Warringah Mall Shopping Centre
Proposed Stage 2 Expansion

Traffic and Parking Impact Assessment Report

Prepared for:

Scentre Group

4 August 2018

The Transport Planning Partnership

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1 Introduction

This traffic and parking impact assessment report relates to a proposed expansion of Westfield Warringah Mall Shopping Centre (Centre) located at 145 Old Pittwater Road, Brookvale (Lot 100, DP 1015283).

Westfield Warringah Mall is a regional shopping centre located in the Northern Beaches suburb of Brookvale. The Centre has an existing gross floor leasable area (GFLA) of approximately 133,500m^2 with some 4,652 car parking spaces (including the completed Stage 1 expansion in November 2016 – see below for details).

In 2008, the Northern Beaches Council (*formerly Warringah Council*) approved a masterplan to expand the Centre by an additional 35,000m^2 GFLA with a corresponding increase in car parking spaces.

Following the masterplan approval, a development application (DA) for Stage 1 consistent with the approved masterplan was submitted and subsequently approved by the then Warringah Council. The Stage 1 DA added a net additional 8,000m^2 of GLFA to the Centre with a corresponding increase in the car parking spaces of some 330 car parking spaces. Stage 1 of the proposed expansion was completed and opened to the public in November 2016.

A development application is being prepared for lodgement with the Northern Beaches Council seeking detailed planning approval for a proposed Stage 2 expansion of the Centre. As part of the Stage 2 expansion, it is proposed to increase the net floor area by approximately 9,847m^2 with a net additional 418 car parking spaces, amongst other internal fitout changes.

The Transport Planning Partnership (TTPP) has prepared this report on behalf of Scentre Group to assess the traffic and transport implications for the Stage 2 proposed expansion.

The remainder of the report is structured as follows:

- Chapter 2 discusses the existing conditions including a description of the subject site
- Chapter 3 provides a brief overview of the strategic transport context surrounding the subject site
- Chapter 4 provides a brief description of the proposed development
- Chapter 5 assesses the proposed on-site parking provision and internal layout
- Chapter 6 examines the traffic generation and its impacts, and
- Chapter 7 presents the conclusions of the assessment.

2 Existing Conditions

2.1 Site Location

The Centre is a regional shopping centre in Sydney's northern beaches located at 145 Pittwater Road, Brookvale. The Centre currently (including the recently completed Stage 1 development) has approximately 133,500m² GFLA, with some 4,652 car parking spaces.

Figure 2.1 shows a locality plan of the subject site and its environ.

Figure 2.1: Site Locality Map

Basemap Source: Google Maps Australia

Figure 2.2 shows an extract from the Northern Beaches Council's Warringah Development Control Plan of the Centre's boundary.

Figure 2.2: Site Boundary

Source: Northern Beaches Council, Warringah Development Control Plan (Part G4 Warringah Mall)

Land use in the vicinity of the site predominately consists of mixed commercial, light industrial, recreational, educational and residential development. Notably, the Warringah Golf Club and Northern Beaches TAFE Campus are situated to the south and an ALDI supermarket to the north of the site.

2.2 Abutting Road Network

It is a common practice to classify roads in accordance to a road hierarchy system, in order to determine their functional role within the road network. Roads are classified according to the role they fulfil and the volume of traffic they should appropriately carry.

The Roads and Maritime Services (RMS) has set down the following guiding principles for the functional classification of roads:

- **Arterial Road** - typically a main road carrying over 15,000 vehicles per day and fulfilling a role as a major inter-regional link (over 1,500 vehicles per hour).
- **Sub-arterial Road** - defined as secondary inter-regional links, typically carrying volumes between 5,000 and 20,000 vehicles per day (500 to 2,000 vehicles per hour).
- **Collector Road** - provides a link between local roads and regional roads, typically carrying between 2,000 and 10,000 vehicles per day (250 to 1,000 vehicles per hour). At

volumes greater than 5,000 vehicles per day, residential amenity begins to decline noticeably.

- **Local Road** - provides access to individual allotments, carrying low volumes, typically less than 2,000 vehicles per day (250 vehicles per hour).

Notwithstanding the above, the Centre is surrounded by a network of roads of varying road functional classifications, including Pittwater Road/Condamine Street to the east, Old Pittwater Road to the south and Cross Street/Green Street/Dale Street to the northern boundaries of the site.

A brief description of these roads is described below.

Pittwater Road

Pittwater Road is classified as a main arterial road and travels along the eastern perimeter of the Centre. The road is aligned in a north-south direction and form part of the major north-south arterial link within the Northern Beaches. It connects Mona Vale in the north to Spit Bridge in the south via Condamine Street. Clearway restrictions exist on both sides of the road to facilitate bus movements during morning and evening peak times, with kerbside parking generally permitted out of these clearway restrictions. Pittwater Road is signposted with a speed limit of 60km/hr.

Condamine Street

Condamine Street functions as an arterial road and has a north-south alignment. The road continues south from Pittwater Road and provides linkage to Spit Bridge. Condamine Street is a six-lane road, separated by a median island, with kerbside parking generally permitted on the west side of the road outside of clearway restrictions. Vehicle access to the Centre is provided off Condamine Street, at its intersection with Pittwater Road. In the vicinity of the site, Condamine Street has a 60km/hr speed limit.

Old Pittwater Road

Old Pittwater Road runs along the southern and western perimeter of the Centre. The road functions as a two-way collector road and provides good connectivity between surrounding local roads to the wider arterial network, i.e. Pittwater Road and Condamine Street. The road is configured as a four-lane road, with a posted speed limit of 50km/h. Kerbside parking is generally permitted on both sides of the road.

Cross Street

Cross Street functions as a local road with a posted speed limit of 50km/h. The street runs along the northern boundary of the site, connecting to Pittwater Road and Old Pittwater Road at the eastern and western ends, respectively. It provides direct vehicle access to the

Centre via the roundabout at Cross Street. Cross Street is located within a 50km/hr speed limit area.

Green Street

Green Street functions as a local road and is generally aligned in a north-south direction. Kerbside parking is generally provided on both sides of the road. Vehicle access to the Centre is provided off Green Street, with a number of pedestrian facilities provided to facilitate key pedestrian movements (i.e. crossing between entry/exit points of carparks to the Centre). Green Street is located within a 50km/hr speed limit area.

Dale Street

Dale Street runs parallel to Green Street and functions as a local road. Indented 90-degree parking is provided along the west side of Dale Street and accommodates approximately 20 car parking spaces. Vehicle access to the main shopping centre forefront is generally provided off the signalised intersection at Cross Street and Dale Street under one-way traffic arrangements between Cross Street to the Centre boundary. Dale Street is also located within a 50km/hr speed limit area.

2.3 Existing Car Park and Vehicle Access Arrangements

The Centre currently provides a total of some 4,652 car parking spaces across eight separate parking areas. These parking areas are colour coded as follows:

- Pink
- Green
- Orange
- Red
- Purple
- Yellow
- Blue, and
- Aqua.

See Figure 2.3 for locations of these car parking areas.

Figure 2.3: Centre Car Parking

Basemap Source: Nearmap

Vehicle access to the Centre car park is provided at eight primary locations and are detailed as follows.

Condamine Street: ingress permitting only left-in movements off the signalised intersection at William Street to the Red, Orange and Purple Car Parks

Pittwater Road: egress near Bunnings permitting only left-out movements from the Red, Orange and Purple Car Parks

Old Pittwater Road (south-east): egress only from the Yellow, Orange and Red Car Parks permitting only left-out movements into Old Pittwater Road

Old Pittwater Road (south): all traffic movements permitted with access provided via signalised intersection and connects to the southern car park (Yellow)

Old Pittwater Road (south-west): all traffic movements permitted accessing the central multi-deck and Myer car parks (Blue and Aqua)

Cross Street: all movements permitted; access provided via a roundabout at the north-west corner of the site, and provides access to the northern car parks (Green) and connects to the western perimeter road

Green Street: all traffic movements permitted via signalised intersection with Cross Street. This access provides primary access to the northern car park (Green), service areas and egress

from the bus interchange. It also provides a secondary access to the eastern car park and Target multi-deck car park (Orange), and

Dale Street: entry access only from the signalised intersection with Cross Street providing ingress access to the eastern car park, Target multi-deck car park and bus interchange.

In addition, it is noted that a number of separate service vehicle access points are provided off the southern frontage of the site along Old Pittwater Road. These accesses provide primary access to/from the Myer and Coles loading docks.

The existing access arrangements to the Centre is shown in Figure 2.4.

Figure 2.4: Existing Access Arrangements

Basemap Source: AMP Capital Shopping Centre

2.4 Public Transport

The Centre is located within close proximity to a number of high frequency bus services that stop to pick up and drop off passengers within the Centre and also externally via Pittwater Road along the eastern boundary of the site.

A bus interchange is provided within the Centre, near the eastern boundary of the site, beneath the Target car park (i.e. Orange). A second bus interchange is located on the eastern boundary of the site with formalised bus shelters, along both sides of Pittwater Road.

The location of the existing bus stops relative to the Centre is shown in Figure 2.5.

Figure 2.5: Site Proximity to Public Transport

Basemap Source: Nearmap

A total of 20 bus services operated by Sydney Buses and Forest Coaches currently service the Centre. Of those 20 bus services, six bus services provide direct service to/from the bus interchange within the Centre, typically operating at a frequency of 15-minutes during peak times and at hourly intervals during off-peak times.

These six bus services are described as follows.

Route 132: between Manly and Warringah Mall; key stops include Manly, Balgowlah Heights, North Seaforth, North Balgowlah and Warringah Mall,

Route 135: between Manly and Warringah Mall; key stops include North Head, Quarantine Station, Manly, Balgowlah, Manly Vale and Warringah Mall,

Route 139: between Manly and Warringah Mall; key stops include Manly, Queenscliff Bridge, Freshwater, South Curl Curl, Warringah Mall,

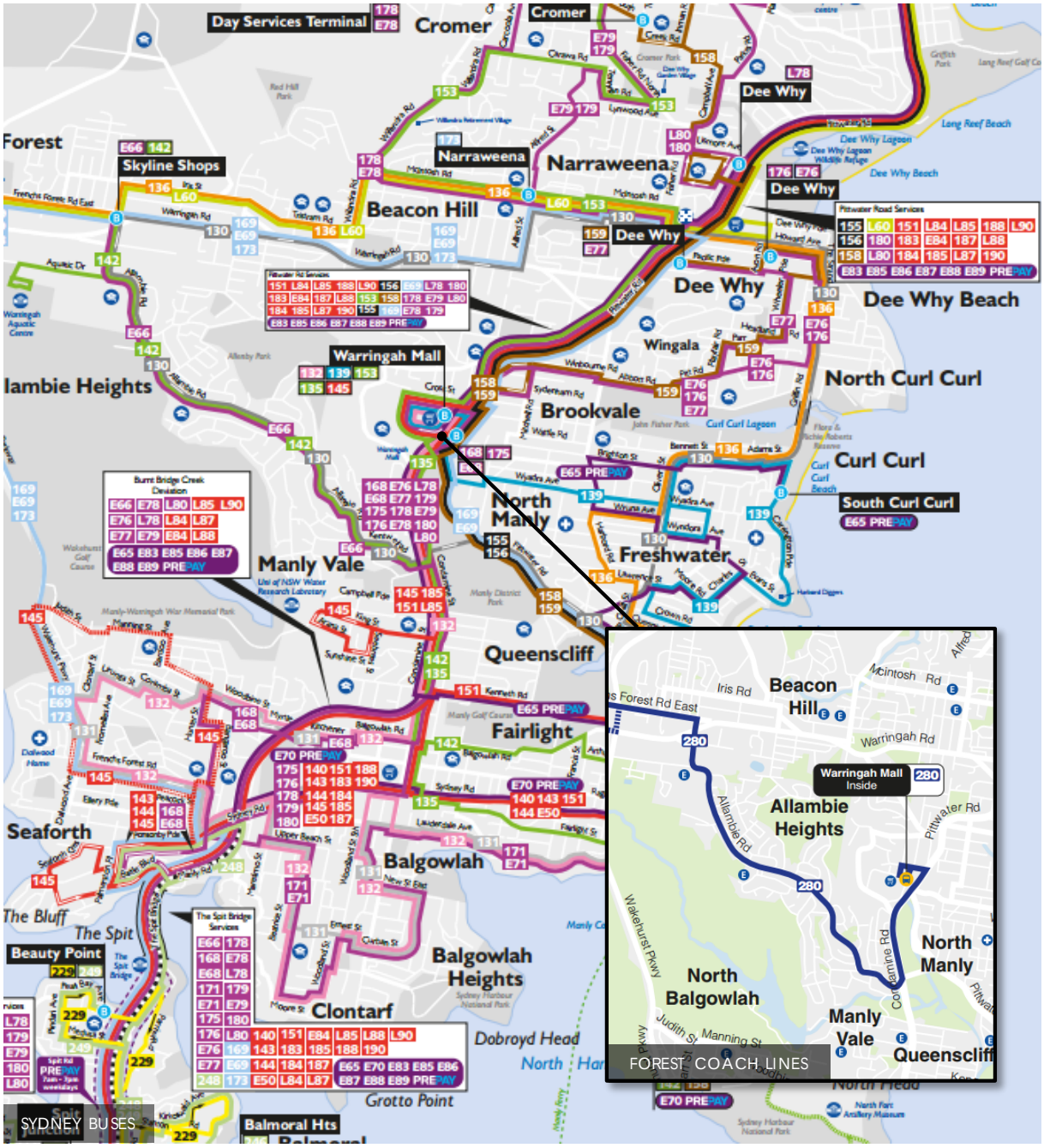
Route 145: between Warringah Mall and The Bluff; key stops include Warringah Mall, Manly Vale, Seaforth, The Bluff,

Route 153: between Wheeler Heights to City; key stops include Collaroy Plateau, Wheeler Heights, Cromer Heights, Narraweena, Dee Why, Warringah Mall, Manly Vale, Balgowlah, Spit Junction, Cremorne, Neutral Bay, City,

Route 280: between Chatswood to Warringah Mall; key stops include Chatswood, East Roseville, Forestville, Davidson, Frenchs Forest, Allambie Heights, Warringah Mall.

The existing bus network map is shown in Figure 2.6.

