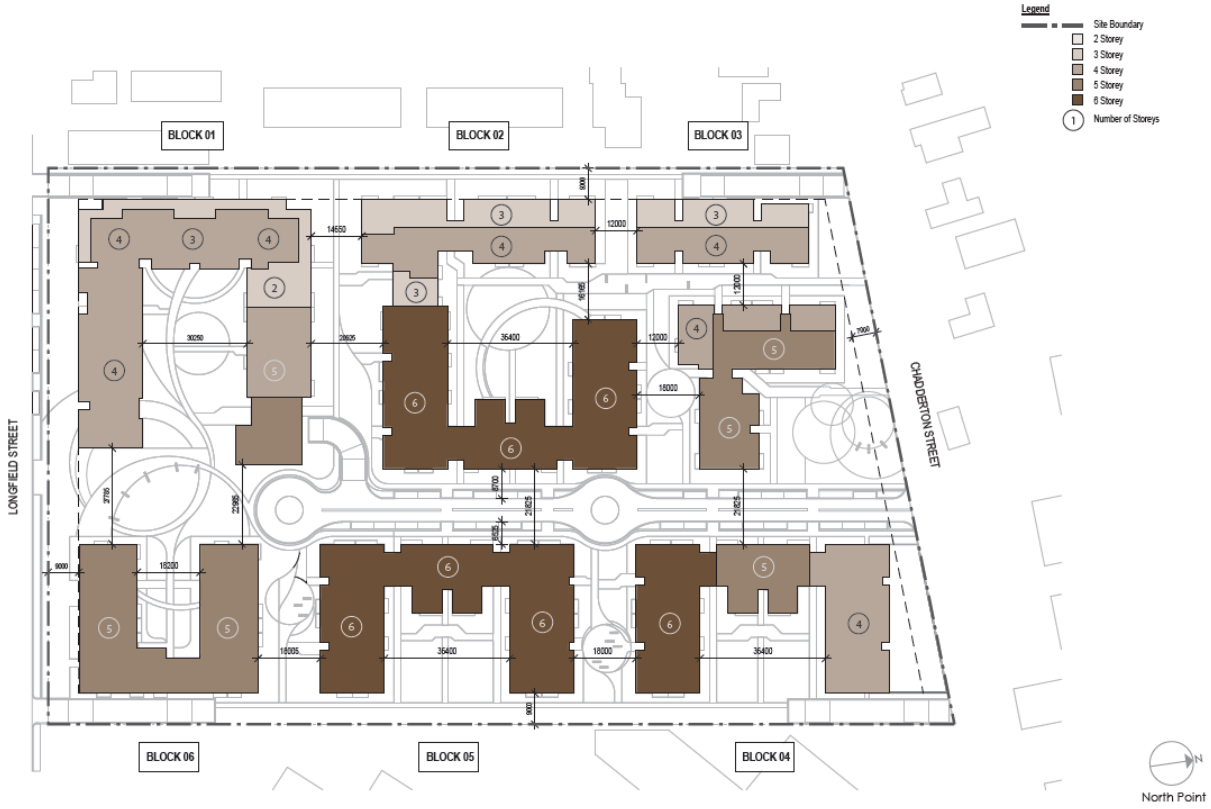
For further detail refer to the Urban Design Report (**Appendix B.1**).

Figure 26 – The proposed built form



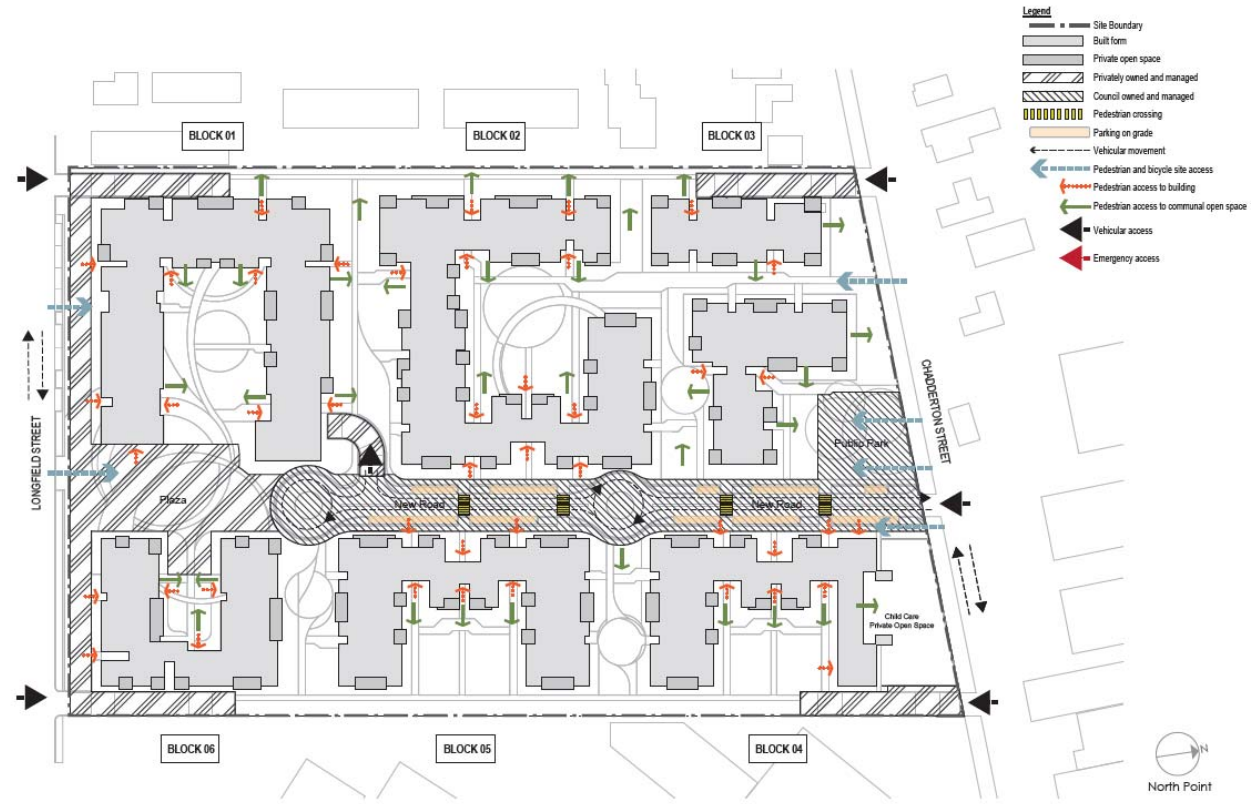
Source: Antoniades Architects

Figure 27 – Proposed building heights



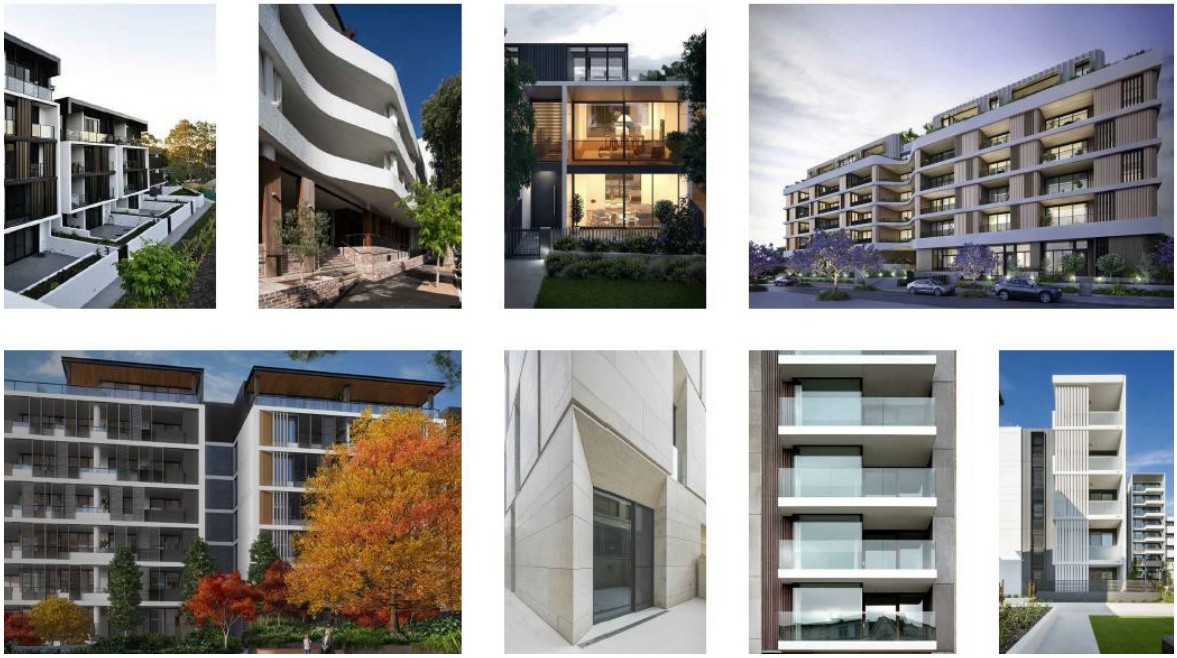
Source: Antoniades Architects

Figure 28 – Proposed open space, access and connections



Source: Antoniades Architects

Figure 29 – Benchmark images



Source: Antoniades Architects

5 Part 1 – Objectives

The planning proposal applies to the following land:

- 17 Longfield Street, Cabramatta (Lot 35 DP 456221)
- 21 Longfield Street, Cabramatta (Lot 34 DP 456221)

The objective of the planning proposal is to rezone the site from B5 Business Development to R4 High Density Residential to facilitate redevelopment of the site for the purposes of:

- a total residential units of between 500 – 650 one, two and three bedroom units
- approximately 80 – 100 over 55's dwellings
- 150 bed aged care facility including a high dependency dementia unit **(refer to note 1 below)**
- a 100 place childcare centre **(refer to note 2 below)**
- a medical centre **(refer to note 2 below)**
- community facility (if required by Council)
- an indoor recreational facility (gym)
- additional permitted uses for:
  - an indoor recreational facility (gym)
  - take-away food and drink premises
- improved pedestrian and cyclist connections though the site and surrounding area
- improved traffic and parking conditions compared to existing approved uses at the site.

The planning proposal is in accordance with Council's decision at its meetings on 10 May 2016 and 24 May 2016 - see **Attachment A.1** for Council report.

NOTE 1: It is noted that following public exhibition of the Planning Proposal and consultation with State Authorities, including NSW SES, the Residential Aged Care Facilities will not be included in this concept as there are overland flooding issues which may prohibit the development of this use. Accordingly, further discussion with Council officers and the NSW SES will be required if the applicant seeks to pursue a residential aged care facility in the future. This would also trigger a revised site specific Development Control Plan.

NOTE 2: It is also noted that these uses will be subject to further assessment and flood assessment at the development application stage.

Part 2 – Explanation of provisions

To achieve the objectives mentioned above, the Planning Proposal will need to amend the Fairfield Local Environmental Plan 2013 (FLEP 2013) as follows:

1. Rezone the subject site from B5 Business Development to R4 High Density Residential
2. Introduce a Floor Space Ratio of 2:1
3. Introduce a maximum Height of Building of 20 metres
4. Utilise Schedule 1 of the Fairfield LEP 2013 to introduce an additional permitted use over the site as below:

21 Use of certain land 17-21 Longfield Street, Cabramatta

1) This clause applies to 17-21 Longfield Street, Cabramatta (being Lot 34 and 35 in DP 456221) and identified as "24" on the Key Sites Map.

2) Development for the purposes of the following is permitted on the land:

a) recreational facilities (indoor);

b) take away food and drink premises.

3) Despite Clause 5.4(2) the maximum combined floor area for Take Away Food and Drink Premises and Neighbourhood Shops is 160 square metres.

Refer to 8 – Part 4 Maps depicting the above mentioned site and related maps.

Part 3 – Justification

Section A – Need for the planning proposal

Is the planning proposal a result of any strategic study or report?

There are a number of studies which apply to this proposal. These include:

- Fairfield Employment Lands Strategy 2008
- Fairfield City Centres Study 2015
- Fairfield City Centres Policy 2015
- Fairfield Residential Development Strategy 2009

Fairfield City Centres Study and Fairfield City Centres Policy 2015

The Fairfield City Centres Study 2015 and Fairfield City Centres Policy 2015 were adopted by Council in February 2016.

The Policy and Study provide a number of principles, objectives and assessment criteria for which applications are to be assessed.

The Fairfield City Centres Study 2015 identifies that:

> *"The City also has a significant shortfall of bulky goods retailing floorspace, estimated to be in the order of 40,000m2. This can be attributed to a lack of vacant appropriately zoned sites and the more recent development of several bulky goods centres outside the City, especially within Liverpool City. Future opportunities may present along the Hume Highway should existing older industrial businesses elect to relocate. It is noted that the City has extensive lands contained within the B5 zone, most of which, however, is occupied by industrial activities."*

The subject site is currently underutilised as bulky goods, currently contains a number of industrial uses.

The Cabramatta North Precinct currently has significant areas which have not been developed for bulky goods. There are a number of areas which also contain residential dwellings, totalling 10,000 square metres.

Wetherill Park precinct has a number of large sites which have not been developed and are currently vacant. These sites are quite large with a total area of 50,000 square metres.

The proposal is seeking to rezone approximately 40,000 square metres of B5 Business Development land. The proposal is also seeking to include an additional permitted use for small convenience store, pharmacy restaurant or café, bakery, video store, dry cleaners, etc.

Fairfield Employment Lands Strategy 2008

The current Employment Lands Strategy from February 2008 identifies that this site is within the Cabramatta North Hume Highway Precinct. The strategic recommendation for this precinct is to protect and promote employment generating uses within the precinct and not permit residential uses, commercial or retail development to protect existing centres.

A review of the current Cabramatta North Hume Highway precinct shows business clustering is limited as the uses within the precinct are extremely varied often not uses that would be encouraged in the B5 Business Development zone, such as bulky goods. The precinct currently contains uses such as large warehousing sites, residential properties, restaurants, a hotel, services stations and car sales, as well as bulky goods.

The subject site is very large, close to 4 hectares in area. Overtime the site has attracted larger industrial type uses such as warehousing which may require 24 hour operation to stay competitive.

As the site is currently zoned B5 Business Development and its close proximity to residential zoned land, these uses and hours of operation are not entirely appropriate. The size of the site attracts uses that create a land use conflict between the sensitive uses in the residential zones and the industrial zone. These types of land use conflicts would not normally happen if the site was being utilised for its purpose as it is zoned, such as a bulky goods which operate normal business hours.

Historically there have been a number of complaints from adjoining land owners relating to the industrial activities on the subject site, particularly relating to noise, hours of operation, large truck movements and trucks parking on the street for extended periods of time.

The planning proposal seeks to remove this land use conflict and introduce more suitable land uses while seeking to maintain the employment capacity of the site through aged care, childcare, and medical centre/uses.

Fairfield Residential Development Strategy 2009

The Fairfield Residential Development Strategy (RDS) identifies areas within Fairfield City that should be investigated for future increase in residential density. The key principle for the increase in density within the City outlined by the RDS is density around centres and along corridors. This was reflected in the initial RDS which proposed residential density increase in and around the Cabramatta Town Centre.

The preparation of the Cabramatta Transport and Accessibility Management Plan (TMAP) identified significant issues associated with the proposed densities in and around Cabramatta, particularly within the western half of the City. The TMAP identified that significant intervention and investment would be required, should the proposed densities be introduced.

On 14 July 2015, Council resolved to not proceed with the proposed residential density for Cabramatta as identified by the Fairfield RDS and the draft Cabramatta Town Centre Development Control Plan. Council also resolved to undertake further investigations to identify the scope for future urban infill development in and around the town centre without compromising the capacity of the current road network and minimises the need for major infrastructure improvements.

Council officers are still in the process of reviewing future density options around Cabramatta, however, it is likely that large strategic sites and residential capacity east of the railway line where the traffic impacts are less significant, will be the focus. The proposal to rezone 17-21 Longfield Street, which is east of the railway line, may be the first stage of this review.

The proposal provides opportunity to implement urban renewal within proximity to services and transport provided within Cabramatta Town Centre.

Fairfield City Community Strategic Plan 2012-2022

The planning proposal is consistent with Theme 1, Goal 3 of the Fairfield City Community Strategic Plan 2012-2022. The table below illustrates how the planning proposal achieves the outcome of the Theme and Goal.

Relevant FCCSP Outcome within the theme	Council's commitment to the outcome	How the planning proposal achieves the outcome
Theme 1 **Goal 3:** Enjoying a good standard of living and enhanced quality of life (we can satisfy our needs to meet our changing life requirements and ambitions)	**3.3** A range of housing types that caters for different life stages, family needs and levels of affordability.	The planning proposal seeks to rezone B5 Business Development zoned land to R4 High Density Residential. The planning proposal will also subsequently increase the Floor Space Ratio and Height of Buildings controls for the subject site. The proposed amendments to the *FLEP 2013* will assist in facilitating a range of housing types in Cabramatta to meet the needs of families at different stages of their lives and levels of affordability. The proposed development will provide housing choice for all family stages including residential apartments, seniors housing and residential care facilities.

Economic Assessment

The key findings from applicant's Economic Assessment report were based on analysis, review and consideration of the following:

- regional and local context of the site
- history of the site and the current planning framework
- recent trends in the supply of industrial land in the Sydney metropolitan area, and how these trends relate to the subject site
- audit of vacant industrial zoned land within the Fairfield LGA
- key drivers of industrial land generally in the Fairfield LGA, and how these key drivers relate to the subject site
- growth in the Fairfield LGA including current and projected population levels over the period to 2026
- socio-economic profile of the Fairfield LGA population by suburb
- employment trends throughout the Fairfield LGA
- net gain in employment as a result of the rezoning of the subject site from 'industrial' to 'residential' under the proposed concept plan
- potential for the planned childcare, aged care and residential support services such as indoor recreation facility (gym).

A summary of the key findings of the assessment included:

- The Cabramatta North Hume Highway Industrial Area is a primarily automotive precinct together with older manufacturing and warehousing facilities. Even though the precinct is zoned for industrial/business development uses, approximately only 43% of total tenants are traditional industrial uses. The natural progression of this precinct, transitioning to a mix of uses as opposed to traditional industrial uses, indicates the decreasing demand for industrial uses in this precinct.

The rezoning of the subject site from industrial/business development to R4 High Density Residential would form a natural progression in the surrounding precinct.

- The main industries currently seeking to occupy the site are logistics or manufacturing uses. These businesses uses do not necessary serve the needs of the local population and could effectively relocate in any industrial precinct within the Fairfield LGA. These uses also present a conflict with surrounding residential uses due to noise/traffic created by industrial tenants.

- The site is difficult to lease with most industrial tenants requiring 24 hour, seven days a week, B Double/Triple access. These requirements are provided at surrounding industrial precincts. In comparison, the subject site is bounded by residential dwellings in the south and west, with limited hour truck movements.

- The subject site accounts for less than 1% of total industrial/business development land within the Fairfield LGA. There is a large supply of industrial zoned land throughout Fairfield that includes modern industrial facilities or is available for the development of modern industrial facilities. There are also a number of proposed developments in the area that are centrally located to transport infrastructure. Consequently, the rezoning of the subject site will not materially impact the availability of suitable industrial land within the Fairfield LGA. This is particularly the case given that the subject site is restricted in its operational uses to industrial/business development, and is not needed given the large supply of existing and proposed industrial zoned/employment generating land.

- The Fairfield LGA has experienced a significant decline in industrial employment over the period from 2006 – 2011. There are also a number of vacancies/vacant land throughout other industrial zoned areas within the Fairfield LGA, reflecting decreased demand for industrial employment in built up areas, which is consistent with broader trends in New South Wales and Australia.

- Based on future population growth, there is likely to be a shortfall of around 18,500 dwellings by 2026 in the Fairfield LGA. This indicates increasing demand for residential land within the Fairfield LGA, while at the same time; demand for industrial employment land is decreasing.

- The proposed development will be highly innovative, reinvigorating the local area and allowing families, including grandparents, parents and children to dwell and age in the one precinct. This is very important culturally to the ethnically diverse population of Cabramatta.

<u>Conclusions</u>
Based on the above, the following conclusions were made:

- The current zoning no longer represents the most suitable zoning of the site. While it is important that a provision of industrial/business development land remains within the Fairfield LGA, it is equally important to recognise optimal locations for these types of facilities. It is clear that the industrial area particularly east of Hume Highway represents a key employment generating area within the Fairfield LGA and be maintained in the future. However, the subject site and directly surrounding uses within the "triangle" is not suitable for purely industrial/business development uses, as demonstrated by the already changing nature, transition and more retail uses.

- There is decreasing need for all industrial employment lands within the Fairfield LGA to remain in their current dated built form and limited access arrangement. As such, the subject site is both not suitable for industrial uses but is also not needed as an industrial

employment generating land. Notwithstanding, the rezoning proposal represents a unique opportunity to revitalise the site, facilitate jobs that are suitable to the profession of the local communities (as per the ABS Census), aged care and other employment generating uses and represents a local brownfield revitalisation project.

A copy of the Economic Assessment Report prepared by Location IQ is provided at **Appendix B.2**.

State Environmental Planning Policy (SEPP) (Housing for Seniors or People with a Disability) 2004

State Environmental Planning Policy (SEPP) (Housing for Seniors or People with a Disability) 2004 (known as HSPD SEPP) provides controls and guidelines relating to the development of seniors housing. The policy aims to encourage the provision of housing that will:

- » increase the supply and diversity of residences that meet the needs of seniors or people with a disability, and
- » make efficient use of existing infrastructure and services, and
- » be of good design.

The proposed development will increase the supply of seniors housing in Cabramatta, make efficient use of existing infrastructure being with closed proximity to Cabramatta Town centre (1.5km east), Liverpool Hospital (3.5km south) and be of a good design.

Any future development application for the seniors housing would need to assessed against the provisions of HSPD SEPP to ensure that the development is of quality design and meets the needs of seniors. In particular clause 26 provides locational and access to facility requirements that must be satisfied before granting consent to a senior's housing development. An extract of this clause is provided at **Appendix B.11**

In summary, clause 26 of the HSPD SEPP requires that residents of the proposed senior's housing development are required to have access to the following:

- o shops, bank service providers and other retail and commercial services that residents may reasonably require, and
- o community services and recreation facilities, and
- o the practice of a general medical practitioner.

The facilities and services referred to above are to be located at a distance of not more than 400 metres from the site of the proposed development, that is a distance accessible by means of a suitable access pathway and the overall average gradient for the pathway is no more than 1:14 (with specified exceptions).

The clause also requires that the there is a public transport service available to the residents of not more than 400 metres from the site of the proposed development and the distance is accessible by means of a suitable access pathway, and that will take those residents to a place that is located at a distance of not more than 400 metres from the facilities and services referred to above and that is available both to and from the proposed development at least once between 8am and 12pm per day and at least once between 12pm and 6pm each day from Monday to Friday (both days inclusive).

Transport

The proposal will provide community and recreation facilities on site by way of high quality and accessible public plazas, a community centre, a gym, a park and landscaped areas that will promote social interaction and assist in creating a sense of place. Refer to Urban Design Report at A.

As shown in Figure 31 and Figure 32 and there are two local bus routes servicing the site, with bus stops located at the northern boundary of the site at Chadderton Street (over 200m from the southern end of the site) and along Longfield Street (200m) from southern entrance to the site.

The site is also within close proximity (approximately 200m from the southern boundary of the site and about 400m from the northern boundary of the site) to the Lansvale Neighbourhood Centre. This centre includes a post office, take away Chinese restaurant, hairdresser, McDonalds, bakery, Porters Liquor, TAB, Lansvale supermarket, pharmacy and medical centre. While this centre is close in terms proximity it is not readily accessible as it is separated from the site by the Hume Highway, a state road with six lanes for traffic that also provides direct access to a number of industrial/commercial businesses (See Figure 33).

Further while buses services connect to the Lansvale Centre itself is not considered to be the most safe or suited to accommodating and meeting the needs of seniors and other residents, given its location and layout which is primarily focused on vehicle access.

The proposed rezoning to R4 High Density Residential will permit development on a neighbourhood shop to a maximum floor area of 80 square metres.

As outlined the proposed residential support uses such as neighbourhood shop and indoor recreation facility uses are only intended to support the mix of uses at the site and assist in the transition from the B5 Business Development Zone to residential. Further consideration of neighbourhood shop impacts is addressed in Part 5.

Figure 31 Bus stops

Source: Nearmap

Figure 32 Bus route map 904 and S1

Source: Transdev NSW V3

Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

The only way to achieve the objectives and outcomes as identified above is to rezone the site to R4 High Density Residential with the additional permitted uses of indoor recreation facility and take away food and drink premises.

Section B – Relationship to strategic planning framework

Is the planning proposal consistent with the objectives and actions contained within the applicable regional or sub-regional strategy (including the Sydney Metropolitan Strategy and exhibited draft strategies)?

This section outlines how the planning proposal is consistent with the objectives and actions of:

- NSW 2021 – A Plan to make NSW Number (1, September 2011)
- South Western Sydney Regional Action Plan (December 2012)
- A Plan for Growing Sydney (December 2014)
- draft West Central Subregional Strategy (WCSRS) (December 2007).

NSW 2021 – A Plan to make NSW Number 1 (September, 2011)

Overview

NSW 2021 is a plan to make NSW number one. It is a 10 year plan to rebuild the economy, provide quality services, renovate infrastructure, restore government accountability, and strengthen our local environment and communities.

Assessment

The proposed development is consistent with the strategies and goals of NSW 2012 in particular the proposal development will assist in achieving the following goals:

Table 10 – Achieving NSW 2021 Goals

NSW 2021 Goals	Comment
1. Improve the performance of the NSW economy	Provides additional employment – The proposal is estimated to increase the number of ongoing jobs from 90 to 246 thereby improving the NSW economy.
7. Reduce travel times	The proposal will increase local employment opportunities thereby creating opportunities for local employment.
8. Grow patronage on public transport by making it a more attractive choice	The site is within 20 minutes walk of the Cabramatta rail station (1.5km), and is located along a bus corridor. As such it is expected that public transport will be an attractive option.
10. Improve road safety	Reduce the number of large trucks operating in the local residential street.
11. Keep healthy people out of hospital	Creates a space for multigenerational living contributing to the social well-being of families within Cabramatta. Further the development has been designed in accordance with Healthy by Design and Active Living Guidelines. In particular the proposal includes a range of public plazas, public and private green spaces that encourage social interaction and active lifestyles all of which contribute to health and well-being.
12. Provide world class clinical services with timely access and effective infrastructure	Aged care facility will be delivered by leading Australian provider Domain. Associated facilities including medical centre and pharmacy will be available to support the facility.

14. Increase opportunities for people with a disability by providing supports that meet their individual needs and realise their potential	Includes independent living units and adaptable units that will enable people with disability to live self-sufficiently.
20. Build liveable centres	The proposal and future residents will support the Cabramatta Town Centre, where the primary facilities and services are provided. Local commercial and residential support services such as neighbourhood shop provided are intended to support the aged care facility and serve the day to day needs of the local residents.
23. Increase opportunities for people to look after their own neighbourhoods and environments	Provides residential accommodation for a wide social mix and potentially deliver a cohesive multi-generational living environment. Opportunities for residents to look after open space and landscaped areas could be investigated.
24. Make it easier for people to be involved in their communities	Provides high quality and accessible public plazas, a community centre, a park, landscaped areas and communal and private open space that promotes social interaction (between residents and the local community) and a sense of place.
25. Increase opportunities for seniors in NSW to fully participate in community life	Delivers housing for seniors including aged care, independent living units and adaptable units in a high quality development with a range of public spaces including park, community centre and plazas; thereby increasing opportunities for seniors to be involved in community life.
27. Enhance cultural, creative, sporting and recreation opportunities	Designed with Feng Shui principles in mind, the Circle's facades will feature colours and materials evocative of the local areas Indo- Chinese culture. Public Art, landscaping and fountains are also being explored. Further the site is well connected to local landmarks, including the Minh Quang Buddhist Temple. Lastly a public park, landscaped areas as well as private and communal open space will be provided.
32. Involve the community in decision making on government policy, services and projects	The community will have the opportunity to have their say on the proposal (subject to it progressing) in accordance with state and local government legislative requirements, guidelines and policy.

A Plan for Growing Sydney (December, 2014)

A Plan for Growing Sydney is the metropolitan strategy that will guide land use planning decisions for the next 20 years. Decisions that determine where people will live and work and how we move around the city.

The Government's vision for Sydney is a strong global city, a great place to live. T o achieve this vision, the Government has set down goals that Sydney will be:

- a competitive economy with world-class services and transport
- a city of housing choice with homes that meet our needs and lifestyles
- a great place to live with communities that are strong, healthy and well connected
- a sustainable and resilient city that protects the natural environment and has a balanced approach to the use of land and resources.

The planning proposal is consistent with the objectives of Plan and can contribute to achieving several directions and actions particularly those related to housing as outlined in the table below.

Table 12 – Assessment of the proposal against A Plan for Growing Sydney

Directions and actions	Consistency
Goal 1: A competitive economy with world-class services and transport	
Direction 1.5: Enhance capacity at Sydney's gateways and freight networks	
Action 1.5.2: Support the productivity of the freight network by identifying buffers around key location on the freight network	The subject site does not have direct access to the Hume Highway. Vehicle entry is only available to the right (south) from Chadderton Street as Longfield Street has a no right-turn, meaning that trucks often need to navigate through residential streets to access the Hume Highway. The rezoning of this site will remove heavy vehicle routes from the local streets thereby improving the operation and efficiency of the freight network. The site will act as a transition site providing a buffer between the residential areas (south-west, west & north-west) and the industrial/business uses which front Hume Highway maximising the productivity of this key freight route.
Direction 1.9: Support priority economic sectors	
Action 1.9.2: Support key industrial precincts with appropriate planning controls	Industrial Lands Strategic Assessment Checklist guides the assessment of proposed rezonings of industrial lands. The Checklist allows for evidence based planning decisions and aims to prevent encroachment on important industrial sites. This Checklist is addressed in Location IQ's Feasibility Report attached to this report and detailed below.
Direction 1.10: Plan for education and health services to meet Sydney's growing needs	
Action 1.10.3: Plan for expansion of health facilities to service Sydney's growing population	The Fairfield LGA population is currently estimated at 197,996 in 2013, including 124,769 persons within the Fairfield East SLA. The Fairfield LGA population is projected to increase to 212,305 by 2026 and 216,508 by 2013. The ageing population has significant implications on the provision of housing, recreation and leisure opportunities and age-specific community facilities. By 2031, Fairfield LGA will house almost double the number and proportion of residents aged 65 years and over, equivalent to 37,000 or 20% of the population aged over 65 years. The proposed redevelopment has the potential to provide health facilities (aged care facility and associated support facilities) for the needs of changing demographics in the Fairfield LGA – ethnically diverse, an ageing population and greater proportion of people needing care.

Goal 2: A city of housing choice, with homes that meet our needs and lifestyles	
Direction 2.1: Accelerate housing supply across Sydney	
Action 2.1.1: Accelerate housing supply and local housing choices	According to the draft Subregional Strategy for the West Central subregion, the Fairfield LGA needs to accommodate 24,000 additional dwellings by 2031. Based on future projected population growth throughout the Fairfield LGA, there is likely to be a projected shortfall of around 18,500 dwellings by 2026 (forecast.id.). The site represents a unique opportunity to deliver housing supply now. The proposed development will deliver a diverse and multi-generational community – a variety of housing options will be provided including 1, 2, 3 bedroom apartments (including adaptable units) and housing for seniors including aged care and independent living units.
Direction 2.2: Accelerate urban renewal across Sydney – providing homes closer to jobs	The proposed development will directly help to achieve and accelerate additional housing supply and employment opportunities; assisting in providing jobs closer to homes. The Circle will provide jobs in child care, aged care and a small neighbourhood shop. The site will generate at least double the employment opportunities currently on site. At present, less than 60 jobs on site. The growing aged and childcare sectors are where the current population living in the area are skilled, and therefore support the local community.
Direction 2.3: Improve housing choice to suit different needs and lifestyles	As outlined above the proposal will deliver multi-generational community. It will provide seniors housing that will assist the elderly to age in place and self-care, provide a mix of housing types and a range of affordable choices so that the labour force has the option of living near potential employment opportunities
Goal 3: A great place to live with communities that are strong, healthy and well connected	
Direction 3.1: Revitalise existing suburbs	The site is located on Longfield Street within close proximity to Cabramatta Town Centre. Longfield Street is a main corridor for access and connectivity to the town centre and Cabramatta East. Redevelopment of the site could rejuvenate the eastern edge of Cabramatta, support good urban design outcomes, create public benefits such as connectivity and open space and trigger redevelopment along the Longfield corridor.

Direction 3.3: Create healthy built environments	The proposal will deliver network of green space including a public park, landscaped boulevards, private and communal open space and buffers. Two (2) public plazas and community centre will also be provided. These spaces will encourage social interaction and create a sense of community all of which will contribute to the health and wellbeing of the community.
Direction 3.4: Promote Sydney's heritage, arts and culture	The proposal has been designed with Feng Shui principles in mind, the facades will feature colours and materials evocative of the local areas Indo- Chinese culture. Public Art, landscaping and fountains are also being explored. The site is also well connected to local landmarks, including for example, the Minh Quang Buddhist Temple.
Goal 4: A sustainable and resilient city that protects the natural environment and has a balanced approach to the use of land and resources	
Direction 4.3: Manage the impacts of development on the environment	The proposal provides a productive, liveable and sustainable environment. The urban design ensures a walkable neighbourhood to open space provision and services for the local and neighbouring community. The site is located within close proximity to bus and rail thereby reducing dependency on cars. Contamination and flooding issues have been addressed to ensure that any adverse impacts are managed.
South West Subregion – Priorities for the south west subregion	
A competitive economy	
Recognise and strengthen the subregion's role in Sydney's manufacturing, construction and wholesale/logistics industries by maximising existing employment lands particularly in Fairfield and Liverpool.	The site will provide a transition between business/industrial uses to the east (across the Hume Highway) as well as protecting the surrounding employment uses particularly those along the Hume Highway and providing opportunities for employment generating uses that are more compatible with the surrounding residential area and in demand. The industrial uses fronting Hume Highway in Cabramatta East should be recognised as playing an important role in terms of employment however this underutilised and constrained site should be considered
Accelerate housing supply, choice and affordability and build great places to live	

Identify suitable locations for housing, employment and urban renewal – particularly around established and new centres and along key public transport corridors including the Cumberland Line, the South Line, the Bankstown Line, the South West Rail Link and the Liverpool-Parramatta T-Way.	It is well serviced by public transport and has good links to surrounding centres. The railway line runs through Cabramatta and provides direct access to the Cumberland line, South line, Inner West and Bankstown lines providing quality public transport accessibility to a large proportion of the Sydney Basin. The subject site is located approximately 1.5 km east of the Cabramatta railway station and Cabramatta town centre catchment. There are regular local bus services along Longfield Street to the Cabramatta town centre to connect with rail services. In addition, there are bus services along the Hume Highway to Liverpool, the major regional centre, and Fairfield.
Capitalise on the subregion's vibrant cultural diversity and global connections.	See comments at Direction 3.4: Promote Sydney's heritage, arts and culture above.

Industrial Lands Strategic Assessment Checklist

Table 13 – Assessment against Industrial Lands Strategic Assessment Checklist

Is the proposed rezoning consistent with State and/or Council strategies on the future role of industrial lands?
No
Is the site near or within direct access to key economic infrastructure?
• The site is located along Longfield Street, to the west of the Hume Highway. • Employment lands within the Cabramatta North Hume Highway Industrial Area (location of the subject site) generally enjoy direct frontage to the Hume Highway, experiencing benefits of direct access. This means vehicle and truck movements are not redirected through residential streets. • The subject site does not share this characteristic as there is no direct access to the Hume Highway, with vehicle and truck access provided via residential streets (Longfield Street and Chadderton Street). As such, while the subject site is located within close proximity to the Hume Highway, it does not enjoy direct access to this key economic infrastructure.
Is the site contributing to a significant industry cluster?
• The subject site is located within the Cabramatta North Hume Highway Industrial Area which extends west of the Hume Highway and is bounded by Lansdowne Road in the north and Boundary Lane in the south. The precinct is only small, incorporating around 16.5 hectares of land and is estimated to employ some 360 workers (Fairfield Employment Lands Strategy, 2008, p86). As such, the subject site does not contribute to a significant industry cluster.

The Cabramatta North Hume Highway Industrial Area is located on the western side of the Hume Highway, with the Lansvale Industrial Area located to the east. There is a significant degree of barrier separation provided by the Hume Highway between the Lansvale Industrial Area and the Cabramatta North Hume Highway Industrial Area. Land uses on the eastern side of the Hume Highway represent a "cluster" of traditional industrial uses such as car dealerships and warehousing. In contrast, the western side of the Hume Highway primarily includes non-industrial uses, such as retail, bulky goods, food catering, hotels and residential dwellings, even though the land is currently zoned B5 Business Development.

How would the proposed rezoning impact the industrial land stocks in the subregion or region and the ability to meet future demand for industrial land activity?

- A total of approximately 774.4 hectares of industrial land is identified within the Fairfield LGA. The Cabramatta North Hume Highway Industrial Area (approximately 16.5 hectares) accounts for approximately 2.1% of the total. The subject site itself, at around 4 hectares, accounts for less than 1.0% of total industrial land in the Fairfield LGA.
- There is a large supply of industrial zoned land throughout Fairfield that includes modern industrial facilities or is available for the development of modern industrial facilities. There are also a number of proposed developments in the area that are centrally located to transport infrastructure. Consequently, the rezoning of the subject site will not materially impact the availability of suitable industrial land within the Fairfield LGA.

How would the proposed rezoning impact on the achievement of the subregion/region and LGA employment capacity targets and employment objectives?

- According to the Fairfield Employment Lands Strategy (2008) and the 2011 Census, industrial lands within the Fairfield LGA employ approximately 30,426 workers. The Cabramatta North Hume Highway Industrial Area employs around 1.2% of this total, with the subject site itself employing less than 0.3% of the total.
- The proposed rezoning of the subject site from industrial uses to residential use (including some other local mix of sues), allowing for the redevelopment of the site under the proposed concept plan, will result in an estimated $125 million investment in the local Fairfield economy.
- Tables 3.1 and 3.2 of the Feasibility Study summarises future employment at the site as a result of the proposed redevelopment. The redevelopment of the subject site would result in an additional 933 temporary and permanent employment positions (687 construction, residential support services, 15 childcare, 150 aged care), resulting in a further 1,178 jobs a result of supplier induced multiplier effects. As such, total employment generated from the redevelopment of the subject site is estimated at 2,111. The proposed rezoning would therefore assist in achieving the subregional employment targets.
- Total employment from the ongoing operation of the Cabramatta Intergenerational Community (neighbourhood shop, gym, takeaway food and drink premises, childcare, aged care) is estimated at 246, which is more than double the current employment level at the subject site.

Is there a compelling argument that the industrial land cannot be used for an industrial purpose now or in the foreseeable future and what opportunities may exist to

redevelop the land to support new forms of industrial land uses such as high-tech or creative industries?

- Based on discussions with the owner of the subject site, the main industries seeking to occupy the site are logistics or manufacturing uses. These uses present a conflict with the surrounding residential uses and there is a long history of land use complaints, primarily due to noise and traffic created by industrial tenants.

- The current site has had difficulties for many years to be fully occupied by employment uses only.
- The existing composition of tenants at the site is not compatible with the surrounding residential uses given the lack of reasonable separation between the Cabramatta North Hume Highway Industrial Area and the existing residential area of Cabramatta.
- According to the owner, the site is difficult to lease with most industrial tenants requiring 24 hour, seven days a week, as well as B Double/Triple access. These requirements are provided at surrounding industrial precincts such as Wetherill Park, Smithfield and the future Western Sydney Employment Area. In comparison, the Longfield Street site is generally surrounded by residential dwellings and truck movements are limited to daylight hours.
- The proposed redevelopment of the subject site is known as the Cabramatta Intergenerational Community, which is planned to include 435 residential apartments, neighbourhood shop to support the residential and other uses such as medical with a floor space of approximately 2,400 sqm, an aged care facility and child care centre.
- The proposed vision for the site is to create a high quality intergenerational mixed use precinct that will reinvigorate the local area, allowing families, including grandparents, parents and children, to live and age in the one precinct. This is very important culturally to the ethnically diverse population of Cabramatta. Furthermore, the proposed development will provide a range of community facilities, including childcare, aged care and neighbourhood shop to service the day to day needs of local residents, benefiting the local community.

Is the site critical to meeting the need for land for an alternative purpose identified in other New South Wales Government or endorsed Council planning strategies?

- Based on population projections prepared by forecast.id, the Fairfield LGA population is currently estimated at 197,996 in 2013, including 124,769 persons within the Fairfield East SLA. The Fairfield LGA population is projected to increase to 212,306 by 2026, representing an additional 14,310 persons or an average annual growth rate of approximately 0.5% over the forecast period.
- The additional 14,310 persons over the forecast period would require in-excess of 5,500 new dwellings as a minimum to be provided by 2026. This allows for a more conservative average household size, based on the Australian average of 2.6 persons per household.
- According to the Department of Planning's Draft (2008) Subregional Strategy for the West Central subregion, the Fairfield LGA needs to accommodate an approximate 24,000 additional dwellings by 2031. This is in keeping with Fairfield LGA growing at a much faster rate than outlined by forecast.id at closer to 1.0% - 1.5% per annum. On this basis, this indicates a shortfall of around 18,500 dwellings by 2026.
- Overall, significant future population growth is planned for the Fairfield LGA by the State Government. However, population growth has not been as strong as predicted, with a significant shortfall in the number of developed dwellings projected to occur. This partly relates to the difficulty in encouraging residential development in established residential areas of Sydney, particularly middle ring suburbs of the metropolitan area, where a combination of land price, difficulty to acquire and consolidate land as well as a range of other factors mean that redevelopment can be economically unviable.
- Given that the planned residential development at the subject site will comprise a minimum of 435 apartments located around 1 km to the east of Cabramatta Town Centre and Cabramatta Railway Station, the proposed development is consistent with the submission to the Draft Metropolitan Strategy for Sydney to 2031 by Fairfield City Council which states

Draft West Central Subregional Strategy (WCSRS) (December 2008)

In 2008, the NSW State Government released the draft West Central Subregional Strategy (WCSRS) which implements the, then, Sydney Metropolitan Strategy at the local level. The draft WCSRS covered the Auburn, Bankstown, Fairfield, Holroyd and Parramatta LGAs.

Since that time, the subregional strategy has been superseded by "A Plan for Growing Sydney". It is anticipated that relevant subregion/district plans will be prepared and finalised by the end of 2016.

However, the WCSRS strategy contains population growth, housing and employment targets which will underpin future development in Fairfield LGA.

Fairfield was identified as the largest and most populated LGA within the West Central subregion and has the highest growth target for dwelling in the subregion. Between 2004 and 2031 an additional:

- 24,000 dwellings are to be provided within the LGA reflecting an increase of 1.5% per annum, and
- 15,000 jobs are to be provided within the LGA reflecting an increase of 26.3% in local employment opportunities.

In addition to these targets, three key directions for the subregion relevant to the rezoning are:

- To provide greater housing choice and affordability
- To provide local employment opportunities
- To plan for housing growth close to public transport corridors.

Is the planning proposal consistent with the local Council's community strategic plan, or other local strategic plan?

Section A – Need for the planning proposal of the Planning Proposal identifies the consistency against Council's strategic documents, including:

There are a number of studies which apply to this proposal. These include:

- Fairfield Employment Lands Strategy 2008
- Fairfield City Centres Study 2015
- Fairfield City Centres Policy 2015
- Fairfield Residential Development Strategy 2009

Is the planning proposal consistent with the applicable state environmental policies?
The relevant State Environmental Planning Policies are outlined in the table below:

SEPP Title	Relevance	Consistency of Planning Proposal
SEPP 19 – Bushland in Urban Areas	N/A	-
SEPP 21 – Caravan Parks	N/A	-
SEPP 30 – Intensive Agriculture	N/A	-
SEPP 32 – Urban Consolidation (Redevelopment of Urban Land)	Yes	The planning proposal involves urban renewal for housing diversity and density and local scale commercial uses at a density and height appropriate to its location. The proposed R4 zone and development controls will reflect this.
SEPP 33 – Hazardous and Offensive Development	N/A	-
SEPP 36 – Manufactured Home Estates	N/A	-
SEPP 50 – Canal Estate Development	N/A	-
SEPP 55 – Remediation of Land	Yes	A phase one environmental assessment (**Appendix B.6**) has been undertaken and indicates there are areas of potential concern. The contaminants that may be present are considered to be of low or moderate significance. The assessment concludes that subject site will be made suitable subject to the completion of a detailed site investigation (and after remediation and validation, if required) for the proposed development.
SEPP 62 – Sustainable Aquaculture	N/A	-
SEPP 64 – Advertising and Signage	Yes	Subsequent future development applications that incorporate signage would need to ensure it is consistent with the objectives and assessment criteria of SEPP 64.
SEPP 65 – Design Quality of Residential Flat Development	Yes	Subsequent future development applications would need to demonstrate how the proposal satisfies the design principles and objectives of SEPP 65. The initial high level concept plan has been broadly tested with SEPP 65 and does comply.
SEPP (Affordable Rental Housing) 2009		Subsequent future development applications that propose to incorporate affordable housing would need to demonstrate compliance with the Affordable Rental Housing SEPP. The change in zone to R4 High Density Residential will provide to a wider range of dwellings.
SEPP (Building Sustainability Index: BASIX) 2004	Yes	Subsequent future development applications would need to demonstrate design principles and objectives consistent with BASIX

SEPP Title	Relevance	Consistency of Planning Proposal
		requirements.
SEEP (Exempt and Complying Development Codes) 2008	Yes	This proposal will not preclude application of this SEPP. Any exempt or complying development on the site will need to apply the provisions of the SEPP.
SEPP (Housing for Seniors or People with a Disability) 2004	Yes	The proposed development will increase the supply of seniors housing in Cabramatta, make efficient use of existing infrastructure being with closed proximity to Cabramatta Town centre (1.5km east) and Liverpool Hospital (3.5km south); and be of a good design. The proposal will deliver a high quality development with a range of public spaces including a park, community centre and plaza as well as small neighbourhood shop as permitted under the R4 High Density Residential zone to support the mix of uses at the site. See Section B of this report for further assessment against the provisions of the SEPP HSPD.
SEPP (Infrastructure) 2007	Yes	The planning proposal does not contain provisions that conflict with or obstruct the application of the SEPP.
SEPP (Major Development) 2005	N/A	-
SEPP (Mining, Petroleum Production and Extractive Industries) 2007	N/A	-
SEPP (Miscellaneous Consent Provisions) 2007	N/A	The planning proposal does not contain provisions that conflict with or obstruct the application of the SEPP.
SEPP (State and Regional Development) 2011	N/A	-

The relevant Sydney Regional Environmental Plans are outlined in the table below:

SREP Title	Relevance	Consistency of Planning Proposal
SREP 9 – Extractive Industry (No 2 – 1995)	N/A	-
SREP 18 – Public Transport Corridors	N/A	-
SREP 20 – Hawkesbury-Nepean River (No 2 – 1997)	N/A	-
GMREP No.2 – Georges River Catchment	Yes	A flood study has been undertaken by Integrated Group Services (to Annexure E). The results of the modelling indicate that the site does not convey an active overland flow. The overland flows are conveyed mainly in the bounding streets. The study concludes that the development of the site is feasible without major impacts on flooding behaviour elsewhere in the floodplain. However, this will need to be confirmed by detailed modelling and assessment at DA stage.

