Proposed MOD3 Development Proposal

23-41 Lindfield Avenue, Lindfield

TRAFFIC AND PARKING ASSESSMENT REPORT

14 April 2015

Ref 15028

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1. INTRODUCTION

This Traffic and Parking Assessment has been prepared to accompany the third application to modify the Minister for Planning & Infrastructure's approval of Project Application MP 08_0244 for the mixed use development at 23-41 Lindfield Avenue and 7 to 11 Havilah Lane, Lindfield.

The modifications to the development comprise the integration of 39-41 Lindfield Avenue into the development site, and resultant amendments to the design of the mixed use development. The description of the modified development is summarised as follows:

1. Demolition of existing structure on the site;

2. Excavation of the site;

3. Construction of a mixed use development with a maximum gross floor area (GFA) of 15,540m^2 comprising:

    - 2,720m^2 GFA retail floor space at ground floor within a single storey podium
    - 141 residential apartment sin two towers above the retail podium
    - 4 levels of parking for 255 vehicles
    - 898m^2 of communal open space at podium level between the two towers
    - fit-out and use of the proposed major retail tenancy as a supermarket.

The purpose of this report is to assess the traffic and parking implications of the modified development proposal and to that end this report:

- describes the site and provides details of the modified development proposal

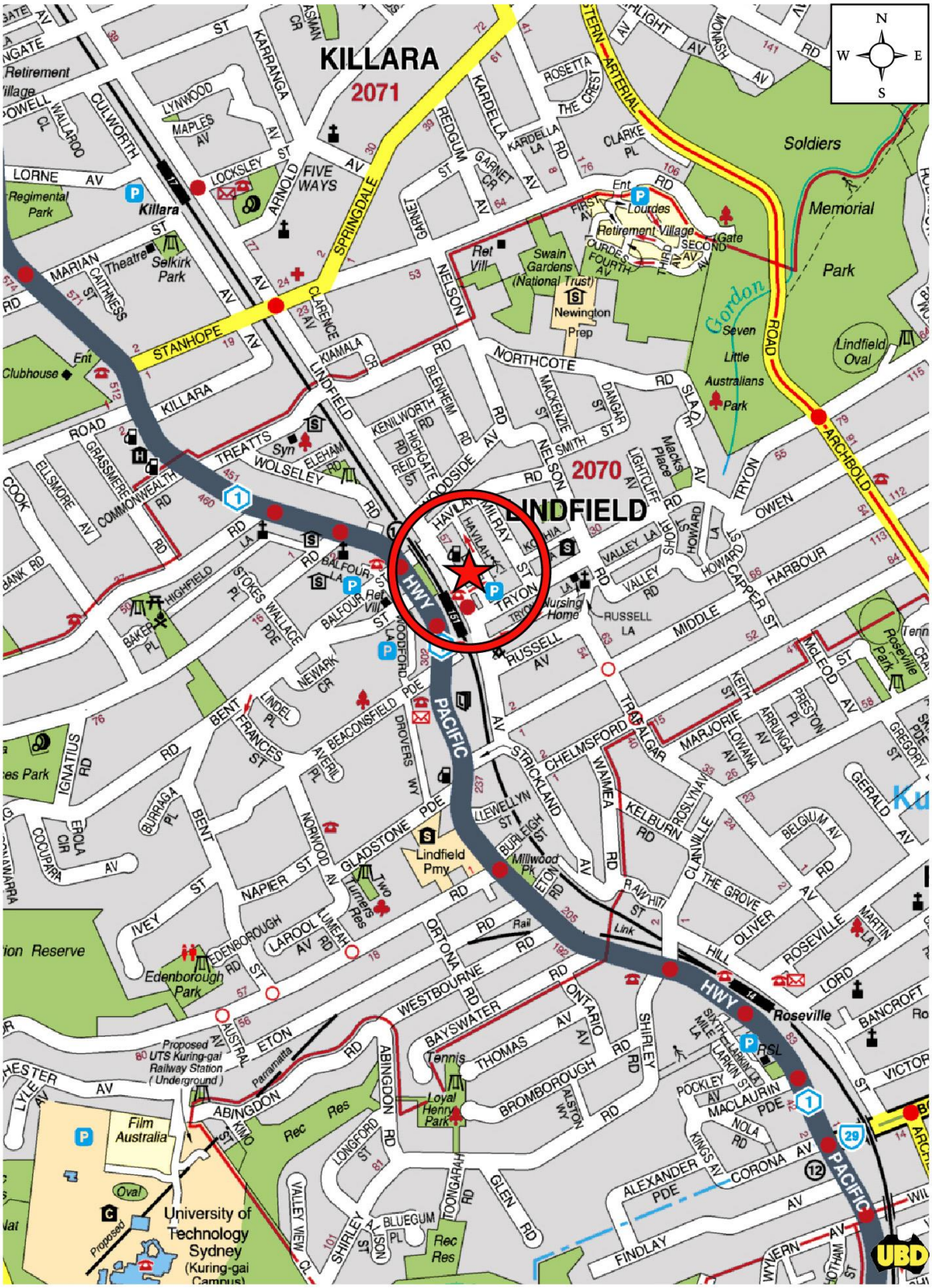
- reviews the road network in the vicinity of the site, and the traffic conditions on that road network

- estimates the traffic generation potential of the development proposal, and assigns that traffic generation to the road network serving the site

- assesses the traffic implications of the development proposal in terms of road network capacity

- reviews the geometric design features of the proposed car parking facilities for compliance with the relevant codes and standards

- assesses the adequacy and suitability of the quantum of off-street car parking provided on the site.



