

Appendix A

Background Document Review Summary Table

Table A.1: Summary of Background Documents

Documents	Major Conclusions and Recommendations
Ku-ring-gai LEP (Local Centres) 2012;	Set car parking requirements, zoning and height limits for certain sites.
	<p>A number of distinct precincts are proposed for Lindfield.</p> <ul style="list-style-type: none"> ♦ L1 – Balfour Street retail area ♦ L2 – Pacific Highway retail area ♦ L3 – Tryon Place mixed use area ♦ L4 – Tryon Road and Lindfield Avenue retail area ♦ L5 – Lindfield Community Hub ♦ L6 – Buildings in R4 zones
	<p>A selection of the proposed community infrastructure includes:</p> <ul style="list-style-type: none"> ♦ Construction of a new Balfour Lane on the south-western boundary of the site which retains the current level of access to properties fronting the Pacific Highway. The lane will have footpaths both sides of the carriageway and include a landscape zone with significant screen planting along the western edge side of the lane. (Land dedicated to Council as part of site redevelopment). ♦ Extended right turn bay on Pacific Highway and Balfour Street/Havilah Road intersection. ♦ Construction of a new 12 metre wide two-way street (realigned Drivers Way) between Beaconsfield Parade and Bent Street including on-street parking. ♦ A new kiss-and-ride zone and taxi ranks on Woodford Lane. ♦ Upgrade and widening of Bent Lane including new footpaths (additional land dedicated to Council as part of redevelopment of adjoining sites). ♦ Upgrade and widening of Woodford Lane including new footpaths (additional land dedicated to Council as part of redevelopment of adjoining sites). ♦ Tryon Lane is retained and improved with new footpaths and car parking. ♦ Construction of new two way lane between Pacific Highway and Tryon Lane (land dedicated to Council as part of site redevelopment) with footpaths. ♦ A new town square at Tryon Place including: the closure of Tryon Place to vehicle traffic (emergency vehicles excepted); installation of high quality paving, furniture and new tree planting; and disabled parking for the rail station. ♦ Installation of new traffic signals at the intersection of Tryon Road and Lindfield Avenue (and removal of existing pedestrian activated traffic signals on Lindfield Avenue). ♦ A new pedestrian lane way from Lindfield Ave to Havilah Road (land for access way dedicated to Council). ♦ A new pedestrian lane way from Havilah Lane to Milray Street (land for access way dedicated to Council). ♦ Widening and modification of Kochia Lane and Havilah Lane including new footpaths both sides. ♦ Upgrade and widening of Havilah Lane including new footpaths (additional land dedicated to Council as part of redevelopment of adjoining sites). ♦ Other works to be undertaken and funded by the State Government include the construction of a new 240 space commuter car park and a new kiss and ride area (Transport for NSW).
Ku-ring-gai DCP (Local Centres) 2013	<p>Building setbacks are shown in Figure 1E.3-1.</p> <p>A number of pedestrian through site links are proposed along with new awnings to improve the pedestrian environment. Figure 1E.5-1.</p> <p>For Precinct L1 and L2, active frontages are proposed for Pacific Highway, Balfour Street, Bent Street and Beaconsfield Parade and Bent Lane and Woodford Lane wherever possible.</p> <p>For Precinct L3 and L4 active frontages are proposed for Tryon Place, a new lane, Tryon Lane, Kochia Lane, Chapman Lane, Lindfield Avenue, Tryon Road, to the proposed town square and to Havilah Lane and Milray Street (wherever possible).</p> <p>For Precinct L5 and L6 active frontages are proposed to the new park, Woodford Land and the street (re-aligned Drivers Way) and supporting active frontages wherever possible.</p> <p>Vehicle and pedestrian access points to each lot are indicated in Figure 1E.6-1.</p>

Ku-ring-gai Public Domain Plan	<p>Identifies a number of objectives and principles that should be followed in relation to:</p> <ul style="list-style-type: none"> ♦ Pedestrian access and circulation ♦ Integrated transport ♦ Vehicle access and circulation ♦ Other public domain design criteria. <p>This document was used as a reference in the DCP preparation.</p>
Ku-ring-gai Contributions Plan 2010	<p>Summarises a range of projects to be completed in the Lindfield Local Centre between 2004 and 2031. It includes a total of approximately \$20M for the identified works in the areas of:</p> <ul style="list-style-type: none"> ♦ Traffic signals and intersections ♦ New streets ♦ Road modifications ♦ Transport ♦ Through-Block connections ♦ Streetscape improvements ♦ Street pedestrian lighting ♦ Undergrounding of overhead power lines ♦ Street tree planting. <p>A detailed plan is provided which demonstrates where the projects will be completed.</p>
Ku-ring-gai Town Centres Parking Management Plan	<p>The recommendation for Lindfield from the ARUP parking study is:</p> <p><i>"Provide future car parking on site in major retail/commercial and mixed use developments in accordance with Council's Town Centres LEP 2006 and retaining existing public car park numbers.</i></p> <p><i>Additional public car parking will be provided on the western side of the Pacific Highway/Railway Line primarily through the construction of new roads between Beaconsfield Parade, Bent Street and Balfour Street."</i></p> <p>The document also has a number of strategies and recommendations in relation to car parking rates, enforcement, how parking should be provided in Town Centres, resident parking (that it not be introduced), commuter parking, parking restrictions, bicycle parking, motorcycle parking, school parking, taxi zones and clearways.</p> <p>The plan also identified long and short-term parking strategies for the eastern and western sides of the Lindfield Local Centre. During the construction of new facilities, strategies to replace the lost short-term parking area identified.</p> <p>A map is provided which demonstrates the proposed long-term parking restrictions across the Lindfield Local Centre.</p>
Ku-ring-gai Councils Submission to the Draft Metropolitan Strategy for Sydney 2031	<p>The submission by Council provides commentary on key aspects of the chapters of the Draft Metropolitan Strategy for Sydney 2013 (March 2013) that are of particular interest and relevance to the Ku-ring-gai Local Government Area. The submission raised concerns that the revised dwelling targets in the draft Metro Strategy changed the target delivery period from 2004-2031 in the original Draft Metropolitan Strategy (2005) and thence, 2006-2036 in the Draft Metropolitan Plan for Sydney 2036 (2010) to 2011-2031 in the current draft Strategy. It was understandable that the revised Metro Strategy should look forward from the latest census, but that this should also recognise Ku-ring-gai's effective delivery of a significant number of new dwellings approved from 2004 onwards.</p>
Lindfield Town Centre Traffic Study (Arup, 2006 and 2008)	<p>Provides a detailed study of the existing intersection operation across the study area, looks at the proposed future growth of the centre and identifies some potential future road network improvements to increase capacity.</p>
Lindfield Town Centre Traffic Improvement Concept Plan	<p>The concept plan prepared by Ku-ring-gai Council provides detail around the proposals for new roads and alterations to Pacific Highway, new signalised intersections, changes to parking restrictions and traffic calming measures.</p>
Ku-ring-gai Bicycle Plan	<p>On-road bicycle facilities are proposed for Lindfield Avenue, Nelson Road, Trafalgar Avenue, Highfield Road, Wallace Parade and Balfour Street connecting under the train line, Russell Avenue, Kochia Lane</p>
Draft Ku-ring-gai Pedestrian Access and Mobility Plan	<p>Maps the existing pedestrian infrastructure across the Local Centre and summarises the existing barriers and constraints for pedestrian movement around the Lindfield Local Centre. The PAMP also has a number of recommended upgrades across the Local Centre. The majority of these include installation of pedestrian fencing across Pacific Highway, improved lighting, improved footpath quality and some new footpaths.</p>