Figure 2.6: Existing Bus Network



Source: Sydney Buses & Forest Coach Lines

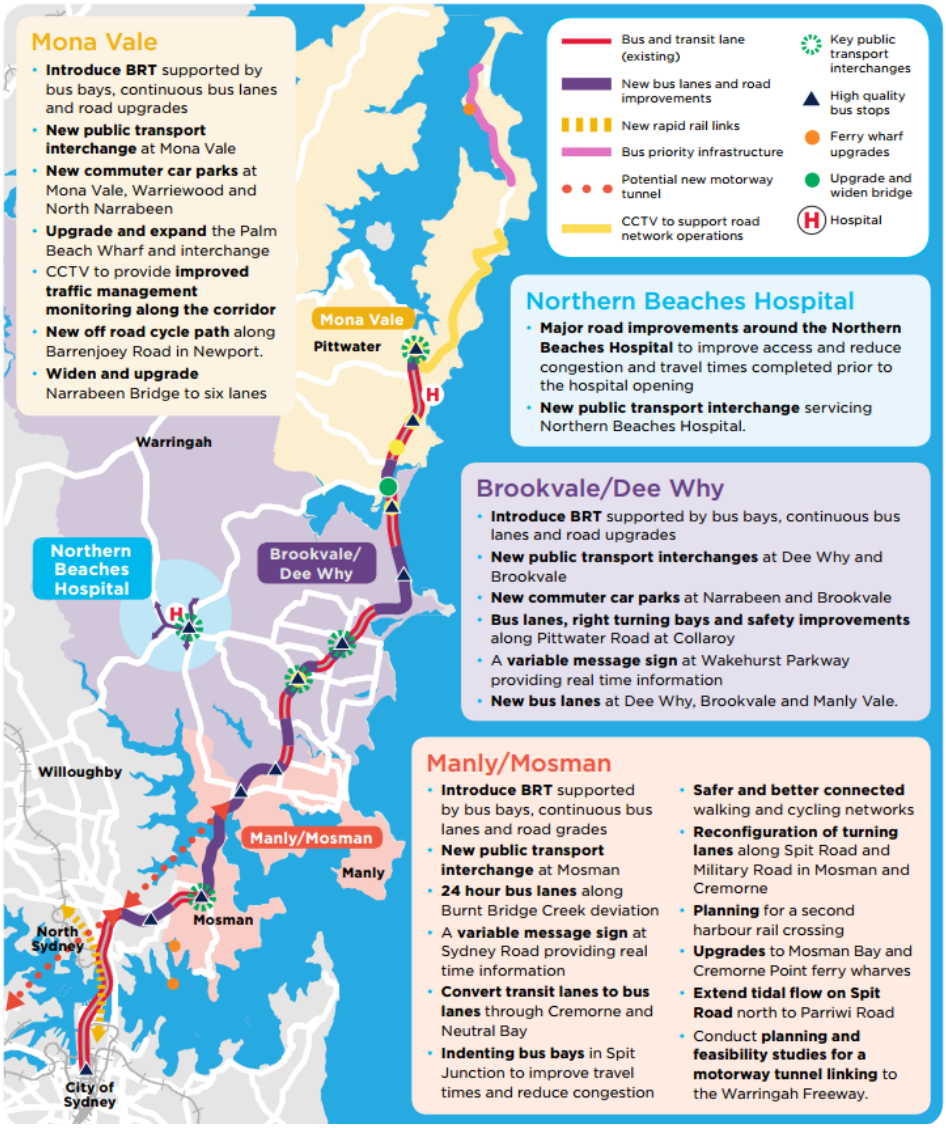
3 Future Transport Infrastructure

3.1 Project Overview

As part of the NSW Government's Transport Action Plan for the Northern Beaches, major transport improvements are set to take place to improve connectivity between the Northern Beaches and the Sydney CBD, more notably the introduction of the B-line express bus service *(formerly known as the Bus Rapid Transit)*.

A project snapshot of the projected infrastructure improvements over the next five years is shown in Figure 3.1.

Figure 3.1: Future Infrastructure Improvements



Source: NSW Government, Northern Beaches Transport Action Plan

3.2 B-Line Express Bus Service

Construction of the new 27 km bus rapid transport network (i.e. B-Line) between Mona Value and the Sydney CBD commenced in late 2016, with express B-line bus services operational since late 2017. Express B-line bus services are expected to run every five minutes during the weekday morning and evening peak periods and every 10 minutes at all other times of the day.

This B-line project will involve:

- new B-Line stops at Mona Vale, Warriewood, Narrabeen, Collaroy, Dee Why, Brookvale, Manly Value, Spit Junction (Mosman) and Neutral Bay,
- new commuter car parks at Mona Vale, Warriewood, Narrabeen, Dee Why, Brookvale and Manly Value providing some 900 car parking spaces,
- new double decker buses with improved on-board capacity and comfort,
- new bus lanes, bus bays, minor lane widening and other road improvements to support bus services, and
- improved pedestrian and cycle links to connect customers with B-Line stops.

The overarching B-Bine route and associated bus stops are illustrated in Figure 3.2.

Figure 3.2: B-Line Route

Source:

3.3 Brookvale BRT Interchange

As part of the B-Line project, it is envisaged that new B-Line bus stops would be provided on both sides of Pittwater Road adjacent to the site, near William Street. Consequently, the proposed B-Line project is expected to improve connectivity to/from the Centre primarily due to:

- increased bus frequencies and on-board capacity, and
- reduced travel time between Mona Vale and Sydney CBD.

The proposed B-Line works in Brookvale is shown in Figure 3.3.

Figure 3.3: Proposed Brookvale Program of Works (B-Line)

Source: Transport for NSW, Brookvale (September 2016 Update)

Figure 3.3 indicates that the following road works/infrastructure upgrades are proposed:

- installation of a new left-turn lane into Cross Street from Pittwater Road to separate left-turning vehicles from the bus lane on Pittwater Road,
- introduction of new B-Line bus stops and shelters along both sides of Pittwater Road, near William Street and Westfield Warringah,
- provision of some 250 commuter car parking spaces within the car park at the new Brookvale Community Heath Care Building located opposite the site, north of William Street, and
- extend the median island along Pittwater Road across Orchard Road and prohibit right turn traffic so to improve traffic flow along Pittwater Road.

The Brookvale Community Health Centre development across Pittwater Road and adjacent to William Street included a pedestrian footbridge across Pittwater Road. This would also enable the removal of the existing signalised pedestrian crossing across Pittwater Road (north of William Street) as part of the Community Health Centre development.

In addition, it is noted that NSW Health Infrastructure intends to modify the existing Pittwater Road-William Street intersection to permit vehicles to turn right out of William Street into Pittwater Road (which is currently restricted to left turn only). Consequently, it is expected that the existing signal phasing at the Pittwater Road intersection with William Street would be subject to change to facilitate the right turn traffic movement out of William Street.

4 Proposed Expansion

4.1 Approved Masterplan

The Centre has a total floor area of approximately 125,500m² GLFA with 4,345 car parking spaces before the completion of Stage 1 expansion in November 2016.

In 2008, the then Warringah Council approved a masterplan permitting the Centre to be expanded with an additional 35,000m² of GLFA with a corresponding increase in car parking provision at a rate of 4.1 car parking spaces per 100m² GLFA. The proposed expansion was proposed to develop over two stages.

In November 2016, Stage 1 expansion of the Centre consistent with the approved masterplan and Stage 1 DA approval was completed and opened to the public. Stage 1 development added an additional 8,000m² GFLA of retail use and 330 net additional car parking spaces. In addition, works were also undertaken at various car parks resulting in a large portion of car parking spaces being relocated from the Blue Car Park to the new multi-deck Green Car Park. Modifications to access arrangements to the Green Car Park was also undertaken. This modification works resulted in an ingress from the Cross Street roundabout being provided to the Green Car Park.

Following the completion of Stage 1 development, the new Centre now has a total floor area of approximately 133,500m² and 4,652 car parking spaces.

4.2 Proposal Description

As noted previously, the approved masterplan permits the expansion of the Centre by an additional 35,000m² GFLA.

The Stage 2 expansion (of which this report relates to) proposes to expand the Centre by an additional 9,847m² GFLA. For traffic analytical purposes, a net additional floor area of 9,900m² GLFA has been adopted. On this basis, a proposed Stage 2 expansion with 9,900m² GFLA will result in an overall Centre expansion of an additional 17,900m² (i.e. total of Stages 1 and 2), which is still within the approved masterplan. The remaining approved masterplan permissible floor area (17,100m²) will be subject to a future application.

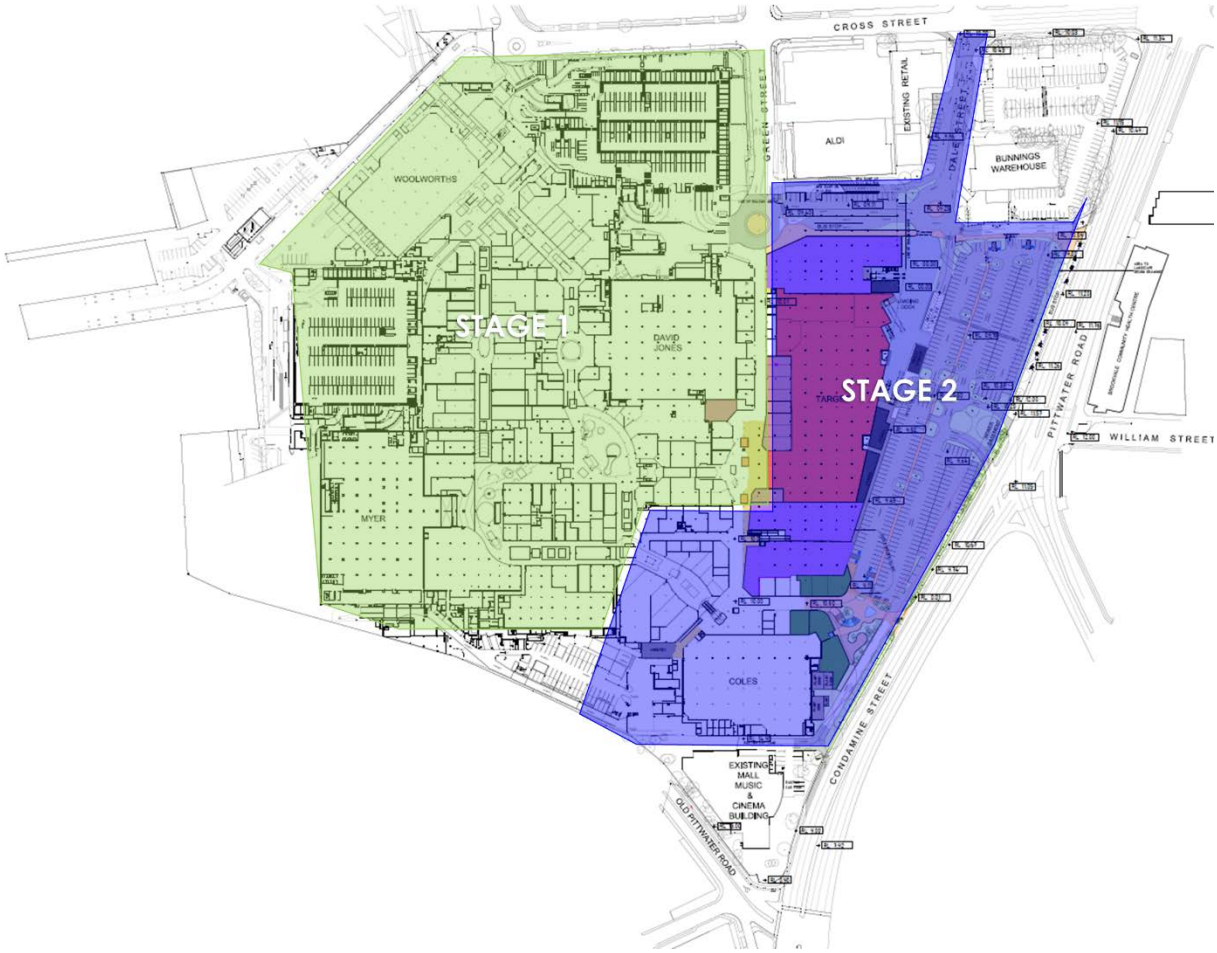
A breakdown of the new floor areas at the Centre is as follows:

- Stage 1: + 8,000m² GLA
- Stage 2: + 9,900m² GLA
- Total: + 17,900m² GLA

It is noted that the approved masterplan was for an additional 35,000m² of GLFA.

The location and extent of the Stage 1 and 2 Centre expansions are illustrated in Figure 4.1 overleaf.

Figure 4.1: Proposed Stage 1 and 2 Centre Expansions



Basemap Source: Scentre Group

Stage 2 proposed expansion includes a net additional of 418 car parking spaces.

Thus, following the completion of the proposed expansion works (including Stage 1), the Centre would have a total gross floor leasable area of 143,400m^2 and 5,070 car parking spaces.

4.3 Proposed Access Arrangements

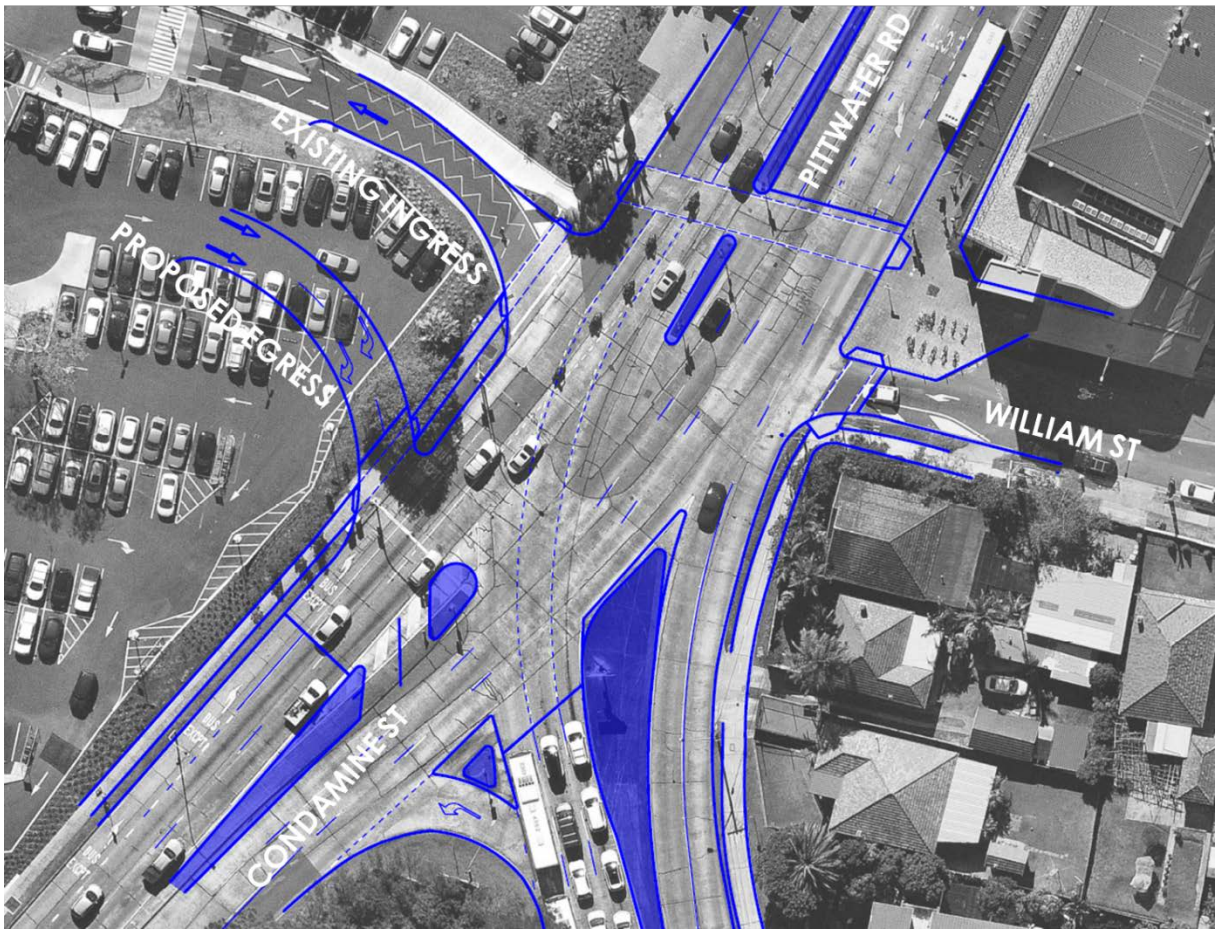
Existing access arrangements to the Centre are as described in Section 2.3. This includes a separate ingress off Condamine Street and egress off Pittwater Road. The Centre can also be accessed off Dale Street (which is a private road) from Cross Street which is a one-way road permitting traffic movement in the southbound direction i.e. access into the Centre only.

As part of Stage 2 development application, it is proposed to modify the existing ingress at the Condamine Street signalised intersection with Pittwater Road and William Street to permit egress movement as well. This would permit retail customers from the Centre's southern retail catchment area to exit the Centre directly to head south along Condamine Street. At present retail customers from the Centre's southern retail catchment area would have to circuitously navigate to the Green Street exit to gain access to Cross Street before they could get on to Pittwater Road and then Condamine Street in order to head south. The proposed direct exit to Condamine Street would provide traffic benefits in that it would reduce the portion of circulating traffic off the local road network and reducing the traffic demand at the critical Pittwater Road intersection with Cross Street.

It is proposed that this new access permits exiting vehicles to turn right into Condamine Street (towards Mosman). The existing ingress would continue to permit traffic to enter the Centre from Pittwater Road (south east) only. Traffic from Condamine Street (south) would not be permitted to turn left at this access. Instead they would do so at the new Condamine Street ingress which an in-principle approval by RMS has been obtained– see below for further discussion.