SREP Title	Relevance	Consistency of Planning Proposal
		Refer to Section C and **Appendix B.5** for more information.

Is the planning proposal consistent with applicable Ministerial Directions (s.117 directions)?

The relevant Section 117 Directions contained within the Environmental Planning and Assessment Act 1979 are outlined in the table below:

Section 117 Direction No. and Title	Contents of Section 117 Direction	Planning Proposal	Comply
1. Employment and Resources			
1.1 Business and Industrial Zones	• Encourage employment growth in suitable locations, • Protect employment land in business and industrial zones and • Support the viability of identified strategic centres.	This direction requires that a planning proposal must retain existing business and industrial zones and not reduce the potential floor space area for employment uses and related public services in a business zone. Justification for varying this objective has been provided in Section A. It is however believed that the key objectives of the 117 Direction have been addressed as employment opportunities will still be provided on-site with the proposed redevelopment.	No. However justification is provided.
1.2 Rural Zones	N/A		
1.3 Mining, Petroleum Production and Extractive Industries	N/A		
1.4 Oyster Aquaculture	N/A		
1.5 Rural Lands	N/A		
2. Environment and Heritage			
2.1 Environment Protection Zones	N/A		
2.2 Coastal Protection	N/A		
2.3 Heritage Conservation	• To conserve items, areas, objects and places of environmental heritage significance and indigenous heritage significance.	Consistent. There are no heritage items or heritage conservation within close proximity to the subject site.	Yes
2.4 Recreation Vehicle Areas	N/A		
3. Housing, Infrastructure and Urban Development			
3.1 Residential Zones	• To encourage a variety and choice of housing types to provide for existing and future housing needs, • To make efficient use of	Consistent. The proposal meets the objectives of this direction as it seeks to provide residential development and associated potential	Yes

Section 117 Direction No. and Title	Contents of Section 117 Direction	Planning Proposal	Comply
	existing infrastructure and services and ensure that new housing has appropriate access to infrastructure and services, and • To minimise the impact of residential development on the environment and resource lands.	employment to satisfy existing and future housing needs in particular seniors housing. The site is in a location that can make efficient use of existing and proposed infrastructure. Environmental impacts of intensified development will be managed through Council's planning policy framework as part of any subsequent development assessment process.	
3.2 Caravan Parks and Manufactured Home Estates	N/A		
3.3 Home Occupations	• To encourage the carrying out of low-impact small businesses in dwelling houses	Home occupations are permissible without consent in the R4 Zone. The planning proposal will not restrict the carrying out of low- impact small businesses in dwellings as no change to the permissibility of home occupations is proposed.	Yes
3.4 Integrating Land Use and Transport	To ensure that urban structures, building forms, land use locations, development designs, subdivision and street layouts: • Improving access to housing, jobs and services by walking, cycling and public transport, and • Increasing the choice of available transport and reducing dependence on cars, and • Reducing travel demand including the number of trips generated by development and the distances travelled, especially by car, and • Supporting the efficient and viable operation of public transport services, and • Providing for the efficient movement of freight.	The planning proposal is consistent with the aims, objectives and principles of: » Improving Transport Choice – Guidelines for planning and development » The Right Place for Business and Services – Planning Policy The planning proposal seeks to increase development intensity through residential development and mixed uses, within walking distance of existing and proposed public transport. It is expected that increased development intensity in this area would result in increased patronage of public transport, reduced travel demand and increased accessibility to housing, jobs and services. The site is strategically located to maximise the use of existing	Yes

Section 117 Direction No. and Title	Contents of Section 117 Direction	Planning Proposal	Comply
		bus services and existing rail services at Cabramatta station. Therefore, the planning proposal is likely to reduce trip generation and distance travelled by car; supporting the efficient and viable use of public transport services. In addition, the aged accommodation and nursing home is likely to have less car movements from the site.	
3.5 Development Near Licensed Aerodromes	• To ensure the effective and safe operation of aerodromes, and • To ensure that their operation is not compromised by development that constitutes an obstruction, hazard or potential hazard to aircraft flying in the vicinity, and • To ensure development for residential purposes or human occupation, if situated on land within the Australian Noise Exposure Forecast (ANEF) contours of between 20 and 25, incorporates appropriate mitigation measures so that the development is not adversely affected by aircraft noise.	Bankstown Airport is located about 3.7km south –east of the subject site. According to the Bankstown Airport Master Plan 2014 the site is located outside the ANEF area.	Yes
3.6 Shooting Ranges	N/A		
4. Hazard and Risk			
4.1 Acid Sulfate Soils	• To avoid significant adverse environmental impacts from the use of land that has a probability of containing acid sulfate soils.	The site is not identified on the Fairfield LEP's Acid Sulfate Soils Map. Class 5 Acid Sulphate Soils is however located within close proximity to the site. Any impacts will be managed through the development process.	Yes
4.2 Mine Subsidence and Unstable Land	N/A		
4.3 Flood Prone Land	• To ensure that development of flood prone land is consistent with the NSW Government's Flood Prone Land Policy and the	The site is outlined in the Prospect Creek Floodplain Management Plan Review to have flooding risk. The study identifies this risk is low as shown in Figure 36 below.	Yes

Section 117 Direction No. and Title	Contents of Section 117 Direction	Planning Proposal	Comply
	principles of the Floodplain Development Manual 2005, and • To ensure that the provisions of an LEP on flood prone land is commensurate with flood hazard and includes consideration of the potential flood impacts both on and off the subject land.	A flood study has been undertaken by Integrated Group Services. The results of the modelling indicate that the site does not convey an active overland flow. The overland flows are conveyed mainly in the bounding streets. The study concludes that the development of the site is feasible without major impacts on flooding behaviour elsewhere in the floodplain. However this will need to be confirmed by detailed modelling and assessment of the DA stage. Refer to Section C and **Appendix B.5** for more information.	
4.4 Planning for Bushfire Protection	N/A		
5. Regional Planning			
5.1 Implementation of Regional Strategies	N/A		
5.2 Sydney Drinking Water Catchments	N/A		
5.8 Second Sydney Airport: Badgerys Creek	• The objective of this direction is to avoid incompatible development in the vicinity of any future second Sydney Airport at Badgerys Creek.	This direction applies to land shown within the boundaries of the proposed airport site and within the 20 ANEF contour as shown on the map entitled "Badgerys Creek– Australian Noise Exposure Forecast– Proposed Alignment– Worst Case Assumptions''. The site does not appear to be located within the boundaries of the proposed airport site.	
6. Local Plan Making			
6.1 Approval and Referral Requirements	• Ensure that LEP provisions encourage the efficient and appropriate assessment of development	The planning proposal does not include provisions that would require the concurrence, consultation or referral of development applications to a Minister or public authority.	
6.2 Reserving Land for Public Purposes	N/A		
6.3 Site Specific Provisions	• To discourage unnecessarily restrictive site specific planning	The planning proposal is consistent with the Standard Instrument and existing zone	

Section 117 Direction No. and Title	Contents of Section 117 Direction	Planning Proposal	Comply
	controls	contained in Fairfield LEP 2013. The proposal is inconsistent with the direction in regard to the Additional Permitted Uses that are being proposed. There is no other zone that would be suitable to allow these the types of uses proposed without introducing additional permitted use. Introducing a B4 Mixed Use zone open up the site to a large range of activities which would have significant economic impacts on existing centres. The additional permitted use is minor in nature. The approach is also consistent with the Fairfield City Retail and Commercial Centres Strategy and Policy. A site-specific chapter in the Fairfield City Wide DCP will be prepared following support for the proposal and subsequent Gateway Determination to proceed with the rezoning. The site-specific DCP will provide objectives, local context analysis, vision and establish detailed design controls for built form, private and communal open space, site access, parking, servicing and bicycle facilities, building design and location of uses and the public domain as well as address a range of other design issues to ensure a transition in height from 6 to 3 storeys and appropriate building setbacks.	
7. Metropolitan Planning			
7.1 Implementation of A Plan for Growing Sydney	• To give legal effect to the planning principles; directions; and priorities for subregions, strategic centres and transport gateways contained in A Plan for Growing Sydney	The planning proposal is consistent with the A Plan for Growing Sydney. Refer to Section B of this Report for an assessment against A Plan for Growing Sydney.	
7.2 Implementation of Greater Macarthur Land Release Investigation	N/A		

Section C – Environmental, social and economic impact

Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?

The planning proposal does not apply as the land has not been identified as containing critical habitat or threatened species, populations or ecological communities, or their habitats.

Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?

Traffic and Parking
The applicant has provided a Traffic Assessment prepared by Thompson Stanbury Associates traffic experts. The proposal is seeking to develop the site for the purposes of residential apartments, seniors housing, aged care facility, childcare centre, and medical facilities, all of which have different traffic generation rates.

The applicant is proposing a number of mitigation measures to address any impact. These include:

- Intersection performance – Reconfiguration of the Chadderton Street, Hume Highway and Hollywood Drive intersection.

- Local Road Performance – The applicant has outlined a number of measures along Chadderton Road such as traffic calming devices.

- Car Parking – The proponent is seeking to provide the majority of car parking on site, however, they are seeking to introduce angled on-street car parking on the northern boundary along Chadderton Street.

- Footpath Network – Council's City Assets team will be consulted in regards to any proposed footpath as suggested in the Traffic and Transport Study in association with the preparation of the site specific development control plan.

Council's Traffic Engineers reviewed the Traffic Assessment and provided the following comments.

Intersection performance – The study has suggested that the southbound lanes of the Hume Highway be converted from the existing layout:

- Approach: (1 dedicated right turn bay, 2 through lane and 1 dedicated left turn bay), and
- Departure lanes (2 through lanes, 1 painted island leading into a dedicated left turn bay at Cutler Road)

To be converted as:

- Approach: 1 dedicated right turn bay, 2 through lanes, 1 shared through/left lane; and
- Departure: 3 through lanes

The above measures would need to be consulted with the Roads and Maritime Services (RMS) as the Hume Highway is a Classified Road controlled by RMS.

Local Road Performance – It has been noted in the submitted Traffic and Transport study that improved traffic calming measure is likely to be necessitated at and on approaches to the 90 degree curve at the junction of Chadderton Street and Ralph Street.

The installation of traffic calming devices on public roads is a matter for Council and it is based on the function of the road, accessibility of the largest design vehicle, accessibility to abutting properties, road safety and impact to affected residents' amenity.

The reasons for suggestion to improve the existing device requires further clarification and requires further consideration of the various factors associated with the improvement of the device.

It is suggested that these measures can be discussed as part of the site specific development control plan process.

Car Parking – It is noted that the proposed development will reduce the on-street parking demand associated with employees of the existing uses, with the provision of sufficient off-street parking.

It is also noted the proponent's intention to provide angled parking in front of the development's frontage to Chadderton Street. The provision of angled parking on Chadderton Street is not supported as there is insufficient road space to comply with AS2890.5 or necessary setback between the kerb and property boundary for the provision of services (electricity, gas, telecom, etc.) and footpath.

Safety concerns are also raised with increased parking activities associated with angled parking, particularly where a childcare centre is proposed.

All car parking spaces associated with the development are to be provided within the site and reliance of use of on-street parking spaces for the development is not supported.

The car parking and footpath network issues are noted, and these will be included as part of the discussion and preparation of a site specific development control plan.

Flooding

The applicant has provided a Flood Impact Study prepared by Integrated Group Services (IGS). The applicant identifies that the site is outlined in the Prospect Creek Floodplain Management Plan Review to have flooding risk. The study identifies this risk is low.

The results of the modelling indicate that the site does not convey an active overland flow. The overland flows are conveyed mainly in the bounding streets.

The study concludes that the development of the site is feasible without major impacts on flooding behaviour elsewhere in the floodplain. However this will need to be confirmed by detailed modelling and assessment of the DA stage.

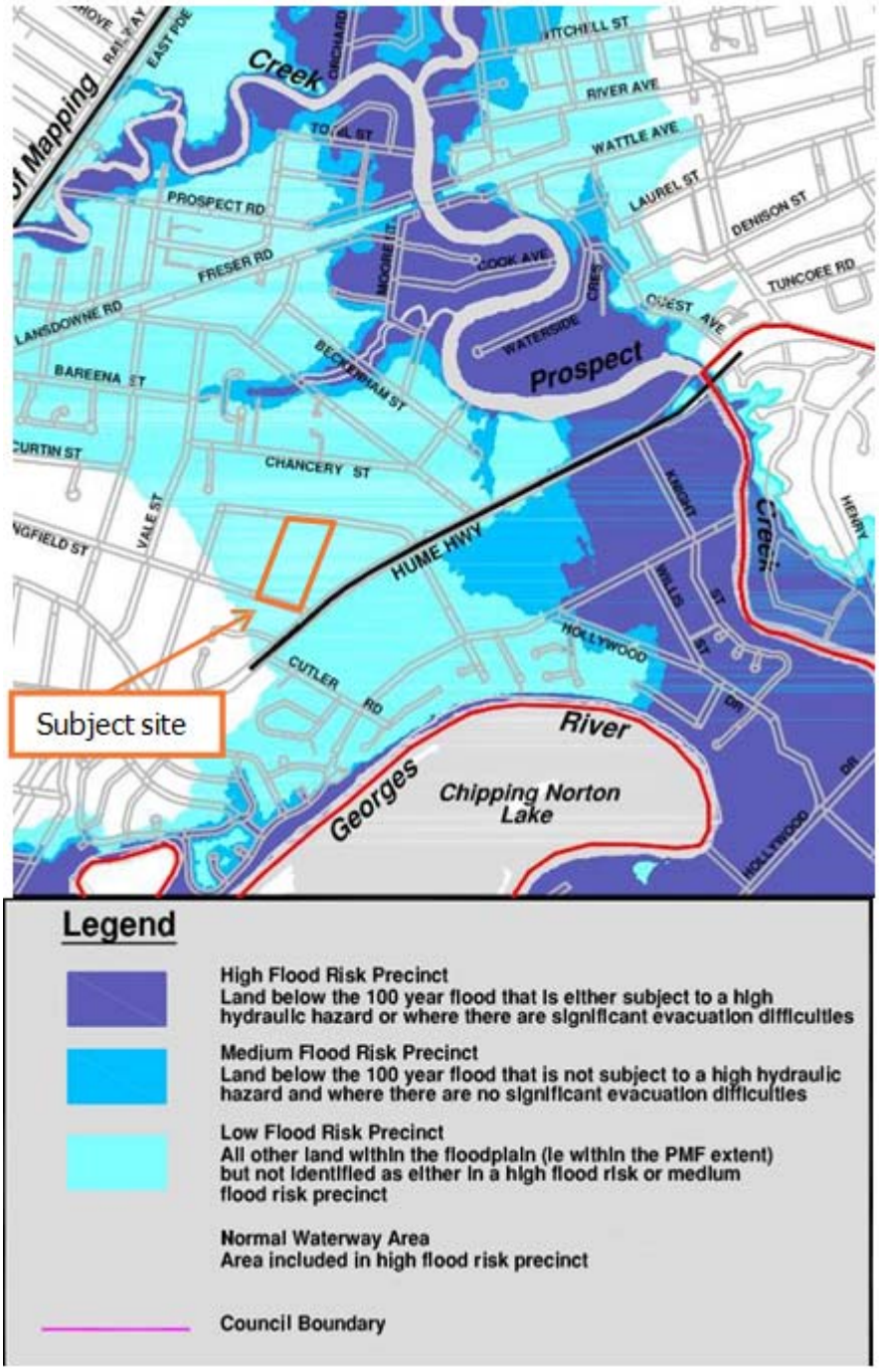
Council's Catchment Planning Branch reviewed the proposal. It is to be noted that the property in questions is constrained by overland flooding at the 100 year Average Recurrence Interval (ARI) flood event and the PMF mainstream flood event. Therefore any future development application proposal submitted by the applicant is to consider overland and mainstream flood constraints and address Sections 6.3 and 6.4 of the Fairfield LEP and Chapter 11 - Flood Risk Management of Council's DCP, considering the proposed developed case. Accordingly, it must be clearly

demonstrated that the future developed case will not cause any greater flood impacts to surrounding property.

Any future development application by the applicant is to consider the potential impact the proposed development is likely to have on increasing stormwater pollution and address pollution reduction techniques and water sensitive urban design measures to mitigate such an increase, in line with the relevant Environmental Planning Instruments.

Catchment Planning has no objections to this planning proposal progressing subject to any future proposal addressing flooding and stormwater constraints likely to occur as a result of the development.

Figure 36 – Flood Map of Site



Land Contamination
The proposal seeks to rezone a B5 Business Development zoned site to R4 High Density Residential. Given the proposal seeks to introduce a number of sensitive uses to the site, a Preliminary Site Investigation report (Stage 1 contamination report) was prepared. The report details the history of the land uses on the site from early 1900s to the present day. From those land uses the report list a potential list and location of potential contaminates.

The findings of the assessment indicated the following areas of potential environmental concern:

- Potential importation of uncontrolled fill that may contain various contaminants;
- Current or past use of pesticides;
- Previous industrial activities;
- Leaks from substation;
- Stockpile that may contain various contaminants;
- Hydrocarbon leaks and spills from parked cars and farm plant machinery;
- Potential burial of livestock carcasses, and animal products;
- Metal degradation from building materials; and
- Asbestos based materials.

The contaminants that may be present in some of these areas were considered to be of low to moderate significance in terms of risk to the human and environmental receptors identified.

Based on the information collected during this investigation and in reference to Clause 7 (DA development of SEPP 55), the site will be suitable subject to the completion of a Detailed Site Investigation (and after remediation and validation, if required) for the proposed medium density residential and commercial development, including a nursing home and childcare centre, with access to landscape.

The Stage 1 contamination report was referred to Council's Environmental Health Branch for review and assessment. The assessment noted the potential for the above mentioned contaminates and identifies that while the potential contamination risk is low to moderate a further Detailed Site Investigation report (Stage 2 contamination report) will be required to identify the required remediation.

Should the proposal proceed to Gateway Determination, Council officers will require that the Stage 2 Contamination Assessment be prepared prior to public exhibition. Council will require the preparation of a Stage 2 Contamination Assessment should the proposal

Noise
The site is currently a noise generating use resulting in current complaints for the use.

The site experiences some noise generated from nearby traffic particularly from the Hume Highway corridor.

The proposed development will be designed with appropriate noise attenuation measures. This will be addressed at the development application stage

How has the planning proposal adequately addressed any social and economic effects?

This planning proposal has examined the following social and economic effects of the proposal.

- Urban design
- Provision of social infrastructure
- Employment generation.

Urban Design

The planning proposal is guided by the Vision and objectives previously referred to in Section 4 including the key urban design principles listed below.

- Through site linkages via Chadderton Street and Longfield Street.
- Locating land uses to reflect nature and character of the surrounding area – residential focussed at Chadderton Street with the other uses to address Longfield Street.
- Modulating building heights and massing across the site to create a relationship with the streetscape and surrounding buildings that responds to existing development patterns. This would include concentrating taller buildings towards the middle of the site to mitigate overshadowing and privacy impacts on residential area
- Enhancing the amenity of the site through integration of variety of open spaces including plazas, a park, landscaped boulevard and private open space.
- Maximising the site's strategic location close to existing public transport, by improving pedestrian and cyclist connections and local amenity.

The site's proposed planning controls (FSR, Building height controls, distribution and mix of land uses) have also been informed by the Urban Design Report attached to this proposal. It is considered that a number of community benefits would also arise from the redevelopment of the site, including:

- decrease the land use conflicts currently arising at the site by providing compatible uses with residential development on the western, northern and southern boundaries
- incorporate leading practice urban design to ensure effective land use transition to the eastern side of the site as well as protecting the surrounding employment uses particularly those along the Hume Highway, thereby improving the interface between industrial uses adjoining the site and surrounding residential areas
- promote connectivity within the site itself, to Cabramatta town centre and beyond
- provide new community facilities, parks and plazas to promote community activities and a sense of place
- boost the availability of aged care places, helping to accommodate the ageing population in purpose-built accommodation
- help to fill the gap in child care places
- provide residential accommodation for a wide social mix and potentially deliver a cohesive multi-generational living environment that is often a cultural preference for many communities in the Fairfield LGA
- increase the supply of residential land for housing and improve the diversity of housing types
- create additional employment
- enhance the amenity and environment of the local area through improved streetscapes and footpaths, and new public access in the form of pedestrian and cyclist linkages through the site and a new internal road network
- providing a safer local road and pedestrian environment by reducing the use of heavy vehicle movements within the adjoining residential area
- contribute towards the social and economic wellbeing of Cabramatta
- maximising the use of existing public transport infrastructure, walking and cycling by locating residents and workers in an accessible location that is close to a range of public transport services
- ensure the development of buildings achieve design excellence and a high standard of sustainability.

Provision of social infrastructure

The Circle will contribute to the social wellbeing of Cabramatta. The Circle will provide a multi-generational community providing housing for all ages including seniors and people with a disability.

Health and welfare

The Circle provides aged care facility and independent living units to cater for the growing ageing population. It is envisaged that include support services such as a privately operated GP medical centre and allied health services such as a dentist and pharmacy.

Open space network consisting of a park, landscaped boulevards, private and communal open space, cycle paths as well as a community centre and public plazas will contribute to the health and wellbeing of residents and wider community. Providing places for active and passive recreation, social interaction and foster a sense of community.

Further the site is approximately 4km from Liverpool Hospital and Sydney South West Private Hospital. Cabramatta Police station and other emergency services such as fire are within close proximity.

Schools

The Department of Education and Communities (DEC) Advisory Notes for School Site Selection sets out the following criteria for the provision of schools in areas of new residential development:

- One public primary school per 2,000 to 2,500 new dwellings
- One public high school per 6,000 to 7,500 dwellings (i.e. catchment of three primary schools)

These criteria indicate that the planning proposal will not be large enough to result in, by itself, a new primary school or high school. In addition, much of the proposed uses will be catering aged and elderly people, therefore not triggering a huge demand for new schools facilities.

It is envisaged that residents will be accommodated in the nearby schools such as Cabramatta High School, Cabramatta West Public School, Carramar Public School or Fairvale High School.

Child care

A childcare centre is proposed on the site. The child care would provide an important service for residents and employees of the nearby residential and industrial uses. Consultation with the appropriate public organisations will establish if there are sufficient community, education and health services available.

Economic Impacts

The change from the existing industrial zoning to enable residential and potential residential support uses such as a neighbourhood shop, gym and takeaway food and drink premises on the site is considered consistent with market demand and likely to generate positive economic outcomes for the surrounding area and Fairfield LGA.

The intention is not to create a new neighbourhood/retail/commercial development at the site but rather provide uses to support the mix of uses at the site in particular seniors housing and assist in the transition from the B5 Business Development Zone to residential. Such uses are also considered appropriate and required to meet the locational and access requirements specified in the SEPP HPSD and consistent with the following objects of the EP&A Act 1979:

- *promotion and co-ordination of the orderly and economic use and development of land*
- *provision and co-ordination of community services and facilities.*

Lastly the proposed uses are consistent with objective "*To enable other land uses that provide facilities or services to meet the day to day needs of residents"* of the R4 Zone.

Section D – State and Commonwealth interests

Is there adequate public infrastructure for the planning proposal?

The site is well serviced by public transport being in close to Cabramatta train station (located within the main centre) and serviced by local bus route. The close proximity of public transport assists in reducing dependence on private car travel and pressures on the local road network. Further consultation at the Public Authority Consultation stage will identify any potential utility issues associated with the proposal.

What are the views of State and Commonwealth public authorities consulted in accordance with the gateway determination?

The views of relevant public authorities under section 57 of the EP&A Act will be sought during the exhibition of the planning proposal. This will likely include consultation with:

- Fairfield City Council (the landowner has met with council on numerous occasions to date)
- Roads and Maritime Services (RMS) (the traffic consultant has had preliminary discussions with RMS regarding upgrades to intersections).
- Transport for NSW
- Sydney Water
- NSW Police
- Housing NSW

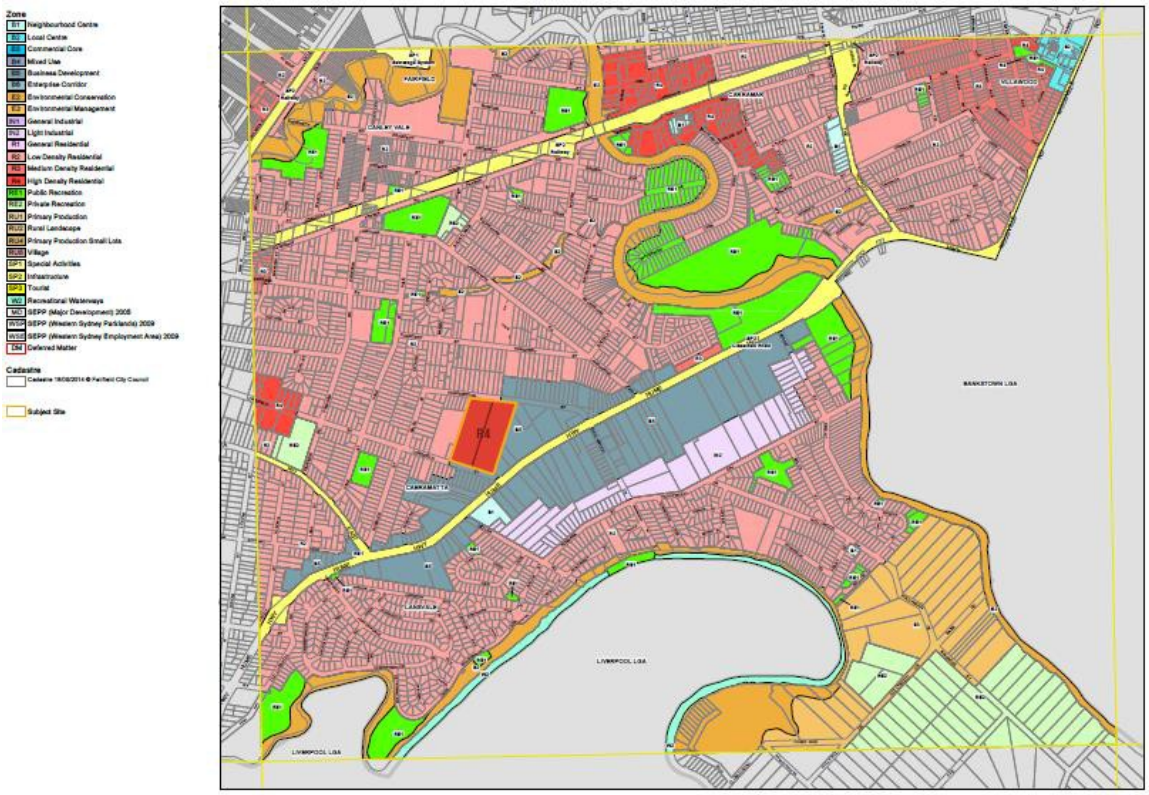
Confirmation of the above list will be confirmed by the Gateway Determination.
Preliminary consultation has been undertaken by the applicant with the Roads and Maritime Services. This will continue as part of the Gateway Requirements.

6 Part 4 – Maps

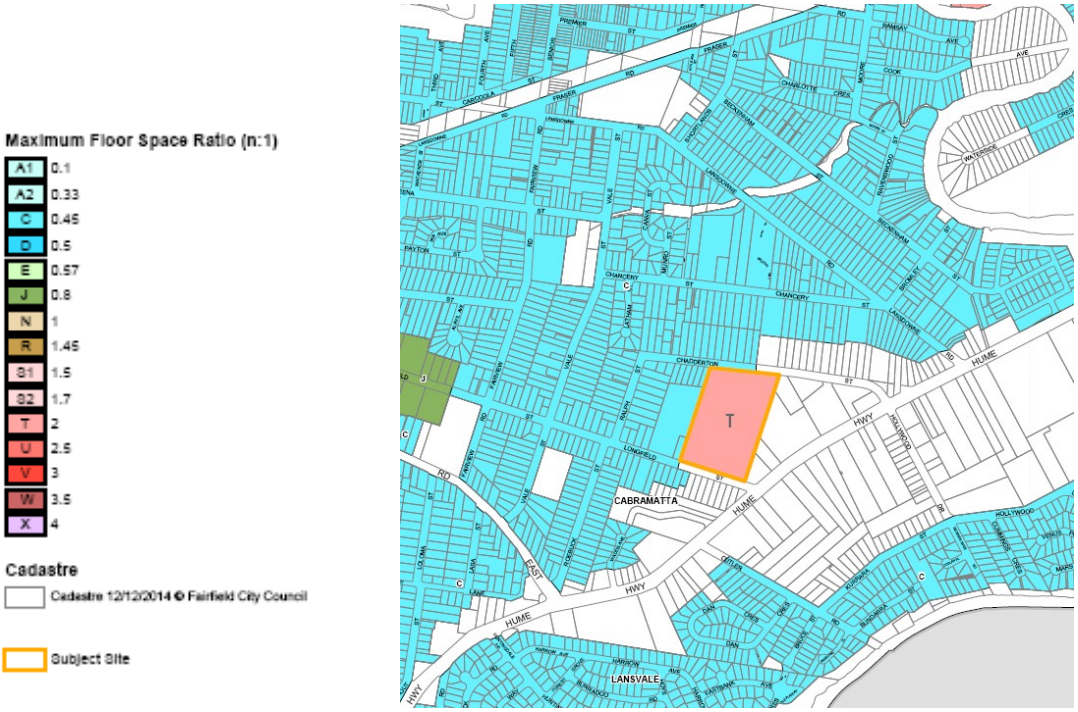
This part of the Planning Proposal deals with the maps associated with the Fairfield Local Environmental Plan 2013 that are to be amended to facilitate the necessary changes as described in this report.

To achieve the objectives of the Planning Proposal, Fairfield Local Environmental Plan 2013 will be amended as follows:

- Amend the relevant zoning map, LZN_021 to rezone the subject land from B5 Business Development to R4 High Density Residential



- Amend the relevant Floor Space Ratio Map, FSR_021 from no FSR to 2:1



- Amend the relevant Height of Buildings map, HOB_021 from no height of building to 18 metres

- Amend the Key Sites map Height of Buildings map, KYS_021 from no affectation to show the site as affected by Key Site “24”. Number to be confirmed closer to Gazettal date.

7 Part 5 - Community Consultation

Community consultation is required under Sections 56(2)(c) and 57 of the Environmental Planning and Assessment Act 1979.

The Act sets out the community consultation requirement for planning proposals and these are determined or confirmed at the Gateway.

The Gateway Determination dated 29 January 2015 requires that the planning proposal be made publicly available for a period of 14 days.

The landowner requested Crosby Textor to undertake a survey, of which the summary and findings can be found in **Appendix B.12**. The survey indicates a high degree of support for the principle of the rezoning, with detailed design and elements to be resolved through the rezoning and development application stage.

The gateway determination will specify the community consultation requirements that must be undertaken on the planning proposal. The gateway determination will:

- outline the timeframe for exhibition
- relevant state or Commonwealth authorities to be consulted
- whether a public hearing is to be held into the matter by the PAC or other specified person or body.

It is expected that the planning proposal will be publicly exhibited for 28 days and that the public agencies aforementioned will be consulted.

Public exhibition of the planning proposal is generally undertaken in the following manner:

- notification in a newspaper that circulates in the area affected by the planning proposal
- notification on the website of the Relevant Planning Authority (RPA) (usually Council)
- notification in writing to affected and adjoining landowners, unless the planning authority is of the opinion that the number of landowners makes it impractical to notify them.

Additional consultation may be undertaken (if this is deemed appropriate or necessary) by the RPA. This may include, but is not limited to broad consultation by letter, open days or public forum.

The following material will be made available for inspection during the exhibition period:

- the planning proposal, in the form approved for community consultation by the Gateway determination
- the Gateway determination
- any information or technical information relied upon by the planning proposal. If required a public hearing will be arranged by the RPA following exhibition period.

The community consultation is complete only when the RPA has considered any submissions made concerning the proposed LEP and the report of any public hearing into the proposed LEP (in accordance with s. 57(8) of the EP&A Act.

The Gateway Determination will list a range of relevant Public Authorities that will need to be consulted, including the NSW Roads and Maritime Services and other relevant Authorities.

8 Part 6 – Project Timeline

The project timeline is intended to be used only as a guide and may be subject to changes such as changes to issues that may arise during the public consultation process and/or community submissions.

No.	Step	Process content	Timeframe
1	s.56 – request for Gateway Determination	• Prepare and submit Planning Proposal to DP&I	June 2016
2	Gateway Determination	• Assessment by DP&I (including LEP Panel) • Advice to Council	August 2016
3	Completion of required technical information and report (if required) back to Council	• Prepare draft controls for Planning Proposal • Update report on Gateway requirements	December 2016 (detailed work such as preparation of SSDCP will be required)
4	Public consultation for Planning Proposal	• In accordance with Council resolution and conditions of the Gateway Determination.	February to March 2018
5	Government Agency consultation	• Notification letters to Government Agencies as required by Gateway Determination	As above
6	Public Hearing (if required) following public consultation for Planning Proposal	• Under the Gateway Determination issued by DP&E public hearing is not required.	Not required
7	Consideration of submission	• Assessment and consideration of submissions	April to May 2018
8	Additional information	• Additional information	June to July 2018
9	Report to Council on submissions to public exhibition and public hearing	• Includes assessment and preparation of report to Council	September 2018
10	Possible re-exhibition	• Covering possible changes to draft Planning Proposal in light of community consultation	Minimum 1 month
11	Report back to Council	• Includes assessment and preparation of report to Council	1 month
12	Referral to PCO and notify DP&I	• Draft Planning Proposal assessed by PCO, legal instrument finalised • Copy of the draft Planning Proposal forwarded to DP&I.	October 2018
13	Plan is made	• Notified on Legislation web site	December 2018
Estimated Time Frame			30 months

9 Appendices

The appendices are attached to the Planning Proposal in chronological order as below:

Appendix A

A.1 Outcomes Committee Report – 10 May 2016
A.2 Ordinary Council Report – 24 May 2016
A.3 Supplementary Outcomes Committee Report – 24 May 2016
A.4 Outcomes Committee Report – 11 September 2018

Appendix B

B.1 Urban Design Report – Revised
B.2 Economic Assessment
B.3 Feasibility Study
B.4 Traffic with additional information
B.5 Flood Study – Stage 2
B.6 Contamination Report – Stage 2
B.7 Council Letter
B.8 Memorandum of Understanding – Opal Specialist Aged Care – Note: the Residential Aged Care Facilities will not be included in this concept as there are overland flooding issues which may prohibit the development of this use. To be further discussed with SES.
B.9 Benchmark Images
B.10 NSW Legislation – Fairfield LEP 2013 – R4 High Density Residential
B.11 NSW Legislation – SEPP (Housing for Seniors or People with a Disability) 2004

The CIRCLE CABRAMATTA

CONCEPT MASTER PLAN

17-23 LONGFIELD STREET, CABRAMATTA

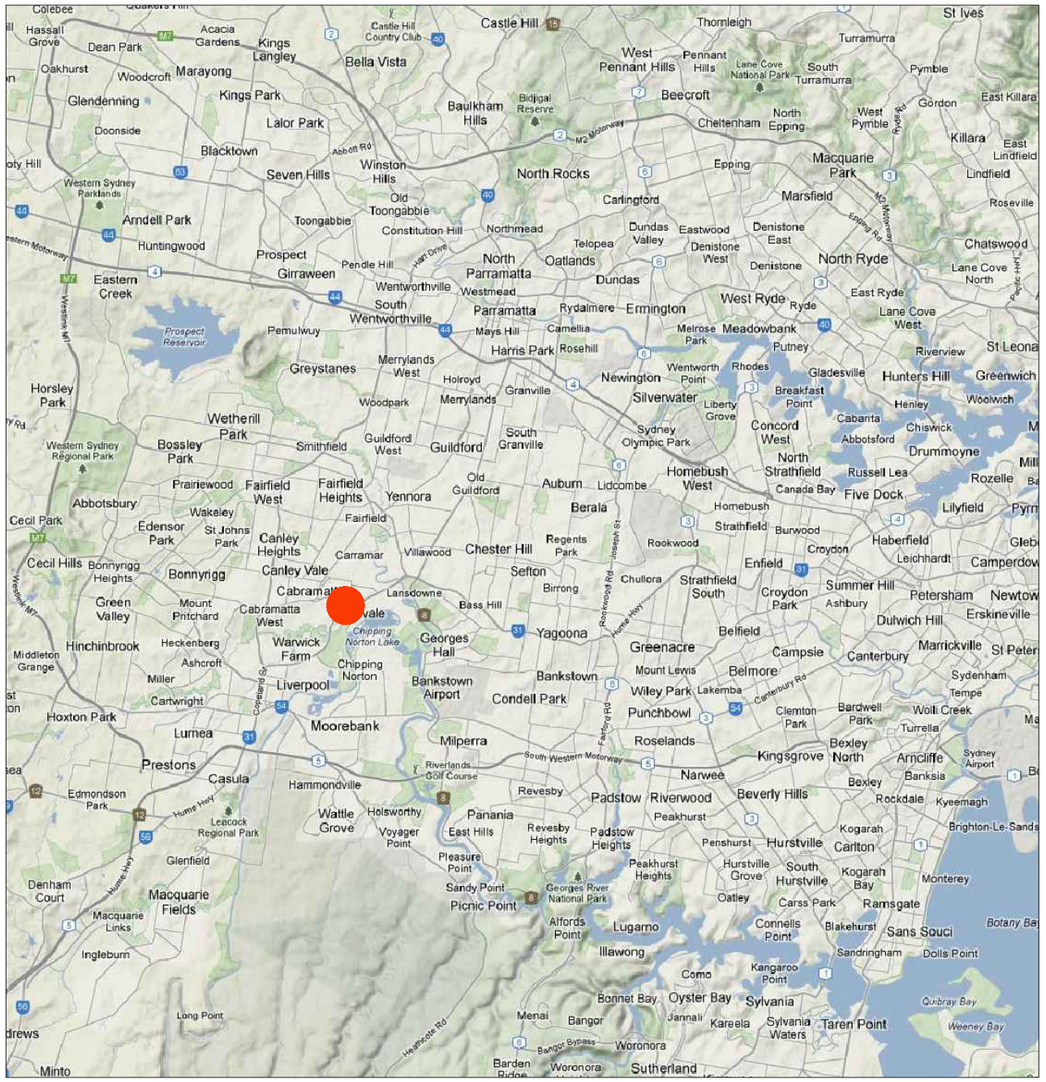
JUL 2018

ANTONIADES ARCHITECTS

THE SITE

The subject site is located in the suburb of Cabramatta within the Fairfield Local Government Area in South West Sydney. The site is bounded by Chadderton Street to the north and Longfield Street to the south. It is located less than 100m west of Hume Highway on Longfield Street. To the east of the site is a number of commercial and warehouse buildings including a restaurant and some warehouse retail specializing in hardware and baby store as well as a motel and service station on the corner of Chadderton Street and Hume Highway. To the west is a residential development consisting mostly of 2 storeys townhouses. Chadderton Street to the east of the site is mainly light industrial including motor mechanics and hardware store; to the west of the site are dwellings of up to 2 storeys. On Longfield Street is mainly residential houses with a number of townhouse developments with commercial premises located at the corner of Hume Highway.

The site is located approximately 1.5km east of Cabramatta and Canley Vale railway station. Liverpool business district and its services including Liverpool Hospital is less than 5km to the south. The employment centre of Fairfield is 4km to the north. A number of schools and leisure facilities are located within 2km from the site.



Regional Location Plan

Aerial Photograph

SITE LOCATION

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ANTONIADES ARCHITECTS

Figure ground study

The figure ground study shows that the massing and grain of the surrounding transition from a courser grain to a finer grain moving from east to west. The site is located at the threshold of this change in grain. The buildings to the east are larger warehouse and industrial buildings while buildings to the west are single and double storeys residential buildings.

OPPORTUNITIES AND CONSTRAINTS

The site has a series of overlays that provide both opportunity and constraints in considering the Master plan.

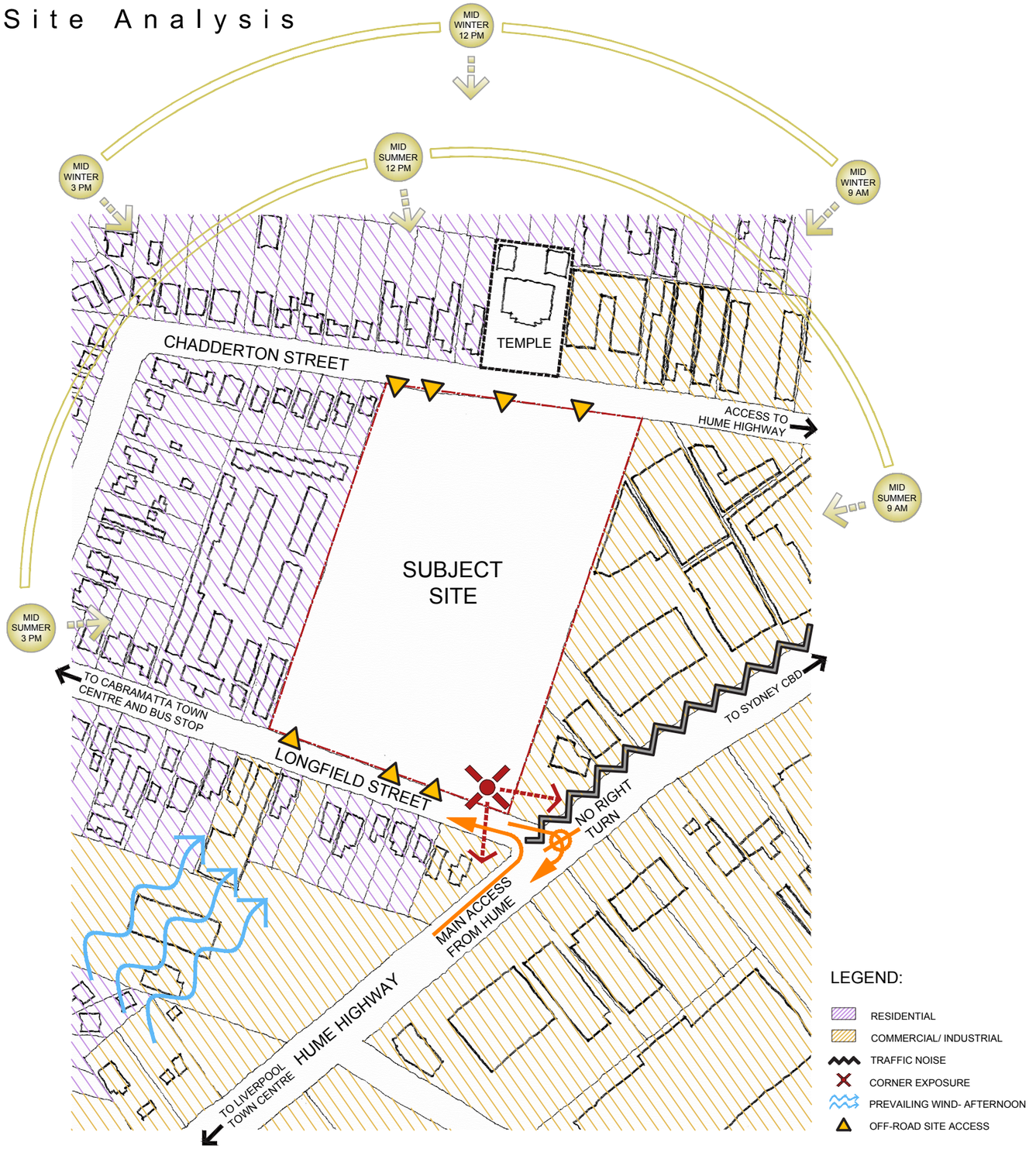
OPPORTUNITIES

- Located on the transition between residential and industrial/business zone.
- Adjoining warehouse and commercial properties have less over shadowing and privacy concerns.
- Located in close proximity to Cabramatta town centre.
- Has easy access to Hume Highway.
- Bus route along Chadderton and Longfield Street for travel to Cabramatta, Lansvale, Fairfield and Liverpool.
- Redevelopment will improve the amenity of the area.
- Site is level and accessible from two street frontages.