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LOCATION
FIGURE 1


N
W
E
S
TREATTS RD
LINDFIELD
KENILWORTH
RD
HIGHGATE
BLENHEIM RD
NELSON
AVE
RD
McKENZIE ST
NELSON
SMITH ST
ELEHAM RD
REID ST
RD
WOLSELEY RD
LA
WOODSIDE
HAVILAH
RD
RD
MILRAY
TRYON RD
PACIFIC HWY
LINDFIELD AVE
HAVILAH LA
KOCHIA LA
ST
RD
NELSON RD
LA
ST
ST
BALFOUR
BENT
PACIFIC HWY
LINDFIELD STATION
TRYON
TRYON
RUSSELL LA
TRYON PL
WOODFORD LA
DROVERS WAY
NEWARK CR
RUSSELL AVE
TRAFALGAR
PDE
LINDFIELD AVE
RD
AVE
MIDDLE HARBOUR
BEACONSFIELD
PACIFIC HWY
DROVERS WAY
STRICKLAND AVE
AVE
AVERIL PL
CHELMSFORD
WAIMEA RD
GLADSTONE PDE
Road Closure / Unformed Road
VARGA TRAFFIC PLANNING Pty Ltd
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SITE
FIGURE 2

2. PROPOSED DEVELOPMENT

Site

The subject site is located on the north-eastern corner of the Lindfield Avenue and Kochia Lane intersection and has rear access via Havilah Lane. The site has a street frontage approximately 61m in length to Lindfield Avenue and to Havilah Lane, and 32m in length to Kochia Lane. The site occupies an area of approximately 3,974m^2.

The ground floor level of the subject site is currently occupied by a shopping centre comprising an IGA Supermarket (821m^2 GLFA / 909m^2 GFA) and specialty stores such as a chemist, travel agency, bakery and green grocer (914m^2 GLFA / 1,484m^2 GFA). The cumulative floor area of the existing shopping centre is therefore approximately 1,735m^2 GLFA or 2,393m^2 GFA.

The first floor level is currently occupied by the Lindfield Bridge Club (647m^2 GFA), a research and marketing company office (213m^2 GFA) and a small yoga, fitness and martial arts gymnasium (378m^2 GFA). The cumulative floor area of the first floor level is therefore approximately 1,238m^2 GFA.

Off-street parking is currently provided on the site for 38 cars in two separate undercover carparking areas located towards the rear of the site, with vehicular access provided via Havilah Lane.

The lower ground floor level is also currently occupied by part of the former Council-owned car park which is also accessed via Havilah Lane. There are 16 spaces currently provided on Lot 1 DP1198025.

Previously Approved Development

The mixed use development was originally approved on 27 January 2012 (Approved Project). It was subsequently modified on 14 November 2013 (MOD1) and on 5 November 2014 a second application to further modify the approved development (i.e. the MOD1 scheme) was submitted to the Minister. The second modification application (referred to as MOD2) is

currently under assessment and a preferred project and response to issues report was submitted to the Department on 9 March 2015.

A total of 122 residential apartments are proposed in the MOD2 application in the two new buildings as follows:

Studio:	4
1 bedroom apartments:	56
2 bedroom apartments:	55
3 bedroom apartments:	7
TOTAL APARTMENTS:	**122**

The MOD2 application also made provision for retail uses on the ground floor level with a cumulative floor area of approximately 2,295m^2 GLFA (or 2,750m^2 GFA) as follows:

Supermarket:	1,604m^2 GLFA
Specialty Retail:	691m^2 GLFA
TOTAL FLOOR AREA:	**2,295m^2 GLFA (or 2,271m² GFA)**

Off-street parking in the MOD2 application was proposed for 221 cars, comprising 131 residential spaces, 28 visitor spaces, 49 retail spaces and 13 retail staff spaces (excluding a carwash bay), in a three level basement car parking area and an at-grade car parking area on the lower ground floor level, off Havilah Lane.

Proposed Development

The amended development now includes 39-41 Lindfield Avenue (Lot D in DP 347906 and Lot 4 in DP 713505) within the site area, resulting in an increase in the site area of approximately 492m^2. Key changes include:

- reconfiguration of the parking layouts on the basement levels and lower ground floor level to provide 17 additional parking spaces

- a slight reduction the retail floor area of 30m^2 GLFA

- the provision of 19 additional residential apartments

- detailed fit-out and use of the major retail tenancy as a supermarket.

Overall, a total of 141 residential apartments are proposed in the two new buildings as follows:

Studio:	4
1 bedroom apartments:	64
2 bedroom apartments:	66
3 bedroom apartments:	7
TOTAL APARTMENTS:	**141**

A retail component is proposed on the ground floor level with a cumulative floor area of approximately 2,328m^2 GLFA (or 2,720m^2 GFA) as follows:

Supermarket:	1,667m^2 GLFA
Specialty Retail:	661m^2 GLFA
TOTAL FLOOR AREA:	**2,328m^2 GLFA**

Off-street car parking is proposed for 255 cars comprising 155 residential spaces, 24 visitor spaces, 62 retail spaces and 14 retail staff spaces (excluding a carwash bay), in the three-level basement car parking area and the at-grade car parking area on the lower ground floor level, off Havilah Lane.

Vehicular access to the basement car parking facilities is to be provided via the previously approved entry/exit driveway located at the southern end of the Havilah Lane site frontage.

Vehicular access to the lower ground level retail car parking area is to be provided via a single two-way entry and exit driveway also located in Havilah Lane as proposed in the MOD2 PPR. The ground level retail car parking area will comprise 62 spaces in a car parking area which will be controlled by boom gates. Traffic flow in this car parking area shall be restricted to a one-way clockwise direction.

A loading dock is also proposed within the northern portion of the site which is capable of accommodating a variety of trucks up to and including an 11m long medium rigid truck. Vehicular access to the loading dock is provided via a separate driveway off Havilah Lane. A truck turntable is proposed to ensure that all trucks can enter and exit the site in a forward direction.

