Dulwich Hill Parking Management Plan

draft

Client // Marrickville Council
Office // NSW
Reference // 15S1012000
Date // 02/03/16

Dulwich Hill

Parking Management Plan

Issue: A-Dr6 29/03/16

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Reference: 15S1012000
GTA Consultants Office: NSW

Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A-Dr	20/10/15	Preliminary Draft	Ashish Modessa Andrew Farran	Brett Maynard	Brett Maynard	
A-Dr2	10/11/15	Draft for consultation and comment	Ashish Modessa Andrew Farran	Brett Maynard	Brett Maynard	
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Executive Summary

Marrickville Council commissioned GTA Consultants to prepare a Parking Management Plan for Dulwich Hill. Dulwich Hill is located approximately seven kilometres south-west of the Sydney Central Business District.

Car parking surveys were initially commissioned by GTA to determine the baseline car parking demands for the study area. In the town centre and surrounding Dulwich Hill Station, on-street parking survey results indicate that parking is approaching the ideal capacity threshold, where finding a parking space becomes increasingly difficult without excessive circulation. The issue of high occupancy has also been reflected through the consultation responses.

Car parking within the surrounding residential areas is typically unrestricted. The car parking surveys and observations indicate that a portion of parking demands within residential areas relate to a mix of commuter and/or employee parking.

In response to the identified issues, a set of parking objectives, guiding principles and actions/ recommendations have been developed. The developed objectives and principles are:

- Manage the different modes of access in an appropriately balanced way
- Manage car parking to prioritise access according to the needs of users, with visitors and customers having higher access over staff and commuter needs
- Manage parking in residential areas to balance residential amenity and the efficient use of available parking resources.

The identified actions/recommendations are categorised as follows:

- Managing existing parking
- Increasing parking supply
- Reducing/ managing parking demands
- Managing future parking
- Other considerations

The specific actions/ recommendations are presented in Section 6 of this report. A key "lever" to managing parking demands is 'rationing' parking as a resource (i.e. introduction of time restrictions), with an equitable distribution between user groups. In this regard recommended future time restrictions have been identified for the study area and are grouped as follows:

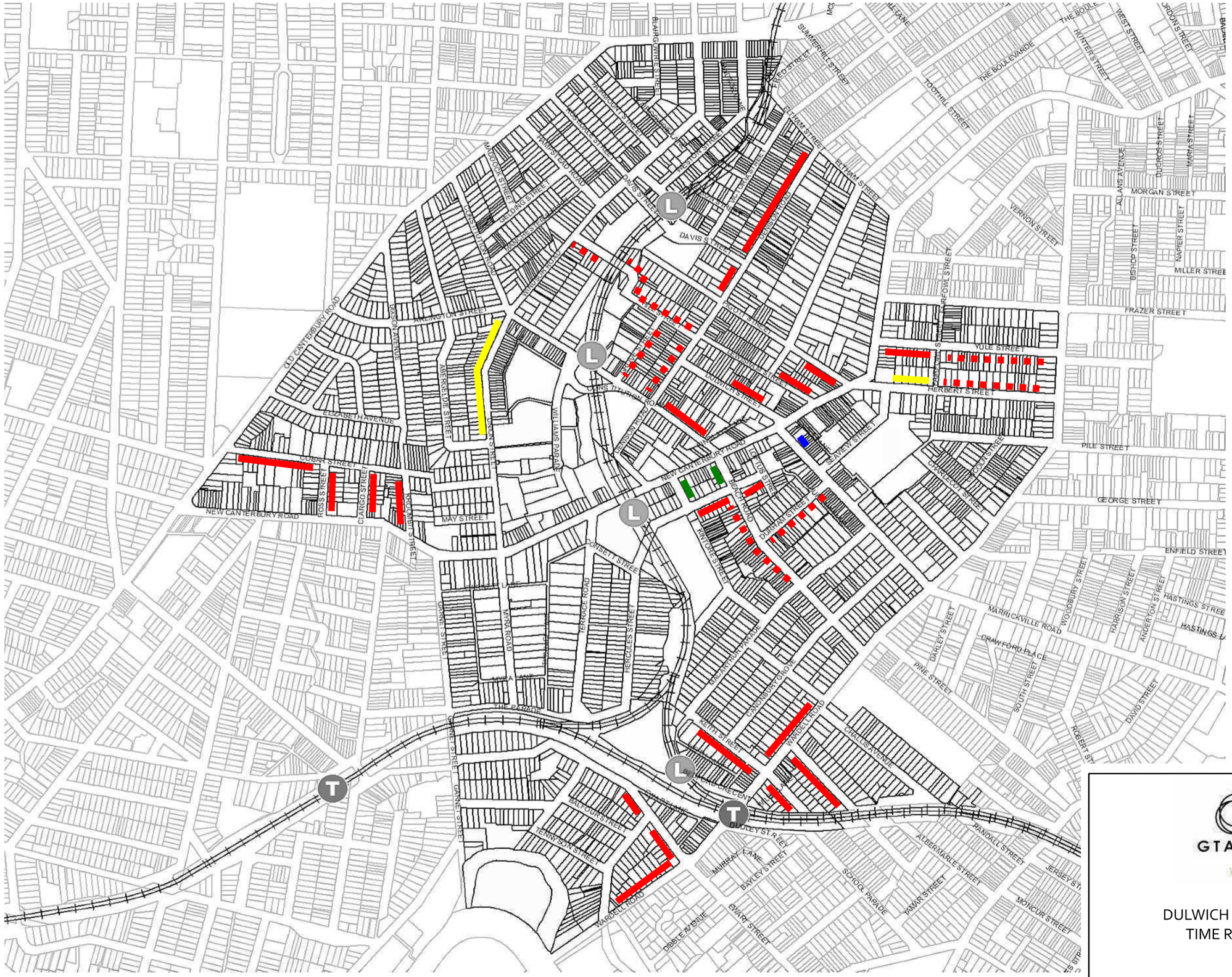
- Short-term recommendations: Address existing issues
- Medium-term recommendations: Address future issues associated with growth

Table E1: Overview of Parking Restriction Changes

Location	Parking Restriction					
	1/4 P	1P (Permit Excepted)	1P	2P (Permit Excepted)	2P	Unrestricted
Short-term recommendations (immediate)						
Pigott Street (south)	-	-	-5	+10	-	-5
Lewisham Street (north)	-	-	-2	+11	-	-9
Dulwich Street (north)	-	-	-	+8	-	-8
Constitution Road (north)	-	-	-	+12	-	-12
Kintore Street (east)	-	-	-	+5	-	-5
Beach Street (west)	-	-	-	+5	-	-5
Hercules Street (south)	-	-	-	+16	-	-16
Herbert Street (north)	-	+16	-3	-	-	-13
Yule Street (south)	-	-	-	+16	-	-16
Marrickville Road (east)	+3	-	-	-	-3	-
Keith Street (south)	-	-	-	+30	-	-30
Kays Avenue West (north)	-	-	-	+26	-	-26
Wilga Avenue (south)	-	-	-	+13	-	-13
Ewart Street (south)	-	-	-	+14	-	-14
Wardell Road (west)	-	-	-	+31	-	-31
Cobar Street (south)	-	-	-	+21	-	-21
Ross Street (east)	-	-	-	+16	-	-16
Clargo Street (east)	-	-	-	+12	-	-12
Kroombit Street (west)	-	-	-	+15	-	-15
Union Street (west)	-	+29	-	-	-	-29
Denison Road (west)	-	-	-	+51	-	-51
Sub Total	***+3***	***+45***	***-10***	***+312***	***-3***	***-347***
Medium-term recommendations (0 to 5 years)						
Terry Road (south)	-	-	-	+9	-	-9
Grove Street (south)	-	-	-	+22	-	-22
Hill Street (east)	-	-	-	+27	-	-27
Denison Road (north)	-	-	-	+23	-	-23
Piggot Street (south)	-	-	-	+47	-	-47
Lewisham Street (north)	-	-	-	+24	-	-24
Dulwich Street (north)	-	-	-	+18	-	-18
Yule Street (south)	-	-	-	+35	-	-35
Herbert Street (north)	-	-	-	+33	-	-33
Marrickville Road (east)	-	-	-	+21	-	-21
Durham Street (south)	-	-	-	+18	-	-18
Beach Road (west)	-	-	-	+32	-	-32
Sub Total	***0***	***0***	***0***	***+309***	***0***	***-309***
Total	**+3**	**+45**	**-10**	**+621**	**-3**	**-656**

An overview of the car parking recommendations is illustrated in the figure on the following page.

In the longer term, car parking management will play a key role in achieving a mode shift away from private car use, in conjunction with ongoing investment in public and active transport facilities and services.



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DULWICH HILL PARKING STRATEGY
TIME RESTRICTION PARKING
29 MARCH 2016

15S1012000-RP-01P2

DRAFT

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1. Introduction

1.1 Background

Councils future vision for the municipality is set out in the "Marrickville Community Strategic Plan (CSP) – Our Place Our Vision 2023" document. The key transport objectives of the vision are reproduced below:

- Marrickville's roads are safer and less congested
- Marrickville's streets, lanes and public spaces are sustainable, welcoming, accessible and clean
- The community walks, ride bikes and use public transport.

Key to delivering the above transport objectives is the development of robust Parking Management and Local Area Traffic Management (LATM) plans. A LATM plan has been previously prepared for the Dulwich Hill South area, whilst a LATM study for Dulwich Hill North is being prepared concurrently with this study.

Marrickville Council commissioned GTA Consultants to prepare a Parking Management Plan for Dulwich Hill.

1.2 Objectives of this Study

The objective of the Precinct Parking Management Plan has been sourced from the study brief prepared by Marrickville Council and is reproduced below:

"Investigate and review the business corridors and neighbouring residential on-street and off-street parking policy framework and management strategies within the study areas. The Plans should identify the parking needs for the area and if there is a need for parking changes for the precinct outline where the parking need is and why and what other actions could be taken to reduce demand and provide alternative forms of access/ transport."

It is intended that once complete, this Parking Management Plan will feed into the Connecting Marrickville initiative. The Connecting Marrickville Initiative seeks to efficiently deliver Council infrastructure through a collaborative approach.

1.3 Purpose of this Report

This car parking management strategy sets out an assessment of the following:

- Existing transport context
- Collation of all existing information and collection of parking usage data for the study area as well as preliminary consultation with stakeholders and community
- Determination of existing car parking demand including short-falls of existing supply
- Estimation of future car parking demand based on anticipated land use growth areas
- Development of parking strategies to manage existing and future car parking demand.

The purpose of this report is not to respond to every specific issue but rather respond to the major issues identified and provide Council with appropriate and consistent management strategies.

1.4 Reference Documents

In preparing this report, reference has been made to the following:

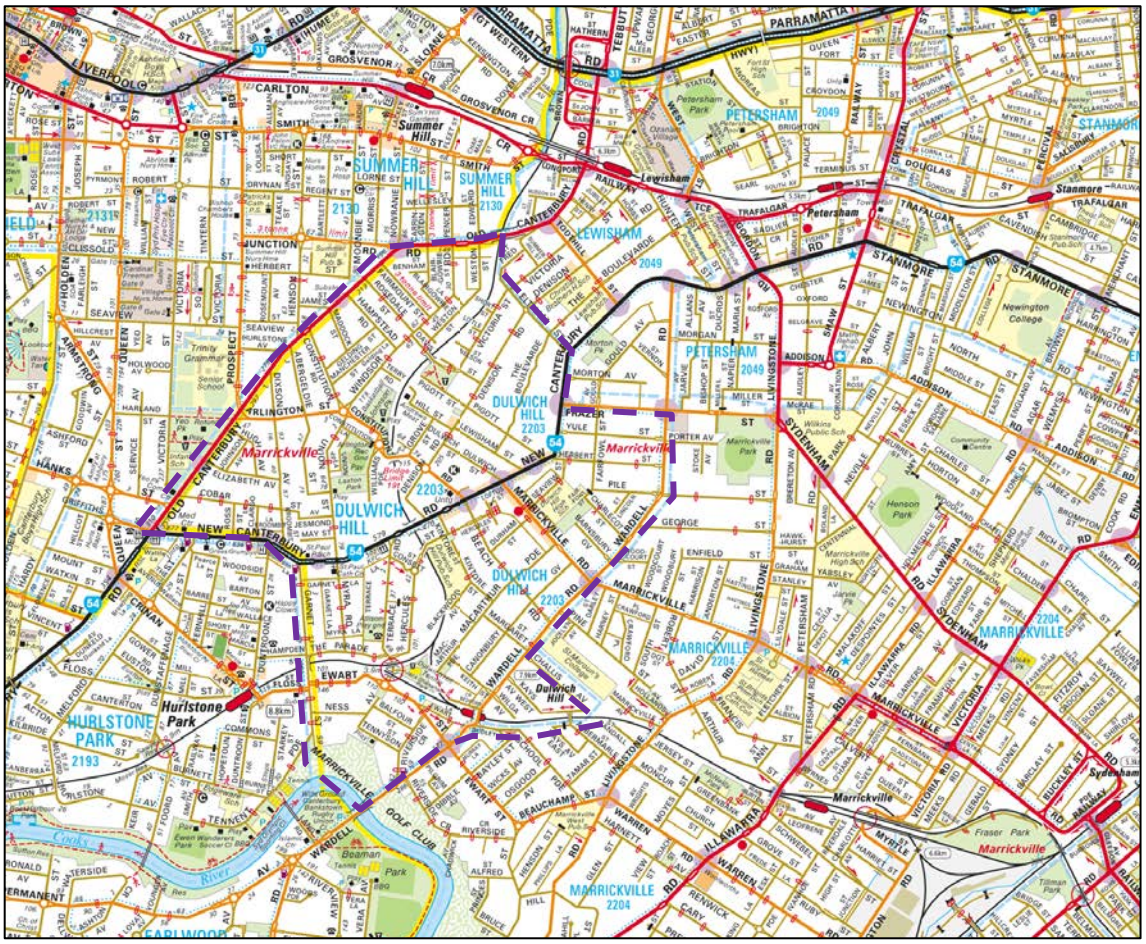
- A number of inspections of the study area
- Marrickville LEP 2011 (15 August 2014)
- Marrickville DCP 2011 2.10 Generic Provisions – Parking
- Guide to Traffic Generating Developments, Roads and Maritime Services, 2002
- Technical Directions (Various), Roads and Maritime Services
- Census 2011, Australian Bureau of Statistics
- Imagining Marrickville Community Survey and raw data, Micromex Research
- car parking surveys undertaken by Austraffic as referenced in the context of this report
- other documents and data as referenced in this report.

2. Transport Network and Characteristics

2.1 Study Area

Dulwich Hill is located approximately seven kilometres south-west of the Sydney Central Business District. The extent of Dulwich Hill is shown in Figure 2.1. The study area is bisected by New Canterbury Road that runs in an east-west direction, with Dulwich Hill North and Dulwich Hill South on either side of the roadway.

Figure 2.1: Dulwich Hill

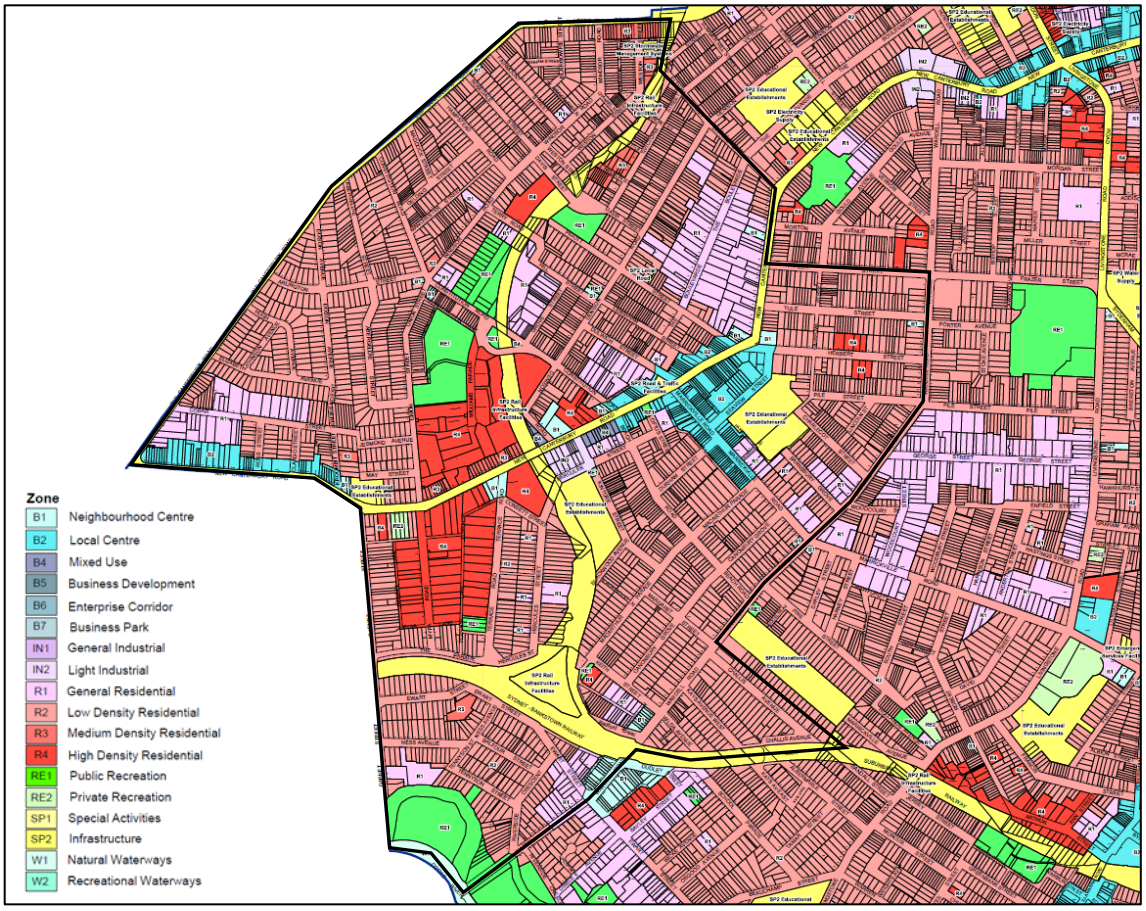


Basemap source: Sydways 2010

2.2 Existing Land Uses

Dulwich Hill predominantly comprises residential land uses as illustrated in Figure 2.2. Land in the vicinity of the light rail stops and New Canterbury Road are zoned for high density residential uses. Commercial land uses, such as retail and office, are typically located along sections of New Canterbury Road and Marrickville Road. There are a number of educational establishments in the vicinity of New Canterbury Road. Public recreation areas are located in the vicinity of the Light Rail corridor.

Figure 2.2: Existing Land Uses



Source: Marrickville Council accessed January 2015 (http://www.legislation.nsw.gov.au/mapindex?type=epi&year=2011&no=645)

2.3 Demographic and Travel Demand

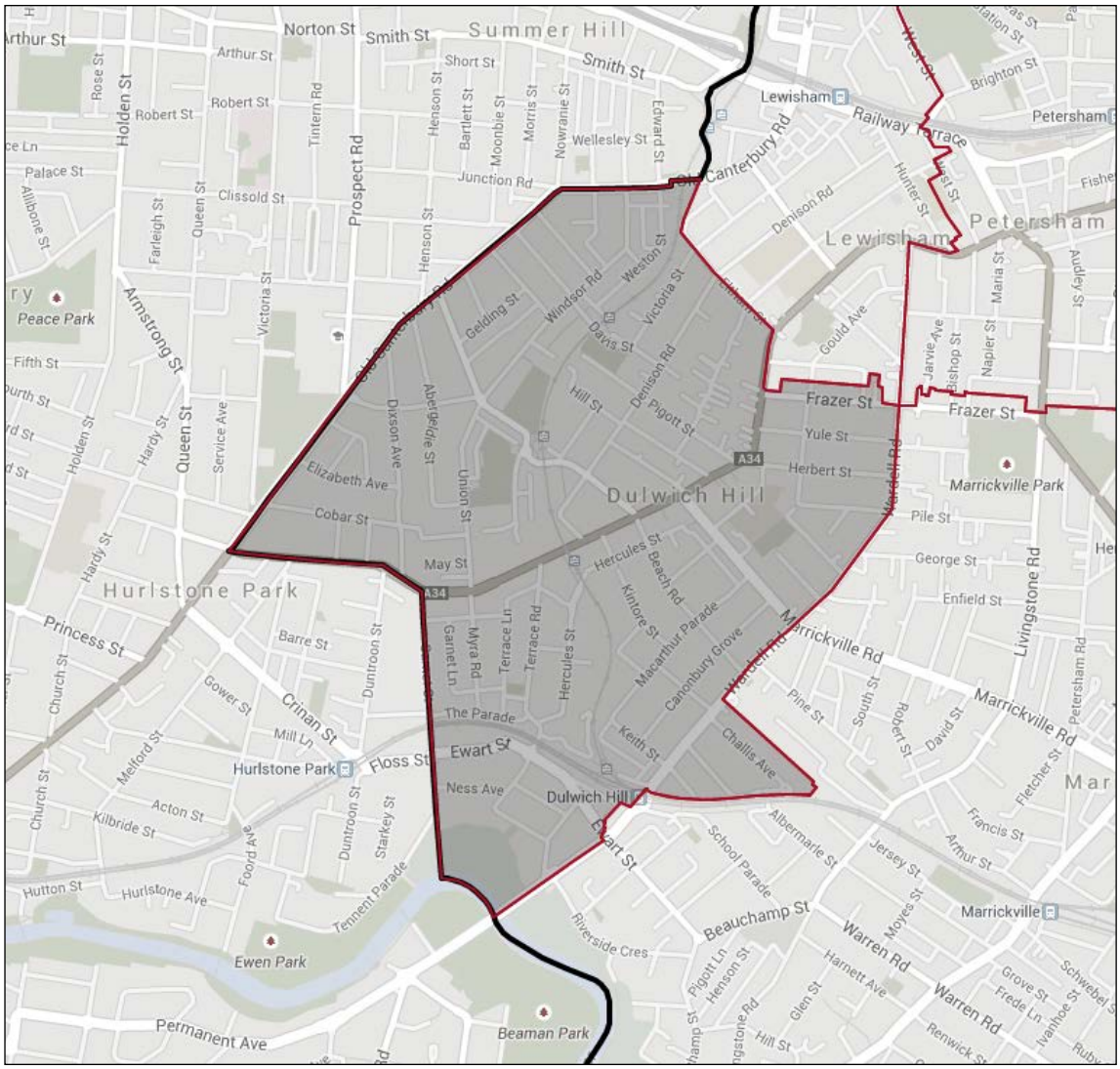
The 2011 Census from the Australian Bureau of Statistics (ABS) was reviewed in this section to understand the demographic and travel demand characteristics of Dulwich Hill. Dulwich Hill was compared with the Southern Sydney Regional Organisation of Councils (SSROC) region[1] to appreciate how the characteristics of Dulwich Hill compare with the surrounding region.

2.3.1 Population

Dulwich Hill has a population of approximately 13,500 people. It spans across 208 hectares, resulting in a population density of approximately 65 people per hectare. The Dulwich Hill boundary for the 2011 Census is presented in Figure 2.3.

[1] The Southern Sydney Regional Organisation of Councils (SSROC) comprises the following LGA's: Ashfield, Bankstown, Botany Bay, Burwood, Canada Bay, Canterbury, Hurstville, Kogarah, Leichhardt, Marrickville, Randwick, Rockdale, Sutherland Shire, Sydney, Waverley and Woollahra.

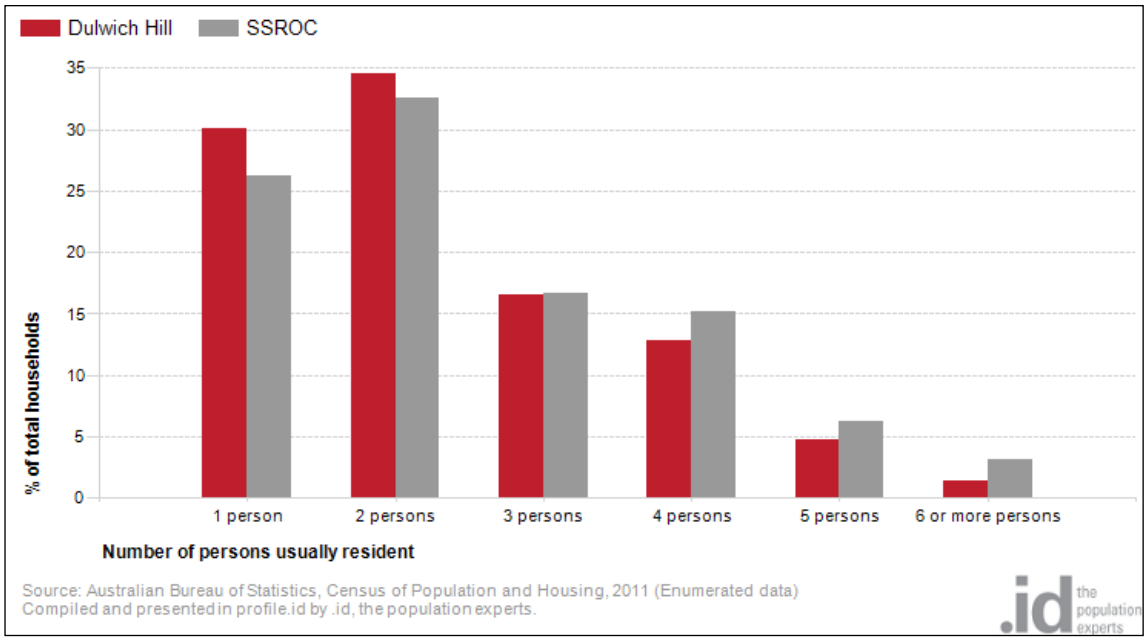
Figure 2.3: Dulwich Hill State Suburb Boundary in the 2011 Census by the ABS



Source: http://profile.id.com.au/ accessed January 2015

Figure 2.4 summarises household size in Dulwich Hill, compared with that of the Southern Sydney Regional Organisation of Councils (SSROC) region, in 2011. It shows that although the household size splits for Dulwich Hill are comparable to the SSROC region, there is a higher proportion of 1 and 2 person households and a lower proportion of larger households (4+ persons).

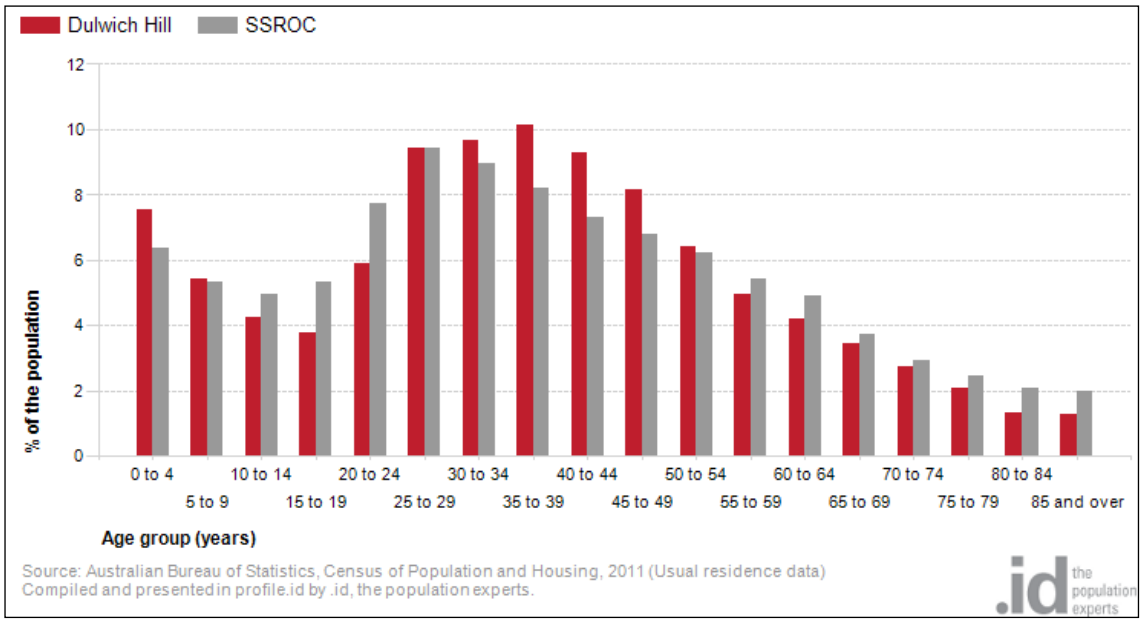
Figure 2.4: Household Size of Dulwich Hill and SSROC Region, Census 2011



Source: http://profile.id.com.au/ accessed January 2015

Figure 2.5 illustrates the age profile of the Dulwich Hill population, compared with that of the SSROC region, based on the 2011 Census. It is noted that Dulwich Hill has a significantly higher proportion of population in the 0 to 4 and 30 to 50 age brackets.

Figure 2.5: Age Profile of Dulwich Hill and SSROC Region, Census 2011



Source: http://profile.id.com.au/ accessed January 2015

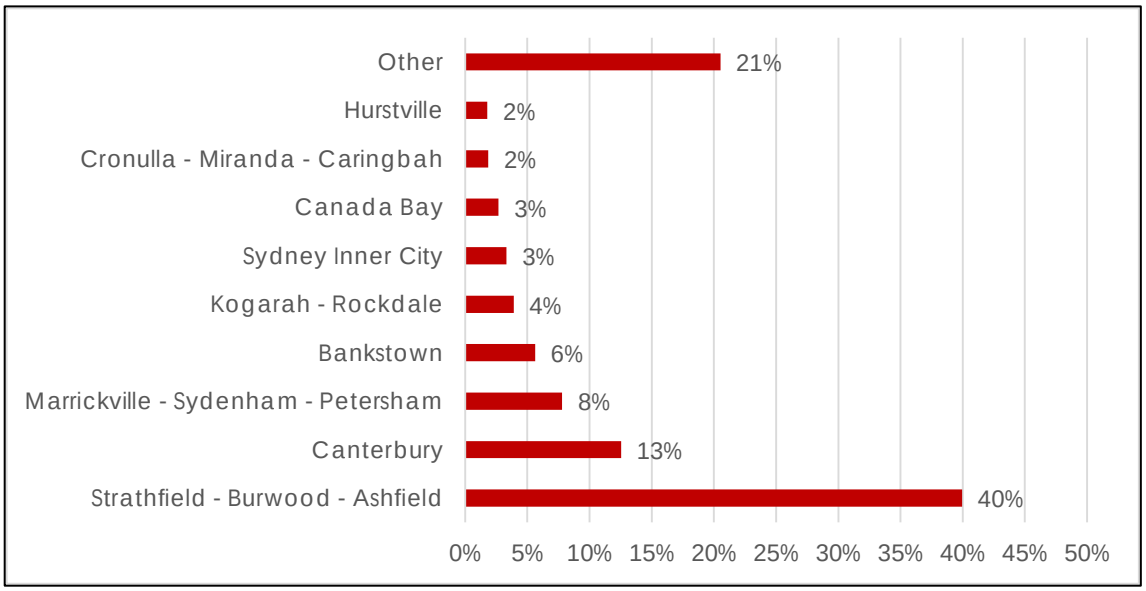
The household size and age profile review indicates that Dulwich Hill comprises a higher proportion of couples and families with one children aged below five years.

2.3.2 Employment

The 2011 Census indicates that a total of 1,564 workers were employed in Dulwich Hill[2]. Of these, 122, or 8% live within Marrickville, Sydenham and Petersham. The remaining 1,442 living outside these areas predominantly live in nearby Council areas such as Strathfield, Burwood and Ashfield (40%) and Canterbury (13%).

Figure 2.6 illustrates the above data, noting that Dulwich Hill workers typically have relatively short travel distances to work.