CONSTRAINTS

- Adjacent low density to the north, west and south will limit height due to potential overshadowing and privacy impacts.
- Industrial use subject to complaints of noise and pollution from nearby residents, residential development would be compatible to neighbouring residential.
- Noise and pollution from nearby industrial sites.
- Vehicles unable to turn right from Longfield Street onto Hume Highway.
- Existing large warehouse is unattractive in the residential setting.

Site Analysis



SITE CONTEXT AND ANALYSIS

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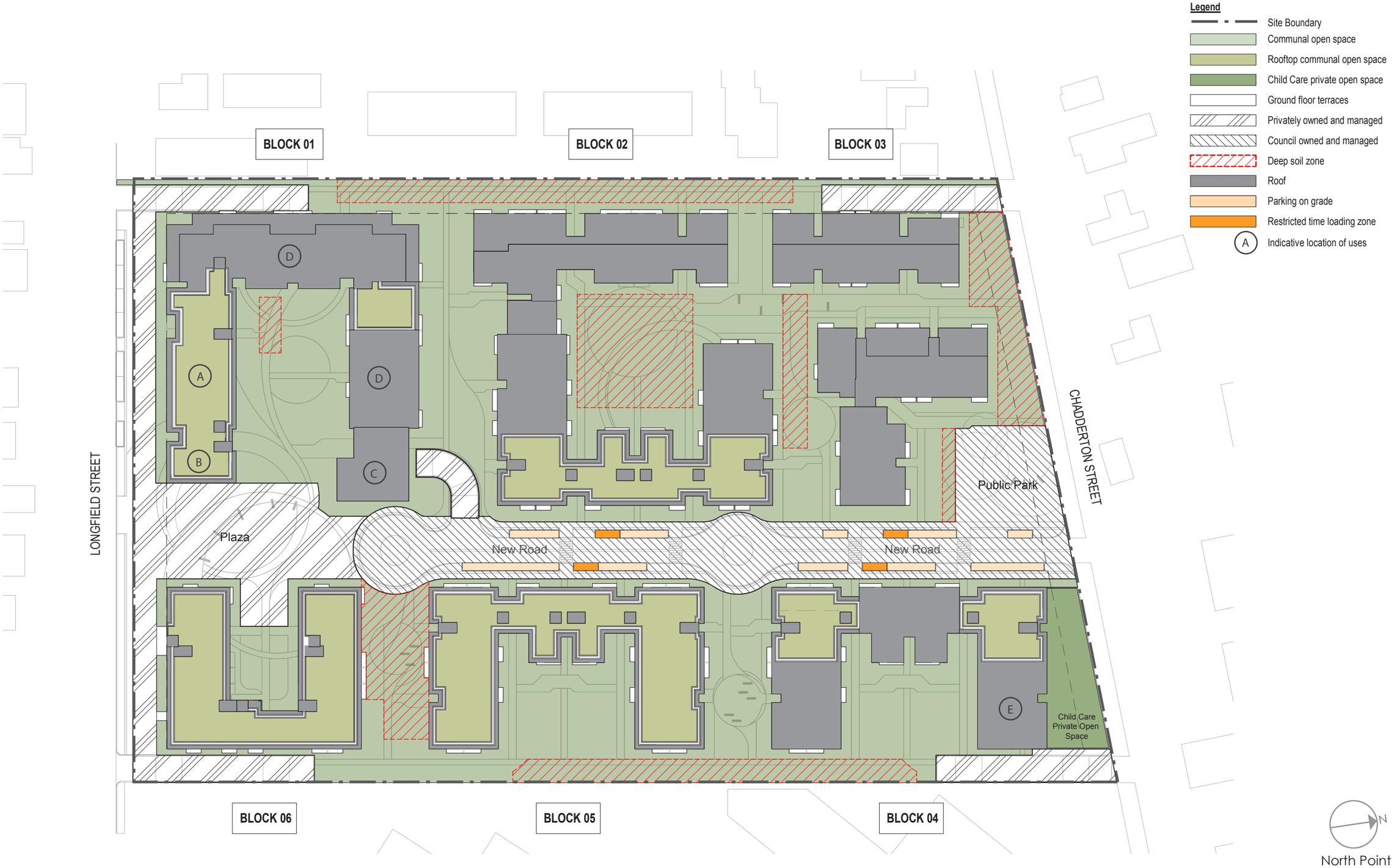

LAND USE AND OPEN SPACE

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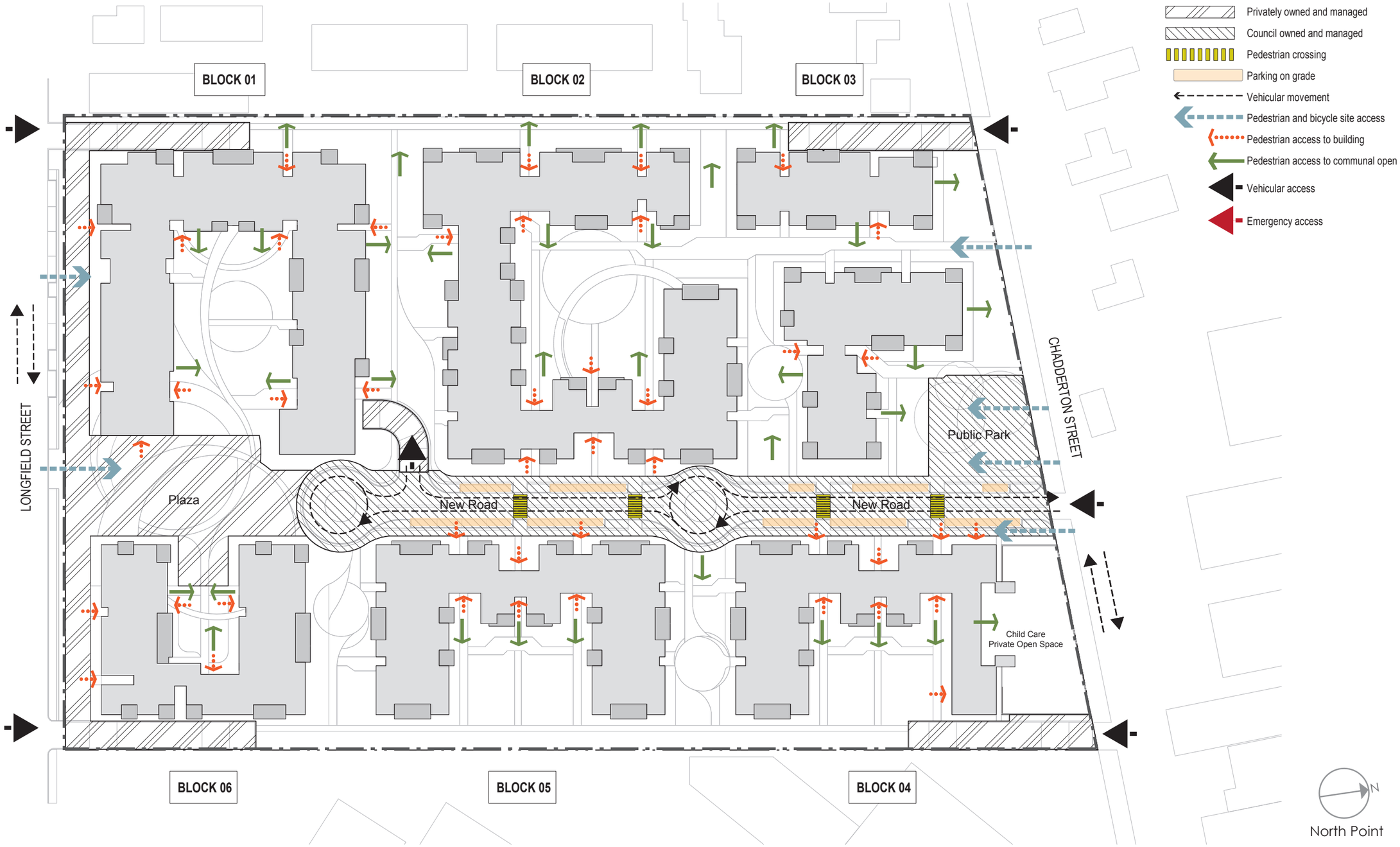

ACCESS, PARKING AND CONNECTIVITY

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ANTONIADES ARCHITECTS

SETBACKS AND HEIGHTS

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ANTONIADES ARCHITECTS

UNIT MIX

	Block 1	
	2 Bed	3 Bed
Ground Floor	10	4
Level 1	13	5
Level 2	13	5
Level 3	9	5
Level 4	1	1
Level 5	0	0
Total	46	20
%	69.7%	30.3%
Total	**66**	

	Block 2			Block 3 (a)			Block 3 (b)		
	1 Bed	2 Bed	3 Bed	1 Bed	2 Bed	3 Bed	1 Bed	2 Bed	3 Bed
Ground Floor	13	15	4	2	4	2	3	9	0
Level 1	14	15	4	2	4	2	3	9	0
Level 2	14	15	4	2	4	2	3	9	0
Level 3	12	11	3	1	1	2	3	9	0
Level 4	9	10	2	0	0	0	1	6	0
Level 5	9	10	2	0	0	0	0	0	0
Total	71	76	19	7	13	8	13	42	0
%	42.8%	45.8%	11.4%	25.0%	46.4%	28.6%	23.6%	76.4%	0.0%
Total	**166**			**28**			**55**		

	Block 4			Block 5			Block 6		
	1 Bed	2 Bed	3 Bed	1 Bed	2 Bed	3 Bed	1 Bed	2 Bed	3 Bed
Ground Floor	6	4	2	10	6	4	6	9	0
Level 1	11	6	4	11	6	4	5	10	0
Level 2	11	6	4	11	6	4	5	10	0
Level 3	11	6	4	11	6	4	5	10	0
Level 4	7	4	2	11	6	4	5	10	0
Level 5	4	2	2	11	6	4	0	0	0
Total	50	28	18	65	36	24	26	49	0
%	52.1%	29%	19%	52.0%	29%	19%	34.7%	65%	0%
Total	**96**			**125**			**75**		

Total (1 Bed)	232	38.0%
Total (2 Bed)	290	47.5%
Total (3 Bed)	89	14.6%
Total Apartments	**611**	**100.0%**

GFA

	Block 1 (Res.)	Block 1 (Com.)	Block 2 (Res.)	Block 3(a)	Block 3(b)
Ground	1616	1069	2732	675	1004
Level 1	2003	670	2801	675	1004
Level 2	2003	670	2801	675	1004
Level 3	1583	670	2224	368	1004
Level 4	277	0	1720	0	661
Level 5	0	0	1720	0	0
Total	7482		13998	2394	4677

	Block 4	Block 4 (child.)		Block 5	Block 6
		Indoor	Outdoor		
Ground	1001	362	854	1633	1267
Level 1	1686			1686	1291
Level 2	1686			1686	1291
Level 3	1686			1686	1291
Level 4	1021			1686	1291
Level 5	665			1686	0
Total	7745	362		10063	6431

Total GFA	53153 sqm
Site Area	39679 sqm
FSR	1.34:1

* GFA Area measured to internal face of external wall, excluding lift shaft, fire stair, parking, garbage storage and handling facilities

AMENITY : COMMON OPEN SPACE

	Lot Area	Required 25%	Common Open Space		
			Ground Floor	Rooftop	Provided
Block 1	7572	1893	1024	961	1985
Block 2	8621	2155	1243	926	2169
Block 3	5350	1337	1491	0	1491
Block 4	5983	1496	1344	618	1962
Block 5	5938	1485	1459	1655	3114
Block 6	3645	911	477	1281	1758
Total	**37109**	**9277**	Total		**12479**
%	**25%**		**33.6%**		

Common Open Space Req	9277 sqm	25%
Total Common Open Space	12479 sqm	33.6%

* Common Open Space out of the Partial Site Area

DEEP SOIL AREA

Deep soil area	4001 sqm
Partial Site Area	37109 sqm
Req 7%	11%

* Deep Soil Area measured out of the Common Open Space Area

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The CIRCLE CABRAMATTA

ANTONIADES ARCHITECTS

AMENITY : CROSS VENTILATION

	Block 1	
	Compliant Apartment	No. Apartments
Ground Floor	10	14
Level 1	13	18
Level 2	13	18
Level 3	12	14
Level 4	2	2
Total	**50**	**66**
%	76%	100%

	Block 2		Block 3(a)	
	Compliant Apartment	No. Apartments	Compliant Apartment	No. Apartments
Ground Floor	26	32	8	8
Level 1	26	33	8	8
Level 2	26	33	8	8
Level 3	20	26	4	4
Level 4	15	21	0	0
Level 5	15	21	0	0
Total	**128**	**166**	**28**	**28**
%	77%	100%	100%	100%

	Block 3(b)		Block 4	
	Compliant Apartment	No. Apartments	Compliant Apartment	No. Apartments
Ground Floor	10	12	14	12
Level 1	10	12	16	21
Level 2	10	12	16	21
Level 3	10	12	16	21
Level 4	5	7	10	13
Level 5	0	0	6	8
Total	**45**	**55**	**78**	**96**
%	82%	100%	81%	100%

	Block 5		Block 6	
	Compliant Apartment	No. Apartments	Compliant Apartment	No. Apartments
Ground Floor	20	20	12	15
Level 1	16	21	12	15
Level 2	16	21	12	15
Level 3	16	21	12	15
Level 4	16	21	12	15
Level 5	16	21		0
Total	**100**	**125**	**60**	**75**
%	80%	100%	80%	100%

Total Apartments	**611**
Total Cross ventilation	**82%**

AMENITY : SOLAR ACCESS

	Block 1	
	Compliant Apartment	No. Apartments
Ground Floor	7	14
Level 1	12	18
Level 2	12	18
Level 3	13	14
Level 4	2	2
Total	**46**	**66**
%	70%	100%

	Block 2		Block 3(a)	
	Compliant Apartment	No. Apartments	Compliant Apartment	No. Apartments
Ground Floor	15	32	5	8
Level 1	22	33	5	8
Level 2	24	33	8	8
Level 3	22	26	4	4
Level 4	17	21	0	0
Level 5	21	21	0	0
Total	**121**	**166**	**22**	**28**
%	73%	100%	79%	100%

	Block 3(b)		Block 4	
	Compliant Apartment	No. Apartments	Compliant Apartment	No. Apartments
Ground Floor	8	12	9	12
Level 1	10	12	16	21
Level 2	10	12	17	21
Level 3	10	12	19	21
Level 4	7	7	11	13
Level 5	0	0	8	8
Total	**45**	**55**	**80**	**96**
%	82%	100%	83%	100%

	Block 5		Block 6	
	Compliant Apartment	No. Apartments	Compliant Apartment	No. Apartments
Ground Floor	7	20	9	15
Level 1	13	21	12	15
Level 2	15	21	15	15
Level 3	16	21	15	15
Level 4	17	21	15	15
Level 5	21	21		0
Total	**89**	**125**	**66**	**75**
%	71%	100%	88%	100%

Total Apartments	**611**
Total Solar Access	**78%**

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ANTONIADES ARCHITECTS

AMENITY : PARKING SPACES

Block 01 - Carpark 01 - Non-Residential

	Code	Required	Provided
Gym	1 / 11 m2	122	122
Retail	0.025	2	5
Food & Drink	0.14	12	12
Medical Centre	3 / Room	60	60
Accesible	10%	20	20
Ground Floor Parking			25
Total		**216**	**244**

20 consulting room

* 25 Car spaces on Ground Floor * 20 consulting rooms for Medical Centre

Block 01 - Carpark 02 - Senior Housing

	Code	Required	Provided
2 Bed	0.85	39	39
3 Bed	1	20	20
Visitors	0.25	17	17
Accesible	10%	8	8
Extra			
Total		**84**	**84**

Block 2 to 3 - Residential Flat Buildings

	Code	Required	Provided
1 Bed	1	91	91
2 Bed	1	131	131
3 Bed	1	27	44
Visitors	0.25	62	62
Accesible	10%	31	31
Total		**342**	**359**

Block 4 to 5 - Residential Flat Buildings

	Code	Required	Provided
1 Bed	1	115	115
2 Bed	1	64	64
3 Bed	1	42	47
Visitors	0.25	19	55
Accesible	10%	24	28
Total		**264**	**309**

Block 4 - Child Care Centre

	Code	Required	Provided
100	0.25	25	33
Total		**25**	**33**

Block 6 - Residential Flat Building

	Code	Required	Provided
1 Bed	1	26	26
2 Bed	1	49	53
Visitors	0.25	19	19
Accessible	10%	9	9
Total		**103**	**107**

CONCEPT MASTER PLAN

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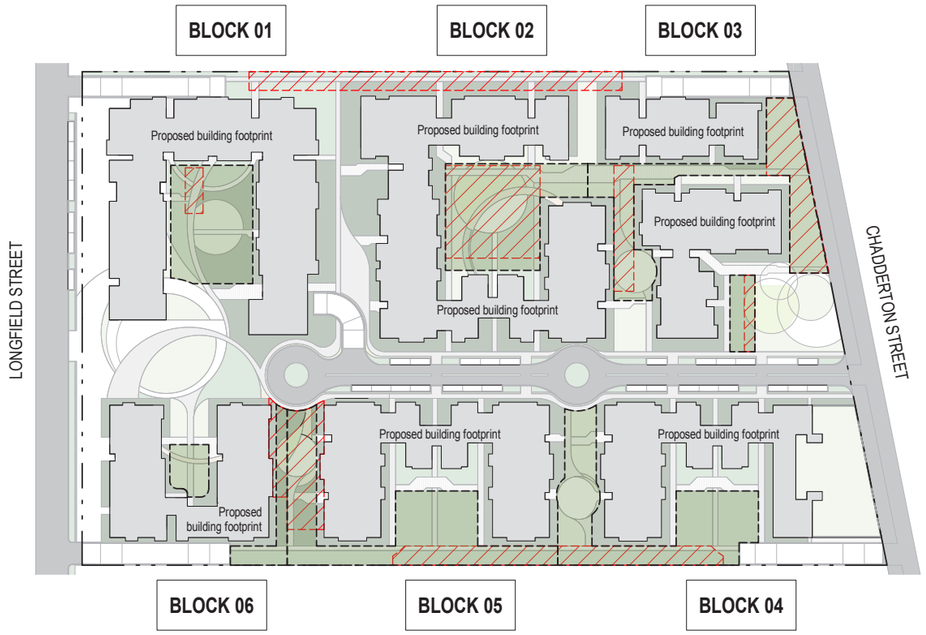
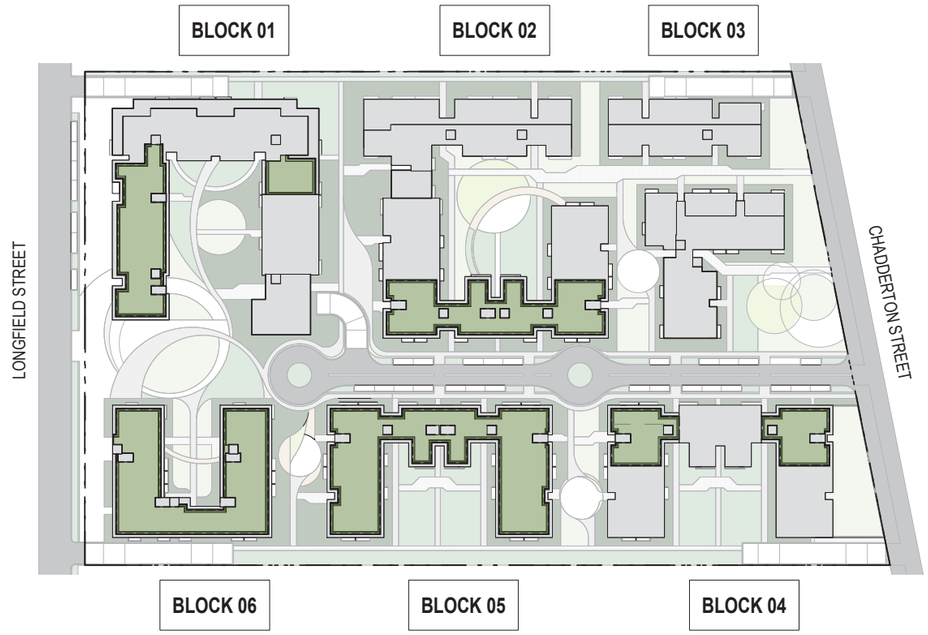
ANTONIADES ARCHITECTS



GOUND FLOOR



ROOFTOP

Legend

- Principal usable part of communal open space
- Site Boundary
- Principal communal open space
- Deep soil zone

N

COMMUNAL OPEN SPACE / DEEP SOIL

CONCEPT MASTER PLAN

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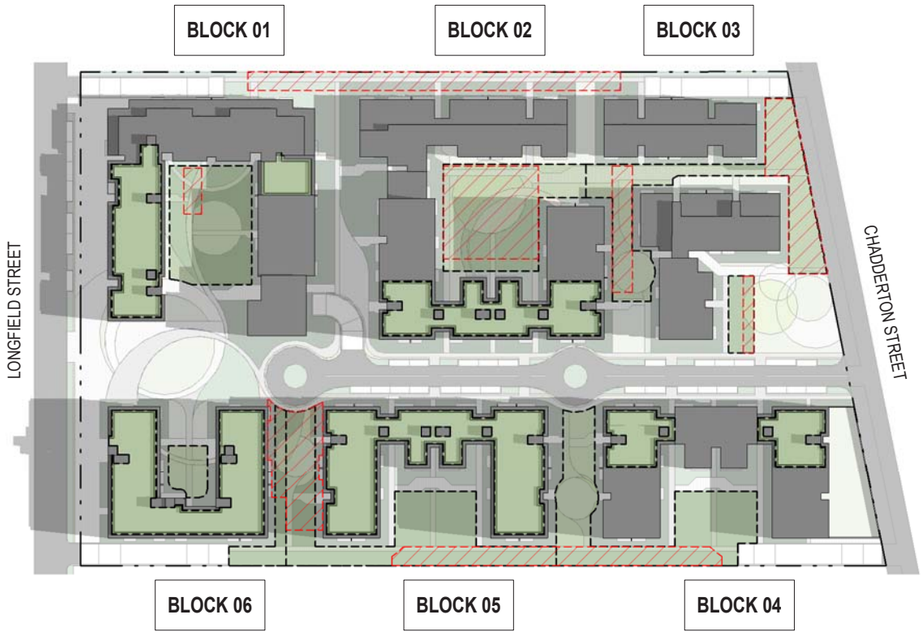
The CIRCLE CABRAMATTA

ANTONIADES ARCHITECTS

SOLAR STUDY - 21 JUNE 9AM

SOLAR STUDY - 21 JUNE 10AM



SOLAR STUDY - 21 JUNE 11AM

SOLAR STUDY - 21 JUNE 12PM

Legend

- Principal usable part of communal open space
- Site Boundary
- Principal communal open space
- Deep soil zone

N

SHADOW ANALYSIS - WINTER

CONCEPT MASTER PLAN

17 - 23 LONGFIELD STREET, CABRAMATTA
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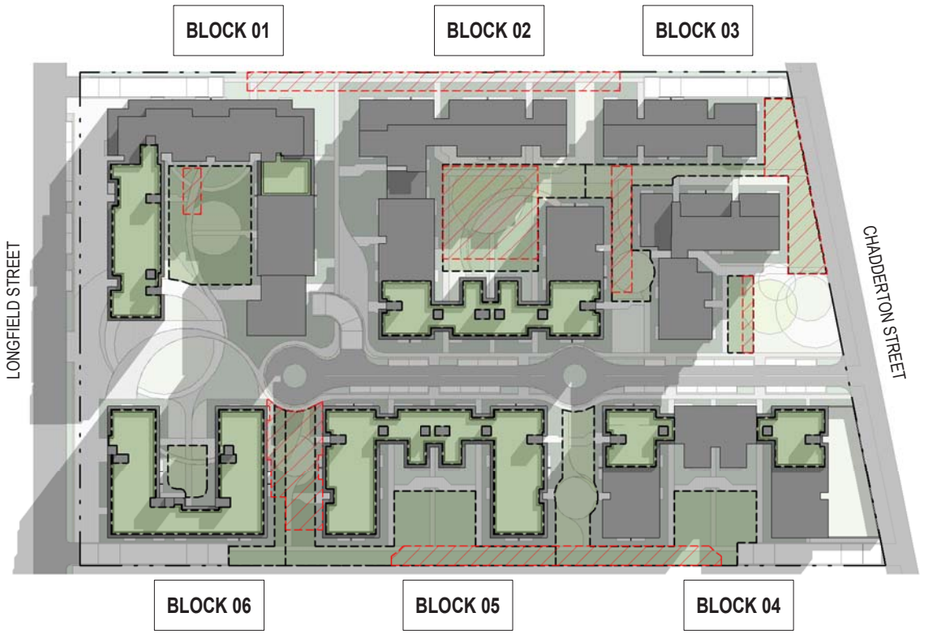
The CIRCLE CABRAMATTA

ANTONIADES ARCHITECTS

SOLAR STUDY - 21 JUNE 1PM

SOLAR STUDY - 21 JUNE 2PM



SOLAR STUDY - 21 JUNE 3PM

Legend

- Principal usable part of communal open space
- Site Boundary
- Principal communal open space
- Deep soil zone

SHADOW ANALYSIS - WINTER

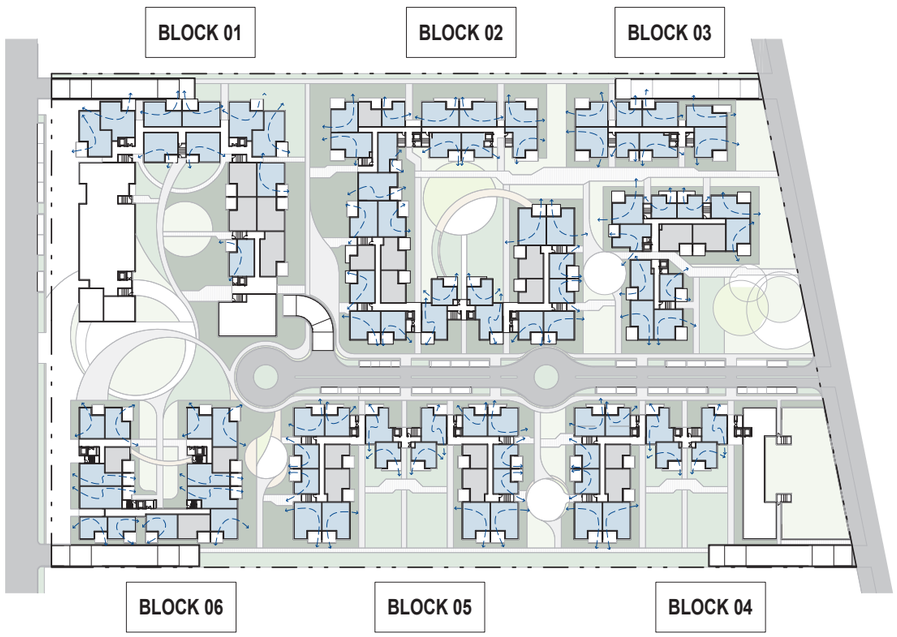
CONCEPT MASTER PLAN

17 - 23 LONGFIELD STREET, CABRAMATTA

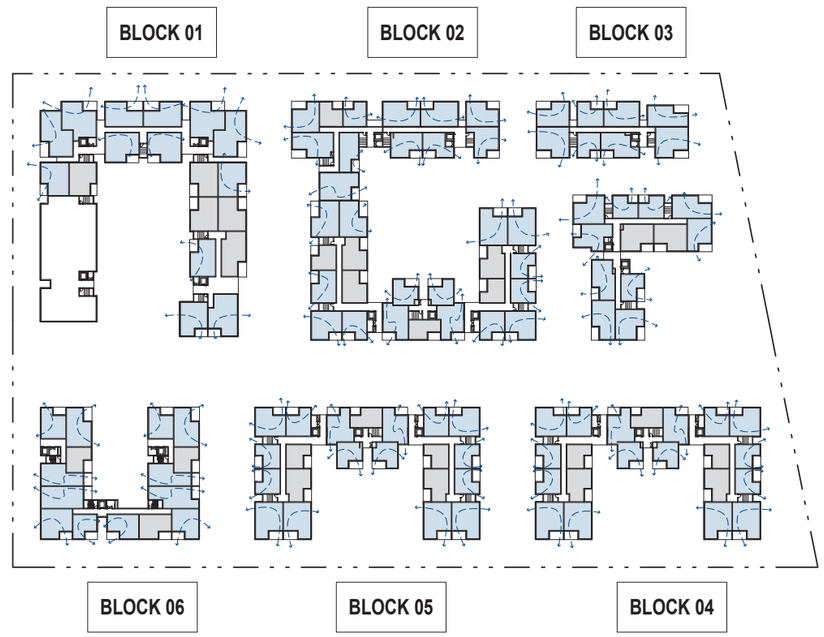
JUL 2018 AA.MPN.1201

The CIRCLE CABRAMATTA

ANTONIADES ARCHITECTS



GOUND FLOOR



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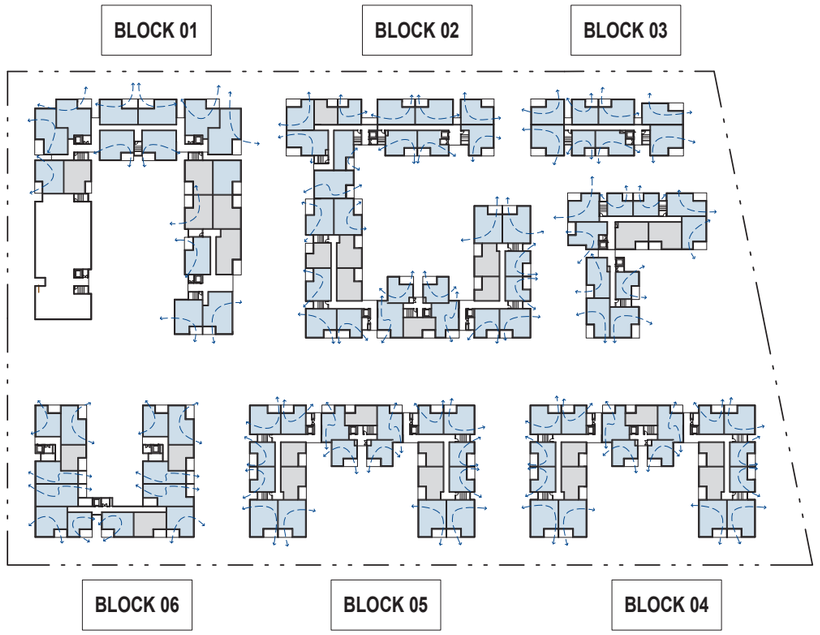

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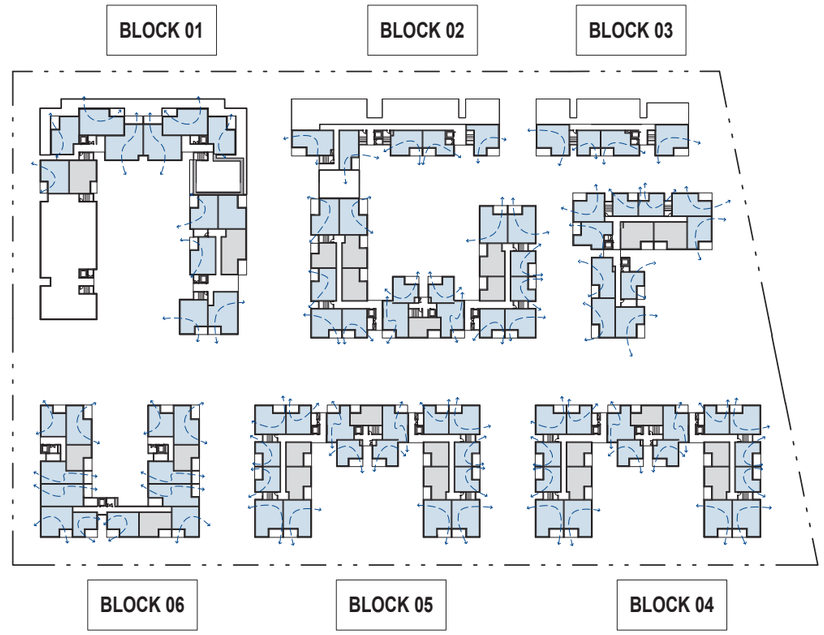


LEVEL 3

Cross Ventilation Legend

- Compliance
- Non-Compliance

N

CROSS VENTILATION

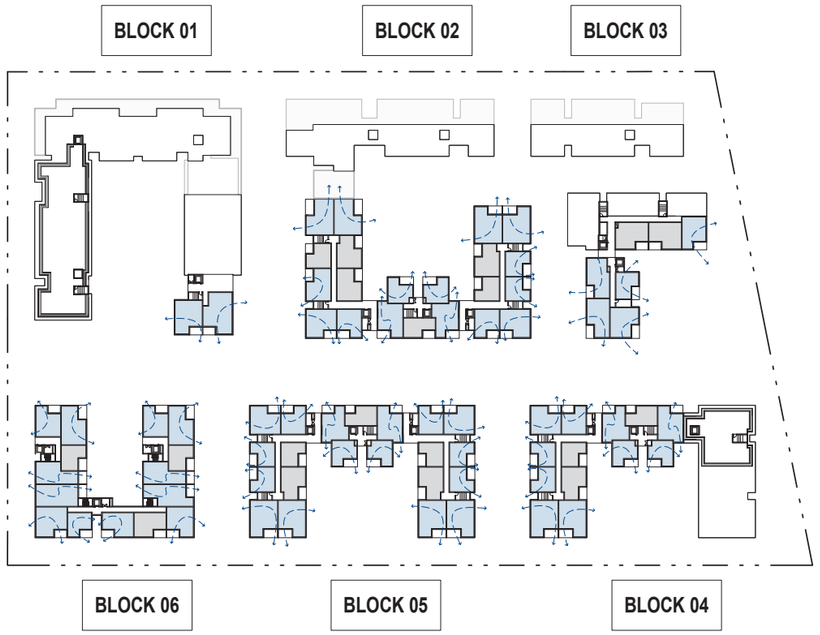
CONCEPT MASTER PLAN

17 - 23 LONGFIELD STREET, CABRAMATTA

JUL 2018 AA.MPN.1201

The CIRCLE CABRAMATTA

ANTONIADES ARCHITECTS



LEVEL 4

LEVEL 5

Cross Ventilation Legend

- Compliance
- Non-Compliance

N

CROSS VENTILATION

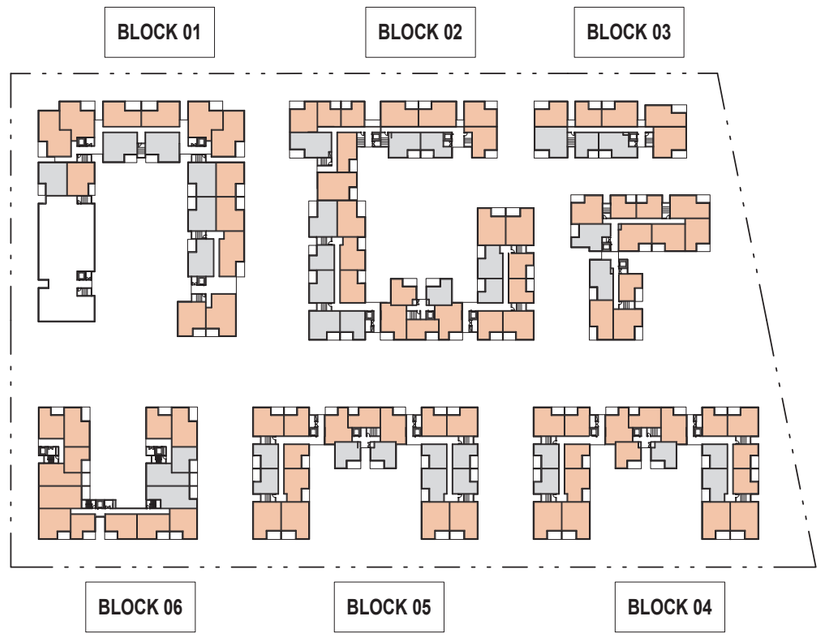
CONCEPT MASTER PLAN

17 - 23 LONGFIELD STREET, CABRAMATTA
JUL 2018 AA.MPN.1201

The CIRCLE CABRAMATTA

ANTONIADES ARCHITECTS

GOUND FLOOR



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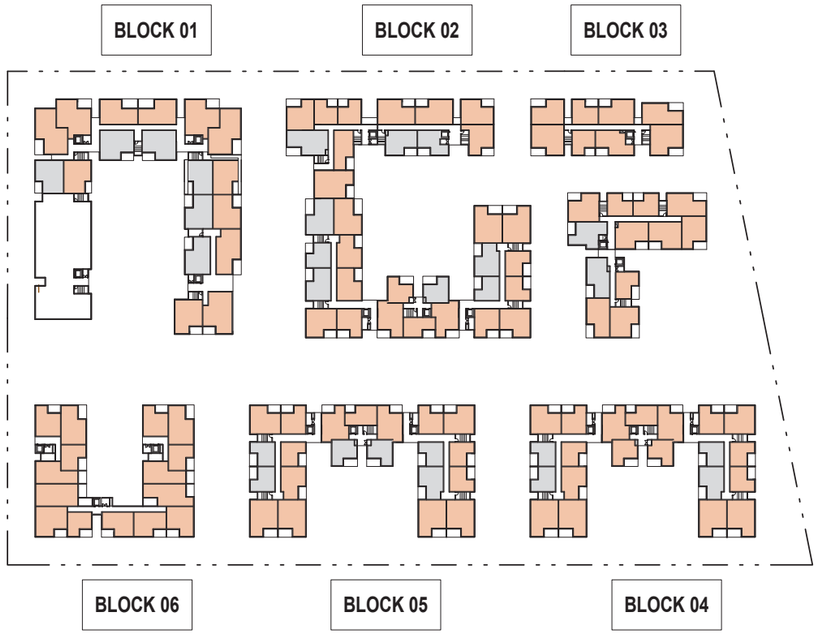

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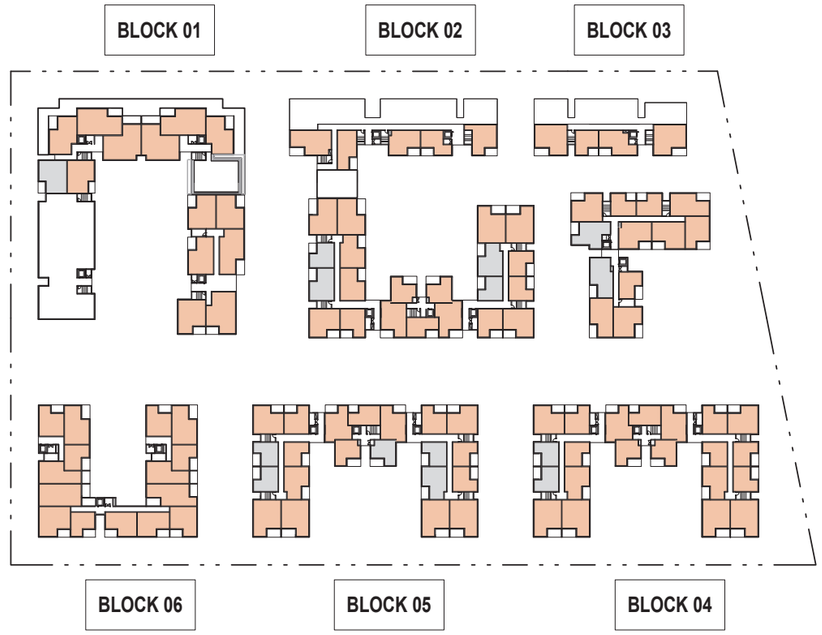

LEVEL 3

Solar Access Legend

- Compliance
- Non-Compliance

SOLAR ACCESS

CONCEPT MASTER PLAN

17 - 23 LONGFIELD STREET, CABRAMATTA

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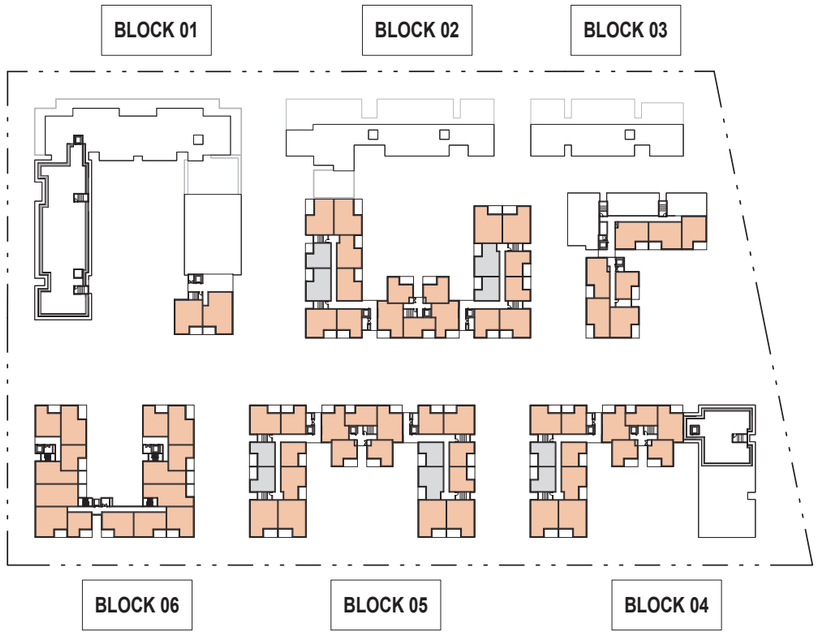
The CIRCLE CABRAMATTA

ANTONIADES ARCHITECTS



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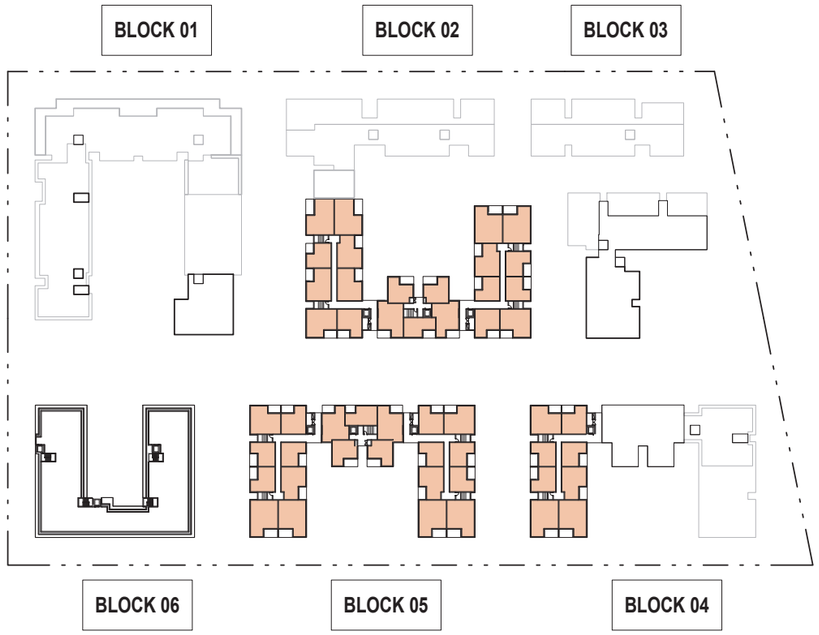

LEVEL 5

Solar Access Legend

- Compliance
- Non-Compliance

N

SOLAR ACCESS

CONCEPT MASTER PLAN

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JUL 2018 AA.MPN.1201

The CIRCLE CABRAMATTA

ANTONIADES ARCHITECTS

UNIT MIX

	Block 1	
	2 Bed	3 Bed
Ground Floor	10	4
Level 1	13	5
Level 2	13	5
Level 3	9	5
Level 4	1	1
Level 5	0	0
Total	46	20
%	69.7%	30.3%
Total	**66**	

	Block 2			Block 3 (a)			Block 3 (b)		
	1 Bed	2 Bed	3 Bed	1 Bed	2 Bed	3 Bed	1 Bed	2 Bed	3 Bed
Ground Floor	13	15	4	2	4	2	3	9	0
Level 1	14	15	4	2	4	2	3	9	0
Level 2	14	15	4	2	4	2	3	9	0
Level 3	12	11	3	1	1	2	3	9	0
Level 4	9	10	2	0	0	0	1	6	0
Level 5	9	10	2	0	0	0	0	0	0
Total	71	76	19	7	13	8	13	42	0
%	42.8%	45.8%	11.4%	25.0%	46.4%	28.6%	23.6%	76.4%	0.0%
Total	**166**			**28**			**55**		

	Block 4			Block 5			Block 6		
	1 Bed	2 Bed	3 Bed	1 Bed	2 Bed	3 Bed	1 Bed	2 Bed	3 Bed
Ground Floor	6	4	2	10	6	4	6	9	0
Level 1	11	6	4	11	6	4	5	10	0
Level 2	11	6	4	11	6	4	5	10	0
Level 3	11	6	4	11	6	4	5	10	0
Level 4	7	4	2	11	6	4	5	10	0
Level 5	4	2	2	11	6	4	0	0	0
Total	50	28	18	65	36	24	26	49	0
%	52.1%	29%	19%	52.0%	29%	19%	34.7%	65%	0%
Total	**96**			**125**			**75**		