At present, the signalised intersection at Condamine Street with Pittwater Road and William Street operate with three traffic signal phases. Phase C permits Pittwater Road northbound traffic movement which travels slight on curved alignment through the intersection. It is proposed that the proposed right turn access would be configured such that it would located just to the south-west of Pittwater Road so that the proposed right turn movement from the Centre could operate in the same phase as the Pittwater Road northbound traffic movement in Phase C. This is so that additional green time is not required to be provided to facilitate the proposed right turn. This is illustrated in Figure 4.2.

Figure 4.2: Proposed Reconfiguration of the Condamine Street Signalised Intersection



Additionally, the imminent changes to the Condamine Street signalised intersection as part of the NSW Health Infrastructure's proposed Brookvale Community Health Centre (see Section 3.3) would also afford additional traffic capacity at this intersection. These changes include:

- modify the existing traffic arrangements on William Street to permit right turn movements out of the street, which is currently restricted to left turn out only
- a new pedestrian footbridge (to replace the at-grade pedestrian crossing across Pittwater Road as per below), and
- the removal of the at-grade pedestrian crossing on the northern approach to Condamine Street intersection with William Street.

The proposed access change to the Centre at this intersection (if approved) together with the changes proposed as part of the Brookvale Community Health Centre would be fully integrated into the existing signalised intersection to RMS requirements.

Separately, it is noted that RMS has provided approval in principle for a new ingress to be provided off Condamine Street near the southern portion of the Centre.

This proposed ingress to the Centre would also provide additional traffic benefits in that the proposed ingress would permit traffic destined for the Centre from the south to leave the external road network quicker thereby reducing the traffic demand circulating on the external road network and improving the efficiency of the road network.

Appendix A contains the written correspondence from RMS confirming the approval in principle together with the Condamine Street slip lane diagram that was reviewed and considered by RMS in granting their approval.

The new Condamine Street ingress would be designed to RMS requirements.

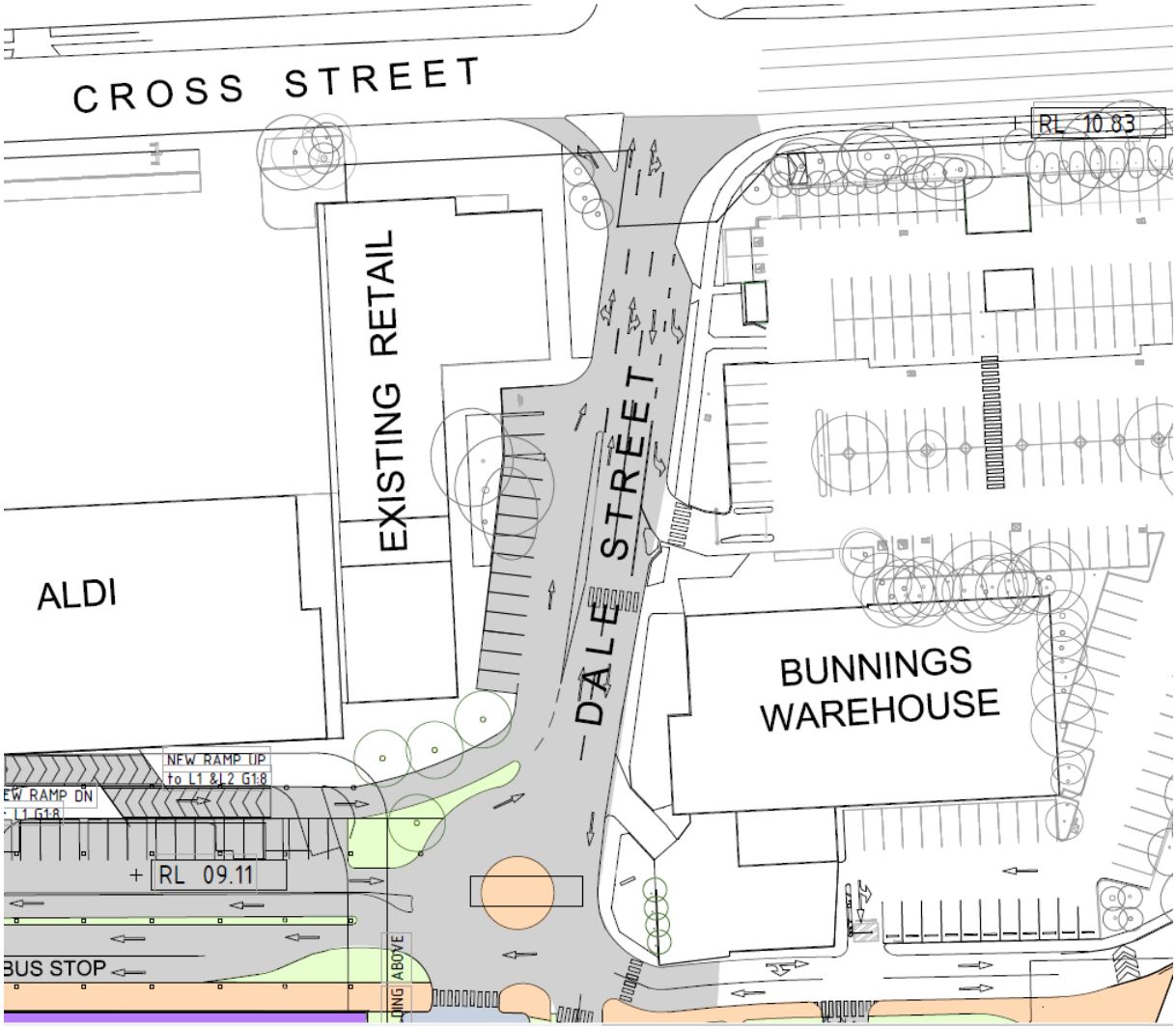
In addition, it is also proposed to convert Dale Street from its current one-way traffic flow arrangement to two-way configuration i.e. permitting ingress traffic movement as well as egress traffic movement. Dale Street is currently configured as a two-lane private road from Cross Street to an existing car park access. It is proposed to widen Dale Street to provide a generally three-lane cross section with two approach lanes (into Cross Street) and one departure lane (from Cross Street. It is also proposed to configure the kerbside approach lane to provide a left turn slip lane.

In addition, under current road arrangements the eastern (Cross Street) approach at this intersection is configured with the kerbside lane as an exclusive left turn lane and the second lane as a shared straight through and left turn lane. It is proposed to re-line mark the second lane as an straight through lane only.

It is also proposed to permit all turning movements at its intersection with Cross Street which would continue to be signalised.

The proposed configuration of Dale Street is shown in Figure 4.3.

Figure 4.3: Proposed Reconfiguration of the Dale St



Private land that forms part of the road reserve located within 30m of signalised intersection would be required to be dedicated to the relevant road authority. As such, the proposed widening of Dale Street will require the dedication of private land within the Centre's site boundary as part of the proposal to convert Dale Street to permit two-way traffic flows (assuming the existing section of Dale Street has also already been dedicated).

Notwithstanding this, the overarching proposed access strategy for the Centre following the completion of Stage 2 development is summarised as follows:

- access to the proposed new two-way access off Condamine Street/Pittwater Road to be provided via the signalised access arrangements facilitated by:
  - the Health Infrastructure access off William Street permitting right-turn movements out, which would include some modifications to the existing phasing of the signalised Condamine Street-Pittwater Road-William Street intersection,

- installation of the new pedestrian footbridge across Pittwater Road, which removes the need for the at-grade pedestrian crossing,

- installation of a new entry-only vehicle access off Condamine Street via a left turn slip lane which has been approved in-principle by RMS, and
- converting Dale Street access to permit two-way traffic flows with the retained signalised intersection with Cross Street permitting all traffic movements.

In addition, it is noted that a new left-turn slip lane is proposed to be provided on Pittwater Road into Cross Street by Transport for NSW to separate left turning vehicles from the B-line route.

Finally, it is noted that the B-Line Project is expected to encourage an increase in bus patronage along this road corridor because of the increased reliability and frequency of bus services. This would result in less traffic demand on the adjacent roads. However, as a conservative approach this reduction in traffic demand has not been accounted in the traffic assessment of the Stage 2 proposed expansion.

5 Parking Assessment

5.1 Car Parking

5.1.1 Car Parking Requirement

The car parking requirements for the Centre are set out in the Northern Beaches Council's (Council) Development Control Plan (DCP), Part G4 Warringah Mall.

Council's DCP sets out the following parking control relevant to the Centre:

- *Car parking is to be provided at a rate of 4.1 spaces per 100m² GFLA*

On this basis, the proposed Stage 2 expansion with 9,847m² GFLA would require an additional 404 car parking spaces to be provided.

5.2 Car Parking Adequacy

As noted early, the proposed Stage 2 expansion of the Centre includes the provision of a net additional 418 car parking spaces.

The proposed parking provision would exceed the DCP required parking provision by 14 car parking spaces. This exceedance of 14 car parking spaces in the context that the existing Centre has some 4,652 is not expected to create any noticeable adverse impacts. Therefore, the proposed parking provision for Stage 2 is satisfactory.

5.2.1 Car Parking Layout

The proposed modifications/additions to the car park and associated elements are proposed to comply with design requirements set out in the Australian Standard, namely AS2890.1:2004 and AS2890.6:2009.

Specifically, AS2890.1:2004 requires retail car parking spaces to have dimensions of 2.6m wide by 5.4m long with an aisle width of 6.6m wide or dimensions of 2.7m wide by 5.4m long with an aisle width of 6.2m.

Similarly, AS2890.6:2009 which relates to the design of accessible car spaces, requires car parking space with an adjacent shared area to each have dimensions of 2.4m wide by 5.4m long with an aisle width of 5.8m wide.

It is however, envisaged that a condition of consent would be imposed requiring compliance with the Australian Standard and as such, any minor amendments can be dealt with prior to the issue of a Construction Certificate.

The architectural car park plans are provided in Appendix B of this report.

5.3 Bicycle Parking

In accordance with Council's DCP:

- Bicycle parking and storage facilities shall be provided for any additional floor area proposed to allow parking or storage of a minimum number of bicycles, in accordance with the followings:
  - Bicycle storage facility for staff – 1 per 300m^2,
  - Bicycle parking facility for retail customers – 1 per 500m^2.

This required provision may be reduced having regard to:

- the expected number of employees, and their likely or desired use of bicycles for travel to and from work, and
- the expected number of visitors, and their likely or desired use of bicycles to visit the development.

Thus, based on the proposed Centre expansion of 9,847m^2 GFLA, an additional 33 bicycle storage (for staff) and 20 (for retail customers) bicycle parking facilities are required in accordance with Council's DCP bicycle requirement.

It is proposed to comply with these bicycle storage and parking requirements. These bicycle parking facilities are proposed to be designed in accordance with the relevant Australian Standards, namely AS2890.3:2015.

5.4 Loading Dock Facilities

It is noted that the DCP does not have any specific requirements for service vehicle loading facilities.

However, it is proposed to provide three service vehicle loading bays to accommodate vehicles up to an Australian Standard 19m semi-trailers plus three compactors.

Based on current operation, the Centre Management considers the proposed provision to be acceptable.

These loading bays are proposed to design in accordance with requirements set out in AS2890.2:2002.

Swept path analysis has been conducted for various Australian Standard design vehicles using the respective loading bays. The analysis found that swept paths to and from the

respective loading bays are satisfactory with dock manager managing the arrivals of the loading dock facility.

The swept path diagrams are provided in Appendix C.

5.5 Queue Length Assessment

An assessment of the entry queue lengths and queuing provisions was undertaken to understand whether there is suitable queuing capacity at the proposed control gate locations and ensuring queuing would not extend onto the external road system.

It is possible that the proposed car parking areas could be controlled by ways of boom gates with automatic ticket issue machines. However, it is also noted that the development of the project is still ongoing. In addition, technological advance in the area of car park control system and equipment in recent years resulted in more and more car parks being managed using number plate recognition and ticketless technology.

However, as a worst case scenario, assessment has been conducted to ascertain the potential to generate vehicle queues associated with the arrival rate of vehicles and the service rate of the system for a manual system where boom gates have been used.

Australian Standard, AS2890.1:2004 Parking Facilities Part 1: Off-street car parking (Appendix D) states that a single control gate at an access for an automatic ticket issue and boom gate would have a capacity of around 300 vph per lane. This has been adopted as the service rate.

The potential queue lengths arising from a car park control system have been determined using traffic queueing theory based on probability principles for a multi-channel queuing system as described in the Transportation and Traffic Engineering Handbook (ITE), together with the above Australian Standard service rate.

The assessment was undertaken assuming a 6m length for each vehicle within the queuing lane (AS2809.1). The queuing storage area did not include ramped sections of the queuing lane as a conservative approach.

This way the 50th (average) and 95th percentile queues have been calculated. The results and the available queue storage area are presented in Table 5.2.

Table 5.1: Estimated Queues at Entry Boom Gates

Entry Locations	Peak Hour Flows (vph)*	No. of Boom Gates	Combined Gate Capacity (vph)	Average Queue (Veh)	95th Percentile Queue (Veh)	Available Queue Space (Veh)
Condamine St Slip Lane	110	2	600	1	3	16
Condamine St/ William St Access	121	2	600	1	3	12
Dale St Access	706	4	1,200	3	8	22
Green St Access	326	2	600	2	6	10
Cross St Access	496	3	900	3	6	12

**denotes the maximum of the Thursday and Saturday peak hour flows.*

From the analysis, there would be sufficient queue storage space within the car park to accommodate the 50th and 95th percentile queues.

Notwithstanding the above, a ticketless parking control system may be installed at the Centre which would reduce vehicle queues to minimal.

6 Traffic Assessment

6.1 Traffic Data Collection

In August/September 2013, intersection turning movement counts were undertaken at the following 13 key intersections:

- Beacon Hill Road-Old Pittwater Road
- Pittwater Road-Winbourne Road
- Pittwater Road-Sydenham Road
- Cross Street-Dale Street
- Cross Street-Green Street
- Cross Street-Mall Access
- Old Pittwater Road-Dale Street
- Old Pittwater Road-Green Street
- Myers Car Park Access-Old Pittwater Road
- Signalised Mall Access-Old Pittwater Road
- Hoyts Exit-Old Pittwater Road
- Condamine Street-Old Pittwater Road
- Condamine Street-Pittwater Road
- Old Pittwater Road-Cross Street, and
- Pittwater Road-Cross Street.

The counts were conducted during the Thursday evening period from 4:00pm to 6:00pm, and Saturday late morning/early afternoon peak period from 11:00am to 1:00pm.

6.2 Traffic Data Collection – 2017 Updated Surveys

The 2013 counts were conducted pre opening of the Stage 1 development which was opened in November 2016. As Stage 1 included a new multi-deck car park adjacent to Cross Street, updated traffic counts for intersections along Cross Street and Pittwater Road/Condamine Street were repeated in November 2017.