Figure 2.6: Origin of Workers in Marrickville LGA, Census 2011



Data source: Bureau of Transport Statistic

2.3.3 Car Ownership

Car ownership data in Dulwich Hill gathered from the 2011 Census indicates that 75.3% of households own at least one car, with 16.5% that do not own a car (8.3% no response stated).

Of the total households, 48.2% own one car, 22.1% own two cars, and 5.0% own 3 or more cars, as presented in Figure 2.7. These statistics could be related to the structure of household sizes in Dulwich Hill.

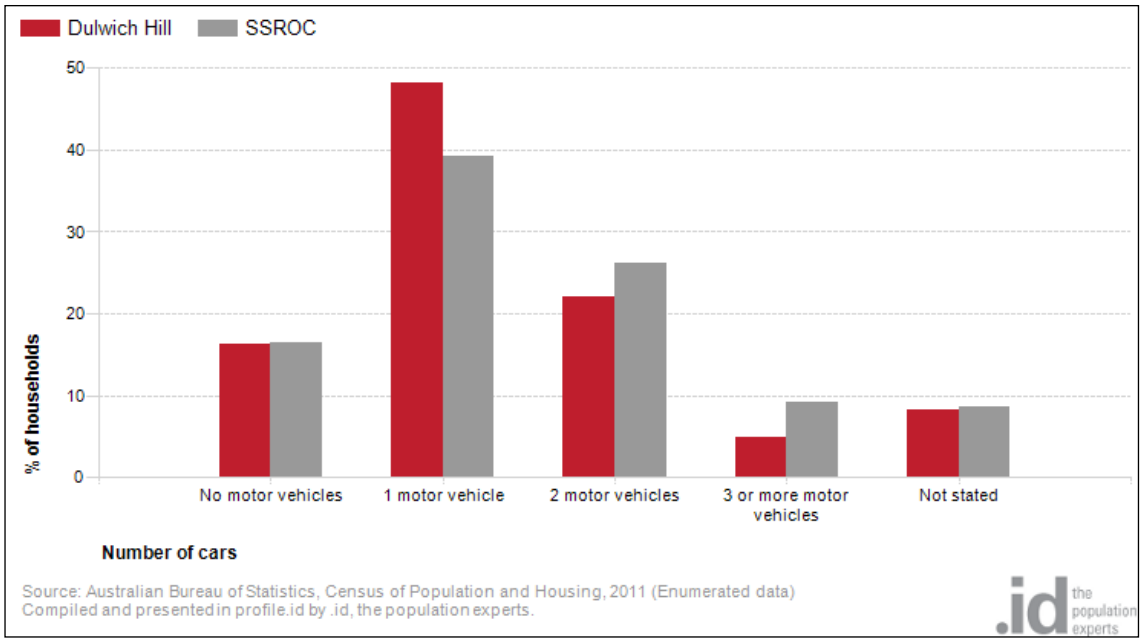
The overall average car ownership for Dulwich Hill and the SSROC is as follows:

- Dulwich Hill: 1.17 vehicles per dwelling
- SSROC: 1.31 vehicles per dwelling

Figure 2.7 illustrates the existing car ownership levels for residents of Dulwich Hill and SSROC.

[2] Travel Zones: 940, 941, 942, 943, 944, 945, 946.

Figure 2.7: Car Ownership in Dulwich Hill and SSROC Region, Census 2011



Source: http://profile.id.com.au/ accessed January 2015

The data for Dulwich Hill has been further refined to only include data relating to medium and high density residential dwellings (i.e. excluding detached houses, townhouses, attached houses, etc.). The existing car ownership rates for medium and high density residential dwellings in Dulwich Hill (sample size = 2,855 dwellings) are as follows:

- Studio apartment: 0.56 spaces per dwelling
- 1-bedroom apartment: 0.82 spaces per dwelling
- 2-bedroom apartment: 1.05 spaces per dwelling
- 3-bedroom apartment: 1.38 spaces per dwelling.

The rates indicate that in medium and high density residential dwellings, residents of apartments with greater than one bedroom require at least 1 car space, whereas approximately 1 in 2 residents that live in a studio apartment require a space.

2.3.4 Journey to Work

Journey-to-Work data[3] for Dulwich Hill gathered from the 2011 Census and presented in Table 2.1 indicates that 45.5% of commuter trips from Dulwich Hill are by private vehicles, either as a driver or passenger, and 23.6% are by train. In comparison to 2006 Census, private vehicle commuter trips reduced by 4.0% and train commuter trips increased by 3.7%. Commuter trips by bus remained at similar levels (10.3% in 2011).

There was an increase of 1.5% between 2006 and 2011 for commuter trips by bicycle to 2.6%, which represents a 236% increase over 5 years. Commuter trips by walking reduced by 1.1% in the same period (noting potential anomalies and influences associated with a single sample day for each year, including weather conditions).

It is expected that the opening of the Inner West Light Rail extension in 2014, that links Dulwich Hill to Sydney CBD via Pyrmont will have some impact on journey to work patterns for Dulwich Hill and the Inner West region.

[3] 6,969 and 6,146 persons employed in Dulwich Hill in 2011 and 2006 respectively.

Table 2.1: Journey to Work Mode Share from Dulwich Hill

Main method of travel	Dulwich Hill 2011	Dulwich Hill 2006	SSROC Region 2011	SSROC Region 2006
Car - as driver	42.1	45.1	46.5	47.4
Train	23.6	19.9	17.0	14.9
Bus	10.3	10.5	7.7	7.6
Did not go to work	8.6	8.8	8.2	9.1
Car - as passenger	3.4	4.4	3.9	4.7
Worked at home	3.3	2.8	3.7	3.5
Bicycle	2.6	1.1	1.3	0.9
Walked only	2.3	3.4	6.7	6.5
Not stated	1.5	1.6	1.4	1.8
Motorbike	1.2	0.6	0.8	0.5
Other	0.7	0.6	1.0	1.0
Truck	0.2	0.9	0.8	1.0
Taxi	0.1	0.3	0.5	0.6
Tram or Ferry	0.0	0.1	0.4	0.4

Source: http://profile.id.com.au/ accessed January 2015

It can be seen from Table 2.1 that private vehicle travel from Dulwich Hill is used for almost half of all work trips, in both 2006 and 2011. Although these figures are significant, they are lower when compared to the SSROC region as a whole. The use of train travel for work trips also has a much higher mode share for Dulwich Hill as compared with the SSROC regional average. Bicycle trips in Dulwich Hill are double the SSROC average, whilst walking trips are less than half the SSROC average.

The results would imply that Dulwich Hill residents have a broad range of alternative transport options available to them compared to the average resident within the SSROC region. A focus on providing walkable neighbourhoods as part of any street treatments would be beneficial based on the above.

2.4 Road Hierarchy

The *Road Design Guide* (RMS, 1996) states that the purpose of a functional road hierarchy is to establish a logical integrated network in which roads of similar functional classifications are:

- provided with the same general level of traffic service with regards to trip purpose, traffic composition, capacity and operational speed
- designed, constructed and maintained to the same general level of structure with regard to alignment, cross section, pavement strength and access control
- assigned to the appropriate administrative control.

This classification includes arterial, sub-arterial, collector and local roads. Together the roads make up a road network. The administrative/ functional road classifications in NSW are:

- State/ Arterial Roads – Predominantly carry through traffic from one region to another, forming principal avenues of communication for urban traffic movements.
- Regional/ Sub-Arterial Roads – Connect the arterial roads to areas of development and carry traffic directly from one part of the region to another. They may also relieve traffic on arterial roads in some circumstances.
- Local Roads – The sub-divisional roads within a particular developed area. These are used solely as local access roads.

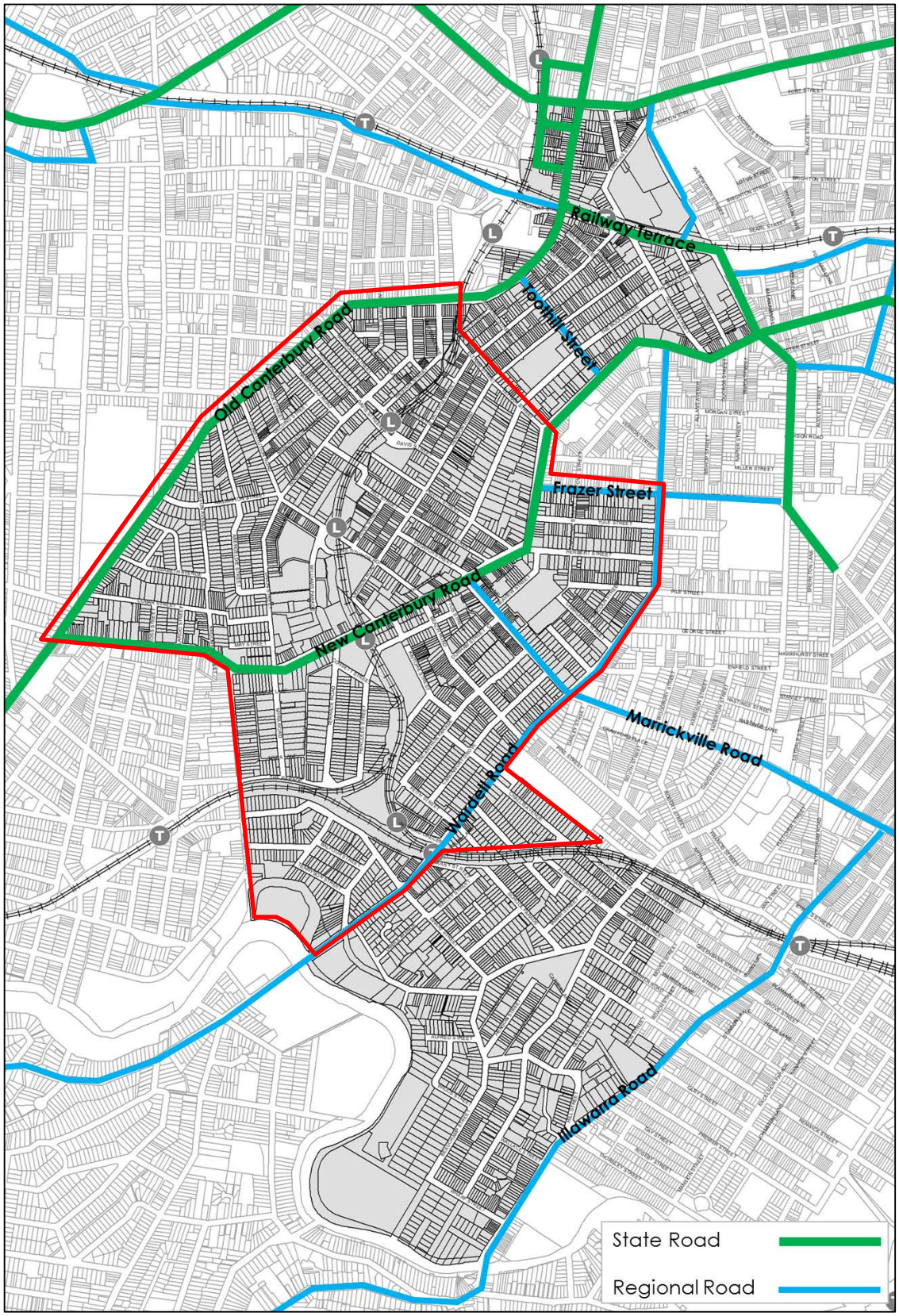
The following roads in the study area, also shown in Figure 2.8, are under the care, control and management of Road and Maritime Services:

State Roads

- New Canterbury Road (RMS Road No. 167)
- Old Canterbury Road/ Tebbutt Street/ Brown Street (652).

All other roads in the study area are classified as local roads. However, there are a number of sub-classifications within the local road classification including local accessways, local streets and local collector roads. The majority of roads function as local streets, with the exception of Constitution Road, Dulwich Street, Denison Road, Davis Street, Windsor Road and Union Street that function as local collector roads by linking local streets to the arterial/ sub arterial road network. A number of laneways provided within the study area are classified as local accessways. These roads are under the care, control and management of Marrickville Council.

Figure 2.8: Study Area Road Hierarchy



2.5 Public Transport

GTA Consultants has completed a review of the existing public transport which services the study area. Understanding the availability of public transport services directly relates to the level of reliance on private car use.

2.5.1 Trains

Dulwich Hill Railway Station

Dulwich Hill Railway Station is located on the south boundary of the study area. The station is serviced by the Bankstown line with the typical service frequencies presented in Table 2.2.

Table 2.2: Dulwich Hill Railway Services – Weekdays

Service	Service Frequency per Hour		
	AM Peak Hour	Off-Peak	PM Peak Hour
Liverpool or Lidcombe to City Circle	5 (7:00am – 8:00am)	4	4 [1]
City Circle to Liverpool or Lidcombe	4 [1]	4	5 (6:00pm – 7:00pm)

[1] No defined peak hour

Lewisham Railway Station

Lewisham Railway Station is located within an approximately 10 minute walk from the northern boundary of the study area. The station is serviced by the Inner West line with typical service frequencies presented in Table 2.3.

Table 2.3: Lewisham Railway Services – Weekdays

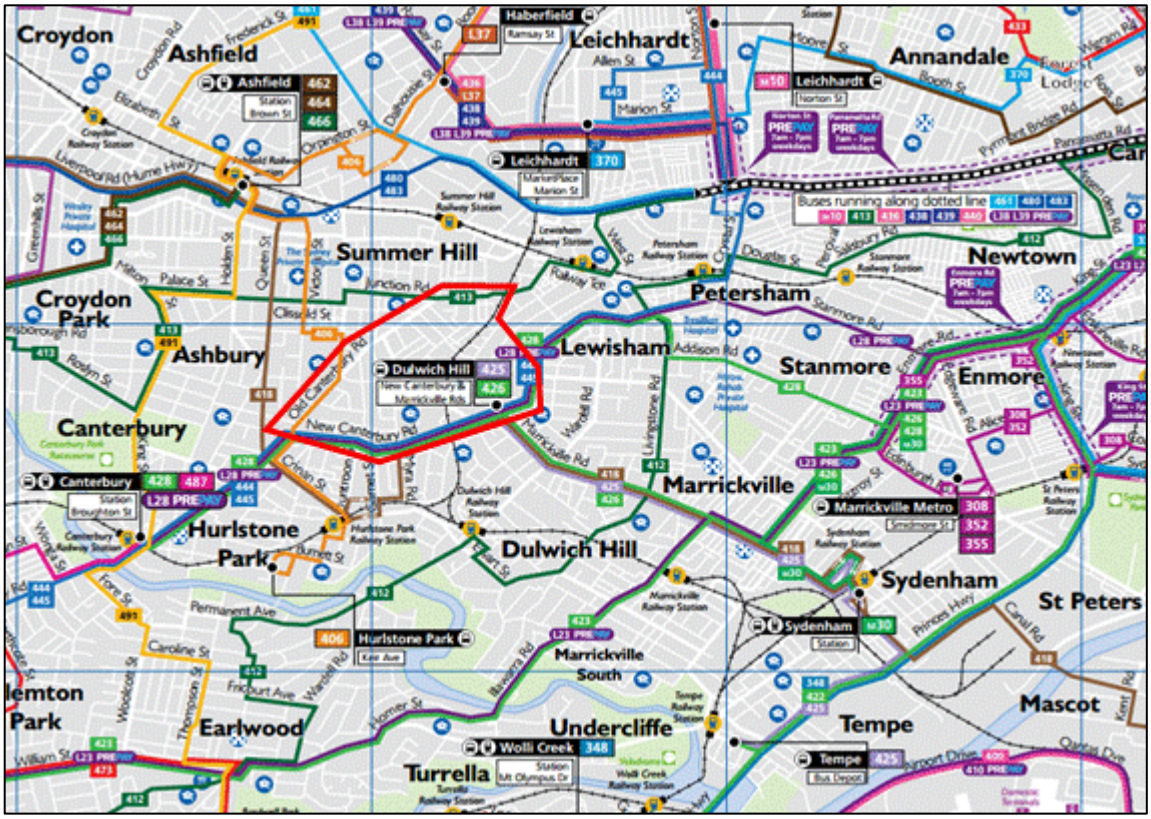
Service	Service Frequency per Hour		
	AM Peak Hour	Off-Peak	PM Peak Hour
Homebush to City Circle	4 [1]	4	4 [1]
City Circle to Homebush	4 [1]	4	4 [1]

[1] No defined peak hour

2.5.2 Buses

An overview of the bus network in the vicinity of Dulwich Hill North is presented Figure 2.9.

Figure 2.9: Sydney Bus Network



Source: Sydney Buses accessed January 2015 (http://www.sydneybuses.info/routes/14054_STA_region_web_map_south.pdf)

Figure 2.9 indicates that Dulwich Hill is serviced by 11 bus routes operated by Sydney Buses, summarised as follows:

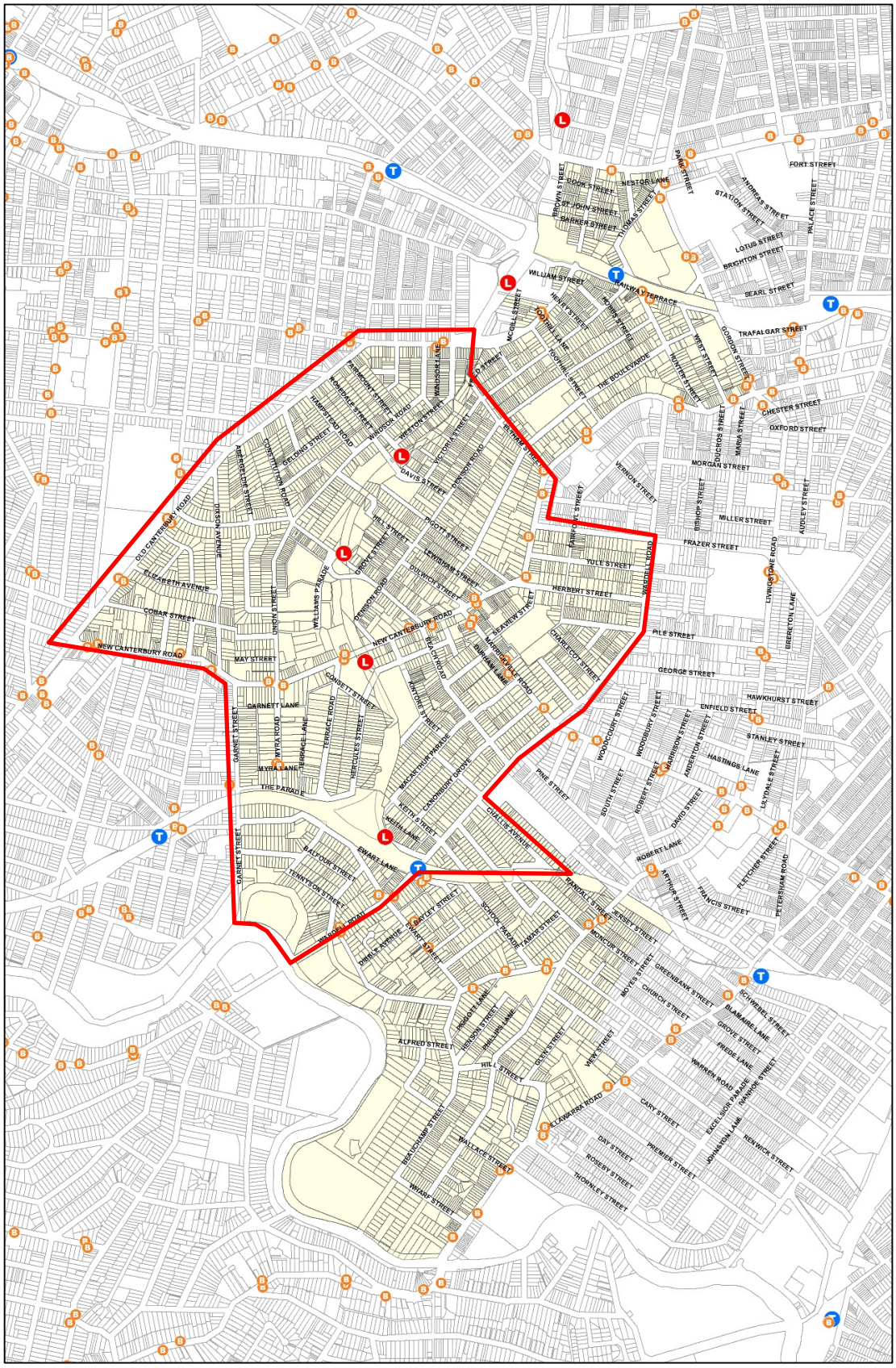
- #406: Five Dock – Hurlstone Park via Ashfield
- #412: Campsie Station – City via Earlwood
- #413: Campsie Station – City via Ashbury
- #418: Burwood – Bondi Junction via Dulwich Hill
- #425: Dulwich Hill – Tempe via Marrickville
- #426: Dulwich Hill – City via Marrickville
- #428: Canterbury - City via Petersham
- #444: Balmain Wharf – Campsie via Leichhardt
- #445: Balmain Wharf – Campsie via Lilyfield Light Rail stop
- #L28: Canterbury – City via Petersham (Limited Stops)

Bus Stops and Taxi Ranks

An inspection of the study area and review of the parking inventory collected as part of the car parking surveys indicates there are no dedicated taxi ranks in the study area.

Bus stops are primarily located along New Canterbury Road, Old Canterbury Road and Marrickville Road; the key bus route corridors in the study area. The locations of the bus stops in the study area are shown in Figure 2.10.

Figure 2.10: Bus Stop Locations



2.5.3 Light Rail

Transdev operates light rail services between Central to the east and Dulwich Hill to the west. There are four stops within the study area as highlighted in Figure 2.11, with the last stop on the line (Dulwich Hill Light Rail stop) located within 100 metres of Dulwich Hill Railway Station.

Figure 2.11: Sydney Light Rail Network

Source: Transport for NSW accessed October 2015 (http://www.transportnsw.info/resources/documents/maps/lightrail-map.pdf)

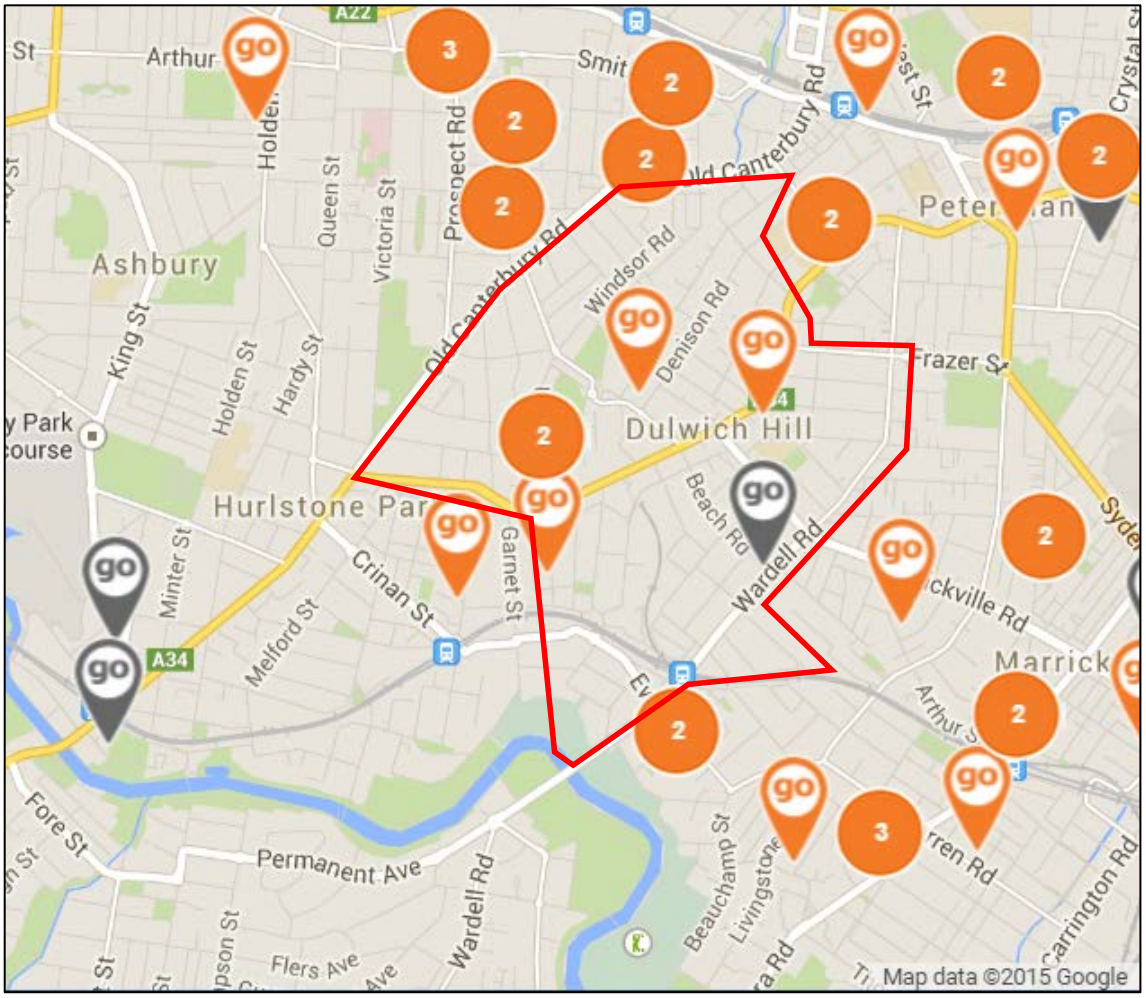
2.6 Local Car Sharing Initiatives

Car share is a concept by which members join a car ownership club, choose a rate plan and pay an annual fee. The fees cover fuel, insurance, maintenance, and cleaning. The vehicles are mostly light/ small hatchbacks and sedans, but also include SUVs, vans and station wagons. Each vehicle has a home location, referred to as a "pod", either in a parking lot or on a street. Members reserve a car by web or telephone and use a key card to access the vehicle.

Car share providers target people that do not own a car or infrequently use their car, as such giving them the option to sell the car to eliminate costs associated with car ownership.

Dulwich Hill is serviced by local car sharing operator GoGet. As shown in Figure 2.12, there are a number of GoGet vehicle pods located within the study area and in close proximity.

Figure 2.12: GoGet Car Share Pods



Base image accessed 21/01/15 (orange markers indicate car was present at the time of map access, grey indicates the car was hired and numbered circled markers indicate multiple cars within proximity)

2.7 Imagining Marrickville Community Survey

Marrickville Council commissioned an 'Imagining Marrickville' survey with residents and workers, to help identify how to improve streets and public spaces within the Marrickville LGA. Approximately 1,250 responses were received. The results of the survey were obtained and analysed with the focus on residents from within the Dulwich Hill, Lewisham and Riverside areas. This section provides a summary of the key parking related findings from the survey for the Dulwich Hill, Lewisham and Riverside areas, with a detailed summary of all transport findings provided in Appendix A.

Participants were asked whether their neighbourhood needed more taxi zones, bicycle parking, accessible parking, car share spaces, loading zones or drop-off zones. 50% of respondents mentioned there was a need, with the common type of facility and locations including:

- Car share spaces (Old Canterbury Road, Frazer Street)
- Bicycle parking (around Railway stations, light rail stops, near bus stops, near shops along Marrickville Road)
- 15 minute drop-off zones (near shops along Marrickville Road, outside railway stations and Dulwich Hill public school)

- Taxi Zone (near shops along Marrickville Road)
- Accessible parking (near Lewisham Station, near doctors/ medical centres)
- Resident parking (near railway station, light rail stops and sporting grounds).

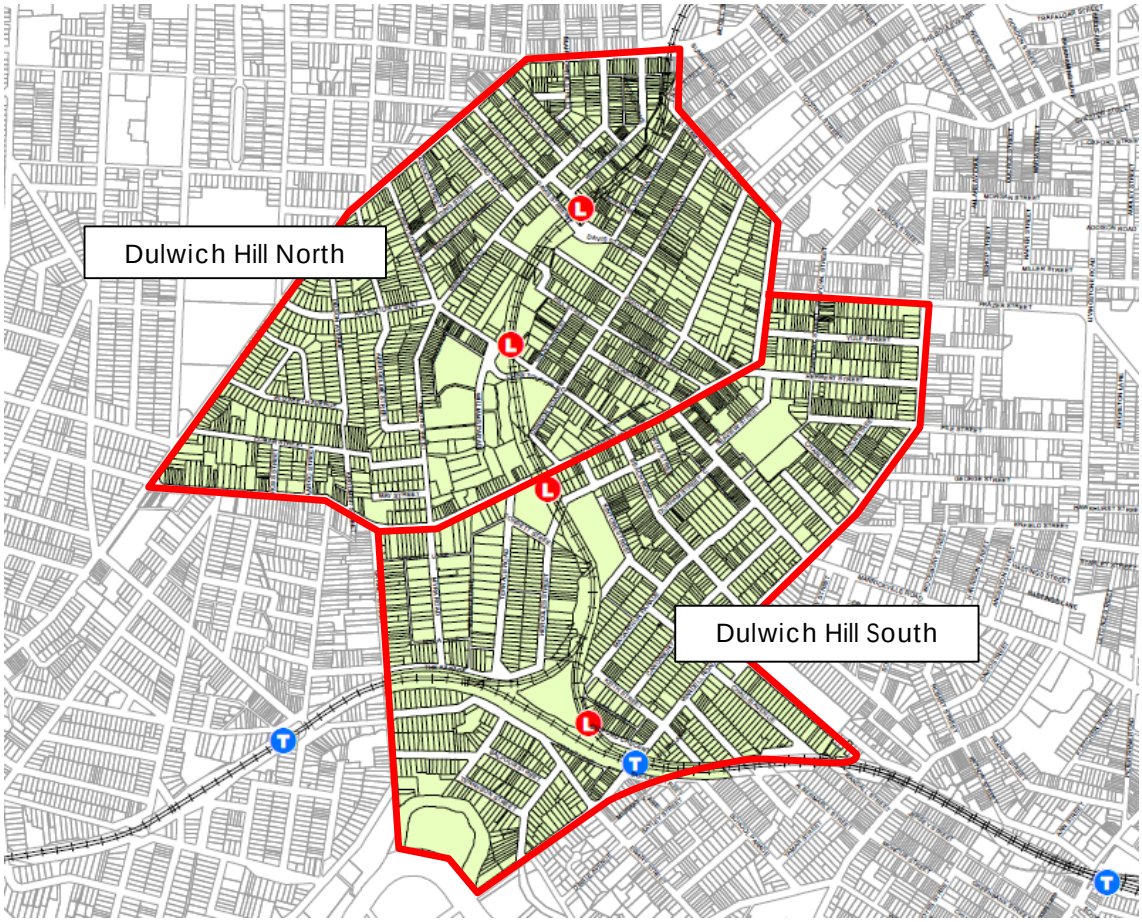
When asked how often they could not find parking within two blocks of their home, 22% responded that it occurred frequently and a further 21% that it sometimes occurred.

3. Parking Assessment

3.1 Overview

For assessment purposes, the study area was split into Dulwich Hill North and Dulwich Hill South, each separated by New Canterbury Road. The study area is shown in Figure 3.1.