Total (1 Bed)	232	38.0%
Total (2 Bed)	290	47.5%
Total (3 Bed)	89	14.6%
Total Apartments	**611**	**100.0%**

GFA

	Block 1 (Res.)	Block 1 (Com.)	Block 2 (Res.)	Block 3(a)	Block 3(b)
Ground	1616	1069	2732	675	1004
Level 1	2003	670	2801	675	1004
Level 2	2003	670	2801	675	1004
Level 3	1583	670	2224	368	1004
Level 4	277	0	1720	0	661
Level 5	0	0	1720	0	0
Total	7482		13998	2394	4677

	Block 4	Block 4 (child.)		Block 5	Block 6
		Indoor	Outdoor		
Ground	1001	362	854	1633	1267
Level 1	1686			1686	1291
Level 2	1686			1686	1291
Level 3	1686			1686	1291
Level 4	1021			1686	1291
Level 5	665			1686	0
Total	7745	362		10063	6431

Total GFA	53153 sqm
Site Area	39679 sqm
FSR	1.34:1

* GFA Area measured to internal face of external wall, excluding lift shaft, fire stair, parking, garbage storage and handling facilities

AMENITY : COMMON OPEN SPACE

	Lot Area	Required 25%	Common Open Space		
			Ground Floor	Rooftop	Provided
Block 1	7572	1893	1024	961	1985
Block 2	8621	2155	1243	926	2169
Block 3	5350	1337	1491	0	1491
Block 4	5983	1496	1344	618	1962
Block 5	5938	1485	1459	1655	3114
Block 6	3645	911	477	1281	1758
Total	**37109**	**9277**	Total		**12479**
%	**25%**		**33.6%**		

Common Open Space Req	9277 sqm	25%
Total Common Open Space	12479 sqm	33.6%

* Common Open Space out of the Partial Site Area

DEEP SOIL AREA

Deep soil area	4001 sqm
Partial Site Area	37109 sqm
Req 7%	11%

* Deep Soil Area measured out of the Common Open Space Area

CONCEPT MASTER PLAN

17 - 23 LONGFIELD STREET, CABRAMATTA

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ANTONIADES ARCHITECTS

AMENITY : CROSS VENTILATION

	Block 1	
	Compliant Apartment	No. Apartments
Ground Floor	10	14
Level 1	13	18
Level 2	13	18
Level 3	12	14
Level 4	2	2
Total	**50**	**66**
%	76%	100%

	Block 2		Block 3(a)	
	Compliant Apartment	No. Apartments	Compliant Apartment	No. Apartments
Ground Floor	26	32	8	8
Level 1	26	33	8	8
Level 2	26	33	8	8
Level 3	20	26	4	4
Level 4	15	21	0	0
Level 5	15	21	0	0
Total	**128**	**166**	**28**	**28**
%	77%	100%	100%	100%

	Block 3(b)		Block 4	
	Compliant Apartment	No. Apartments	Compliant Apartment	No. Apartments
Ground Floor	10	12	14	12
Level 1	10	12	16	21
Level 2	10	12	16	21
Level 3	10	12	16	21
Level 4	5	7	10	13
Level 5	0	0	6	8
Total	**45**	**55**	**78**	**96**
%	82%	100%	81%	100%

	Block 5		Block 6	
	Compliant Apartment	No. Apartments	Compliant Apartment	No. Apartments
Ground Floor	20	20	12	15
Level 1	16	21	12	15
Level 2	16	21	12	15
Level 3	16	21	12	15
Level 4	16	21	12	15
Level 5	16	21		0
Total	**100**	**125**	**60**	**75**
%	80%	100%	80%	100%

Total Apartments	**611**
Total Cross ventilation	**82%**

AMENITY : SOLAR ACCESS

	Block 1	
	Compliant Apartment	No. Apartments
Ground Floor	7	14
Level 1	12	18
Level 2	12	18
Level 3	13	14
Level 4	2	2
Total	**46**	**66**
%	70%	100%

	Block 2		Block 3(a)	
	Compliant Apartment	No. Apartments	Compliant Apartment	No. Apartments
Ground Floor	15	32	5	8
Level 1	22	33	5	8
Level 2	24	33	8	8
Level 3	22	26	4	4
Level 4	17	21	0	0
Level 5	21	21	0	0
Total	**121**	**166**	**22**	**28**
%	73%	100%	79%	100%

	Block 3(b)		Block 4	
	Compliant Apartment	No. Apartments	Compliant Apartment	No. Apartments
Ground Floor	8	12	9	12
Level 1	10	12	16	21
Level 2	10	12	17	21
Level 3	10	12	19	21
Level 4	7	7	11	13
Level 5	0	0	8	8
Total	**45**	**55**	**80**	**96**
%	82%	100%	83%	100%

	Block 5		Block 6	
	Compliant Apartment	No. Apartments	Compliant Apartment	No. Apartments
Ground Floor	7	20	9	15
Level 1	13	21	12	15
Level 2	15	21	15	15
Level 3	16	21	15	15
Level 4	17	21	15	15
Level 5	21	21		0
Total	**89**	**125**	**66**	**75**
%	71%	100%	88%	100%

Total Apartments	**611**
Total Solar Access	**78%**

CONCEPT MASTER PLAN

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ANTONIADES ARCHITECTS

AMENITY : PARKING SPACES

Block 01 - Carpark 01 - Non-Residential

	Code	Required	Provided
Gym	1 / 11 m2	122	122
Retail	0.025	2	5
Food & Drink	0.14	12	12
Medical Centre	3 / Room	60	60
Accesible	10%	20	20
Ground Floor Parking			25
Total		**216**	**244**

20 consulting room

* 25 Car spaces on Ground Floor * 20 consulting rooms for Medical Centre

Block 01 - Carpark 02 - Senior Housing

	Code	Required	Provided
2 Bed	0.85	39	39
3 Bed	1	20	20
Visitors	0.25	17	17
Accesible	10%	8	8
Extra			
Total		**84**	**84**

Block 2 to 3 - Residential Flat Buildings

	Code	Required	Provided
1 Bed	1	91	91
2 Bed	1	131	131
3 Bed	1	27	44
Visitors	0.25	62	62
Accesible	10%	31	31
Total		**342**	**359**

Block 4 to 5 - Residential Flat Buildings

	Code	Required	Provided
1 Bed	1	115	115
2 Bed	1	64	64
3 Bed	1	42	47
Visitors	0.25	19	55
Accesible	10%	24	28
Total		**264**	**309**

Block 4 - Child Care Centre

	Code	Required	Provided
100	0.25	25	33
Total		**25**	**33**

Block 6 - Residential Flat Building

	Code	Required	Provided
1 Bed	1	26	26
2 Bed	1	49	53
Visitors	0.25	19	19
Accessible	10%	9	9
Total		**103**	**107**

CONCEPT MASTER PLAN

17 - 23 LONGFIELD STREET, CABRAMATTA

JUL 2018 AA.MPN.1201

The CIRCLE CABRAMATTA

ANTONIADES ARCHITECTS

Office:
Suite 15/9 Hoyle Ave., Castle Hill NSW 2154

All Correspondence:
75 Gindurra Ave, Castle Hill NSW 2154

Telephone: (02) 8850 2799
E-mail: david@thompsonstanbury.com.au
yafeng@thompsonstanbury.com.au
www.thompsonstanbury.com.au

MOBILE PHONES: *David Thompson: 0418 262 125* *Yafeng Zhu: 0450 747 401*

TSA

ABN: 79 943 737 368

17 July 2018

Elton Consulting
Level 6, 332 – 342 Oxford Street
BONDI JUNCTION
NSW 2022

Attention: Vasiliki Andrews, Project Manager

Dear Madam,

PROPOSED REZONING
17 - 21 LONGFIELD STREET, CABRAMATTA

This Practice has been requested by Elton Consulting to respond to the following comments raised by Roads and Maritime Services (RMS) within their letter to Fairfield City Council (applicant) dated 6 June 2018 (Ref: SYD16/00434/03) associated with a rezoning proposal at 17 – 21 Longfield Street, Cabramatta:

> *I refer to your email dated 21 March 2018 inviting Roads and Maritime Services to provide comment on the abovementioned planning proposal. Roads and Maritime appreciates the opportunity to provide comment and apologises for the delay in providing a submission.*
>
> *Roads and Maritime has reviewed the information provided and it is noted that the proposal is unchanged since RMS' preliminary advice to Council dated 20 December 2016. It is also noted that the additional traffic and transport analysis requested by RMS to support the proposed traffic management measures on the Cumberland Highway have not been undertaken. In this regard, RMS reiterates the comments of the letter dated 20 December 2016 (copy of letter attached) and does not support the proposed traffic management measures on Cumberland Highway at this stage.*

With regard to the above RMS outcome, I have no issues with the RMS wanting to leave the existing traffic signal arrangement at Hume Highway's intersection with Chadderton Street and Hollywood Drive unchanged.

It is noted that the poor level of service at the intersection of Hume Highway and Chadderton Street for the afternoon peak period presented within our original Traffic Report represents an existing condition. As such, the upgrades proposed at this intersection was proposed as a means to improve its existing performance (being the resultant of peak hour traffic currently generated by existing surrounding land uses in its immediate vicinity), whilst also being capable of satisfactorily accommodating the additional traffic associated by the subject proposal.

In any case, in light of the RMS recommendation to not support the proposed upgrades at the intersection of Hume Highway and Chadderton Street, it is noted that the additional traffic projected to be generated by the proposed development is not expected to alter the overall existing level of service at this intersection despite some increases in the average delay and degree of saturation at this intersection.

Submitted for your consideration.

Yours faithfully,

David J Thompson
Transport Planner & Accredited Lead Road Safety Auditor

Office:
Suite 15/9 Hoyle Ave., Castle Hill NSW 2154

All Correspondence:
75 Gindurra Ave, Castle Hill NSW 2154

Telephone: (02) 8850 2788
Facsimile: (02) 8850 2799
E-mail: david@thompsonstanbury.com.au
morgan@thompsonstanbury.com.au
www.thompsonstanbury.com.au

MOBILE PHONES: *David Thompson: 0418 262 125* *Morgan Stanbury: 0410 561 848*

THOMPSON STANBURY ASSOCIATES

ABN: 79 943 737 368

TRAFFIC & TRANSPORT STUDY
REZONING PROPOSAL
LOTS 34 AND 35 DP 456221
17 – 21 LONGFIELD STREET
CABRAMATTA

Ref: 13-133

NOVEMBER 2015

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PAGE NO.

APPENDICES

1. INTRODUCTION

A Planning Proposal is to be lodged with Fairfield City Council (Council) and the Planning and Infrastructure for the rezoning of 17 – 21 Longfield Street, Cabramatta. The proposal involves the rezoning of the land from B5 Business to R4 Residential under Fairfield LEP 2013. The rezoning is proposed to allow for the creation of an intergenerational community comprising various different forms of residential development with associated complementary high demand uses, such as an aged care facility and child care centre (herein referred to as 'the development').

The Planning Proposal is required to incorporate, among other specialist studies, a Traffic and Transport Study. Upon completion, the Planning Proposal, including the Traffic & Transport Study, will be submitted to Council for assessment and / or endorsement. Subsequent to Council's approval, the Proposal will be submitted to Planning and Infrastructure for comments and / or Gateway approval.

The Practice of Thompson Stanbury Associates has been engaged by FTD Holdings Pty. Ltd. to prepare the required Traffic & Transport Study to accompany the Planning Proposal. This report assesses and documents the potential parking, traffic and transport impacts of the development that is associated with the Planning Proposal on the surrounding road network in terms of traffic efficiency and safety. Particular consideration has been given to the following specific issues:

- Likely additional traffic generated by the rezoning;
- The impact of this additional traffic on the existing surrounding road network;
- The extent and timing of infrastructure upgrading works (related to all road users being vehicles, pedestrians and cyclists in conjunction with public transport considerations) required within and adjoining the subject land to adequately accommodate the proposal; and
- The proposed development access arrangements and suitability with respect to existing environmental and traffic conditions.

This report should be read in conjunction with a Concept Plan prepared by Antoniades Architects, a reduced copy of which (site plan only) is attached as **Appendix 1**.

The report has been prepared pursuant to State Environmental Planning Policy (Infrastructure) 2007.

2. SITE DETAILS

2.1 Site Location

The site provides a northern frontage to Chadderton Street and a southern frontage to Longfield Street, Cabramatta, being located approximately 30m and 250m to the west of Hume Highway at the southern and northern boundaries of the site respectively. The extent and location of the land is illustrated overleaf as **Figure 1** being an extract of UBD's *Australian City Streets – Version 4*.

2.2 Site Description

The site provides a legal description of Lots 34 and 35 DP 456221 and a street address of 17 – 21 Longfield Street, Cabramatta. It forms a predominantly rectangular shaped parcel of land providing approximate frontages of 164m and 161m to Chadderton and Longfield Streets respectively.

The total site area is approximately 3.97 hectares.

2.3 Existing Use

The subject site currently contains a number of industrial buildings as follows:

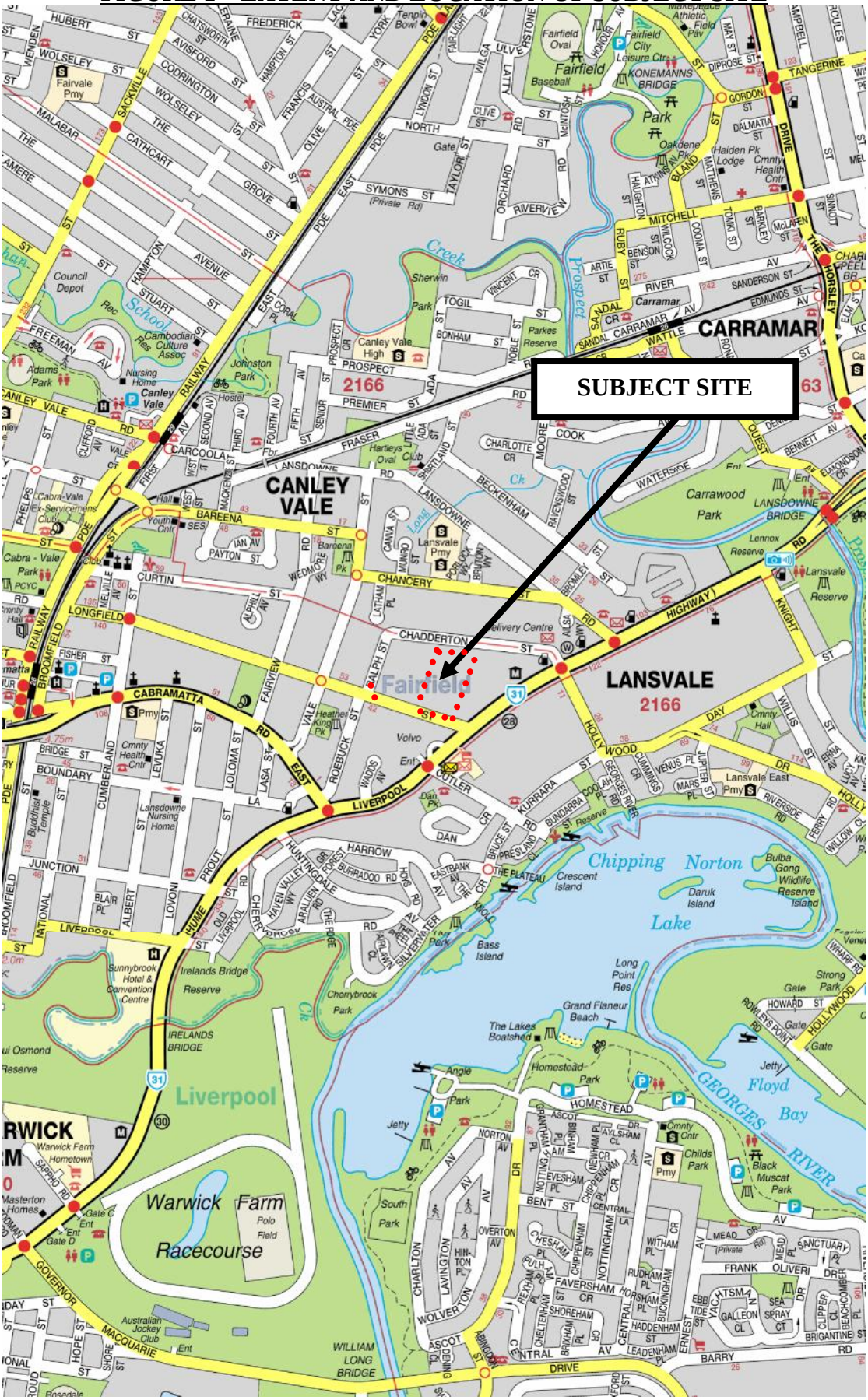
- A large industrial building located within the central southern portion of the site, providing 10,245m^2 warehouse space and 500m^2 office space;
- An industrial building located within the north-western corner of the site, providing 1,853m^2 warehouse space and 200m^2 office space; and
- An industrial building located within the north-eastern corner of the site, providing 1,605m^2 warehouse space and 200m^2 office space.

The first of the above buildings was unoccupied at the time of writing this report.

The two existing occupied buildings located within the northern portion of the site are understood to accommodate in the order of 60 employees.

The existing site uses are serviced by four driveways connecting with Chadderton Street and three driveways connecting with Longfield Street.

FIGURE 1 – EXTENT AND LOCATION OF SUBJECT SITE



2.4 Surrounding Uses

The site is located within a transition area between residential and industrial zoned land. In this regard, a number of commercial and warehouse buildings, a motel and a service station are located to the east of the site, fronting Longfield Street, Hume Highway and Chadderton Street. Detached residential dwellings occupy land to the south and north-west whilst medium density residential townhouse development primarily adjoins the site to the west.

The Ming Quang Buddhist Temple is located to the north on the opposite side of Chadderton Street.

3. PROPOSED DEVELOPMENT

3.1 Built Form

The subject proposal involves the rezoning of the site from B5 Business to R4 Residential under Fairfield LEP 2013 to allow for residential development with associated high demand uses.

A Concept Plan has been developed by Antoniades Architects to accompany the Planning Proposed. The Concept Plan is designed to create a vibrant and co-generational residential and mixed use environment, comprising the following mix of land-uses:

- Up to 450 standard residential apartments;
- Up to 150 independent living unit (seniors living) dwellings;
- A nursing home with up to 150 beds;
- Approximately 2,397m^2 of floor space for commercial / retail and other uses; and
- 500m^2 child care centre with an indicative capacity of up to 100 children.

The commercial / retail building is proposed to be located within the south-eastern corner of the site fronting Longfield Street, taking advantage of the proximity and exposure of this location to Hume Highway.

The remainder of the site is primarily proposed to accommodate a variety of residential and employment generating land-uses with the independent living units located within the south-western corner of the site fronting Longfield Street whilst the nursing home component located within the southern central portion of the site, being set-back from the public street frontages. The standard residential dwellings are proposed to be located within the northern portion of the site whilst the child care centre is proposed to be located within the north-eastern corner of the site fronting Chadderton Street.

The buildings are proposed to be between three to six storeys in height, with the reduced building heights fronting both Chadderton and Longfield Streets and the western site boundary and the maximum height buildings being located within the eastern and central portions of the site.

Various areas of open space are proposed to be provided throughout the site, including public plazas fronting Chadderton and Longfield Streets.

3.2 Site Access

A through site north-south pedestrian, cyclist and visual link is proposed between Chadderton and Longfield Streets, approximately central to the site frontages to the public roads. This link is also proposed to allow for emergency vehicles to traverse the site, and provide the public with access to dwellings / open space.

The northern portion of the through site link is proposed to facilitate vehicular access to the central and north-eastern buildings, through the provision of a separated carriageway intersecting with Chadderton Street to the north. A single further vehicular access is proposed to those buildings within the north-western corner of the site via a driveway connecting with Chadderton Street adjoining the western site boundary.

Separated vehicular connectivity to the commercial / retail and the seniors living components is proposed via driveways connecting with Longfield Street, located within the south-eastern and south-western corners of the site respectively.

The above access arrangements provide connectivity to underground parking for site residents and visitors.

In addition, public access indented angled street parking is also proposed within Chadderton Street for site visitors as well as the wider community. The ultimate number of on-street car parking spaces provided adjoining the northern site frontage within Chadderton Street is between 20 – 30 spaces, subject to detailed design.

4. EXISTING TRANSPORT CONDITIONS

4.1 Road Network Function and Controls

4.1.1 Regional Road Network

The Regional Road network in the vicinity of the subject site primarily accommodates Hume Highway and Cabramatta Road East.

4.1.1.1 Hume Highway

Hume Highway performs a State Road function under the care and control of the Roads & Maritime Services. In this regard, it forms an important arterial link between Parramatta Road at Summer Hill in the north-east and M5 / M7 Motorway at Casula in the south-west.

Within the vicinity of the subject site, Hume Highway forms a six lane divided carriageway, providing three through lanes in each direction. It forms signalised intersections with Cabramatta Road East and Cutler Road to the south and Chadderton Street / Hollywood Drive and Chancery Street to the north. S-Lane treatments often reduce the number of southbound through travel lanes to two to facilitate the provision of exclusive left and right turn lanes at these signalised intersections.

Hume Highway also forms a junction with Longfield Street in the immediate vicinity of the site under signage control. The central median along the Hume Highway restricts access to Longfield Street to left in-left out (for northbound vehicles along the Hume Highway).

In addition to its arterial function, Hume Highway provides direct access to a number of highway business uses within the vicinity of the site.

Traffic flow is governed by a sign posted speed limit of 70 km/h.

4.1.1.2 Cabramatta Road East

Cabramatta Road East performs a State Road under the care and control of the Roads & Maritime Services. It provides an east-west arterial function between Cabramatta Road West (which in turn continues to Elizabeth Drive at Bonnyrigg) in the west and Hume Highway at Lansvale in the east.

Cabramatta Road East primarily provides a 13m wide carriageway providing two through lanes in each direction. It forms signalised intersections with Hume Highway and Cumberland Street in the vicinity of the site. Pavement widening is provided on approach to these signalised intersections to accommodate additional exclusive turning lanes.

Cabramatta Road East also intersects with Fairview Road, Vale Street and Roebuck Street in the vicinity of the subject site under signage control. Whilst an exclusive right turn lane is provided in Cabramatta Road East facilitating access movements to Fairview Street, right turn egress movements are prohibited. Further, right turn (ingress and egress) restrictions also apply at the Cabramatta Road East junctions with Vale Street and Roebuck Street.

4.1.2 Local Road Network

4.1.2.1 Longfield Street

Longfield Street performs a Collector road function under the care and control of Council. In this regard, it provides an east-west connection between Hume Highway in the east and Broomfield Street in the west.

Longfield Street provides a 13m wide pavement providing one through lane of traffic in each direction in conjunction with parallel parking along both kerb alignments. It forms a signalised intersection with Cumberland Street and also intersects with Fairview Road and Vale Street under single lane circulating roundabout control. It forms an off-set cross intersection with Ralph Street and Roebuck Street in the immediate vicinity of the subject site under major / minor priority control with Longfield Street forming the priority route.

Traffic flow is governed by a sign posted speed limit of 50km/h.

4.1.2.2 Chadderton Street

Chadderton Street, with Ralph Street, performs a continuation of the abovementioned Longfield Street Collector Road linking Longfield Street to Hume Highway, with which it intersects under traffic signal control.

Chadderton Street provides a 13m wide pavement providing one through lane of traffic in each direction in conjunction with parallel parking along both kerb alignments. It provides an east-west alignment, prior to curving to the south at its western extremity where it forms Ralph Street. Speed humps, kerb extensions and short sections of central median are provided on approach to the 90 degree curve, also being supplemented with chevron signs at the curve.

Traffic flow is governed by a sign posted speed limit of 50km/h.

4.1.2.3 Cumberland Street

Cumberland Street performs a Collector Road function under the care and control of Council providing a north-south connection between the Cabravale Leisure Centre in the north and Liverpool Street in the south.

Cumberland Street provides a 13m wide pavement providing one through lane of traffic in each direction in conjunction with parallel parking along both kerb

alignments. It intersects with Cabramatta Road East and Longfield Street under traffic signal control. Parking restrictions on approach to these intersections facilitate the provision of two travel lanes on approach to these intersections. Cumberland Street also intersects with Curtin Street within the immediate vicinity under major / minor priority control within Cumberland Street forming the priority route

4.2 Existing Traffic Volumes

This Practice has undertaken extensive traffic surveys in the general vicinity of the subject site between 7.00am – 9.00am and 4.00pm – 6.00pm on various weekdays in February 2014, at the following intersections:

- Hume Highway, Chadderton Street and Hollywood Drive;
- Hume Highway and Longfield Street;
- Cabramatta Road East and Cumberland Street;
- Longfield Street, Ralph Street and Roebuck Street; and
- Longfield Street and Cumberland Street.

Further to the above, surveys of the driveways linking the subject site and Chadderton Street and Longfield Street were also undertaken.

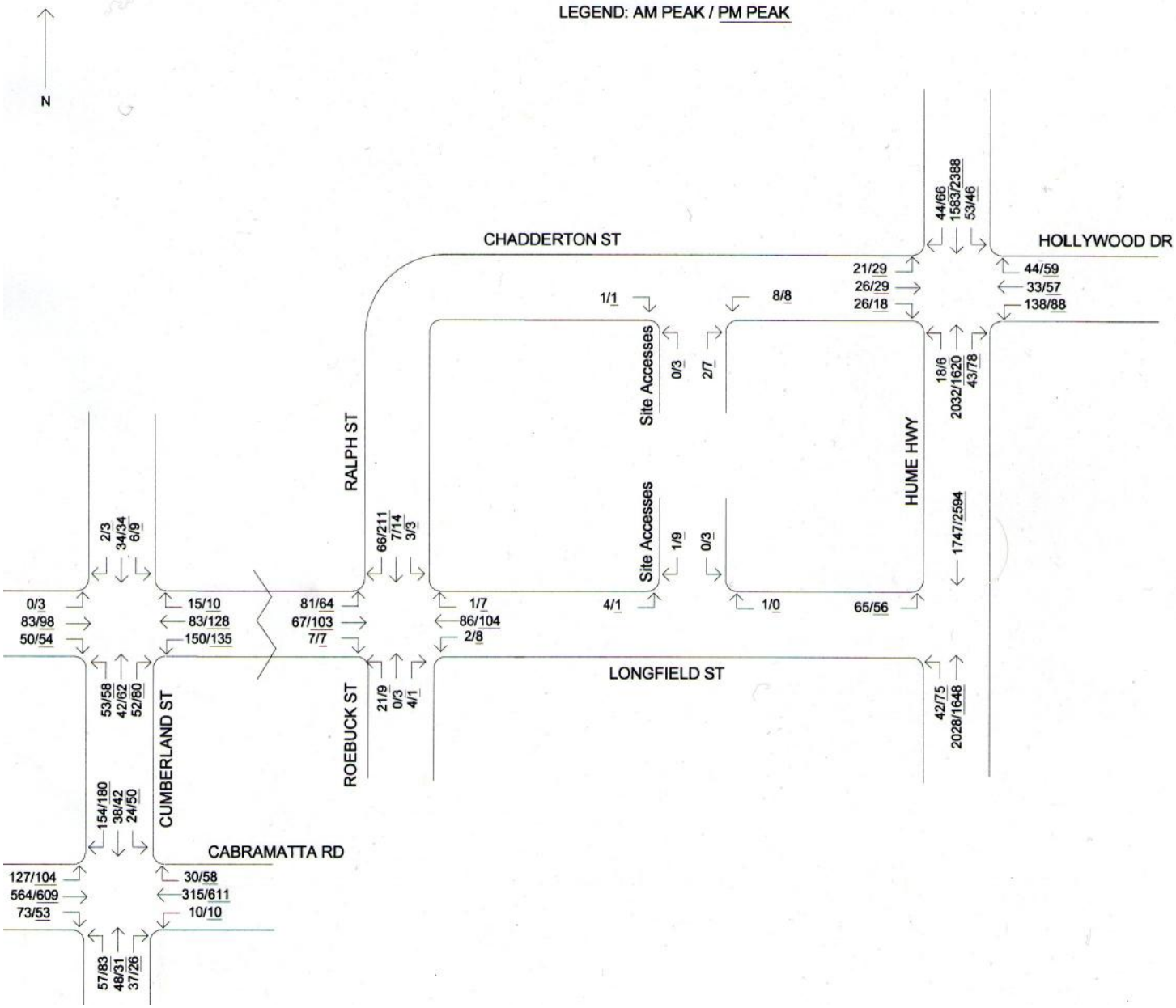
Figure 2 overleaf illustrates the surveyed peak hour (8.00am – 9.00am and 5.00pm – 6.00pm) traffic flows at the surveyed intersections, whilst full details are available upon request. There are some minor net gains and losses between intersections associated with private development access locations, parking / unparking manoeuvres and differing survey days.

Figure 2 indicates the following peak hourly traffic flows:

- Hume Highway accommodates 3,800 – 4,300 vehicles;
- Cabramatta Road East accommodates 1,000 – 1,350 vehicles;
- Chadderton Street, adjoining the subject site, accommodates 150 – 200 vehicles;
- Longfield Street, adjoining the subject site, accommodates 150 – 200 vehicles;
- Cumberland Street accommodates 400 – 500 vehicles; and
- The subject site currently generates 15 – 30 vehicle movements to and from the site (Chadderton Street and Longfield Street driveways combined).

FIGURE 2
EXISTING (2014) WEEKDAY PEAK HOUR TRAFFIC VOLUMES
8.00AM - 9.00AM & 5.00PM - 6.00PM

LEGEND: AM PEAK / PM PEAK



4.3 Existing Intersection Operation

In order to objectively assess the operation of the surveyed intersections, they have been analysed using SIDRA computer intersection analysis program. 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.

Other key indicators provided by SIDRA are average vehicle delay, the number of stops per hour and the degree of saturation. Degree of saturation, known as the X-value, is the ratio of the arrival rate of vehicles to the capacity of the approach. The X-value is a useful and professionally accepted measure of intersection performance. A value of 0.75 permits the intersection to operate in a generally satisfactory manner and provides tolerance for minor disturbances and fluctuations in the traffic conditions. At values of 'X' at 0.8 the traffic will be subject to queuing and delays which could extend over more than one signal cycle. For intersections controlled by traffic signals both queue length and delay increase rapidly as DS approaches 1.0.

For intersections controlled by a roundabout or give way or stop signs, a degree of saturation of 0.8 or less indicates satisfactory intersection operation.

SIDRA provides analysis of the operating conditions that can be compared to the performance criteria set out in **Table 1** (being the RTA 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

4.3.1 Intersection Modelling Output

The results of the analyses are presented in **Table 2** overleaf whilst more detailed summaries are contained within **Appendix 2**.

TABLE 2 SIDRA ANALYSIS EXISTING CONDITIONS		
Intersection	**AM Peak**	**PM Peak**
Hume Hwy & Chadderton St		
Average Vehicle Delay	18.4	75.2
Degree of Saturation	0.69	1.07
Level of Service	B	F
Hume Hwy & Longfield St		
Average Vehicle Delay	12.6	11.0
Degree of Saturation	0.37	0.46
Level of Service	A	A
Cabramatta Rd East & Cumberland St		
Average Vehicle Delay	27.4	28.0
Degree of Saturation	0.43	0.46
Level of Service	B	B
Longfield St, Ralph St & Roebuck St		
Average Vehicle Delay	10.4	11.9
Degree of Saturation	0.10	0.35
Level of Service	A	A
Longfield St & Cumberland St		
Average Vehicle Delay	16.5	16.9
Degree of Saturation	0.18	0.23
Level of Service	B	B

Notes:

1. The off-set Longfield Street junctions with Ralph Street and Roebuck Street has been modelled as a standard cross intersection.

4.3.2 Discussion of Output

Table 2 indicates that the following:

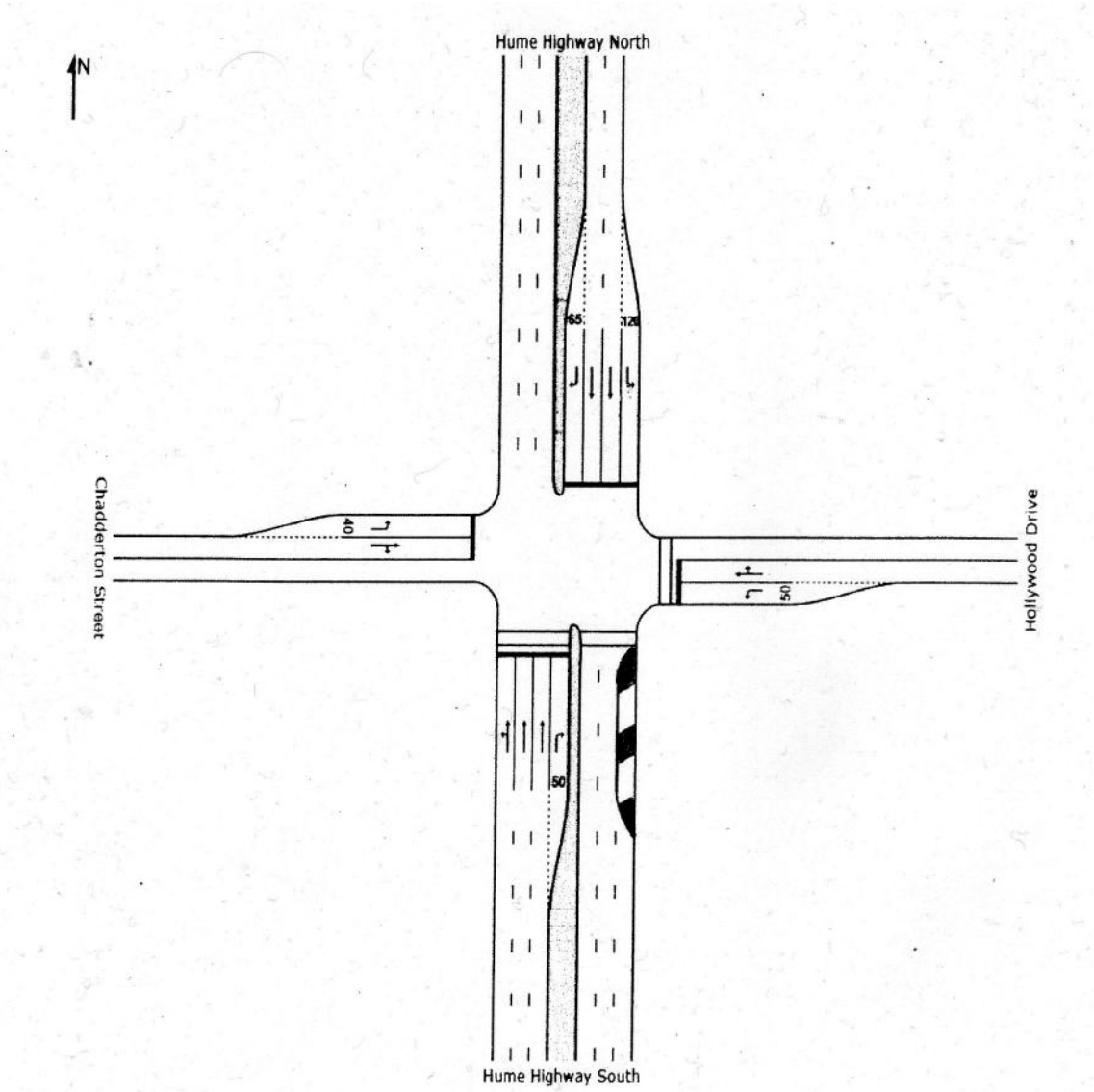
- Whilst the intersection of Hume Highway, Chadderton Street and Hollywood Drive operates with a good level of service (level of service 'B') during the morning peak period, poor conditions (level of service 'F') prevail during the evening peak; and

- All other modelled intersections provide a good level of service ('B' or better) during the morning and evening peak periods.

Inspection of the SIDRA output indicates that the poor level of service at the intersection of Hume Highway, Chadderton Street and Hollywood Drive during the evening peak period results from extended delays for through southbound Highway movements. The limitation of the southbound Highway carriageway to two through lanes restricts the capacity to accommodate the significant southbound traffic demands during the evening peak period.

Figure 3 provides a graphical representation of the existing lane configuration of the intersection.

FIGURE 3
EXISTING LANE CONFIGURATION AT THE INTERSECTION OF HUME HIGHWAY, CHADDERTON STREET & HOLLYWOOD DRIVE



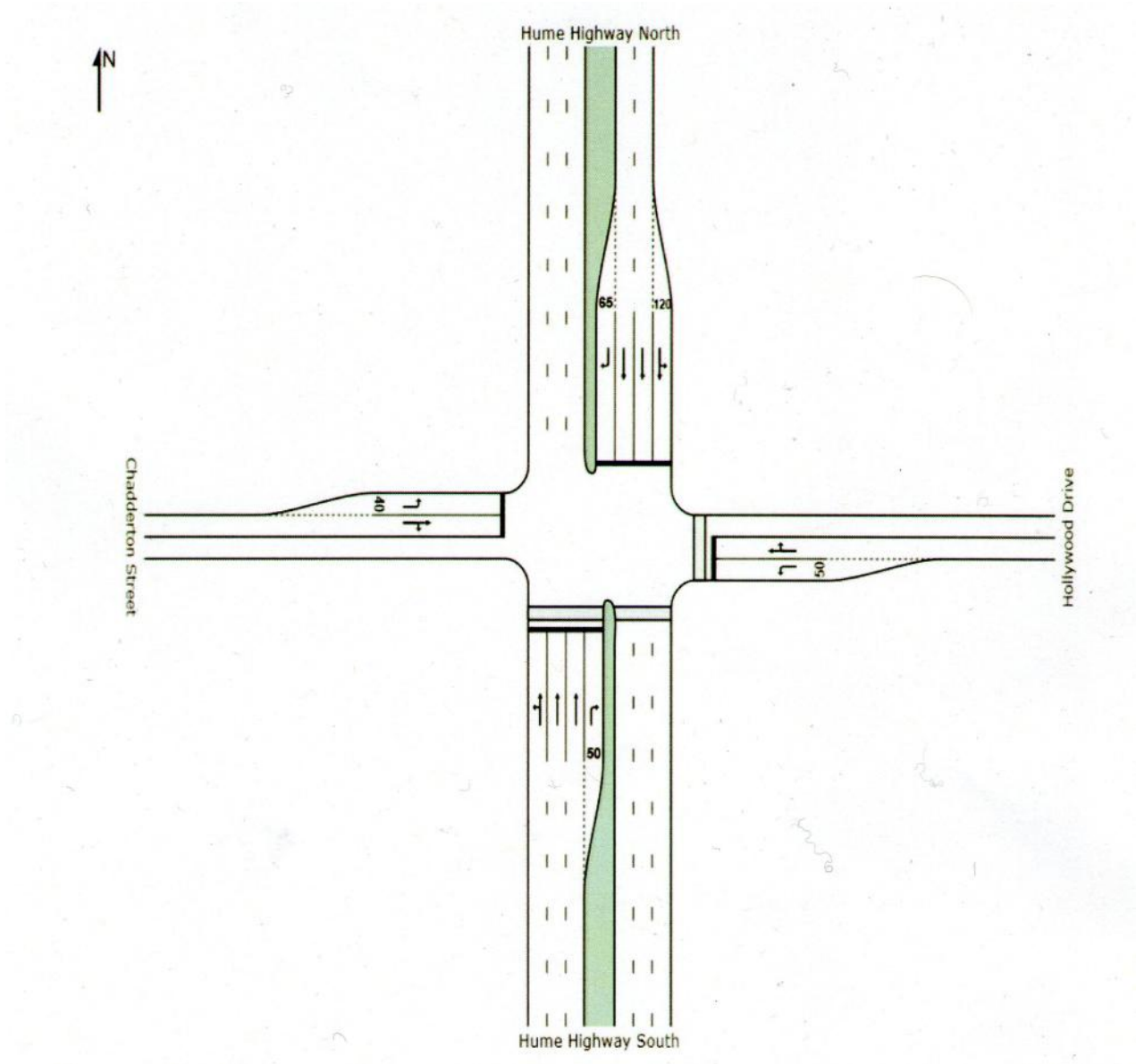
The previously described existing limitation to southbound Highway capacity can be assisted by the reconfiguration of the existing southbound carriageway lane arrangement as follows:

- Converting the existing exclusive left turn lane within the southbound Hume Highway approach to the intersection to a shared through / left turn lane; and

- Removal of the existing painted kerb extension within the southbound Highway departure from the intersection allowing the provision of a southbound through kerb side lane.

Figure 4 provides a graphical representation of the recommended intersection lane configuration.

FIGURE 4
EXISTING LANE CONFIGURATION AT THE INTERSECTION OF HUME HIGHWAY, CHADDERTON STREET & HOLLYWOOD DRIVE



Whilst the poor operational experienced at the intersection of Hume Highway, Chadderton Street and Hollywood Drive conditions during the evening peak represent an existing condition, and therefore not a result of the subject proposal, it is recommended that the above lane configuration alterations be undertaken as part of the development as the costs associated with which are primarily limited to road and

linemarking alterations. In this regard, no civil or signal alterations are required or recommended and as such, any unlikely costs associated with such, should not be borne by the proponent. These road and linemarking alterations have been supported by Roads & Maritime Services road network officers during preliminary discussions with respect to the subject proposal.

In order to undertake an assessment of the operational performance of the intersection of Hume Highway, Chadderton Street and Hollywood Drive, incorporating the recommended lane configuration alterations, a further SIDRA analysis has been undertaken. **Table 3** provides a summary of the SIDRA analysis results whilst more detailed summaries are contained within **Appendix 3**.

TABLE 3
SIDRA ANALYSIS
INTERSECTION OF HUME HIGHWAY, CHADDERTON STREET & HOLLYWOOD DRIVE

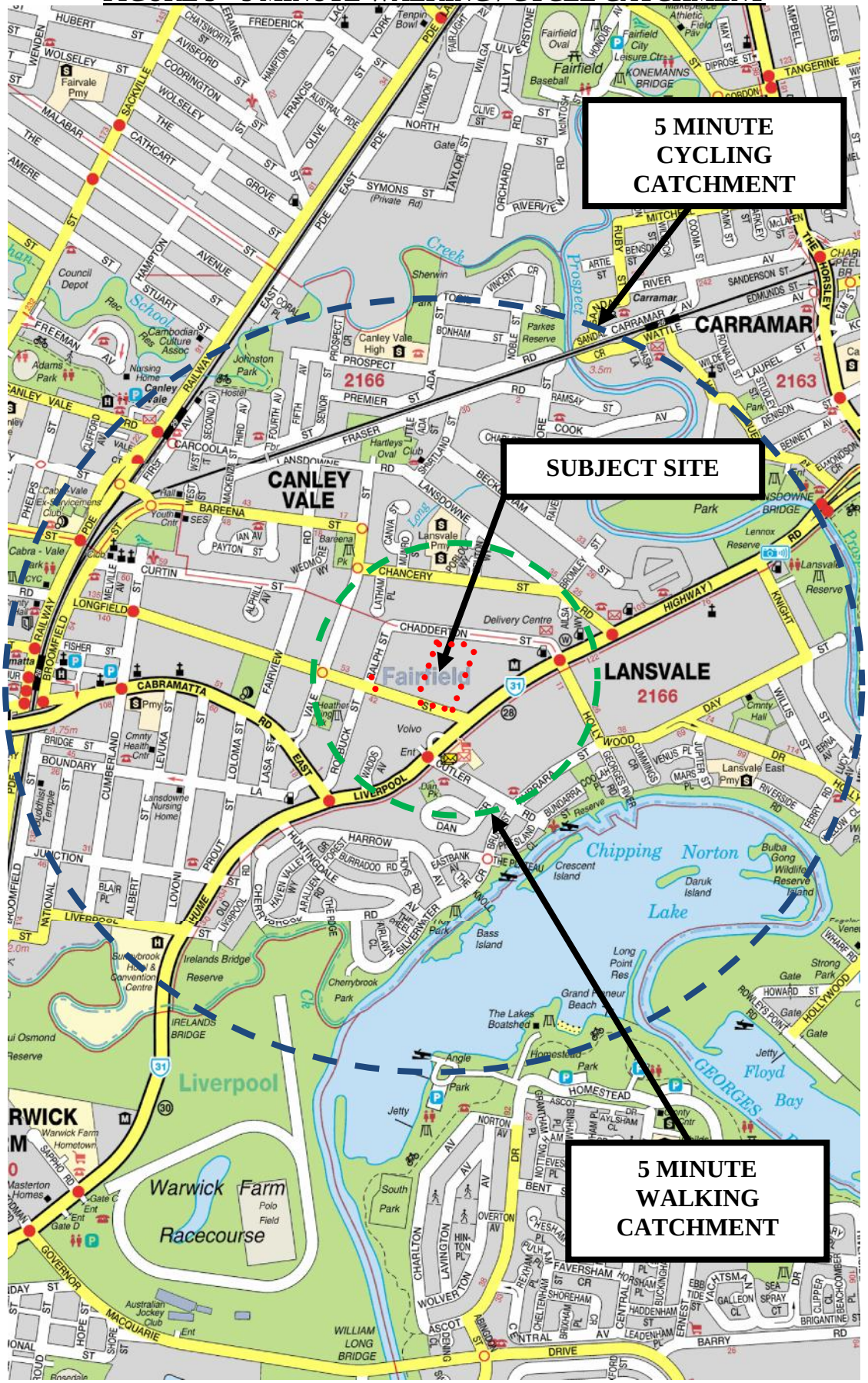
	Figure 3 Lane Configuration		**Figure 4 Lane Configuration**	
	AM Peak	**PM Peak**	**AM Peak**	**PM Peak**
Average Vehicle Delay	18.4	75.2	18.7	20.6
Degree of Saturation	0.69	1.07	0.63	0.75
Level of Service	B	F	B	B

Table 3 indicates that the recommended lane configuration alterations within the southbound Hume Highway carriageway are expected to result in a significant improvement to the existing operational performance of the intersection of the Highway, Chadderton Street and Hollywood Drive during the evening peak period.