Plans of the proposed development have been prepared by *Crone Architects Pty Ltd* and are reproduced in the following pages.


S75W SUBMISSION - MOD 3
LINDFIELD MIXED-USE DEVELOPMENT
23-41 LINDFIELD AVE & 7,11 HAVILAH LA
LINDFIELD NSW 2070
BASEMENT 2 PLAN
S75W(MOD3) SUBMISSION
CA 2924 ADAZ 1001 L
AQUALAND
cronepartners
COLOR FILL LEGEND
AMENITY
CIRCULATION
ELECTRICAL RISER
GARBAGE
HORIZONTAL TRANSPORTATION
HYD/FIRE RISER
MECH. RISER
PARKING
PUBLIC AREA
RESIDENT(A)
RESIDENT(B)
RETAIL
SERVICE ZONE
TANKS
VERTICAL TRANSPORTATION

3. TRAFFIC ASSESSMENT

Road Hierarchy

The road hierarchy allocated to the road network in the vicinity of the site by the Roads and Maritime Services is illustrated on Figure 3.

The Pacific Highway is classified by the RMS as a *State Road* and provides the key north-south road link in the area, linking the City to Wahroonga and the F3 Freeway. It typically carries three traffic lanes in each direction in the vicinity of the site, with opposing traffic flows separated by a centre median island. Kerbside parking is permitted at selected locations outside of commuter peak periods.

Stanhope Road, Springdale Road, Eastern Arterial Road and Archbold Road are all classified by the RMS as *Regional Roads*. Eastern Arterial Road and Archbold Road typically carry two traffic lanes in each direction in the vicinity of the site, whilst Stanhope Road and Springdale Road typically carry one traffic lane in each direction.

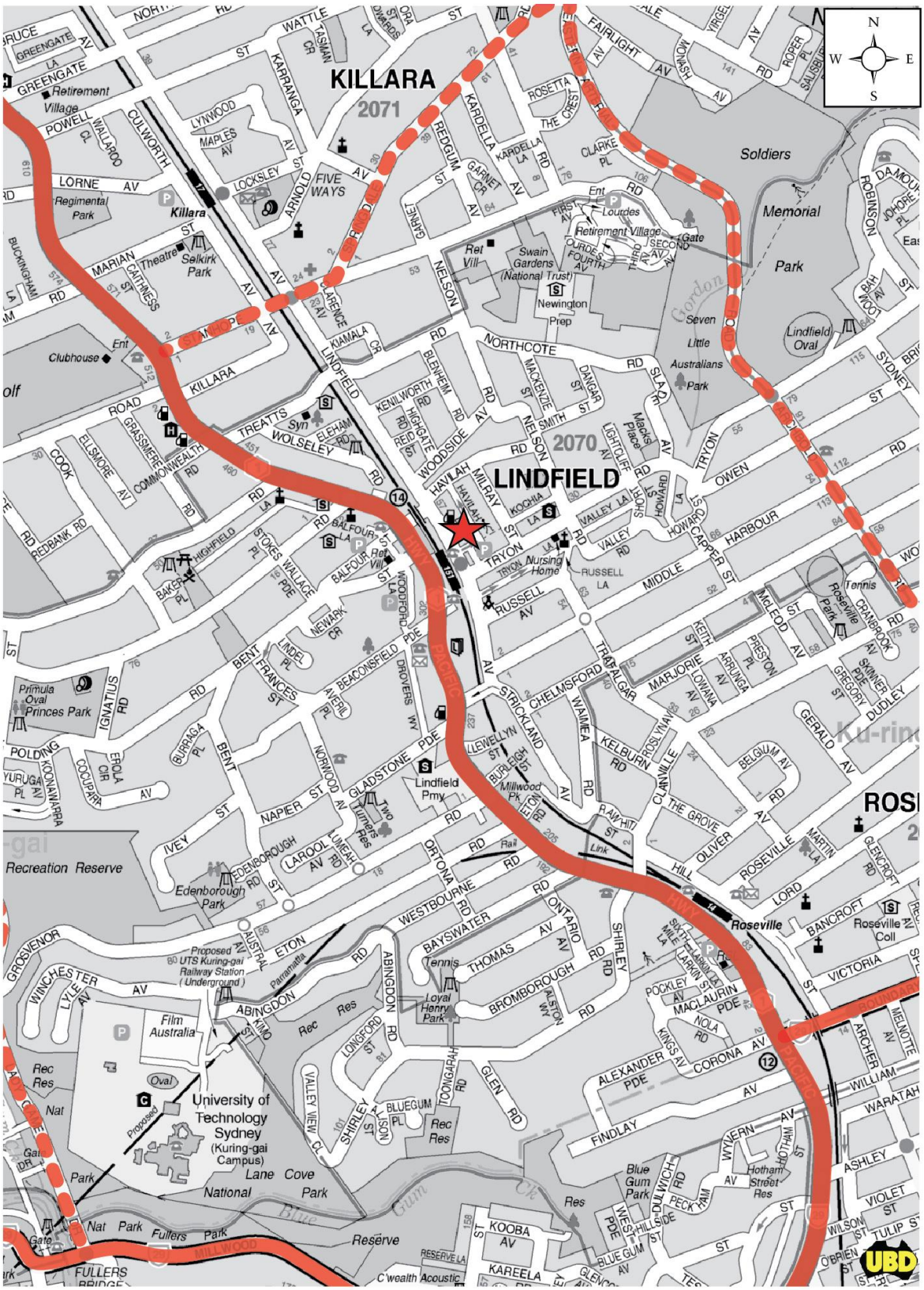
Lindfield Ave and Tryon Road are local, unclassified roads which perform the function of a "*collector route*", providing a link between the local road network and the higher order classified RMS road network. Kerbside parking is generally permitted on both sides of both roads.