Figure 3.1: Study Area

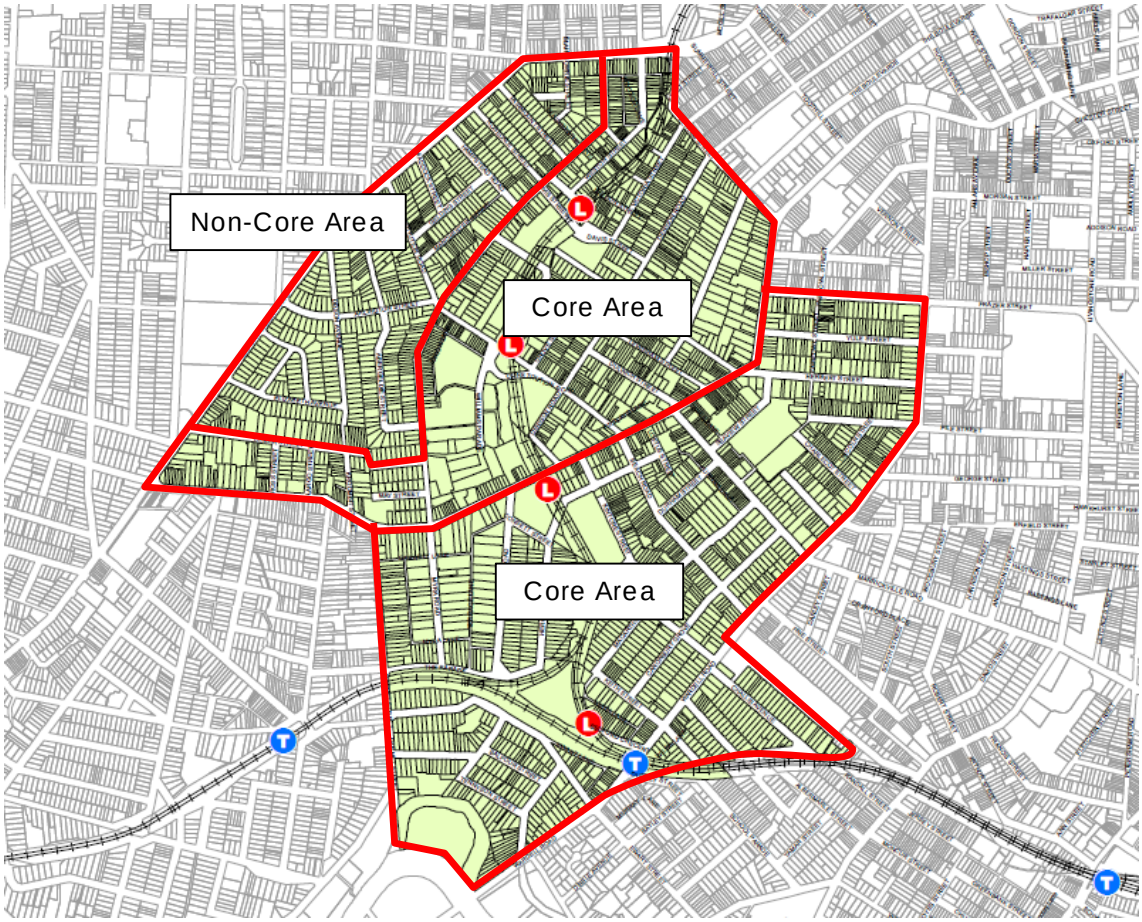


A detailed inventory of the available parking within the study area was prepared, following which hourly car parking surveys were undertaken to determine the car parking occupancy and duration of stay during the following periods:

- Saturday 8 November 2014 (9:00am to 3:00pm)
- Tuesday 11 November 2014 (8:00am to 8:00pm)
- Thursday 13 November 2014 (8:00am to 8:00pm) – targeted areas only.

For the Saturday and Tuesday surveys, a non-core area, shown in Figure 3.2 was identified that contains unrestricted car parking spaces and is primarily residential in nature. Car parking occupancy for the non-core area was only collected at 8:00am, midday and 8:00pm, rather than hourly. No duration of stay data was recorded for the non-core area.

Figure 3.2: Core & Non-Core Areas



The Thursday survey was primarily focussed on the targeted areas shown in Figure 3.3, which includes car parking in the vicinity of Arlington Reserve, Dulwich Hill Railway Station and retail precincts. The survey was undertaken to provide additional data around the key uses and understand whether the retail uses influence the car parking conditions on a Thursday.

Figure 3.3: Targeted Area

The weather during the Thursday and Saturday surveys was fine, whilst there were some showers during the Tuesday surveys.

3.2 Supply

Dulwich Hill provides a combination of 5,634 on-street and 245 off-street car parking spaces. All off-street car parking spaces are located within Dulwich Hill South. The non-core area in Dulwich Hill North contains 900 on-street spaces.

A summary by restriction type of the on-street and off-street car parking supply is provided in Table 3.1. The percentage each restriction type accounts for in the overall parking supply is shown in brackets.

Table 3.1: Summary of Car Parking Types (Weekday)

Car parking Type	Parking Supply (proportion of spaces)		
	Dulwich Hill North	Dulwich Hill South	Dulwich Hill Total
Unrestricted [1]	2,845 (98%)	2,629 (88%)	5,474 (93%)
Time-Restricted [1]	44 (2%)	328 (11%)	372 (6%)
Accessible Parking	12 (<1%)	15 (1%)	27 (<1%)
Other [1]	-	6 (<1%)	6 (<1%)
Total	**2,901 spaces**	**2,978 spaces**	**5,879 spaces**

[1] Includes spaces subject to peak period clearway and/ or bus zone restrictions.
[2] Includes work zone and day-time bus zone.

Table 3.1 indicates that the majority of car parking spaces in each of the study areas are unrestricted, particularly in Dulwich Hill North. This is reflective of the low density residential uses that dominate these precincts.

The majority of time-restricted car parking is located in Dulwich Hill South and concentrated around the retail strip areas and the railway station. A breakdown by restriction (and the number of spaces provided as off-street car parking) is provided in Table 3.2. An overview of the weekday restrictions within the study area is shown in Appendix A.

Table 3.2: Summary of Time-Restricted Car Parking Types (Weekday)

Car parking Type	Number of Car Parking Spaces (off-street car park spaces)		
	Dulwich Hill North	Dulwich Hill South	Dulwich Hill Total
5-minute	-	4	4
10-minute	2	2	4
¼P	-	5	5
½P	8		8
1P	34	85	119
2P	-	97 (46)	97 (46)
3P	-	78 (78)	78 (78)
4P	-	57 (57)	57 (57)
Total	**44 spaces**	**328 spaces (181 spaces)**	**372 spaces (181 spaces)**

Table 3.2 indicates that all time-restricted parking of 1 hour or less is provided on-street and targeting higher turnover, whereas the longer time-restricted parking is concentrated in off-street car parks.

There is currently one resident permit parking scheme in the study area. Residents on Bedford Crescent are eligible for Parking Area M13 (Dulwich Hill Station) resident parking permits. The parking area includes 11 on-street spaces and a two-hour parking restriction applies for vehicles without a permit.

3.3 Survey Results

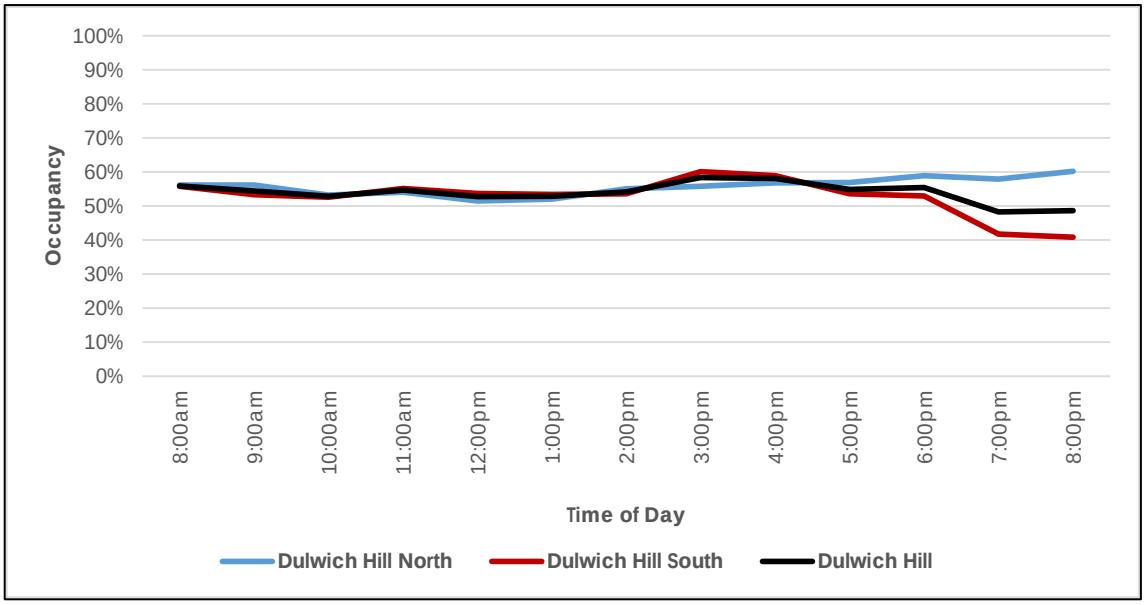
A summary of the car parking occupancy and duration of stay recorded for the study area is provided below. Full car parking survey results have been provided electronically as part of the project deliverable package.

3.3.1 Level of Occupancy

Typically, car parking occupancy levels greater than 85% are often considered to represent the theoretical capacity (refer to Section 5.4.3 for definition of theoretical capacity).

The car parking occupancy profiles for the Core Area are shown in Figure 3.4 for the Tuesday and Figure 3.5 for the Saturday. A comparison of the Tuesday and Saturday occupancy profiles are shown in Figure 3.6.

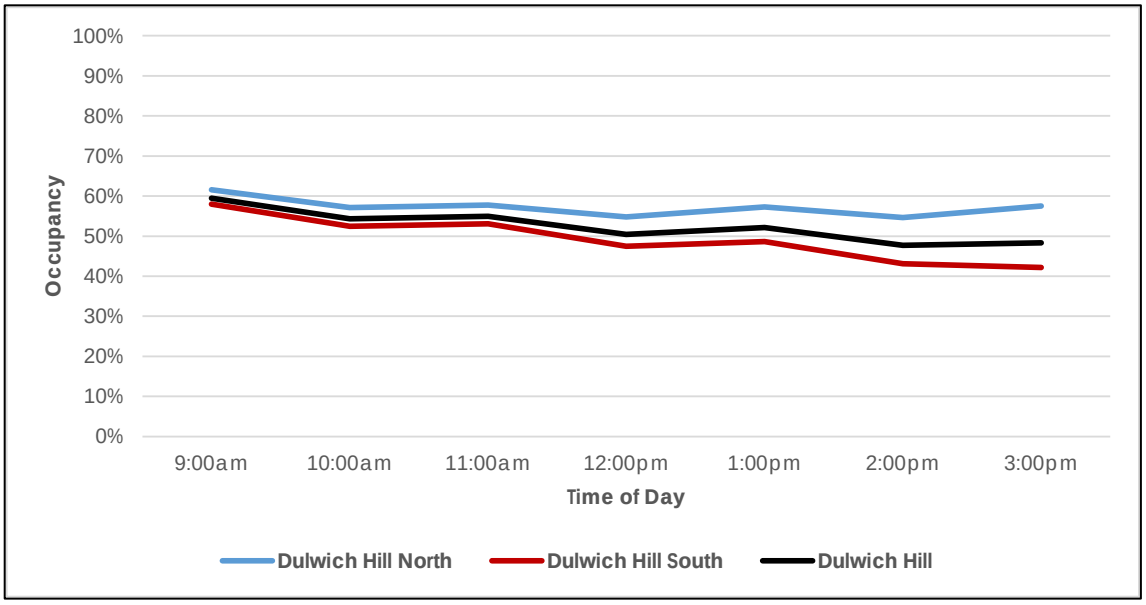
Figure 3.4: Car Parking Occupancy Profile – Core Area (Tuesday)



The occupancy profile for the Tuesday illustrates that for both Dulwich Hill North and Dulwich Hill South, the occupancy is continually between 50% and 60% from 8:00am to 6:00pm. After 6:00pm, occupancy increases above 60% in Dulwich Hill North and reduces to 40% in Dulwich Hill South.

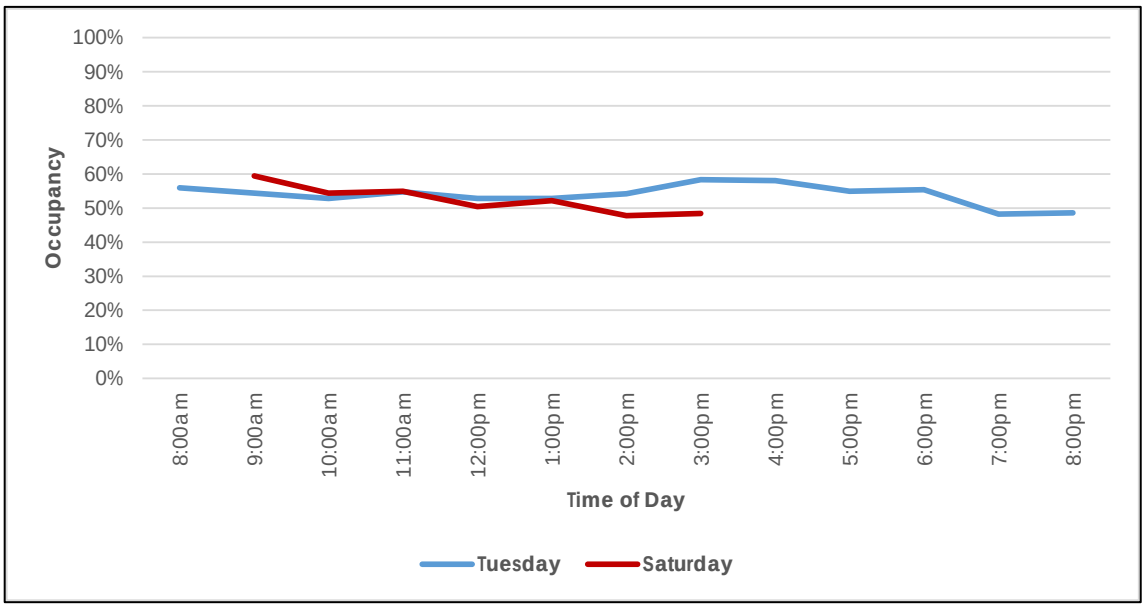
The peak hour for Dulwich Hill South is at 3:00pm, compared with 8:00pm for Dulwich Hill North. The different peak hours illustrates the different users of the car parking in the two areas, being residents in Dulwich Hill North and commuters/ shoppers in Dulwich Hill South.

Figure 3.5: Car Parking Occupancy Profile – Core Area (Saturday)



The car parking occupancy profiles for the Saturday illustrates a generally consistent occupancy in Dulwich Hill North. There is a steady reduction in occupancy in Dulwich Hill South from 58% to 42%. The results would indicate a higher reliance on on-street car parking by residents in Dulwich Hill North, whereas in Dulwich Hill South, parking associated with the railway station and retail precinct influence demand.

Figure 3.6: Car Parking Occupancy Profile – Core Area



Non-Core Area

The car parking occupancies in the non-core area of Dulwich Hill North is shown in Figure 3.7 for the Tuesday and Figure 3.8 for the Saturday. The occupancies in the core area of Dulwich Hill North is provided as a comparison, as is the combined occupancy (Dulwich Hill North).

Figure 3.7: Car Parking Occupancy Summary - Tuesday

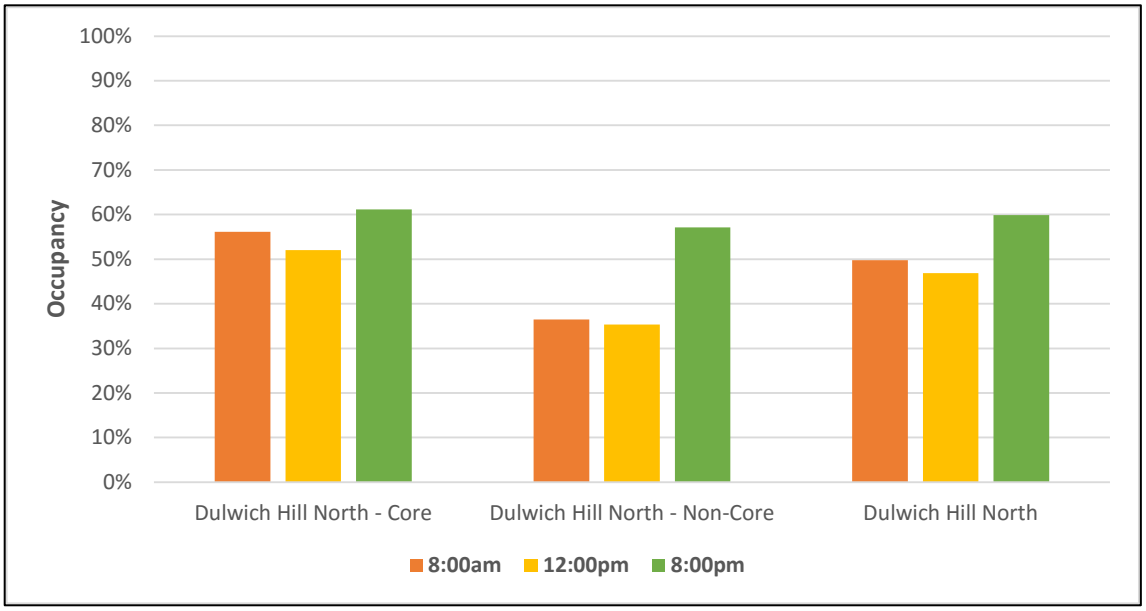
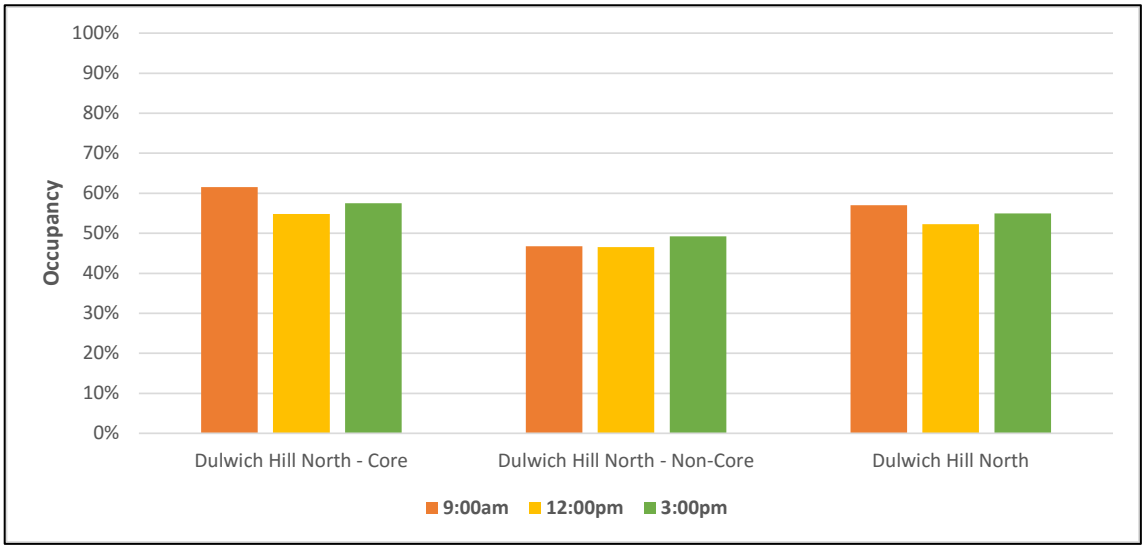


Figure 3.8: Car Parking Occupancy Summary - Saturday



The results for the non-core area illustrate that:

- On the Tuesday, occupancy is approximately 35% in the morning and midday, compared to between 50 to 56% in the core area. This could indicate that residents in the non-core area drive to their destination or closer to public transport.
- Occupancy increases to 57% at night, illustrating the residential nature of the non-core area and that residents are predominantly using the available car parking spaces.
- Occupancies in the core area are anticipated to be higher during the day as vehicles are attracted to the core area as a destination.
- Occupancy on the Saturday is higher in the morning and midday compared to the Tuesday indicating residents parking on-street during the day.

Time-Restricted Off-Street Car Parks

There are three time-restricted off-street car parks in Dulwich Hill that include:

- Durham Lane Car Park (3-hour restriction) – 78 spaces
- Seaview Street Car Park (4-hour restriction) – 57 spaces
- Dan Shanahan Car Park (2-hour restriction) – 46 spaces.

The car parking occupancy profiles of the off-street car parks, presented in Figure 3.9 to Figure 3.11, illustrate the following:

- On weekdays, occupancy in the Durham Lane Car Park is typically below 60%. However, on the Thursday, occupancy peaks at approximately 65% in the late afternoon.
- On weekdays, both the Seaview Street Car Park and Dan Shanahan Car Park peak in the morning, noting there is a second peak later afternoon on the Thursday in Dan Shanahan Car Park.
- Occupancy on Saturday is typically higher compared to weekdays, with the Dan Shanahan Car Park 90% occupied for the duration of the survey.

The results would indicate that the retail precinct's peak trading occurs in the morning; on a weekday occurring after parents drop their children off at school. The late afternoon peak on the Thursday would be related typical Thursday night extended trading.

Figure 3.9: Durham Lane Car Park (78 spaces)

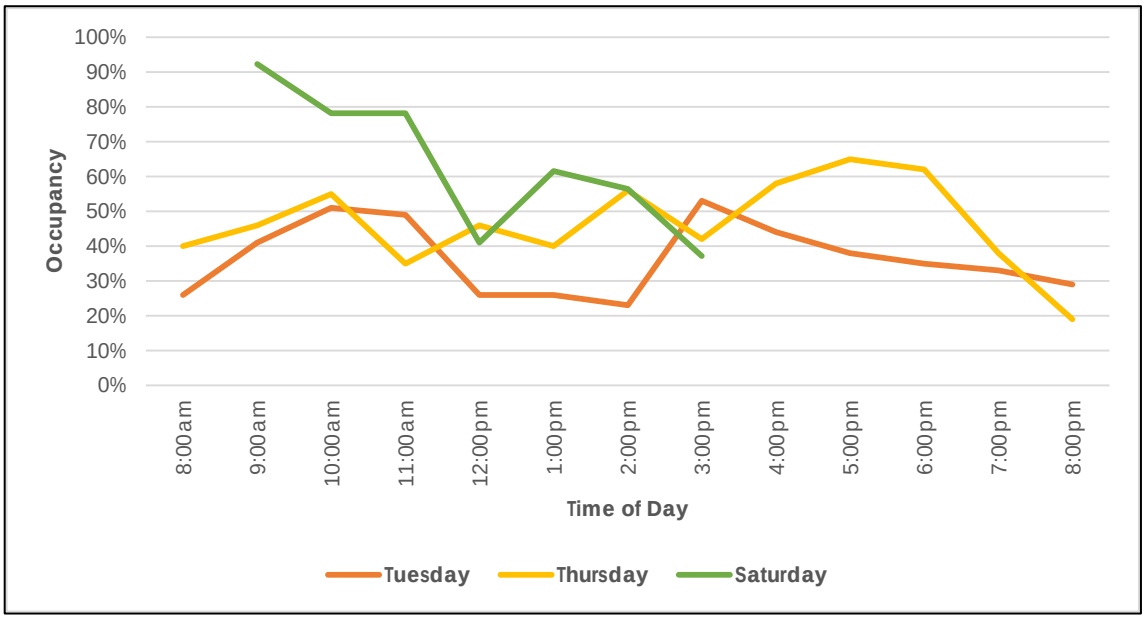


Figure 3.10: Seaview Street Car Park (57 spaces)

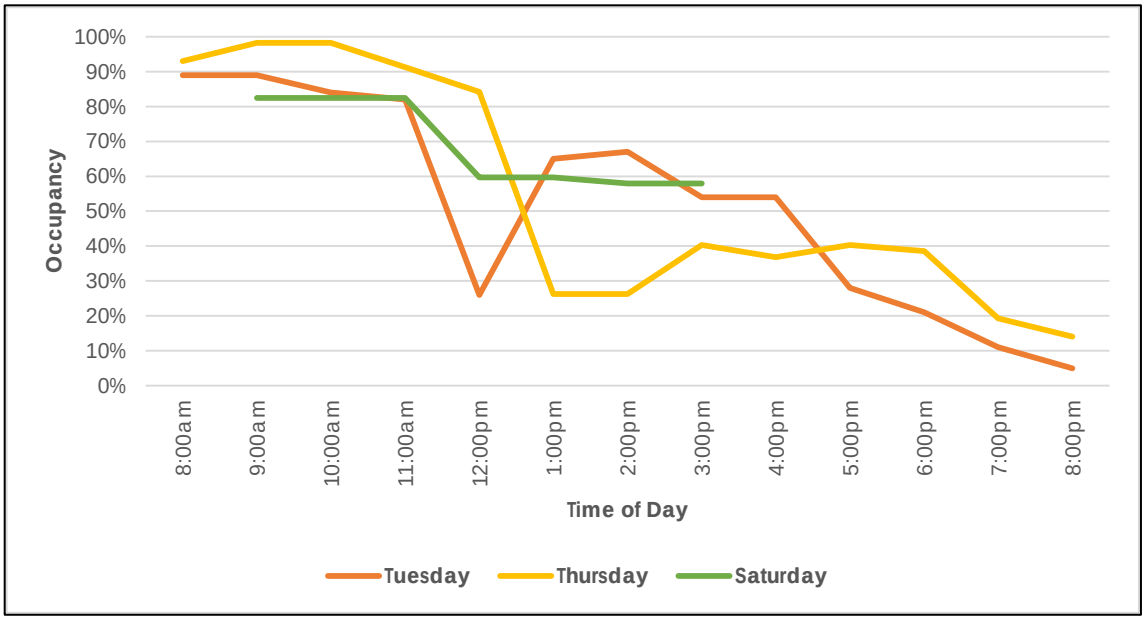
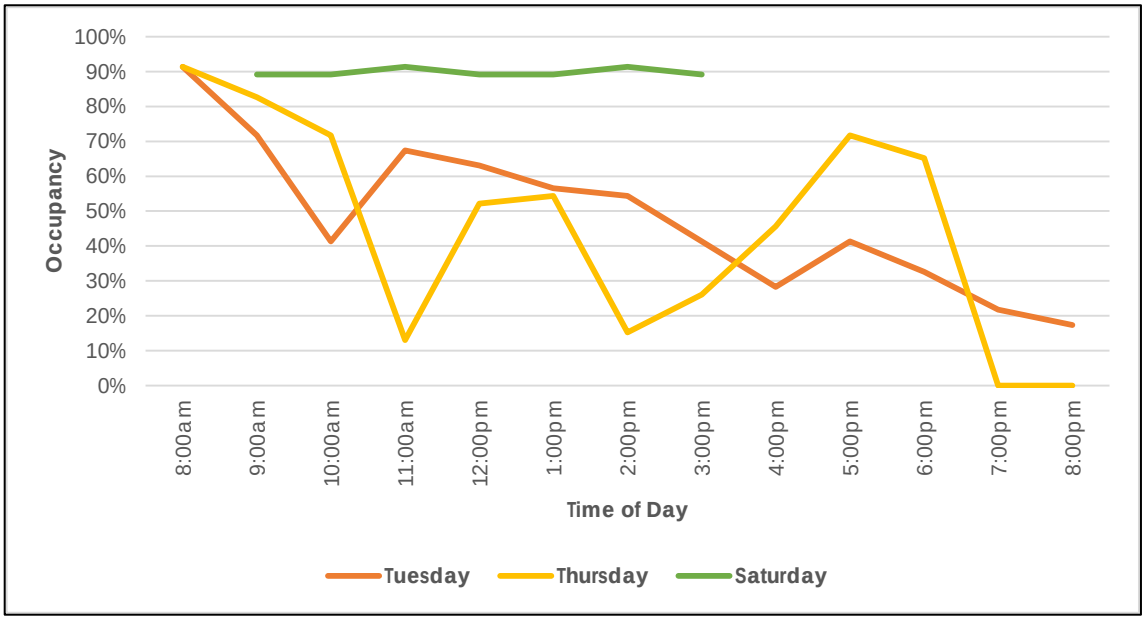


Figure 3.11: Dan Shanahan Car Park (46 spaces)



Detailed Assessment Findings

To understand areas of higher car parking occupancy in Dulwich Hill, the car parking occupancy of the each on-street and off-street car parking zone are shown graphically in Appendix B.

The assessment indicates that although a majority of the study area is below 75% occupancy for most of the day, the following on-street parking areas are typically highly occupied:

- Side streets off New Canterbury Road (Tuesday and Saturday morning)
- In the vicinity of Dulwich Railway Station (Tuesday morning and afternoon)
- In the vicinity of the retail precinct at the New Canterbury Road and Marrickville Road intersection (Saturday morning)

- The Boulevard (Tuesday afternoon and evening), Windsor Road (Tuesday evening), Denison Road (Saturday morning).

3.3.2 Duration of Stay

The level of compliance of time-restricted car parking in Dulwich Hill was assessed for the Tuesday and the key findings are outlined below.

1-hour Restricted Parking

Figure 3.12 presents the level of compliance for all 1-hour time-restricted on-street parking zones.

Figure 3.12: 1-hour Restricted Parking

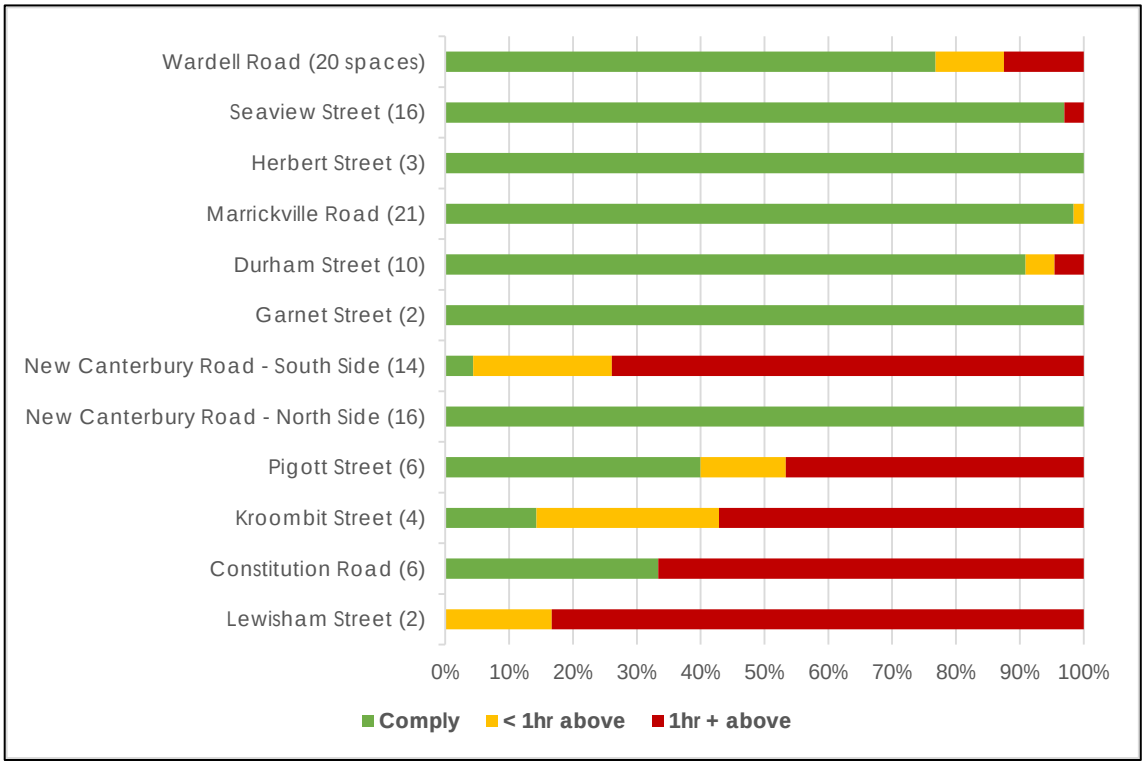


Figure 3.12 illustrates the following in relation to existing 1-hour time-restricted on-street car parking:

- high level of compliance for car parking on the streets in Dulwich Hill South (more than 75%)
- low level of compliance for car parking on the streets in Dulwich Hill North (less than 40%)
- no compliance for the time-restricted car parking on Lewisham Street (supply of 2 spaces)
- full compliance for car parking on the north side of New Canterbury Road. However, less than 5% compliance on the south side of the road, with approximately 75% of vehicles parking for 3 hours or more.