4.4 Public Transport and Non-Car Travel

The subject site is located within close proximity to rail services within a 5 minute cycle and bus services within a 5 minute walk. **Figure 5** overleaf provides a graphical representation of the 5 minute cycle and walk catchments relative the subject site, being an extract of *UBD's Australian City Streets – Version 4*.

FIGURE 5 – 5 MINUTE WALKING / CYCLE CATCHMENT



4.4.1 Train

The subject site is located approximately 1.4km to the east of Cabramatta Railway Station. This is a junction station of the Sydney trains network where the Airport, Inner West & South Line, Cumberland Line and the Bankstown Line merge.

The Airport, Inner West & South Line provides connectivity between Liverpool, Macarthur and the Southern Highlands to the south and Lidcombe, Strathfield and the City to the east, The Airport and the East Hills region to the south-west. The Cumberland Line provides connectivity between Liverpool and Campbelltown in the south to Schofields in the north. The Bankstown Line provides connectivity between Liverpool in the south-west, Lidcombe to the north and the City to the east.

4.4.2 Bus

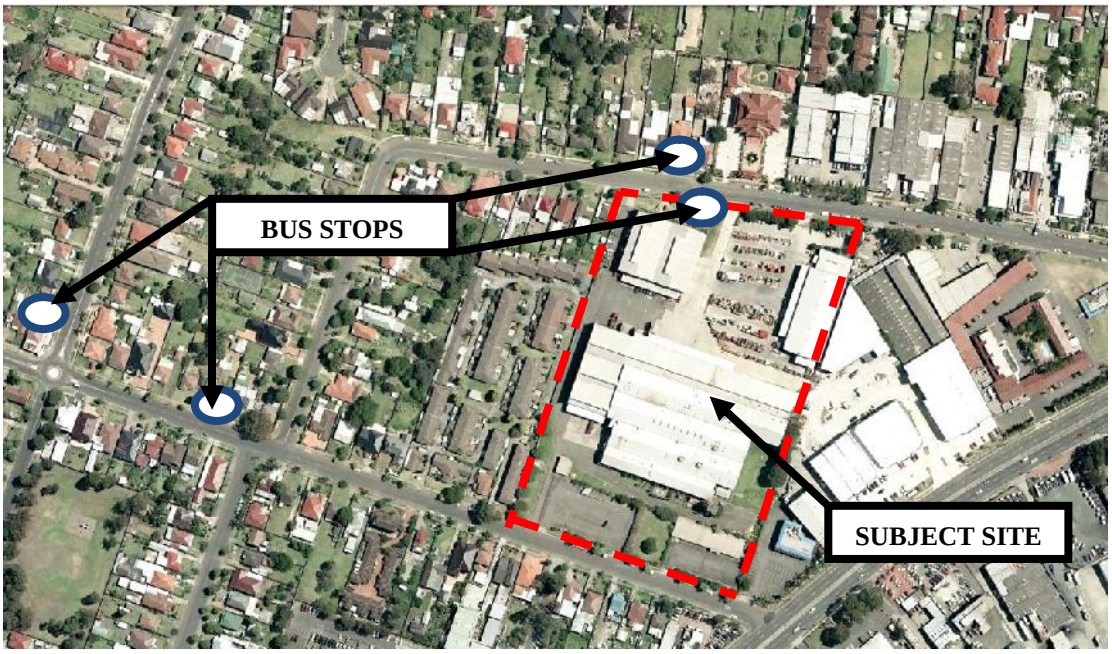
Veolia Transport operates the following routes in the immediate vicinity of the subject site:

- Route S1 between Fairfield and Liverpool via Cabramatta; and
- Route 904 between Fairfield and Liverpool via Canley Vale.

Route S1 provides connectivity between the site and Cabramatta Railway Station whilst Route 904 provides connectivity to / from Liverpool Railway Station.

The above routes are serviced by bus stops located on both sides of Chadderton Street approximately central to the site frontage. Further, bus stops are provided on the northern side of Longfield Street to the west of Ralph Street and the western side of Vale Street to the north of Longfield Street. The proximity of these stops to the subject site is illustrated by an aerial photograph provided as **Figure 6** overleaf, being an extract of Google Earth.

FIGURE 6
EXISTING BUS STOP LOCATIONS WITHIN THE IMMEDIATE PROXIMITY OF THE SUBJECT SITE



Route S1 provides an hourly service on weekdays between 8.45am and 3.35pm.

Route 904 provides a 30 minute frequency during weekday commuter peaks, lengthening to 60 minutes during other periods between 6.37am and 6.52pm. It provides an hourly service on Saturdays between 8.42am and 5.42pm and a two hourly service on Sundays and Public Holidays between 9.47am and 3.45pm.

The Parramatta-Liverpool-Bankstown Area Bus Services map (Regional 13), incorporating the above routes, prepared by Veolia Transport is attached as **Appendix 4** for reference.

4.4.3 Walk / Cycle

Pedestrians are provided with the following infrastructure in the vicinity of the subject site:

- Signalised crossings are provided over:
  - The southern Hume Highway and Hollywood Drive approaches at their intersection with Chadderton Street;
  - The southern and eastern approaches to the junction of Hume Highway and Cutler Road;
  - All approaches at the intersection of Longfield Street and Cumberland Street;
  - The southern approach to the junction of Hume Highway and Cabramatta Road East; and

  - All approaches at the intersection of Cabramatta Road East and Cumberland Street;
- Splitter island / refuges are provided over:
  - All approaches at the roundabout controlled intersection of Longfield Street and Vale Street; and
  - All approaches at the roundabout controlled intersection of Longfield Street and Fairview Road.

- A footpath is provided on:
  - The northern side of Chadderton Street;
  - Both sides of Longfield Street;
  - Both sides of Hume Highway; and
  - The western side of Ralph Street.

There are no established cycle routes within the immediate vicinity of the subject site. Notwithstanding this, the width and alignment (vertical and horizontal) of the surrounding local roads (primarily 13m) is suitable to accommodate on-road cycle activity in a safe and efficient manner.

5. PROJECTED TRANSPORT CONDITIONS

5.1 Traffic Generation

5.1.1 Existing Site Generation

Figure 2 indicates that the existing occupied site uses currently generate 17 and 32 morning and evening peak hour vehicle movements respectively to and from the site.

5.1.2 Existing Traffic Generating Capacity

Section 2.3 of this report presented that the largest of the three existing industrial buildings was unoccupied at the time of the undertaking of this assessment. This building provides 10,245m^2 of warehouse space and 500m^2 of office space. The Roads & Maritime Services have established average traffic generation rates for warehouse and office space as published within its *Guide to Traffic Generating Developments*, being 0.5 trips per 100m^2 and 2 trips per 100m^2 respectively.

Accordingly, the existing unoccupied building is therefore capable of generating 61 peak hour trips to and from the site. Adding this traffic generation to the surveyed site generation, the traffic generating capacity of the existing development is therefore estimated to be between 78 and 93 peak hour vehicle trips.

5.1.3 Proposed Rezoning

The Planning Proposal is accompanied by a Concept Plan, which incorporates a range of land-uses with differing traffic generating potential. The following subsections provide discussion on the traffic generating potential of each of the various land-uses proposed under the Concept Plan.

5.1.3.1 Standard Residential Dwellings

The proposal involves the provision of up to approximately 450 standard residential apartments.

The Roads & Maritime Services' *Guide to Traffic Generating Developments* specifies an average peak hour traffic generation rate of 0.29 trips per unit for standard residential apartments within high density developments in sub-regional locations. Application of this rate to the proposed 450 standard residential apartments results in a peak hour traffic generation estimate of 131 trips.

5.1.3.2 Seniors Living

The proposal involves the provision of up to 150 independent living units for seniors and a nursing home facility containing up to 150 beds.

The Roads & Maritime Services provides an average traffic generation rate of 0.1 – 0.2 trips per dwelling for 'Housing for Aged and Disabled Persons' within its *Guide to Traffic Generating Developments*.

The assisted living nature of the nursing home would suggest that a significant majority of the residents would, in fact not drive or own a vehicle given their limited abilities. Considering this, the lower of the abovementioned traffic generation rates (0.1) has been adopted for the nursing home component and the higher traffic generation rate (0.2) has been adopted for the independent living component, deriving a peak hour traffic generation estimate for the seniors living component of the proposal of 45 peak hour trips (whereby 15 trips are generated by the nursing home component and 30 trips are generated by the independent living units component).

5.1.3.3 Commercial / Retail

The proposal involves the provision of approximately 2,397m^2 of floor space for commercial / retail and other uses. The exact nature or split of the commercial / retail floor space is unknown at this stage however for the purposes of this assessment, it has been assumed that 75% of the floor space (1,798m^2) is standard retail shops whilst the remaining 25% is office or medical suite floor space (599m^2).

The Roads & Maritime Services provide average traffic generation rates for retail and office / medical floor space of 4.6 trips per 100m^2 and 2 trips per 100m^2 respectively within its *Guide to Traffic Generating Developments*. Application of these rates results in a traffic generation estimate for the commercial / retail component of the development of 95 trips.

It is however noted that extended shopping hours experienced throughout the retail sector now mean that the shoppers have much more choice over the times they choose to satisfy shopping needs. Having regard to this increased shopping time choice, it is unlikely that shoppers will choose to leave home and go shopping during peak traffic periods and therefore subject themselves to unnecessary delays.

It is further noted that the retail component of the subject development will most likely primarily service the residents of the development. In this regard, the types of retail uses are local-based uses appropriate to support the proposed aged care, such as a pharmacy, cafes and the like. It is therefore considered appropriate that a 20% reduction in the traffic generation of the retail component be applied. This is consistent with recommended reductions for linked and multi-purpose trips for retail developments associated with retail floor space as provided by the Roads & Maritime Services' *Guide to Traffic Generating Developments*. Application of this reduction to the retail based trips results in a reduced traffic generation estimate for the commercial / retail component of 78 peak hour trips.

5.1.3.4 Child Care Centre

The proposal involves the provision of a child care centre with an indicative capacity of 100 children.

The Roads & Maritime Services' *Guide to Traffic Generating Developments* specifies a maximum hourly traffic generation rate of 0.8 vehicle trips per child during peak periods for long day child care centres. Application of this rate to the child care centre component of the development results in a traffic generation estimate of 80 peak hour trips.

Similarly to that stated above for the retail component of the development, it is considered most likely that the child care centre will service the residential component of the subject development. Accordingly, a traffic generation reduction of 20% has been applied, resulting in a reduced traffic generation estimate of 64 peak hour trips.

5.1.3.5 Summary

The following provides a summary of the traffic generation estimation for the subject development:

Standard Residential Dwelling	- 131 trips
Independent Living Units	- 30 trips
Nursing Home	- 15 trips
Commercial / Retail	- 78 trips
Child Care Centre	- 64 trips

TOTAL	- 318 trips

The proposed development is therefore estimated to generate in the order of 318 peak hour vehicle movements to and from the site during peak periods.

Such a generation represents up to 301 additional peak hour trips over and above that currently generated by the subject site. The proposed development traffic generation estimate also represents up to 240 additional peak hour trips over and above that currently capable of being generated by the existing site development, assuming full occupation. Notwithstanding this, for the purposes of generating an absolute worst case scenario, the subject proposal has been assessed to generate 318 peak hour vehicle movements over and above that currently generated by the existing development.

5.2 Trip Assignment

In order to gauge the impact of the traffic projected to be generated by the proposal, it is necessary to determine the impact on surrounding route and 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.

For the purposes of reaching the abovementioned objective, the additional trips projected to be generated by the proposed residential component has been split into

two types of trips; outgoing trips and incoming trips. For the purposes of this study, the following has been assumed:

- 80% of trips associated with the standard residential dwellings and the independent living units are outbound trips during the morning peak, with the remaining 20% being inbound;

- The reverse condition to that above applies during the evening peak for the standard residential dwellings and the independent living units;

- 20% of nursing home are outbound trips during the morning peak, with the remaining 80% being inbound;

- The reverse condition to that above applies during the evening peak for the nursing home; and

- Peak hour vehicle trips for the commercial / retail and child care centre components are evenly split during both the morning and evening peak periods.

Incorporating such an assignment, the subject development is projected to generate 115 inbound trips and 203 outbound trips during the morning peak period. The reverse condition is assigned during the evening peak, comprising 203 inbound trips and 115 outbound trips.

Section 3.1 of this report presents that the independent living units, nursing home and commercial / retail components of the site are to be located within the southern portion of the site, accessed via Longfield Street. Conversely, the standard residential dwellings and the child care centre are proposed to be contained within the northern portion of the site, accessed via Chadderton Street. The subject development is therefore projected to generate a total of 123 peak hour vehicle movements between the site and Longfield Street and 195 peak hour vehicle movements between the site and Chadderton Street, comprising:

- 57 inbound and 66 outbound trips via Longfield Street during the morning peak hour;

- 58 inbound and 137 outbound trips via Chadderton Street during the morning peak hour;

- 66 inbound and 57 inbound trips via Longfield Street during the evening peak hour; and

- 137 inbound and 58 outbound trips via Chadderton Street during the evening peak hour.

With respect to the greater regional road network, it is normal traffic engineering practice to assign traffic generation for new developments throughout the road system

based on current traffic distributions. In this regard, the following trips assignment has been applied to the greater road network with reference to existing traffic distributions illustrated within **Figure 2**:

- 30% of traffic is projected to approach and depart the site from and to the south via Hume Highway;
- 30% of traffic is projected to approach and depart the site from and to the north via Hume Highway;
- 20% of traffic is projected to approach and depart the site from and to the south-east via Cabramatta Road East; and
- 20% of traffic is projected to approach and depart the site from and to the north-east via Longfield Street.

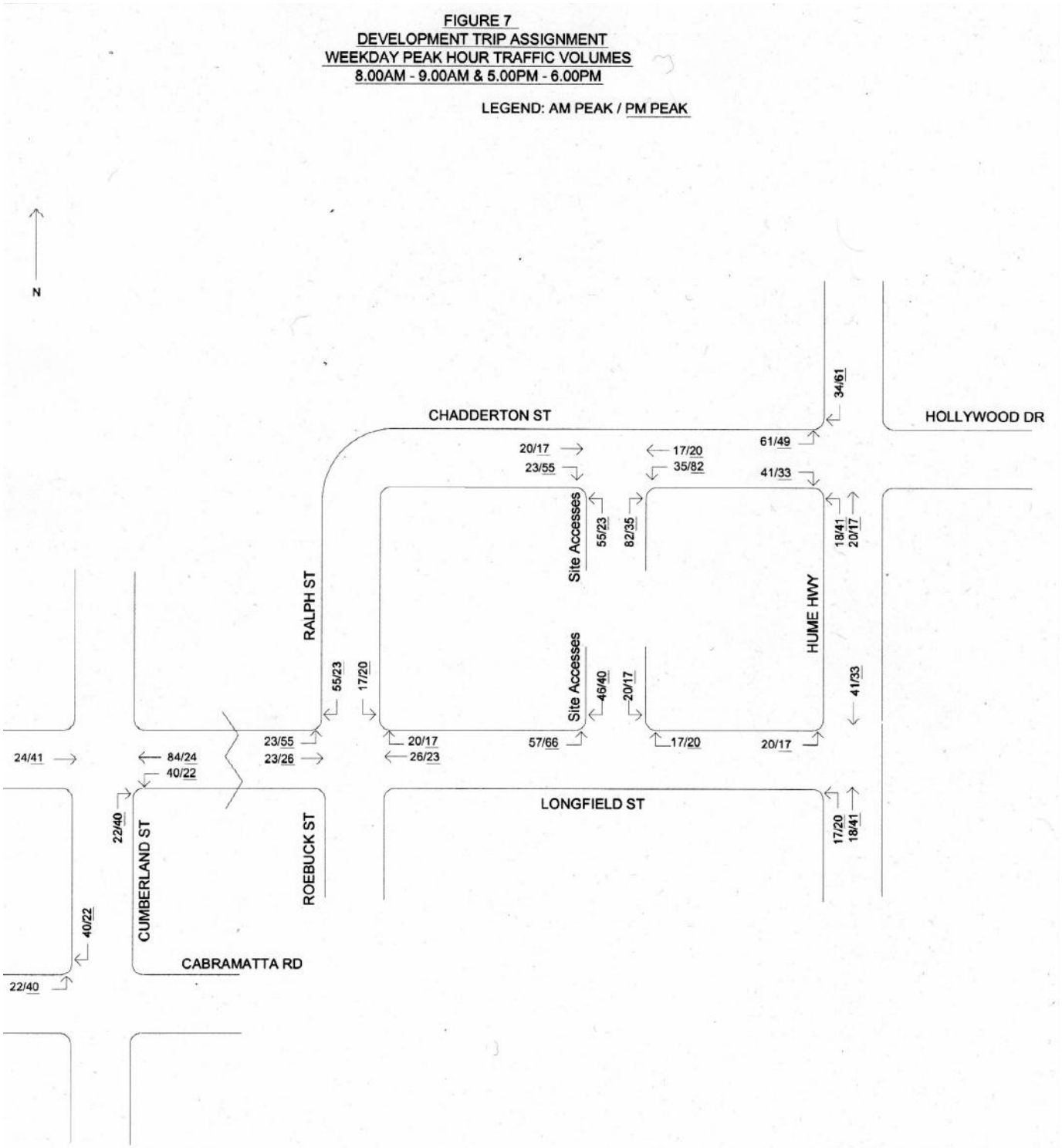
Figure 7 overleaf provides a graphical representation of the peak hour trip assignment associated with the additional traffic movements projected to be generated by the residential component of the proposal.

5.3 Projected Traffic Volumes

Based on the discussion provided previously on likely traffic generation and trip assignment, the projected peak hour traffic volumes have been formulated by adding the trip assignment presented above to the volumes existing surveyed peak conditions provided within **Figure 2**. **Figure 8** on page 26 provides an estimation of the future traffic volumes associated with and adjoining the subject site.

FIGURE 7
DEVELOPMENT TRIP ASSIGNMENT
WEEKDAY PEAK HOUR TRAFFIC VOLUMES
8.00AM - 9.00AM & 5.00PM - 6.00PM

LEGEND: AM PEAK / PM PEAK



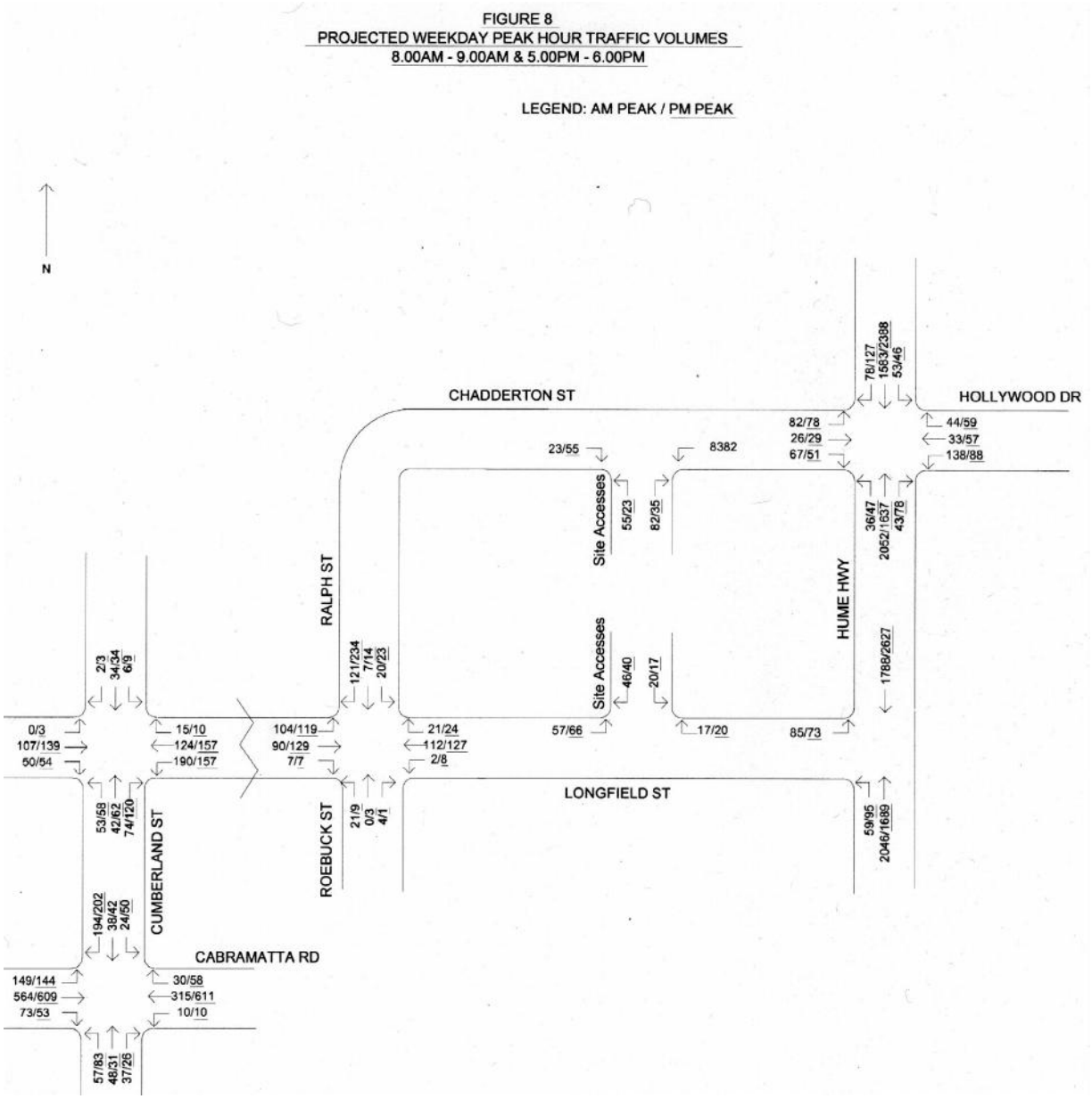


Table 4 overleaf provides a summary comparison of the existing and projected road network link traffic demands during peak periods, based on volumes presented within **Figure 6**.

TABLE 4 EXISTING & PROJECTED NETWORK PEAK HOUR TRAFFIC VOLUMES						
Road Link	**Existing Volumes**		**Projected Volumes**		**% Increase**	
	AM Peak	**PM Peak**	**AM Peak**	**PM Peak**	**AM Peak**	**PM Peak**
Hume Hwy (north of Chadderton St						
Northbound	2097	1708	2178	1774	4%	4%
Southbound	1680	2500	1714	2561	2%	2%
Total	3777	4208	3892	4335	3%	3%
Hume Hwy (south of Chadderton St						
Northbound	2093	1704	2131	1762	2%	3%
Southbound	1747	2594	1788	2627	2%	1%
Total	3840	4298	3919	4389	2%	2%
Cabramatta Rd (east of Cumberland St)						
Eastbound	625	685	625	685	0%	0%
Westbound	355	679	355	679	0%	0%
Total	980	1364	980	1364	0%	0%
Cabramatta Rd (west of Cumberland St)						
Eastbound	764	766	786	806	3%	5%
Westbound	526	874	566	896	8%	3%
Total	1290	1640	1352	1702	5%	4%
Chadderton St (west of Hume Highway)						
Eastbound	76	76	178	158	134%	79%
Westbound	95	129	147	231	55%	79%
Total	171	205	325	189	90%	79%
Longfield St (east of Ralph St)						
Eastbound	74	107	131	173	77%	62%
Westbound	89	119	135	159	52%	34%
Total	163	226	266	332	63%	47%
Longfield St (west of Ralph St)						
Eastbound	141	187	187	268	33%	43%
Westbound	248	273	329	319	33%	17%
Total	389	460	516	587	33%	28%
Longfield St (west of Cumberland St)						
Eastbound	133	155	157	196	18%	26%
Westbound	138	189	179	213	30%	13%
Total	271	344	336	409	24%	19%
Ralph St						
Northbound	82	74	125	146	52%	97%
Southbound	76	228	148	281	95%	23%
Total	158	302	273	427	73%	41%
Cumberland St (south of Longfield St)						
Northbound	147	200	169	240	15%	20%
Southbound	234	223	274	245	17%	10%
Total	381	423	443	485	16%	15%

5.4 Projected Intersection Performance

Utilising the projected traffic generation characteristics of the proposed development and the abovementioned assumed trip assignment, a number of significant junctions have been modelled in order to estimate the likely impact on traffic safety and efficiency. A summary of the most pertinent results are indicated within **Table 5** whilst more detailed summaries are provided as **Appendix 5**.

TABLE 5 POST DEVELOPMENT SIDRA ANALYSIS				
Intersection	**Existing Conditions**		**Projected Conditions**	
	AM Peak	**PM Peak**	**AM Peak**	**PM Peak**
Hume Hwy & Chadderton St				
Average Vehicle Delay	18.4	75.2	19.6	21.3
Degree of Saturation	0.61	1.07	0.64	0.75
Level of Service	B	F	B	B
Hume Hwy & Longfield St				
Average Vehicle Delay	12.6	11.0	12.6	11.0
Degree of Saturation	0.37	0.46	0.37	0.46
Level of Service	A	A	A	A
Cabramatta Rd East & Cumberland St				
Average Vehicle Delay	27.4	28.0	28.6	28.9
Degree of Saturation	0.43	0.46	0.49	0.50
Level of Service	B	B	C	C
Longfield St, Ralph St & Roebuck St				
Average Vehicle Delay	10.4	11.9	11.7	14.7
Degree of Saturation	0.10	0.35	0.21	0.44
Level of Service	A	A	A	B
Longfield St & Cumberland St				
Average Vehicle Delay	16.5	16.9	16.4	17.8
Degree of Saturation	0.18	0.23	0.23	0.28
Level of Service	B	B	B	B

Notes:

1. The existing performance levels of the intersection of Hume Highway, Chadderton Street and Hollywood Drive do not include the recommended lane configuration alterations to the southbound carriageway.
2. The projected performance levels of the intersection of Hume Highway, Chadderton Street and Hollywood Drive include the recommended lane configuration alterations to the southbound carriageway.

Table 5 indicates that the following:

- The intersection of Hume Highway, Chadderton Street and Hollywood Drive is projected to be suitably capable of accommodating the additional traffic projected to be generated by the subject development, incorporating the recommended alterations to the existing Hume Highway southbound carriageway lane configuration;

- The junction of Hume Highway and Longfield Street is projected to continue to provide a level of service ‘A’, incorporating the subject development;

- The level of service at the intersection of Cabramatta Road East and Cumberland Street is projected to reduce from ‘B’ to ‘C’ during peak periods

incorporating the subject development, however still providing motorists with satisfactory conditions;

- The intersection of Longfield Street, Ralph Street and Roebuck Street is projected to continue to provide motorists with good conditions incorporating the subject development, despite the level of service reducing from 'A' to 'B' during the evening peak; and

- The existing good level of service ('B') at the intersection of Longfield Street and Cumberland Street is projected to remain unchanged incorporating the subject development.

The public road intersections surrounding the subject site are therefore projected to provide motorists with acceptable levels of performance, incorporating the additional traffic associated with the subject development and the recommended infrastructure alterations at the intersection of Hume Highway, Chadderton Street and Longfield Street.

5.5 Local Road Link Performance

Section 3.1 of this report presents that Chadderton Street, Longfield Street, Ralph Street and Cumberland Street effectively perform collector functions within the surrounding local road hierarchy providing direct or indirect connectivity to the adjoining regional road network in Hume Highway and Cabramatta Road. The Roads & Maritime Services' *Guide to Traffic Generating Developments* provides an indicative environmental capacity for collector roads of 500 vehicles per hour.

Table 4 indicates that peak hour traffic demands within all surrounding local roads are not projected to exceed the above indicative environmental capacity of 500 vehicles per hour, with the exception of the section of Longfield Street between Ralph Street and Cumberland Street. This road link is however already provided with appropriate traffic calming and intersection treatments in the form of roundabout intersection control at Vale Street and Fairview Road as well as signalised intersection control at Cumberland Street. These measures, in conjunction with the wide pavement, are considered to result in Longfield Street being suitably capable of accommodating the projected moderate increase in traffic demands resulting from the subject development, without any unreasonable impact on abutting residential amenity.

Notwithstanding this above, this Practice considers that an improved traffic calming measure is likely to be necessitated at and on approach to the 90 degree curve in roadway at the junction of Chadderton Street and Ralph Street. The existing narrow central median, kerb blisters and speed hump on approach to the curve could be improved by the provision of a more visually prominent traffic management device such as a road narrowing treatment combined with a raised threshold treatment. Such an arrangement is therefore recommended to assist in the accommodation of the additional traffic demands resulting from the subject development. In consideration of this and the above discussion, the surrounding local road network is projected to be

suitably capable of accommodating the additional traffic associated with the subject proposal, incorporating the recommended infrastructure alterations.

5.6 Parking Considerations

The existing industrial land-use within the site has the potential to generate notable demand for on-street parking within Chadderton and Longfield Streets associated with employees of the development. This potential activity, combined with periods of high on-street parking demand associated with the Ming Quang Buddhist Temple located to the north of the site, can result in significant demand for on-street, particular within Chadderton Street.

The subject proposal is expected to reduce the potential for on-street parking, being self-sufficient with respect to the provision of on-site parking. Further, the proposal involves the provision of indented angled parking within Chadderton Street immediately adjacent to the subject development, thereby significantly increasing the capacity of the public road to accommodate the abovementioned periods of notable parking demand associated with the operation of the Ming Quang Buddhist Temple.

It is recommended that the abovementioned indented parking be provided at 90 degrees to ensure that it is readily accessible to east and westbound traffic along Chadderton Street.

5.7 Pedestrian Considerations

There is currently no footpath adjoining the site along the southern side of Chadderton Street. The provision of indented parking adjoining the site will necessitate the provision of a formalised footpath to provide connectivity between this on-street parking and the site. It is also recommended that pedestrian crossing treatments in the form of refuges be provided within Chadderton Street at both the eastern and western ends of the site to facilitate connectivity between the on-street parking (and the subject site) and the footpath on the northern side of Chadderton Street, the bus stop on the northern side of Chadderton Street and the Ming Quang Buddhist Temple.

6. BENEFITS OF THE PLANNING PROPOSAL

The following provides a summary of the benefits of the subject proposal, having regard to the contents of this report:

Road Network Operation

- The recommended lane configuration alterations at the intersection of Hume Highway, Chadderton Street and Hollywood Drive is projected to significantly improve the overall performance of the intersection, resulting in the evening level of service improving from 'F' to 'B';

- The proposal will result in the removal of notable volumes of heavy vehicle trips associated with the existing industrial land use along from the primarily residential collector streets of Chadderton, Ralph and Longfield Streets between the site and Hume Highway; and

- The recommended improved traffic management measures at the junction of Chadderton Street and Ralph Street will provide an improved traffic calming measure, thereby improving residential amenity and the overall level of safety within the immediate area.

Residential Amenity

- The proposal will result in the removal of noise from loading and operation of trucks within the site and other equipment associated with the industrial use.

Parking Considerations

- The proposal will result in a reduction in on-street parking demand associated with employees of the existing industrial uses within Chadderton and Longfield Streets; and

- The proposal seeks to provide additional public on-street parking within Chadderton Street to benefit the community users of the adjacent Temple.

Land-Use Transport Integration

- The proposal seeks to minimise external vehicle based trips providing a series of complementary land-uses within one site, with connectivity between uses being provided in a safe and efficient manner;

- The proposal promotes public transport utilisation through its proximity of bus and rail transport options within 5 minute walking and cycling catchments; and

- The recommended provision of pedestrian refuge/s within Chadderton Street will provide for safe and efficient connection between the site and the Temple.

7. CONCLUSION & RECOMMENDATIONS

This Practice has undertaken an assessment of the potential traffic and transport related impacts resulting from the proposed rezoning of 17 – 21 Longfield Street, Cabramatta. Based on this assessment, the following conclusions are provided:

- The subject proposal involves the rezoning of the site from B5 Business to R4 Residential under Fairfield LEP 2013 to allow for residential development with associated high demand uses. The Concept Plan is designed to create a vibrant and co-generational residential and mixed use environment, comprising the following mix of land-uses:

  - 450 standard residential apartments;
  - 150 independent living unit (seniors living) dwellings;
  - A nursing home with 150 beds;
  - Approximately 2,397m^2 of floor space for commercial / retail and other uses; and
  - 500m^2 of child care centre with an indicative capacity of 100 children.

- The limitation of the southbound Hume Highway carriageway to the north of Chadderton Street to two through lanes restricts the capacity of the Highway to accommodate the significant southbound traffic demands during the evening peak period. This results in the intersection of Hume Highway, Chadderton Street and Hollywood Drive providing poor conditions (level of service 'F') during the evening peak, resulting in extended delays for through southbound Highway movements.

- The previously described existing limitation to southbound Highway capacity can be assisted by the reconfiguration of the existing southbound carriageway lane arrangement as follows:

  - Converting the existing exclusive left turn lane within the southbound Hume Highway approach to the intersection to a shared through / left turn lane; and
  - Removal of the existing painted kerb extension within the southbound Highway departure from the intersection allowing the provision of a southbound through kerb side lane.

- SIDRA modelling indicates that the above lane configuration alterations within the southbound Hume Highway carriageway are expected to result in a significant improvement to the existing operational performance of the intersection of the Highway, Chadderton Street and Hollywood Drive during the evening peak period.

- All other modelled intersections surrounding the subject site currently provide a good level of service ('B' or better) during the morning and evening peak periods.

- The subject site is reasonably well serviced by public transport, with two bus services adjoining the site providing connectivity to Cabramatta and Liverpool Railway Stations.

- The proposed development is estimated to generate in the order of 318 peak hour vehicle movements to and from the site during peak periods.

- Such a generation represents up to 301 additional peak hour trips over and above that currently generated by the subject site. The proposed development traffic generation estimate also represents up to 240 additional peak hour trips over and above that currently capable of being generated by the existing site development, assuming full occupation. Notwithstanding this, for the purposes of generating an absolute worst case scenario, the subject proposal has been assessed to generate 318 peak hour vehicle movements over and above that currently generated by the existing development.

- Post development SIDRA modelling indicates that the public road intersections surrounding the subject site are projected to provide motorists with acceptable levels of performance, incorporating the additional traffic associated with the subject development and noted infrastructure alterations at the intersection of Hume Highway, Chadderton Street and Longfield Street.

- The additional traffic projected to be generated by the subject development is not projected to result in the environmental capacity of the surrounding collector road network being unreasonably exceeded, particularly considering the obvious benefits of the proposal with respect to the removal of existing undesirable heavy vehicle movements associated with the existing industrial land use within Chadderton, Longfield and Ralph Streets.

- Notwithstanding the above, this Practice considers that an improved traffic calming measure is likely to be necessitated at and on approach to the 90 degree curve in roadway at the junction of Chadderton Street and Ralph Street to assist in the accommodation of the additional traffic demands resulting from the subject development.

- The proposal involves the provision of indented angled parking within Chadderton Street immediately adjacent to the subject development, thereby significantly increasing the capacity of the public road to accommodate the periods of notable parking demand associated with the operation of the Ming Quang Buddhist Temple.

In consideration of the findings of this report and abovementioned conclusions, the following recommendations are provided:

- The existing lane configuration within the Hume Highway southbound carriageway be converted on approach and departure from its intersection with Chadderton Street and Hollywood Drive as follows:

  - The existing exclusive left turn lane within the southbound Hume Highway approach to the intersection be converted to a shared through / left turn lane; and
  - The existing painted kerb extension within the southbound Highway departure from the intersection be removed allowing the provision of an additional southbound travel lane.

- The existing narrow central median, kerb blisters and speed hump on approach to the curve could be improved by the provision of a more visually prominent traffic management device such as a landscaped road narrowing treatment combined with a raised threshold treatment.

- The following pedestrian infrastructure be provided:

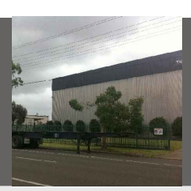
  - A footpath extending for the frontage of the site along the southern side of Chadderton Street; and
  - Pedestrian refuges within Chadderton Street at both the eastern and western ends of the site to facilitate connectivity between the on-street parking (and the subject site) and the footpath on the northern side of Chadderton Street, the bus stop on the northern side of Chadderton Street and the Ming Quang Buddhist Temple.

Incorporating the implementation of the abovementioned recommendations, the surrounding local road network is projected to be suitably capable of accommodating the additional traffic associated with the subject proposal and accordingly, there are no traffic or transport related reasons why the subject planning proposal should be not be supported.

APPENDIX 1

ANTONIADES ARCHITECTS

Suite 1, L2, 24 Bay Street, Double Bay NSW 2028
Tel : 9328 3339 Fax : 9328 3369
www.antoniades.com.au ACN 129 731 559



LONGFIELD STREET, CABRAMATTA
Urban Design Report
February 2012
GROUND FLOOR AND LANDSCAPE

APPENDIX 2

MOVEMENT SUMMARY

Site: Hume Highway & Chadderton Street

Existing AM Peak
Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hume Highway South											
1	L2	18	5.0	0.602	23.6	LOS B	24.6	179.2	0.67	0.62	40.2
2	T1	2032	5.0	0.602	15.3	LOS B	24.6	179.5	0.66	0.61	40.4
3	R2	43	5.0	0.221	22.9	LOS B	1.0	7.6	0.71	0.74	36.8
Approach		2093	5.0	0.602	15.5	LOS B	24.6	179.5	0.67	0.61	40.3
East: Hollywood Drive											
4	L2	138	5.0	0.264	43.2	LOS D	6.2	45.2	0.81	0.78	27.4
5	T1	33	5.0	0.318	49.4	LOS D	4.1	29.9	0.93	0.76	23.8
6	R2	44	5.0	0.318	57.4	LOS E	4.1	29.9	0.93	0.76	23.8
Approach		215	5.0	0.318	47.1	LOS D	6.2	45.2	0.85	0.77	26.0
North: Hume Highway North											
7	L2	53	5.0	0.049	18.1	LOS B	1.2	8.9	0.42	0.70	40.0
8	T1	1583	5.0	0.692	16.8	LOS B	30.8	224.6	0.73	0.67	39.1
9	R2	44	5.0	0.241	20.7	LOS B	1.0	7.0	0.66	0.73	38.2
Approach		1680	5.0	0.692	16.9	LOS B	30.8	224.6	0.72	0.67	39.2
West: Chadderton Street											
10	L2	21	5.0	0.040	40.5	LOS C	0.9	6.3	0.74	0.71	28.3
11	T1	26	5.0	0.225	49.5	LOS D	2.7	20.0	0.92	0.73	23.8
12	R2	26	5.0	0.225	57.5	LOS E	2.7	20.0	0.92	0.73	23.8
Approach		73	5.0	0.225	49.8	LOS D	2.7	20.0	0.87	0.73	25.0
All Vehicles		4061	5.0	0.692	18.4	LOS B	30.8	224.6	0.70	0.65	38.3

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	11	54.2	LOS E	0.0	0.0	0.95	0.95
P2	East Full Crossing	11	12.2	LOS B	0.0	0.0	0.45	0.45
All Pedestrians		21	33.2	LOS D			0.70	0.70

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Hume Highway & Chadderton Street

Existing PM Peak
Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hume Highway South											
1	L2	6	5.0	0.479	21.9	LOS B	17.5	127.6	0.60	0.54	41.7
2	T1	1620	5.0	0.479	13.6	LOS A	17.5	127.6	0.59	0.53	41.9
3	R2	78	5.0	0.505	44.0	LOS D	3.3	24.1	1.00	0.75	27.1
Approach		1704	5.0	0.505	15.1	LOS B	17.5	127.6	0.61	0.54	40.8
East: Hollywood Drive											
4	L2	188	5.0	0.359	44.4	LOS D	8.7	63.6	0.84	0.80	27.0
5	T1	57	5.0	0.491	51.9	LOS D	6.4	46.9	0.96	0.79	23.2
6	R2	59	5.0	0.491	60.0	LOS E	6.4	46.9	0.96	0.79	23.2
Approach		304	5.0	0.491	48.8	LOS D	8.7	63.6	0.89	0.80	25.4
North: Hume Highway North											
7	L2	46	5.0	0.042	18.1	LOS B	1.1	7.7	0.42	0.70	40.0
8	T1	2388	5.0	1.068	125.0	LOS F	128.8	940.1	1.00	1.54	13.2
9	R2	66	5.0	0.291	18.1	LOS B	1.3	9.3	0.60	0.73	40.1
Approach		2500	5.0	1.068	120.2	LOS F	128.8	940.1	0.98	1.50	13.6
West: Chadderton Street											
10	L2	29	5.0	0.055	40.7	LOS C	1.2	8.8	0.75	0.72	28.3
11	T1	29	5.0	0.215	50.4	LOS D	2.5	18.3	0.92	0.73	23.7
12	R2	18	5.0	0.215	58.4	LOS E	2.5	18.3	0.92	0.73	23.7
Approach		76	5.0	0.215	48.6	LOS D	2.5	18.3	0.86	0.72	25.3
All Vehicles		4584	5.0	1.068	75.2	LOS F	128.8	940.1	0.83	1.09	19.1

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	11	54.2	LOS E	0.0	0.0	0.95	0.95
P2	East Full Crossing	11	12.2	LOS B	0.0	0.0	0.45	0.45
All Pedestrians		21	33.2	LOS D			0.70	0.70

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

▽ Site: HUME HIGHWAY & LONGFIELD STREET

EXISTING AM PEAK
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: HUME HIGHWAY SOUTH											
1	L2	42	5.0	0.366	8.2	LOS A	0.0	0.0	0.00	0.06	59.1
2	T1	2028	5.0	0.366	0.1	LOS A	0.0	0.0	0.00	0.02	59.6
Approach		2070	5.0	0.366	0.2	NA	0.0	0.0	0.00	0.02	59.6
North: HUME HIGHWAY NORTH											
8	T1	1747	5.0	0.308	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		1747	5.0	0.308	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: LONGFIELD STREET											
10	L2	65	5.0	0.110	12.6	LOS A	0.4	2.8	0.57	0.85	44.6
Approach		65	5.0	0.110	12.6	LOS A	0.4	2.8	0.57	0.85	44.6
All Vehicles		3882	5.0	0.366	0.4	NA	0.4	2.8	0.01	0.03	59.4

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: HUME HIGHWAY & LONGFIELD STREET

EXISTING PM PEAK
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: HUME HIGHWAY SOUTH											
1	L2	75	5.0	0.305	8.2	LOS A	0.0	0.0	0.00	0.13	58.2
2	T1	1648	5.0	0.305	0.0	LOS A	0.0	0.0	0.00	0.04	59.4
Approach		1723	5.0	0.305	0.4	NA	0.0	0.0	0.00	0.04	59.3
North: HUME HIGHWAY NORTH											
8	T1	2594	5.0	0.458	0.1	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		2594	5.0	0.458	0.1	NA	0.0	0.0	0.00	0.00	59.9
West: LONGFIELD STREET											
10	L2	56	5.0	0.076	11.0	LOS A	0.3	1.9	0.49	0.75	46.0
Approach		56	5.0	0.076	11.0	LOS A	0.3	1.9	0.49	0.75	46.0
All Vehicles		4373	5.0	0.458	0.3	NA	0.3	1.9	0.01	0.03	59.4

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: CABRAMATTA ROAD & CUMBERLAND STREET

EXISTING AM PEAK
Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: CUMBERLAND STREET SOUTH											
1	L2	57	5.0	0.069	27.4	LOS B	1.8	13.3	0.59	0.72	34.2
2	T1	48	5.0	0.161	30.2	LOS C	3.5	25.5	0.74	0.69	30.4
3	R2	37	5.0	0.161	38.3	LOS C	3.5	25.5	0.74	0.69	30.4
Approach		142	5.0	0.161	31.2	LOS C	3.5	25.5	0.68	0.70	31.8
East: CABRAMATTA ROAD EAST											
4	L2	10	5.0	0.195	29.9	LOS C	5.7	41.7	0.65	0.56	35.9
5	T1	315	5.0	0.195	21.7	LOS B	5.7	41.8	0.65	0.55	36.1
6	R2	30	5.0	0.091	25.1	LOS B	0.9	6.4	0.67	0.71	35.5
Approach		355	5.0	0.195	22.2	LOS B	5.7	41.8	0.65	0.56	36.0
North: CUMBERLAND STREET NORTH											
7	L2	24	5.0	0.029	26.9	LOS B	0.8	5.5	0.57	0.70	34.4
8	T1	38	5.0	0.429	34.5	LOS C	8.9	64.9	0.83	0.80	27.9
9	R2	154	5.0	0.429	42.6	LOS D	8.9	64.9	0.83	0.80	27.9
Approach		216	5.0	0.429	39.4	LOS C	8.9	64.9	0.80	0.79	28.5
West: CABRAMATTA ROAD WEST											
10	L2	127	5.0	0.432	32.8	LOS C	14.1	103.1	0.74	0.72	33.2
11	T1	564	5.0	0.432	24.4	LOS B	14.1	103.1	0.73	0.67	34.0
12	R2	73	5.0	0.144	24.2	LOS B	2.2	16.2	0.61	0.72	36.0
Approach		764	5.0	0.432	25.8	LOS B	14.1	103.1	0.72	0.68	34.0
All Vehicles		1477	5.0	0.432	27.4	LOS B	14.1	103.1	0.71	0.67	33.3