Kochia Lane and Havilah Lane are local, unclassified laneways which are primarily used to provide rear vehicular and pedestrian access to properties fronting Lindfield Avenue and Milray Street, as well as the Council carparking area. Kerbside parking is not permitted on either side of both laneways.

Existing Traffic Controls

The existing traffic controls which apply to the road network in the vicinity of the site are illustrated on Figure 4. Key features of those traffic controls are:

- a 60 km/h SPEED LIMIT which applies to the Pacific Highway



Key: State Road

Regional Road

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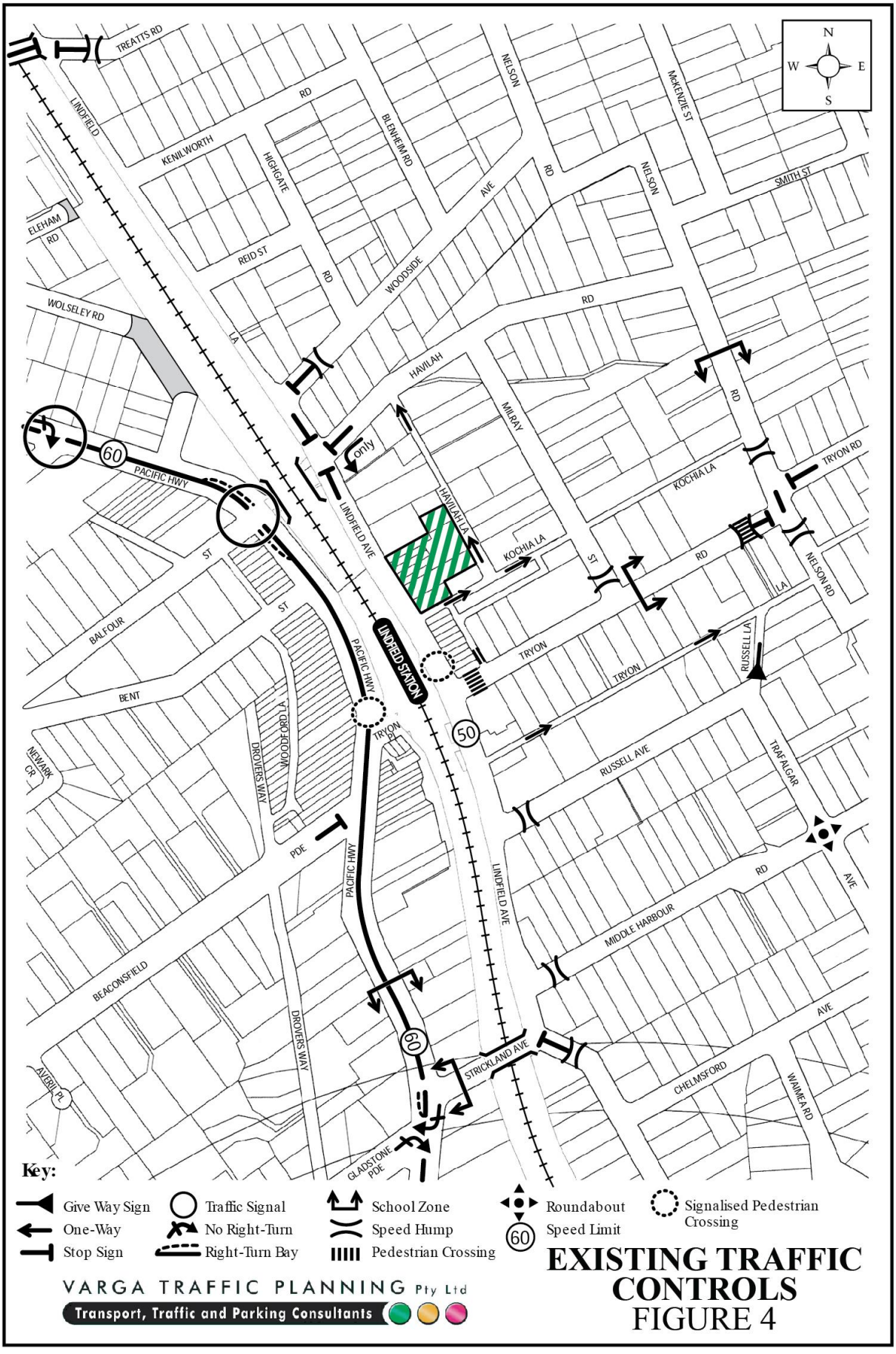
ROAD HIERARCHY
FIGURE 3


N
W
E
S
TREATTS RD
LINDFIELD
KENILWORTH
RD
HIGHGATE
BLENHEIM RD
NELSON
AVE
RD
McKENZIE ST
NELSON
SMITH ST
ELEHAM
RD
REID ST
RD
WOODSIDE
WOLSELEY RD
LA
RD
HAVILAH
MILRAY
RD
60
PACIFIC HWY
only
HAVILAH LA
KOCHIA LA
TRYON RD
KOCHIA LA
ST
RD
NELSON RD
LA
LINDFIELD AVE
LINDFIELD STATION
BALFOUR
ST
PACIFIC HWY
TRYON
TRYON
RUSSELL LA
BENT
50
TRYON PL
RUSSELL AVE
TRAFALGAR
NEWARK CR
WOODFORD LA
DROVERS WAY
PDE
PACIFIC HWY
LINDFIELD AVE
RD
AVE
MIDDLE HARBOUR
BEACONSFIELD
DROVERS WAY
60
STRICKLAND AVE
AVE
AVERIL PL
CHELMSFORD
WAIMEA RD
GLADSTONE PDE
Key:
Give Way Sign
One-Way
Stop Sign
Traffic Signal
No Right-Turn
Right-Turn Bay
School Zone
Speed Hump
Pedestrian Crossing
Roundabout
60
Speed Limit
Signalised Pedestrian Crossing
VARGA TRAFFIC PLANNING Pty Ltd
Transport, Traffic and Parking Consultants
EXISTING TRAFFIC CONTROLS
FIGURE 4