2-hour Restricted Parking

Figure 3.13 presents the level of compliance for all 2-hour time-restricted on-street parking zones.

Figure 3.13: 2-hour Restricted Parking

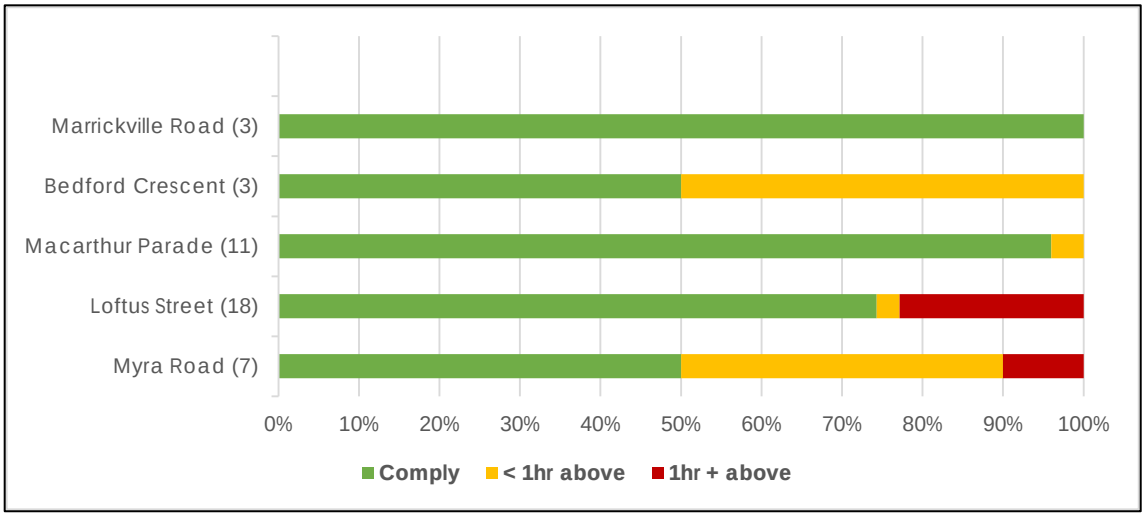


Figure 3.13 illustrates the following in relation to existing 2-hour time-restricted on-street car parking:

- compliance of 50% or more for all the streets
- low number of vehicles parking for 4 hours or more, except on Loftus Street (up to 25%).

Time-Restricted Off-Street Parking

Figure 3.14 presents the level of compliance for all time-restricted off-street car parks.

Figure 3.14: Time-Restricted Off-Street Car Parks

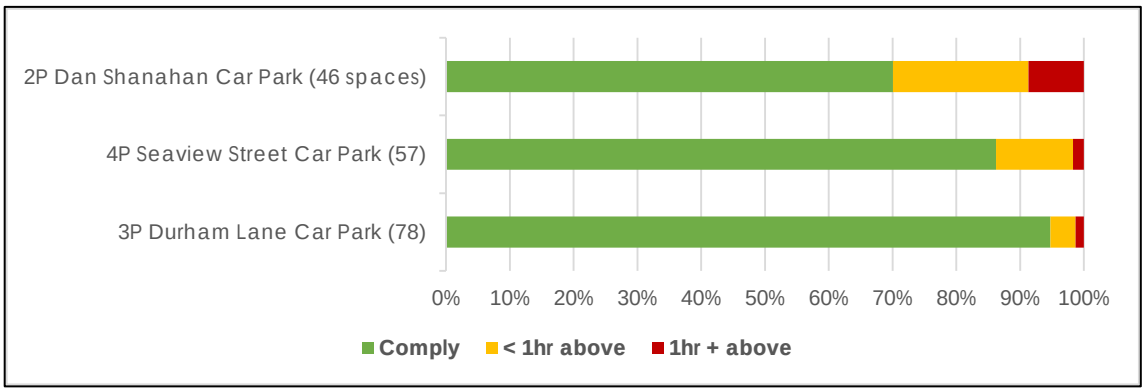


Figure 3.14 illustrates the following in relation to existing time-restricted off-street car parks:

- high level of compliance for the three car parks
- less than 10% of vehicles parking for more than 1 hour above the time restriction.

The compliance results would potentially indicate that there is stronger history of parking infringements being distributed in certain areas, such as the retail precinct, than other area where drivers do not anticipate monitoring and enforcement.

3.4 Bicycle Parking

On-site observations indicated that there was limited demand for bicycle parking at the light rail stops, the railway station and in general throughout the study area.

A bicycle was observed to have been secured to a signpost on Union Street at Constitution Road in the vicinity of the local café.

Bicycle parking facilities in the vicinity of the commercial/ retail uses along New Canterbury Road were also unused. As shown in Figure 3.20, a bicycle was secured to the fence as opposed to the bicycle facility visible in the photo.

The low demand for bicycle parking could be attributed to the close proximity of the destinations to the residential areas, indicating commuters/ shoppers prefer to walk over cycling because of convenience and the short distances travelled or alternatively residents prefer to drive rather than ride.

Samples of the provided bicycle parking in the study area are shown in Figure 3.15 to Figure 3.22.

Figure 3.15: Waratah Mills Light Rail Stop

Figure 3.16: Arlington Light Rail Stop

Figure 3.17: Dulwich Grove Light Rail Stop

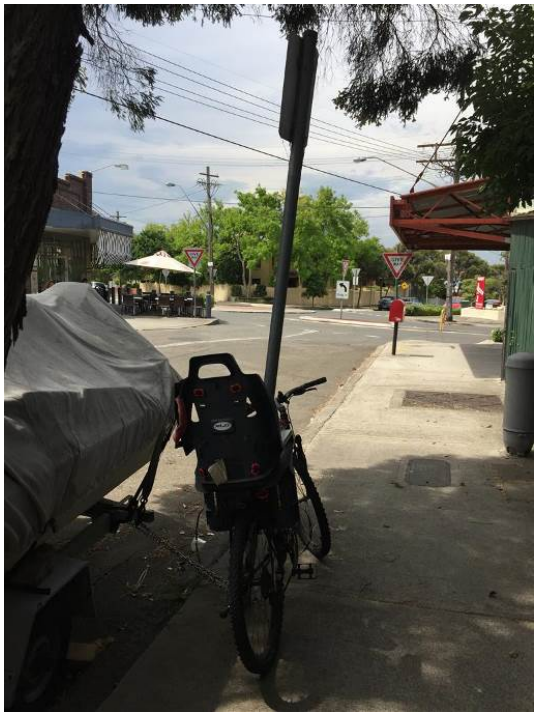
Figure 3.18: Dulwich Hill Light Rail Stop

Figure 3.19: Dulwich Hill Railway Station

Figure 3.20: New Canterbury Road

Figure 3.21: New Canterbury Road

Figure 3.22: Union Street



3.5 Inner West Light Rail Extension Parking Impacts

As detailed in Figure 2.11, there are four light rail stations located within the Dulwich Hill study area. Each of the stations were opened as part of the Inner West Light Rail Extension project, with light rail services commencing in March 2014.

Transport for NSW (TfNSW) commissioned a Parking Management Strategy[4] for the Inner West Light Rail Extension, which assessed the pre and post light rail project parking demands surrounding each of the new stations.

[4] 'Inner West Light Rail Extension Post-opening Parking Survey' prepared by Parsons Brinckerhoff for TfNSW, dated 6 February 2015

As part of the study, car parking occupancy surveys were undertaken in the vicinity of each station (approximately 400m walking distance) prior to the opening (2013) and post opening of the light rail services (December 2014).

A summary of the pre and post light rail car parking occupancies at each of the stations is provided in Table 3.3.

Table 3.3: Summary of Pre and Post Light Rail Opening Occupancies

Light Rail Stop	Change in Occupancies			
	Weekday			Saturday
	4am – 7am	10am – 2pm	7pm – 9pm	10am – 2pm
Waratah Mills	+5%	+1%	+2%	+2%
Arlington	+5%	+14%	+1%	+5%
Dulwich Grove	-8%	+3%	0%	-14%
Dulwich Hill	+18%	+20%	+15%	+13%

Table 3.3 indicates that following the implementation of the Inner West Light Rail Extension car parking occupancies during the day, when commuter demands would be anticipated to be at their greatest, have increased by between 1 and 20 percent.

The data indicates that there has been a noticeable increase in daytime (10:00am to 2:00pm) car parking occupancies at the Arlington and Dulwich Hill stops, with negligible change recorded at the Waratah Mills and Dulwich Grove stops.

However, it is noted that the peak car parking occupancies for the Arlington and Dulwich Hill stops were recorded in the early morning (4:00 to 7:00am) when car parking demands could be primarily generated by local residents rather than any commuter demands. Indeed peak car parking occupancies at the Arlington stop reduced from 81% to 63% between the early morning and daytime periods and increased to 75% during the evening period. Parking occupancies of between 73 and 78% were recorded at the Dulwich Hill stop, indicating that car parking demands were consistently high.

Based on the analysis presented within the Parsons Brinckerhoff report, several recommendations were provided as follows:

- *"Investigate the implementation of a resident parking scheme in the streets surrounding Taverners Hill light rail station. It should be noted that parking in these streets were in high demand (due to local businesses) prior to the opening of the light rail.*
- *Investigate the extension of the existing resident parking scheme at Lewisham West. It should be noted that parking in the streets east of the light rail station were in high demand (due to heavy rail stations) prior to the opening of the light rail.*
- *Investigate the implementation of a resident parking scheme in the streets surrounding Dulwich Hill light rail station. It should be noted that parking in these streets were in high demand (due to the heavy rail station and businesses) prior to the opening of the light rail."*

The Taverners Hill and Lewisham West stations are located outside the study area. Further analysis regarding the potential expansion of the existing resident permit scheme is provided later in this report.

4. Future Parking Requirements

This section determines the future parking requirements resulting from anticipated development in the study area, noting that this is based on future land use targets set out in the 'Marrickville Section 94/94A Contributions Plan 2014' prepared by Council.

There are currently Urban Renewal Corridor studies being completed as a result of major transport infrastructure projects, such as the WestConnex and Sydney Metro projects that would influence the future parking demands, however have not been considered in detail as part of this study. Details regarding these projects are discussed in Section 4.4.

4.1 Projected Floor Area and Jobs Growth

Future residential dwelling targets for each Sydney Local Government Area (LGA) are set out in the Metropolitan Plan for Sydney 2036 and the Draft South Subregional Strategy prepared by the Department of Planning and Infrastructure (now Department of Planning and Environment). In this regard these documents set out an additional dwelling target of 4,150 dwellings for the Marrickville LGA to 2031 (+16 years).

Subsequent to the above, Marrickville Council has identified future land use targets (residential and employment) for each suburb in the LGA in the 'Marrickville Section 94/94A Contributions Plan 2014'.

Non-Residential Land Uses

The projected change in worker population by suburb is provided in Table 4.1. The projected floor area changes are also included in the table and are based on the floor area to employee assumptions provided in the report.

Table 4.1: Future Non-Residential Land Use Forecasts (+16 years)

Suburb	Worker Population			Floor Area Change [1] (sq.m)		
	Commercial	Industrial	Retail	Commercial	Industrial	Retail
Marrickville	+305	-37	+231	+6,100	-3,700	+4,620
Dulwich Hill	**+99**	**-50**	**+185**	**+1,980**	**-5,000**	**+3,700**
St Peters	+766	-237	+667	+15,320	-23,700	+13,340
Petersham	0	-33	0	0	-3,300	0
Lewisham	-26	-101	0	-520	-10,100	0
Sub-Total	**+1,143**	**-458**	**+1,085**	**+22,860**	**-45,800**	**+21,700**
Total	**+1,770**			**-1,240**		

[1] Commercial = 1 employee per 20sq.m, Industrial = 1 employee per 100sq.m, Retail = 1 employee per 20sq.m

Table 4.1 indicates a net change of 1,770 additional employees in the Marrickville LGA and a net reduction of 1,240sq.m non-residential floor area. Specifically the data indicates an increase of 234 jobs and a net increase of 680sq.m non-residential floor area in Dulwich Hill.

It is envisaged that the additional commercial floor area will be distributed amongst the existing non-residential areas provided within the study area.

Residential Land Uses

The projected change in the number of dwellings by suburb is provided in Table 4.2.

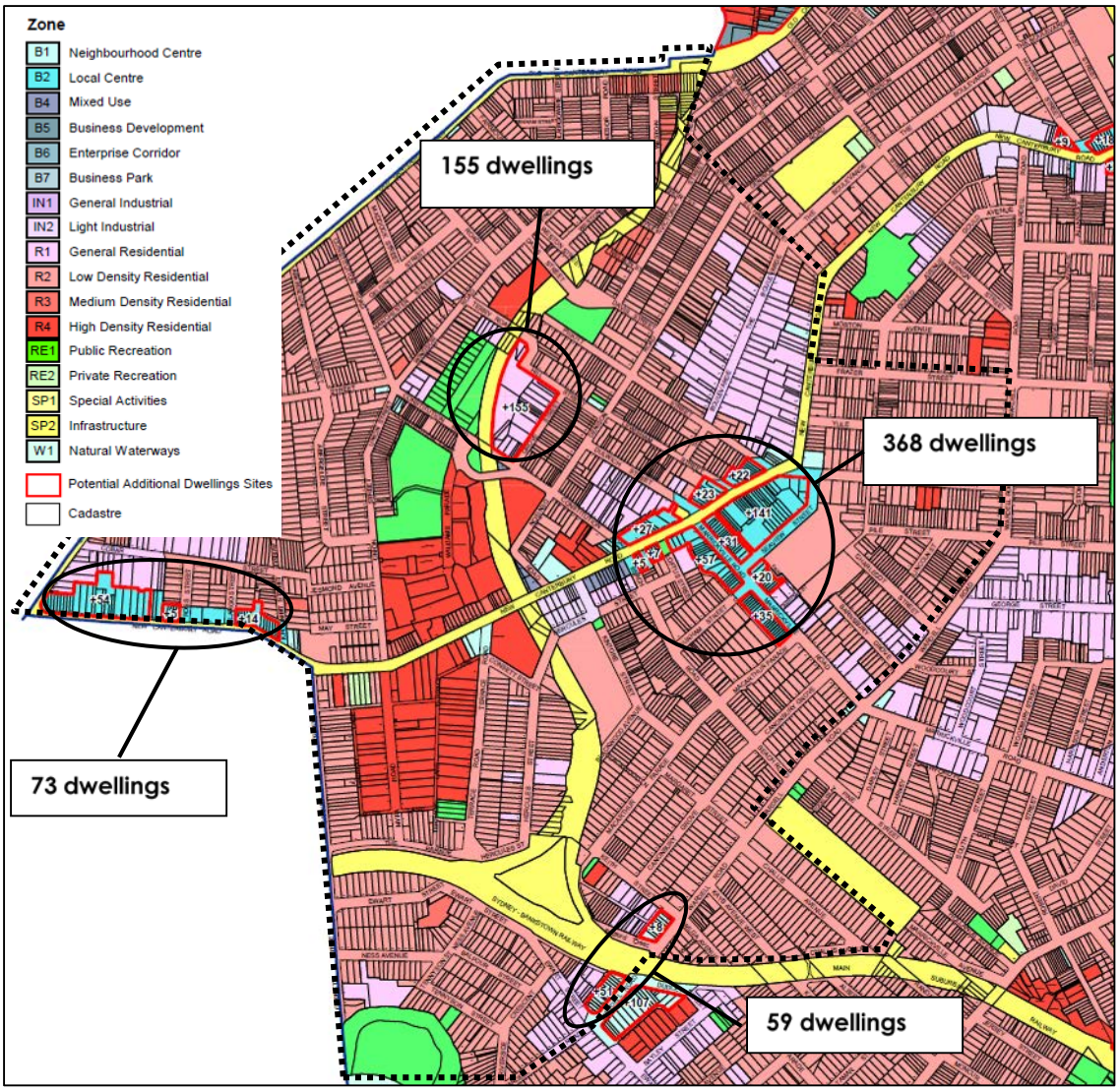
Table 4.2: Future Residential Dwelling Land Use Forecasts (+16 years)

Suburb	Additional Dwellings [1]
Dulwich Hill	**604**
Lewisham	452
Petersham	672
Marrickville	1,722
Sydenham	7
Tempe	0
Mascot	0
St Peters	450
Enmore	58
Stanmore	56
Camperdown	15
Newtown	342
Total	**4,378**

[1] Excludes a total of 610 secondary and subdivision dwellings.

Table 4.2 indicates that some 4,378 additional dwellings (4,988 dwellings when secondary and subdivision dwellings are included) are anticipated for the Marrickville LGA, including 604 dwellings in Dulwich Hill. The anticipated distribution of additional residential dwellings is defined in the Marrickville LEP 2010 and illustrated in Figure 4.1. It is noted that the Marrickville LEP 2010 had identified a total of 655 additional dwellings in Dulwich Hill, of which 596 dwellings are in Dulwich Hill North. This is more than anticipated for Dulwich Hill in the Marrickville Section 94/94A Contribution Plan 2014 (604 dwellings).

Figure 4.1: Forecast Additional Residential Dwellings



4.2 Estimated Future Demand

The car parking provision requirements for different land uses and development types are set out in 'Section 2.10 General Provisions Parking' of the Marrickville Council DCP. Nine car parking objectives are provided in the DCP, including Objective 1 pertaining to car parking supply reproduced below (each of the Objectives are provided in Section 5.1):

"To balance the need to meet car parking demand on-site to avoid excessive spillover on to streets, with the need to constrain parking to maintain Marrickville LGA's compact urban form and promote sustainable transport"

The DCP continues to detail the approach to the car parking provision, as follows:

- *"1. Car parking provision is slightly constrained across the entire LGA as a demand management measure;*
- *2. Car parking provision rates are further constrained in accessible areas;*

- *3. The approach adopted by the DCP is supported by other private and public domain parking management policies and actions that collectively aim to improve the management of parking and promote sustainable transport across the LGA."*

Specific car parking rates are recommended in Table 1 of Section 2.10.5 of the DCP for various land use types. The car parking rates differ depending on the location of the development site, based on their proximity to public transport and other essential services.

The car parking rates for residential, retail and office (i.e. commercial) uses are provided in Table 4.3.

Table 4.3: Marrickville DCP On-Site Car Parking Requirements

Use	Car Parking Spaces Required			ABS Car Parking Rate (2011)
	Parking Area 1	Parking Area 2	Parking Area 3	
Studio apartment	0.2 spaces per apartment	0.4 spaces per apartment	0.6 spaces per apartment	0.56 spaces per dwelling
1-bedroom apartment	0.4 spaces per apartment	0.5 spaces per apartment	0.8 spaces per apartment	0.82 spaces per dwelling
2-bedroom apartment	0.8 spaces per apartment	1.0 spaces per apartment	1.2 spaces per apartment	1.05 spaces per dwelling
3+ bedroom apartment	1.1 spaces per apartment	1.2 spaces per apartment	1.2 spaces per apartment	1.38 spaces per dwelling
Residential visitors	0.1 spaces per apartment	0.1 spaces per apartment	0.1 spaces per apartment	-
Office	1 space per 100sq.m	1 space per 80sq.m	1 space per 60sq.m	-
Retail (up to 500sq.m)	1 space per 100sq.m1	1 space per 80sq.m	1 space per 50sq.m	-

For assessment purposes, the rates presented in Parking Area 2 have been adopted. The following commentary is offered regarding the appropriateness of the application of the above DCP rates:

- The resident car parking rates are generally less than the ABS car ownership data. For assessment purposes it is assumed that approximately 0.2 spaces per dwelling would be accommodated off-site (this represents the shortfall between provision and ownership).
- The residential visitor car parking demands could be accommodated entirely on-site, but for assessment purposes have been assumed to be split 50:50 between on-site and the greater public car parking pool.
- The retail and office car parking rates appear to be on the low side and for assessment purposes it is assumed that 20% of the parking demand is accommodated off-site.

Table 4.4 provides a summary of the applicable future car parking rates.

Table 4.4: Future Car Parking Generation Rates

Use	Car Parking Rate		
	On-site	Off-site	Total
Residential (residents)	0.4-1.2 per dwelling	0.2 spaces per dwelling	0.6-1.4 spaces per dwelling
Residential (visitors)	0.05 spaces per dwelling	0.05 spaces per dwelling	0.1 spaces per dwelling
Office	1 space per 80sq.m	0.2 spaces per 80sq.m	1.2 spaces per 80sq.m
Retail	1 space per 80sq.m	0.2 spaces per 80sq.m	1.2 spaces per 80sq.m

A minor reliance on on-street parking is not surprising given the Council adopted approach to requiring reduced parking provisions.

4.3 Estimated Future Demands

A summary of the anticipated future off-site car parking demands generated by each of the development precincts is provided in Table 4.5.

Table 4.5: Additional Car Parking Demands by Development Area / Precinct (+16 years)

Precinct	Residential Dwellings	Commercial Floor Area [1]	Car Parking Demand			
			Residential (Residents) [0.2 spaces per dwelling]	Residential (visitors) [0.05 spaces per dwelling]	Commercial (retail/office) [0.2 spaces per 100sq.m]	Total
Precinct 1	73	633sq.m	15	4	2	20
Precinct 2	155	1,344sq.m	31	8	3	42
Precinct 3	368	3,191sq.m	74	18	8	100
Precinct 4	59	512sq.m	12	3	1	16
Total	**655**	**5,680sq.m**	**131**	**33**	**14**	**178**

[1] Including 3,700sq.m of Retail and 1,980sq.m of Commercial (Table 4.1) and distributed proportionately to the dwelling distribution.

Table 4.5 indicates that an additional on-street car parking demand of 178 spaces could be generated by the forecast additional land uses. The distribution of the additional demands is illustrated in Figure 4.2.

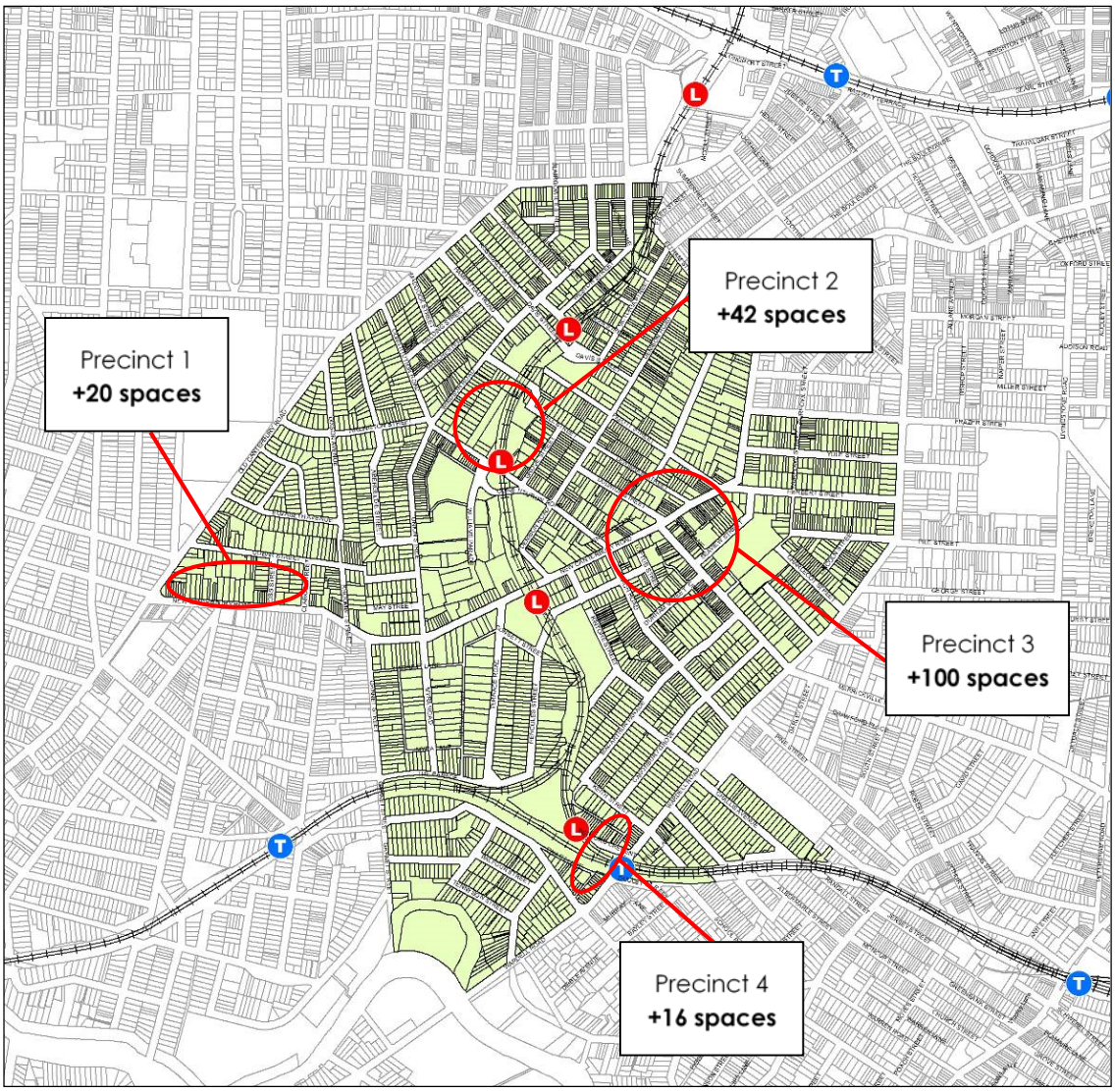
4.4 Other Influences on Future Parking Demands

The 33 kilometre WestConnex road project and Sydney Metro rail project have resulted in Urban Renewal Corridor studies that look at opportunities to increase housing density, employment and connectivity within walking distance of the transport corridors. In this instance, the studies are concentrated along Parramatta Road and the Bankstown line (Sydenham to Bankstown).

The Dulwich Hill Precinct being investigated for Urban Renewal, largely comprises the land south of and along New Canterbury Road, with the vision to include a combination of low, medium and medium-high rise housing, as well as shop top housing along main roads.

Any urban renewal resulting from these studies will have both positive and negative influences to future car parking demands that would need to be factored into future studies once details are confirmed.

Figure 4.2: Anticipated Additional On-Street Car Parking Demands (+16 years)



5. Car Parking Objectives and Principles

In order to determine the basis for any applied car parking strategies for Dulwich Hill, it is relevant to first understand:

- the overarching transport planning context of the area
- the fundamental, principles which relate to car parking and car park planning.

These enable the setting of specific objectives and principles for the study area.

5.1 Existing Marrickville Council Objectives

Overarching transport objectives and parking objectives are set out within existing policy documents and provide a key starting point for the development of specific parking objectives to guide the way in which parking should be managed from this point forward in the study area.

In this respect key objectives as they relate to the management of parking are set out in the following:

5.1.1 Marrickville LEP

The aims of the Marrickville LEP are reproduced below, with those pertaining to transport bolded:

"(a) to support the efficient use of land, vitalisation of centres, integration of transport and land use and an appropriate mix of uses,

(b) to increase residential and employment densities in appropriate locations near public transport while protecting residential amenity,

(c) to protect existing industrial land and facilitate new business and employment,

(d) to promote sustainable transport, reduce car use and increase use of public transport, walking and cycling,

(e) to promote accessible and diverse housing types including the provision and retention of affordable housing,

(f) to ensure development applies the principles of ecologically sustainable development,

(g) to identify and conserve the environmental and cultural heritage of Marrickville,

(h) to promote a high standard of design in the private and public domain."

5.1.2 Marrickville DCP

The objectives of Section 2.10 'Parking' of the Marrickville DCP are reproduced below. It is noted that these objectives are provided to promote aim (d) of the Marrickville LEP presented above.

- *"O1 To balance the need to meet car parking demand on-site to avoid excessive spillover on to streets, with the need to constrain parking to maintain Marrickville LGA's compact urban form and promote sustainable transport.*
- *O2 To balance the need to provide service/delivery areas on-site to avoid excessive use of streets for this purpose, with the need to constrain these areas to maintain Marrickville LGA's compact urban form and promote sustainable transport.*
- *O3 To improve the integration of land use and transport by applying strict constraints to car parking within accessible areas and more modest constraints in less accessible areas.*

- *O4 To ensure parking provision and design is compatible with the particular development proposed.*
- *O5 To allow for appropriate variation of provision rates and design parameters for developments with particular characteristics, such as affordable housing or re-use of older buildings.*
- *O6 To provide for current and future demand for bicycle parking and to ensure bicycle parking is well designed and located.*
- *O7 To ensure all parking facilities are safe, functional and accessible to all through compliance with design standards.*
- *O8 To ensure all parking facilities achieve positive visual, environmental, sustainable transport and pedestrian safety outcomes through adoption of best practice principles.*
- *O9 To give priority, in larger developments and where appropriate, to certain users in allocating parking space, including emergency vehicle parking, service/delivery, mobility parking, bus/bicycle priority and parking for carshare and environmental vehicles."*

Further to the above objectives the following Policy Approach is contained within Section 2.10 'Parking' of the Marrickville DCP:

"Parking policy is an important component of promoting sustainable transport and planning for liveable and economically viable communities. Traditional car parking policies aimed to meet demand, whereas contemporary policies balance this against the need to constrain car ownership/use and promote sustainable transport. The constrained approach can improve building design, improve affordability of housing, retain heritage values, improve the viability of developments and businesses, improve visual amenity and reduce environmental impacts. Contemporary policies also meet current demand and allow for future demand for bicycle parking and parking for carshare and environmental vehicles.

This approach also aims to improve the management of existing parking resources to optimise turnover and make best use of valuable land devoted to car parking. Many tools can improve management of parking, such as pricing and enforcement. Although many of these tools apply to the public domain, and as such are outside the ambit of this section of the DCP, they can and should be utilised where appropriate in the private domain.

In larger developments, and in some smaller developments where appropriate, a key action for improved management of parking is prioritising targeted users of parking space - for efficiency, equity and environmental reasons. In general terms, highest priority should be given to emergency vehicle parking, service/delivery areas, mobility parking, bus/bicycle priority and parking for carshare and environmental vehicles. Lowest priority should be given to conventional private cars."

5.1.3 Marrickville Council 2007 Marrickville Integrated Transport Strategy

Purpose/Objectives:

"This Strategy provides the rationale and recommended actions for addressing local transport issues and moving Marrickville toward sustainable transport – that is, reducing car use and increasing use of public transport, walking and cycling."

The Integrated Transport Strategy informed the principles and objectives of the current Marrickville DCP.

5.2 What Is Parking?

Before developing a set of parking strategy objectives and how these integrate with overall transport objectives we must also have a comprehensive understanding of what parking is.

As a general rule, land uses generate and attract patrons, customers, staff and / or residents resulting in economic activity.

A by-product of access to these land uses is, in its simplest form, a 'trip'. Trips can be made by a variety of methods including (but not limited to) walking, cycling, public transport and / or the private motor vehicle.

Where does car parking enter this equation? Car Parking provides an end of trip facility for the private motor vehicle mode.

The type of land use has differing levels of attractiveness (i.e. trip generation) and therefore different requirements for car parking. Different uses also have different customer bases and in turn different needs in regard to their required length of stay. Accordingly, different types of car parking are required (for example, pick up drop off parking – 5 to 15 minutes, short stay parking – 1 to 4 hours and long stay parking – all day) to satisfy differing needs. In a town centre setting a single parking event can serve a number of trip purposes and a single space can be shared between a number of users over the course of the day due to the differing temporal patterns of land uses.