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	22.9	LOS C	0.1	0.1	0.62	0.62
P2	East Full Crossing	53	33.8	LOS D	0.1	0.1	0.75	0.75
P3	North Full Crossing	53	22.9	LOS C	0.1	0.1	0.62	0.62
P4	West Full Crossing	53	33.8	LOS D	0.1	0.1	0.75	0.75
All Pedestrians		211	28.3	LOS C			0.68	0.68

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: CABRAMATTA ROAD & CUMBERLAND STREET

EXISTING PM PEAK
Signals - Fixed Time Cycle Time = 121 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: CUMBERLAND STREET SOUTH											
1	L2	83	5.0	0.098	26.9	LOS B	2.7	19.4	0.58	0.74	34.4
2	T1	31	5.0	0.103	27.8	LOS B	2.2	16.3	0.70	0.66	31.4
3	R2	26	5.0	0.103	36.0	LOS C	2.2	16.3	0.70	0.66	31.4
Approach		140	5.0	0.103	28.8	LOS C	2.7	19.4	0.63	0.70	33.1
East: CABRAMATTA ROAD EAST											
4	L2	10	5.0	0.384	33.3	LOS C	12.4	90.6	0.73	0.64	34.0
5	T1	611	5.0	0.384	25.1	LOS B	12.4	90.6	0.73	0.63	34.0
6	R2	58	5.0	0.185	26.8	LOS B	1.8	13.2	0.71	0.73	34.5
Approach		679	5.0	0.384	25.3	LOS B	12.4	90.6	0.73	0.64	34.1
North: CUMBERLAND STREET NORTH											
7	L2	50	5.0	0.059	26.5	LOS B	1.6	11.5	0.57	0.72	34.7
8	T1	42	5.0	0.461	32.6	LOS C	10.2	74.2	0.82	0.80	28.6
9	R2	180	5.0	0.461	40.7	LOS C	10.2	74.2	0.82	0.80	28.6
Approach		272	5.0	0.461	36.8	LOS C	10.2	74.2	0.77	0.79	29.6
West: CABRAMATTA ROAD WEST											
10	L2	104	5.0	0.454	34.2	LOS C	15.0	109.8	0.76	0.72	32.7
11	T1	609	5.0	0.454	25.9	LOS B	15.0	109.8	0.75	0.68	33.3
12	R2	53	5.0	0.151	26.0	LOS B	1.6	12.0	0.68	0.72	34.9
Approach		766	5.0	0.454	27.0	LOS B	15.0	109.8	0.75	0.69	33.3
All Vehicles		1857	5.0	0.461	28.0	LOS B	15.0	109.8	0.74	0.69	33.0

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	23.9	LOS C	0.1	0.1	0.63	0.63
P2	East Full Crossing	53	32.8	LOS D	0.1	0.1	0.74	0.74
P3	North Full Crossing	53	23.9	LOS C	0.1	0.1	0.63	0.63
P4	West Full Crossing	53	32.8	LOS D	0.1	0.1	0.74	0.74
All Pedestrians		211	28.4	LOS C			0.68	0.68

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

▽ Site: LONGFIELD STREET & RALPH STREET

EXISTING AM PEAK
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: ROEBUCK STREET											
1	L2	21	5.0	0.018	8.5	LOS A	0.1	0.4	0.18	0.60	48.2
2	T1	1	5.0	0.007	8.4	LOS A	0.0	0.2	0.34	0.60	47.5
3	R2	4	5.0	0.007	9.8	LOS A	0.0	0.2	0.34	0.60	47.5
Approach		26	5.0	0.018	8.7	LOS A	0.1	0.4	0.21	0.60	48.0
East: LONGIFLED STREET EAST											
4	L2	2	5.0	0.001	8.2	LOS A	0.0	0.0	0.00	0.64	49.0
5	T1	86	5.0	0.046	0.6	LOS A	0.3	2.1	0.26	0.01	55.0
6	R2	1	5.0	0.046	8.9	LOS A	0.3	2.1	0.26	0.01	55.0
Approach		89	5.0	0.046	0.9	NA	0.3	2.1	0.26	0.03	54.9
North: RALPH STREET											
7	L2	3	5.0	0.002	8.4	LOS A	0.0	0.1	0.15	0.59	48.3
8	T1	7	5.0	0.104	9.0	LOS A	0.4	3.0	0.40	0.68	46.7
9	R2	66	5.0	0.104	10.4	LOS A	0.4	3.0	0.40	0.68	46.7
Approach		76	5.0	0.104	10.2	LOS A	0.4	3.0	0.39	0.67	46.8
West: LONGFIELD STREET WEST											
10	L2	81	5.0	0.045	8.2	LOS A	0.0	0.0	0.00	0.64	48.9
11	T1	67	5.0	0.041	0.3	LOS A	0.2	1.7	0.19	0.09	55.4
12	R2	7	5.0	0.041	8.6	LOS A	0.2	1.7	0.19	0.09	55.4
Approach		155	5.0	0.045	4.8	NA	0.2	1.7	0.09	0.38	51.8
All Vehicles		346	5.0	0.104	5.3	NA	0.4	3.0	0.21	0.37	51.1

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: LONGFIELD STREET & RALPH STREET

EXISTING PM PEAK
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: ROEBUCK STREET											
1	L2	9	5.0	0.008	8.6	LOS A	0.0	0.2	0.19	0.59	48.1
2	T1	3	5.0	0.006	9.1	LOS A	0.0	0.2	0.42	0.58	47.6
3	R2	1	5.0	0.006	10.4	LOS A	0.0	0.2	0.42	0.58	47.6
Approach		13	5.0	0.008	8.8	LOS A	0.0	0.2	0.26	0.59	47.9
East: LONGIFLED STREET EAST											
4	L2	8	5.0	0.004	8.2	LOS A	0.0	0.0	0.00	0.64	49.0
5	T1	104	5.0	0.061	0.7	LOS A	0.4	2.8	0.29	0.06	54.2
6	R2	7	5.0	0.061	9.0	LOS A	0.4	2.8	0.29	0.06	54.2
Approach		119	5.0	0.061	1.7	NA	0.4	2.8	0.27	0.10	53.8
North: RALPH STREET											
7	L2	3	5.0	0.003	8.6	LOS A	0.0	0.1	0.19	0.58	48.1
8	T1	14	5.0	0.345	10.5	LOS A	1.8	13.1	0.52	0.78	45.2
9	R2	211	5.0	0.345	11.9	LOS A	1.8	13.1	0.52	0.78	45.2
Approach		228	5.0	0.345	11.8	LOS A	1.8	13.1	0.52	0.78	45.2
West: LONGFIELD STREET WEST											
10	L2	64	5.0	0.036	8.2	LOS A	0.0	0.0	0.00	0.64	48.9
11	T1	103	5.0	0.060	0.5	LOS A	0.4	2.6	0.23	0.06	55.2
12	R2	7	5.0	0.060	8.8	LOS A	0.4	2.6	0.23	0.06	55.2
Approach		174	5.0	0.060	3.6	NA	0.4	2.6	0.15	0.27	52.7
All Vehicles		534	5.0	0.345	6.8	NA	1.8	13.1	0.34	0.46	49.4

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: LONGFIELD STREET & CUMBERLAND STREET

EXISTING AM PEAK
Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: CUMBERLAND STREET SOUTH											
1	L2	53	5.0	0.089	23.1	LOS B	1.1	7.9	0.72	0.73	36.6
2	T1	42	5.0	0.179	15.6	LOS B	2.0	14.6	0.74	0.70	37.7
3	R2	52	5.0	0.179	23.8	LOS B	2.0	14.6	0.74	0.70	37.7
Approach		147	5.0	0.179	21.2	LOS B	2.0	14.6	0.73	0.71	37.3
East: LONGFIELD STREET EAST											
4	L2	150	5.0	0.179	18.3	LOS B	2.6	18.8	0.61	0.75	39.9
5	T1	83	5.0	0.121	9.8	LOS A	1.6	11.9	0.59	0.53	44.3
6	R2	15	5.0	0.121	18.0	LOS B	1.6	11.9	0.59	0.53	44.3
Approach		248	5.0	0.179	15.4	LOS B	2.6	18.8	0.61	0.67	41.5
North: CUMBERLAND STREET NORTH											
7	L2	6	5.0	0.014	22.6	LOS B	0.2	1.2	0.69	0.63	38.0
8	T1	34	5.0	0.055	14.7	LOS B	0.7	4.9	0.71	0.55	40.3
9	R2	2	5.0	0.055	22.9	LOS B	0.7	4.9	0.71	0.54	40.4
Approach		42	5.0	0.055	16.2	LOS B	0.7	4.9	0.70	0.56	39.9
West: LONGFIELD STREET WEST											
10	L2	1	5.0	0.039	17.5	LOS B	0.5	3.9	0.57	0.44	45.6
11	T1	83	5.0	0.156	10.1	LOS A	1.8	12.8	0.60	0.57	43.2
12	R2	50	5.0	0.156	18.9	LOS B	1.8	12.8	0.62	0.65	41.7
Approach		134	5.0	0.156	13.4	LOS A	1.8	12.8	0.61	0.60	42.6
All Vehicles		571	5.0	0.179	16.5	LOS B	2.6	18.8	0.65	0.65	40.5

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	14.7	LOS B	0.1	0.1	0.70	0.70
P2	East Full Crossing	53	20.9	LOS C	0.1	0.1	0.84	0.84
P3	North Full Crossing	53	14.7	LOS B	0.1	0.1	0.70	0.70
P4	West Full Crossing	53	20.9	LOS C	0.1	0.1	0.84	0.84
All Pedestrians		211	17.8	LOS B			0.77	0.77

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: LONGFIELD STREET & CUMBERLAND STREET

EXISTING PM PEAK
Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: CUMBERLAND STREET SOUTH											
1	L2	58	5.0	0.081	20.3	LOS B	1.1	7.7	0.65	0.73	38.5
2	T1	62	5.0	0.228	13.0	LOS A	2.8	20.4	0.70	0.70	39.5
3	R2	80	5.0	0.228	21.2	LOS B	2.8	20.4	0.70	0.70	39.5
Approach		200	5.0	0.228	18.4	LOS B	2.8	20.4	0.68	0.71	39.2
East: LONGFIELD STREET EAST											
4	L2	135	5.0	0.188	20.9	LOS B	2.6	18.9	0.68	0.76	38.1
5	T1	128	5.0	0.190	12.7	LOS A	2.7	19.4	0.68	0.58	42.0
6	R2	10	5.0	0.190	20.9	LOS B	2.7	19.4	0.68	0.58	42.0
Approach		273	5.0	0.190	17.1	LOS B	2.7	19.4	0.68	0.67	40.0
North: CUMBERLAND STREET NORTH											
7	L2	9	5.0	0.013	19.8	LOS B	0.2	1.2	0.62	0.67	38.9
8	T1	34	5.0	0.051	11.9	LOS A	0.7	4.8	0.64	0.51	42.7
9	R2	3	5.0	0.051	20.1	LOS B	0.7	4.8	0.64	0.51	42.8
Approach		46	5.0	0.051	14.0	LOS A	0.7	4.8	0.63	0.54	41.9
West: LONGFIELD STREET WEST											
10	L2	3	5.0	0.052	20.1	LOS B	0.7	5.1	0.64	0.51	42.8
11	T1	98	5.0	0.209	12.6	LOS A	2.3	16.6	0.67	0.61	41.0
12	R2	54	5.0	0.209	21.2	LOS B	2.3	16.6	0.69	0.68	40.0
Approach		155	5.0	0.209	15.7	LOS B	2.3	16.6	0.68	0.63	40.6
All Vehicles		674	5.0	0.228	16.9	LOS B	2.8	20.4	0.68	0.66	40.0

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	17.7	LOS B	0.1	0.1	0.77	0.77
P2	East Full Crossing	53	17.7	LOS B	0.1	0.1	0.77	0.77
P3	North Full Crossing	53	17.7	LOS B	0.1	0.1	0.77	0.77
P4	West Full Crossing	53	17.7	LOS B	0.1	0.1	0.77	0.77
All Pedestrians		211	17.7	LOS B			0.77	0.77

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

APPENDIX 3

MOVEMENT SUMMARY

Site: Hume Highway & Chadderton Street

Existing AM Peak
Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hume Highway South											
1	L2	18	5.0	0.628	25.6	LOS B	26.2	191.1	0.71	0.66	38.6
2	T1	2032	5.0	0.628	17.3	LOS B	26.2	191.4	0.71	0.65	38.8
3	R2	43	5.0	0.195	19.0	LOS B	0.9	6.4	0.60	0.72	39.4
Approach		2093	5.0	0.628	17.4	LOS B	26.2	191.4	0.70	0.65	38.8
East: Hollywood Drive											
4	L2	138	5.0	0.243	40.7	LOS C	6.0	43.5	0.78	0.78	28.3
5	T1	33	5.0	0.264	45.2	LOS D	3.9	28.5	0.89	0.75	24.9
6	R2	44	5.0	0.264	53.2	LOS D	3.9	28.5	0.89	0.75	24.9
Approach		215	5.0	0.264	44.0	LOS D	6.0	43.5	0.82	0.77	27.0
North: Hume Highway North											
7	L2	53	5.0	0.496	23.7	LOS B	18.3	133.9	0.63	0.60	39.9
8	T1	1583	5.0	0.496	15.5	LOS B	18.4	134.6	0.63	0.58	40.2
9	R2	44	5.0	0.245	22.2	LOS B	1.0	7.1	0.70	0.74	37.3
Approach		1680	5.0	0.496	15.9	LOS B	18.4	134.6	0.63	0.58	40.1
West: Chadderton Street											
10	L2	21	5.0	0.037	38.2	LOS C	0.8	6.1	0.72	0.71	29.2
11	T1	26	5.0	0.191	45.4	LOS D	2.6	19.1	0.88	0.72	25.0
12	R2	26	5.0	0.191	53.4	LOS D	2.6	19.1	0.88	0.72	25.0
Approach		73	5.0	0.191	46.2	LOS D	2.6	19.1	0.84	0.72	26.1
All Vehicles		4061	5.0	0.628	18.7	LOS B	26.2	191.4	0.68	0.63	38.1

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	11	54.2	LOS E	0.0	0.0	0.95	0.95
P2	East Full Crossing	11	13.5	LOS B	0.0	0.0	0.48	0.48
All Pedestrians		21	33.9	LOS D			0.71	0.71

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Hume Highway & Chadderton Street

Existing PM Peak
Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hume Highway South											
1	L2	6	5.0	0.500	23.8	LOS B	18.7	136.2	0.63	0.57	40.2
2	T1	1620	5.0	0.500	15.5	LOS B	18.7	136.3	0.63	0.57	40.3
3	R2	78	5.0	0.495	37.0	LOS C	3.1	22.3	0.97	0.79	29.7
Approach		1704	5.0	0.500	16.5	LOS B	18.7	136.3	0.65	0.58	39.7
East: Hollywood Drive											
4	L2	188	5.0	0.331	41.8	LOS C	8.4	61.2	0.81	0.80	27.9
5	T1	57	5.0	0.423	48.6	LOS D	6.2	45.2	0.94	0.78	24.0
6	R2	59	5.0	0.423	56.6	LOS E	6.2	45.2	0.94	0.78	24.0
Approach		304	5.0	0.423	45.9	LOS D	8.4	61.2	0.86	0.79	26.3
North: Hume Highway North											
7	L2	46	5.0	0.745	27.7	LOS B	34.8	253.9	0.80	0.75	36.9
8	T1	2388	5.0	0.745	19.4	LOS B	34.9	254.7	0.79	0.73	37.2
9	R2	66	5.0	0.300	19.5	LOS B	1.4	10.0	0.63	0.74	39.1
Approach		2500	5.0	0.745	19.5	LOS B	34.9	254.7	0.79	0.73	37.2
West: Chadderton Street											
10	L2	29	5.0	0.051	38.4	LOS C	1.2	8.5	0.72	0.72	29.1
11	T1	29	5.0	0.183	47.1	LOS D	2.4	17.6	0.90	0.72	24.6
12	R2	18	5.0	0.183	55.1	LOS D	2.4	17.6	0.90	0.72	24.6
Approach		76	5.0	0.183	45.7	LOS D	2.4	17.6	0.83	0.72	26.2
All Vehicles		4584	5.0	0.745	20.6	LOS B	34.9	254.7	0.74	0.68	36.8

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

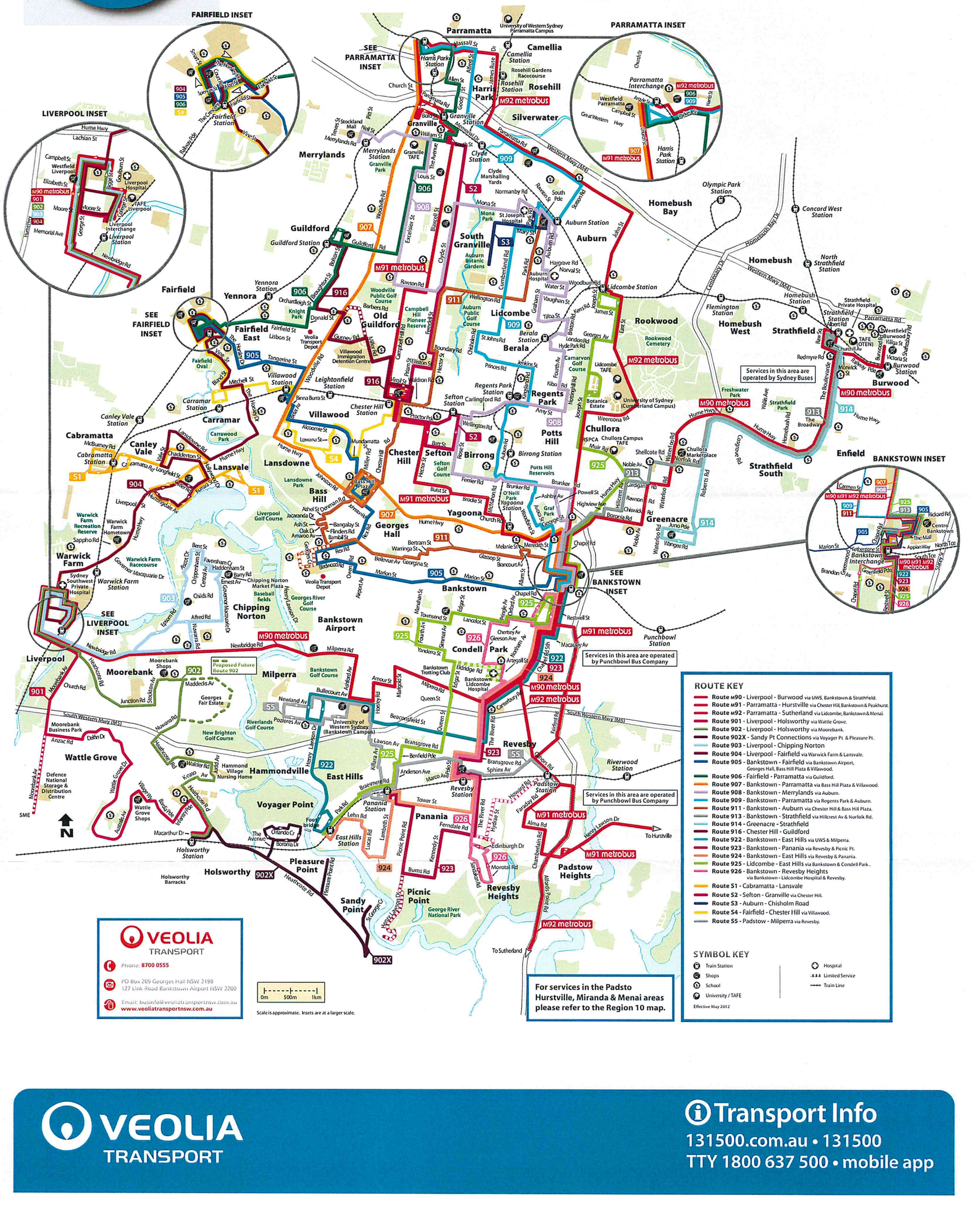
Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	11	54.2	LOS E	0.0	0.0	0.95	0.95
P2	East Full Crossing	11	13.5	LOS B	0.0	0.0	0.48	0.48
All Pedestrians		21	33.9	LOS D			0.71	0.71

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

APPENDIX 4

Parramatta-Liverpool-Bankstown Area Bus Services (Region 13)



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APPENDIX 5

MOVEMENT SUMMARY

Site: Hume Highway & Chadderton Street

Projected AM Peak
Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hume Highway South											
1	L2	36	5.0	0.640	25.8	LOS B	26.9	196.7	0.72	0.67	38.4
2	T1	2052	5.0	0.640	17.5	LOS B	27.0	197.2	0.71	0.66	38.6
3	R2	43	5.0	0.195	19.0	LOS B	0.9	6.4	0.60	0.72	39.4
Approach		2131	5.0	0.640	17.7	LOS B	27.0	197.2	0.71	0.66	38.6
East: Hollywood Drive											
4	L2	138	5.0	0.243	40.7	LOS C	6.0	43.5	0.78	0.78	28.3
5	T1	33	5.0	0.283	46.4	LOS D	4.0	28.9	0.90	0.75	24.6
6	R2	44	5.0	0.283	54.4	LOS D	4.0	28.9	0.90	0.75	24.6
Approach		215	5.0	0.283	44.4	LOS D	6.0	43.5	0.83	0.77	26.8
North: Hume Highway North											
7	L2	53	5.0	0.496	23.7	LOS B	18.3	133.9	0.63	0.60	39.9
8	T1	1583	5.0	0.496	15.5	LOS B	18.4	134.6	0.63	0.58	40.2
9	R2	78	5.0	0.440	24.3	LOS B	2.1	15.7	0.79	0.78	36.0
Approach		1714	5.0	0.496	16.2	LOS B	18.4	134.6	0.64	0.59	40.0
West: Chadderton Street											
10	L2	82	5.0	0.144	39.5	LOS C	3.4	24.9	0.75	0.76	28.7
11	T1	26	5.0	0.384	48.5	LOS D	5.0	36.2	0.93	0.78	23.8
12	R2	67	5.0	0.384	56.5	LOS E	5.0	36.2	0.93	0.78	23.8
Approach		175	5.0	0.384	47.4	LOS D	5.0	36.2	0.85	0.77	25.9
All Vehicles		4235	5.0	0.640	19.6	LOS B	27.0	197.2	0.69	0.64	37.5

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	11	54.2	LOS E	0.0	0.0	0.95	0.95
P2	East Full Crossing	11	13.5	LOS B	0.0	0.0	0.48	0.48
All Pedestrians		21	33.9	LOS D			0.71	0.71

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Hume Highway & Chadderton Street

Projected PM Peak
Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hume Highway South											
1	L2	47	5.0	0.519	24.0	LOS B	19.6	143.2	0.65	0.61	39.7
2	T1	1637	5.0	0.519	15.7	LOS B	19.7	143.8	0.64	0.59	40.0
3	R2	78	5.0	0.495	37.0	LOS C	3.1	22.3	0.97	0.79	29.7
Approach		1762	5.0	0.519	16.9	LOS B	19.7	143.8	0.65	0.59	39.4
East: Hollywood Drive											
4	L2	188	5.0	0.331	41.8	LOS C	8.4	61.2	0.81	0.80	27.9
5	T1	57	5.0	0.452	49.8	LOS D	6.3	45.9	0.95	0.78	23.7
6	R2	59	5.0	0.452	57.8	LOS E	6.3	45.9	0.95	0.78	23.7
Approach		304	5.0	0.452	46.4	LOS D	8.4	61.2	0.86	0.79	26.1
North: Hume Highway North											
7	L2	46	5.0	0.752	27.9	LOS B	35.4	258.3	0.81	0.75	36.8
8	T1	2388	5.0	0.752	19.4	LOS B	35.5	259.1	0.79	0.73	37.2
9	R2	127	5.0	0.597	22.0	LOS B	3.2	23.3	0.77	0.79	37.4
Approach		2561	5.0	0.752	19.7	LOS B	35.5	259.1	0.79	0.74	37.2
West: Chadderton Street											
10	L2	78	5.0	0.137	39.4	LOS C	3.2	23.6	0.75	0.75	28.7
11	T1	29	5.0	0.376	50.3	LOS D	4.3	31.7	0.94	0.77	23.5
12	R2	51	5.0	0.376	58.3	LOS E	4.3	31.7	0.94	0.77	23.5
Approach		158	5.0	0.376	47.5	LOS D	4.3	31.7	0.85	0.76	25.8
All Vehicles		4785	5.0	0.752	21.3	LOS B	35.5	259.1	0.75	0.69	36.4

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	11	54.2	LOS E	0.0	0.0	0.95	0.95
P2	East Full Crossing	11	13.5	LOS B	0.0	0.0	0.48	0.48
All Pedestrians		21	33.9	LOS D			0.71	0.71

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

▽ Site: HUME HIGHWAY & LONGFIELD STREET

PROJECTED AM PEAK
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: HUME HIGHWAY SOUTH											
1	L2	59	5.0	0.372	8.2	LOS A	0.0	0.0	0.00	0.09	58.8
2	T1	2046	5.0	0.372	0.1	LOS A	0.0	0.0	0.00	0.03	59.5
Approach		2105	5.0	0.372	0.3	NA	0.0	0.0	0.00	0.03	59.5
North: HUME HIGHWAY NORTH											
8	T1	1788	5.0	0.316	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		1788	5.0	0.316	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: LONGFIELD STREET											
10	L2	85	5.0	0.143	12.6	LOS A	0.5	3.6	0.58	0.85	44.5
Approach		85	5.0	0.143	12.6	LOS A	0.5	3.6	0.58	0.85	44.5
All Vehicles		3978	5.0	0.372	0.4	NA	0.5	3.6	0.01	0.03	59.3

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: HUME HIGHWAY & LONGFIELD STREET

PROJECTED PM PEAK
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: HUME HIGHWAY SOUTH											
1	L2	95	5.0	0.316	8.2	LOS A	0.0	0.0	0.00	0.16	57.8
2	T1	1689	5.0	0.316	0.0	LOS A	0.0	0.0	0.00	0.05	59.3
Approach		1784	5.0	0.316	0.5	NA	0.0	0.0	0.00	0.05	59.2
North: HUME HIGHWAY NORTH											
8	T1	2627	5.0	0.464	0.1	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		2627	5.0	0.464	0.1	NA	0.0	0.0	0.00	0.00	59.9
West: LONGFIELD STREET											
10	L2	73	5.0	0.099	11.0	LOS A	0.3	2.5	0.50	0.77	46.0
Approach		73	5.0	0.099	11.0	LOS A	0.3	2.5	0.50	0.77	46.0
All Vehicles		4484	5.0	0.464	0.4	NA	0.3	2.5	0.01	0.03	59.3

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: LONGFIELD STREET & RALPH STREET

PROJECTED AM PEAK
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: ROEBUCK STREET											
1	L2	21	5.0	0.018	8.6	LOS A	0.1	0.5	0.21	0.60	48.0
2	T1	1	5.0	0.008	9.3	LOS A	0.0	0.2	0.42	0.62	46.6
3	R2	4	5.0	0.008	10.6	LOS A	0.0	0.2	0.42	0.62	46.6
Approach		26	5.0	0.018	8.9	LOS A	0.1	0.5	0.25	0.60	47.8
East: LONGIFLED STREET EAST											
4	L2	2	5.0	0.001	8.2	LOS A	0.0	0.0	0.00	0.64	49.0
5	T1	112	5.0	0.078	0.9	LOS A	0.5	3.5	0.32	0.14	53.0
6	R2	21	5.0	0.078	9.2	LOS A	0.5	3.5	0.32	0.14	53.0
Approach		135	5.0	0.078	2.3	NA	0.5	3.5	0.31	0.15	53.0
North: RALPH STREET											
7	L2	20	5.0	0.017	8.5	LOS A	0.1	0.4	0.18	0.60	48.2
8	T1	7	5.0	0.208	10.3	LOS A	0.9	6.4	0.50	0.76	45.4
9	R2	121	5.0	0.208	11.7	LOS A	0.9	6.4	0.50	0.76	45.4
Approach		148	5.0	0.208	11.2	LOS A	0.9	6.4	0.46	0.74	45.8
West: LONGFIELD STREET WEST											
10	L2	104	5.0	0.058	8.2	LOS A	0.0	0.0	0.00	0.64	48.9
11	T1	90	5.0	0.053	0.5	LOS A	0.3	2.3	0.23	0.07	55.1
12	R2	7	5.0	0.053	8.8	LOS A	0.3	2.3	0.23	0.07	55.1
Approach		201	5.0	0.058	4.8	NA	0.3	2.3	0.11	0.37	51.7
All Vehicles		510	5.0	0.208	6.2	NA	0.9	6.4	0.27	0.43	49.9

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: LONGFIELD STREET & RALPH STREET

PROJECTED PM PEAK
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: ROEBUCK STREET											
1	L2	9	5.0	0.008	8.7	LOS A	0.0	0.2	0.22	0.59	48.0
2	T1	3	5.0	0.007	10.2	LOS A	0.0	0.2	0.49	0.62	46.5
3	R2	1	5.0	0.007	11.6	LOS A	0.0	0.2	0.49	0.62	46.5
Approach		13	5.0	0.008	9.2	LOS A	0.0	0.2	0.30	0.60	47.5
East: LONGIFLED STREET EAST											
4	L2	8	5.0	0.004	8.2	LOS A	0.0	0.0	0.00	0.64	49.0
5	T1	127	5.0	0.090	1.2	LOS A	0.6	4.2	0.37	0.14	52.3
6	R2	24	5.0	0.090	9.5	LOS A	0.6	4.2	0.37	0.14	52.3
Approach		159	5.0	0.090	2.8	NA	0.6	4.2	0.35	0.16	52.1
North: RALPH STREET											
7	L2	23	5.0	0.020	8.7	LOS A	0.1	0.5	0.22	0.60	48.0
8	T1	14	5.0	0.440	13.3	LOS A	2.7	20.0	0.63	0.94	42.8
9	R2	234	5.0	0.440	14.7	LOS B	2.7	20.0	0.63	0.94	42.8
Approach		271	5.0	0.440	14.1	LOS A	2.7	20.0	0.59	0.91	43.1
West: LONGFIELD STREET WEST											
10	L2	119	5.0	0.066	8.2	LOS A	0.0	0.0	0.00	0.64	48.9
11	T1	129	5.0	0.074	0.6	LOS A	0.5	3.4	0.26	0.05	54.8
12	R2	7	5.0	0.074	8.9	LOS A	0.5	3.4	0.26	0.05	54.8
Approach		255	5.0	0.074	4.4	NA	0.5	3.4	0.14	0.33	51.9
All Vehicles		698	5.0	0.440	7.9	NA	2.7	20.0	0.37	0.52	48.1

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: LONGFIELD STREET & CUMBERLAND STREET

PROJECTED AM PEAK
Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: CUMBERLAND STREET SOUTH											
1	L2	53	5.0	0.089	23.1	LOS B	1.1	7.9	0.72	0.73	36.6
2	T1	42	5.0	0.224	15.9	LOS B	2.5	18.3	0.76	0.73	37.2
3	R2	74	5.0	0.224	24.1	LOS B	2.5	18.3	0.76	0.73	37.2
Approach		169	5.0	0.224	21.8	LOS B	2.5	18.3	0.74	0.73	37.0
East: LONGFIELD STREET EAST											
4	L2	190	5.0	0.227	18.5	LOS B	3.3	24.4	0.63	0.76	39.7
5	T1	124	5.0	0.168	10.0	LOS A	2.4	17.3	0.61	0.54	44.3
6	R2	15	5.0	0.168	18.2	LOS B	2.4	17.3	0.61	0.54	44.3
Approach		329	5.0	0.227	15.3	LOS B	3.3	24.4	0.62	0.67	41.5
North: CUMBERLAND STREET NORTH											
7	L2	6	5.0	0.014	22.6	LOS B	0.2	1.2	0.69	0.63	38.0
8	T1	34	5.0	0.055	14.7	LOS B	0.7	4.9	0.71	0.55	40.3
9	R2	2	5.0	0.055	22.9	LOS B	0.7	4.9	0.71	0.54	40.4
Approach		42	5.0	0.055	16.2	LOS B	0.7	4.9	0.70	0.56	39.9
West: LONGFIELD STREET WEST											
10	L2	1	5.0	0.046	17.5	LOS B	0.6	4.7	0.57	0.44	45.6
11	T1	107	5.0	0.185	10.3	LOS A	2.1	15.3	0.61	0.57	43.2
12	R2	50	5.0	0.185	19.0	LOS B	2.1	15.3	0.63	0.64	41.9
Approach		158	5.0	0.185	13.1	LOS A	2.1	15.3	0.62	0.59	42.8
All Vehicles		698	5.0	0.227	16.4	LOS B	3.3	24.4	0.66	0.66	40.5

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	14.7	LOS B	0.1	0.1	0.70	0.70
P2	East Full Crossing	53	20.9	LOS C	0.1	0.1	0.84	0.84
P3	North Full Crossing	53	14.7	LOS B	0.1	0.1	0.70	0.70
P4	West Full Crossing	53	20.9	LOS C	0.1	0.1	0.84	0.84
All Pedestrians		211	17.8	LOS B			0.77	0.77

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: LONGFIELD STREET & CUMBERLAND STREET

PROJECTED PM PEAK
Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: CUMBERLAND STREET SOUTH											
1	L2	58	5.0	0.075	18.9	LOS B	1.0	7.3	0.61	0.72	39.4
2	T1	62	5.0	0.276	12.0	LOS A	3.5	25.5	0.68	0.72	39.9
3	R2	120	5.0	0.276	20.2	LOS B	3.5	25.5	0.68	0.72	39.9
Approach		240	5.0	0.276	17.8	LOS B	3.5	25.5	0.66	0.72	39.8
East: LONGFIELD STREET EAST											
4	L2	157	5.0	0.239	22.6	LOS B	3.2	23.7	0.73	0.77	36.9
5	T1	157	5.0	0.251	14.5	LOS B	3.5	25.3	0.74	0.62	40.5
6	R2	10	5.0	0.251	22.7	LOS B	3.5	25.3	0.74	0.62	40.5
Approach		324	5.0	0.251	18.7	LOS B	3.5	25.3	0.73	0.69	38.7
North: CUMBERLAND STREET NORTH											
7	L2	9	5.0	0.012	18.5	LOS B	0.2	1.1	0.59	0.67	39.8
8	T1	34	5.0	0.047	10.6	LOS A	0.6	4.6	0.60	0.49	44.0
9	R2	3	5.0	0.047	18.8	LOS B	0.6	4.6	0.60	0.49	44.0
Approach		46	5.0	0.047	12.7	LOS A	0.6	4.6	0.60	0.52	43.1
West: LONGFIELD STREET WEST											
10	L2	3	5.0	0.071	21.5	LOS B	0.9	6.8	0.68	0.54	41.6
11	T1	139	5.0	0.284	14.9	LOS B	3.2	23.4	0.73	0.64	39.4
12	R2	54	5.0	0.284	23.8	LOS B	3.2	23.4	0.76	0.70	38.4
Approach		196	5.0	0.284	17.4	LOS B	3.2	23.4	0.74	0.66	39.2
All Vehicles		806	5.0	0.284	17.8	LOS B	3.5	25.5	0.71	0.68	39.4

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	19.2	LOS B	0.1	0.1	0.80	0.80
P2	East Full Crossing	53	16.2	LOS B	0.1	0.1	0.73	0.73
P3	North Full Crossing	53	19.2	LOS B	0.1	0.1	0.80	0.80
P4	West Full Crossing	53	16.2	LOS B	0.1	0.1	0.73	0.73
All Pedestrians		211	17.7	LOS B			0.77	0.77

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: CABRAMATTA ROAD & CUMBERLAND STREET

PROJECTED AM PEAK
Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: CUMBERLAND STREET SOUTH											
1	L2	57	5.0	0.067	26.2	LOS B	1.8	12.9	0.57	0.72	34.8
2	T1	48	5.0	0.147	26.5	LOS B	3.3	23.8	0.70	0.67	32.1
3	R2	37	5.0	0.147	34.6	LOS C	3.3	23.8	0.70	0.67	32.1
Approach		142	5.0	0.147	28.5	LOS B	3.3	23.8	0.65	0.69	33.2
East: CABRAMATTA ROAD EAST											
4	L2	10	5.0	0.203	31.2	LOS C	5.9	43.0	0.67	0.57	35.1
5	T1	315	5.0	0.203	23.0	LOS B	5.9	43.1	0.67	0.56	35.2
6	R2	30	5.0	0.097	26.6	LOS B	0.9	6.6	0.71	0.71	34.6
Approach		355	5.0	0.203	23.6	LOS B	5.9	43.1	0.67	0.58	35.2
North: CUMBERLAND STREET NORTH											
7	L2	24	5.0	0.028	25.8	LOS B	0.7	5.3	0.55	0.70	35.1
8	T1	38	5.0	0.489	33.2	LOS C	10.7	78.3	0.83	0.81	28.4
9	R2	194	5.0	0.489	41.3	LOS C	10.7	78.3	0.83	0.81	28.4
Approach		256	5.0	0.489	38.6	LOS C	10.7	78.3	0.81	0.80	28.9
West: CABRAMATTA ROAD WEST											
10	L2	149	5.0	0.465	34.6	LOS C	15.2	111.0	0.77	0.75	32.2
11	T1	564	5.0	0.465	26.1	LOS B	15.2	111.0	0.76	0.69	33.0
12	R2	73	5.0	0.149	25.4	LOS B	2.3	16.8	0.63	0.72	35.3
Approach		786	5.0	0.465	27.6	LOS B	15.2	111.0	0.75	0.70	33.1
All Vehicles		1539	5.0	0.489	28.6	LOS C	15.2	111.0	0.73	0.69	32.7

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	24.1	LOS C	0.1	0.1	0.63	0.63
P2	East Full Crossing	53	32.3	LOS D	0.1	0.1	0.73	0.73
P3	North Full Crossing	53	24.1	LOS C	0.1	0.1	0.63	0.63
P4	West Full Crossing	53	32.3	LOS D	0.1	0.1	0.73	0.73
All Pedestrians		211	28:2	LOS C			0.68	0.68

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: CABRAMATTA ROAD & CUMBERLAND STREET

PROJECTED PM PEAK
Signals - Fixed Time Cycle Time = 121 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: CUMBERLAND STREET SOUTH											
1	L2	83	5.0	0.097	26.3	LOS B	2.6	19.1	0.57	0.73	34.8
2	T1	31	5.0	0.101	27.1	LOS B	2.2	16.1	0.69	0.66	31.8
3	R2	26	5.0	0.101	35.3	LOS C	2.2	16.1	0.69	0.66	31.8
Approach		140	5.0	0.101	28.2	LOS B	2.6	19.1	0.62	0.70	33.5
East: CABRAMATTA ROAD EAST											
4	L2	10	5.0	0.392	34.0	LOS C	12.6	92.1	0.74	0.65	33.6
5	T1	611	5.0	0.392	25.8	LOS B	12.6	92.1	0.74	0.64	33.6
6	R2	58	5.0	0.198	27.8	LOS B	1.8	13.4	0.74	0.73	34.0
Approach		679	5.0	0.392	26.1	LOS B	12.6	92.1	0.74	0.65	33.7
North: CUMBERLAND STREET NORTH											
7	L2	50	5.0	0.058	25.9	LOS B	1.5	11.3	0.56	0.72	35.0
8	T1	42	5.0	0.498	32.4	LOS C	11.3	82.2	0.83	0.81	28.7
9	R2	202	5.0	0.498	40.6	LOS C	11.3	82.2	0.83	0.81	28.7
Approach		294	5.0	0.498	36.9	LOS C	11.3	82.2	0.78	0.79	29.6
West: CABRAMATTA ROAD WEST											
10	L2	144	5.0	0.492	35.4	LOS C	16.4	119.6	0.78	0.75	31.8
11	T1	609	5.0	0.492	27.0	LOS B	16.4	119.6	0.77	0.70	32.6
12	R2	53	5.0	0.154	26.6	LOS B	1.7	12.2	0.69	0.72	34.6
Approach		806	5.0	0.492	28.5	LOS B	16.4	119.6	0.77	0.71	32.6
All Vehicles		1919	5.0	0.498	28.9	LOS C	16.4	119.6	0.75	0.70	32.5

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	24.6	LOS C	0.1	0.1	0.64	0.64
P2	East Full Crossing	53	32.1	LOS D	0.1	0.1	0.73	0.73
P3	North Full Crossing	53	24.6	LOS C	0.1	0.1	0.64	0.64
P4	West Full Crossing	53	32.1	LOS D	0.1	0.1	0.73	0.73
All Pedestrians		211	28.3	LOS C			0.68	0.68

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Morrison
Water and Spatial

Flood Impact Assessment for 17 – 23 Longfield St Cabramatta

Report Prepared For
Elton Consulting

November 2017

DRAFT REPORT

Morrison Water and Spatial Pty Ltd
Mobile: 0421 775 175
Email: Tim@Morrisonws.com.au
ABN: 16 612 644 158

Project Details	
Report	Flood Impact Assessment for 19 – 23 Longfield St Cabramatta
Client	Vas Andrews (Elton Consulting)
Author	Tim Morrison, Erika Taylor
Job Number	0029

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Version	Type	Review	Release	Date
2	Draft	Internal	Client Review	24/11/2017
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Morrison
Water and Spatial

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1 Introduction

1.1 Subject Site

17 – 23 Longfield Street, Cabramatta (Lot 34 – 35, DP456221) is located within the Fairfield LGA in South Western Sydney. The site is known to be flood prone from local overland flow as well as from Prospect Creek in very extreme floods, i.e. Probable Maximum Flood (PMF).

The site currently has several large industrial buildings (timber processing) and associated carparking and stockyard. Access is through either Longfield St to the south and Chadderton St to the north. The site is bordered by residential dwellings to the west and commercial premises to the east and Chadderton and Longfield St to the north and south respectively.

The site's location is shown below in Figure 1.

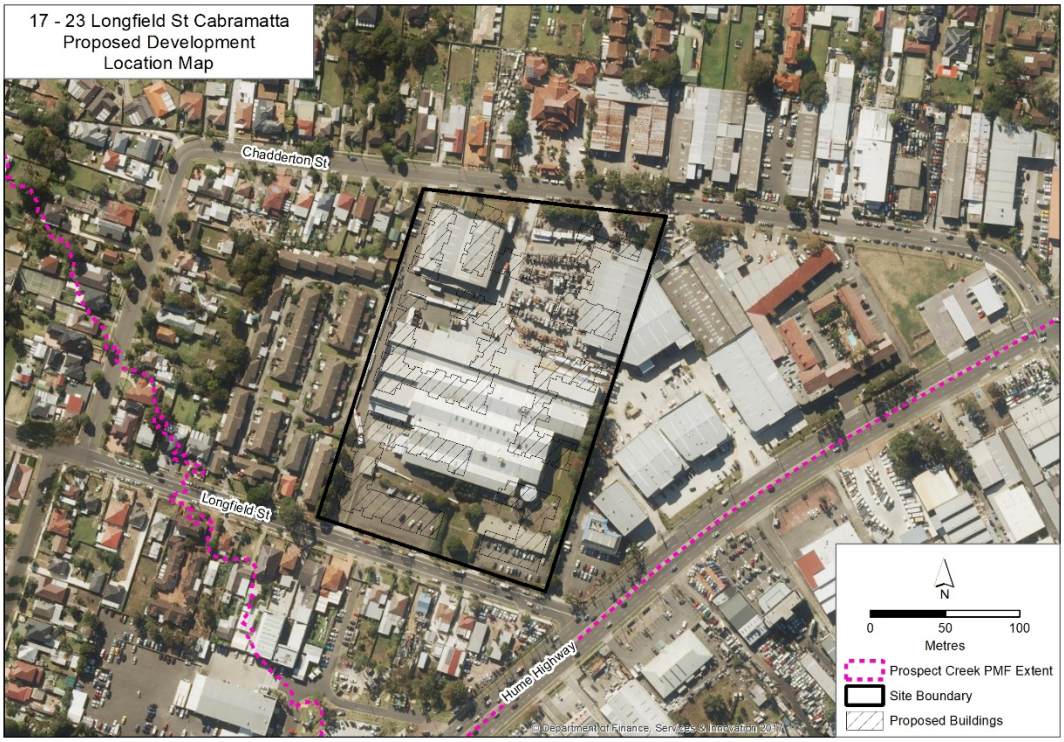

Figure 1 Location Map

1.2 Proposed Development

The owners (FTD Holdings) are currently seeking to re-develop the site into a mix of residential and other uses outlined in Section 3.2. This involves the submission of a Planning Proposal to rezone the land to allow the development as well as a site-specific Development Control Plan.

The proposed re-development includes six "blocks" of buildings up to six stories high. The ground floor of each building will have a mix of residential premises, retail shops, a child care centre, a medical centre and a residential aged care facility.

Site access is through a number of driveways to basement carparking off Longfield and Chadderton St as well as a proposed internal road running approximately perpendicular from Chadderton St.

Figure 2 Proposed Development

2 Available Data

The sections below discuss the data that was available for the Flood Impact Assessment.

2.1 Development Data

The following development data was used for this assessment:

- Antoniades Architects: Concept Master Plan 17 – 23 Longfield St, Cabramatta (Oct 2017 AA.MPN.1201)
- Integrated Group Service (IGS) 17 – 21 Longfield St, Cabramatta: Flood Study (Job No: EN – N15_136, November 2015, Rev 0.2)
- Planning Proposal – Rezoning of 17-21 Longfield St, Cabramatta from B5 Business Development to R4 High Density Residential. Outcomes Supplementary Reports (Meeting Date 24 May 2016). Including the Planning Proposal as Attachment A

2.2 Correspondence

The following development related correspondence was included in the data handover:

- Chris Shinn email (Friday, 11 August 2017 9:35:28AM) regarding SES comments on the planning proposal
- SES Submission Re: Planning proposal for 17 – 21 Longfield St, Cabramatta (undated)
- Ashraful Alam (Senior Professional Engineer: Catchment Planning) memo to Chris Shinn (Strategic Planning Coordinator) Dated 22 February 2016

2.3 Model Data

It is our understanding that Council now requests that all flood modelling for development purposes within the LGA are undertaken independently by a Council approved consultant. As such, Elton Consulting has engaged Catchment Simulation Solutions (CSS) Pty Ltd to provide modelling services independently to this study.