<p>State agency consultation with Roads and Maritime Services regarding the Lindfield Town Centre Traffic Improvement Concept Plan 2008</p>	<p>Ku-ring-gai Local Centres - Planning Proposal Item GB,8 Ordinary Meeting of Council - 3 April 2012</p> <ul style="list-style-type: none"> • <u>9.5 Lindfield Local Centre - Land Use Strategy</u> (page 94) "Key Site No. 1 (corner Tryon Place) - height increased to 23.5 metres (7 storeys) to allow redevelopment of existing shops ... " - RMS has concerns regarding increased traffic flows which will be generated by the redevelopment of the existing retail. Additional traffic generated from Key Site No.1, the impact on signalised intersections within and surrounding the local centre, as well as pedestrian improvements around the site, should be assessed with development as it occurs. <p><u>Planning Proposal Ku-ring-gai Local Centres Local Environmental Plan</u></p> <ul style="list-style-type: none"> • RMS raises no objection to the proposed zoning amendments as there will be minimal impact upon the Pacific Highway. <p>Proposed Road Traffic Improvements</p> <ul style="list-style-type: none"> • RMS raises no objection to the realignment of Balfour Lane, the extension of parking restrictions in Balfour Street, the extension of Tryon Place southward to a new connecting road, a pedestrian only connection between the Pacific Highway and the new access lane at Tryon Lane, the extension of parking restrictions on Grosvenor Road, and the new local road connection between Beaconsfield Parade and Bent Street, as detailed in the Lindfield Local Centre, Proposed Road Traffic Improvements Plan (dated 11/7/2012). • RMS raises no objection to the signalisation of the Pacific Highway and Strickland Avenue intersection to provide dual right turn lanes out of Strickland Avenue into the Pacific Highway. • RMS raises no objection to the proposed one-way traffic direction on Havilah Road, between the Pacific Highway and Lindfield Avenue or to the extension of the right turn bay on the Pacific Highway (by 55 metres), for traffic turning right into Havilah Street from the Pacific Highway. <p>These improvements are consistent with the RTA's (now RMS) advice dated 24 October 2008.</p> <ul style="list-style-type: none"> • RMS raises no objection to the signalisation of the Tryon Road and Lindfield Avenue intersection <p>RMS reiterates its advice dated 24 October 2008 for the Lindfield Local Centre:</p> <p>"The RTA [now RMS] recommends the removal of the Burleigh Street signal phase and to restrict movements on Burleigh Street to left in/left out only."</p>
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Appendix B

Transport Stakeholder Issues Workshop Minutes

Meeting Minutes

Job Number:	13S170	Rep	Alan Stewart	Date:	20/09/13
Job Name:	Lindfield Local Centre – Transport Network Study			Time:	10:00am-12:00pm
Client:	Ku-ring-gai Council			Location:	Ku-ring-gai Council Offices, Gordon
Purpose:	Stakeholders Issues Meeting				
Attendees:	Joseph Piccoli (JP) – KMC Bill Royal (BR) – KMC Noah Tranter (NT) – KMC Alan Stewart (AS) – Project Director, PeopleTrans Matthew Houlden (MH) – Project Manager, PeopleTrans Matthew James (MJ) – TfNSW Sam Ward (SW) – TfNSW Divna Cvetojevic (DC) – RMS Owen Hodgson (OH) – RMS				
Apologies:	Anissa Levy - TfNSW, Ennio Morrison - RMS, Kathryn Hawkins - RMS, Peter McCue - PCAL, Simon Kinnear - TMA, Tony Biddle - TfNSW, Tonu Aisatullin - TfNSW, Tom Longworth - TMA, Steven Scott - Transdev, Maria Leotta - KMC.				
Distribution:	All Attendees				
Item				Action	Date
1.	Round table introductions were conducted.			Note	NA
2.	BR provided background to the study which was initiated by TfNSW's proposal for commuter car parking at Lindfield and Council's desire to consolidate community facilities into a more centralised location within the Town Centre.			Note	NA
3.	AS explained that the key purpose of this meeting was to identify things that were important to consider as part of the study and further to identify key land use and transport issues. AS further explained that a number of external stakeholders had been invited but they had either declined or simply not responded despite follow-ups.			Note	NA
4.	AS introduced the objectives of the study and the program which was being worked to and outlined the progress that had been made to date. A proposed land use map was tabled which was going to form the basis of the analysis undertaken. Council agreed to review this and provide comment.			KMC	WE 27/09/13

Item		Action	Date
5	BR indicated that they were hoping to take a report on the Masterplan to Council in the first 1-2 weeks of December and it would be useful to get some initial results of the modelling as soon as possible in November.	PeopleTrans	TBC
5.	MJ indicated that TfNSW's preference for the location of the commuter car parking was to consolidate it into one location on the western side of Pacific Highway but did acknowledge that they would consider splitting it only if there were strong reasons for doing this.	Note	NA
6	Council indicated that they are firming up the land use options for the Masterplan site on the western side of the Pacific Highway which should be finalised and provided with the next 2-3 weeks.	KMC	As soon as available
7.	<p>AS outlined the current landscape as it related to each individual mode of transport as follows.</p> <p>General Traffic – Queuing at Balfour Road/Pacific Highway Intersection & Grosvenor Road/Pacific Highway intersection. Current traffic volumes on the Pacific Highway indicate much higher volumes during the AM peak period inbound compared to the PM outbound or Saturday (both directions).</p> <p>Buses – Typically very low occupancy during the AM, PM & Sat Peak Periods. Bus stop environment is good with shelter and buses have no operational issues accessing the bus stops.</p> <p>Bicycles – Lindfield Avenue is a key commuter route during the AM (southbound) & PM (northbound) weekday peak periods. Lindfield is not a destination for bikes.</p> <p>Taxis – Taxi rank in Lindfield Avenue is quite heavily utilised by waiting taxis but this location appears to be a dispatch location rather than used for pickup of passengers at Lindfield Station.</p> <p>Kiss & Ride - There is informal kiss ride activity taking place in Woodford Lane. This is an attractive location due to being able to access and egress easily from the north. There may be opportunities to provide more kiss & ride closer to the station.</p> <p>Pedestrians/Safety – During the AM & PM weekday peak hours the movement of people is defined primarily by the arrival and departure times of the trains. The pedestrian crossing across the Pacific Highway poses a safety risk due to the long wait time and narrowness of the central median island. This was demonstrated by video.</p>	Note	NA