With consideration of the above, in a town centre environment, it is important to have a sufficient amount of car parking relative to demand and the centre's context, while balancing different user group needs and the impacts of car parking on the centre.

Car parking can be managed to achieve this balance and influence travel patterns and modes including through parking provision policies, time restrictions and the pricing of car parking.

The cost of providing parking (by developer, Council, landowners or businesses) must also be recognised. Whether it be physical infrastructure cost, maintenance cost, management cost or lost opportunity cost, the cost of providing car parking is ultimately borne by parking users and by others (through increased rental, costs of goods and Council rates) whether they use car parking or not.

In this context it is therefore important that parking be managed to:

- Recognise that parking space doesn't attract people; it's the destination that attracts people.
- Enhance and not detract from Dulwich Hill as a great destination.
- Encourage economic activity while advancing liveability.
- Ensure that Dulwich Hill is not placed at a competitive disadvantage relative to other centres due to car parking.
- Maintain a suitable amenity for local residents.

5.3 Parking Strategy Objectives and Guiding Principles

A set of strategy objectives (see Table 5.1) have been developed along with guiding principles to provide further guidance around the appropriateness of various available actions:

Table 5.1: Strategy Objectives and Guiding Principles

Strategy Objective	Guiding Principles
Manage the different modes of access in an appropriately balanced way	○ Recognise that walking, cycling, bus, train and taxi are important forms of access to/within the study area that have increased in popularity in recent times and are forecast to increase in importance. ○ Enhance existing pedestrian and cyclist environments to encourage further mode share shift. ○ Recognise that car travel is currently the dominant form of access to the study area at this time, noting that its dominance is decreasing. ○ The assessment of the appropriate quantum of parking in the study area is to be based upon data and evidence. ○ The provision and management of on-street car parking should be aimed to achieve an 85% peak repeatable occupancy level across the centre representing an appropriate balance of the availability of vacant spaces to minimise vehicle circulation in finding a space however also reflecting an effective use of infrastructure and resources. ○ Recognise Council policy that indicates a reluctance to provide an oversupply of car parking.
Manage car parking to prioritise access according to the needs of users, with visitors and customers having higher access over staff and commuter needs.	○ Central short-stay parking areas are primarily for use by customers and short-term visitors. ○ Surrounding long-stay parking areas are primarily for use by workers and long-stay customers. ○ It is reasonable to walk 400 metre from the core area of the town centre to all day car parking. ○ Parking time limits are essential to manage parking turnover and generate parking availability in convenient areas for preferred users. ○ A range of parking time limits should be provided to reflect the differing time needs of users. ○ Parking enforcement is central to ensuring that parking management operates as intended. ○ If required, use parking pricing as a means to reinforce parking turnover, access to preferred users and enforcement. ○ Car parking should be clearly identified to minimise circulation to find a car parking space.
Manage parking in residential areas to balance residential amenity and the efficient use of available parking resources.	○ On-street parking is a Council resource that can be shared between a number of users. ○ Parking in residential streets surrounding the town centres and transport nodes is acceptable and manageable. ○ The benefits of living close to a town centre and/or transport node must also be considered in the context of a lower level of amenity.

5.4 Additional Parking Principle Detail

Further to the above, additional detailed principles are provided below for a more specific and contextual understanding.

5.4.1 On-Street Parking Space Allocation Needs

Table 5.2, Table 5.3 and Table 5.4 provide details of the differing needs of road users and how these needs should be considered differently between commercial and residential areas.

Table 5.2: Allocation of Parking – Commercial Areas

Needs (Highest to Lowest)	Description
Disabled	In accordance with identified needs and relevant published standards
PT Zone	Typically bus stop or taxi rank
Loading Zone	Where off-street loading is not provided
Bike Racks	Where space for footpath bicycle parking is not available
Drop off / Pick up	Short term parking for drop off / pick up
Customers / Shoppers	Time restrictions to vary from 15 minutes to 4 hours as required by the nature of the business / service, e.g. short term for post office, dry cleaner and longer term for consultations, hairdressers, restaurants and cafes
Residential (including visitors)	Only applies in smaller centre with a mix of shop and residences; requires balancing of economic needs of the strip and surrounding residential amenity
Traders and Local Employees	Local employees should not park in shopping strips where this undermines parking turnover that supports the businesses, but should be encouraged to use non car based transport or in trader permit zones (if available)
Commuter Parking	Parking for commuter use will only be considered where deemed to be appropriate and not to impact on residential amenity or economic viability

Table 5.3: Allocation of Parking – Residential Fringe Surrounding Commercial Areas

Needs (Highest to Lowest)	Description
Disabled	Where individual residents qualify & no off-street parking exists
PT Zone	Typically bus stop or taxi rank
Drop off / Pick Up	Short Term parking for student drop off / pick up
Residential [1]	Time restricted as required e.g. 1P to 4P and/or permit parking
Short-term/Loading Zone	For local activity e.g. corner milk bar (minimum 1 bay) to support a local business
Residential visitors	Time restricted e.g. 1P to 4P and/or permit parking as required
Bike racks	Where space for footpath bicycle parking is not available
Customers	Managed to also allow for residential parking
Local employees	Managed to also allow for residential parking
Commuter Parking	Managed to also allow for residential parking
Bus parking	Buses should not normally park in residential streets but allowance may be required for school and/or community buses

[1] While residential parking is identified to have a higher need than customer and employee parking this does not preclude parking by customers and employees in residential streets. This simply highlights that consideration of the needs of residential parking is required to ensure that these users can be suitably managed before allowing the intrusion of commercial parking into residential streets.

Table 5.4: Allocation of Parking – Residential Areas (including around Transport Nodes)

Needs (Highest to Lowest)	Description
Disabled	Where individual residents qualify & no off-street parking exists
PT Zone	Typically a bus stop
Residential	Typically unrestricted or time restricted in combination with residential permit parking
Residential Visitors	Typically unrestricted or time restricted (e.g. 1P to 4P) in combination with residential permit parking
Commuter Parking	Managed to also allow for residential parking

5.4.2 Walking Distance

Acknowledgement must be given to appropriate walking distances between car parking locations and a user's intended destination. Generally, the time and distance which drivers are prepared to walk depends on the length of time which will be spent at their destination. The acceptable walking distance can also be impacted by the quality of the pedestrian environment, climate, line of site (can the destination be seen), and friction (barriers such as crossing busy roads).

The Victorian Transport Policy Institute Paper (Canada) on Shared Parking dated 4 September 2007 indicates the following walking distances as a guide for various activities as set out in Table 5.5.

Table 5.5: Acceptable Walking Distances (Adapted from the Victorian Transport Policy Institute, Canada)

Adjacent (Less than ~50m)	Short (Less than ~250m)	Medium (Less than ~400m)	Long (Less than ~500m)
People with disabilities	Grocery store	General retail	Airport parking
Deliveries and loading	Professional services	Restaurant	Major sport or cultural event
Emergency services	Medical clinic	Employees	Overflow parking
Convenience store	Residents	Entertainment centre	
		Religious institution	

Note: This table assumes good pedestrian conditions.

Table 5.5 shows that the uses whose customers would stay for the shortest time typically accept the shortest walking distances and as the time each user expects to spend at the destination, the longer they find it acceptable to walk.

5.4.3 Theoretical Capacity

A car parking occupancy of around 85% is typically considered to represent theoretical capacity (particularly for on-street parking). This occupancy level represents the equilibrium and a good utilisation of car parking, and further given the dynamic nature of parking, provides the ability for drivers arriving to an area to find a car parking without excessive circulation.

5.4.4 Town Centre and Commuter Parking

Differing approaches can be taken to the provision of car parking particularly around town centres where an interface exists between residential and commercial uses. The same principle applies for commuter parking around key transport nodes, such as Dulwich Hill railway station and the light rail stops.

The use of peripheral area parking around a town centre (or transport node) is a common occurrence to support the core areas which often results in intrusion into surrounding residential areas.

While traditional residential areas are sought to be protected from commercial intrusion, those adjacent to a town centre or transport node cannot necessarily expect the same level of amenity as those in outer residential areas. Indeed the benefits of living close to a town centre or transport node must also be considered in the context of a lower level of amenity.

While traditional approaches may seek to remove commercial parking from residential areas, the above identifies that parking in residential streets surrounding a town centre is acceptable and manageable.

Having regard for the above, the following options could be considered in addressing parking overspill.

- **No Intrusion Permitted**
  Imposing parking restrictions, such as resident permit parking restrictions, in the surrounding residential area to not allow any intrusion of parking could be adopted. This primarily forces drivers to find an alternate mode of transport or circulate within the commercial area until they find a vacant parking space. During absolute peak parking periods this can lead to congestion if there are not sufficient alternate parking options or facilities to support alternate modes of transport.
- **Managed Intrusion**
  The management of parking intrusion on adjacent residential areas is commonly dealt with through a combination of time restricted parking and permit parking either side of the road. Such an approach provides a compromise to residents who expect parking to be available for themselves and their visitors whilst allows the effective use of public parking supplies.
- **Unlimited Intrusion**
  Acceptance could be given to allowing unlimited or unmanaged intrusion of car parking into residential areas. This approach acknowledges that on-street parking is a public resource and nobody, residents or retail staff and customers, has a 'sole right' to this resource. Such a response is more commonly accepted during peak periods and/or infrequent events (concert or sports game), however could be adopted also for frequent occurrences. This option would require a large percentage of dwellings to have off-street car parking for the unlimited intrusion strategy to have limited impacts on residential parking provisions.

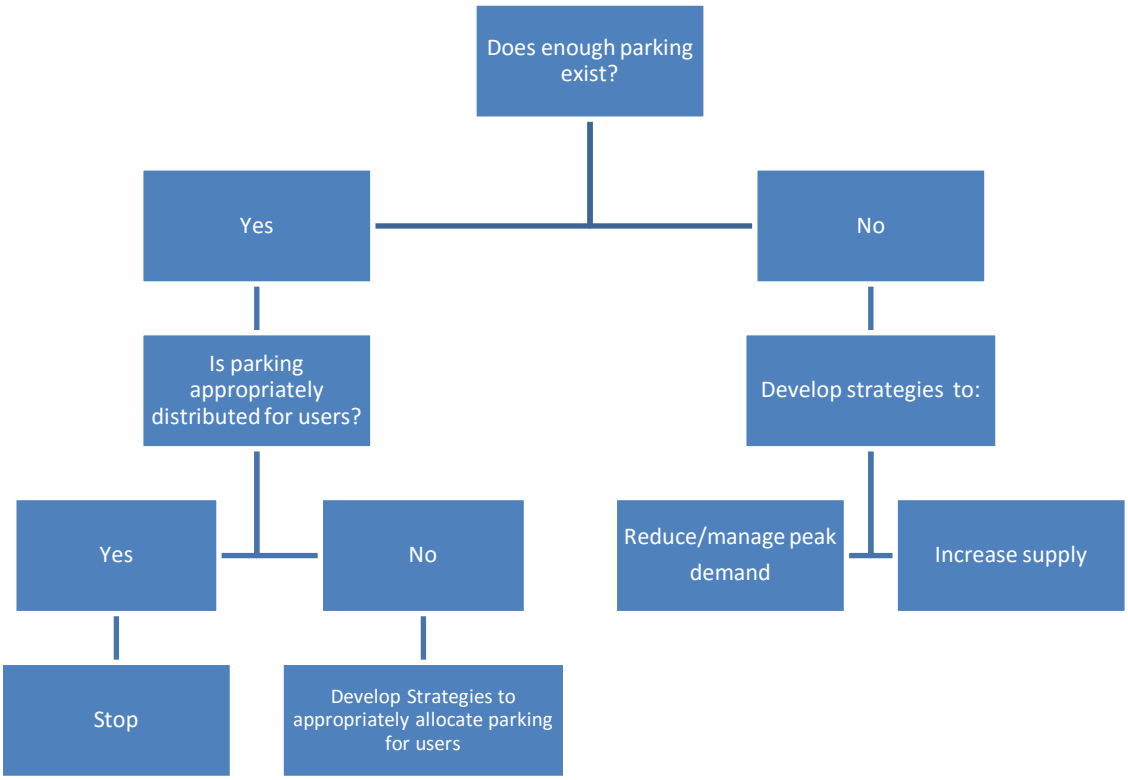
6. Car Parking Strategy

6.1 Managing Existing Parking

The basis for developing strategies to manage existing car parking provisions must be formed from answering the simple question – does enough car parking exist to accommodate the demands?

From here, whether enough parking does or does not exist, a process can be followed to establish strategies to better manage car parking. This process is set out within Figure 6.1.

Figure 6.1: Management of Existing Car Parking



In this regard, reference is made to the assessment of existing car parking demands presented earlier in this report.

Overall car parking demands generally vary between 50% and 60% throughout the day, with localised peaks occurring at 3:00pm on weekdays and 9:00am on Saturday mornings.

With regard to the theoretical capacity of parking (85%), it is evident that overall demands within the core areas (62% occupancy) are not approaching capacity. However, further interrogation of the car parking demands (refer to Appendix B) indicates that localised areas are experiencing demands greater than the ideal 85% occupancy level.

A summary of locations where car parking occupancies are regularly exceeding the theoretical capacity are provided in Table 6.1.

Table 6.1: Parking Areas Exceeding Theoretical Capacity

Street	Section	Context (Town Centre, Periphery Other)	Periods Occupancy Exceeds Theoretical Capacity
Kintore Street	New Canterbury Road to Blackwood Avenue	Periphery/ School	Weekday and Saturday mornings
Ewart Street	Garnett Street to Wardell Road	Station	Weekday daytime
Marrickville Road	New Canterbury Road to Macarthur Parade	Town Centre	Weekday and Saturday mornings
Beach Road	New Canterbury Road to Hercules Street	Periphery	Weekday daytime/ Saturday mornings
Dulwich Street	New Canterbury Road to Denison Road	Periphery	Weekday afternoons/ Saturday mornings
Lewisham Street, Piggot Street and Constitution Road	New Canterbury Road to Denison Road	Periphery	Saturday mornings
Keith Street	Macarthur Parade to Wardell Road	Station	Weekday daytime
Wilga Avenue	Wardell Road to railway	Station	Weekday daytime
Ross Street, Clargo Street and Kroombit Street	New Canterbury Road to Cobar Street	Periphery / Residential	Various
Union Street	Abergeldie Street to Arlington Street	Residential / Sporting Fields	Weekday evenings
Denison Road	Piggott Street to Eltham Street	Residential	Saturday morning
The Boulevard	Piggott Street to Eltham Street	Residential	Various
Myra Road	New Canterbury Road to The Parade	Residential	Weekday and Saturday daytime

On the above basis, some of the existing car parking provisions within the study area could be considered to be currently at a tipping point between simply managing the existing parking allocations and needing to develop strategies to reduce/ manage peak demand or increase parking supply.

As such, public car parking demands within parts of the study area could be considered to have generally reached capacity (greater than 85% occupancy) at peak times. Further, given the dynamic nature of parking, a perception would exist to drivers that parking within parts of the study area are at capacity and, while not reaching absolute capacity (100% occupancy), will require additional circulation in order to find a space.

Having regard to Figure 6.1, strategies will need to primarily consider ways in which to increase parking supply or reduce and manage peak demands.

6.2 Increasing Parking Supply

The ability to increase car parking supply can consider a number of opportunities:

- Can existing on-street car parking supplies be modified to provide additional parking supplies?
- Should additional off-street parking facilities be constructed?
- Can parking within surrounding peripheral residential areas be used to support town centre and/or commuter parking?

These are discussed further in the following sections.

Creation of Additional On-Street Parking

Existing on-street parking within the study area is generally provided in a parallel arrangement. Additional on-street parking could be achieved through re-orientating parking to a 90 degree angle, however the disadvantages of this include reduced safety (particularly to vulnerable road users such as cyclists) and greater manoeuvring times to enter and exit spaces which would further impede through traffic movements.

Several roads within the study area are 12.8m wide (approx.) and can therefore support 90 degree parking on one side and parallel parking on the other side. Although not strictly meeting the requirements of AS2890.5:1993 *Parking Facilities Part 5: On-street parking*, parts of The Boulevarde, Kintore Street, Bedford Crescent, Lincoln Street and Williams Parade have been converted to 90 degree parking.

To increase car parking supply in the town centre or in the vicinity of transport nodes, additional car parking spaces could be converted to 90 degree parking spaces in streets wide enough to accommodate them. A typical 12.8m street section is provided in Figure 6.2.

Figure 6.2: Typical 90 Degree Treatment on a 12.8m wide Road

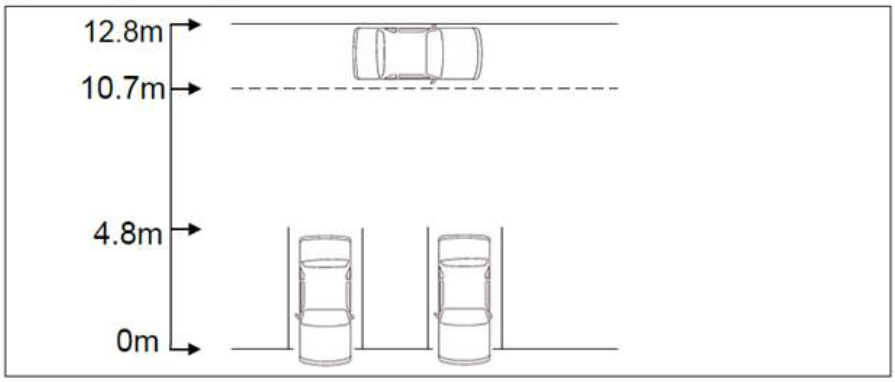


Figure 6.2 indicates that with a 600mm overhang on the kerb on one side of the road, approximately 5.9m is provided between parked cars, which is sufficient for two cars in oncoming directions to pass each other. Whilst not strictly meeting AS2890.5:1993, for roads with relatively low traffic volumes (0-800 vehicles/ hour) this treatment is considered satisfactory. In addition, it is likely to lower traffic speeds on roads where this treatment is implemented as a result of increased parking movements and a reduced width between parked cars.

An initial review has identified that the following streets (based on the Council road widths database) could be considered for angle parking conversion (90 degree parking):

- Ewart Street (between Wardell Road and Garnet Street)
- Macarthur Parade (between Marrickville Road Keith Street)
- Pile Street (between Fairfowl Street and Wardell Road)
- Seaview Street (Marrickville Road and Herbert Street)

Further discussion regarding the provision of angled parking in the above streets is provided in Table 6.2.

Table 6.2: Potential Angled Parking Locations

Location	Typical Parking Demands	Comment	Recommendations
Ewart Street	High	Angled parking could be provided subject to existing traffic flows (particularly at the western end where traffic flows are predicted to be lower)	Further investigation required
Macarthur Parade	Moderate	Car parking demands do not warrant an increase in car parking supply	No angled parking
Pile Street	Low	Car parking demands do not warrant an increase in car parking supply	No angled parking
Seaview Street	High	The existing angled car parking on the southern side of the carriageway could be continued towards Herbert Street. Any car parking would need to consider the operation of the existing bus zone	Further investigation required

The majority of streets, where existing car parking demands are high, are not capable of accommodating angled car parking as road widths are not sufficient.

The creation of angled car parking could be integrated into potential Local Area Traffic Management (LATM) treatments by alternating the side of the road that the angled parking is created. This is particularly pertinent to any angled parking on Ewart Street. An example of such an arrangement on Pitt Street in Redfern is shown in Figure 6.3.

Figure 6.3: Example of Offset Angled Parking – Pitt Street, Redfern

Source: Nearmap (used under licence)

It is noted that Marrickville Council has an angled parking policy and these recommendations should be considered by Council with reference to that policy. Additional site-specific investigation will be required for each street to review the camber (cross-fall) of the road or any other obstructions which could limit or prevent vehicles overhanging the adjacent kerb.

Construction of Additional Off-Street Parking

A key tool to increase car parking supply to support the town centre would be through the construction of additional off-street car parking facilities.

Before considering available opportunities to construct additional off-street car parking facilities consideration should be given to the following questions:

- **Do transport objectives seek to support car driving as a mode of transport or seek a shift in travel modes to the centre?**
  As identified within the parking principles, it is recognised that car travel is the dominant form of access, however walking, cycling, bus, train, taxi are important forms of access to/within the centre that are forecast to increase in importance. While no specific mode shift targets have been set, mode shift targets in the order of a 10% shift away from private motor car travel are generally accepted as realistic mode shift targets and are consistent with a number of planning strategies.
  Achieving a 10% mode shift target would further reduce the overall parking occupancy further below the ideal capacity limit of 85%. This could allow some localised modifications to parking restrictions to accommodate particular parking types that may remain above the ideal capacity.
- **Are existing off-street car parking facilities at capacity and/or located in appropriate locations?**
  As detailed in Figure 3.9 to Figure 3.11, with the exception of the 9am Saturday count, there is typically spare capacity available in the existing off-street car parks provided in the town centre (Durham Lane, Seaview Street and Dan Shanahan car parks).
  Providing additional off-street parking to cater for a short period of time over the course of a week is not considered warranted.
  The existing off-street car parks are located centrally to the town centre.
- **Who will bear the cost of providing such parking and is such expenditure appropriate having regard to alternatives to change travel modes?**
  The provision of additional car parking to resolve existing parking supply issues within a town centre is most often borne by Council. Alternatives, through the use of special rates schemes are sometimes used, however are often considered too politically sensitive and therefore not preferred. In order to minimise the impost to Council of funding parking facilities, these facilities are often required to be charged.

Based on the above it is not considered necessary to pursue the provision of any additional off-street parking facilities beyond those already provided servicing the town centre.

Residential Area Reliance

The increased use of parking within the surrounding residential areas represents an opportunity to utilise existing parking resources and infrastructure to satisfy the high parking demands generated by the town centre. As identified within the parking objectives and principles, the use of parking within residential streets can and should be balanced between town centre and residential needs.

However, as identified by Table 5.3 (Allocation of Parking within the Residential Fringe), residential needs must be first considered and when appropriately managed, can allow for remaining parking to be used by nearby commercial uses. It is noted that a number of dwellings surrounding the commercial core are not provided any off-street parking and as such, are reliant on on-street parking.

Further discussion regarding potential opportunities to accommodate commercial car parking in residential areas is provided in Section 6.3, noting that any measures will require management to balance the needs of residential and commercial parking.

Considerations to Increase Parking Supply

Having regard to the above, it could be considered more appropriate in the first instance to rely on the existing parking supply within the surrounding residential areas and encourage a mode shift rather than investing funds in additional parking provision to satisfy existing parking demands.

The provision of additional parking must however be balanced with the provision of other supporting mode shift initiatives to ensure that the provision of additional parking does not become a continuous cycle which simply encourages greater car use to the centre. Mode shift initiatives are further considered later in this report.

This also does not rule out the modification of parking provisions such as relocating parking to new purpose-built facilities in order to achieve better town centre outcomes, or the requirement to create additional parking to facilitate additional centre growth. These aspects will be discussed later in this report.

Strategy Recommendation 1

Further explore the opportunity to provide additional on-street car parking (90 degree) on Ewart Street and Seaview Street.

Strategy Recommendation 2

Rely on existing parking supplies within the surrounding residential areas to accommodate the short term existing parking demands of the centre.

Strategy Recommendation 3

Modify parking restrictions within surrounding residential of the town centre to appropriately manage demands and needs of all users (refer to Section 6.3).

6.3 Reducing/ Managing Parking Demands

6.3.1 Paid/ Time Restricted Parking Overview

In terms of economic theory, parking spaces constitute a 'finite resource'. As with any such resource, when demand exceeds or approaches supply there can be inefficiencies in resource utilisation – those who occupy spaces may have lesser needs than those who miss out.

In situations where resources are inefficiently allocated governments may be required to regulate the use of the resource. Intervention may take the form of 'rationing' the resource (e.g. time restrictions) or creating a 'market' for the resource (e.g. parking fees).

Rationing in the form of time restrictions is common in the parking planning. Spaces where a high turnover rate is intended have short stay limits while others have medium stay limits, including where all day parking is discouraged.

Rationing can also favour particular persons by providing exemptions, such as those extended to the mobility impaired and to residents in designated areas (i.e. resident permit scheme).

Rationing access to parking spaces can have external effects, in that the relative attractiveness of destinations as a place to visit by car within the urban environment is impacted. For example, a shopping centre where parking is rationed may be perceived to be less attractive to visit than a centre where parking is freely available, not subject to time conditions and where fines do not apply.

The second level of intervention is creating a market for the resource through the agency of parking fees. The underlying theory is that a market can allocate resources on an efficient basis. Resources are consumed the most by those who are prepared to pay the most. Consumers who are required to pay for a resource, use the resource more wisely and sparingly. Hence demand may be mitigated, thus freeing up resources for others.

In reality, both time restrictions (rationing) and pricing (market) can apply. Time restrictions allocate spaces to areas where high turnover is desirable and to spaces where it is less critical. Pricing of spaces creates more efficient use within the time restrictions. Pricing, of course, has other effects in that it generates revenue for the Council.

Hence, in this environment, the Council has many objectives in applying time restrictions:

- efficiency of resource allocation
- favour target groups
- traffic management
- travel demand management
- generate revenue
- preserve the competitive position of employment centres.

It can be seen that there are inherent conflicts in these objectives. Invariably the pattern of time restrictions (short, medium and long term) and exclusions is the product of refinement as a centre evolves. Most centres trade in a competitive environment where equilibrium has been achieved and businesses have adjusted to the market shares they are achieving.

Traders in traditional centres feel they are at a competitive disadvantage relative to free-standing centres where parking is plentiful and free. Any proposal that is perceived to adversely affect the equilibrium is feared.

Introducing fee parking is one such change. While there are potential advantages with pricing (higher turnover of spaces) and disadvantages (diversion of shoppers to other centres) the general perception amongst traders is that the net effect will be negative. In economic terms the questions of 'shopper displacement' related to parking fees depends on the shopper's 'elasticity of demand' (i.e. the measure of the propensity to shop in a given centre in response to a rise in the cost of parking in that centre).

Demand elasticities are driven by multiple factors such as:

- the availability of a substitute for the good or service in another location
- the additional time, effort and expense of accessing the other location
- the availability and price of parking in the alternative location, or
- options for avoiding or reducing the cost without switching locations (e.g. alternative mode, shorter trip, combining trips or park further away).

As such, in addition to the consideration of 'rationing' the resource (time restrictions) or creating a 'market' for the resource (parking fees), consideration must also be given to the ability to encourage demand change through provision of alternatives such as providing better public transport services or bicycle facilities.

In the context of a car parking strategy, the scope of travel demand management measures generally relates to actions that directly impact on travel behaviour leading to potential reductions in car parking.

The following section deals with time restricted and paid parking as well as a range of potential 'soft' actions for consideration to support the overall objectives of the strategy.

Having regard for the above, further consideration has been given to the restrictions on parking and appropriateness of paid parking in the study area.

6.3.2 Time Restricted Parking

Summary

GTA has undertaken a street by street review of the study area and has identified a number of streets where modifications to the existing parking restrictions are recommended. The recommendations are detailed in the Technical Note provided at Appendix C and are identified as follows:

- Short-term recommendations (immediate)
- Medium-term recommendations (0 to 5 years)

An overview of the proposed car parking changes is summarised in Table 6.3 and illustrated in Appendix C.

Table 6.3: Overview of Parking Restriction Changes

Location	Parking Restriction					
	1/4 P	1P (Permit Excepted)	1P	2P (Permit Excepted)	2P	Unrestricted
Short-term recommendations (immediate)						
Pigott Street (south)	-	-	-5	+10	-	-5
Lewisham Street (north)	-	-	-2	+11	-	-9
Dulwich Street (north)	-	-	-	+8	-	-8
Constitution Road (north)	-	-	-	+12	-	-12
Kintore Street (east)	-	-	-	+5	-	-5
Beach Street (west)	-	-	-	+5	-	-5
Hercules Street (south)	-	-	-	+16	-	-16
Herbert Street (north)	-	+16	-3	-	-	-13
Yule Street (south)	-	-	-	+16	-	-16
Marrickville Road (east)	+3	-	-	-	-3	-
Keith Street (south)	-	-	-	+30	-	-30
Kays Avenue West (north)	-	-	-	+26	-	-26
Wilga Avenue (south)	-	-	-	+13	-	-13
Ewart Street (south)	-	-	-	+14	-	-14
Wardell Road (west)	-	-	-	+31	-	-31
Cobar Street (south)	-	-	-	+21	-	-21
Ross Street (east)	-	-	-	+16	-	-16
Clargo Street (east)	-	-	-	+12	-	-12
Kroombit Street (west)	-	-	-	+15	-	-15
Union Street (west)	-	+29	-	-	-	-29
Denison Road (west)	-	-	-	+51	-	-51
Sub Total	***+3***	***+45***	***-10***	***+312***	***-3***	***-347***
Medium-term recommendations (0 to 5 years)						
Terry Road (south)	-	-	-	+9	-	-9
Grove Street (south)	-	-	-	+22	-	-22
Hill Street (east)	-	-	-	+27	-	-27
Denison Road (north)	-	-	-	+23	-	-23
Piggot Street (south)	-	-	-	+47	-	-47
Lewisham Street (north)	-	-	-	+24	-	-24
Dulwich Street (north)	-	-	-	+18	-	-18
Yule Street (south)	-	-	-	+35	-	-35
Herbert Street (north)	-	-	-	+33	-	-33
Marrickville Road (east)	-	-	-	+21	-	-21
Durham Street (south)	-	-	-	+18	-	-18
Beach Road (west)	-	-	-	+32	-	-32
Sub Total	***0***	***0***	***0***	***+309***	***0***	***-309***
Total	**+3**	**+45**	**-10**	**+621**	**-3**	**-656**

Table 6.3 indicates that immediate parking control changes are recommended to 360 spaces within the study area, including the introduction of 357 resident permit spaces (1P and 2P) and three ¼ P spaces. Beyond the immediate recommendations, medium term parking controls are recommended to 309 spaces within the study area (all "2P permit excepted" spaces).

Arlington Reserve

Whilst not necessarily identified in the GTA survey results, anecdotal evidence indicates that car parking demands regularly exceed supply in the streets immediately surrounding Arlington Reserve during events (e.g. sporting matches). This results in constrained car parking availability for residents during such events. These events typically occur about 10 to 15 times per year and generally on a Saturday.

It is understood that the increased car parking demands primarily impact the following streets in the vicinity of Arlington Reserve:

- Union Street
- Williams Parade
- Constitution Road
- Abergeldie Street
- Arlington Street

GTA has explored a number of potential solutions for car parking control on the above streets, including 1P and 2P time restrictions, with and without a resident or special event permit schemes. There are a number of advantages and disadvantages associated with each of the options, which are detailed in Table 6.3.