The model data that CSS has provided has been derived from the Cabravale Overland Flow Flood Study, currently in preparation for Council. The model data provided by CSS includes:

- Setup files for the TuFlow hydraulic model.
- Water level, depth, velocity and hazard results for the “High Blockage” 1% AEP and PMF for the following scenarios:
    - The existing case
    - The proposed development
    - The proposed development with a range of mitigation options considered
- The flood extent and typical stage hydrograph from the Prospect Creek PMF Flood.

2.3.1 Site Landform

It is our understanding that the final landform and grades within the site are unknown, therefore Catchment Simulation Solutions have made a number of assumptions. These are:

- The land will grade down from the Longfield St side of the site to the Chadderton St side and will tie in to the terrain along the eastern and western property boundaries.
- The proposed roadway located with the centre of the site will be 0.15m lower than the adjoining terrain and will also grade down towards Chadderton St.
- A shallow swale (0.1m deep) will be provided to direct flows from Longfield St to the central roadway.

3 Development Control Plan Review

The following sections outline our review of the flood related development controls on site, with particular respect to the Fairfield City Wide Development Control Plan 2013 (Amendment no.13).

3.1 Hazard Precinct

The site is located within the Low Flood Risk Precinct of the Prospect Creek Floodplain, approximately 100 m from the edge of the PMF extent.

Currently no flood risk planning precincts exist for the overland flow. Review of the Fairfield CBD Overland Flood Study (SKM, 2010) (Section 4.2) suggests that the designation of Flood Risk Precincts by Fairfield Council is a relatively complicated and potentially iterative process for overland flood studies. However, the following can be ascertained from SKM (2010):

- The high flood risk precinct is defined as the area within the 1% Annual Exceedence Probability Flood (AEP) extent that has high hydraulic hazard;
- The medium flood risk precinct is defined as the remaining area within the 1% AEP extent;
- The low flood risk precinct is defined as the area within the extent of the PMF that is not within either the medium or high flood risk precincts;
- Flood depths of less than 150 mm in the 1% AEP are generally ignored as “nuisance flooding”; and
- Flood Risk precincts are largely continuous (i.e. there are no isolated patches).

During a PMF event, Figure 6 shows that the whole site is flooded to a depth greater than 150 mm and would therefore be a Low Flood Risk Precinct at a minimum. When examining the hydraulic hazard for the 1% AEP event (Figure 9), the site is more than 99% low hazard, and mostly low hazard in adjacent roadways. Therefore, the site would not be within the high flood risk precinct.

In the existing 1% AEP model results, the majority of the site is covered by flooding of less than 150 mm with isolated areas of depth exceeding 150 mm (Figure 5). Figure 7 shows that these areas also have relatively low velocity (on average less than 0.1 m/s) and would not convey significant amounts of water. Review of the Digital Elevation

Model (DEM) with respect to the existing 1% AEP flooding also suggests that some of these isolated areas above 150 mm deep are potentially DEM anomalies and would likely be stripped from the results when developing the Flood Risk Precincts.

With only isolated pockets of depth exceed 150 mm, rather than a continuous flow path, it is possible that the site could be delineated as a low flood risk precinct, although some interpretations may connect the isolated deeper points and view the site as a medium flood risk precinct.

Figure 11 shows that the level of the PMF across the site is below any flood planning level (1% AEP plus 500 mm freeboard). Therefore, there is no chance that the proposed development could be flooded from overland flooding to above floor flooding. Based on this, and the isolated nature of the flooding greater than 150 mm, it is suggested that the site be included in the Low Flood Risk Precinct.

3.2 Land Use

The proposal has a number of proposed land-uses. The land-uses have been categorised as per the DCP Chapter 11 Schedule 2. The schedule has eight "land use categories" and lists the types of development that fit into these categories. Different land use categories have different flood related development controls associated with them.

Table 1 DCP Land Use Categories

Proposed Land Use	**DCP Category**
Residential Apartments	Residential
Takeaway food and drink premises and Neighbourhood shop	Commercial or Industrial
Management Office	Commercial or Industrial
Child Care Centre	Sensitive Uses and Facilities
Medical Centre	Commercial or Industrial
Residential Aged Care Facility	Critical Use and Facility
Gym (indoor recreational facility)	Commercial or Industrial

3.3 Development Controls

The development controls associated with the Low Flood Risk Precinct and the proposed land uses have been derived from DCP Chapter 11 Schedule 6, which covers flooding from both Prospect Creek and Local Overland Flooding. These development controls are presented in Table 2. Note there are no controls related to the residential aged care facility as it is deemed "not suitable".

Table 2 DCP Development Controls

	Critical Uses and Facilities	Sensitive Uses and Facilities	Residential	Commercial and Industrial
Flood Level	NS	• Habitable floor levels to be above the PMF level, non-habitable floor levels to be no lower than the PMF unless justified by site specific assessment.	• Habitable floor levels to be above the 100 Year ARI plus freeboard • Non-Habitable be floor levels to be above the 100 Year ARI plus freeboard where possible, else above the 20 Year ARI with site specific justification.	• Habitable floor levels to be above the 100 Year ARI plus freeboard else floor level to be as high as possible • Non-Habitable be floor levels to be above the 100 Year ARI plus freeboard where possible, else above the 20 Year ARI with site specific justification
Building Components	NS	• All structures to have flood compatible building components to the level of the PMF	• All structures to have flood compatible building components to the level of the 1 in 100 Year ARI plus freeboard	
Structural Soundness	NS	• Applicant to demonstrate structure can withstand flood forces up to the level of the PMF	• Applicant to demonstrate structure can withstand flood forces up to the level of the 1 in 100 Year ARI plus freeboard	
Flood Effects	NS	• Flood impact needs to be considered to ensure the development will not increase flood affects elsewhere		
Car Parking and Driveway Access	NS	• Open car parking should be as high as possible but not below the 1 in 20 Year ARI level • Garages capable of accommodating more than 3 vehicles or enclosed parking must be protected up to the 100 Year ARI level • Where the drive is 0.3 m or more lower than the 100 Year ARI level, the depth of flooding on the driveway must be less than that of the road or car space • Enclosed car spaces below the 20 Year ARI level shall have adequate warning and signage. • Restraints or barriers to be fitted to prevent floating vehicles from leaving the site during a 100 Year ARI flood		
Evacuation	NS	• Reliable access for pedestrians or vehicles is	• Reliable access for pedestrians or vehicles is required from the	• Reliable access for pedestrians or vehicles is required from the building to an area of refuge

		required from the building to an area of refuge above the PMF level, or 20% of the floor area to be above the level of the PMF • The development is to be consistent with a flood evacuation strategy or similar • The evacuation requirements of the development are to be considered	building to an area of refuge above the 100 year ARI • OR • Reliable access for pedestrians or vehicles is required from the building to an area of refuge above the PMF level, or 20% of the floor area to be above the level of the PMF • The development is to be consistent with a flood evacuation strategy or similar	above the PMF level, or 20% of the floor area to be above the level of the PMF • The development is to be consistent with a flood evacuation strategy or similar
Management and Design	NS	• Applicant is to demonstrate that area is available to store goods above the PMF level • No storage of materials below the design floor level thay may cause pollution or be potentially hazardous during any flood	• Site emergency response plan required where floor levels are below the design floor level • Demonstrate there is area to store goods above the 100 year level plus freeboard • No storage of materials below the design floor level that may cause pollution or be potentially hazardous during any flood	

NS: Considered Not Suitable and no controls given
Freeboard: defined as 500 mm
Note: the DCP uses “1 in 100 Year ARI” while the current accepted nomenclature for this event is the 1% AEP

4 Hydraulic Impacts

4.1 Development Base Case Impacts

The impact of a development is generally measured using peak water surface level afflux. This is calculated by deducting the model results of the existing scenario from the developed scenario. Where values are positive, this indicates an increase in flood level due to the development. The 1% AEP event has been used for the impact assessment.

The current design was modelled and the impacts of the development determined, this is referred to as the "Base Case" impacts and is shown in Figure 12. It can be seen that there are impacts (i.e. increases in flood level) that extend beyond the site in a number of locations. Particularly, to the commercial development to the east and along Longfield St and the Hume Highway with a very minor area of impact on Chadderton St.

4.2 Proposed Mitigation Options

To mitigate the potential impacts from the development, the following mitigation options were investigated:

Option 1: Two stormwater detention basins.

This option involved a swale along the southern site boundary and along the eastern boundary of the proposed roadway within the site to direct overland flow into two proposed stormwater detention basins located between the three buildings proposed along the eastern portion of the site. The proposed swale was 0.3 m deep and the proposed stormwater detention basin was 1 m deep with a battered slope connecting to the surrounding ground level. The two proposed stormwater detention basins were drained via a 0.3 m diameter stormwater pipe towards the northern site boundary where it connected to the existing stormwater network along Chadderton Street. Figure 13 shows the hydraulic model schematisation of this option.

Option 2: One stormwater detention basin.

This option involved a swale along the southern site boundary to direct overland flow into a proposed stormwater detention basin located along the southern site boundary. The proposed stormwater detention basin was 1 m deep with a battered slope connecting to the surrounding ground level. The detention basin was drained via a 0.3 m diameter stormwater pipe towards the northern site boundary where it connected to the existing stormwater network along Chadderton Street. Figure 14 shows the hydraulic model schematisation of this option.

Option 3: Impermeable Wall.
This option involved an impermeable wall along the eastern site boundary to a height of 9.3 m AHD. Figure 15 shows the hydraulic model schematisation of this option.

Option 4: Two Stormwater Detention Basins and Impermeable Wall.

This option combined option 1 and option 3, with the latter varied at the northern site boundary. Additionally, an overland flow path was cut to grade between buildings in the north-western portion of the site. Figure 16 shows the hydraulic model schematisation of this option.

4.2.1 Mitigation Option Results

Option 1: Two Stormwater Detention Basins.

The flood level impact resulting from mitigation option 1 is shown in Figure 17. In this it is shown that the 1% AEP peak flood levels decreased along Longfield Street located to the south of the site.

However, the 1% AEP peak flood levels increased within the private properties directly adjacent to the site to the east and west.

Option 2: One Stormwater Detention Basin.

The flood level impact resulting from mitigation option 2 is shown in Figure 18. In this it is shown that the 1% AEP peak flood levels decreased along Longfield Street located to the south and the Hume Highway located to the east of the site. However, the 1% AEP peak flood levels increased within the private properties directly adjacent to the site to the east and west as well as along Chadderton Street located to the north of the site.

Option 3: Impermeable Wall

The flood level impact resulting from mitigation option 3 is shown in Figure 19. In this it is shown that the 1% AEP peak flood levels decreased along Longfield Street located to the south, the Hume Highway located to the east, and the private property located to the east of the site. However, the 1% AEP peak flood levels increased within the private properties directly adjacent to the western site boundary.

Option 4: Two Stormwater Detention Basins and Impermeable Wall

The flood level impact resulting from mitigation option 4 is shown in Figure 20. In this it is shown that the 1% AEP peak flood levels decreased within the private properties directly adjacent to the site to the east and west as well as along Chadderton Street located to the north of the site. Marginal areas of increased 1% AEP peak flood levels were shown to occur within the roadway on Longfield Street and the intersection of Longfield Street and the Hume Highway.

4.3 Recommended Options

As option 4 resulted in no adverse flood level impacts on private property with only relatively minor impacts (0.01 – 0.05 m) on Longfield St and the Hume Highway. These roads will already be flooded and likely closed during the event.

It was found that this option was the more favourable option.

4.4 Proposed Development Flood Planning Level

The proposed flood planning level would be the 1% AEP flood levels plus 500 mm freeboard. As the flood surface level varies significantly across the site, the 1% AEP

flood levels are shown at key locations around the site on Figure 21, 500 mm would need to be added to these levels to determine the flood planning level.

5 Emergency Management Review

This section includes a review of the flood behaviour with respect to the emergency management on site.

5.1 Flood Behaviour

Flood Depths

Under existing and proposed development conditions the site is subject to flooding during the 1% AEP event with depths varying between 0 and 0.6 m. Figure 5 shows that the vast majority of the site is less than 0.15 m deep and only small pockets of flooding is greater than 0.3 m. Smaller, more frequent events are likely to inundate the site, however an even larger proportion of the site would be less than 0.15 m deep.

During a PMF event, depths on the site increase to an average of around 0.3 m with a maximum of around 0.8 m in a very small section on the eastern boundary of the site (Figure 6). As the site ground floor levels would be set at a minimum of 1% AEP plus 500 mm freeboard for the residential and commercial components, the PMF would not exceed the ground floor level. This is shown spatially in Figure 11, where the flood water surface level of the 1% AEP has been deducted from the PMF water surface and in no location on the site does the difference exceed 500 mm.

Flood Velocities

During the 1% AEP flood velocities on site are generally relatively low (Figure 7), with much of the site less than 0.1 m/s and nearly allof the site less than 0.3 m/s. The exception to these low flow velocities is the proposed internal road and small flow path to the south east, which has velocities generally between 0.3 – 0.5 m/s but up to around 1 m/s in very isolated locations.

During a PMF, velocities immediately around the buildings remain relatively low, however in the open areas between buildings velocities are increased to around 0.5 – 1 m/s with isolated areas up to around 1.3 m/s (Figure 8).

Flood velocities are generally greater in the streets outside of the site, with flows up to around 1.3 m/s during the 1% AEP and exceeding 2 m/s during the PMF.

Flood Hazard

During both a 1% AEP and PMF event (Figure 9 Figure 10 respectively), more than 95% of the site has Low Hazard conditions (as defined by the NSW Floodplain Development Manual, 2005) with very isolated pockets of High Hazard. This suggests that even during a PMF, internal access between buildings is feasible.

Along the egress points at Longfield St and Chadderton St, the flooding is also almost entirely low hazard during the 1% AEP event, however during a PMF the roadways are mostly High Hazard with generally low hazard along the footpaths and small isolated sections of high hazard on footpaths.

Flood Duration

Figure 3 shows a typical depth hydrograph for the site for the Overland flood PMF. While the new AR&R 2016 approach may produce longer lasting floods at smaller AEPs, the flood conditions are likely to be far less severe than the PMF.

Flood durations on site are relatively short, with the PMF generally only having flood levels elevated above 0.05 m deep for around 90 minutes, and above 0.15 m deep for around 45 minutes.

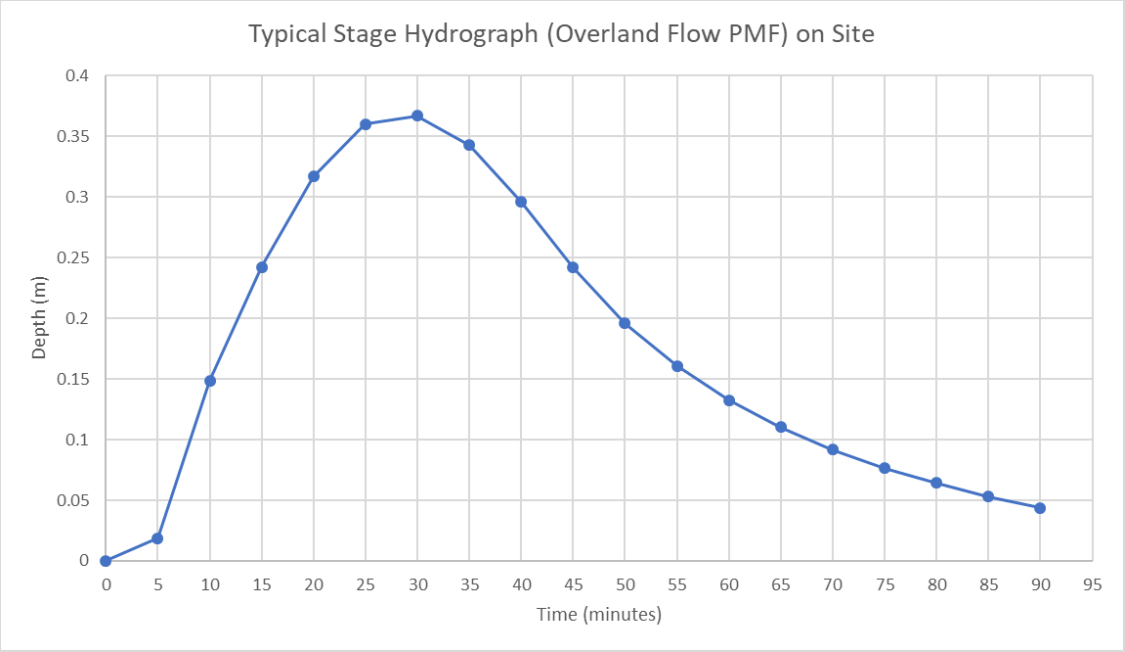

Figure 3 Overland Flow Stage Hydrograph (Typical location on site)

5.1.1 Prospect Creek Flooding

The site is within the extent of the Prospect Creek PMF but well beyond the extent of the Prospect Creek 1% AEP (approximately 300 – 400 m).

Flood Depths

The PMF has a flood level of approximately 10.8 m AHD on site (this has been derived by comparing the DEM level at the boundary of the flood extent along Longfield St, approximately 100 m from the site). Therefore, Prospect Creek PMF flooding would be around 1.5 - 1.8 m deep on site and would likely inundate the ground floor of the proposed buildings.

Flood Velocities

The Prospect Creek hydraulic model uses a static water level as the tailwater condition to represent flow in the Georges River. The area around the site is heavily influenced

by this tailwater condition and therefore has no velocity. Floodwaters on the site would largely be ponded.

Flood Hazard

Even with negligible velocity, the flood hazard on site during a Prospect Creek PMF will present a high hazard to the occupants outside or on the ground floor, this is due to the high depths that will occur across the site.

Flood Duration

Due to the tailwater condition, the stage hydrograph on site does not show a rise and fall in the PMF level. Therefore, CSS extracted a stage hydrograph at a location just upstream of the area affected by the tailwater conditions. This can be used as a proxy to represent the rise and fall of the Prospect Creek PMF.

The stage hydrograph is shown in Figure 4. It takes approximately 5 hours for the flood to return to less than 0.1 m. While the duration on site will vary from that presented, it is likely that the difference would be in the order of an hour or two.

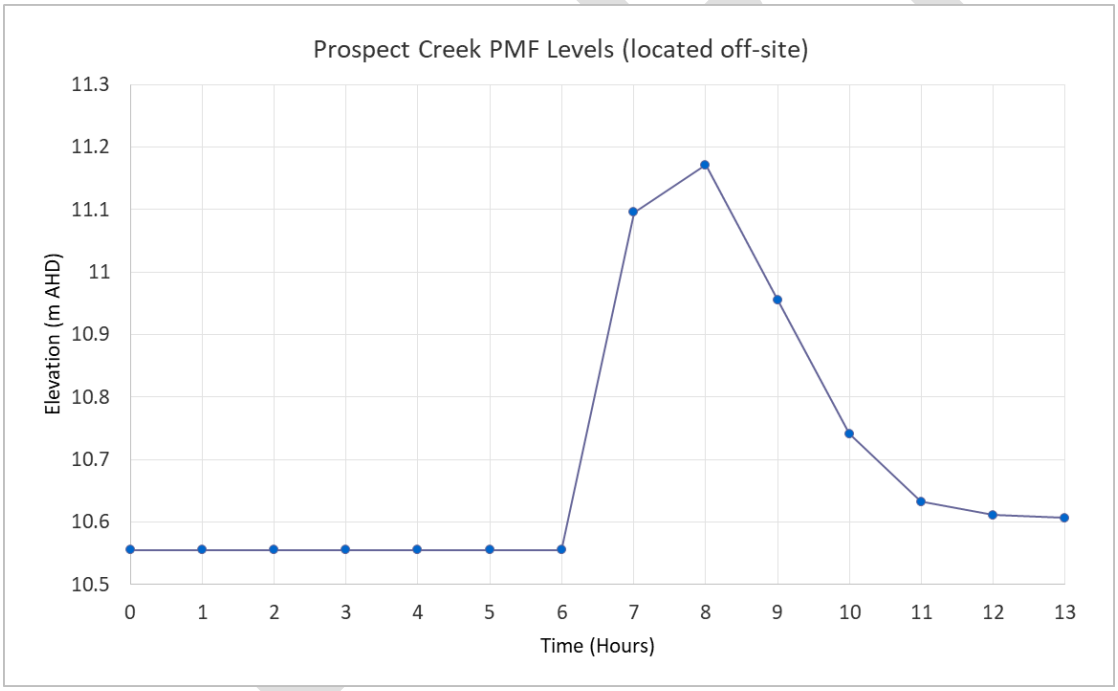

Figure 4 Prospect Creek Stage Hydrograph (Located off-site)

5.2 Emergency Management Strategy

5.2.1 Evacuation Potential

Due to the flash flood nature, evacuation from the site from Overland Flooding is unlikely to be feasible. There is insufficient warning time for the NSW SES and other emergency services to mobilise and warn the community.

Evacuees would likely be evacuating into flooding conditions that would be far worse than if they elected to shelter in place. A storm that would produce flooding in the order of a 1% AEP event or greater is likely to have rainfall intensities such that clear vision ahead of the car while driving is impossible.

Similarly, flooding from Prospect Ck is likely to coincide to some extent with overland flooding. So even if some warning time is available for flood waters rising from Prospect Creek, it is also likely that all evacuation routes will be flooded due to local overland flow.

5.2.2 Overland Escape Route

Should evacuation be necessary, then there is an Overland Escape Route from the site from the south-west corner of the site and then along Longfield St footpath to the west and onto Vale St (approximately 350 m total length). The overland escape route is shown with respect to PMF hazard in Figure 10. Given the very short duration of the PMF from overland flooding, conditions similar to the peak will only last approximately 10 minutes and it would be suggested that occupants wait to leave until flooding subsides. Similarly, if evacuees along the overland escape route face high hazard conditions it is suggested that they stand in place or retreat until the high hazard flooding recedes.

However, in a Prospect Ck PMF, it is recommended that if the overland escape route is to be used, then it is used as soon as flood water reaches the site. This route is a continuously rising access and takes the evacuees beyond the extent of the catchment and outside of the extent of the Prospect Creek PMF (approximately 95 m total length).

The rate of rise for the PMF can be estimated from Figure 4, during the steepest part of the rising limb, the rate of rise is approximately 0.6 m / hour. Assuming a 2 km / hour walking speed, it would take approximately 3 minutes for evacuees to be beyond the extent of the PMF, during this time the flood would only rise 0.03 m. Along the route, the ground surface rises approximately 1 m and the evacuees would therefore easily outpace the rising flood.

5.2.3 Shelter in Place

The recommended emergency management strategy for the site is to Shelter in Place. The site presents minimal danger to its occupants should they elect to shelter in place and represents the safest possible strategy for this site.

While the adopted position of the NSW SES is to oppose Shelter in Place in all circumstances, there are several reasons why this proposed development is a good example of where shelter in place is appropriate. These are:

- The site is only inundated for a short duration (approximately 5 hours in a Prospect Creek PMF). Therefore, there is minimal risk of secondary emergencies such as fire or medical emergencies and minimal risk of occupants attempting to leave, or attempting to enter the site.
- The ground floor will be at or above the PMF level for overland flooding, therefore only in a Prospect Creek PMF will flood levels exceed the ground floor. The first floor of all buildings will be above the level of the Prospect Creek PMF and therefore a safe PMF refuge is available.

- The site will have on site management. This allows for the effective implementation of a Flood Emergency Response Plan (FERP).
- The site will have on site medical facilities. By including the residential aged care facility, the site will have access to medical facilities should a secondary emergency occur.
- Movement within the site (between buildings), even in peak conditions of an overland flood PMF will be possible.

5.2.4 Recommended Risk Reduction Measures

Flood Emergency Response Plan

The risks of Shelter in Place can be mitigated by incorporating a robust Flood Emergency Response Plan.

- A description of the flood behaviour;
- A description of the development, including the number of persons at risk and their conditions;
- Emergency services contact details;
- Nominated "flood warden" who is responsible for maintaining and activating the plan;
- A heads up warning to ensure the site is prepared for flooding, usually a severe weather warning or flood watch or flood warning issued by the Bureau of Meteorology;
- A clear "trigger" for action, such as a depth of rainfall over a designated time period, or the presence of flood water on site;
- A clear list of actions, roles and responsibilities, including the flood warden and managers of individual facilities on site; and
- Systems to ensure that the plan is regularly exercised (at least annually) and that a review is undertaken by an appropriately qualified person following a flood event.

Given the relatively short nature of the flooding, it is not expected that the site will require maintaining food and water supplies and residents are likely to have access to medications that last beyond a day.

The sensitive facilities on site (aged care facility and child care centre) should also have their own detailed flood emergency response plan that ties in with the overall site plan.

PMF Refuge

It is recommended that the critical and sensitive uses, such as the residential aged care facility and child care centre are located above the level of the Prospect Creek PMF. All of the buildings on site are likely to have their ground floor level set below this level, however typically the 1st floor will be at least 2.7 m above the ground floor level. Therefore, if the sensitive uses are set on the 1st floor, then they will be above the level of the PMF and won't require a PMF refuge.

For all other uses on the ground floor, it is recommended that they have access to a PMF refuge, which would be a publicly accessible space on the 1st floor or higher. The FERP will include details on how to access the PMF refuges and how long to wait there.

Given the relatively short length of time that refuge is likely to be required, there only needs to be minimal provisions, such as water and first aid supplies.

Backup Electrical Generation

Systems should be in place to ensure that power is maintained at the critical locations, such as the aged care facility, to ensure that all equipment remains operational during a flood event.

Basement Car Parking

Basement car parks present a significant risk to life during a flood event. The level of the basement car parking entry should be set at the level of the Overland flow PMF. This will prevent overland flow from affecting the basement car park. Therefore, only in a Prospect Creek PMF will the basement car park become flooded and it is recommended that the FERP include procedures to ensure that the basement car parks are evacuated and subsequently remain inaccessible until after the flood has receded.

Alternatively, the use of flood gates or flood barriers could be investigated.

Building Construction

In addition to the Flood Emergency Response Plan and PMF Refuge, it is important that the buildings be designed with flood aware principles in mind, in particularly this should include:

- Construction using flood compatible materials up to and including the level of the PMF; and
- Assurance that the buildings can withstand the forces applied by the flooding.

Flood compatible materials are outlined in the Fairfield DCP (2013) Schedule 1.

6 Conclusions and Recommendations

A flood assessment of the proposed development has been undertaken using data provided by CSS in preparation of the Cabravale Flood Study.

The site is subject to overland flooding, with the primary flow paths being Longfield St to the south and Chadderton St to the north. Flood conditions on site during the 1% AEP are relatively low hazard and much of the site would not be considered flooded during this event (depths less than 150 mm). During a PMF event, flood depths increase, however nearly all of the site is still low hazard. The duration of flooding on site from overland flooding is around 1 hour in the PMF.

The site is also subject to flooding from Prospect Creek, however it is only inundated during a PMF where depths are up to around 1.8 m with minimal velocity. The duration of flooding from Prospect Ck in the PMF is likely to be around 5 hours.

Under the base case scenario, the development has some impact on neighbouring properties. However, if the proposed mitigation Option 4 is worked in with the development, then these impacts are mitigated to having only a minor impact on adjacent roadways and no impact on neighbouring properties.

Given the flash flood nature of the flooding, evacuation of the site is likely to be infeasible and present a greater risk to the occupants than sheltering in place, which will typically require occupants to shelter for less than an hour with a maximum of around 5 hours. If an evacuation is critical, then there is rising road access and an overland escape route from the south-western corner of the site onto Longfield St. In an overland flow PMF this overland escape route is largely low hazard and the occupants could easily outpace a rising Prospect Ck PMF.

6.1 Recommendations

6.1.1 Incorporation of Flood Impact Mitigation Options

We recommend that the design is altered to include the measures presented in Option 4 (see Figure 16).

6.1.2 Shelter In Place Provisions

We recommend that the site adopt a “shelter in place” approach to emergency management and that the risk reduction measures outlined in Section 5.2.4 are adopted.

6.1.3 Critical Uses and Facilities (Aged Care Facility)

The DCP states that Residential Aged Care Facilities are not a suitable land use for development within the Low Flood Risk Precinct. It is our understanding that reluctance on many Council’s behalf to place aged care facilities within the floodplain is due to the risks associated with evacuating such premises and the residual risk faced by those on site during prolonged flooding.

Should the recommendations of our report be adopted, we believe that the flood risk associated with the aged care facility is largely mitigated and should be acceptable and that the aged care facility treated as a “Sensitive Use and Facility”. This is primarily due to:

- The floor level will be above the level of the PMF and therefore there is no risk of flooding
- The shelter in place policy will eliminate the risk associated with evacuation
- The aged care facility will have backup sources of power to ensure all equipment remains operational
- The short duration of the flooding means that sheltering in place will not be prolonged and restoration of access would be in a similar timeframe of an aged care facility outside of a floodplain (that undergoes a storm with rainfall as intense as a 1% AEP or PMF).

6.1.4 Other DCP Controls

In accordance with the other flood related DCP controls, we recommend that:

- The floor level for the aged care facility and child care centre be raised above the level of the Prospect Ck PMF. This can be achieved by moving these to the first floor or above
- All other flood levels be set to the 1% AEP level plus 500 mm Freeboard for overland flooding, which is above the level of the overland flooding PMF
- All building components to be constructed using flood compatible materials up to the 1% AEP level plus freeboard for the residential and commercial areas and up to the Prospect Ck PMF for the aged care and child care facilities
- The sill of the driveways to basement car parking be set to the 1% AEP level plus 500 mm freeboard
- All goods and materials be stored either above the level of the PMF or enclosed such that they cannot become hazards or pollution risks during a flood.

7 References

Fairfield Development Control Plan (2013) Amendment 13

NSW Department of Infrastructure, Planning and Natural Resources (2005) NSW Floodplain Development Manual

SKM (2010) Fairfield CBD Overland Flood Study: Final Report, prepared for Fairfield City Council

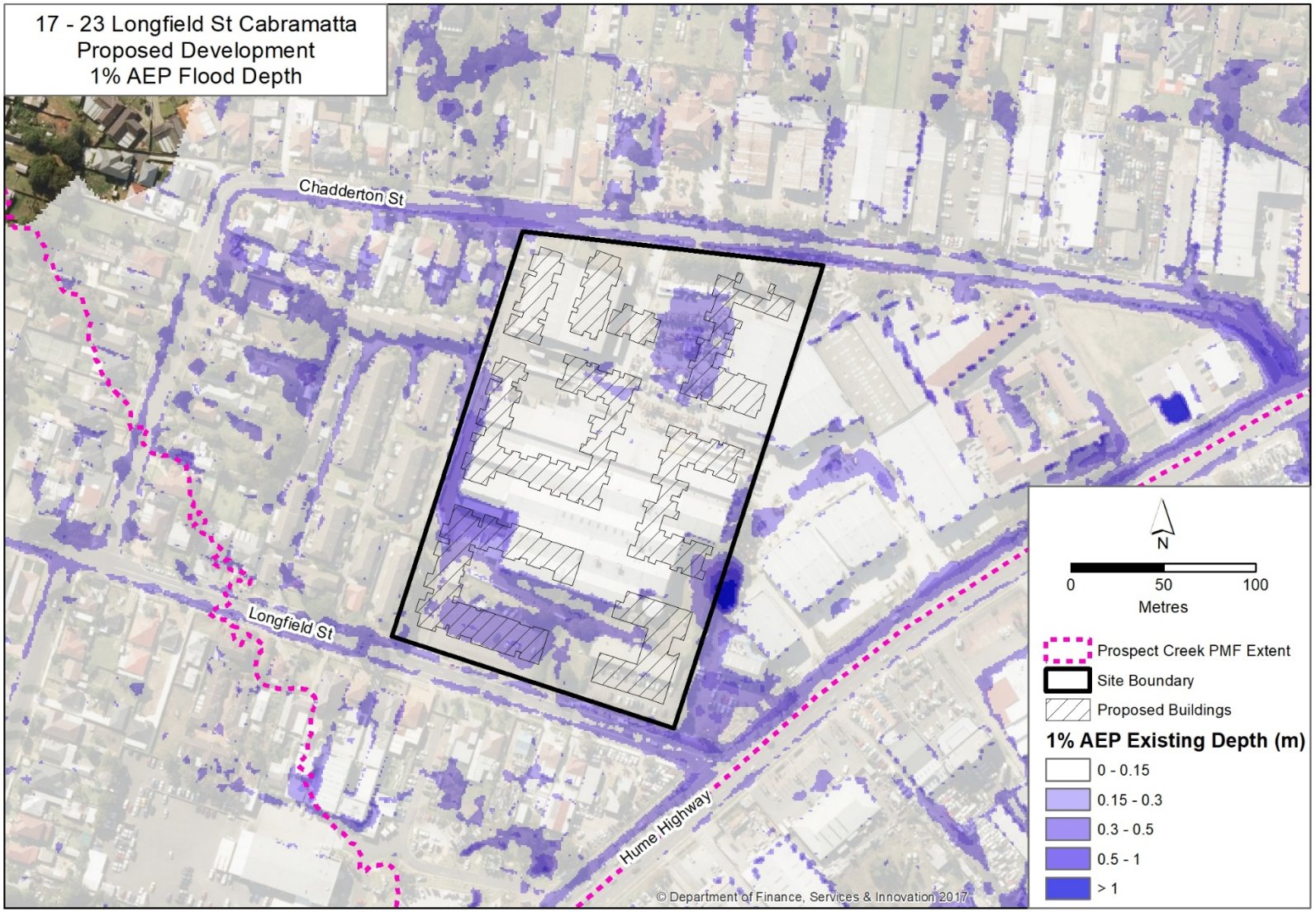

Figure 5 1% AEP Flood (Existing) Depth Map

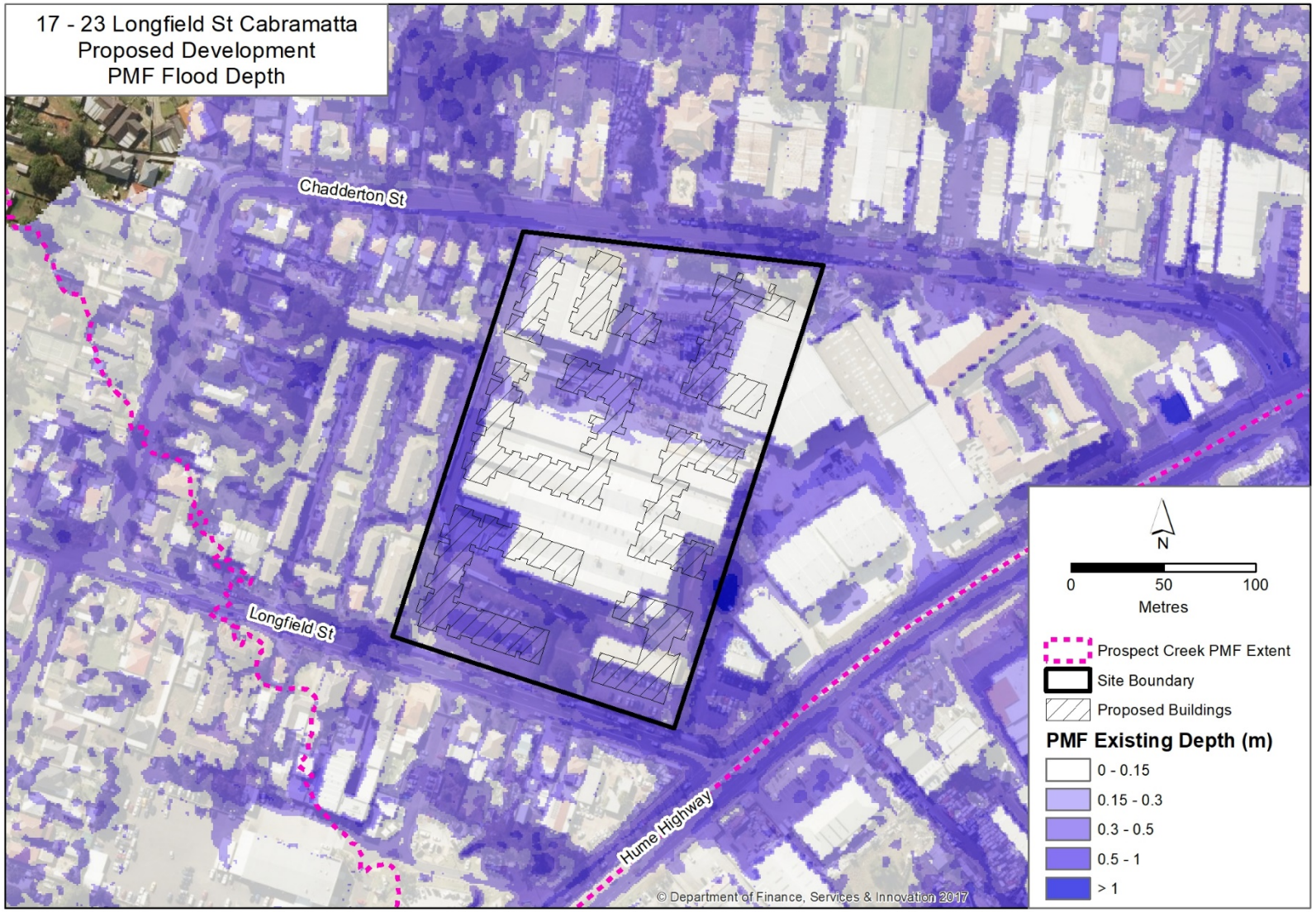

Figure 6 PMF (Existing) Depth Map

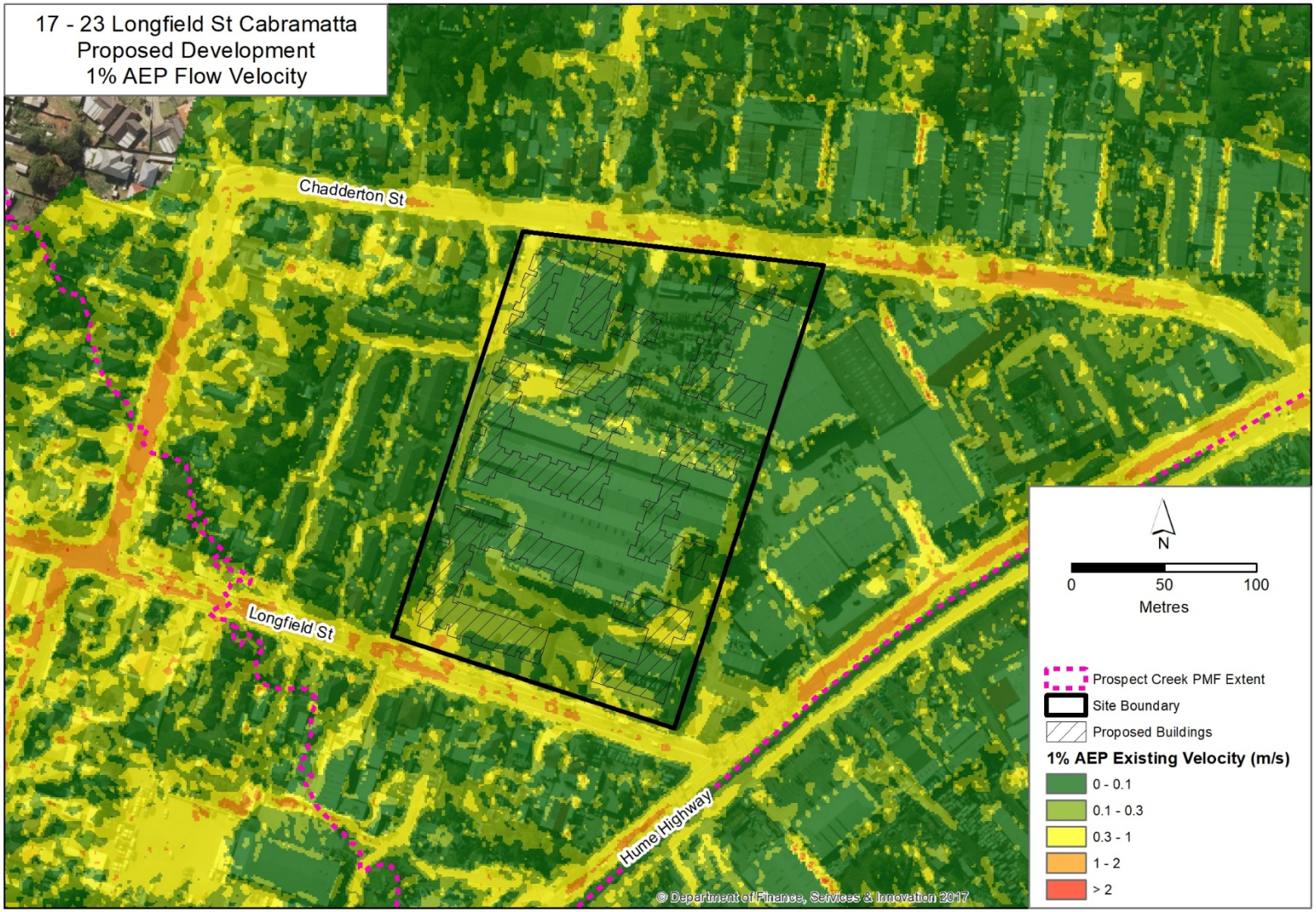

Figure 7 1% AEP (Existing) Flow Velocity

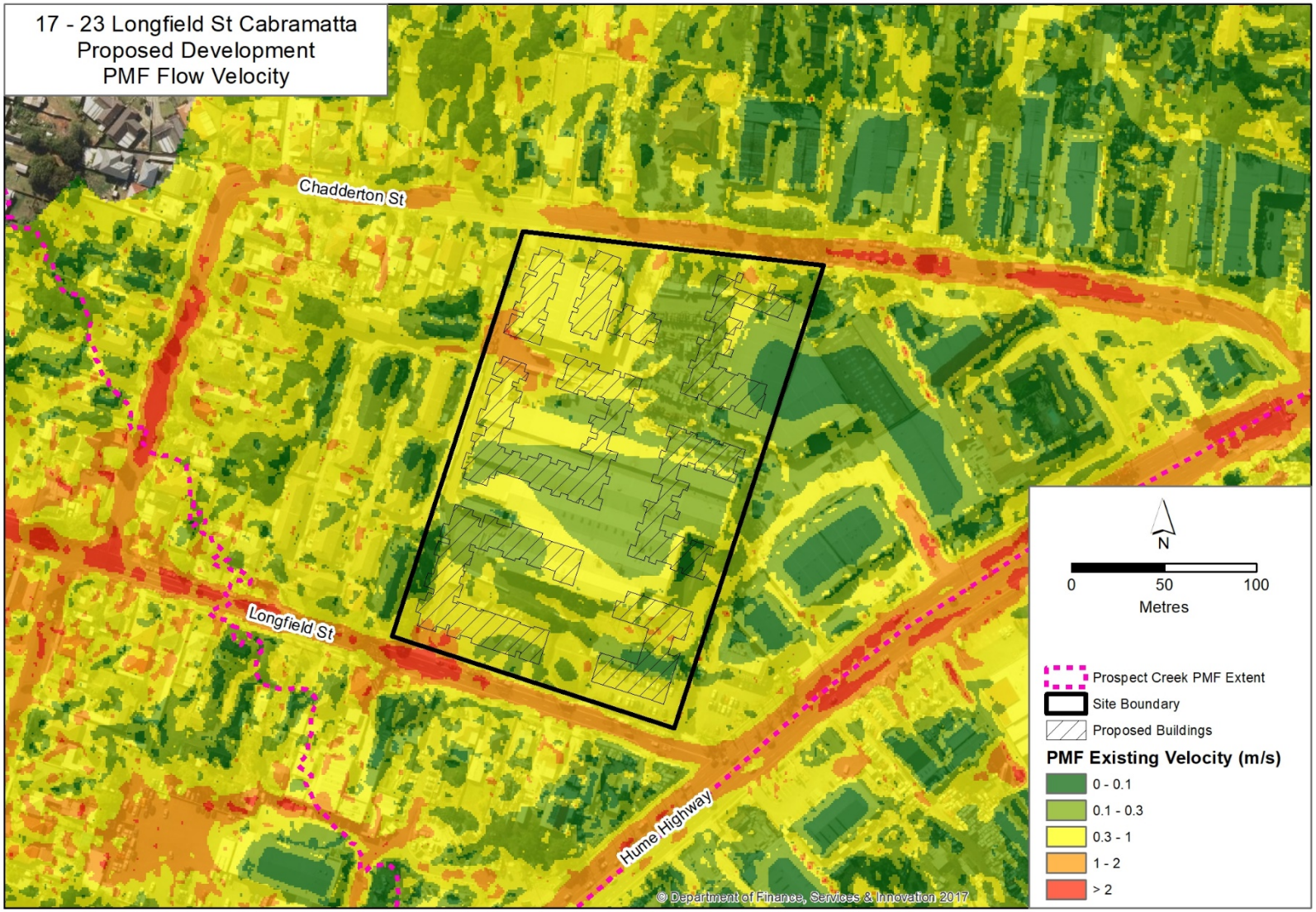

Figure 8 PMF (Existing) Flow Velocity

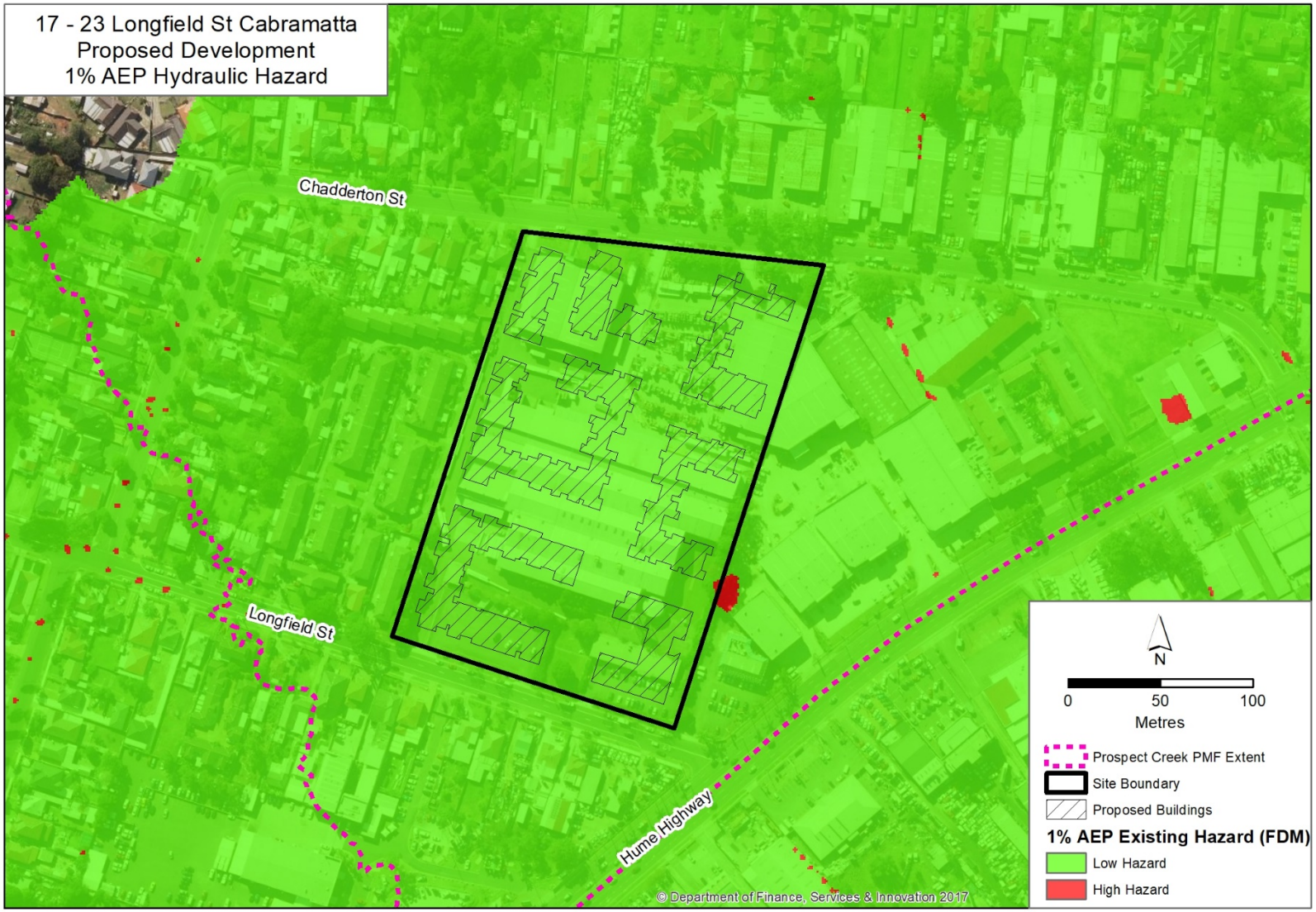

Figure 9 1% AEP (Existing) Flood Hazard (FDM, 2005)