Item		Action	Date
8	There was a break for morning tea.	Note	NA
9	<p>AS put up a 3 x Powerpoint slides with the following headings:</p> <ol style="list-style-type: none"> 1. Important things for this study 2. Key Land Use Issues 3. Key Transport Issues <p>These were documented and have been prepared in a separate table attached to these minute.</p>	Note	NA
10	AS indicated that the next steps were to finalise the data analysis and complete the existing commuter model. The next stakeholder meeting was planned towards the end of November 2013.	Note	NA
	The meeting closed at 11:30am.	Note	NA

Lindfield Local Centre Transport Model

Summary of Issues from the First Workshop 20/9/13

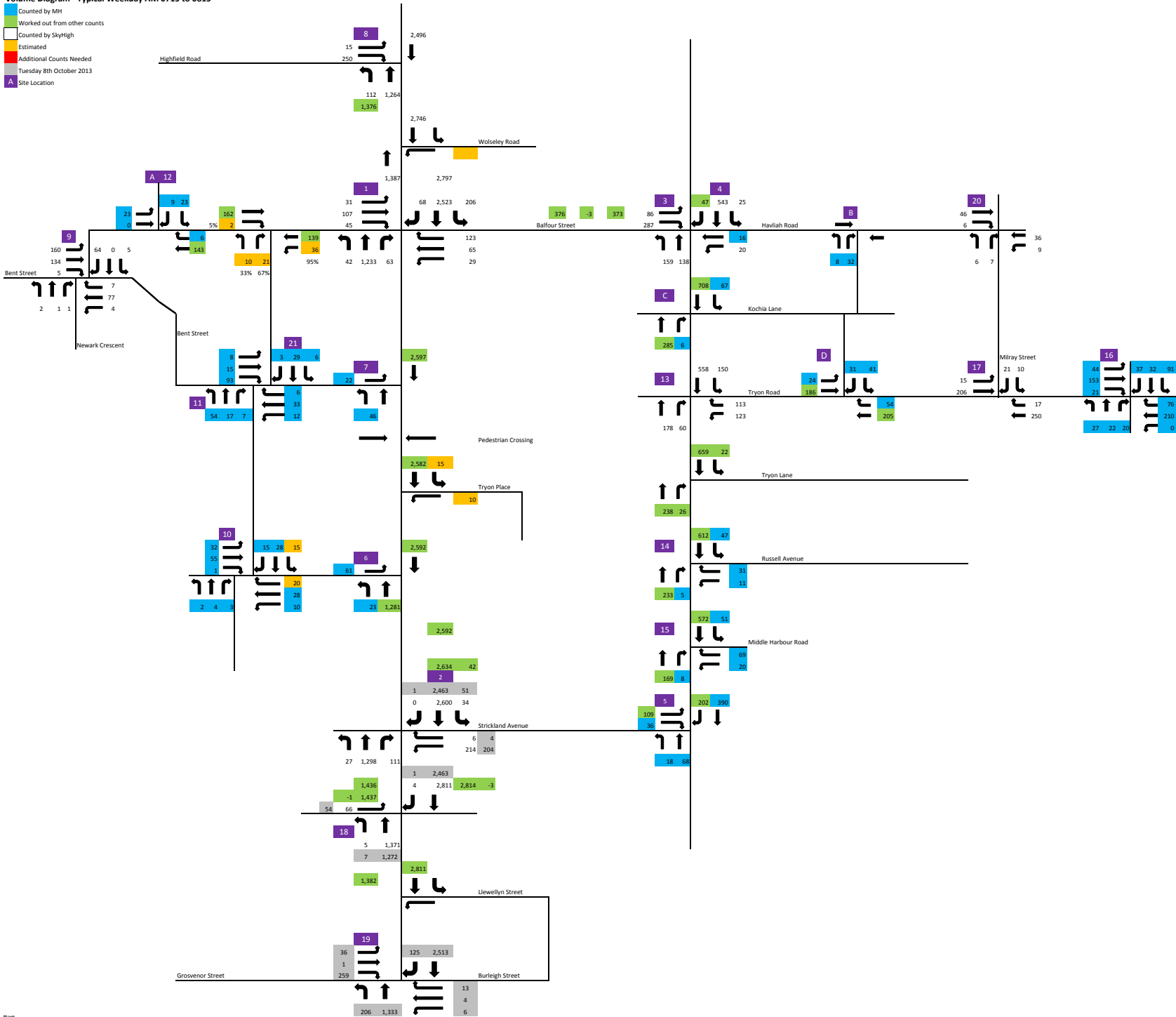
Category	Issue
Land Use	<ul style="list-style-type: none"> Existing community facilities are spaced out across the Local Centre. There is a clear disconnect between the east and west side of Lindfield resulting from the barrier of Pacific Highway and the railway line.
Pedestrians	<ul style="list-style-type: none"> Pedestrian crossing (safety) across Pacific Highway – potential above grade crossing (not part of initial scope). Disabled access, check draft PAMP for existing issues. Intersection of Havilah Road / Lindfield Avenue and the underpass is difficult to cross.
Bicycles	<ul style="list-style-type: none"> No major issues at the moment but the community hub is expected to become a destination.
Taxis	<ul style="list-style-type: none"> No major issues identified. Taxi rank is primarily used as a lay-up before getting calls for jobs.
Train	<ul style="list-style-type: none"> No major issues identified. New timetable coming in late October.
Parking	<ul style="list-style-type: none"> 240 space commuter car park – preference to all be together but if significant constraints, they could be split. Clearways – how could any changes impact Lindfield – include consideration of other parking issues along the highway. Motorcycles and scooter parking consideration for new car park.
Kiss and Ride	<ul style="list-style-type: none"> Informal Kiss & Ride operating in Woodford Lane. Tryon Place also used as well as the west side of Pacific Highway (small amount). Could the existing pedestrian crossing on Pacific Highway be relocated to Tryon Place.
Buses	<ul style="list-style-type: none"> No major issues identified in the study area. Potential for bus lanes on Pacific Highway if no parking (if warranted).
Loading / Heavy Vehicles	<ul style="list-style-type: none"> No major issues identified.
Cars and Road Network	<ul style="list-style-type: none"> Bent Lane / Balfour Street – narrow, two way access. Consideration of Council traffic scheme and necessary input from RMS if anything changes as a result of our study. What changes would be required if scheme is implemented.