Table 6.4: Overview of Parking Restriction Changes – Arlington Reserve

Option	Advantages	Disadvantages
1P	○ Will restrict car parking demands associated with events at the Reserve	○ Residents will not be able to park on-street ○ The time restriction may not allow enough time for residential visitors to park
1P Residents Excepted	○ Will restrict car parking demands associated with events at the Reserve ○ Eligible residents with resident parking permits will be able to continue to park on-street	○ Not all residents will be eligible to park on-street (i.e. those with off-street parking) ○ The time restriction may not allow enough time for residential visitors to park
2P	○ The time restriction will allow enough time for residential visitors to park	○ Residents will not be able to park on-street ○ The time restriction is too long to deter parking demands associated with events at the reserve
2P Residents Excepted	○ The time restriction will allow enough time for residential visitors to park ○ Eligible residents with resident parking permits will be able to continue to park on-street	○ Not all residents will be eligible to park on-street (i.e. those with off-street parking) ○ The time restriction is too long to deter parking demands associated with events at the reserve
1P Special Event Parking Area	○ Will restrict car parking demands associated with events at the Reserve ○ Enforcing the restriction during special events only will limit the inconvenience to residents for non-event periods	○ Residents will not be able to park on-street during events ○ Significant cost associated with updating special event signage during the sporting season(s) ○ The time restriction may not allow enough time for residential visitors to park ○ Restriction type will require special approval from RMS; only provided in limited locations in Sydney
1P Special Event Parking Area Residents Excepted	○ Will restrict car parking demands associated with events at the Reserve ○ Eligible residents with resident parking permits will be able to continue to park on-street	○ Not all residents will be eligible to park on-street (i.e. those with off-street parking) ○ Significant cost associated with updating special event signage during event season ○ The time restriction may not allow enough time for residential visitors to park ○ Restriction type will require special approval from RMS, only provided in limited locations in Sydney
No Change	○ Residents can continue to park relatively conveniently for the majority of the year	○ Parking for residents during events at the Reserve will continue to be difficult

It is recommended that the options identified above be presented to the surrounding residents such that they can be involved with identifying the preferred parking control measure.

Strategy Recommendation 4

Provide additional time restricted car parking spaces (short and medium term locations) as detailed in Table 6.3 and in Appendix C.

Strategy Recommendation 5

Present potential car parking options to residents surrounding Arlington Reserve to determine a preferred car parking strategy.

6.3.3 Paid Parking

The pricing of car parking can act as an extremely powerful demand management tool as it directly imposes a charge on the use of the car (in addition to the indirect charges associated with vehicle registration, fuel, maintenance and insurance).

While there are potential advantages and disadvantages with pricing the general perception amongst traders is that the net effect will be negative. In this regard consideration has been given to the theoretical positives and negatives of the introduction of a paid parking system:

Positives

- Would be likely to increase the turnover of car parking particularly within prime car locations increasing the availability of parking for additional customers to the town centre.
- Encourages sustainable transport travel modes such as public transport, cycling walking and car pooling.
- Shopping 'browsing' expenditure may be increased by those waiting for public transport arrivals.
- Potential shifts in mode of travel reduce traffic congestion improving the amenity of an area further enhancing the overall attractiveness of a centre.
- Potential shifts in mode of travel reduce traffic congestion improving accessibility for new customers and for those who must drive to the centre.
- Anecdotally other centres introducing paid parking have not experienced significant reductions in trade.
- The collection of parking revenue can be reinvested within the centre from which it was collected to further enhance amenity, other sustainable forms of travel etc.

Negatives

- Trade may be diverted to other surrounding centres that have free parking.
- Shopping expenditure may be lessened due to drivers parking for lesser time.
- Shopping 'browsing at leisure' expenditure may be lessened as drivers seek to lessen the length of their parking stay or rush to avoid overstaying restrictions.
- Drivers may park elsewhere within the precinct to avoid paying for parking and creating intrusion into residential areas.

Summary

Short and long-term parking is currently free of charge within the study area.

Paid parking could be used as a means to increase the turnover of parking within high demand areas such as within the town centre to increase the availability of parking for additional customers.

The introduction of paid parking could also encourage a mode shift for customers accessing the centre to use alternate forms of transport including public transport, walking and cycling, thereby freeing up parking for those who require it or are willing to pay for the convenience.

However, car parking demands within the town centre and in particular within the existing off-street car parks is typically below the desired 85% threshold (with the exception of Saturday morning). Furthermore, reference to Section 3.3 indicates an existing duration of stay compliance of between 70 and 95% for vehicles parked in the off-street car parks in the town centre. This indicates that there is reasonable turnover occurring within the off-street car parks servicing the town centre.

As such, at this time, it may not be appropriate to introduce paid parking to short stay parking within the study area, with time restrictions to continue to be used to manage customer parking and creating turnover within important parking areas.

Demands in these areas should, however, continue to be monitored and the potential economic impact to businesses further studied as paid parking may in the future become an increasingly needed tool to reduce and manage parking demands within the town centre.

Should paid parking be introduced to the Dulwich Hill town centre, there would likely be an increase in car parking demands to the surrounding on-street car parking supplies, including those in the surrounding residential streets. This could actually increase the level of circulation within the local road network and would likely require the extension of existing parking restrictions further into the adjacent residential street network.

Strategy Recommendation 6

The existing car parking demands and turnover do not warrant the introduction of paid parking into the study area at this stage. Continue to use time restrictions to manage parking demands.

Strategy Recommendation 7

Continue to monitor car parking demands and turnover within the three existing off-street car parks servicing the town centre.

6.3.4 Cycling and Pedestrian Measures

A range of supporting measures should be considered for implementation, including:

- Providing a network of safe and amenable pedestrian connections to the Dulwich Hill town centre from surrounding residential areas. These should seek to reduce the key barriers presented to walking such as major roads, and may also be beneficial in improving access to and use of the consolidated car parking locations around the centre.
- Providing end of trip facilities for cyclists, including bicycle hoops throughout the centre as well as requiring end of trip facilities (showers, lockers, change rooms and bicycle storage) in major developments.

Clearly there are a large number of other travel demand management measures that could be introduced to assist in managing the overall transport task in the study area, however these actions represent the most relevant in terms of their direct impact on parking and nexus with this Strategy.

Strategy Recommendation 8

Review the network of pedestrian connections to the Dulwich Hill town centre from surrounding residential areas and consolidated car parking locations, to ensure these are safe and amenable in order to reduce the key barriers presented to walking such as major roads.

Strategy Recommendation 9

Continue to provide end of trip facilities for cyclists, including bicycle hoops throughout the centre.

Strategy Recommendation 10

Ensure end of trip facilities for cyclists (showers, lockers, change rooms and bicycle storage) are provided in major developments.

6.3.5 The Impact of Public Transport on Car Parking

Typically, the better the access that a development has to public transport, the lower the car parking rate required. If an efficient, reliable and comfortable public transport system can serve the study area, this will serve to reduce the demand for car parking within the study area both by residents and for shoppers.

It is recommended that Marrickville Council lobby Transport for New South Wales (TfNSW) to improve the bus stops within the study area. This could include improved maps and timetable information, real-time displays of next bus arrival times, improved or larger shelters, fully DDA compliant stops and greater priority for bus movements throughout the town centre.

It is also recommended that Marrickville Council lobby TfNSW to ensure that the train service and bus service is improved in the future. This could include additional peak hour services, extra late night services, investigation of points of delay and improvement schemes to improve travel times throughout the study area.

Often, a developer pays contributions to Council as part of the development to improve the public domain. To improve the access to public transport in the town centre, it is recommended that developer contributions partly go toward the improvement of public transport facilities.

Strategy Recommendation 11

Continue to lobby TfNSW to ensure that the best possible public transport facilities are provided in the study area.

6.4 Other Considerations

6.4.1 Parking for People with Disabilities

As outlined earlier in this report there is currently an average occupancy of 49% and peak occupancy of 56% for disabled parking spaces within the study area. This level of utilisation is generally consistent with the overall occupancies for the study area of 50 to 60%.

The Building Code of Australia (BCA) outlines requirements of new buildings to provide car parking for people with disabilities. Whilst not strictly applicable, the BCA disabled car parking

requirements have been applied across the entire town centre commercial area in order to enable comparison against current standards.

BCA requirements for key buildings types are set out in Table 6.4.

Table 6.5: BCA Car Parking Requirements for People with Disabilities

BCA Class	Description	BCA Disabled Parking Requirement
Class 5 - Office	Office building used for professional or commercial purpose	1 space for every 100 car parking spaces or part thereof
Class 6 - Retail	Shop or other building for the sale of goods by retail or the supply of services to the public including an eating room, café, restaurant, milk or soft drink bar, dining room, bar, shop, kiosk part of a hotel or motel, hairdressers, barber shop, public laundry or undertaker's establishment	1 Space for every 50 car parking spaces or part thereof for up to 1000 car spaces and then 1 space for each additional 100 car parking spaces of part thereof in excess of 1000 car parking spaces
Class 7A - Carpark	Carpark	1 space for every 100 car parking spaces or part thereof

As indicated above, the disabled parking requirement is generally between 1%-2% for typical activity centre land uses as well as public car parks.

Application of these rates to the total existing parking supply of approximately 400 spaces servicing the town centre equates to a requirement of 4 to 8 disabled car parking spaces.

Currently, there are a total of 7 parking spaces provided for people with disabilities within the town centre, which falls within the recommended range identified above (adopting the BCA rates). Six of the 7 spaces are provided within the three off-street car parks (two spaces each), with one additional space provided on Seaview Street.

The surveys indicate that parking for people with disabilities within the town centre is never at absolute capacity. However, they do indicate that certain spaces are more utilised than others. In this regard, it is noted that the two disabled spaces in the Dan Shanahan Car Park were at capacity for 14 of the 33 hourly counts undertaken on the Tuesday, Thursday and Saturday. With the exception of the Saturday surveys (when the occupancy of the car park was typically at 90%), the occupancy of the parking spaces for people with disabilities in the car park were generally greater than that of the standard spaces. These spaces are typically more popular than the other parking spaces provided for people with disabilities due to their proximity to key destinations within the town centre.

On this basis, it is recommended consideration be given to providing an additional parking space for people with disabilities in the Dan Shanahan Car Park or on-street in a central location (i.e. Marrickville Road).

Outside of the town centre, parking spaces for people with disabilities are generally provided on an "as needs basis" for abutting residents. Residents with a valid 'RMS Mobility Parking Permit' are eligible to apply for an on-street disabled parking space abutting their property. It is understood that the application is then reviewed based on a number of criteria, including whether the resident has an accessible space within their property. In this regard, there are a number of such parking spaces distributed throughout the residential streets within the study area.

The car parking surveys indicated that the majority of these parking spaces for people with disabilities are used at certain times throughout the day. However, there were spaces on Windsor Road (between Davis Street and Terry Road) and Davis Street[5] (between Victoria Street and the

[5] This space may have been provided to cater for disabled commuter parking demands associated with the adjacent Waratah Mills Light Rail stop.

light rail) that did not generate any car parking demands across the Tuesday and Saturday surveys. In this regard it is recommended that Council liaise with residents adjacent to these spaces to ensure that they are still required to ensure that car parking is efficiently allocated.

Additionally, it is recommended that Council collect data on the frequency of use of parking spaces for people with disabilities by those without a permit.

Strategy Recommendation 12

Consider providing one (1) additional parking space for people with disabilities in either the Dan Shanahan Car Park or centrally located on Marrickville Road.

Strategy Recommendation 13

Continually review inventory of residential parking spaces for people with disabilities to ensure efficient use of on-street parking provisions.

6.4.2 On-Street Loading Provisions

Objective

The provision of suitable on-street loading zones within a town centre is necessary to support deliveries of goods to commercial premises, as well as facilitating the pick-up requirements of certain land uses where on-site facilities are not available.

Achieving the appropriate mix of loading zones, as well as other zones such as bus and taxi zones typically evolves with land uses over time, according with site specific needs.

Loading Strategy

There are three spaces which provide for loading and unloading of vehicles, including two part-time spaces on Macarthur Parade (7am to 6pm Monday to Friday) and one part-time space on Marrickville Road (8:30am to 6pm Monday to Friday and 8:30am to 12:30pm Saturday). The peak parking demand for these spaces was one space at any one time.

It is not desirable to provide a supply of on-street loading spaces that experiences a significantly lower occupancy that the surrounding on-street car parking provision, as this could encourage illegal usage. Notwithstanding, a suitable number of loading spaces still needs to be provided to service the commercial uses.

Anecdotally, the existing provision of loading appears adequate and there is no evidence of any instances where loading vehicles cause a significant safety hazard or operational issue for the road network.

On the basis of the above, the existing supply of loading areas is considered to be adequate. Notwithstanding, it is recommended that:

- Existing loading requirements are monitored over time and if necessary, a reactive approach be taken to accommodate any significant changes to pick-up or delivery requirements, having regard to balancing competing objectives such as availability of on-street visitor parking to support economic function.
- On-site loading be pursued for new development, particularly those having access to back-of-house areas, in accordance with the guidance provided in the DCP.

Strategy Recommendation 14

Existing loading requirements should be monitored over time and if necessary, a reactive approach be taken to accommodate any significant changes to pick-up or delivery requirements, having regard to balancing competing objectives such as availability of on-street visitor parking to support economic function.

Strategy Recommendation 15

On-site loading should continue to be pursued for larger new developments, particularly those having access to back-of-house areas, in accordance with the guidance provided in the DCP.

6.4.3 Parking Wayfinding Strategy

Objectives

Car parking wayfinding signage is important to:

- Increase efficiency of use of all available spaces, particularly areas which may not be initially visible or known to drivers. Even distribution of car parking demand can assist in improving network operation.
- Promote awareness of available car parking spaces.
- Assist orientation of drivers not familiar with the town centre.
- Assist drivers at key decision points within the town centre (and enhance the user experience associated with vehicle trips to the centre), as well as providing early guidance to divert traffic around the most congested areas.
- Reduce congestion caused by circulating traffic in search of a car space.

For car parking guidance to be effective, it is critical that the system offers meaningful information at a location which is able to affect the decision point of the driver on their approach route to the final destination.

Car parking wayfinding in town centre is likely to be complementary in the sense that it is unlikely to affect many commuters or frequent visitors which could likely have already chosen their preferred parking location.

Existing Arrangements

The existing off-street car parks are accessed from the local road network and are not directly visible from New Canterbury Road. In this regard, directional signage is currently provided from New Canterbury Road to the off-street car parks.

A sample of the existing directional signage provided on New Canterbury Road is shown in Figure 6.10 and Figure 6.11.

Figure 6.4: New Canterbury Road (westbound) on Approach to Beach Road

Figure 6.5: New Canterbury Road (eastbound) on Approach to Marrickville Road

The existing signage is not readily visible in the existing cluttered roadside environment and as such, there is an opportunity to upgrade the existing signage. This could include providing larger sign faces and potentially providing them overhead rather than on the side of the road.

The demands within the various off-street car parks fluctuate during the day, with periods where some of the car parks (but not all) are at capacity. During periods of high utilisation, there is more likely to be a level of circulating traffic and localised congestion. In order to more evenly distribute demands, dynamic signage could be introduced to inform drivers not to enter when these car parks are full. The design of dynamic signage could also alert drivers to alternate parking locations.

Strategy Recommendation 16

Upgrade parking wayfinding signage to include the following key features:

- Upgrade of existing sign faces and sign locations.
- Investigate potential implementation of dynamic parking signage.

6.4.4 Car Share Parking Strategy

If public transport can be supplemented with sufficient access to car share spaces, this can further serve to reduce car parking demand in the area.

The priority of these modes of transport over the private car is a demand management response and must occur in the future as development of the study area proceeds.

Car share spaces work by providing access to a car for many households, sharing the registration, insurance and valuable space required to park the car. The provision of car share spaces reduces the level of car ownership for residents, either such that they are not required to own a car or in some instances a second car.

As development of the study area (particularly high density residential) proceeds in the future, it is recommended that Council work with developers and car share companies to ensure the provision of car share spaces be provided. Car share spaces should be provided in locations as follows (from highest to lowest priority):

i prominent on-street locations
ii public off-street car parks
iii within selected private developments

Advice from car share operators indicates that typically the utilisation of car share vehicles located in publicly accessible locations is greater than those provided in private settings.

The existing Marrickville DCP (Section 2.10.9) recognises that car share reduces car parking demands and transport impacts. The DCP does not however provide any specific car share parking requirement for developments. In this regard, introducing a minimum car share parking requirement for larger developments could be considered.

Strategy Recommendation 17

Introduce a car share parking requirement for larger developments into the DCP.

6.4.5 Enforcement

Enforcement of car parking restrictions is paramount to the adoption and maintenance of a given car parking system. Without suitable enforcement, particularly when demands are significant, car parking restrictions and strategies risk not being adhered to, which can result in the loss of any efficiencies and amenity that might be gained.

The enforcement of parking is critical to ensure that:

- Parking is occurring in line with the intended allocation of parking
- Parking activities are occurring in a safe manner
- Illegal parking activities do not interfere with the flow and circulation of traffic.

In order to provide a suitable level of enforcement to maintain compliance with the nominated parking restrictions, there needs to be an appropriate level of surveillance and penalty.

The duration of stay data presented in Section 3.3.2 indicates that there is a reasonable level of compliance for the time restricted car parking south of New Canterbury Road (including the town centre). The data does however indicate comparatively low compliance for parking on the side streets north of New Canterbury Road. This is likely as a result of less rigorous surveillance by Council officers of this area. It is recommended that enforcement be increased in these areas to ensure appropriate turnover of car parking spaces and spaces are being used as intended. Ongoing enforcement would also be required where no restrictions are provided as part of this study, to ensure that the spaces are used as intended.

Strategy Recommendation 18

It is recommended that enforcement be increased in the time restricted areas to the north of New Canterbury Road to ensure appropriate turnover of car parking spaces and spaces are being used as intended.

6.4.6 Car Parking in Laneways

Laneways service a number of competing needs. The Marrickville Council 'Laneway Parking Guidelines' (December 2015) identifies the following priorities (highest to lowest):

i *Emergency access*
ii *Deliveries and waste collection services*
iii *Access to off-street parking*

iv *Accessible on-street parking*
v *On-street parking*

To allow parking in a laneway, the width must be sufficient to ensure parked vehicles do not obstruct through traffic or access to private property. Table 6.5 presents minimum dimensions required to maintain unobstructed traffic flows in laneways (the absolute minimum laneway width is consistent with the Council Laneway Parking Guidelines).

Table 6.6: Minimum Dimensions for Parking in Laneways

Design Criteria	Through Traffic Lane Width (m)	Car Parking Space Width (m)	Combined Total Laneway Width (m)
Desirable Minimum	3.3 [1]	2.4 [1]	5.7
Absolute Minimum	3.0 [2]	2.1 [3]	5.1

[1] Based on AS/NZS2890.1:2004 Figure 2.5 – includes 300mm clearance to obstructions greater than 150mm high
[2] Based on AS/NZS2890.1:2004 Figure 2.5 – excluding 300mm clearance
[3] AS/NZS2890.1:2004 Figure 2.5 with no allowance for obstructions

The existing Council policy regarding laneway operation is reproduced below:

"Council's preference is for residents to negotiate with each other to avoid implementing parking bans. Where problems occur, parking restrictions can be considered for individual laneways on a case-by-case basis. These guidelines will provide consistency for assessing the need for parking controls"

It is recommended that the above policy approach be maintained by Council.

However, it is noted that through the various community consultation forums, the following existing issues regarding laneways within the study area have been raised by residents:

vi Parking in Keith Lane
vii Vehicle access from Myra Lane

Further discussion regarding each of these laneways is provided below.

Keith Lane

The car parking demands within Keith Lane are understood to be commuter car parking demands associated with the nearby Dulwich Hill Railway Station. Observations indicate that vehicles park in Keith Lane across driveways, physically denying residents access to their properties. It is not considered appropriate that Keith Lane be used by commuters and as such, it is recommended that "No Parking" restrictions be introduced to the laneway.

A summary of the observed car parking demands in Keith Lane is provided in Table 6.7. Should parking in the lane be restricted, the existing car parking demands would be displaced and need to be accommodated by the surrounding road network.

Table 6.7: Existing Keith Lane Car Parking Demands

Location	Peak Parking Demand	Time of Peak Parking Demand	Anticipated Parking Type	Predicted Impact
Keith Lane	18 spaces	11:00am weekdays	Commuter	Additional commuter demands within the surrounding residential streets (resident permit scheme proposed)

Myra Lane

It is understood that vehicle access from Myra Lane is compromised by vehicles parked within the laneway. Myra Lane is 5.2m (approx.) wide, which is greater than the absolute minimum width for parking within a laneway but less than the desirable minimum width. Council wishes to ensure

that adequate space is available for emergency and service vehicles, whilst having the least impact on on-street parking as practically possible. As such, it is recommended that residents are consulted to determine the specific access issues, with 'No Stopping' restrictions introduced in Myra Lane to address any such specific geometrical access constraints.

Strategy Recommendation 19

Maintain Council's current policy for parking in laneways.

"Council's preference is for residents to negotiate with each other to avoid implementing parking bans. Where problems occur, parking restrictions can be considered for individual laneways on a case-by-case basis. These guidelines will provide consistency for assessing the need for parking controls"

Strategy Recommendation 20

Remove car parking from Keith Lane to cater for improved property access.

Strategy Recommendation 21

Review geometrical access constraints (in consultation with residents) in Myra Lane and implement specific 'No Stopping' restrictions if required to ensure that adequate property access is maintained.

6.4.7 Parking at Intersections/ Crossings

The Australian Road Rules stipulates that vehicles are required to park a specified distance from an intersection. Restricting vehicles from parking in close proximity to intersections and/or pedestrian crossings improves the safety and capacity of these facilities.

Further guidance regarding the required offsets is provided in the RMS Technical Direction 'Stopping and Parking Restrictions at Intersections and Crossings' published October 2011 (TDT2002/12C).

The RMS Technical Direction indicates the following minimum 'No Stopping' requirements:

- Signalised intersection:
  - on approach 20m measured from the kerb or 10m measured from the stop line whichever is greater
  - on departure 20m measured from the kerb (or 10m where through traffic volumes in the kerbside lane are low and subject to RMS approval)
- Unsignalised intersection:
  - 10m on approach to the intersection measured from the kerb
- Mid Block Pedestrian Crossing
  - 20m on approach to the pedestrian crossing
  - 10m on departure to the pedestrian crossing

A reduction in the above offsets may be suitable where kerb outstands or indented parking is provided.

The RMS Technical Direction notes that specific 'No Stopping' signage is not necessarily required at all locations but rather as follows:

"It is not intended that signs will be installed at all locations. Where signs are not installed the legislative restrictions will apply. Generally signposting of restrictions covered by legislative requirements is only required where there is adjoining signposting or compliance is an issue."

There are a number of locations in the study area, particularly in areas of high parking demand (at the town centre and Dulwich Hill railway station), where vehicles regularly park closer to intersections and pedestrian crossings than the legislative restrictions require.

Strategy Recommendation 22

Introduce formal 'No Stopping' parking restrictions (for 10m) at unsignalised intersections to improve safety in the town centre and surrounding Dulwich Hill Station (combination of signs and/or linemarking).

Strategy Recommendation 23

That a 'No Stopping' restriction be introduced adjacent to the properties at 115-117 Constitution Road to improve sight lines for vehicles on Constitution Road and vehicles exiting the adjacent driveways (refer to Item C5 of the Pedestrian, Cyclist & Traffic Calming Advisory Committee dated 11 December 2015).

6.5 Managing Future Parking

Figure 4.2 sets out the potential additional on-street car parking demands to be generated by future developments within the study area. Existing car parking occupancies are nearing capacity at each of these locations and as such, the additional car parking cannot simply be accommodated within the existing supply. For the most part car parking management strategies have been identified above to manage car parking in these locations.

A summary of the future demands, locations and car parking strategies developed are provided in Table 6.8.

Table 6.8: Car Parking

Location	Predicted Additional Car Parking Demand	Existing Car Parking Occupancy	Identified Strategy
Precinct 1 (Cobar Street, Old Canterbury Road, New Canterbury Road and Kroombit Street)	+20 spaces	High	○ Resident permit parking scheme proposed to protect the car parking amenity of existing residents (particularly those not provided any off-street car parking)
Precinct 2 (Lands surrounding Arlington Light Rail Station)	+42 spaces	Moderate to High	○ Resident permit parking scheme proposed to protect the car parking amenity of existing residents (particularly those not provided any off-street car parking) ○ Car parking demands should continue to be monitored to identify the presence of any commuter car parking demands associated with the Arlington Light Rail stop
Precinct 3 (Dulwich Hill town centre)	+100 spaces	High	○ Extension of existing short term parking restrictions (2P) into the surrounding streets ○ The additional car parking demand comprises 74 resident spaces. Extending the short-term restrictions will limit on-street parking opportunities and will likely result in lower car ownership levels ○ The 18 residential visitor spaces will peak in the evening when the existing parking demands are lower and vacancies exist ○ The additional 8 short-term customer spaces could be absorbed into the existing supply
Precinct 4 (Dulwich Hill Railway Station)	+16 spaces	High	○ It is proposed to expand the existing resident permit parking scheme around the station precinct ○ The 18 residential visitor spaces will peak in the evening when the existing parking demands are lower and vacancies exist

Residents in future medium and high density residential developments will not be eligible for resident parking permits.

7. Community and Stakeholder Consultation

7.1 Tomorrow's Dulwich Hill. Stage 1. Learn and Share – Traffic and Parking

GTA Consultants prepared a traffic and parking issues plan that was posted on Marrickville Council's 'Your Say Marrickville' website for residents and other stakeholders to discuss traffic and parking issues in an open forum. The forum was open to the public from late March 2015 to early May 2015 and received 38 responses.

A summary of the parking issues raised is provided below:

- On-street car parking in the vicinity of new residential developments along New Canterbury Road as a result of clearway operations and insufficient on-site car parking provided by the new developments.
- On-street car parking in the vicinity of Dulwich Hill Railway Station and Light Rail stop.
- Short-term car parking in the vicinity of retail uses in the vicinity of Dulwich Hill Railway Station as a result of insufficient on-site car parking provided by new shop top developments.
- On-street car parking availability along Denison Road.
- Off-street car parking supply and compliance of spaces behind retail precinct.
- On-street car parking in the vicinity of St Maroun's School for residents with no on-site parking as a result of all day parking by staff and students and current drop-off and pick up operations.
- Parking and traffic lanes linemarking along Ewart Street, particularly at bend approaching Ness Avenue intersection.
- Rear property access along Myra Lane blocked by vehicles parked adjacent. Loss of parking along Myra Road and The Parade contributing to more parking demand in Myra Lane.
- Dulwich Hill Shop owners parking outside their shops in time-restricted on-street spaces, reducing supply for customers to the retail precinct.
- Parked vehicles on Ewart Street between Wardell Road and Ness Avenue are predominantly cars associated with Mechanic shop.

7.2 Tomorrow's Dulwich Hill – Stakeholder Group Priorities

Marrickville Council consulted with stakeholder groups to understand what would make Dulwich Hill a better place. A summary of the key parking issues raised is provided below:

- There are limited accessible parking spaces in the Dulwich Hill retail precinct. There are two off-street accessible parking spaces at the Seaview St carpark adjacent to the former Baby health centre and on on-street space on Seaview St near the school. The on-street space has cross-fall issue due to road curvature.
- Difficulty finding parking for residents in Wilga Avenue as a result of commuter parking.
- Insufficient parking around the school for staff and senior students.

7.3 Tomorrow's Dulwich Hill – Stakeholder Group Options Testing

A consultation session was held with the Denison Road Group on 26 November 2015 to workshop parking options for Denison Road. The Denison Road Group are a group of residents that have been campaigning for improved traffic and parking conditions along Denison Road, which functions as collector road within the study area.

The Denison Road Group expressed their frustration with parking availability in the vicinity of the Christian Brothers' High School during pick-up and drop-off periods, as well as student and staff parking on the local streets throughout the daytime.

The workshop was an opportunity for GTA Consultants and Council to inform the Denison Road Group of the existing road design constraints with respect to increasing parking supply, as well as the parking recommendations identified for the street and corresponding benefits and implications.

In terms of outcomes, there was general acceptance that Denison Road could not accommodate angled car parking and that time restrictions with a resident permit parking scheme was an appropriate strategy to address the existing parking issues. It was clear that Council would also need to work with the school to manage pick-up and drop-off impacts, as well as illegal parking during these times.

8. Implementation

8.1 Action Plan

Having regard for the identified recommendations the following actions table has been prepared.

Each identified action has been described providing the following information:

- Recommendation ID. Number
- Strategy Recommendation
- Priority
  - S – Short term representing 1 – 2 years
  - M – Medium term representing 3 – 5 years
  - L – Long term representing greater than 5 years
- Cost[6]
  - L – Low cost representing less than $50,000
  - M – Medium cost representing $50,000 – $200,000
  - H – High cost representing greater $200,000

Table 8.1: Action Plan

ID. No.	Action	Priority (S / M / L)	Cost (L / M / H)
1	Further explore the opportunity to provide additional on-street car parking (90 degree) on Ewart Street and Seaview Street.	M	L
2	Rely on additional parking supplies within the surrounding residential areas to accommodate the short term existing parking demands of the centre.	M	-
3	Modify parking restrictions within surrounding residential of the town centre to appropriately manage demands and needs of all users (refer to Section 6.3).	-	-
4	Provide additional time restricted car parking spaces (short and medium term locations) as detailed in Table 6.3 and in Appendix C.	S/M	L
5	Present potential car parking options to residents surrounding Arlington Reserve to determine a preferred car parking strategy.	S	L
6	Continue to monitor car parking demands in the vicinity of the light rail stops to see whether commuter parking demands increase, to the detriment of resident demands.	M	M
7	The existing car parking demands and turnover do not warrant the introduction of paid parking into the study area. Continue to use time restrictions to manage parking demands.	L	H
8	Continue to monitor car parking demands and turnover within the three existing off-street car parks servicing the town centre.	M	L
9	Review the network of pedestrian connections to the centre from surrounding residential areas and consolidated car parking locations to ensure these are safe and amenable in order to reduce the key barriers presented to walking such as major roads.	M	M
10	Continue to provide end of trip facilities for cyclists, including bicycle hoops throughout the centre.	M	L

[6] Costing is indicative only and should not be relied upon for cost planning purposes.