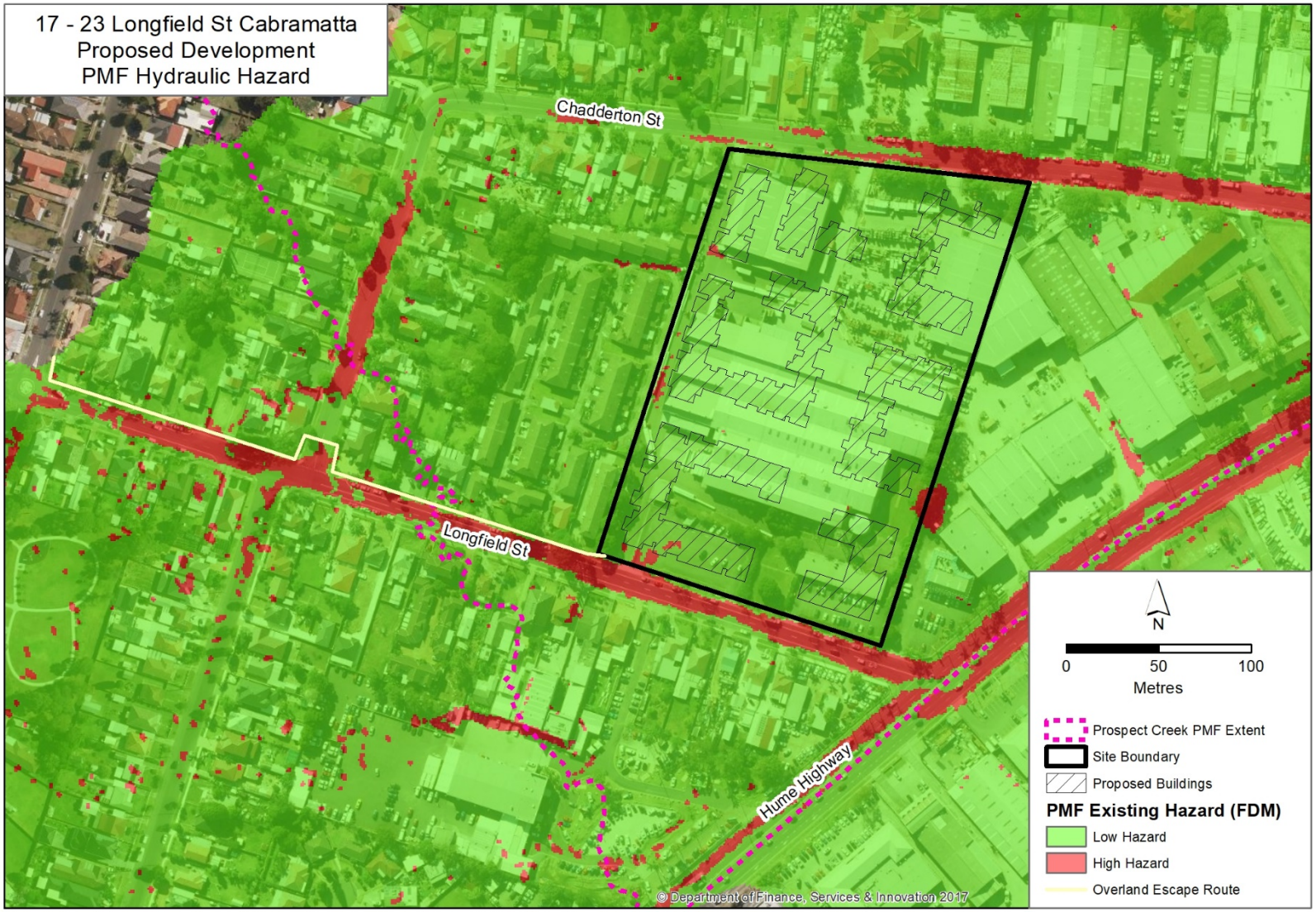

Figure 10 PMF (Existing) Flood Hazard (FDM, 2005)

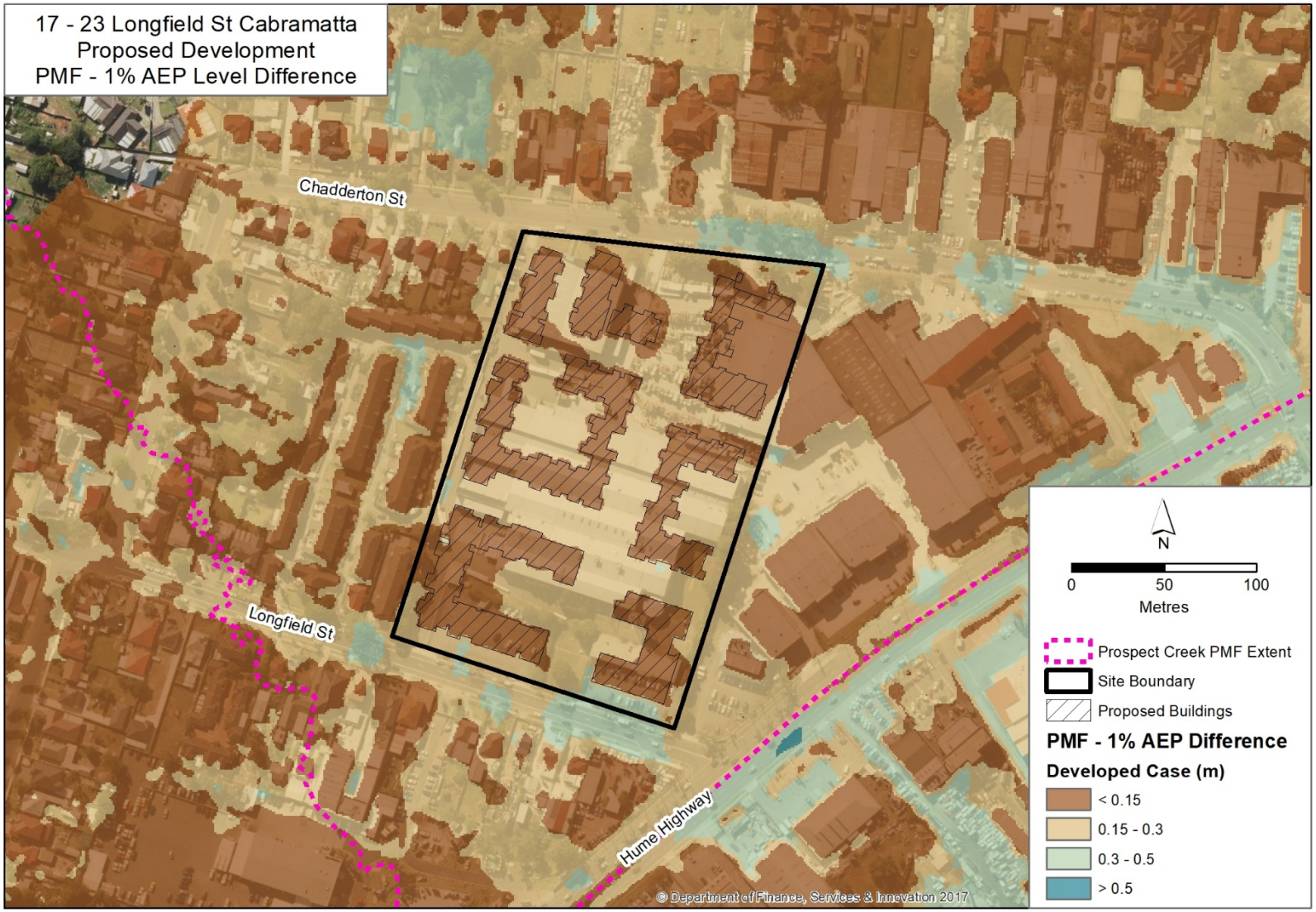

Figure 11 PMF - 1% AEP (Base Developed Case) Water Surface Level Difference

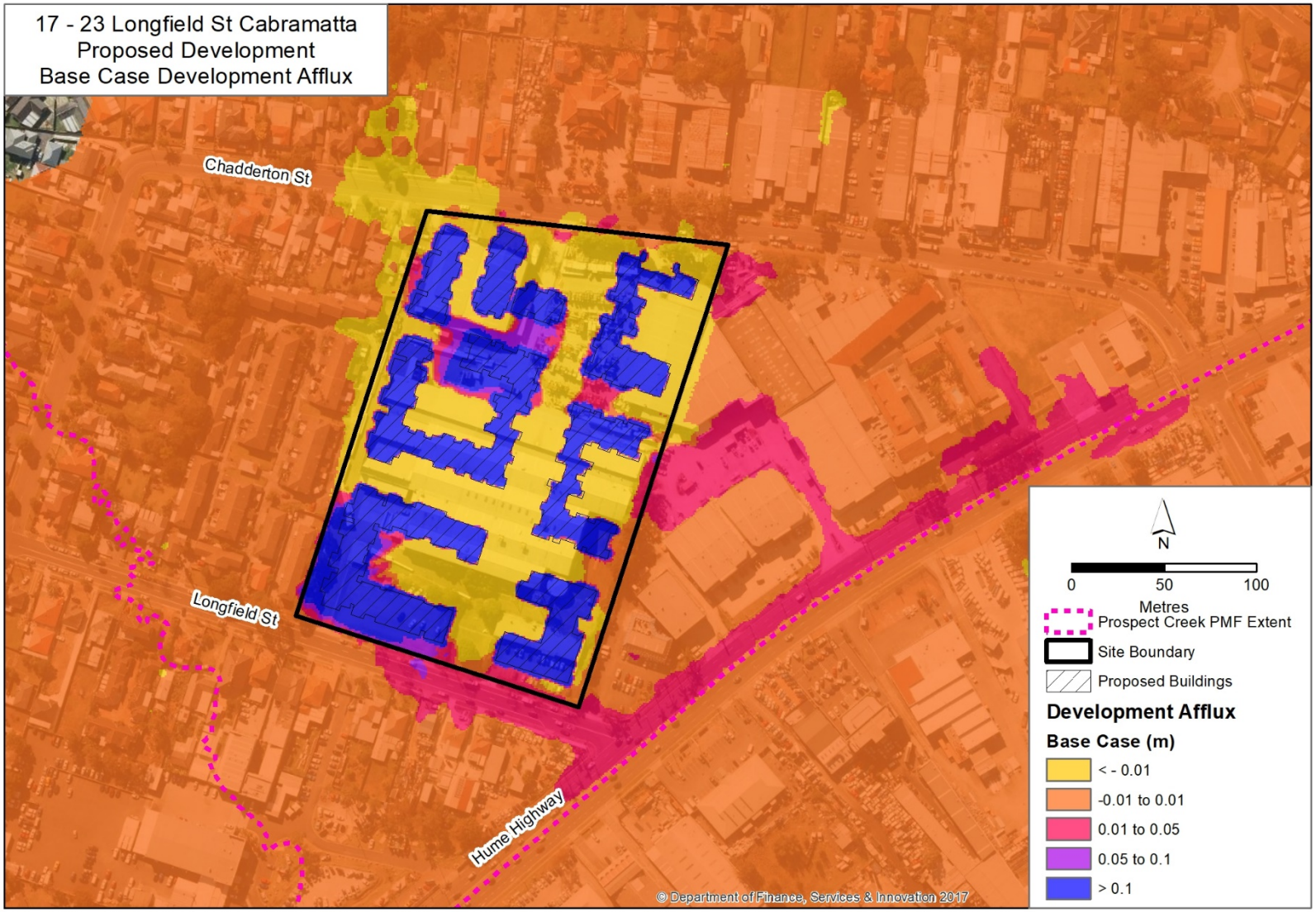

Figure 12 Base Development Case Water Level Afflux

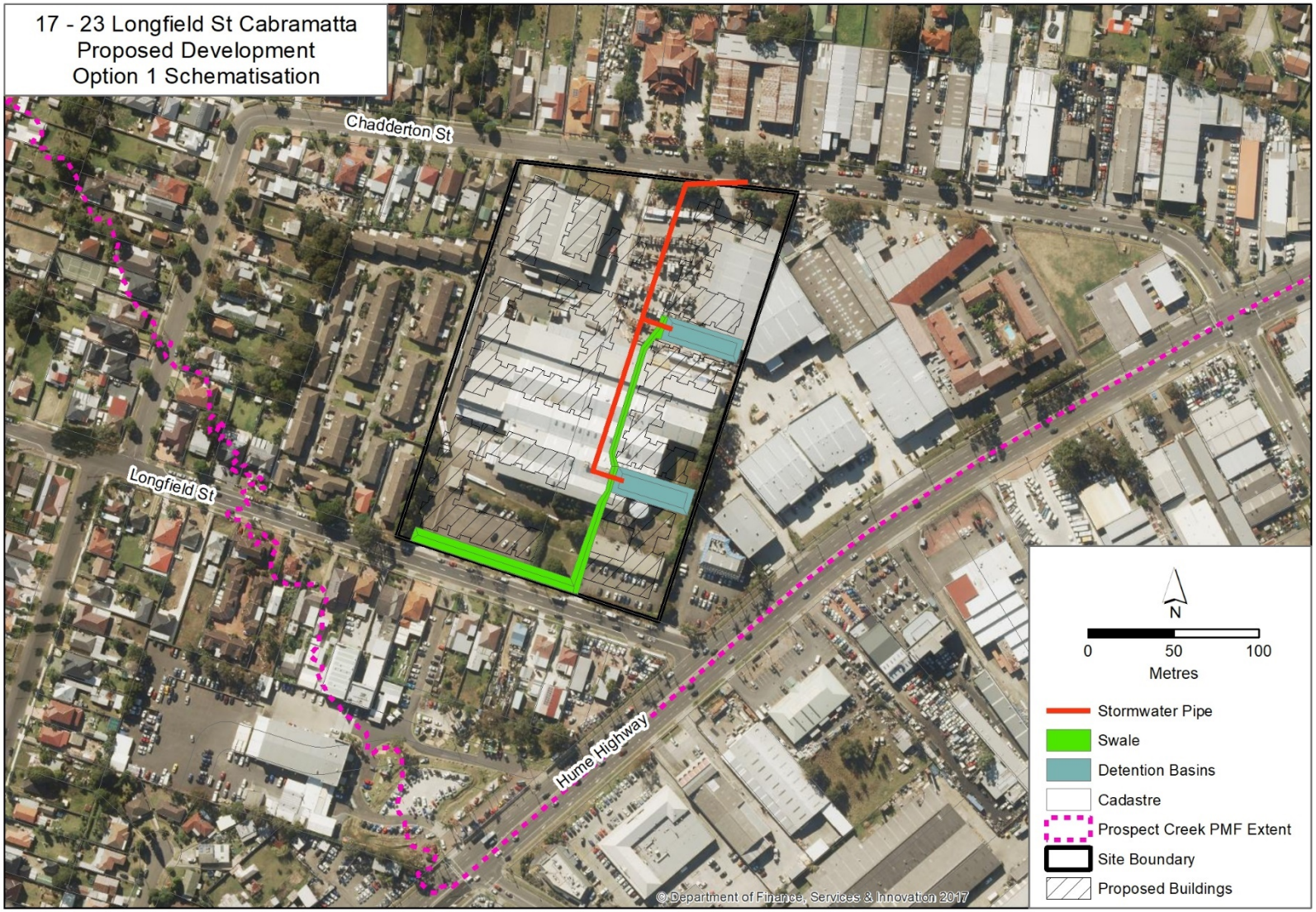

Figure 13 Option 1 Schematisation

Figure 14 Option 2 Schematisation

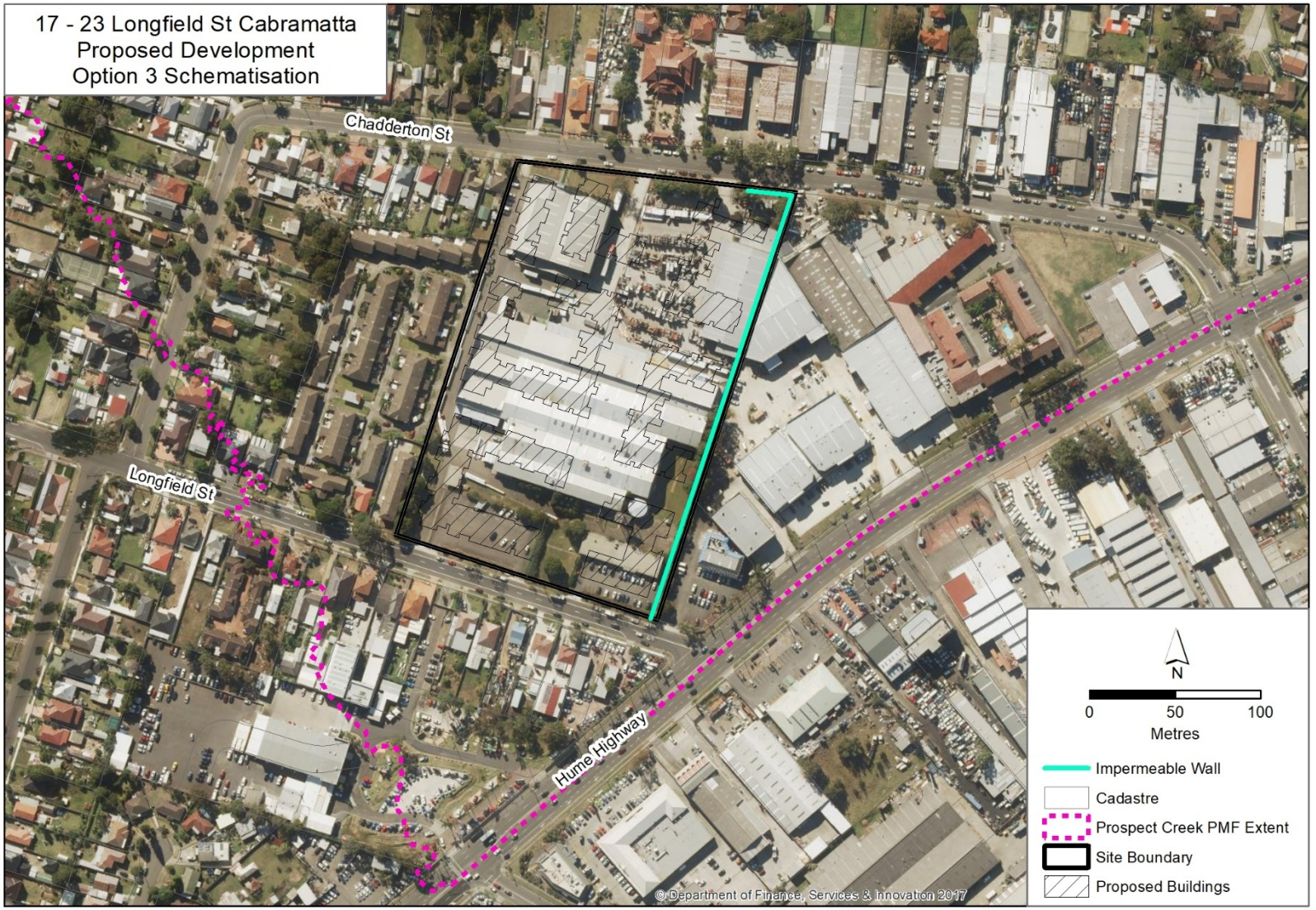

Figure 15 Option 3 Schematisation

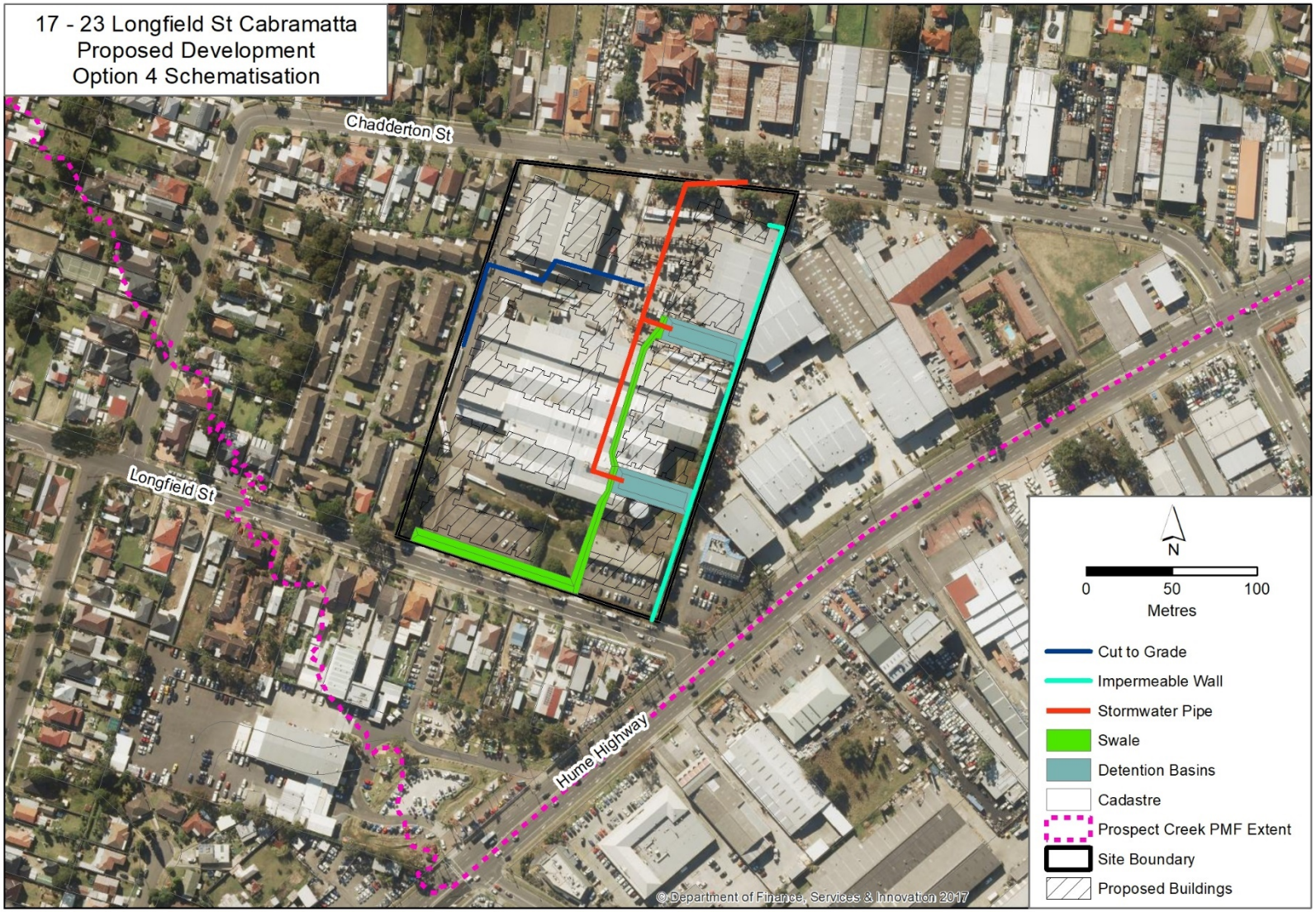

Figure 16 Option 4 Schematisation

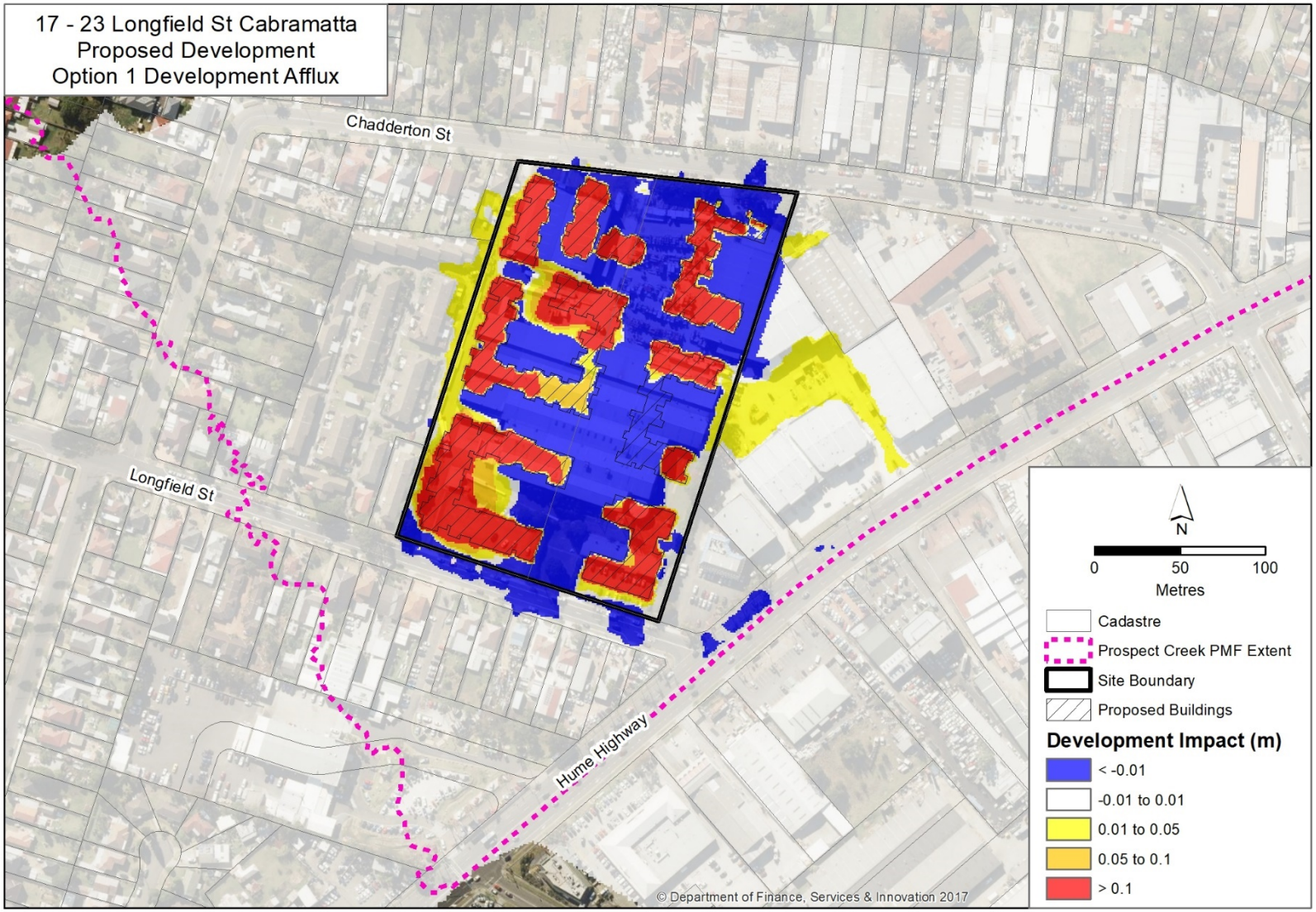

Figure 17 Option 1 Development Afflux

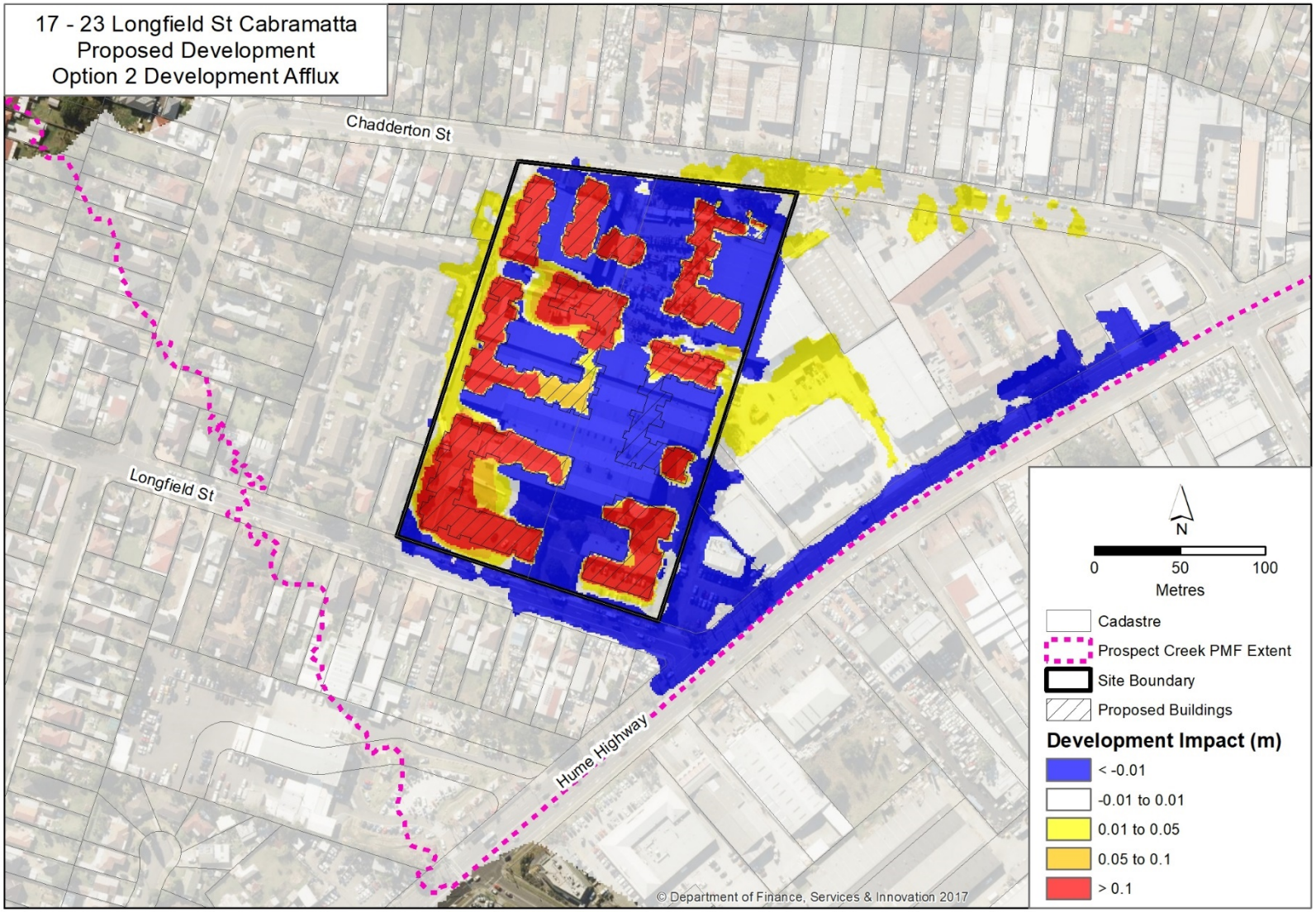

Figure 18 Option 2 Development Afflux

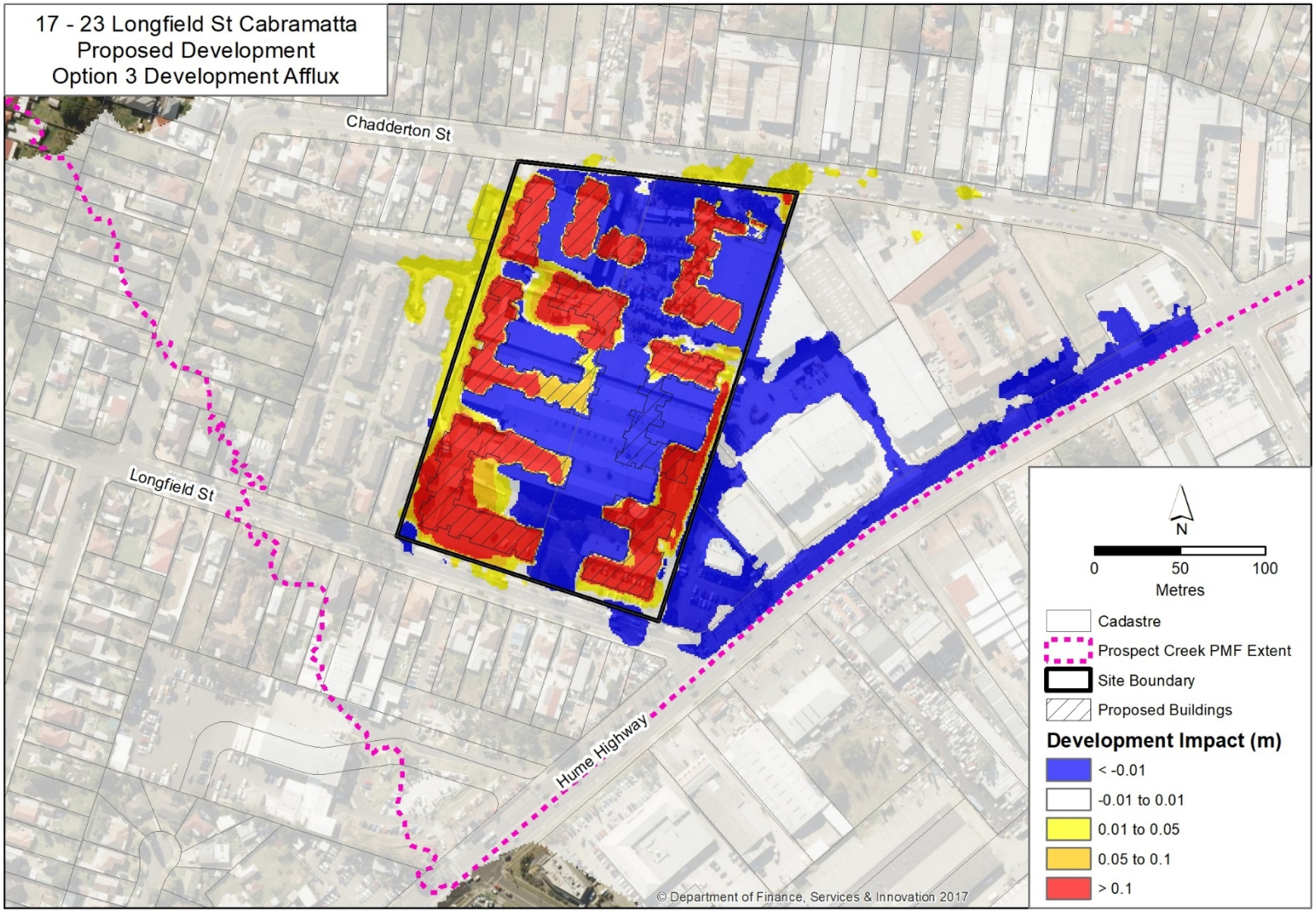

Figure 19 Option 3 Development Afflux

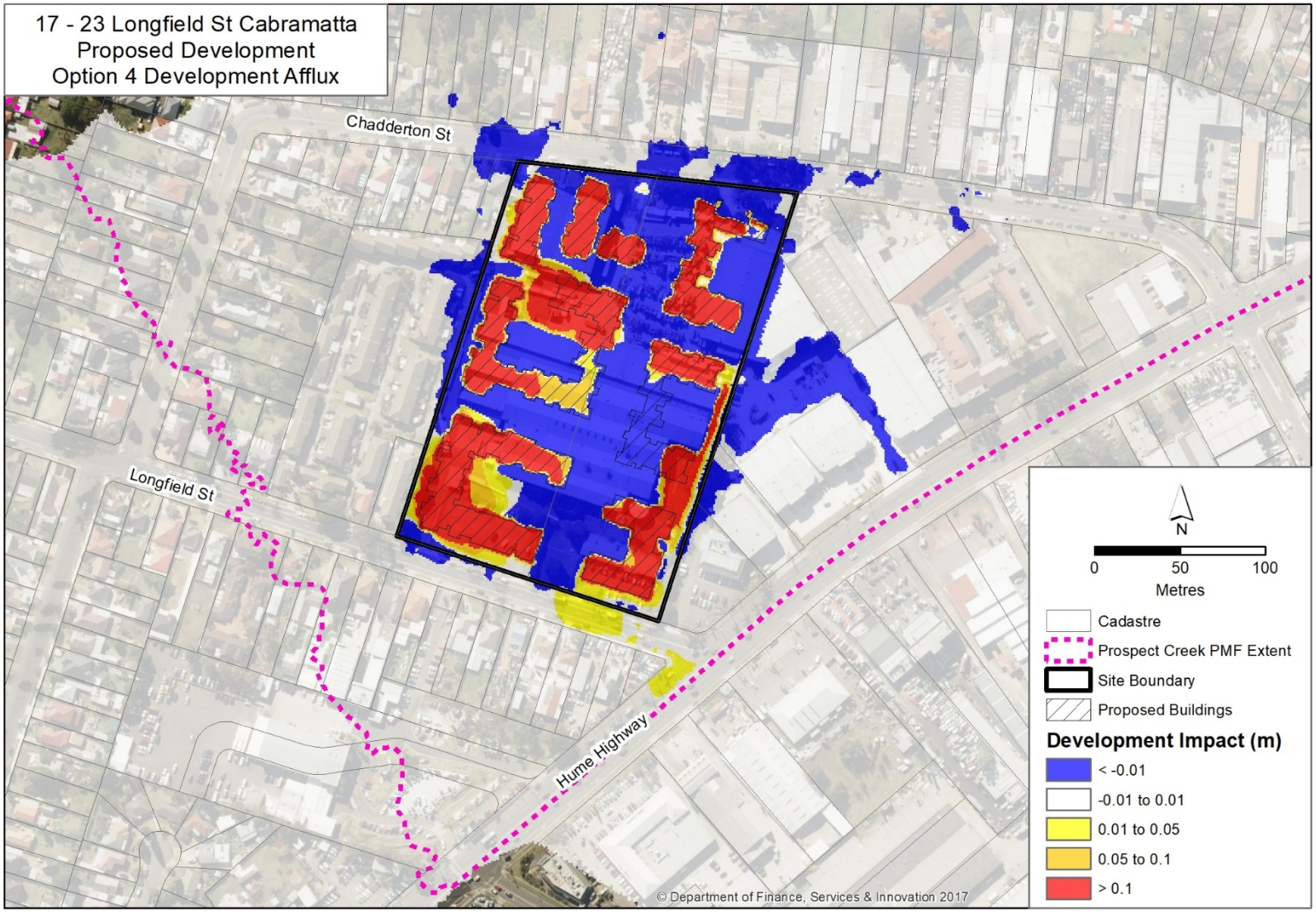

Figure 20 Option 4 Development Afflux

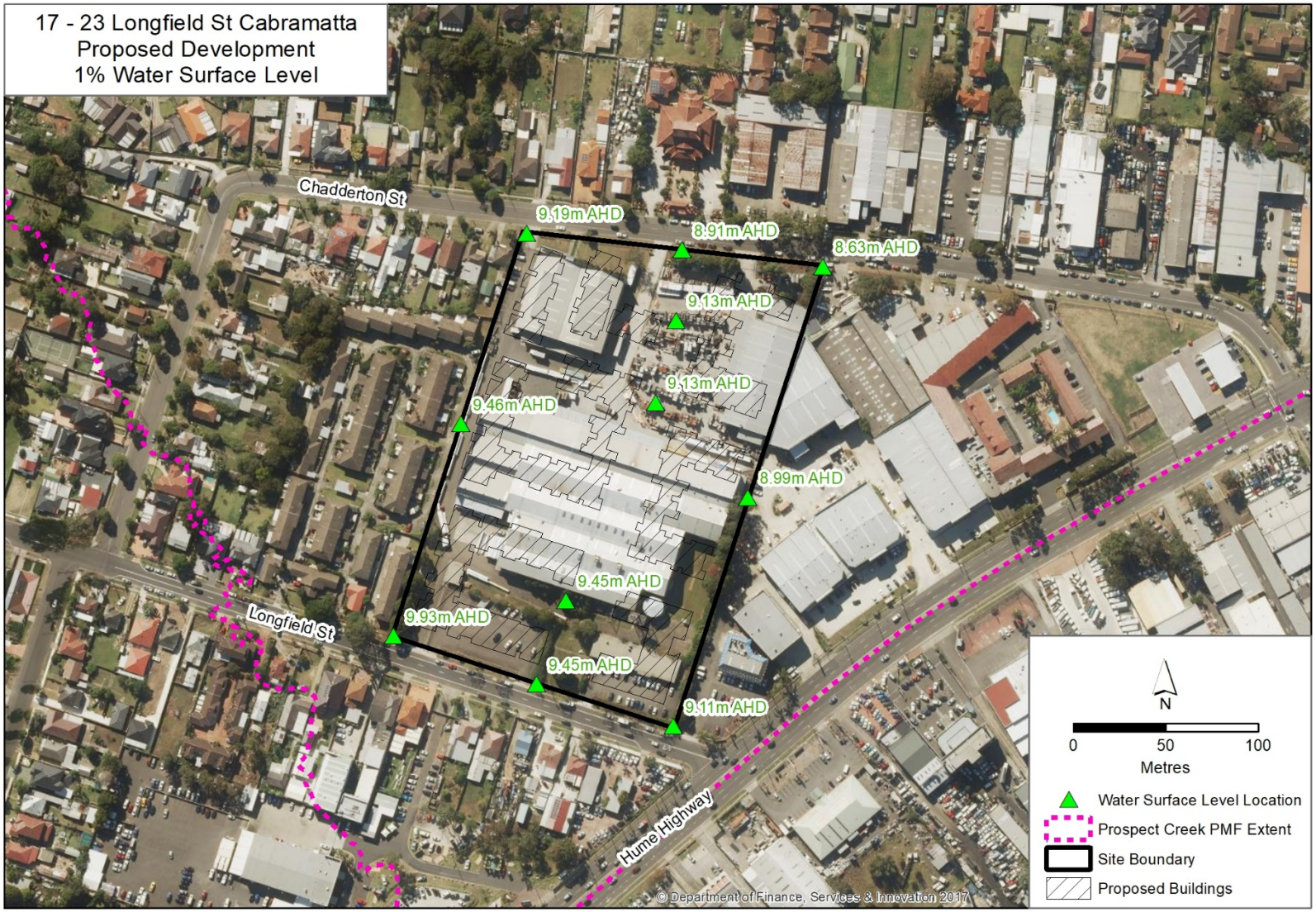

Figure 21 1% AEP Water Surface Levels


Site Boundary
1% AEP Extent
<= 0.15
> 0.15
PMF Extent
<= 0.15
> 0.15