Appendix C

AM, PM & Saturday Peak Hour Traffic Survey Summary

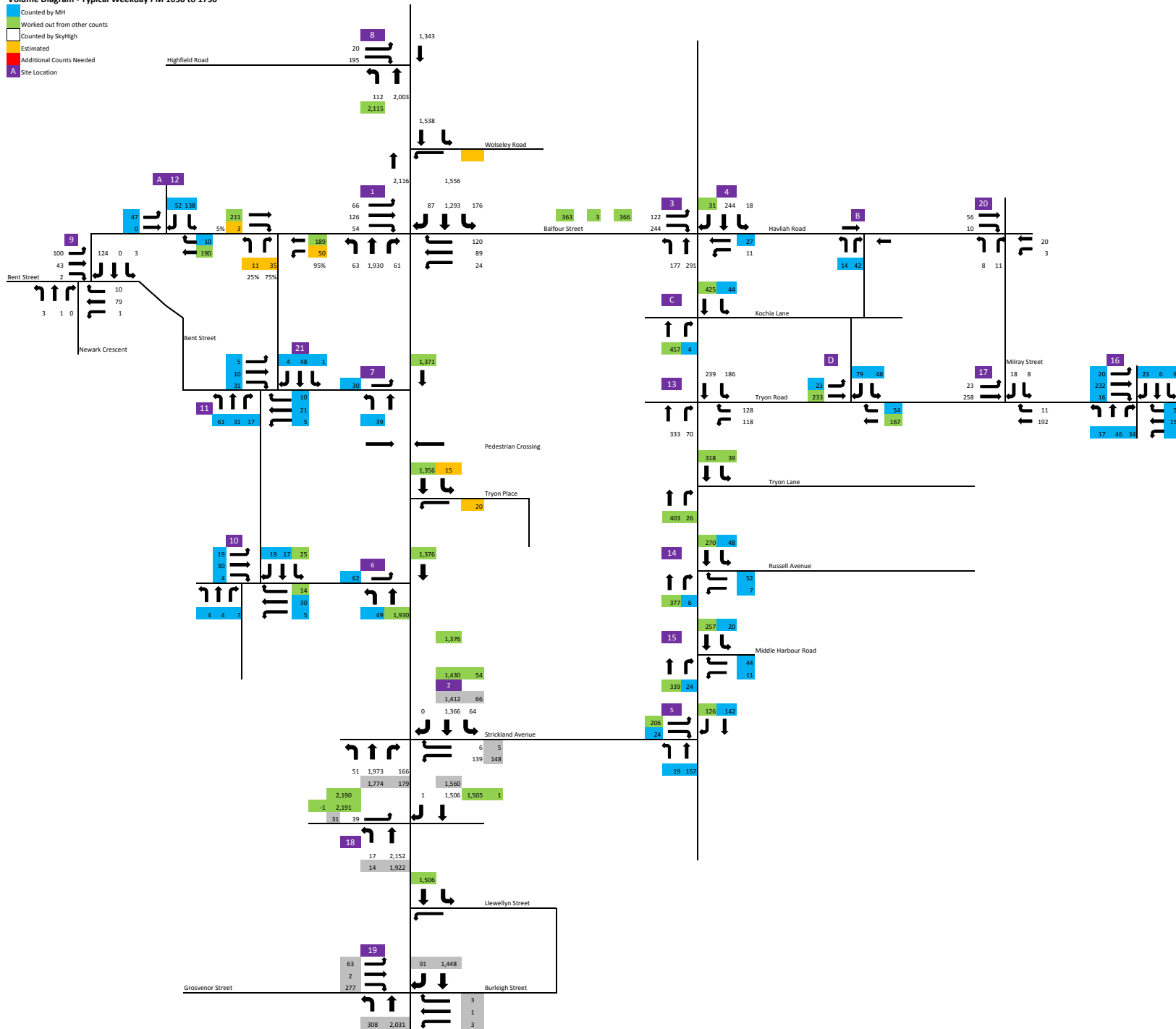
135170 - Lindfield Local Centre Transport Model
Volume Diagram - Typical Weekday AM 0715 to 0815

- Counted by MH
- Worked out from other counts
- Counted by SkyHigh
- Estimated
- Additional Counts Needed
- Tuesday 8th October 2013
- Site Location



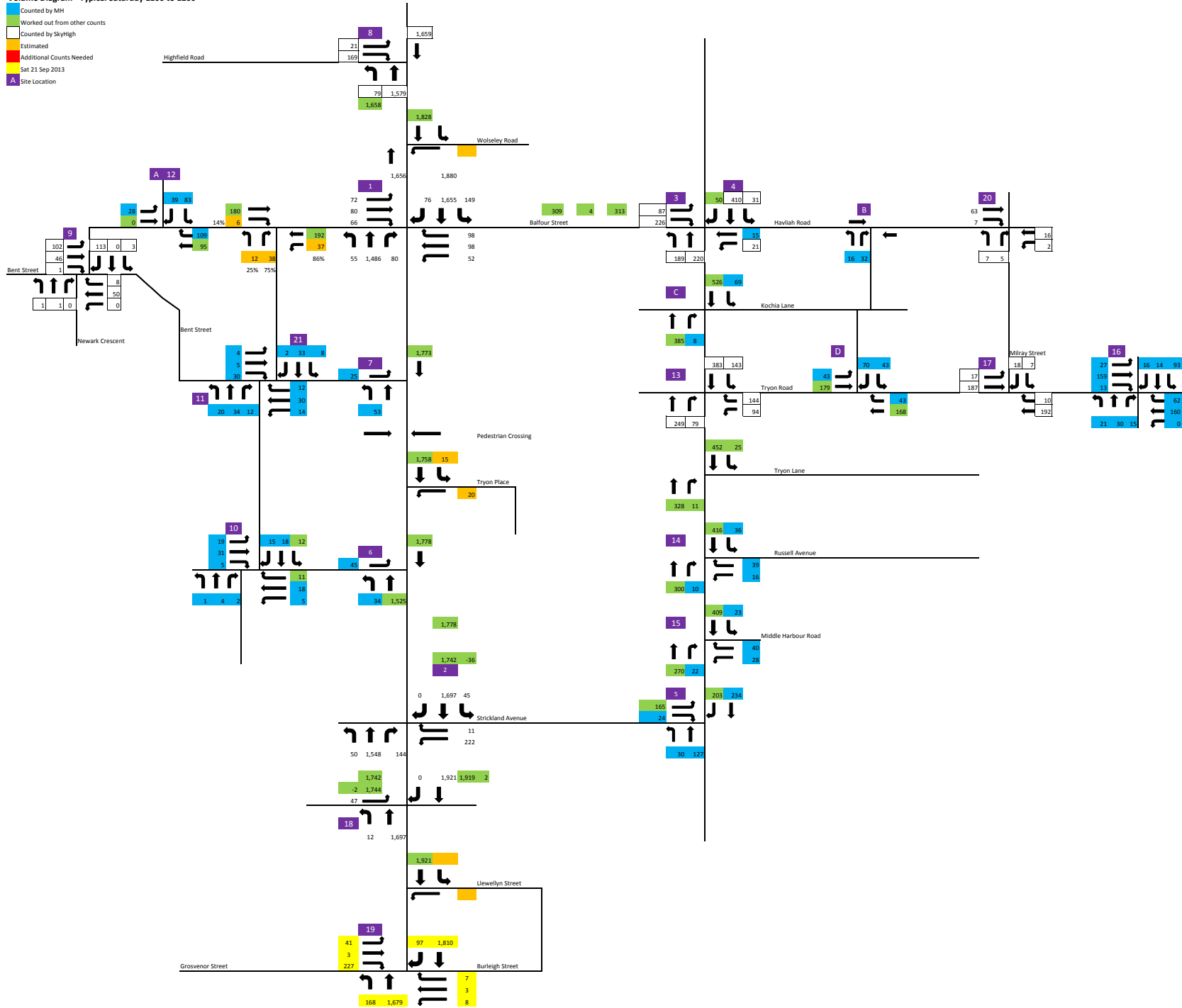
13S170 - Lindfield Local Centre Transport Model
Volume Diagram - Typical Weekday PM 1630 to 1730