ID. No.	Action	Priority (S / M / L)	Cost (L / M / H)
11	Ensure end of trip facilities for cyclists (showers, lockers, change rooms and bicycle storage) are provided in major developments.	S	L
12	Continue to lobby TfNSW to ensure that the best possible public transport facilities are provided in the study area.	M	L
13	Consider providing one (1) additional disabled parking space in either the Dan Shanahan Car Park or centrally located on Marrickville Road.	S	L
14	Continually review inventory of residential disabled parking spaces to ensure efficient use of on-street parking provisions.	M	L
15	Existing loading requirements should be monitored over time and if necessary, a reactive approach be taken to accommodate any significant changes to pick-up or delivery requirements, having regard to balancing competing objectives such as availability of on-street visitor parking to support economic function.	M	L
16	On-site loading should continue to be pursued for larger new developments, particularly those having access to back-of-house areas, in accordance with the guidance provided in the DCP.	M	M
17	Upgrade parking wayfinding signage to include the following key features: (a) Upgrade of existing sign faces and locations (b) Investigate potential implementation of dynamic parking signage.	(a) S (b) L	(a) L (b) H
18	Introduce a car share parking requirement for larger developments into the DCP.	M	L
19	It is recommended that enforcement be increased in the time restricted areas to the north of New Canterbury Road to ensure appropriate turnover of car parking spaces and spaces are being used as intended.	S	L
20	Maintain Council's current policy for parking in laneways.	S	L
21	Remove car parking from Keith Lane to cater for improved property access.	S	L
22	Review geometrical access constraints (in consultation with residents) in Myra Lane and implement specific 'No Stopping' restrictions if required to ensure that adequate property access is maintained.	M	L
23	Introduce formal 'No Stopping' parking restrictions (for 10m) at unsignalised intersections to improve safety in the town centre and surrounding Dulwich Hill Station.	S	M
24	That a 'No Stopping' restriction be introduced adjacent to the properties at 115-117 Constitution Road to improve sight lines for vehicles on Constitution Road and vehicles exiting the adjacent driveways (refer to Item C5 of the Pedestrian, Cyclist & Traffic Calming Advisory Committee dated 11 December 2015).	S	L

Appendix A

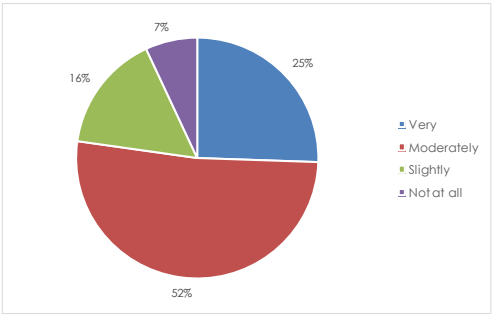
Community Consultation Findings

Community Consultation Survey – Transport Findings

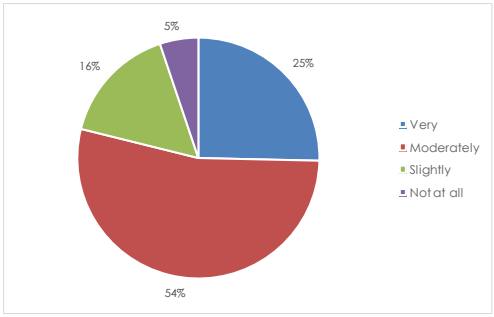
1. General

1.1 My street (including the footpath, nature strip and road) feels - Safe

Marrickville LGA

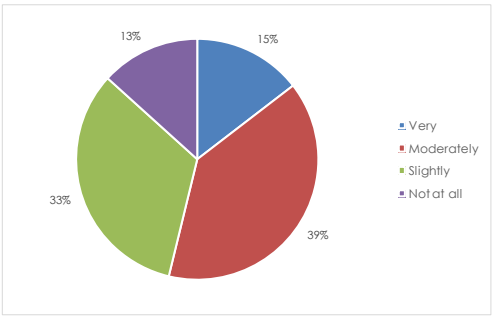


Dulwich Hill, Lewisham & Riverside

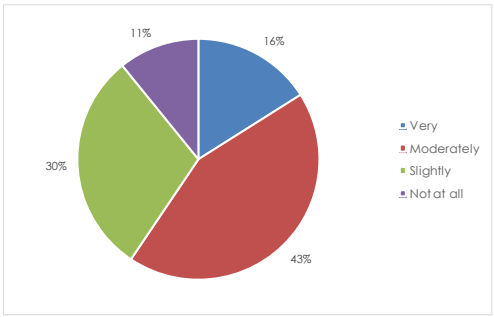


1.2 My street (including the footpath, nature strip and road) feels – Well-Maintained

Marrickville LGA



Dulwich Hill, Lewisham & Riverside



1.3 What would improve the feel of your street, if anything?

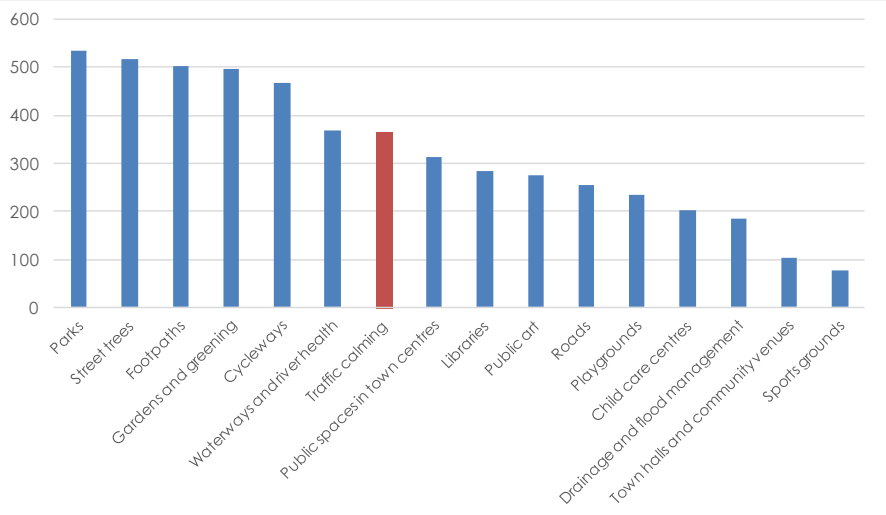
- Improve/ introduce car parking linemarking particularly for angled parking spaces
- Resident parking scheme in busy areas
- Alternative traffic calming to speed humps (noisy) to deter speeding
- Maintenance of roadways and footpaths
- Improve street lighting.

1.4 Imagine you have been granted three wishes to design better streets (footpaths, roads and nature strips) and public spaces (parks, town centres and squares). What would you wish for?

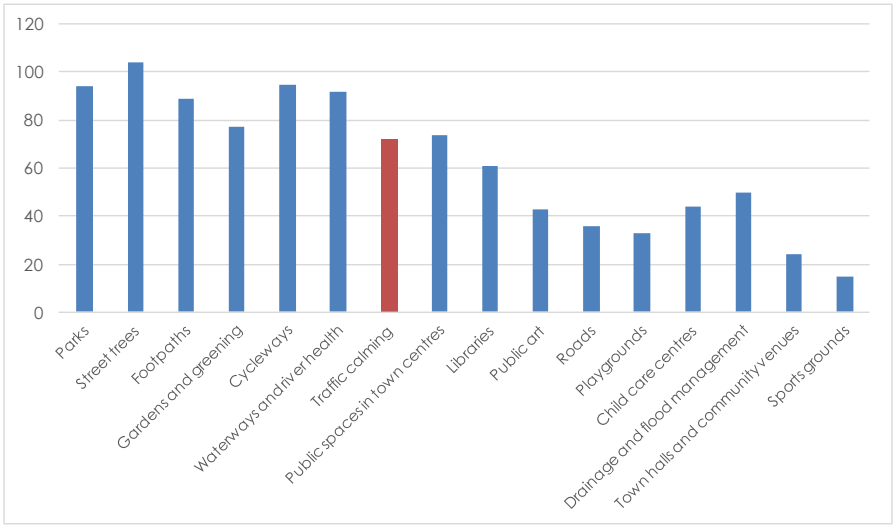
- Separated cycleways
- Link cycleways with rail and light rail
- Well maintained and wider network of footpaths
- Safer pedestrian crossing on Toothill Street
- More street trees
- Improved street lighting near Waratah Mills light rail stop
- Shared zones in shopping areas
- Traffic calming that prioritises cycling and walking
- More parking in busy areas
- Resident parking on Seaview Street
- More commuter parking near stations and bus stops
- More human activity, less vehicles.

1.5 Council doesn't have all the resources needed to improve and build new infrastructure assets and we'd like to know what's most important to you.

Marrickville LGA



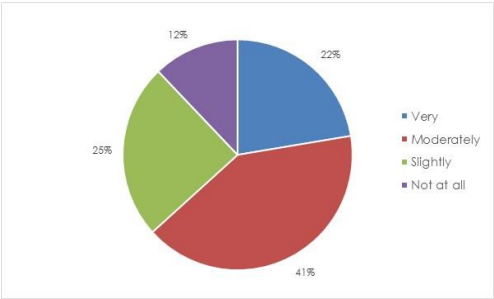
Dulwich Hill, Lewisham & Riverside



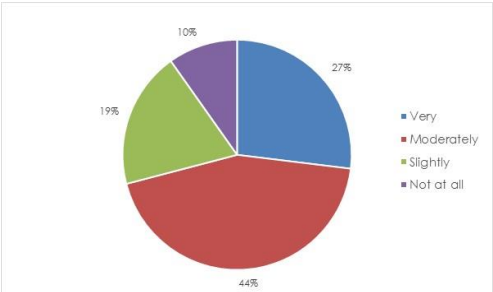
2. Pedestrian

2.1 How much do you agree with the following statement? It is easy to move around my neighbourhood (e.g. footpaths are free from obstructions, roads are easy to cross)

Marrickville LGA

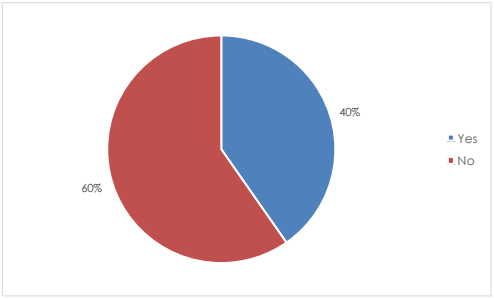


Dulwich Hill, Lewisham & Riverside

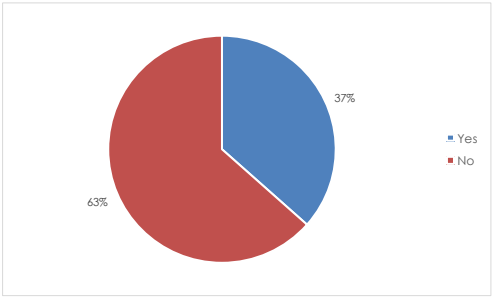


2.2 Are there barriers that prevent you and your family/ household walking more in your neighbourhood?

Marrickville LGA

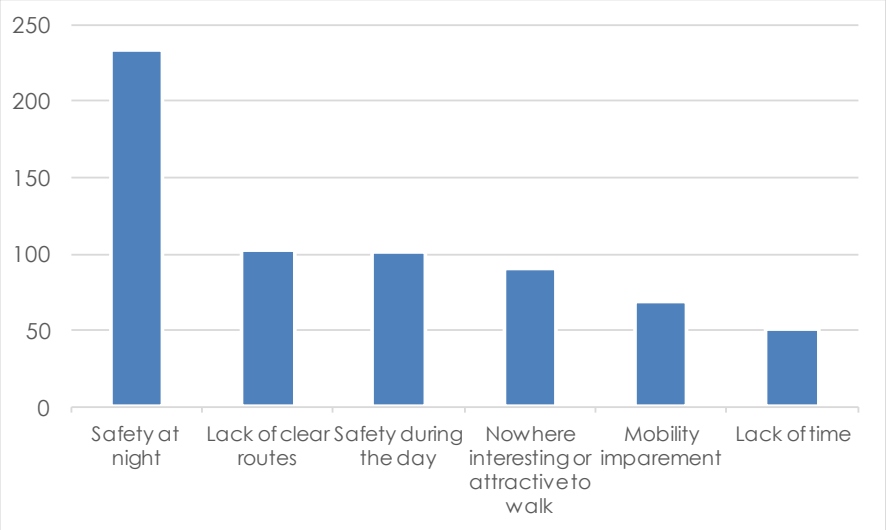


Dulwich Hill, Lewisham & Riverside

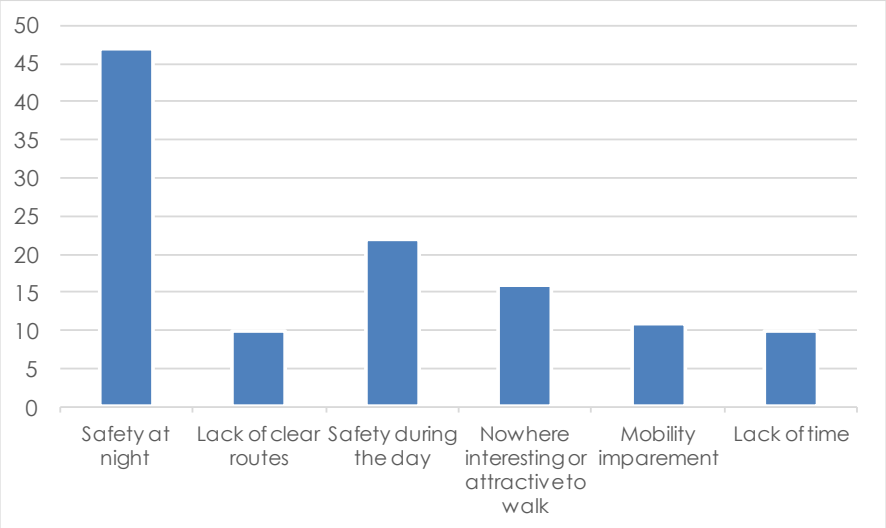


2.2.1 What are the barriers?

Marrickville LGA



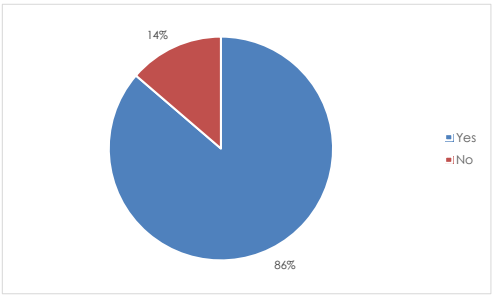
Dulwich Hill, Lewisham & Riverside



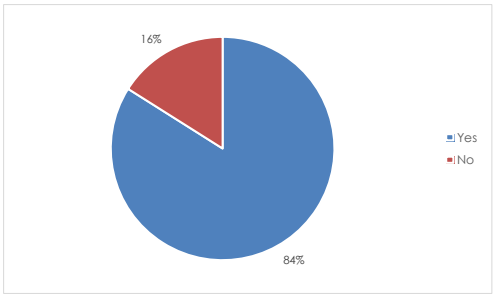
- Other common barriers mentioned?
    - Quality of footpaths causing trip hazards (uneven surface and obstructions on footpaths)
    - Limited street lighting
    - Speeding cars.

2.3 Could your neighbourhood be improved to make getting around easier and more attractive?

Marrickville LGA



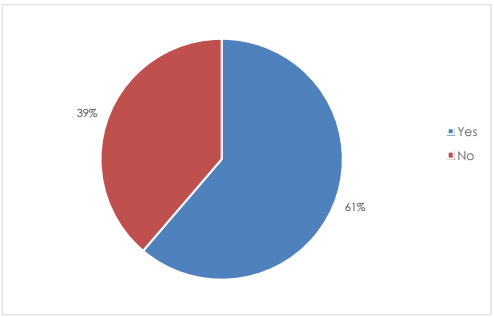
Dulwich Hill, Lewisham & Riverside



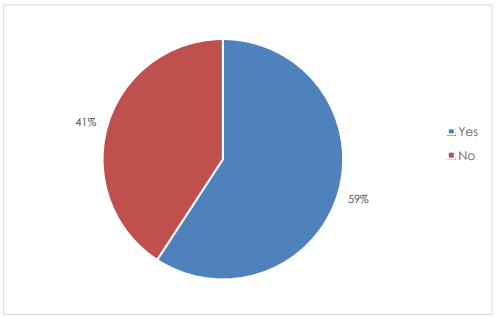
- How? (Where in Dulwich Hill, Lewisham & Riverside?)
  - Improve footpaths (New Canterbury Road, Victoria Street, Denison Road, Hercules Street, Dixson Avenue)
  - Improve street scaping, including shading (Wardell Road, New Canterbury Road, Denison Road, Yule Street)
  - Improve or addition safe crossing points (Denison Road, Toothill Street, Davis Street, The Boulevarde, Frazer Street, Constitution Street, New Canterbury Road)
  - Improve street lighting (Hunter Street, near railway station and parks)
  - Additional traffic calming measures, including closure of some residential streets at main roads to reduce rat running (Moncur Street, Jersey Street)
  - Remove excess rubbish from roads and footpaths (Williams Parade).

2.4 Thinking about the bus stops, light rail, train stations, parks, schools and shops in your neighbourhood, could the routes to these be improved?

Marrickville LGA



Dulwich Hill, Lewisham & Riverside



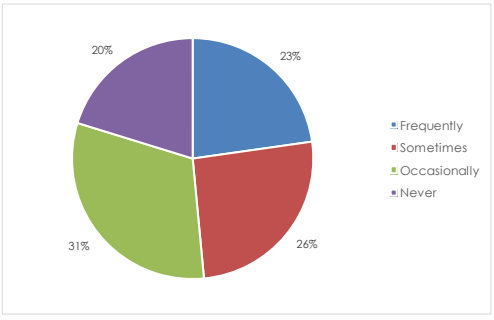
- How? (Where – Dulwich Hill, Lewisham & Riverside only)
    - Improve street lighting (Lewisham light rail stops, bus stops)
    - Improve access to Lewisham West light rail stop across Old Canterbury Road
    - Direct walking routes at Waratah Mills light rail stop from the corner of Frazer Street and New Canterbury Road
    - Safer pedestrian crossings to schools (Denison Road, The Boulevard and Toothill Street)
    - Improve link between Dulwich Hill light rail stop and Dulwich Hill Railway Station.
    - Improve wayfinding signage (general)
    - Additional pedestrian crossing near Arlington light rail stop (across Constitution Road)
    - Additional pedestrian crossing near Dulwich Grove light rail stop (across New Canterbury Road)
    - Improved bus stop facilities (general).

2.5 If there was one major walking route in Marrickville local government area that you would like to see created, where would it be and why?

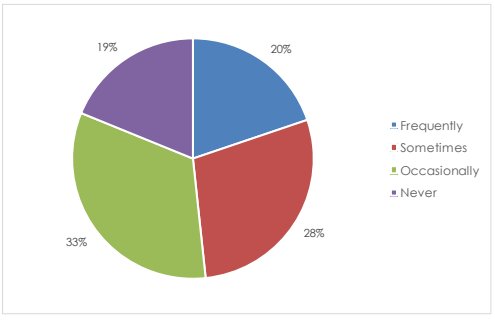
- The Greenway shared path (Cooks River to Iron Cove) along the light rail line – safety and convenience.
- Lewisham/ Dulwich Hill to Newtown/ Enmore – connecting to entertainment hub
- All laneways – more inviting walking experience.

2.6 How often do the following happen in your street? – Times when pedestrians are in danger.

Marrickville LGA

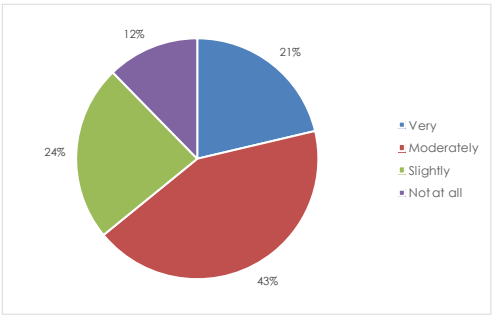


Dulwich Hill, Lewisham & Riverside

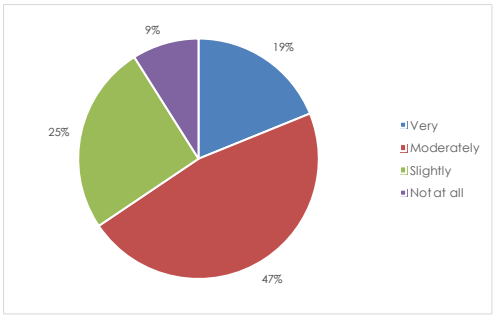


2.7 My street (including the footpath, nature strip and road) feels? – Pedestrian friendly.

Marrickville LGA



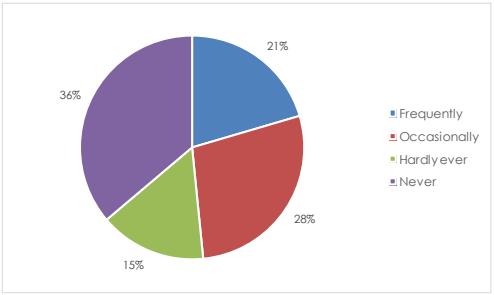
Dulwich Hill, Lewisham & Riverside



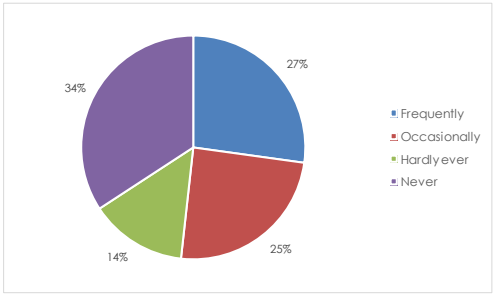
3. Cyclists

3.1 I and/ or members of my family/ household ride a bicycle in my neighbourhood.

Marrickville LGA

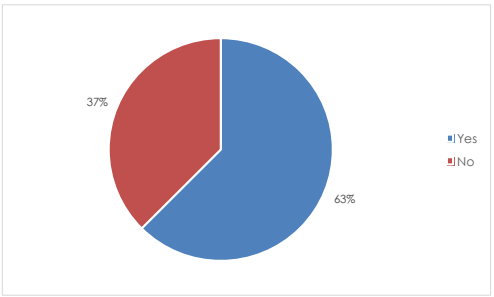


Dulwich Hill, Lewisham & Riverside

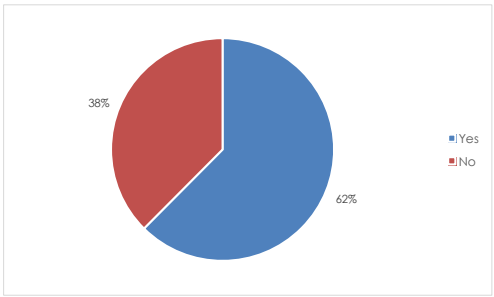


3.2 Are there barriers that prevent you and your family/ household cycling or cycling more often in your neighbourhood

Marrickville LGA

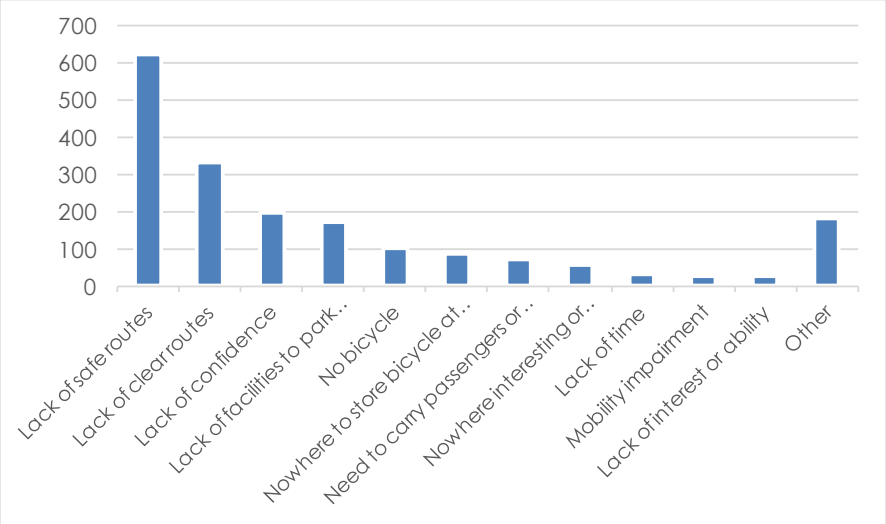


Dulwich Hill, Lewisham & Riverside

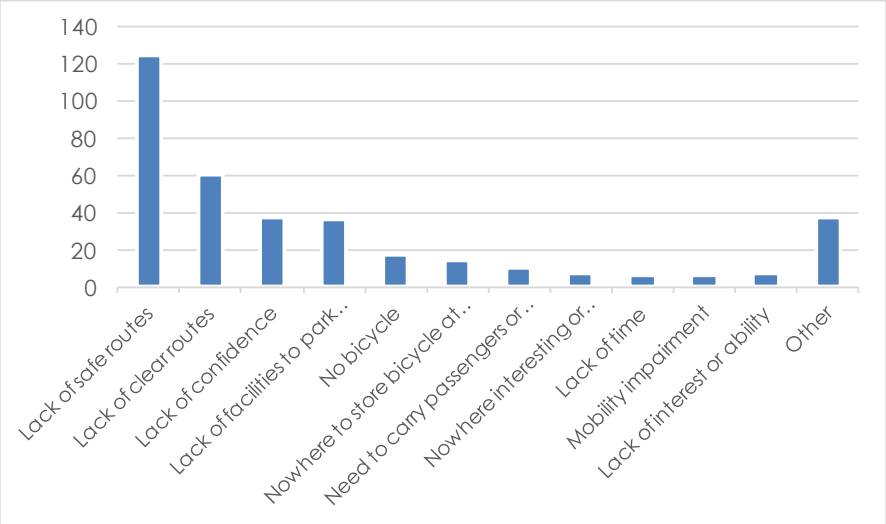


3.2.1 What are the barriers?

Marrickville LGA



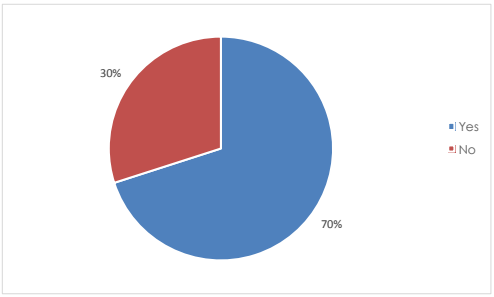
Dulwich Hill, Lewisham & Riverside



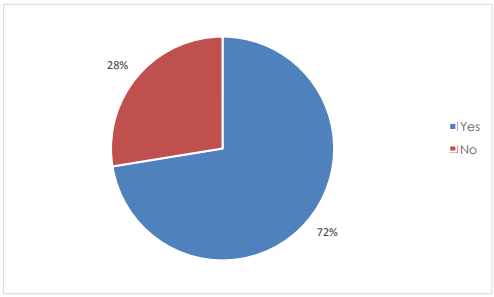
- Other common barriers mentioned?
  - Speeding cars
  - Too dangerous.

3.3 Would anything about the streets and public spaces need to change to improve cycling in your neighbourhood?

Marrickville LGA



Dulwich Hill, Lewisham & Riverside



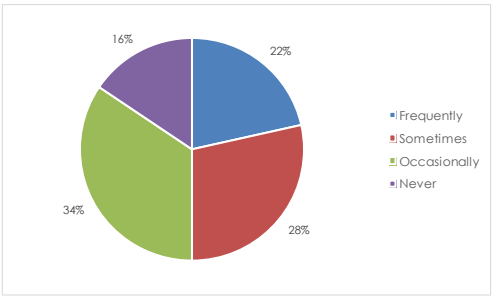
- What? (Where in Dulwich Hill, Lewisham & Riverside?)
  - Dedicated separated cycle paths (on all main roads and near railway stations)
  - Direct cycle routes to the city
  - Driver awareness.

3.4 If there was one major cycling route in Marrickville local government area that you would like to see created, where would it be and why?

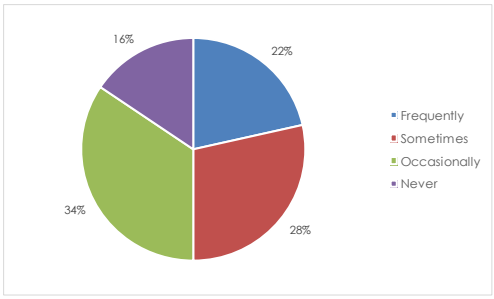
- The Greenway shared path (Cooks River to Iron Cove) along the light rail line – safety, convenience and connectivity
- Dulwich Hill to Sydenham Station – access rail services
- Dulwich Hill to Newtown – access to entertainment and leisure.

3.5 How often do the following happen in your street? – Times when cyclists are in danger.

Marrickville LGA

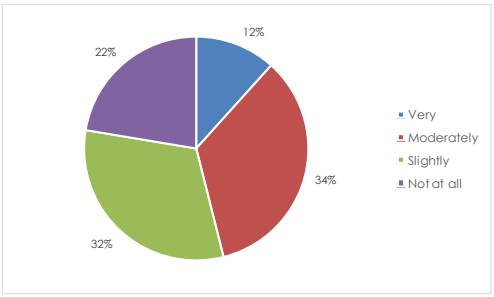


Dulwich Hill, Lewisham & Riverside

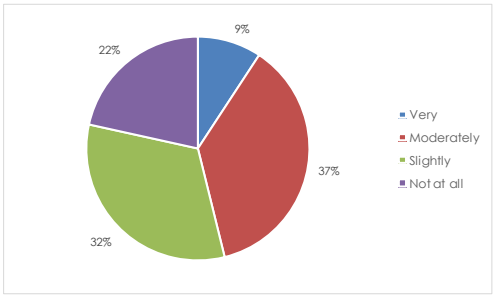


3.6 My street (including the footpath, nature strip and road) feels.... – Bike friendly.

Marrickville LGA



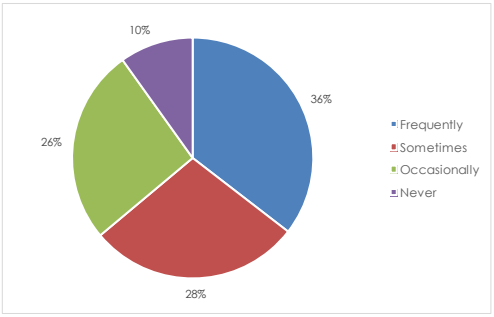
Dulwich Hill, Lewisham & Riverside



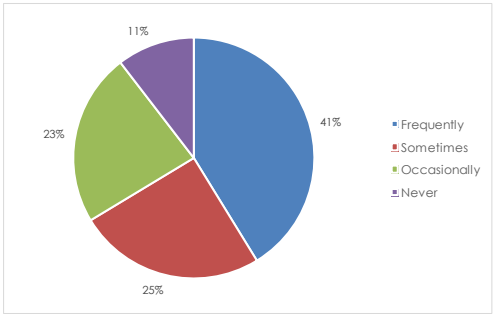
4. Traffic

4.1 How often do the following happen in your street? – Speeding traffic

Marrickville LGA

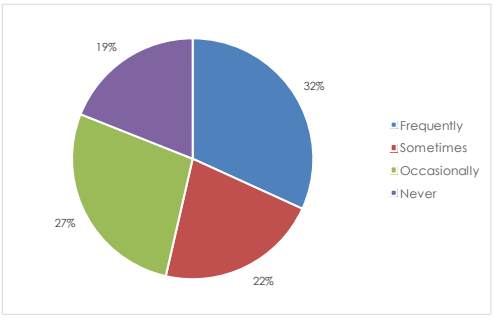


Dulwich Hill, Lewisham & Riverside

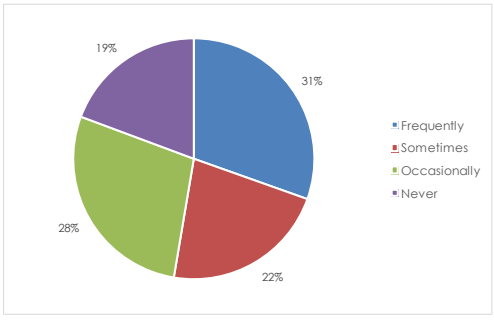


4.2 How often do the following happen in your street? – Too much traffic or 'rat-running'

Marrickville LGA



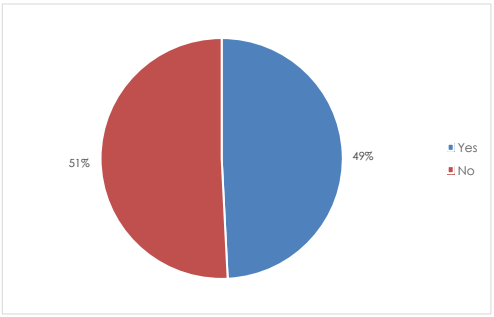
Dulwich Hill, Lewisham & Riverside



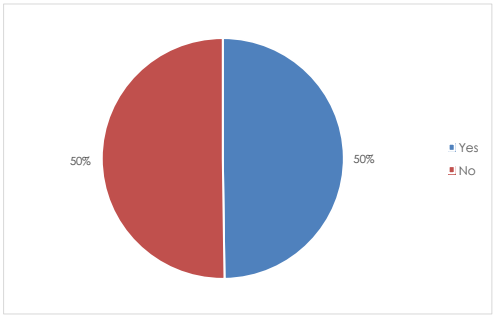
5. Parking

5.1 Does your neighbourhood need more taxi zones, bicycle parking, accessible parking, car share spares, loading zones or 15 minute drop-off zones?