- a 50 km/h SPEED LIMIT which applies to Lindfield Avenue and all other local roads in the area

- TRAFFIC SIGNALS in the Pacific Highway where it intersects with Balfour Street / Havilah Road

- PEDESTRIAN TRAFFIC SIGNALS in Lindfield Avenue just north of Tryon Road

- a ONE-WAY eastbound restriction in Kochia Lane (between Lindfield Avenue and Chapman Lane)

- a ONE-WAY northbound restriction in Havilah Lane (north of the site where the roadway reduces in width only)

Existing Traffic Conditions

An indication of the existing traffic conditions on the road network in the vicinity of the site is provided by reference to the RMS's *Annual Average Daily Traffic* data. The relevant count stations nearest to the subject site are summarised below.

Roads & Maritime Services of NSW

Annual Average Daily Traffic Volumes

Station No.	Location	1996	1999	2002	2005
00.925	Pacific Highway & Highfield Rd (TCS)	-	54,696	-	54,938
00.924	Pacific Highway & Havilah Rd (TCS)	-	58,902	-	-
00.923	Pacific Highway & Grosvenor Rd (TCS)	58,077	31,289	56,746	-

A more detailed indication of the existing traffic conditions on the road network in the vicinity of the site is provided by peak period traffic surveys undertaken at the following intersections:

1) The Pacific Highway & Balfour Street / Havilah Lane (AM & PM Peak)
2) Lindfield Avenue & Tryon Avenue (AM & PM Peak)
3) Havilah Street & Havilah Lane (PM Peak Only)
4) Kochia Lane & Havilah Lane (PM Peak Only)

The results of the traffic surveys and reveal that:

- two-way traffic flows in the Pacific Highway are typically in the order of 3,300-3,800 vehicles per hour (vph) during the *morning* and *afternoon* peak periods

- two-way traffic flows in Havilah Street are typically in the order of 500-700 vph during the *morning* and *afternoon* peak periods

- two-way traffic flows in Lindfield Avenue are typically in the order of 750-1,200 vph during the *morning* and *afternoon* peak periods
- two-way traffic flows in Tryon Avenue are typically in the order of 400 vph during the *morning* and *afternoon* peak periods

- two-way traffic flows in Kochia Lane are typically in the order of 70-100 vph during the *afternoon* peak period

- northbound traffic flows in Havilah Lane are typically in the order of 60 vph during the *afternoon* peak period.

Projected Traffic Generation

An indication of the traffic generation potential of the development proposal is provided by reference to the former Roads and Maritime Services (RMS) publication *Guide to Traffic Generating Developments, Section 3 - Landuse Traffic Generation (October 2002).*

The RMS *Guidelines* are based on extensive surveys of a wide range of land uses and nominates the following traffic generation rates which are applicable to the development proposal:

> **High Density Residential Flat Buildings in Sub-Regional Centres**
> 0.29 peak hour vehicle trips per dwelling

The RMS *Guidelines* also make the following observation in respect of high density residential flat buildings:

Definition

A *high density residential flat building* refers to a building containing 20 or more dwellings. This does not include aged or disabled persons housing. *High density residential flat buildings* are usually more than 5 levels, have basement level carparking and are located in close proximity to public transport services. The building may contain a component of commercial use.

Factors

The above rates include visitors, staff, service/delivery and on-street movements such as taxis and pick-up/set-down activities.

Reference is also made to the *Trip Generation and Parking Demand Surveys of Shopping Centre Analysis Report (September 2011)* report prepared by *Halcrow* on behalf of the Roads and Maritime Services. The *Halcrow* report provides an update of the traffic generation rates nominated in the RMS *Guidelines* for shopping centres.

The *Halcrow* report is based on extensive surveys of a wide range of shopping centres and nominates the following traffic generation rates which are applicable to the retail component of the development proposal:

Shopping Centres (0-20,000m^2 GLFA)

AM: 1.86 peak hour vehicle trips per 100m^2 GLFA

PM: 3.88 peak hour vehicle trips per 100m^2 GLFA

Application of the above traffic generation rates to the retail and residential components of the development proposal yields a traffic generation potential of approximately 85 vehicle trips per hour during the *morning* commuter peak period and 132 vehicle trips per hour during the *afternoon* commuter peak period as set out below:

Projected Future MOD3 Traffic Generation Potential Peak Network Hour Vehicle Trips		
	Thursday Morning	**Thursday Afternoon**
Supermarket (1,667m^2 GLFA)	31 vph	65 vph
Specialty Retail (661m^2 GLFA)	13 vph	26 vph
Residential (141 Apartments)	41 vph	41 vph
TOTAL	**85 vph**	**132 vph**

In practice however, it is likely that the traffic generation potential of the proposed development will be considerably ***less than*** is suggested in the tables above because:

- a substantial proportion of customers of the supermarket and retail shops are likely to be residents of the proposed development or similar high density potential developments nearby who are railway and bus commuters and will visit the shops when walking home from the bus rail station to purchase "daily needs" items such as bread, milk or fresh food and vegetables which may be required for the evening meal

- vehicular traffic generated by the retail component is likely to include an element of "passing trade" or "linked trips" drawn from *existing* traffic flows which are already using the adjacent road network; for example, a person calling into the shopping the centre on the way home from work. Surveys conducted for the *Halcrow* report found that 46% of shopping centre trips were "linked trips".