Fresh intersection counts and queue length surveys were carried on Thursday, 23 November 2017 from 4:00pm to 6:00pm and on Saturday, 25 November 2017 from 11:00am to 1:00pm at the following nearby intersections:

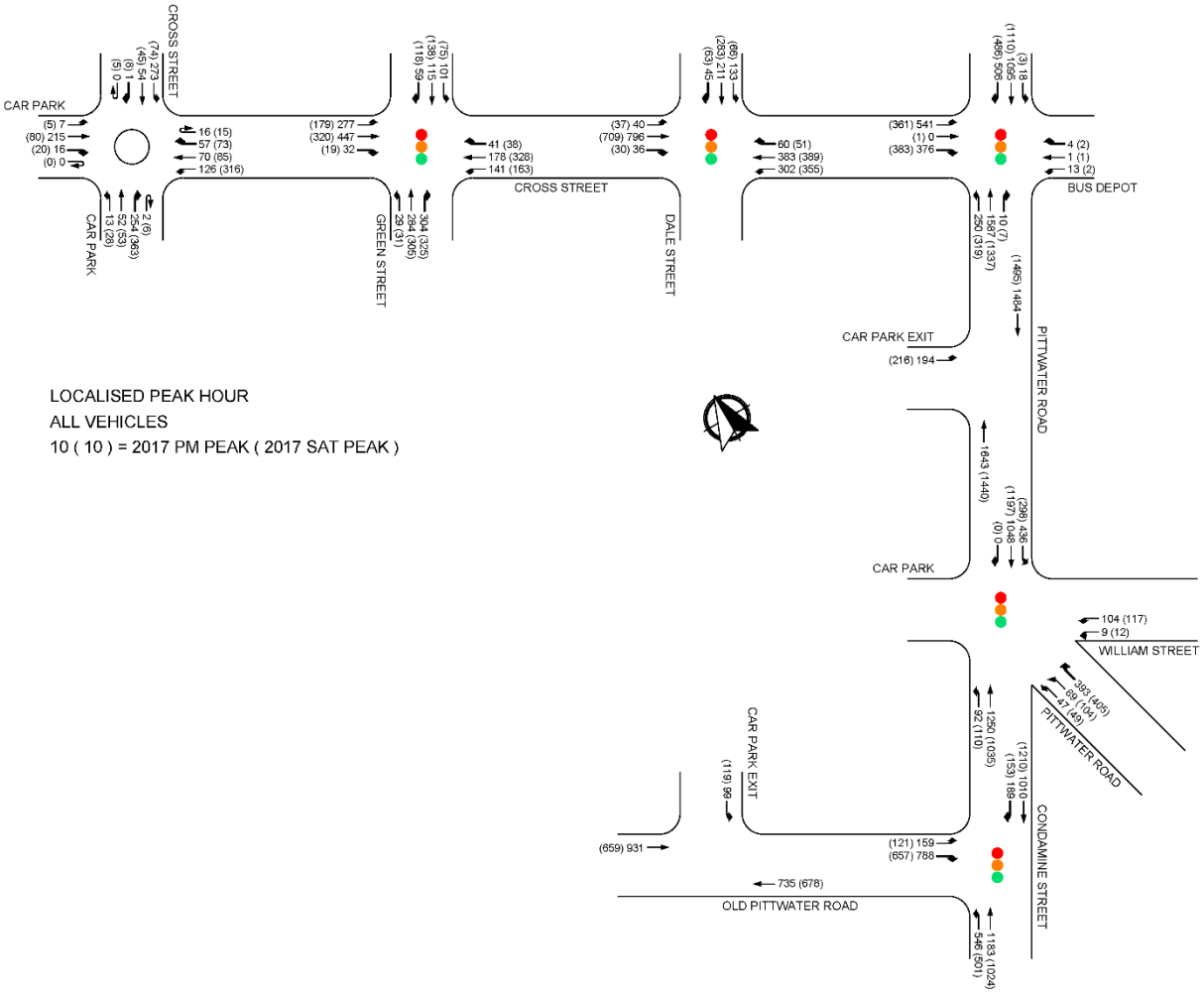
- Cross Street-Green Street (signalised intersection)

- Cross Street-Dale Street (signalised intersection)
- Cross Street-Pittwater Road (signalised intersection)
- Pittwater Road-Centre Access (unsignalised intersection)
- Pittwater Road-William Street-Condamine Street-Centre Access (signalised intersection)
- Condamine Street-Old Pittwater Road (signalised intersection), and
- Old Pittwater Road-Centre Access (unsignalised intersection).

In addition, traffic signal timing data at the above signalised intersections were also obtained from RMS for the same time period. These traffic count data have been used as a baseline for our modelling of the Stage 2 proposed expansion.

The existing peak hour traffic volumes are shown in Figure 6.1.

Figure 6.1: Existing Peak Hour Intersection Turning Movement Counts



6.3 Traffic Generation

Based on the traffic generation surveys (as discussed above), the existing Centre traffic generation during the Thursday and Saturday peak periods are presented in Table 6.1, with their associated trip generation rates.

Table 6.1 also includes the traffic generation rates from RMS *Guide to Traffic Generation Developments* and its recent update in Technical Direction TDT 2013/04a for a generic shopping centre with a floor area greater than 70,000m².

Table 6.1: Existing and Future Centre Traffic Generation Rates

Scenarios	Floor Area (GLFA)	Traffic Generation (veh/hr)	Trip Rate (veh/hr/100m² GFLA)
Based 2013 Surveys			
- Thursday Peak Period	*125,500m²*	4,147	3.3
- Saturday Peak Hour	*125,500m²*	4,896	3.9
Based 2017 Surveys§			
- Thursday Peak Period	*133,500m²*	*4,173*	3.1
- Saturday Peak Hour	*133,500m²*	*4,885*	3.7
RMS Traffic Generation Rates†			
- Thursday Peak Period	*> 70,000m²*	-	3.1
- Saturday Peak Hour	*> 70,000m²*	-	3.6
Future Estimates			
- Thursday Peak Period	*143,400m²*	4,364	3.1
- Saturday Peak Hour	*143,400m²*	5,242	3.7

Notes:
§ – supplemented with 2013 survey data
† – for a theoretical shopping centre with gross leasable floor area greater than 70,000m²

From Table 6.1, traffic generation surveys of the existing Centre indicate that the Centre generates traffic at rates 3.3 (2013 surveys)/3.1 (2017 surveys) and 3.9 (2013 surveys)/3.7 (2017 surveys)vehicle trips per peak hour per 100m² for Thursday and Saturday peak periods respectively. While RMS suggests, for a generic centre with more than 70,000m², traffic generation rates of 3.1 and 3.6 vehicle trips per peak hour per 100m² for Thursday and Saturday peak periods respectively. As such, the surveyed rates are generally consistent with RMS rates.

On this basis, future traffic generation rate of 3.1 and 3.7 vehicle trips per peak hour per 100m² have been adopted for the Thursday and Saturday peak periods respectively. Table 6.2 provides estimates of the future development traffic.

Table 6.2: Estimated Traffic Generation (2017 and 2027 Scenarios)

Scenarios	Estimated Development Traffic	
	Thursday Evening Period	Saturday Peak Period
Pre Stage 2 Development (2017)	4,173 vph	4,885 vph
Post Stage 2 Development	4,489 vph	5,429 vph
Net Additional	316 vph	544 vph

Following the completion of Stage 2 development, the Centre is expected to generate 4,489 vph and 5,429 vph during the Thursday evening peak period and Saturday peak period respectively.

6.4 Modelling Scenarios

The traffic effects of the proposed development have been assessed using SIDRA network modelling software. It is noted that RMS has been consulted in relation to the use of SIDRA network modelling and has indicated acceptance for the use of SIDRA network modelling for this project. In fact, RMS has requested that SIDRA network modelling be conducted at the following intersections:

- Pittwater Road-Condamine Street-William Street
- Pittwater Road-Cross Street
- Cross Street-Dale Street
- Cross Street-Green Street, and
- Pittwater Road-Old Pittwater Road.

RMS has requested for the following four traffic scenarios to be modelled:

- **Scenario S1** – 2017 existing base case (no development, no access change) using traffic flows shown in Figure 6.1
- **Scenario S2** – Scenario S1 plus Stage 2 development traffic using traffic flows shown in Figure 6.2 with the following access changes:
  - provision of left turn slip lane ingress for northbound Condamine Street traffic
  - provision of a right-turn egress movement at the Pittwater Road-Condamine Street-William Street-Centre access intersection
  - provision of two-way operations at the southern approach on Dale Street to the Cross Street-Dale Street intersection
- **Scenario S3** – Scenario S1 plus 2027 base case with background traffic growth (using STM data) plus the NSW Proposed Community Health access arrangements at the corner of Pittwater Road-William Street (including the new right-turn movement from William Street and removal of the Pittwater Road pedestrian crossing on north approach) and the

additional left-turn lane on south approach on Pittwater Road into Cross Street as part of the B-Line Project using future traffic flows shown in Figure 6.3, and

- **Scenario S4** – Scenario S3 plus Stage 2 development with the same access changes noted in Scenario S2 using future traffic flows shown in Figure 6.4.

It is noted that all future case relates to a future design year of 2027 i.e. 2017 background traffic plus 10 year traffic growth as requested by RMS. The 2017 traffic data has been grown to 2027 based on growth factors provided by RMS obtained from the Sydney's Strategic Travel Model (STM) operated by the Bureau of Transport Statistics (BTS).

Figure 6.2: Future 2017 Peak Hour Intersection Turning Movement Counts

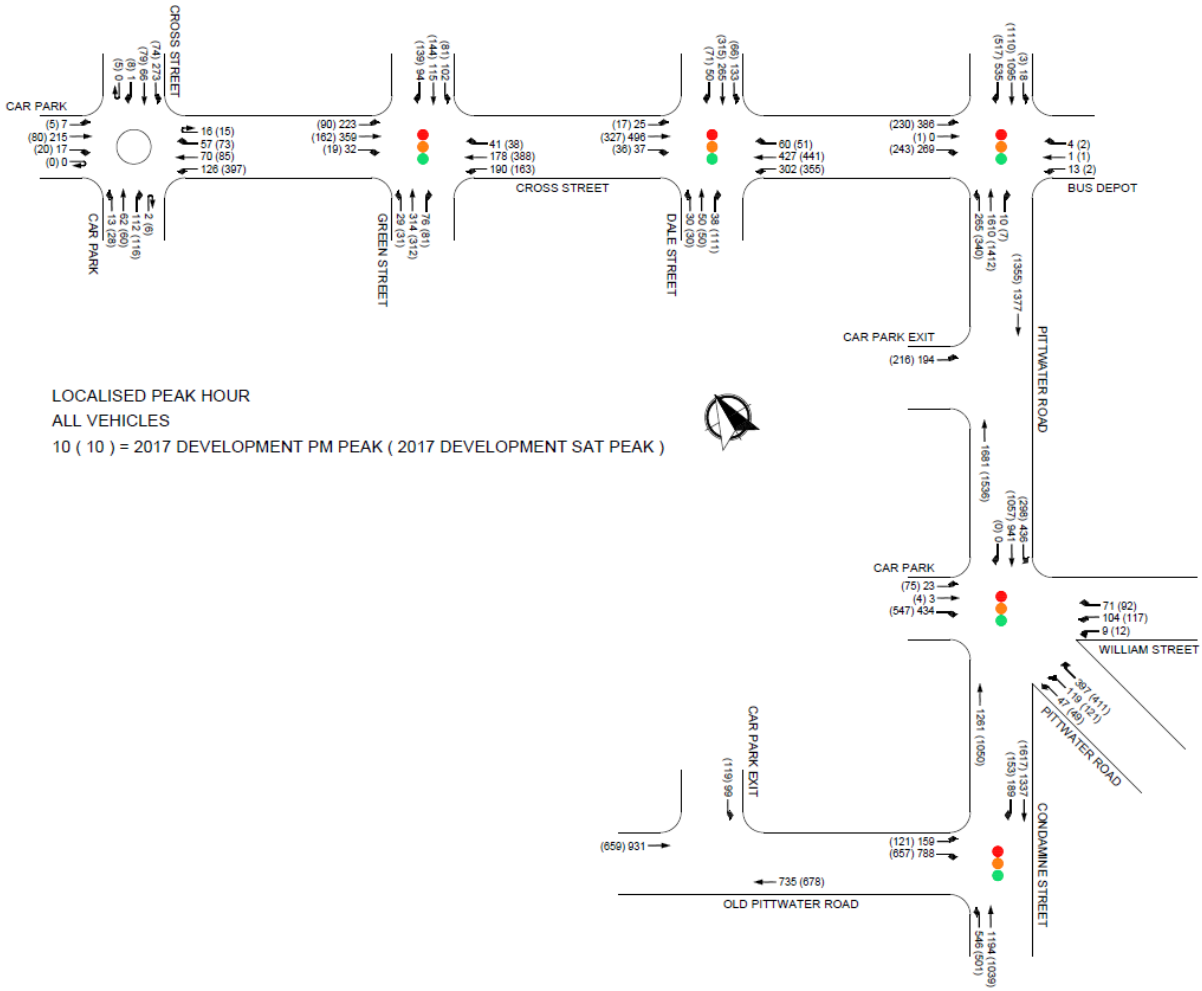


Figure 6.3: Future 2027 Base Case Hour Intersection Turning Movement Counts

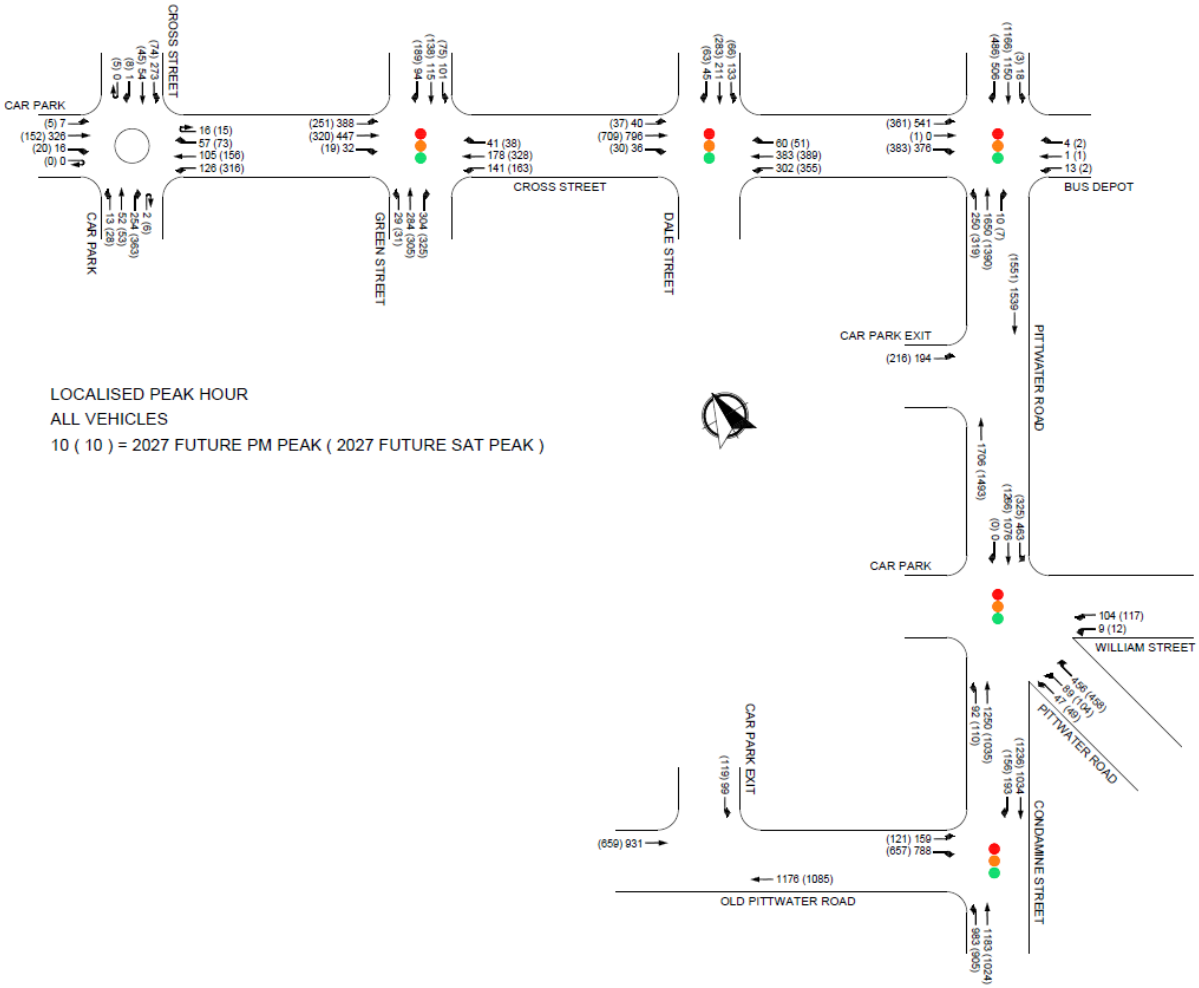
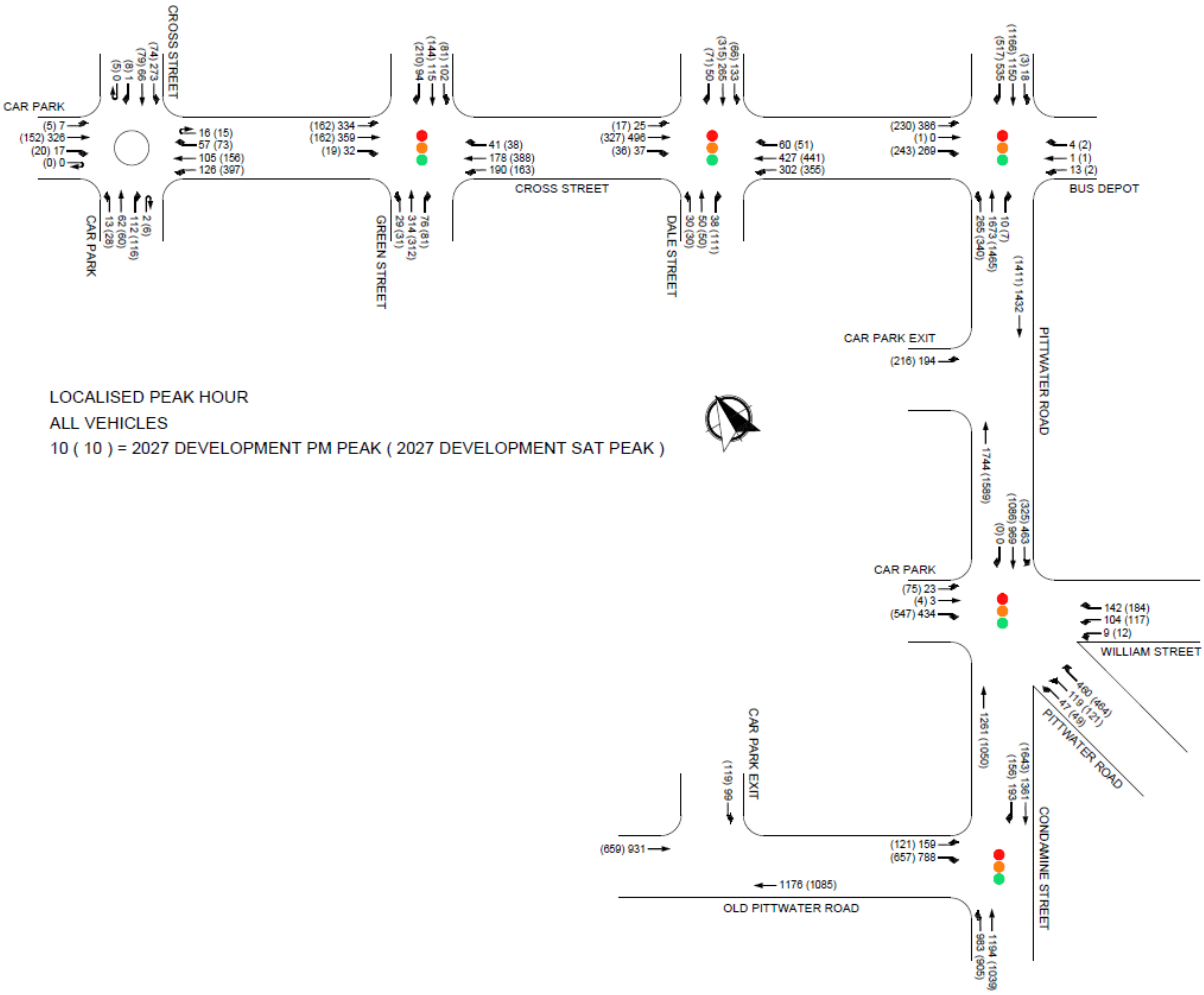