- Counted by MH
- Worked out from other counts
- Counted by SkyHigh
- Estimated
- Additional Counts Needed
- Site Location



13S170 - Lindfield Local Centre Transport Model
Volume Diagram - Typical Saturday 1100 to 1200

- Counted by MH
- Worked out from other counts
- Counted by SkyHigh
- Estimated
- Additional Counts Needed
- Sat 21 Sep 2013
- Site Location



Appendix D

Ku-ring-gai LGA – Residential Apartment Ratio Assessment (2-bedroom versus 3-bedroom)

Approved RFB Yield Within Lindfield Local Centre

(Provided by Ku-ring-Gai Council 16/09/13)



Site	Property No.	Description	Bedrooms				Total
			1	2	3	4	
2-6 Wolseley Road	134202	18 units	4	12	2	0	18
20-22 Tryon Road	131800	26 units	2	7	15	2	26
5,5A,7 Gladstone Parade	112370	27 units	1	19	7	0	27
5-9 Woodside Avenue (2B Havilah Road)	142710	27 units	0	10	17	0	27
		Ave %					
7-15 Milray Street	142803	58 units	0	18	40	0	58
2-8 ,Milray Street, 10 Havilah Lane	120814	72 units	0	12	57	3	72
9-25 Tryon Road	131606	74 units	0	9	65	0	74
		Ave %					

Site	Property No.	Description	Bedrooms				Total
			1	2	3	4	
2-6 Wolseley Road	134202	18 units	22%	67%	11%	0%	100%
20-22 Tryon Road	131800	26 units	8%	27%	58%	8%	100%
5,5A,7 Gladstone Parade	112370	27 units	4%	70%	26%	0%	100%
5-9 Woodside Avenue (2B Havilah Road)	142710	27 units	0%	37%	63%	0%	100%
		Ave %	8%	50%	39%	2%	
7-15 Milray Street	142803	58 units	0%	31%	69%	0%	
2-8 ,Milray Street, 10 Havilah Lane	120814	72 units	0%	17%	79%	4%	
9-25 Tryon Road	131606	74 units	0%	12%	88%	0%	
		Ave %	2%	28%	69%	2%	

**ADOPT 60/40 Ratio
for future residential
30 units or less**

**ADOPT 30/70 Ratio
for future residential
30 units and above**

Appendix E

Modelling Methodology, Assumptions & Traffic Generation Calculations

Lindfield Modelling Methodology, Assumptions and Traffic Generation Note

This note outlines the proposed future land use options modelling methodology and the underlying assumptions utilised in determining the future traffic demands or traffic generation for the Lindfield Transport Network Model study. The modelling methodology is also represented graphically in Attachment 1.

The approach consisted of the following key tasks following acceptance by RMS and Council of the existing 2013 Base AM, PM and Saturday Commuter Transport Models.

1.1 Prepare Future Baseline Traffic Models (AM, PM & Saturday) – 2023 Year

In the case of Lindfield, this would incorporate the following land uses as indicated in Attachment 2:

- ◆ Approved DA traffic matrices (Includes site M1)
- ◆ Anticipated Council Town Centre LEP Development take up traffic matrices (Includes residential sites R1-R13 and sites M2 & M3)
- ◆ Committed short term infrastructure projects i.e. (Lindfield Avenue/Tryon Road Traffic Signals)

The project team has qualified that the anticipated LEP development above is generally consistent with the Bureau of Transport Statistics 10 year population and employment growth projections for the Lindfield Travel Zone Areas TZ2578 and TZ2580.

1.2 Prepare Future Land Use Options Traffic Models (AM, PM & Saturday) – 2023 Year

In the case of Lindfield this incorporated the Woodford Lane Land Use Options (A-E) traffic demand matrices as also indicated in Attachment 2.

- ◆ Run 2023 Models with each of the five Woodford Lane Land Use Options A-E traffic (AM/PM/SAT) and compare impacts against the Baseline to determine a preferred Woodford Lane Land Use Option.
- ◆ Undertake an iterative assessment of transport management measures in support of the preferred Woodford Lane Land Use Option.

In order to test the traffic and transport implications of potential development options these base models needed to be modified to reflect expected future conditions.

The types of changes applied to the base models included:

- ◆ Additional demands due to existing site development approvals, which are expected to be taken up in the near-term;
- ◆ The additional demands associated with the land use options under consideration for the town centre as a whole; and
- ◆ Potential committed changes to the road infrastructure to support these land uses.

2. Future Traffic Demand & Trip Distribution Assumptions

2.1 Future Demands

The future demands or traffic generation that were analysed using the commuter transport model were determined based on projections of future land use for the Lindfield Town Centre. The calculation of these future demands and how they are spatially distributed within the network are important inputs into the transport model.

The details of the future demands and spatial distribution together with the supporting assumptions are described in the following sections.

2.2 Traffic Generation Rates

The traffic generation rates used for the proposed land uses have been sourced primarily from the RMS' latest trip generation research, particularly as it relates to medium and high density residential apartments, supermarkets and speciality retail land uses.

The medium and high density residential rates take account of the effects of public transport accessibility as it relates to some trips being taken by public transport which is relevant in the context of Lindfield with good access to rail and buses on the Pacific Highway.

Industry recognised directional in/out balances for the various land uses have been applied as follows:

- ◆ Residential – AM (20% In/80% Out); PM (60% In/40% Out)
- ◆ Retail – AM/PM (50% Out/50% In)
- ◆ Community – AM/PM (50% In/50% Out)
- ◆ Commuter – AM (100% In/0% Out); PM (90% In/10% Out).

Other important assumptions adopted which relate to traffic generation and land use include the following:

2.2.1 Residential

- ◆ All new residential apartments with 30 units or less have been classified as medium density.
- ◆ New medium density residential apartments consist of 60% three bedrooms and 40% two or less bedrooms based on recent DA information provided by Ku-ring-gai Council.
- ◆ All new residential apartments with 30 units or more have been classified as high density.
- ◆ New high density residential apartments to consist of 30% two bedrooms or less and 70% three or more bedrooms based on recent DA information provided by Ku-ring-gai Council.
- ◆ New residential apartment sizes assumed to be 110m² (2 beds) and 150m² (3 beds) as utilised on other Ku-ring-gai Local Centre projects.

2.2.2 Retail

- ◆ A factor of 0.75 has been applied to retail floor spaces quoted as gross floor area (GFA) to provide a gross leasable floor area (GLFA) figure consistent with the retail rates as recommended by RMS.
- ◆ The AM weekday peak hour trip generation is 50% of the PM peak hour trip generation reflecting the low level of retail activity during this time period.