That projected future level of traffic generation potential should however, be offset or *discounted* by the volume of traffic which could reasonably be expected to have been generated by the previous MOD2 development proposal, in order to determine the *nett increase (or decrease)* in traffic generation potential of the site which is expected to occur as a consequence of the MOD3 development proposal.

Application of the above traffic generation rates to the various components of the previous MOD2 development yields a traffic generation potential of approximately 78 vehicle trips per hour during the *morning* commuter peak period and 124 vehicle trips per hour during the *afternoon* commuter peak period as set out below:

Previous MOD2 Development – Peak hour Traffic Generation Potential		
	Thursday Morning	**Thursday Afternoon**
Supermarket (1,604m^2 GLFA)	30 vph	62 vph
Specialty Retail (691m^2 GLFA)	13 vph	27 vph
Residential (122 Apartments)	35 vph	35 vph
TOTAL	**78 vph**	**124 vph**

Accordingly, it is likely that the proposed development will result in a *slight increase* in the traffic generation potential the site of approximately 7 vph during the *morning* commuter peak, and 8 vph during the *afternoon* commuter peak period as set out below:

Projected Nett *Increase* in Peak Hour Traffic Generation Potential of the Site as a consequence of the MOD3 development proposal when compared with the previous MOD2 development		
	Thursday Morning	**Thursday Afternoon**
Projected Future MOD3Traffic Generation Potential	85 vph	132 vph
Previous MOD2 Traffic Generation Potential	-78 vph	-124 vph
NETT INCREASE IN TRAFFIC GENERATION POTENTIAL:	**+7 vph**	**+8 vph**

In any event, for the purposes of providing a more *rigorous* traffic assessment, it has been assumed that the site is currently vacant and that all of the projected future traffic flows will be new or *additional* to the existing traffic flows on the adjacent road network.

Traffic Implications - Road Network Capacity

The traffic implications of development proposals primarily concern the effects that any *additional* traffic flows may have on the operational performance of the nearby road network. Those effects can be assessed using the SIDRA program which is widely used by the RMS and many LGA's for this purpose. Criteria for evaluating the results of SIDRA analysis are reproduced in the following pages.

The results of the SIDRA analysis of the Pacific Highway & Havilah Street / Balfour Street intersection are summarised on Table 3.1 below, revealing that:

- under the projected future traffic demands expected to be generated by the MOD2 development proposal, the Pacific Highway & Havilah Street / Balfour Street intersection is expected to operate at *Level of Service "B",* with average vehicle delays in the order of 22-23 seconds/vehicle.

- under the projected future traffic demands expected to be generated by the MOD3 development proposal, the Pacific Highway & Havilah Street / Balfour Street intersection is also expected to operate at *Level of Service "B",* with average vehicle delays in the order of 22-23 seconds/vehicle.

The results of the SIDRA analysis of the Lindfield Avenue & Tryon Avenue intersection are summarised on Table 3.2 below, revealing that:

- under the projected future traffic demands expected to be generated by the previous MOD2 development proposal, the Lindfield Avenue & Tryon Avenue intersection is expected to operate at *Level of Service "A",* with average vehicle delays in the order of 6-7 seconds/vehicle.

- under the projected future traffic demands expected to be generated by the MOD3 development proposal, the Lindfield Avenue & Tryon Avenue intersection is also expected to operate at *Level of Service "A",* with average vehicle delays in the order of 6-7 seconds/vehicle.

In the circumstances, it is clear that:

- the anticipated *Levels of Service* and the surrounding key intersections are the same as those anticipated for the approved MOD1 development

- the proposed development will not have any unacceptable traffic implications in terms of road network capacity, and

- the proposed development does not require any upgrades to nearby roads and intersections.

TABLE 3.1 - RESULTS OF SIDRA ANALYSIS OF PACIFIC HIGHWAY & HAVILAH STREET & BALFOUR STREET

Key Indicators		Previous MOD2 Traffic Demand		Projected MOD3 Development Traffic Demand	
		AM	**PM**	**AM**	**PM**
Level of Service		B	B	B	B
Degree of Saturation		0.784	0.746	0.784	0.736
Average Vehicle Delay (secs/veh)					
Pacific Highway (north)	L	22.7	14.3	22.7	14.7
	T	16.1	16.5	16.1	17.2
	R	50.4	51.7	50.4	53.1
Balfour Street (west)	L	52.4	48.1	52.4	47.2
	T	66.7	55.2	66.7	54.1
	R	73.6	62.1	73.6	61.0
Pacific Highway (south)	L	13.0	23.2	13.0	23.9
	T	14.1	16.2	14.4	16.8
	R	49.6	36.1	50.2	37.7
Havilah Street (east)	L	51.6	47.0	51.9	46.1
	T	61.0	57.3	61.0	55.1
	R	67.9	64.2	67.9	62.1
TOTAL AVERAGE VEHICLE DELAY		**22.2**	**22.3**	**22.3**	**22.7**
		PAC_HAVS		PAC_HAVT	

TABLE 3.2 - RESULTS OF SIDRA ANALYSIS OF LINDFIELD AVENUE & TRYON AVENUE

Key Indicators		Previous MOD2 Traffic Demand		Projected MOD3 Development Traffic Demand	
		AM	**PM**	**AM**	**PM**
Level of Service		A	A	A	A
Degree of Saturation		0.588	0.491	0.590	0.495
Average Vehicle Delay (secs/veh)					
Lindfield Avenue (north)	L	6.4	6.4	6.4	6.4
	T	0.0	0.0	0.0	0.0
Lindfield Avenue (south)	T	5.8	2.5	5.8	2.5
	R	12.3	9.1	12.4	9.1
Tryon Avenue (east)	L	12.2	8.2	12.2	8.2
	R	35.0	23.6	35.2	23.9
TOTAL AVERAGE VEHICLE DELAY		**6.3**	**6.4**	**6.3**	**6.5**

LIN_TRYS PAC_HAVT

Criteria for Interpreting Results of Sidra Analysis

1. Level of Service (LOS)

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'	Good operation.	Good operation.
'B'	Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
'C'	Satisfactory.	Satisfactory but accident study required.
'D'	Operating near capacity.	Near capacity and accident study required.
'E'	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.
'F'	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode.