Figure 6.4: Future 2027 Development Peak Hour Intersection Turning Movement Counts



6.5 Intersection Assessment Criteria

RMS uses level of service as a performance measure to indicate the operating efficiency of a given intersection. The level of service ranges from A to F. Levels of service between A and D indicate the intersection is operating within capacity with LoS A providing exceptionally good performance to LoS D indicating satisfactory performance. LoS E and F indicate the intersection is operating at or near capacity and generally would require intersection improvement works to maintain reasonable performance.

The level of service is directly related to the average delay experienced by vehicles travelling through the intersection. At signalised intersections, the average delay is the volume weighted average of all movements. For roundabouts and priority (give way and stop sign) controlled intersections, the average delay relates to the worst movement.

Table 6.4 presents the level of service criteria and its relation with traffic delays.

Table 6.3: Level of Service Criteria

Level of Service (LoS)	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

Source: RMS' Guide to Traffic Generating Development, 2002

6.6 Modelling Results

Following the above, the modelling results from SIDRA are presented in Table 6.5 and Table 6.6 for the Thursday evening and Saturday peak periods respectively.

The level of service results (worse of either peak period) are also presented in Figure 6.3 to Figure 6.7 for Scenarios S1 to S4 respectively.

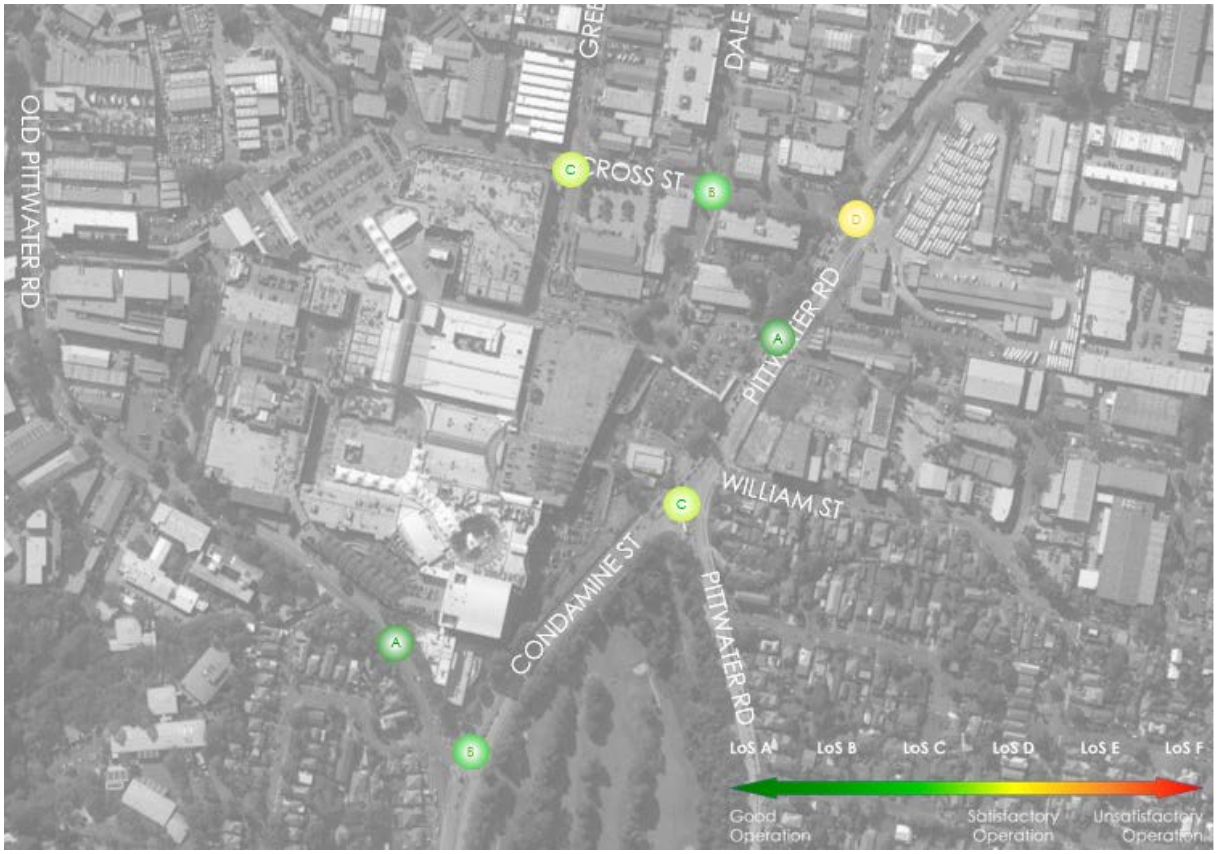
Table 6.4: Modelling Results for Thursday Evening Peak Period

Intersection	Scenario S1		Scenario S2		Scenario S3		Scenario S4	
	Delay	LoS	Delay	LoS	Delay	LoS	Delay	LoS
Green St-Cross St	26	B	23	B	46	D	26	B
Dale St-Cross St	14	A	19	B	13	A	19	B
Pittwater Rd-Cross St	45	D	42	C	44	D	42	C
Pittwater Rd-Shopping Centre Access	1	A	1	A	1	A	1	A
Pittwater Rd-William St	33	C	39	C	38	C	39	C
Condamine St-Old Pittwater Rd	27	B	39	C	25	B	40	C
Old Pittwater Rd-Shopping Centre Access	3	A	3	A	3	A	3	A

Table 6.5: Modelling Results for Saturday Peak Period

Intersection	Scenario S1		Scenario S2		Scenario S3		Scenario S4	
	Delay	LoS	Delay	LoS	Delay	LoS	Delay	LoS
Green St-Cross St	29	C	22	B	32	C	22	B
Dale St-Cross St	16	B	25	B	15	B	19	B
Pittwater Rd-Cross St	40	C	35	C	38	C	34	C
Pittwater Rd-Shopping Centre Access	1	A	1	A	1	A	1	A
Pittwater Rd-William St	30	C	33	C	30	C	35	C
Condamine St-Old Pittwater Rd	24	B	27	B	22	B	25	B
Old Pittwater Rd-Shopping Centre Access	2	A	2	A	2	A	2	A

Figure 6.5: S1 Modelling Results



The modelling results for 2017 existing traffic conditions indicate that the intersections assessed currently operate at LoS D or better during peak periods. Notably, the existing Pittwater Road-Cross Street intersection operates at LoS D and C in the Thursday evening and Saturday afternoon peak respectively.

Figure 6.6: S2 Modelling Results

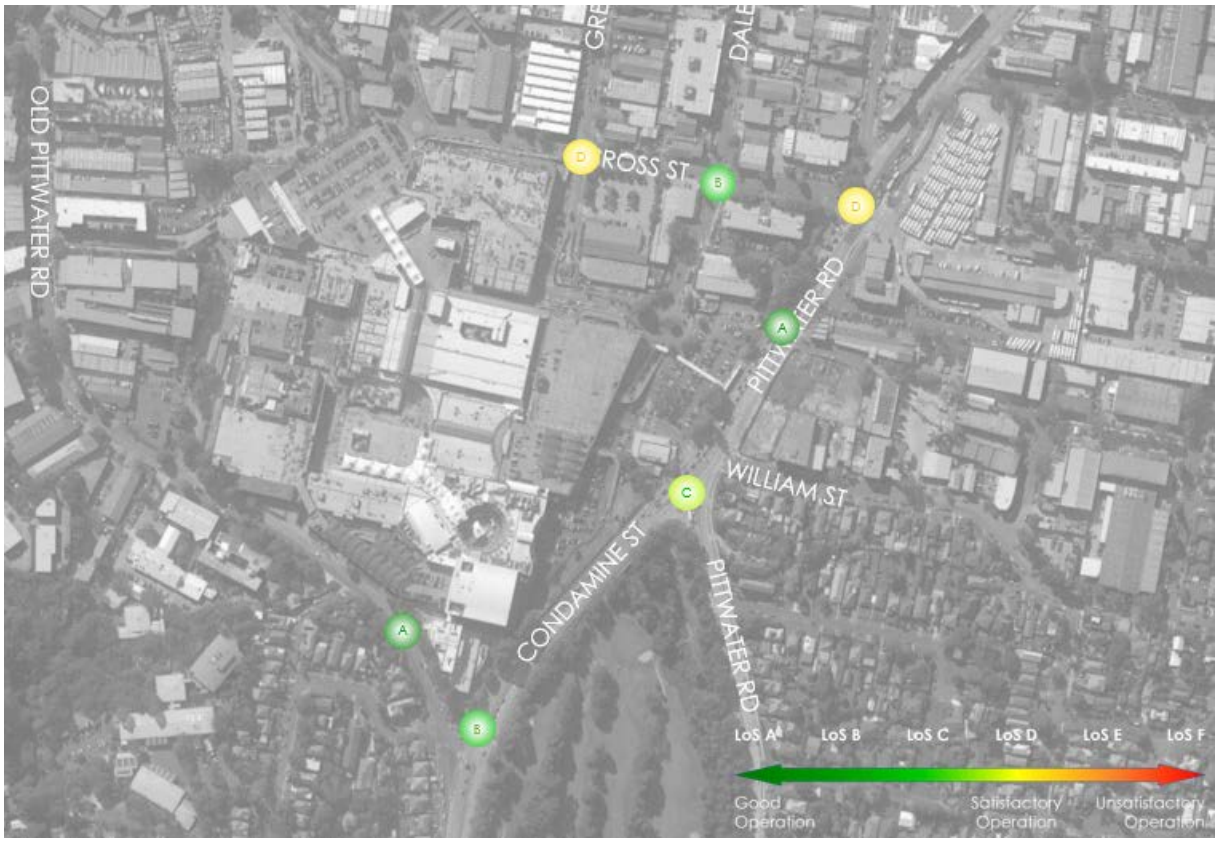
In Scenario S2 where the Stage 2 development traffic has been superimposed on to 2017 existing traffic volumes. This scenario includes the addition of an ingress access of Condamine Street as well as converting Dale Street into a two-way road and the introduction of the right-turn egress movement onto Condamine Street at the Condamine Street-William Street-Pittwater Road-Centre access signalised intersection.

Under these conditions, the intersections would operate satisfactory at LoS C or better.

As noted previously, the proposed changes to the access arrangements within the Centre (i.e. the introduction of the right-turn egress movement at the Condamine Street-William Street-Pittwater Road intersection) would provide some traffic benefit by reducing the demand at the critical Pittwater Road-Cross Street intersection. As such, it should be noted that the Pittwater Road-Cross Street intersection is expected to operate at LoS C with the proposed access changes in place, which is an improvement from the existing base case of LoS D.

As such, under this scenario, the proposed development is not expected to result in any adverse detriment onto the surrounding road network.

Figure 6.7: S3 Modelling Results



In Scenario S3 where the existing 2017 background traffic has been grown to 2027 using STM projected traffic flows in the vicinity of the subject site. Scenario S3 does not include any development traffic from the subject proposed Stage 2 expansion.

Based on this assessment, growth in the background traffic to 2027 traffic conditions would tip the Cross Street-Green Street intersection to operate at LoS D. Intersections along the arterial roads would continue to operate at LoS D or better during peak periods. Although the intersections continue to operate satisfactorily in the future base case, it is noted that the worsening performance of the intersections as noted above are purely due to growth of the background traffic, and are not related to additional development (as this scenario does not include any future additional development traffic arising from the Centre).

Figure 6.8: S4 Modelling Results

Scenario S4 assesses the traffic effects of the Stage 2 development traffic (including background traffic growth consistent with Scenario S3) together with the proposed access changes at the Condamine Street intersection with William Street on the local road network. The Condamine Street access intersection at William Street has been modified to permit retail customers to exit onto Condamine Street in the southbound direction.

As per the analysis results for Scenario S2, the results for Scenario S4 indicates that the proposed access changes would provide benefits to the overall road network performance in that the critical Cross Street intersection with Pittwater Road would operate with better performance in the future. It is further noted that the Condamine Street intersection with Pittwater Road where the new right access from the Centre into Condamine Street is proposed would also operate satisfactorily in the future.

In addition, it is noted that the above future scenarios assume the works (e.g. proposed right turn out from William Street and removal of the at-grade pedestrian crossing) related to the Brookvale Community Health Care Building would be in place. A separate assessment assuming that these works would not proceed was also undertaken. The results for this additional scenario (Scenario S4) with and without the additional works are shown in Table 6.6.