2.2.3 Community Uses

- ◆ A traffic generation rate of 1 movement per 2 spaces has been estimated for the weekday AM peak hour (30 movements in and out).
- ◆ A traffic generation rate of 1 movement per space has been estimated for the weekday PM and Saturday midday peak hours (60 movements).

2.2.4 Station Commuter Parking

- ◆ 50% of all commuters enter the car park during the weekday AM traffic peak hour, with the remaining 50% entering prior to the traffic peak hour.
- ◆ 25% of all commuters leave the car park during the weekday PM traffic peak hour.
- ◆ A proportion of this car parking will be by users who currently park within Woodford Lane, as well as those who park on-street in the general area around the station precinct. It is assumed that vehicles that might be attracted to these proposed spaces from existing on-street parking would be net additional to the model area, as they may currently park further from the station than the model extents.

2.2.5 Council Car Park

The existing Council car park, which contains 40 unrestricted and 72 time-restricted parking spaces, will be replaced within the development. The traffic model will direct vehicles to park in these incremental spaces where they present a more attractive option than other spaces in the surrounding streets.

3. Traffic Discounts

Traffic discounting within a town centre environment is often something which is overlooked resulting in an overestimation of traffic generation and ultimately an overestimation of the impacts. The key traffic discounts which can be applied to this study are as follows:

- ◆ Multi-Purpose Trips (sometimes referred to as Non-Diverted Linked Trips) – Shoppers already coming to the town centre who extend their stay to visit the new retail development.
- ◆ Pass-By Trips (sometimes referred to as Diverted Linked Trips) – Shoppers already passing the site that divert to the new retail development.

RMS research¹ states however that for **new retail development within existing Town Centres** that a **20% reduction can be applied** to the total generation into the site encompassing primarily multi-purpose trips.

No trip reduction has been applied for residential uses and only a 10% trip reduction has been applied to community uses based on the fact that the community facilities will include function rooms with not as many multi-purpose trips resulting from this use.

¹ RMS Guide to Traffic Generating Developments 2002, Page 3-7 & RMS Linked Trips and Traffic Generation Review Summary Report, 1987, Page 12&13.

It is also important to ensure that with any traffic generation calculation that the existing trips associated with the existing land uses are deducted as these trips are already accounted for within the existing traffic currently on the road network.

The future demands for the residential LEP and Woodford Lane land use development sites are included in Attachment 3.

4. Future Network Distribution

The spatial distribution of future trips onto the network is influenced not only by the type of trip to be made but also by other factors like the configuration of the road network and the location of the site access relative to the network.

The three main types of trips applicable to the Lindfield Town Centre are residential, retail/town centre and commuter.

Information used in determining the trip distribution for these trip types are set out below.

4.1 Residential

The source for determining the spatial distribution for residential land uses was a combination of the existing traffic distributions within the base model as well as the Journey to Work Census data i.e. Where Lindfield residents work?

4.2 Retail/Commercial

The source for determining the spatial distribution for retail/commercial land uses relate to a notional catchment based on the relationship with surrounding centres and the geographic barriers. The trip distribution for town centre visitors uses dwelling numbers in each of the statistical area 1s (SA1) to provide weights for the distribution as indicated in Attachment 4.

4.3 Commuter

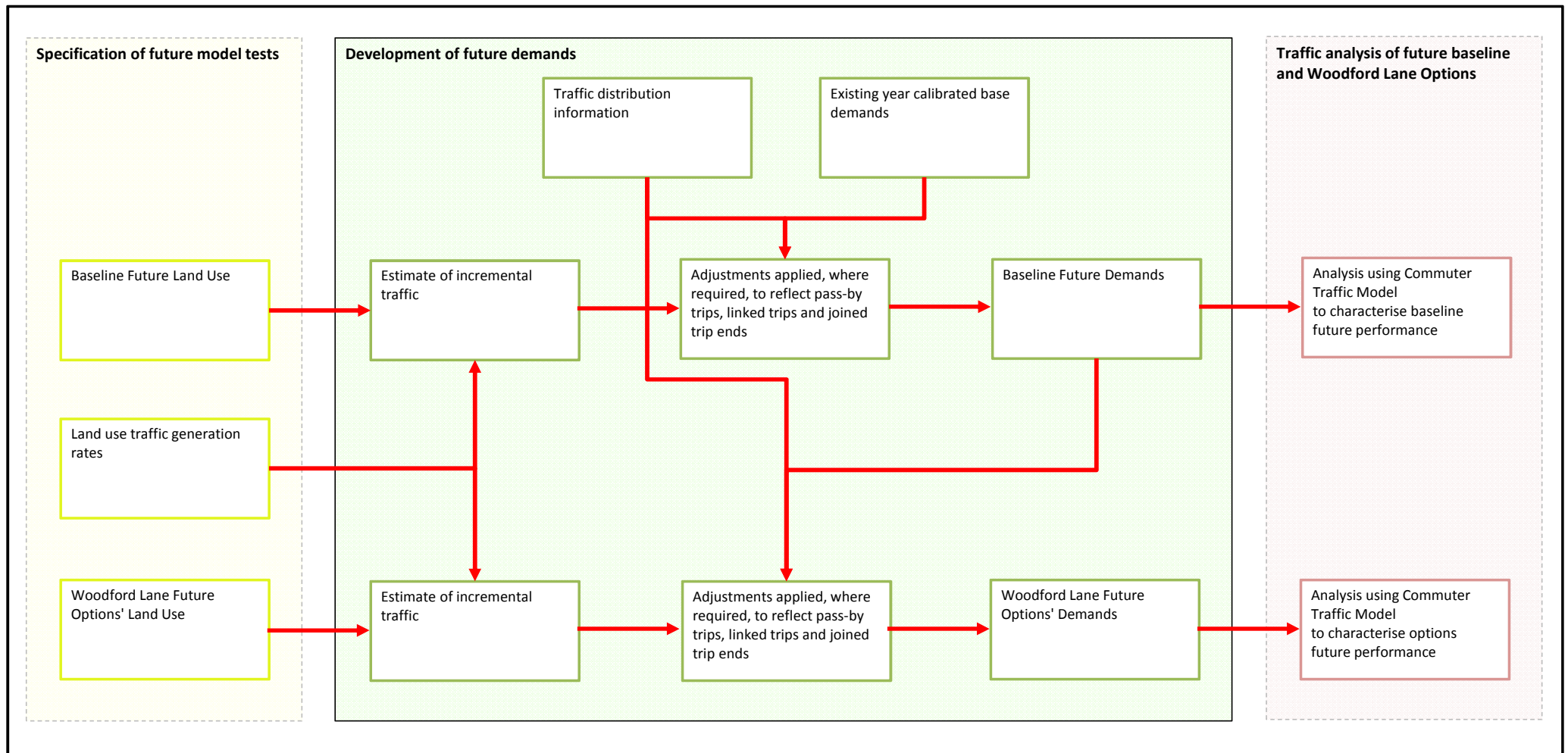
The source for determining the spatial distribution for commuters is based on an origin/destination station survey undertaken on behalf of Ku-ring-gai Council as part of the development of the Town Centres Parking Management Plans.