2. Average Vehicle Delay (AVD)

The AVD provides a measure of the operational performance of an intersection as indicated on the table below which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (ie inner city conditions) and on some roads (ie minor side street intersecting with a major arterial route).

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
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	Operating near capacity.	Near capacity and accident study required.
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.

3. Degree of Saturation (DS)

The DS is another measure of the operational performance of individual intersections.

For intersections controlled by traffic signals[1] both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a roundabout or GIVE WAY or STOP signs, satisfactory intersection operation is indicated by a DS of 0.8 or less.

[1] *The values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs.*

4. CONSTRUCTION TRAFFIC MANAGEMENT PLAN

The construction activities are expected to be undertaken over a duration of approximately 24 months. Working hours are proposed from 7:00am to 6:00pm Monday to Friday and 8:00am to 3:00pm on Saturday, which is a minor variation to Council's standard work hours. No work is to be carried out on Sundays or Public Holidays.

CONSTRUCTON PROGRAM - DURATION AND STAFFING LEVELS		
Stage	**Work**	**Duration**
1	Demolition	2 months
2	Excavation	4 months
3	Construction	18 months

Demolition & Excavation Stage

All spoil will be loaded wholly within the site using a variety of trucks including truck and dog trailers. All trucks will be able to enter and exit the site whilst travelling in a forward direction at all times, under the supervision of an authorised traffic controller.

Construction Stage

All deliveries will be loaded wholly within the site, whenever possible, with the movement of trucks across the footpath during major deliveries to be supervised by an authorised traffic controller.

Works Zone

A Works Zone will likely be required along the Lindfield Avenue and/or Havilah Lane site site frontage at some stage during construction. The Works Zone parking restrictions would apply during construction hours only which are specified above. Works Zones are provided specifically for the set down and pick up of materials and not for the parking of private vehicles associated with the site.

Construction Truck Routes

All heavy vehicles involved in the demolition, excavation and construction of the proposed development would approach and depart the site via Lindfield Avenue and the Pacific Highway.

Authorised Traffic Controllers

Authorised traffic controllers will be required to supervise the movement of all vehicles across the footpath during the demolition and excavation stages of the project. An authorised traffic controller will also be required during the construction stage of the project to facilitate major deliveries to the site, such as concrete pours.

Tradesmen and Concrete Car Parking

The site manager will ensure that adequate on-site parking is available for employee, tradesperson and construction vehicles, whenever practical. Parking shall be provided in the basement car parking area as soon as practicable.

5. PARKING IMPLICATIONS

Existing Kerbside Parking Restrictions

The existing kerbside parking restrictions which apply to the road network in the vicinity of the site are illustrated on Figure 5 and comprise:

- NO STOPPING / NO PARKING restrictions along both sides of Kochia Lane (in between Lindfield Avenue and Chapman Lane) and also Havilah Lane

- ½ HOUR PARKING restrictions along both sides of Lindfield Avenue including along the site frontage

- 1 HOUR PARKING restrictions in Kochia Lane, adjacent to the Council car parking area, in a sawtooth arrangement

- 2 HOUR PARKING restrictions in the Council car parking area located on the northern side of Tryon Avenue

- 2 HOUR PARKING restrictions along both sides of Tryon Avenue

- 4 HOUR PARKING restrictions in the car parking area to the north of the site on No.9 Havilah Lane

- BUS ZONES located on both sides of the Pacific Highway and also Lindfield Avenue

Parking Accumulation Surveys

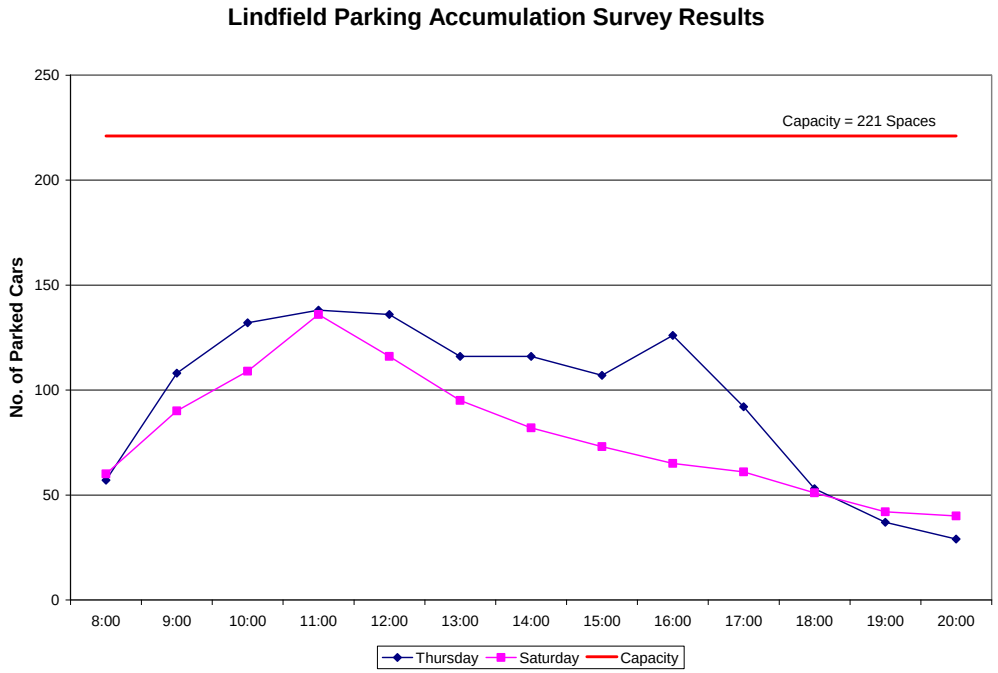
In order to gain an accurate appreciation of the general availability of car parking on the subject site and in the surrounding area (including the adjacent road network), a detailed survey of car parking accumulation was undertaken between 8:00am-8:00pm on a Thursday and Saturday as part of the traffic study for the previously approved development on the site.