Table 6.6: Scenario S4 Modelling Results With/Without Brookvale Community Care Building Works

Intersection	Scenario S4 (With HI Works)				Scenario S4 (No HI Works)			
	Thursday Peak		Saturday Peak		Thursday Peak		Saturday Peak	
	Delay	LoS	Delay	LoS	Delay	LoS	Delay	LoS
Green St-Cross St	26	B	22	B	26	B	22	B
Dale St-Cross St	19	B	19	B	19	B	25	B
Pittwater Rd-Cross St	42	C	34	C	43	D	34	C
Pittwater Rd-Shopping Centre Access	1	A	1	A	1	A	1	A
Pittwater Rd-William St	39	C	35	C	38	C	34	C
Condamine St-Old Pittwater Rd	40	C	25	B	40	C	25	B
Old Pittwater Rd-Shopping Centre Access	3	A	2	A	3	A	2	A

The results in Table 6.6 show that the assessed intersections would continue to operate satisfactorily with similar intersection performance whether the works proceed or not.

From the above modelling results, it can be concluded that the development traffic arising from Stage 2 proposed expansion of Warringah Mall would generally result in similar intersection performance to that found under existing traffic conditions (i.e. Scenario S1). The proposed access changes would also result in a less congested road network.

7 Conclusion

This report examines the traffic and parking implications of the proposed Stage 2 expansion of the Westfield Warringah Mall Shopping Centre at 145 Pittwater Road, Brookvale. The key findings of this report are presented below.

- In 2008 the then Warringah Council approved a masterplan permitting the Centre to be expanded with an additional 35,000m² of GLFA with a corresponding increase in car parking spaces.
- The Stage 1 expansion of the Centre was complete in November 2016 and involved the addition of 8,000m² GFLA of retail uses, including 330 additional car parking spaces.
- The Stage 2 expansion proposed to provide approximately an additional 9,900m² GFLA, resulting in a net increase of approximately 17,900m² GFLA.
- Following the completion of the proposed expansion works, the Centre would be comprised of a total of approximately 143,400m² GFLA.
- It is proposed to provide car parking spaces as part of the Stage 2 expansion. The development is expected to provide an overall car parking provision rate of 4.1 spaces per 100m² following the completion of the Stage 2 works consistent with the parking requirements stipulated in the DCP.
- Stage 2 proposed expansion includes an additional 418 car parking spaces.
- In terms of vehicle access arrangements, it is proposed to:
  - install a new vehicle access off Condamine Street (left-turn entry only), of which RMS has provided in-principle approval
  - provide a direct exit to Condamine Street and Pittwater Road at the William Street signalised intersection including a third northbound traffic lane to facilitate the efficient operation of the intersection, and
  - convert Dale Street to permit two-way traffic flows.
- The proposed vehicle access arrangements are considered satisfactory.
- All changes in access and internal car parking layouts are proposed to be designed in accordance with the Australian Standards, namely AS2890.1 and AS2890.6.
- The expected development traffic arising from the Centre following the completion of Stage 2 Centre expansion is in the order of 4,489 vph and 5,429 vph in the Thursday and Saturday peak periods, respectively. These represent net additional traffic of 316 vph and 544 vph during the Thursday and Saturday peak periods respectively.
- Based on the SIDRA modelling assessment, the assessed intersections would continue operate satisfactorily following the completion of the Stage 2 development.

- It is noted that although the traffic assessment assumes the future works at the signalised intersection of Condamine Street-Pittwater Road/William Street to accommodate the Brookvale Community Health Care Building would be in place, the Stage 2 proposed expansion does not rely on these works. That is, the assessed intersections would operate with similar performance with or without these proposed works.
- It is further noted that the proposed access changes to the Centre would result in the critical intersections operating more efficiently.

Overall, the traffic and parking effects of the proposed expansion would be satisfactory.

Appendix A

Condamine Street Ingress Approval in Principle from RMS

Michael Lee

From: JEGATHESAN Jana <Jana.JEGATHESAN@rms.nsw.gov.au>
Sent: Friday, 20 November 2015 11:32 AM
To: Michael Lee - GTA Consultants
Subject: RE: Warringag Mall Meeting with RMS

Hi Michael,

Roads and Maritime has reviewed the preliminary design for the PRE DA application and provides "in-principal" support. Final approval and detailed comments will be subject to the DA being officially lodged.

Regards,

Jana Jegathesan
Land Use Planner
Network Management | Journey Management
T 02 8849 2313
www.rms.nsw.gov.au
Every journey matters

Roads and Maritime Services
Level 7 27 Argyle Street Parramatta NSW 2150

From: Michael Lee - GTA Consultants [mailto:Michael.Lee@gta.com.au]
Sent: Tuesday, 20 October 2015 11:12 AM
To: JEGATHESAN Jana; Development Sydney
Subject: RE: Warringag Mall Meeting with RMS

Hi Jana,

Following our meeting a few weeks back, please find attached schematic plan showing the proposed access off Condamine Street as discussed in the meeting. Please note that the deceleration lane for the proposed slip lane off Condamine Street will be designed to RMS standard. I look forward to your comments on this.

Any issues, please call me.

Regards

Michael Lee
Associate - Traffic & Transport
GTA Consultants
02 8448 1800
0403 107 146
Level 6, 15 Help Street, Chatswood, NSW, 2067
www.gta.com.au

The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location.

From: JEGATHESAN Jana [mailto:Jana.JEGATHESAN@rms.nsw.gov.au]
Sent: Wednesday, 16 September 2015 10:09 AM
To: Michael Lee
Subject: RE: Warringag Mall Meeting with RMS
Importance: High

Micheal,

As per my previous email, Roads and Maritime require some detail information as to what's being proposed at the meeting. The proposal regarding the bridge, the relocation of the bus stop and what is actually being proposed. Meeting may require the attendance of representatives from various sections but there is insufficient information regarding the proposal.

Regards,

Jana Jegathesan
Land Use Planner
Network Management | Journey Management
T 02 8849 2313
www.rms.nsw.gov.au
Every journey matters

Roads and Maritime Services
Level 7 27 Argyle Street Parramatta NSW 2150

From: Michael Lee - GTA Consultants [mailto:Michael.Lee@gta.com.au]
Sent: Wednesday, 16 September 2015 9:32 AM
To: JEGATHESAN Jana
Subject: RE: Warringag Mall Meeting with RMS

Hi Jana,

Would you please meeting invite please?

Thanks

Michael Lee
Associate - Traffic & Transport
GTA Consultants
02 8448 1800
0403 107 146
Level 6, 15 Help Street, Chatswood, NSW, 2067
www.gta.com.au

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From: JEGATHESAN Jana [mailto:Jana.JEGATHESAN@rms.nsw.gov.au]
Sent: Tuesday, 15 September 2015 9:22 AM
To: Michael Lee
Subject: RE: Warringag Mall Meeting with RMS

Michael,

It is on the 24/09/15 Thursday. 10:30am is preferred time as things are busy at the moment.

Regards,

Jana

From: Michael Lee - GTA Consultants [mailto:Michael.Lee@gta.com.au]
Sent: Tuesday, 15 September 2015 9:22 AM
To: JEGATHESAN Jana
Subject: RE: Warringag Mall Meeting with RMS

Hi Jana,

Just to confirm that the proposed time for the meeting is 10:30am on Thursday 17 September. Do you have alternative time slots? Even on the same day?

Thanks

Michael Lee
Associate - Traffic & Transport
GTA Consultants
02 8448 1800
0403 107 146
Level 6, 15 Help Street, Chatswood, NSW, 2067
www.gta.com.au

From: JEGATHESAN Jana [mailto:Jana.JEGATHESAN@rms.nsw.gov.au]
Sent: Tuesday, 15 September 2015 8:58 AM
To: Michael Lee
Subject: RE: Warringag Mall Meeting with RMS

Hi Michael,

Thank you for the information. RMS can meet Next Thursday at this point and I will be on leave for two weeks from the 24/09/15. Thursday will suit all the RMS representatives to be at the meeting. I can send out a meeting invite as soon as you confirm. Meeting can be held at 10:30am at RMS office. In addition, prior to the meeting could you please provide me with more information as to what is being proposed with the bridge?

Regards,

Jana Jegathesan
Land Use Planner
Network Management | Journey Management
T 02 8849 2313
www.rms.nsw.gov.au
Every journey matters

Roads and Maritime Services
Level 7 27 Argyle Street Parramatta NSW 2150

From: Michael Lee - GTA Consultants [mailto:Michael.Lee@gta.com.au]
Sent: Monday, 14 September 2015 11:25 AM
To: JEGATHESAN Jana
Cc: Anthony Iannuzzi
Subject: Warringag Mall Meeting with RMS

Hi Jana,

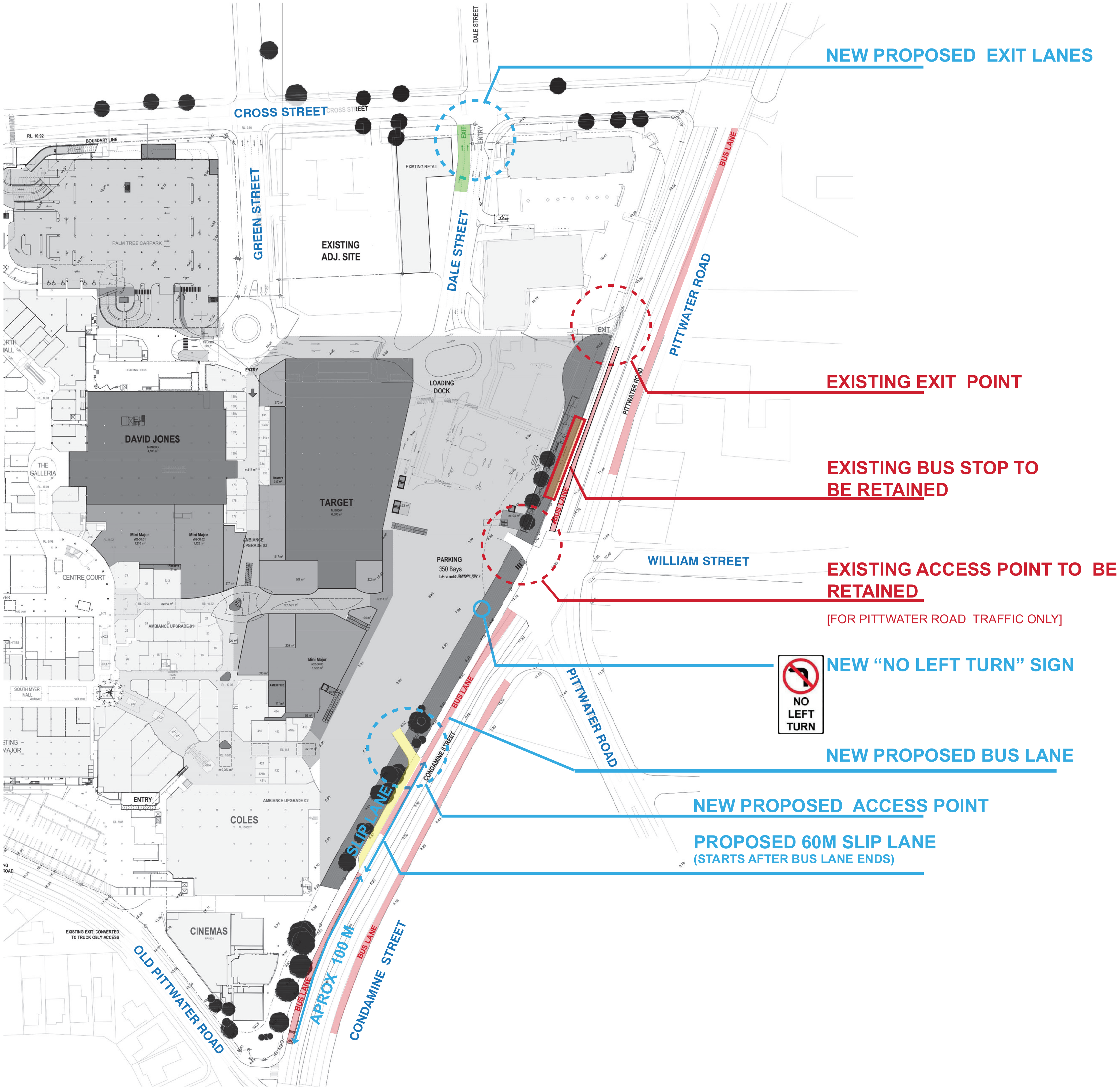
Further to my previous conversation with you RE meeting with RMS, as requested please find attached a proposed agenda and some early plans for discussion at the meeting.

We would appreciate if you could please confirm when in the next couple of weeks RMS is available to meet with us. As there are a number of people required to attend the meeting, can you please provide additional alternative time slots.

In the meantime, any questions please call me.

Thanks

Michael Lee
Associate - Traffic & Transport
GTA Consultants
02 8448 1800
0403 107 146
Level 6, 15 Help Street, Chatswood, NSW, 2067
www.gta.com.au



CONDAMINE STREET: SLIPLANE DIAGRAM scale 1/750@A0

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Owner and Operator of Westfield in Australia and New Zealand

Scentre Design and Construction Pty Limited
100 Market Street, Sydney NSW 2000
Phone (02) 9358 7000 Fax (02) 9028 8500
GPO Box 4004 Sydney NSW 2001

SLIP LANE DIAGRAM

WARRINGAH MALL STAGE 02

SCHEME 03E

PLANNING DESIGN PACKAGE

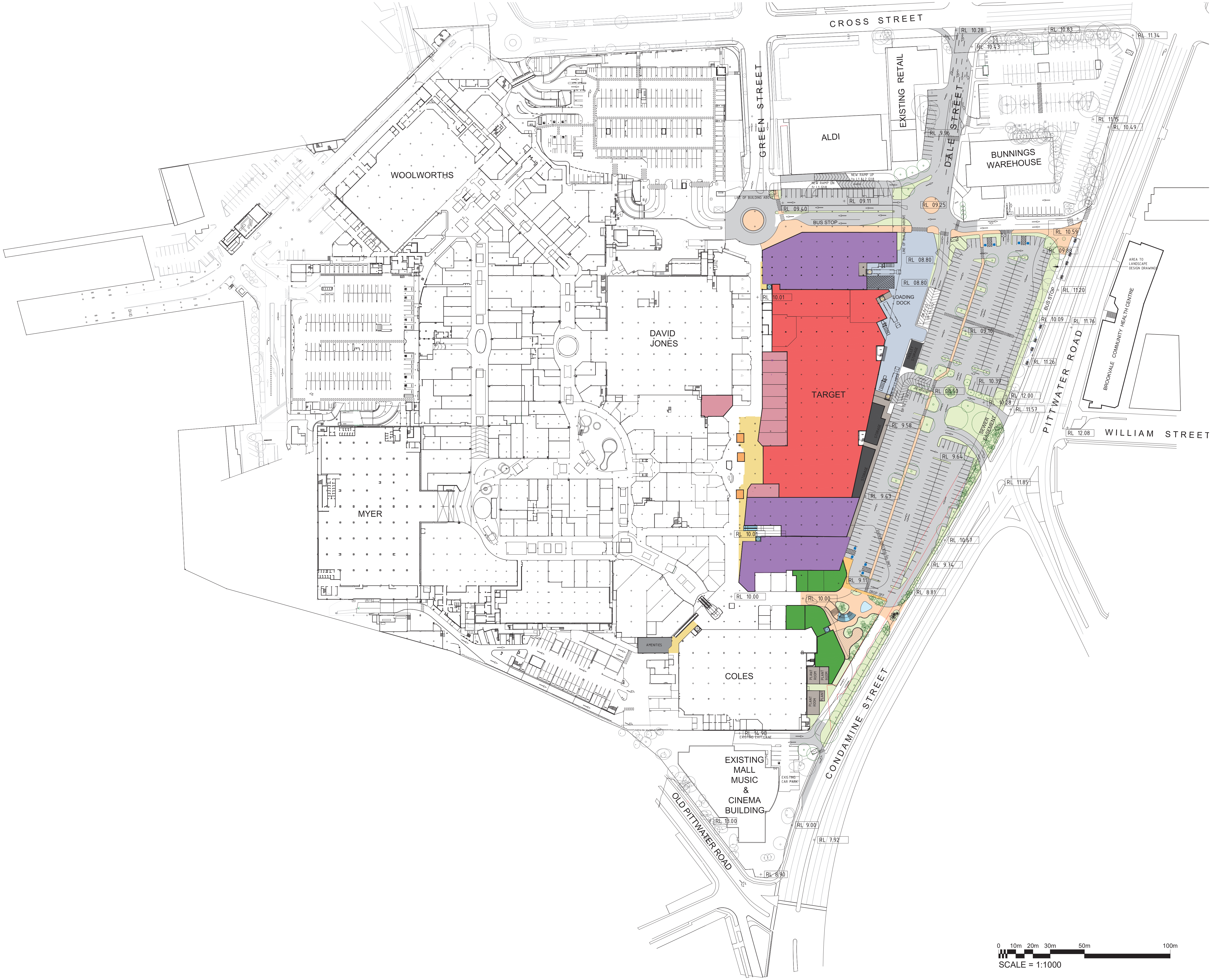
Project Number 11754

Scale @ Sheet Size 100%@A0

Plot Date 2015-10-19

Appendix B

Architectural Car Park Plans



LEGEND

PROPOSED:

- PROPOSED MAJOR
- PROPOSED MINI-MAJOR
- PROPOSED SPECIALTY
- PROPOSED KIOSK
- PROPOSED CINEMA
- PROPOSED MALL
- PROPOSED FOOD
- PROPOSED VERTICAL TRANSPORT
- PROPOSED AMENITIES/STORAGE
- PROPOSED FORECOURT
- PROPOSED SERVICE
- PROPOSED CAR PARK
- EXISTING TREES
- PROPOSED TREES
- CENTRE DIRECTORY SIGNAGE: PROPOSED LOCATIONS

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85 Castlereagh Street. Sydney NSW 2000
Phone (02) 9358 7000 Fax (02) 9028 8500
GPO Box 4004 Sydney NSW 2001
ACN 000 267 265

Title

PROPOSED GROUND LEVEL

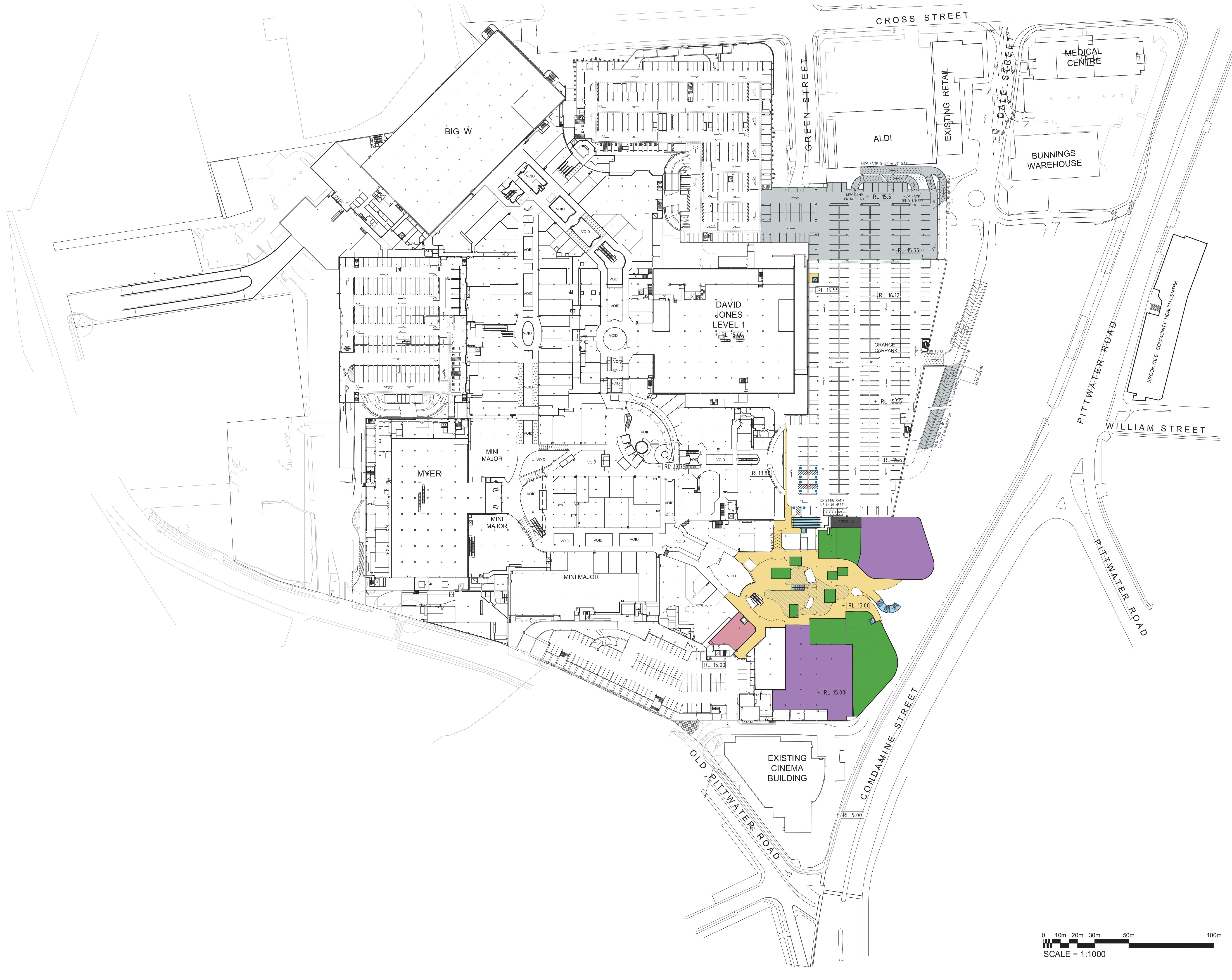
Centre

WARRINGAH MALL
STAGE 02
SCHEME 14F

DEVELOPMENT APPLICATION

Project No.	Drawing No.	Revision
11754	01.5201	1
Drawing Scale: 100% @A1		
Plot Date: 2018-07-18		

T:\WARRINGAH\11754 REDEVELOPMENT STAGE 2\01 CONCEPTS\02 DESIGN\01 CAD\ACTIVE\WR2_PRO_SCH14F_01_GROUND.DWG



LEGEND

PROPOSED:

- PROPOSED MAJOR
- PROPOSED MINI-MAJOR
- PROPOSED SPECIALTY
- PROPOSED KIOSK
- PROPOSED CINEMA
- PROPOSED MALL
- PROPOSED FOOD
- PROPOSED VERTICAL TRANSPORT
- PROPOSED AMENITIES/STORAGE
- PROPOSED FORECOURT
- PROPOSED SERVICE
- PROPOSED CAR PARK

0 10m 20m 30m 50m 100m

SCALE = 1:1000

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GPO Box 4004 Sydney NSW 2001
ACN 000 267 265

Title

PROPOSED LEVEL 1

Centre

WARRINGAH MALL
STAGE 02
SCHEME 14F

DEVELOPMENT APPLICATION

Project No.	Drawing No.	Revision
11754	01.5203	1
Drawing Scale: 100% @A1		
Plot Date: 2018-07-18		

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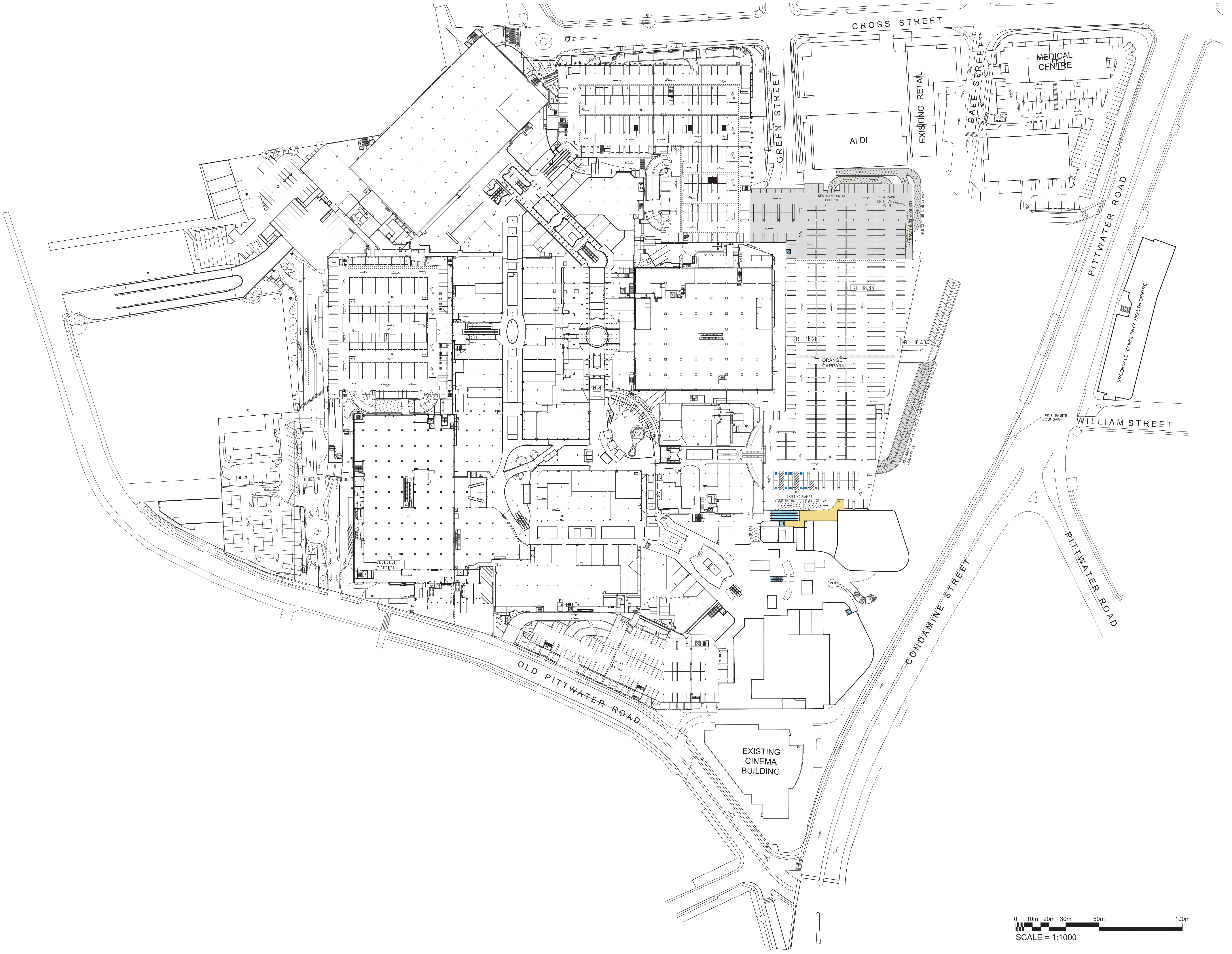

LEGEND

PROPOSED:

- PROPOSED MAJOR
- PROPOSED MINI-MAJOR
- PROPOSED SPECIALTY
- PROPOSED KIOSK
- PROPOSED CINEMA
- PROPOSED MALL
- PROPOSED FOOD
- PROPOSED VERTICAL TRANSPORT
- PROPOSED AMENITIES/STORAGE
- PROPOSED FORECOURT
- PROPOSED SERVICE
- PROPOSED CAR PARK

NOTES:

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- Written dimensions take precedence over scaling and are to be checked on site.
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- Refer any discrepancies to the Project Design Manager
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AMP CAPITAL

SCENTRE GROUP

Scentre Design and Construction Pty Limited
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Phone (02) 9358 7000 Fax (02) 9028 8500
GPO Box 4004 Sydney NSW 2001
ACN 000 267 265

Title

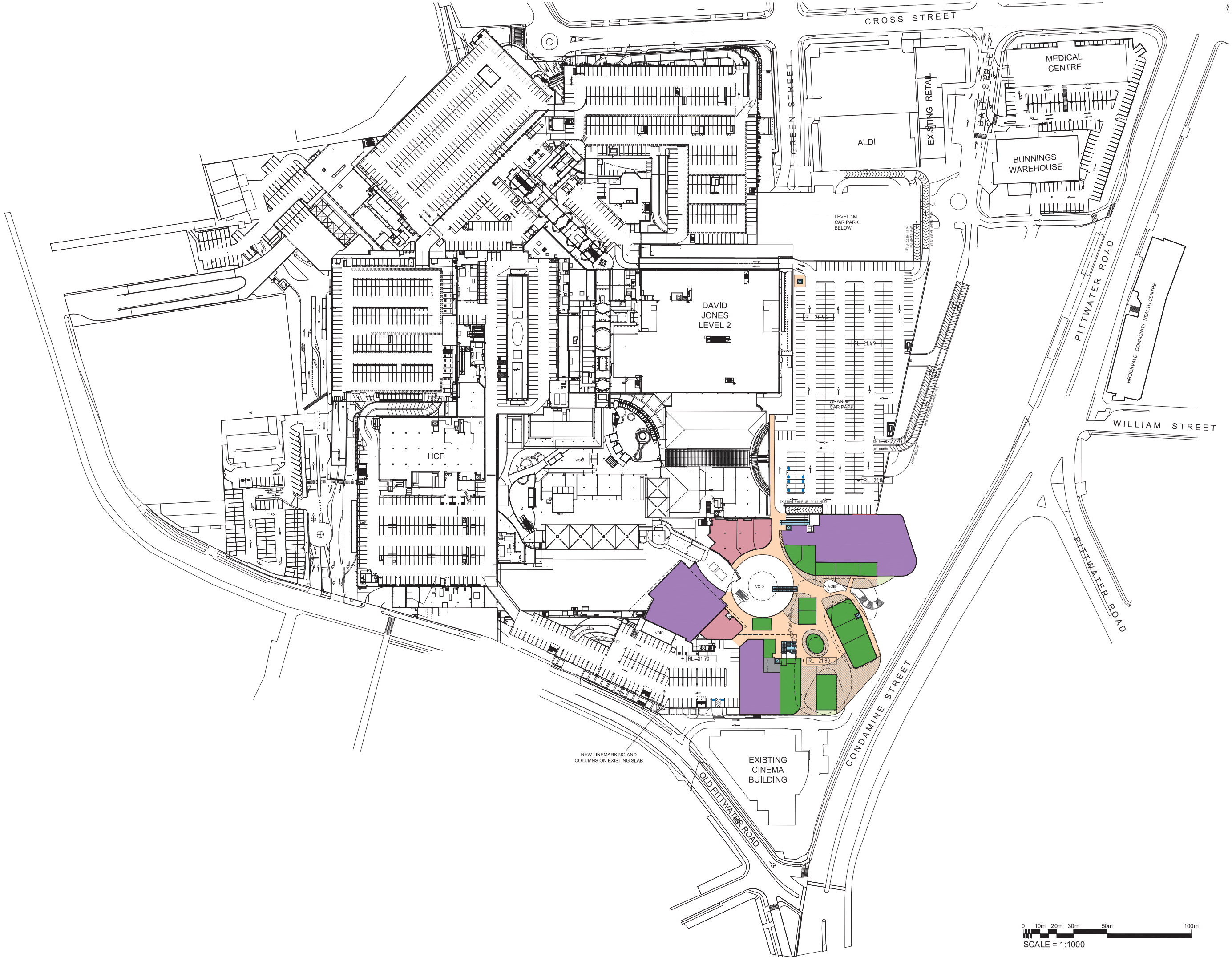
PROPOSED LEVEL 1 MEZZANINE

Centre

WARRINGAH MALL
STAGE 02
SCHEME 14F

DEVELOPMENT APPLICATION

Project No.	Drawing No.	Revision
11754	01.5204	1
Drawing Scale 100% @A1		
Plot Date 2018-07-18		



LEGEND

PROPOSED:

- PROPOSED MAJOR
- PROPOSED MINI-MAJOR
- PROPOSED SPECIALTY
- PROPOSED KIOSK
- PROPOSED CINEMA
- PROPOSED MALL
- PROPOSED FOOD
- PROPOSED VERTICAL TRANSPORT
- PROPOSED AMENITIES/STORAGE
- PROPOSED FORECOURT
- PROPOSED SERVICE
- PROPOSED CAR PARK

N

0 10m 20m 30m 50m 100m

SCALE = 1:1000

NOTES:

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GPO Box 4004 Sydney NSW 2001
ACN 000 287 265

Title

PROPOSED LEVEL 2

Centre

WARRINGAH MALL
STAGE 02
SCHEME 14F

DEVELOPMENT APPLICATION

Project No.	Drawing No.	Revision
11754	01.5205	1
Drawing Scale 100% @A1		
Plot Date 2018-07-18		

T:\WARRINGAH\11754-REDEVELOPMENT STAGE 2\01 CONCEPTS\02 DESIGN\01 CAD\ACTIVE\ARC_PRE_SCHAT_05_LEVEL 2.DWG

LEGEND

PROPOSED:

- PROPOSED MAJOR
- PROPOSED MINI-MAJOR
- PROPOSED SPECIALTY
- PROPOSED KIOSK
- PROPOSED CINEMA
- PROPOSED MALL
- PROPOSED FOOD
- PROPOSED VERTICAL TRANSPORT
- PROPOSED AMENITIES/STORAGE
- PROPOSED FORECOURT
- PROPOSED SERVICE
- PROPOSED CAR PARK

CAR PARK BELOW

EXISTING SITE BOUNDARY

PITTWATER ROAD

RL 27.30

EXISTING ROOF

RL 27.30

NEW METAL ROOFS

RL 29.30

NEW CINEMA

RL 27.30

RL 27.30

OLD PITTWATER ROAD

EXISTING CINEMA BUILDING

CONDAMINE STREET

N

0 10m 20m 30m 50m 100m

SCALE = 1:1000

NOTES:

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ACN 000 207 265

Title

PROPOSED LEVEL 3

Centre

WARRINGAH MALL
STAGE 02
SCHEME 14F

DEVELOPMENT APPLICATION

Project No.	Drawing No.	Revision
11754	01.5207	1
Drawing Scale: 100% @A1		
Plot Date: 2018-07-18		

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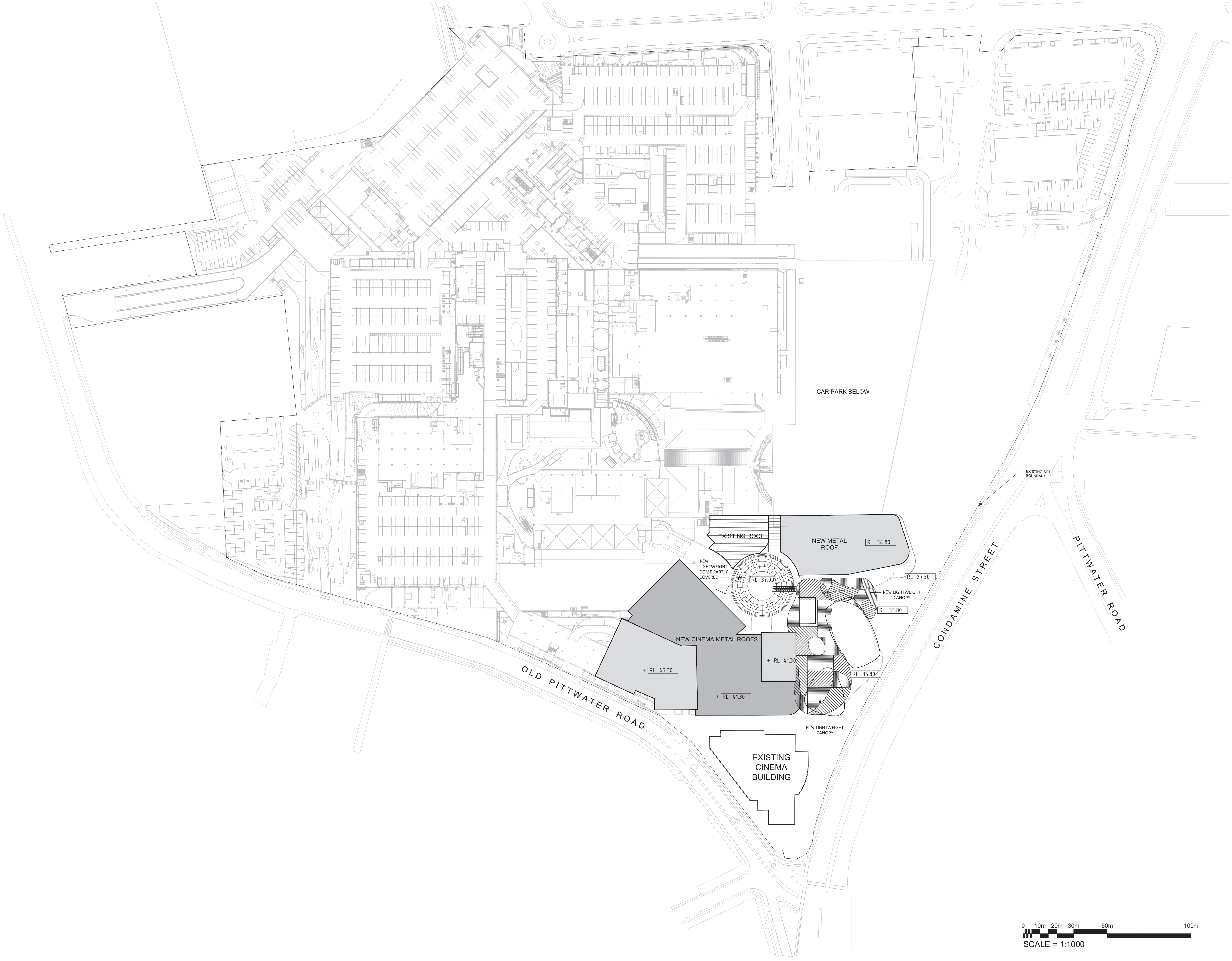

LEGEND

PROPOSED:

- PROPOSED MAJOR
- PROPOSED MINI-MAJOR
- PROPOSED SPECIALTY
- PROPOSED KIOSK
- PROPOSED CINEMA
- PROPOSED MALL
- PROPOSED FOOD
- PROPOSED VERTICAL TRANSPORT
- PROPOSED AMENITIES/STORAGE
- PROPOSED FORECOURT
- PROPOSED SERVICE
- PROPOSED CAR PARK

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Title

PROPOSED ROOF PLAN

Centre

WARRINGAH MALL
STAGE 02
SCHEME 14F

DEVELOPMENT APPLICATION

Project No.	Drawing No.	Revision
11754	01.5209	1
Drawing Scale 100% @A1		
Plot Date 2018-07-18		

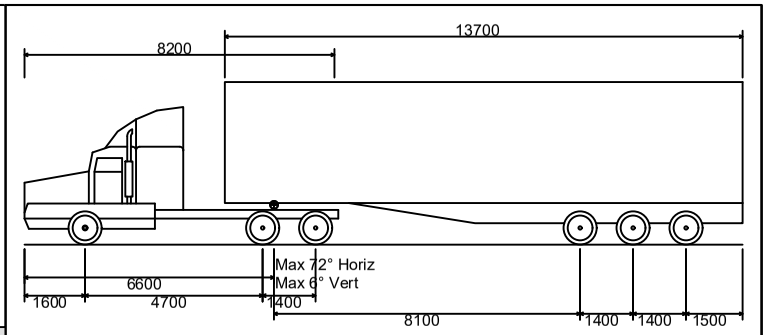
T:\WARRINGAH\11754 REDEVELOPMENT STAGE 2\01 CONCEPTS\02 DESIGN\01 CAD\ACTIVE\WR2_PRO_SCH14F_09_ROOF.DWG

Appendix C

Loading Dock Swept Path Diagrams

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		



AV - Articulated Vehicle

Overall Length	19000mm
Overall Width	2500mm
Overall Body Height	4301mm
Min Body Ground Clearance	418mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

LINE OF BUILDING ABOVE

LOADING DOCK

TROLLEY STORAGE

DN fr L2
UP to L1/2

VEHICLE ENTERING

VEHICLE EXITING

By: Karl magistrado
Date: 3 August 2018
Filename: 16111DA16-Loading Dock-180803.dwg

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	ML	ML	03/08/18

The Transport Planning Partnership
Suite 402, 22 Atchison Street
St. Leonards NSW 2065
Tel: 02 8437 7800
Email: info@ttpp.net.au

PROJECT: WARRINGAH MALL

TITLE: 1AS2890.2:2002 19m SEMI-TRAILER SWEPT PATH DIAGRAM
LOADING DOCK

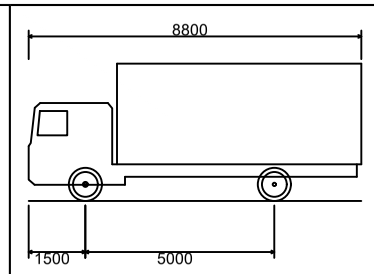
DWG No.: FIGURE 1

DATE STAMP: 03 AUGUST 2018

PROJECT No.	SCALE	REV.
16111	1:350 @A3	A

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		



MRV - Medium Rigid Vehicle

Overall Length	8800mm
Overall Width	2500mm
Overall Body Height	3633mm
Min Body Ground Clearance	428mm
Track Width	2500mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10000mm

LINE OF BUILDING ABOVE

LOADING DOCK

TROLLEY STORAGE

DN fr L2
UP to L1/2

MRV - Medium Rigid Vehicle

VEHICLE ENTERING

VEHICLE EXITING

By: Karl.magistrado
Date: 3 August 2018
Filename: 16111DA16-Loading Dock-180803.dwg

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	ML	ML	03/08/18

The Transport Planning Partnership
Suite 402, 22 Atchison Street
St. Leonards NSW 2065
Tel: 02 8437 7800
Email: info@ttpp.net.au

PROJECT: WARRINGAH MALL

TITLE: AS2890.2:2002 8.8m MEDIUM RIGID VEHICLE SWEPT PATH DIAGRAM
LOADING DOCK

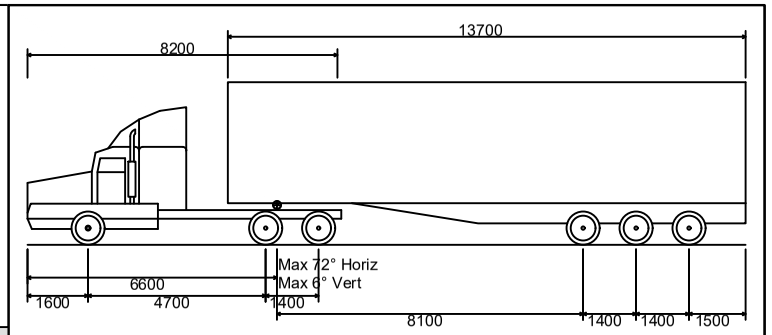
DWG No. FIGURE 2

DATE STAMP 03 AUGUST 2018

PROJECT No.	SCALE	REV.
16111	1:350 @A3	A

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		



AV - Articulated Vehicle

Overall Length	19000mm
Overall Width	2500mm
Overall Body Height	4301mm
Min Body Ground Clearance	418mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

LINE OF BUILDING ABOVE

LOADING DOCK

TROLLEY STORAGE

DN fr L2
UP to L1/2

3

1

2

4

VEHICLE EXITING

By: Karl magistrado

Date: 3 August 2018

Filename: 16111\2A16-Loading Dock-180803.dwg

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	ML	ML	03/08/18

The Transport Planning Partnership

Suite 402, 22 Atchison Street
St. Leonards NSW 2065
Tel: 02 8437 7800
Email: info@ttpp.net.au

PROJECT: WARRINGAH MALL

TITLE: AS2890.2:2002 19m SEMI-TRAILER SWEPT PATH DIAGRAM
LOADING DOCK

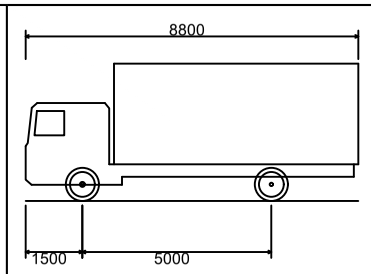
DWG No.: FIGURE 3

DATE STAMP: 03 AUGUST 2018

PROJECT No.	SCALE	REV.
16111	1:350 @A3	A

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		



MRV - Medium Rigid Vehicle

Overall Length	8800mm
Overall Width	2500mm
Overall Body Height	3633mm
Min Body Ground Clearance	428mm
Track Width	2500mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10000mm

LINE OF BUILDING ABOVE

LOADING DOCK

TROLLEY STORAGE

DN fr L2
UP to L1/2

MRV - Medium Rigid Vehicle

VEHICLE ENTERING

1

2

3

VEHICLE EXITING

By: Karl.magistrado
Date: 3 August 2018
Filename: 161112A16-Loading Dock-180803.dwg

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	ML	ML	03/08/18

The Transport Planning Partnership
Suite 402, 22 Atchison Street
St. Leonards NSW 2065
Tel: 02 8437 7800
Email: info@ttpp.net.au

PROJECT: WARRINGAH MALL

TITLE: AS2890.2:2002 8.8m MEDIUM RIGID VEHICLE SWEPT PATH DIAGRAM
LOADING DOCK

DWG No. FIGURE 4

DATE STAMP 03 AUGUST 2018

PROJECT No.	SCALE	REV.
16111	1:350 @A3	A

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

AV - Articulated Vehicle

Overall Length	19000mm
Overall Width	2500mm
Overall Body Height	4301mm
Min Body Ground Clearance	418mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

VEHICLE ENTERING

VEHICLE EXITING

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	ML	ML	03/08/18

The Transport Planning Partnership
Suite 402, 22 Atchison Street
St. Leonards NSW 2065
Tel: 02 8437 7800
Email: info@ttpp.net.au

PROJECT: WARRINGAH MALL

TITLE: AS2890.2:2002 19m SEMI-TRAILER SWEPT PATH DIAGRAM
LOADING DOCK

DWG No.: FIGURE 5

DATE STAMP: 03 AUGUST 2018

PROJECT No.: 16111

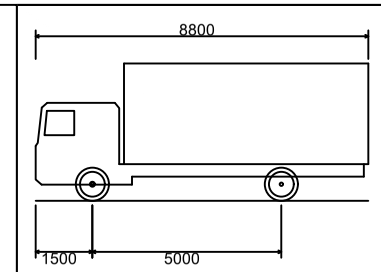
SCALE: 1:400 @A3

REV.: A

Filename: 16111DA1EL-Loading Dock-180803.dwg
Date: 3 August 2018
By: Karl magistrado

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		



MRV - Medium Rigid Vehicle

Overall Length	8800mm
Overall Width	2500mm
Overall Body Height	3633mm
Min Body Ground Clearance	428mm
Track Width	2500mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10000mm

LINE OF BUILDING ABOVE

LOADING DOCK

DN fr L1 MEZZ

TROLLEY STORAGE

DN fr L2
UP to L1/2

MRV - Medium Rigid Vehicle

VEHICLE ENTERING

VEHICLE EXITING

By: Karl.maglistrado
Date: 3 August 2018
Filename: 16111DA1EL-Loading Dock-180803.dwg

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	ML	ML	03/08/18

The Transport Planning Partnership
Suite 402, 22 Atchison Street
St. Leonards NSW 2065
Tel: 02 8437 7800
Email: info@ttpp.net.au

PROJECT: WARRINGAH MALL

TITLE: AS2890.2:2002 8.8m MEDIUM RIGID VEHICLE SWEPT PATH DIAGRAM
LOADING DOCK

DWG No.: FIGURE 6

DATE STAMP: 03 AUGUST 2018

PROJECT No.	SCALE	REV.
16111	1:400 @A3	A

The Transport Planning Partnership
Suite 402 Level 4, 22 Atchison Street
St Leonards NSW 2065

P.O. Box 237
St Leonards NSW 1590

02 8437 7800

info@ttpp.net.au

www.ttpp.net.au