This survey indicated that of all those commuters driving to Lindfield Station in 2010 approximately 50% originated from the North, 25% from the East, 15% from the West and 10% from the South.

Attachment 1

Lindfield Modelling Methodology Flowchart

Flowchart 1 - Future demand development process flow chart



Attachment 2

Lindfield Future Land Use Plan



13S170 Lindfield Town Centre Study
Ku-ring-gai Council
Figure 1.1: Land Use Plan - Approved and Likely Development Sites 2013-2031

Attachment 3

Future Land Use Traffic Demands/Generation

Likely Town Centres LEP Mixed Use Development Uptake

Site M1,M2 & M3



Mixed use site M1, summary of net traffic generation

Site and condition	Weekday AM	Weekday PM	Saturday
Northern existing	30	57	25
Southern existing	64	115	132
Total existing	94	172	157
Northern future	55	96	96
Southern future	75	132	166
Total future	130	228	262
Net addition	36	56	105

Mixed use sites M2/M3 traffic generation

Access Use Sites May/June traffic generation							Residential and Combined										Retail							
Site	Location Relative to Pacific Highway	Net Increase in Residential Dwellings	Assumed Residential Type	Rate (Source)	Net Change in Retail GFA	Traffic Generation Rate	Weekday AM Peak Hour Trip Generation	AM In	AM Out	Weekday PM Peak Hour Trip Generation	AM In	AM Out	Saturday Midday Peak Hour Trip Generation	Sat In	Sat Out	Weekday AM Peak Hour Trip Generation	AM In	AM Out	Weekday PM Peak Hour Trip Generation	PM In	PM Out	Saturday Midday Peak Hour Trip Generation	Sat In	Sat Out
M2	East	62	High Density	0.29/unit (RMS GTTGD)	2056	4.2 (Wkday PM) or 10.7 (Sat) per 100sqm	18	9	9	18	9	9	18	9	9	17	8	9	51	26	25	174	87	87
M3	East	31	High Density	0.29/unit (RMS GTTGD)	2083	4.2 (Wkday PM) or 10.7 (Sat) per 100sqm	9	4	5	9	4	5	9	4	5	28	14	14	55	27	28	163	82	81
Total							150	75	75	231	115	116	231	115	116	45	22	23	106	53	53	337	169	168

Notes

Saturday generation for Site 1 is assumed to be the same at the Weekday PM peak hour trip generation

Net increase in traffic generation based on approved reports

Includes a 20% reduction for pass-by trips for retail

Existing showroom based on 1 movement per 100sqm during the PM and Saturday peaks with the AM 50% that rate

Existing commercial rate based on 2 movements per 100sqm during the AM and PM peak hours with Saturday 10% of that rate.

Assumed a 50% in out split for all periods

Mixed use sites M1/M2/M3 NET traffic generation summary table

Traffic Generation (NET) Summary Table - M1,M2,M3 Sites			
	M1	M2	M3
	Retail/Residential	Retail/Residential	Retail/Residential
AM	36	35	37
PM	56	69	64
SAT	105	192	172

Likely Town Centres LEP Residential Development Uptake
Traffic Generation



Site	Location Relative to Pacific Highway	Net Increase in Residential Dwellings	Assumed Residential Type	Peak Hour Generation Rate	Peak Hour Trip Generation	AM In	AM Out	PM In	PM Out	Sat In	Sat Out
R1	West	90	High Density	0.29/unit (RMS GTTGD)	26	23	3	16	10	13	13
R3	West	304	High Density	0.29/unit (RMS GTTGD)	88	79	9	53	35	44	44
R8	East	74	High Density	0.29/unit (RMS GTTGD)	21	19	2	13	8	11	10
R9	East	62	High Density	0.29/unit (RMS GTTGD)	18	16	2	11	7	9	9
R10	East	78	High Density	0.29/unit (RMS GTTGD)	23	20	3	14	9	11	12
R2	West	26	Medium Density	0.5/2 Bed Dwelling & 0.65/3 Bed Dwelling (RMS GTTGD)	15	13	2	9	6	7	8
R4	East	7	Medium Density	0.5/2 Bed Dwelling & 0.65/3 Bed Dwelling (RMS GTTGD)	4	4	0	2	2	2	2
R5	East	7	Medium Density	0.5/2 Bed Dwelling & 0.65/3 Bed Dwelling (RMS GTTGD)	4	4	0	2	2	2	2
R6	East	7	Medium Density	0.5/2 Bed Dwelling & 0.65/3 Bed Dwelling (RMS GTTGD)	4	4	0	2	2	2	2
R7	East	12	Medium Density	0.5/2 Bed Dwelling & 0.65/3 Bed Dwelling (RMS GTTGD)	7	6	1	4	3	3	4
R11	East	8	Medium Density	0.5/2 Bed Dwelling & 0.65/3 Bed Dwelling (RMS GTTGD)	4	4	0	3	1	2	2
R12	East	18	Medium Density	0.5/2 Bed Dwelling & 0.65/3 Bed Dwelling (RMS GTTGD)	10	9	1	6	4	5	5
R13	East	14	Medium Density	0.5/2 Bed Dwelling & 0.65/3 Bed Dwelling (RMS GTTGD)	8	7	1	5	3	4	4
Total					232	209	23	139	93	116	116

Notes

1. For medium density residential a ratio of 60% 2 bedroom and 40% 3 bedroom units has been adopted

Based on information provided by KMC

Lindfield Town Centre
Woodford Lane Car Park Site Development Options A,B&D
Traffic Generation