NO PARKING 6-10am
1P
HAVILAH RD
LINDFIELD AVE
4 Hour Public Carpark
1/2P
HAVILAH LA
MILRAY
ST
KOCHIA LA
1P
2 Hour Public Carpark
2P
TRYON ST
(AM/PM)
LZ
CLEARWAY AM
CLEARWAY PM
BZ
PACIFIC HWY
MZ
TRYON PL
TX
NO PARKING 7-9am, 3-6pm
TRYON LA
N
W
E
S
Key:
No Stopping
No Parking
Restricted Parking
BZ Bus Zone
TX Taxi Zone
MZ Mail Zone
VARGA TRAFFIC PLANNING Pty Ltd
Transport, Traffic and Parking Consultants
EXISTING PARKING RESTRICTIONS
FIGURE 5

The results of the parking accumulation surveys are reproduced in full in Appendix A and reveal that:

- the site has a car parking capacity of approximately 54 spaces
- there are an additional 9 spaces adjacent to the site at No.9 Havilah Lane (former Council car park)
- there are 122 spaces in the Tryon Avenue and Kochia Lane public car parking areas
- there are a further 36 kerbside spaces along both sides of Lindfield Avenue in the vicinity of the site
- Thursday's peak parking demand occurred at 11:00am when there was 138 parked cars recorded, leaving 83 vacant spaces
- Saturday's peak parking demand also occurred at 11:00am when there was 136 parked cars recorded, leaving 85 vacant spaces

The cumulative results of the parking accumulation surveys are summarised on the graph below, confirming that substantial spare car parking capacity is readily available in the vicinity of the site at all times, both during business hours and after hours.



Off-Street Parking Provisions

The off-street parking requirements specified in Council's *Local Centres Development Control Plan* document are as follows:

	Minimum Number of Parking Spaces per Dwelling	**Maximum Number of Parking Spaces per Dwelling**
Studio:	0.0 space	0.5 spaces
One Bedroom:	0.6 spaces	1.0 space
Two Bedrooms:	1.0 space	1.25 spaces
Visitors:	1.0 space	1.5 spaces
Three or More Bedrooms:	1.0 space / 6 dwellings	1.0 space / 6 dwellings
Shops, Including Restaurants and Cafes	1 space per 33m^2 GFA	1 space per 26m^2 GFA

Application of the above parking requirements to the retail and residential components of the development proposal yields an off-street parking requirement of in the range 217 to 287 spaces as set out below:

Off-Street Parking Requirements

	Minimum	**Maximum**
Residential (141 Apartments):	111.4 spaces	159.0 spaces
Residential Visitors:	23.5 spaces	23.5 spaces
Retail (2,720m^2 GFA):	82.4 spaces	104.6 spaces
TOTAL PARKING REQUIRED:	**217.3 spaces**	**287.1 spaces**

The proposed development makes provision for a total of 255 off-street car parking spaces, comprising 155 residential spaces, 24 residential visitor spaces, 76 retail spaces (including 14 spaces for staff) plus a carwash bay, thereby satisfying Council's DCP parking requirements.

Whilst it appears that there is a shortfall of 6 parking spaces for the retail component when assessed against Council's requirements, the proposed parking provision of 76 retail spaces (including 14 spaces for staff) is equivalent to 1 space per 36m^2 GFA whereas the previous MOD2 retail parking provision was equivalent to 1 space per 44m^2 GFA for the retail component. That increase in retail car parking is consistent with recent DOP request to provide additional retail car parking on the site.

In addition, the *actual* parking demands likely to be generated by the site is expected to be *less* than is suggested by the car parking code, as a substantial proportion of retail customers are expected to be railway and bus commuters who will stop at the shops or supermarket when *walking* home from the bus/rail station to purchase smaller, "daily needs" items such as bread, milk or fresh food and vegetables which may be required for the evening meal.

In the circumstances, it is reasonable to conclude that the proposed provision of 255 off-street car parking spaces will comfortably satisfy the needs of the development.

The geometric design layout of the proposed car parking facilities have been designed to comply with the relevant requirements specified in the Standards Australia publication *Parking Facilities Part 1 - Off-Street Car Parking AS2890.1* in respect of parking bay dimensions, ramp gradients and aisle widths.

Loading/servicing for the proposed development is expected to be undertaken by vehicles up to and including 11m long medium rigid trucks. The loading dock is to be located at the rear of the site, off Havilah Lane. The loading dock has been designed to accommodate the swept path turning requirements of these trucks, with the aid of a truck turntable.

The management plan prepared by the prospective occupant of the supermarket indicates that:

- a maximum of 19 deliveries are expected on Mondays

- the number of deliveries will decrease progressively throughout the week, with only 3 deliveries expected on Sundays.

In addition, the proposed loading dock will also be used by the other retail shops proposed on the site. In this regard, the supermarket's loading dock manager will liaise with the centre's loading dock manager (who will be responsible for all other parties that share the use of the loading dock) to ensure that arrivals and departures are coordinated in an efficient manner.

In summary, the proposed parking facilities satisfy the relevant requirements specified in both Council's Parking Code as well as the Australian Standards and it is therefore concluded that the proposed development will not have any unacceptable parking and loading implications.