Option A	Use	Area (Sqm GFA)	AM Traffic Generation	Rate and Source	AM In	AM Out	PM Traffic Generation	Source	PM In	PM Out	Sat Traffic Gen	Source	Sat In	Sat Out
FSR 0.93 to 1 Height 11.5m	Community Facilities	2700	30	0.5 spaces / hour	15	15	30	1 mvmt per sp	15	15	60	1 mvmt per sp	30	30
	Secondary Retail	400	7	4.2 per 100sqm GFA x 50% for AM	3	4	13	4.2 per 100sqm GFA (RMS GTTGD)	7	7	34	10.7 sp / 100sqm (RMS GTTGD)	17	17
	Residential (Med Density)	2930	14	0.5/2 Bed Dwelling & 0.65/3 Bed Dwelling (RMS GTTGD)	12	2	14	0.5/2 Bed Dwelling & 0.65/3 Bed Dwelling (RMS GTTGD)	8	6	14	0.5/2 Bed Dwelling & 0.65/3 Bed Dwelling (RMS GTTGD)	7	7
	TfNSW Commuter Parking	0	100	50% in in peak hour	100	0	50	25% total (90% out and 10% in)	5	45	50	25% of all spaces (70% in and 30% out)	35	15
	Council Parking	0	13	33% in peak hour	12	1	40	100% in peak hour	20	20	40	100% in peak hour	20	20
		6030	164		142	22	147		55	93	198		109	89
Option B	Use	Area (Sqm GFA)	AM Traffic Generation	Rate and Source	AM In	AM Out	PM Traffic Generation	Source	PM In	PM Out	Sat Traffic Gen	Source	Sat In	Sat Out
FSR 2.13 to 1 Height 11.5m	Community Facilities	2700	30	0.5 spaces / hour	15	15	30	1 mvmt per sp	15	15	60	1 mvmt per sp	30	30
	Major Retail	3430	142	10.35 PER 100sqm GFA 50% for AM	71	71	284	10.35 PER 100sqm GFA (RMS x .75)	142	142	303	11.025 per 100sqm GFA (RTA x.75)	151	151
	Secondary Retail	400	7	4.2 per 100sqm GFA x 50% for AM	3	4	13	4.2 per 100sqm GFA (RMS GTTGD)	7	7	34	10.7 sp / 100sqm (RMS GTTGD)	17	17
	Residential (Med Density)	7230	32	0.5/2 Bed Dwelling & 0.65/3 Bed Dwelling (RMS GTTGD)	29	3	32	0.65/3 Bed Dwelling (RMS GTTGD)	19	13	32	0.65/3 Bed Dwelling (RMS GTTGD)	16	16
	TfNSW Commuter Parking	0	100	50% in in peak hour	100	0	50	25% total (90% out and 10% in)	5	45	50	25% of all spaces (70% in and 30% out)	35	15
	Council Parking	0	13	33% in peak hour	12	1	40	100% in peak hour	20	20	40	100% in peak hour	20	20
		13760	324		230	94	450		208	242	519		269	249
Option D	Use	Area (Sqm GFA)	AM Traffic Generation	Rate and Source	AM In	AM Out	PM Traffic Generation	Source	PM In	PM Out	Sat Traffic Gen	Source	Sat In	Sat Out
FSR 2.13 to 1 Height 17.5m	Community Facilities	2700	30	0.5 spaces / hour	15	15	30	1 mvmt per sp	15	15	60	1 mvmt per sp	30	30
	Major	0	0	10.35 PER 100sqm GFA 50% for AM	0	0	0	10.35 PER 100sqm GFA (RMS x .75)	0	0	0	11.025 per 100sqm GFA (RTA x.75)	0	0
	Secondary Retail	0	0	4.2 per 100sqm GFA x 50% for AM	0	0	0	4.2 per 100sqm GFA (RMS GTTGD)	0	0	0	10.7 sp / 100sqm (RMS GTTGD)	0	0
	Residential (High Density)	11060	24	0.29/Dwelling (RMS GTTGD)	21	3	24	0.29/Dwelling (RMS GTTGD)	14	10	24	0.29/Dwelling (RMS GTTGD)	12	12
	TfNSW Commuter Parking	0	100	50% in in peak hour	100	0	50	25% total (90% out and 10% in)	5	45	50	25% of all spaces (70% in and 30% out)	35	15
	Council Parking	0	13	33% in peak hour	12	1	40	100% in peak hour	20	20	40	100% in peak hour	20	20
		13760	167		148	19	144		54	90	174		97	77

Lindfield Town Centre
Woodford Lane Car Park Site Development Options C&E
Traffic Generation



Option C	Use	Area (Sqm GFA)	AM Traffic Generation	Rate and Source	AM In	AM Out	PM Traffic Generation	Source	PM In	PM Out	Sat Traffic Gen	Source	Sat In	Sat Out
FSR 2.13 to 1 Height 11.5m	Community Facilities	2700	30	0.5 spaces / hour	15	15	30	1 mvmt per sp	15	15	60	1 mvmt per sp	30	30
	Major Retail	3430	142	10.35 PER 100sqm GFA 50% for AM	71	71	284	10.35 PER 100sqm GFA (RMS x .75)	142	142	303	11.025 per 100sqm GFA (RTA x.75)	151	151
	Secondary Retail	400	7	4.2 per 100sqm GFA x 50% for AM	3	4	13	4.2 per 100sqm GFA (RMS GTTGD)	7	7	34	10.7 sp / 100sqm (RMS GTTGD)	17	17
	Residential (Med Density)	7230	32	0.5/2 Bed Dwelling & 0.65/3 Bed Dwelling (RMS GTTGD)	29	3	32	0.65/3 Bed Dwelling (RMS GTTGD)	19	13	32	0.65/3 Bed Dwelling (RMS GTTGD)	16	16
	TfNSW Commuter Parking	0	100	50% in in peak hour	100	0	50	25% total (90% out and 10% in)	5	45	50	25% of all spaces (70% in and 30% out)	35	15
	Council Parking	0	13	33% in peak hour	12	1	40	100% in peak hour	20	20	40	100% in peak hour	20	20
	Sub-Total 1	13760	324	Sub-Total 1	230	94	450	Sub-Total 1	208	242	519		269	249
Coles Redevelopment	Major Retail NET INCREASE	1,900	98	10.35 PER 100sqm GFA 50% for AM	49	49	197	10.35 PER 100sqm GFA (RMS x .75)	98	98	209	11.025 per 100sqm GFA (RTA x.75)	105	105
	Secondary retail	3,000	126	4.2 per 100sqm GFA	63	63	126	4.2 per 100sqm GFA x 50% for AM	63	63	321	10.7 sp / 100sqm (RMS GTTGD)	161	161
	Residential (High Density) - Net Units	110	32	0.29/unit (RMS GTTGD)	29	3	32	0.29/unit (RMS GTTGD)	19	13	32	0.29/unit (RMS GTTGD)	16	16
	Sub-Total 2		256	Sub-Total 2	141	115	355	Sub-Total 2	180	174	562		281	281
	Grand Total		580				804				1081			
Option E	Use	Area (Sqm GFA)	AM Traffic Generation	Rate and Source	AM In	AM Out	PM Traffic Generation	Source	PM In	PM Out	Sat Traffic Gen	Source	Sat In	Sat Out
	Community Facilities	2820	31	0.5 spaces / hour	16	15	31	1 mvmt per sp	15	17	63	1 mvmt per sp	30	32
	Major	4150	286	13.8 PER 100sqm GFA 50% for AM	143	143	573	13.8 PER 100sqm GFA	286	286	610	14.7 per 100sqm GFA	305	305
	Secondary Retail	2250	63	5.6 per 100sqm GFA x 50% for AM	32	31	126	5.6 per 100sqm GFA (RMS GTTGD)	63	63	241	10.7 sp / 100sqm (RMS GTTGD)	120	120
	Gymnasium	1000	15	3.0 PER 100 sqm x 50% for AM	7	8	30	3.0 PER 100 sqm	15	15	30	3.0 PER 100 sqm	15	15
	TfNSW Commuter Parking	0	123	50% in in peak hour	123	0	61	25% total (90% out and 10% in)	6	55	61	25% of all spaces (70% in and 30% out)	43	18
	Council Parking	0	13	33% in peak hour	12	1	40	100% in peak hour	20	20	40	100% in peak hour	20	20
		10220	532		332	199	861		405	457	1045		533	511

Attachment 4

Lindfield Retail/Commercial Weighted Trip Distribution Figure

Figure B3 - Town Centre catchment trip distribution weights (%)