Marrickville LGA



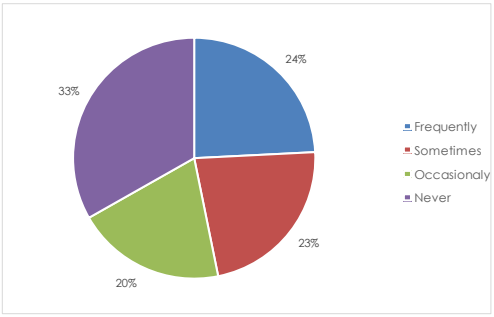
Dulwich Hill, Lewisham & Riverside



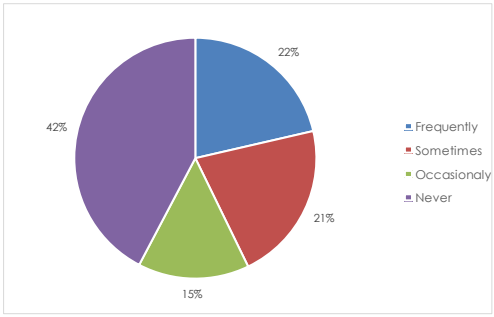
- What? (Where in Dulwich Hill, Lewisham & Riverside)
  - Car share spaces (Old Canterbury Road, Frazer Street)
  - Bicycle parking (around Railway stations, light rail stops, near bus stops, near shops along Marrickville Road)
  - Resident parking (near light rail stops and sporting grounds)
  - 15 minute drop-off zones (near shops along Marrickville Road, outside railway stations and Dulwich Hill public school)
  - Taxi Zone (near shops along Marrickville Road)
  - Accessible parking (near Lewisham Station, near doctors/ medical centres)

5.2 How often do the following happen in your street? – Can't find a parking spot within two blocks

Marrickville LGA

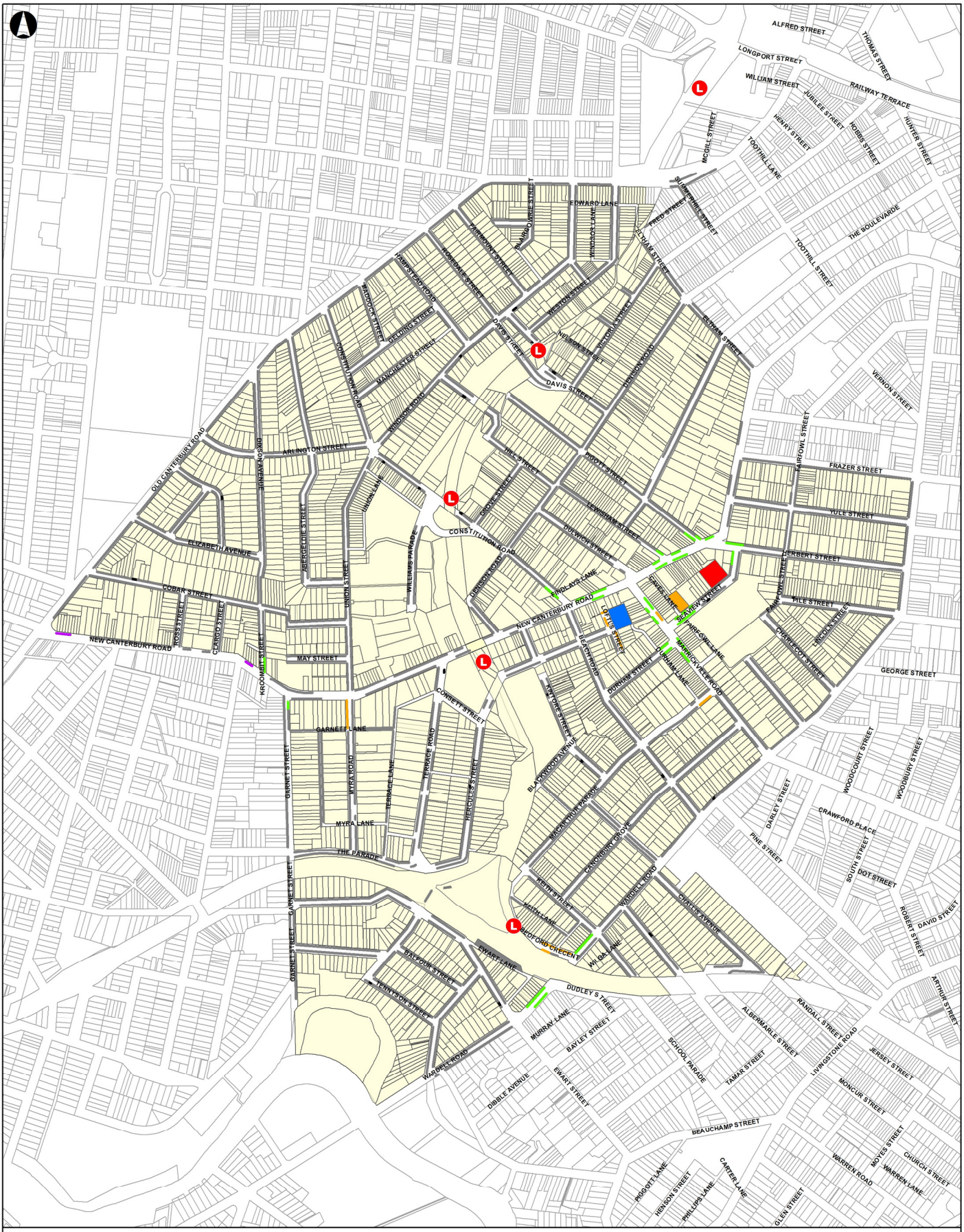


Dulwich Hill, Lewisham & Riverside



Appendix B

Car Parking Supply and Occupancy



Legend

Restriction at 12:00pm Mon-Fri

- 1/2P
- 1P
- 2P
- Disabled
- Unrestricted
- 2P
- 3P
- 4P
- Unrestricted

Issue	Date	By	Chkd	Appd
P1	21-01-15	ADM	ADF	BDM

Client

Marrickville Council

Job Title

Dulwich Hill, Lewisham and Riverside Traffic Plan

Drawing Title

Dulwich Hill Car Parking Restriction Weekday 12:00pm

Metres

0 105 210 420

GTAconsultants

www.gta.com.au

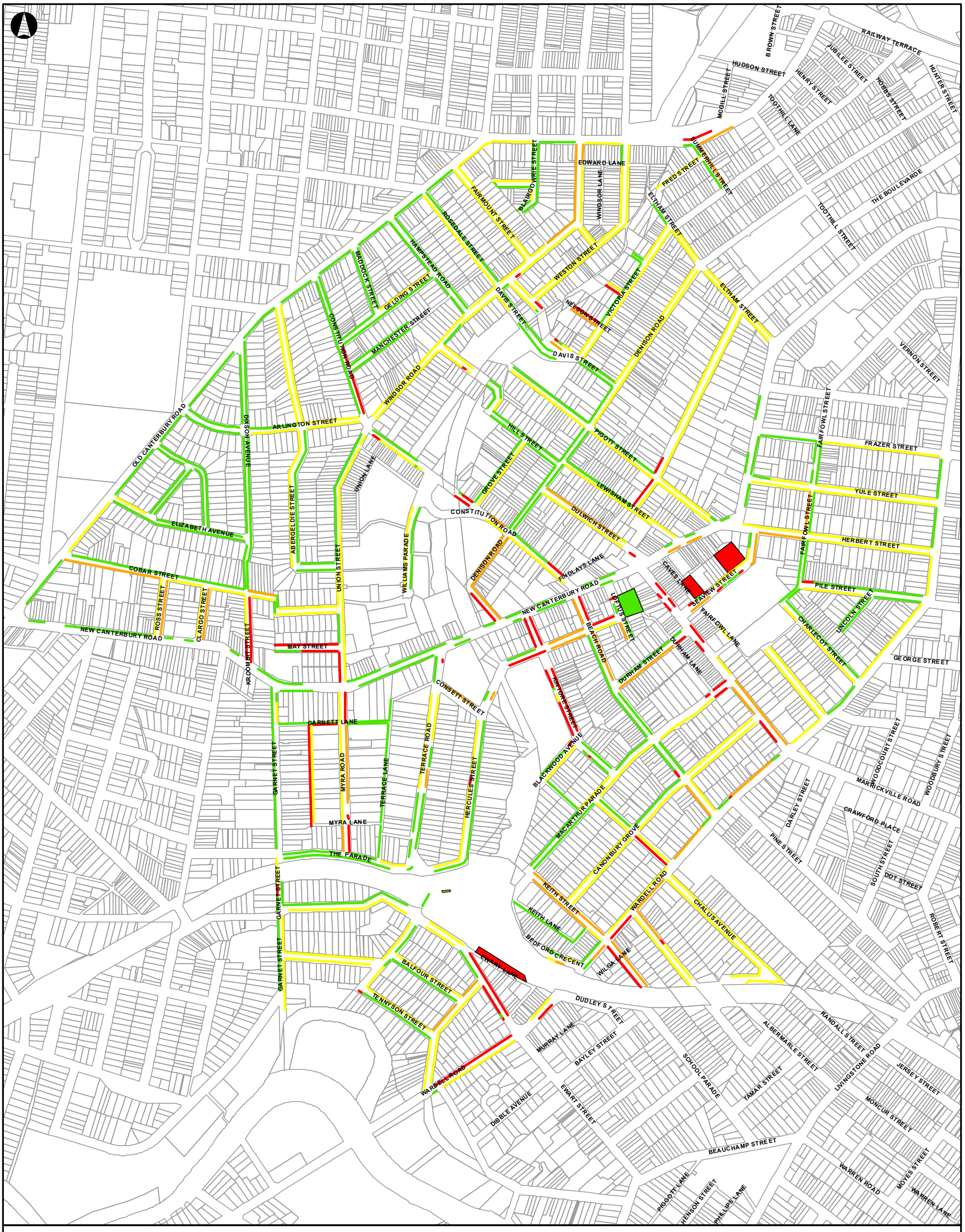
Scale at A3

1:8,000

Drawing Status

Preliminary

Job No	Drawing No	Issue
15S1012000	004-02	P1



Legend

Tuesday 8:00am

- 0 - 49%
- 50 - 74%
- 75 - 84%
- 85% +

Issue	Date	By	Chkd	Appd
P1	09-01-15	RLG	ADF	BDM

Client

Marrickville Council

Job Title

Dulwich Hill, Lewisham and Riverside Traffic Plan

Drawing Title

Dulwich Hill Car Parking Demand Tuesday 8:00am

Metres

0 100 200 400

GTAconsultants

www.gta.com.au

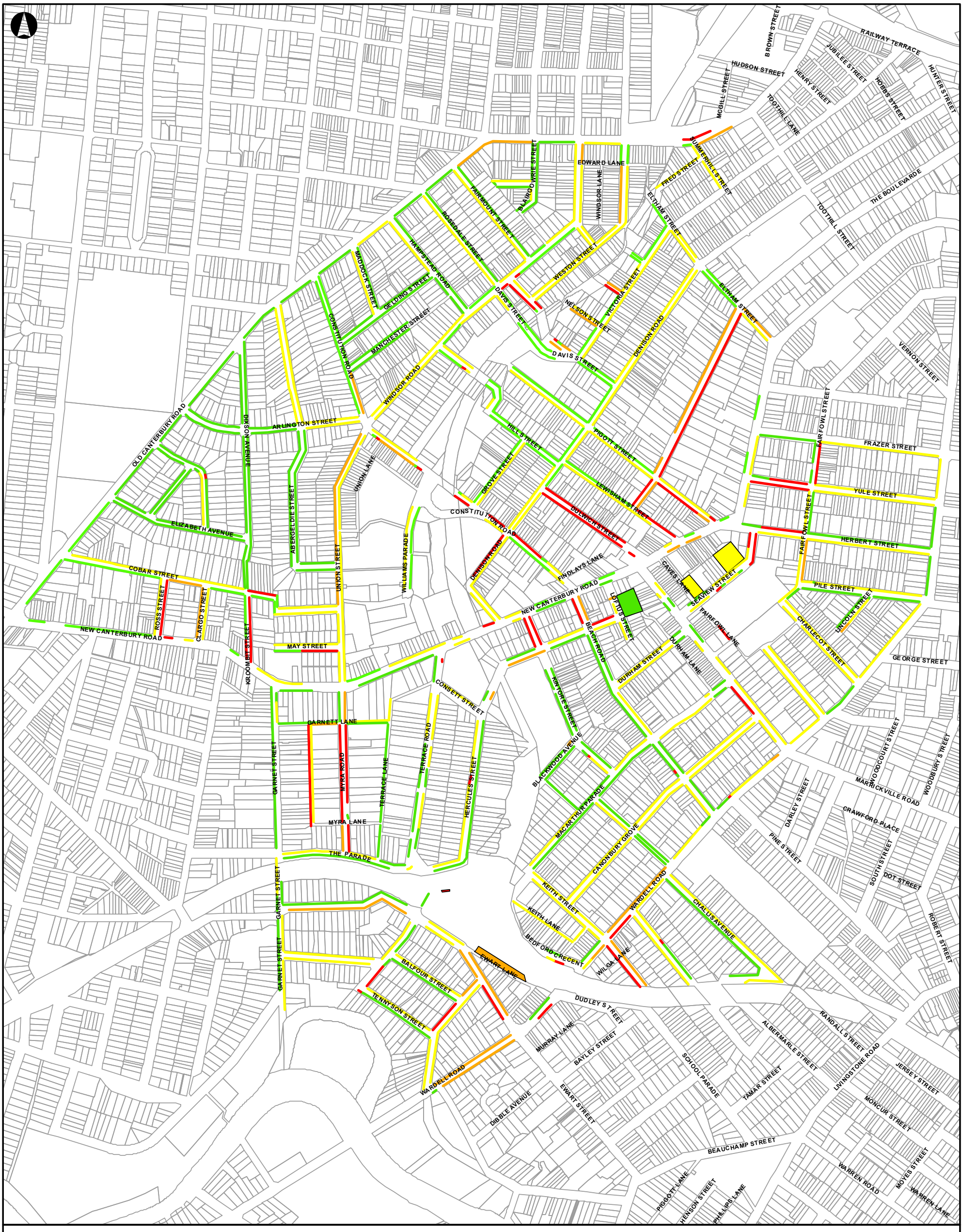
Scale at A3

1:7,500

Drawing Status

Preliminary

Job No	Drawing No	Issue
15S1012000	003-10	P1



Legend

Tuesday 2:00pm

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- 50 - 74%
- 75 - 84%
- 85% +

Issue	Date	By	Chkd	Appd
P1	09-01-15	RLG	ADF	BDM

Client

Marrickville Council

Job Title

Dulwich Hill, Lewisham and Riverside Traffic Plan

Drawing Title

Dulwich Hill Car Parking Demand Tuesday 2:00pm

Metres

0 100 200 400

GTAconsultants

www.gta.com.au

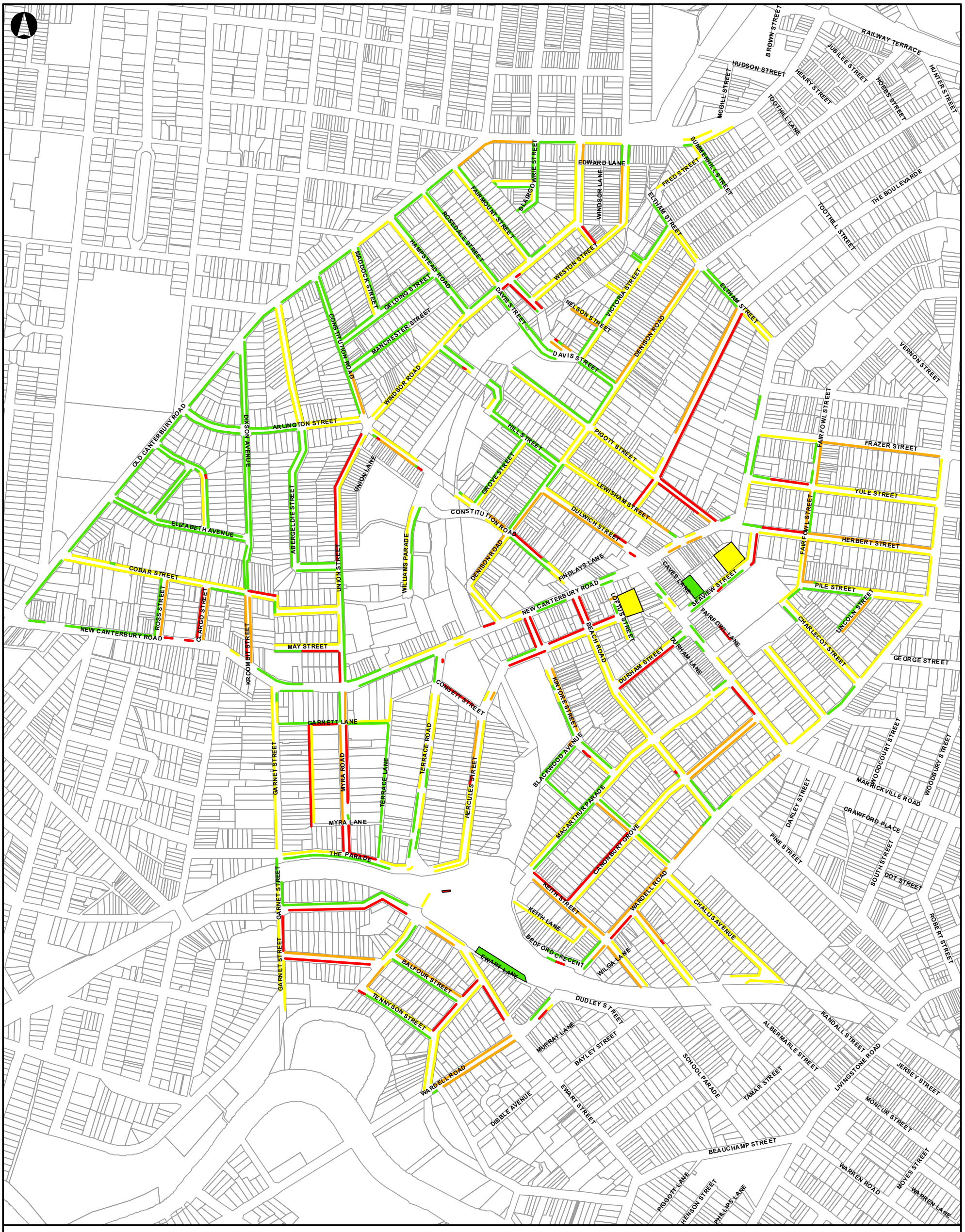
Scale at A3

1:7,500

Drawing Status

Preliminary

Job No	Drawing No	Issue
15S1012000	003-11	P1



Legend

Tuesday 3:00pm

- 0 - 49%
- 50 - 74%
- 75 - 84%
- 85% +

Issue	Date	By	Chkd	Appd
P1	09-01-15	RLG	ADF	BDM

Client

Marrickville Council

Job Title

Dulwich Hill, Lewisham and Riverside Traffic Plan

Drawing Title

Dulwich Hill Car Parking Demand Tuesday 3:00pm

Metres

0 100 200 400

GTAconsultants

www.gta.com.au

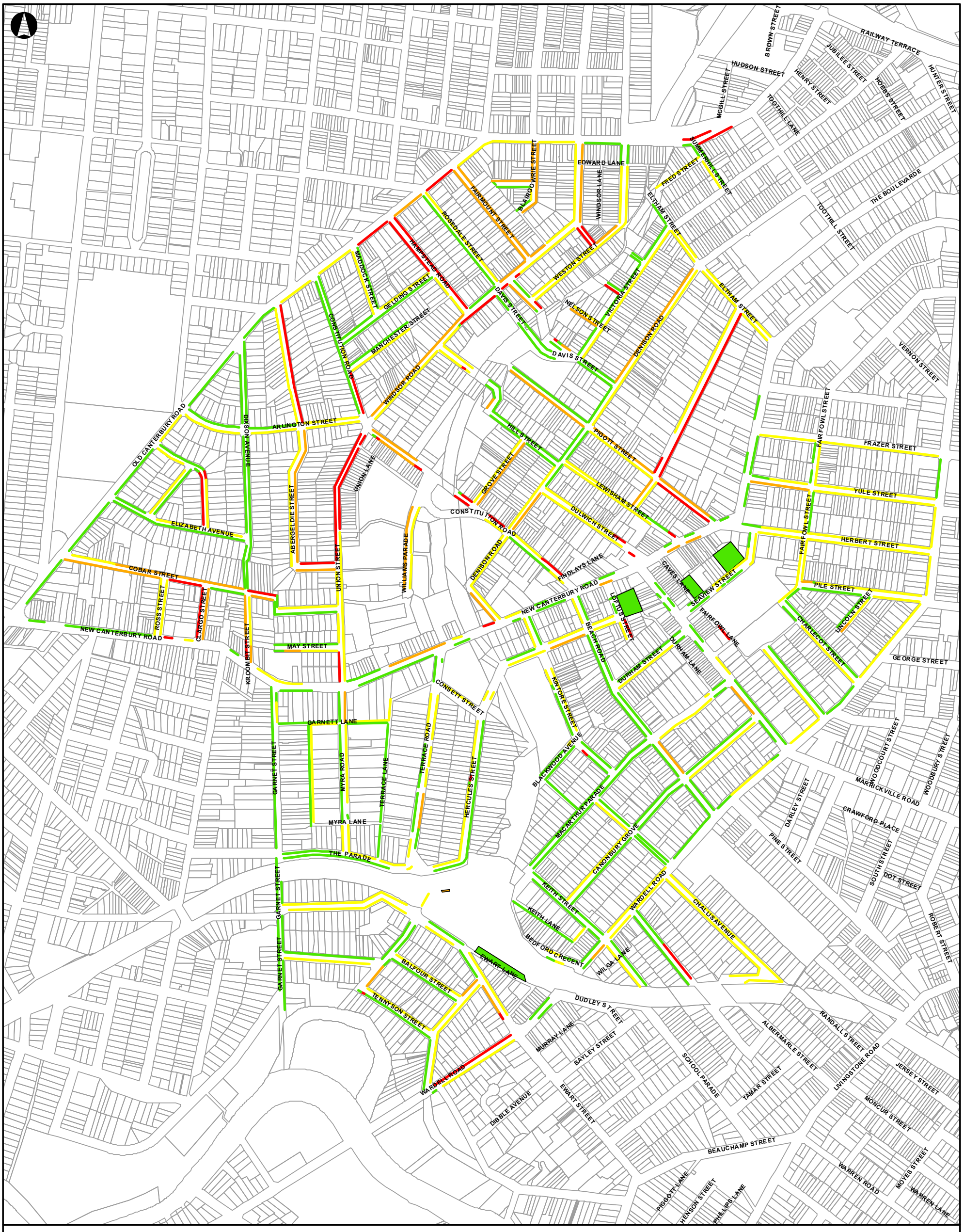
Scale at A3

1:7,500

Drawing Status

Preliminary

Job No	Drawing No	Issue
15S1012000	003-12	P1



Legend

Tuesday 7:00pm

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- 50 - 74%
- 75 - 84%
- 85% +

Issue	Date	By	Chkd	Appd
P1	09-01-15	RLG	ADF	BDM

Client

Marrickville Council

Job Title

Dulwich Hill, Lewisham and Riverside Traffic Plan

Drawing Title

Dulwich Hill Car Parking Demand Tuesday 7:00pm

Metres

0 100 200 400

GTAconsultants

www.gta.com.au

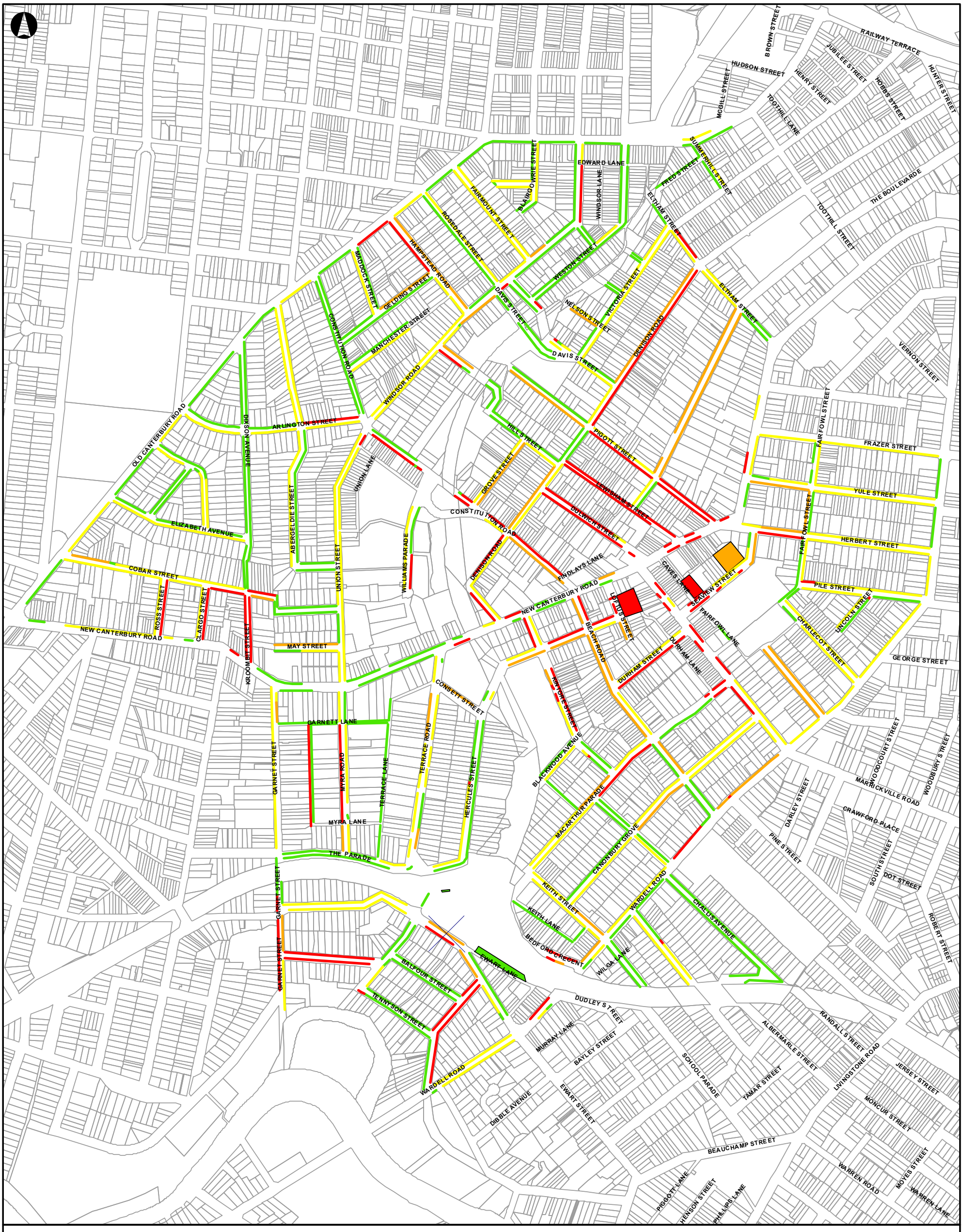
Scale at A3

1:7,500

Drawing Status

Preliminary

Job No	Drawing No	Issue
15S1012000	003-13	P1



Legend

Saturday 9:00am

- 0 - 49%
- 50 - 74%
- 75 - 84%
- 85% +

Issue	Date	By	Chkd	Appd
P1	09-01-15	RLG	ADF	BDM

Client

Marrickville Council

Job Title

Dulwich Hill, Lewisham and Riverside Traffic Plan

Drawing Title

Dulwich Hill Car Parking Demand Saturday 9:00am

Metres

0 100 200 400

GTAconsultants

www.gta.com.au

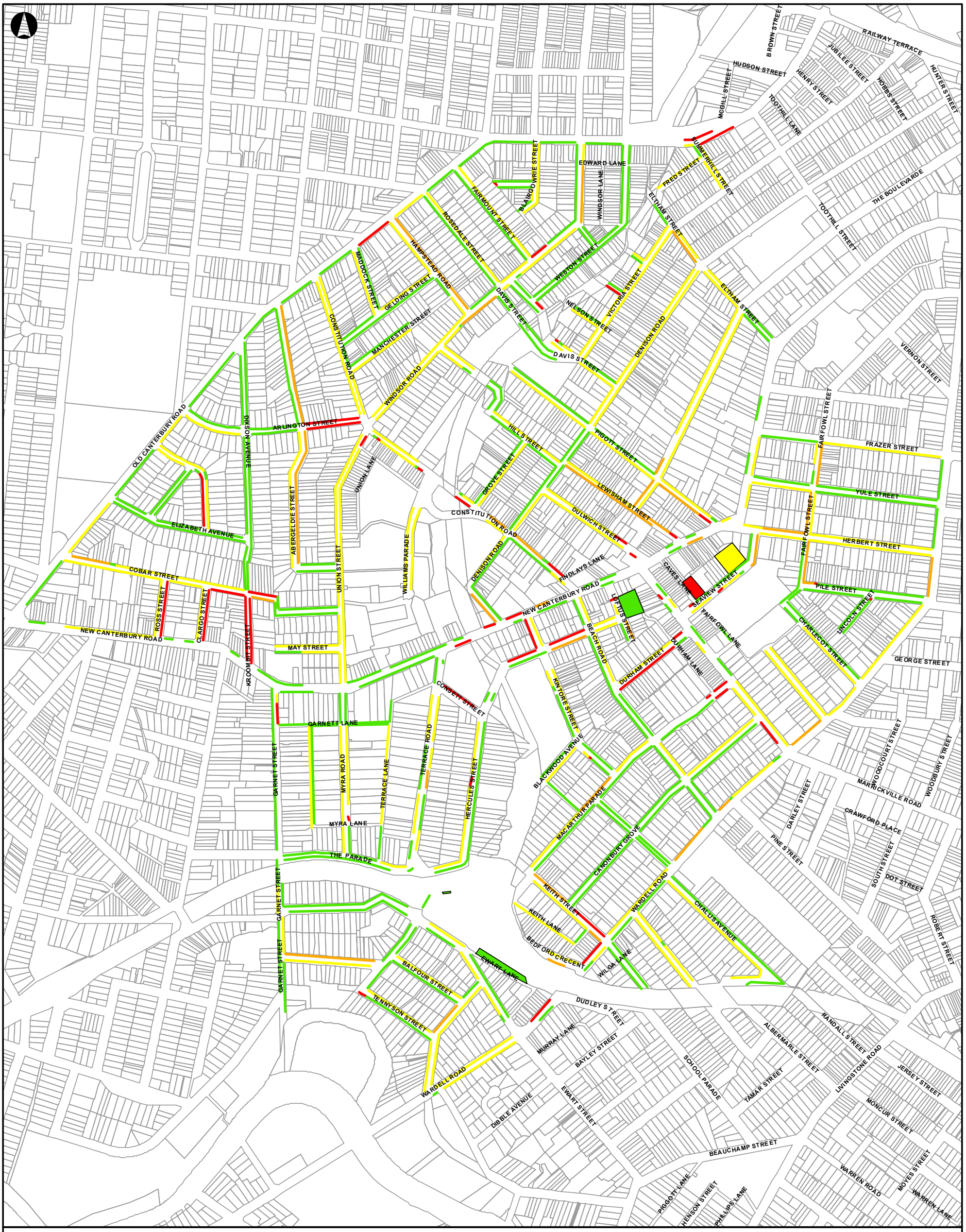
Scale at A3

1:7,500

Drawing Status

Preliminary

Job No	Drawing No	Issue
15S1012000	003-07	P1



Legend

Saturday 12:00pm

- 0 - 49%
- 50 - 74%
- 75 - 84%
- 85% +

Issue	Date	By	Chkd	Appd
P1	09-01-15	RLG	ADF	BDM

Client

Marrickville Council

Job Title

Dulwich Hill, Lewisham and Riverside Traffic Plan

Drawing Title

Dulwich Hill Car Parking Demand Saturday 12:00pm

Metres

0 100 200 400

GTAconsultants

www.gta.com.au

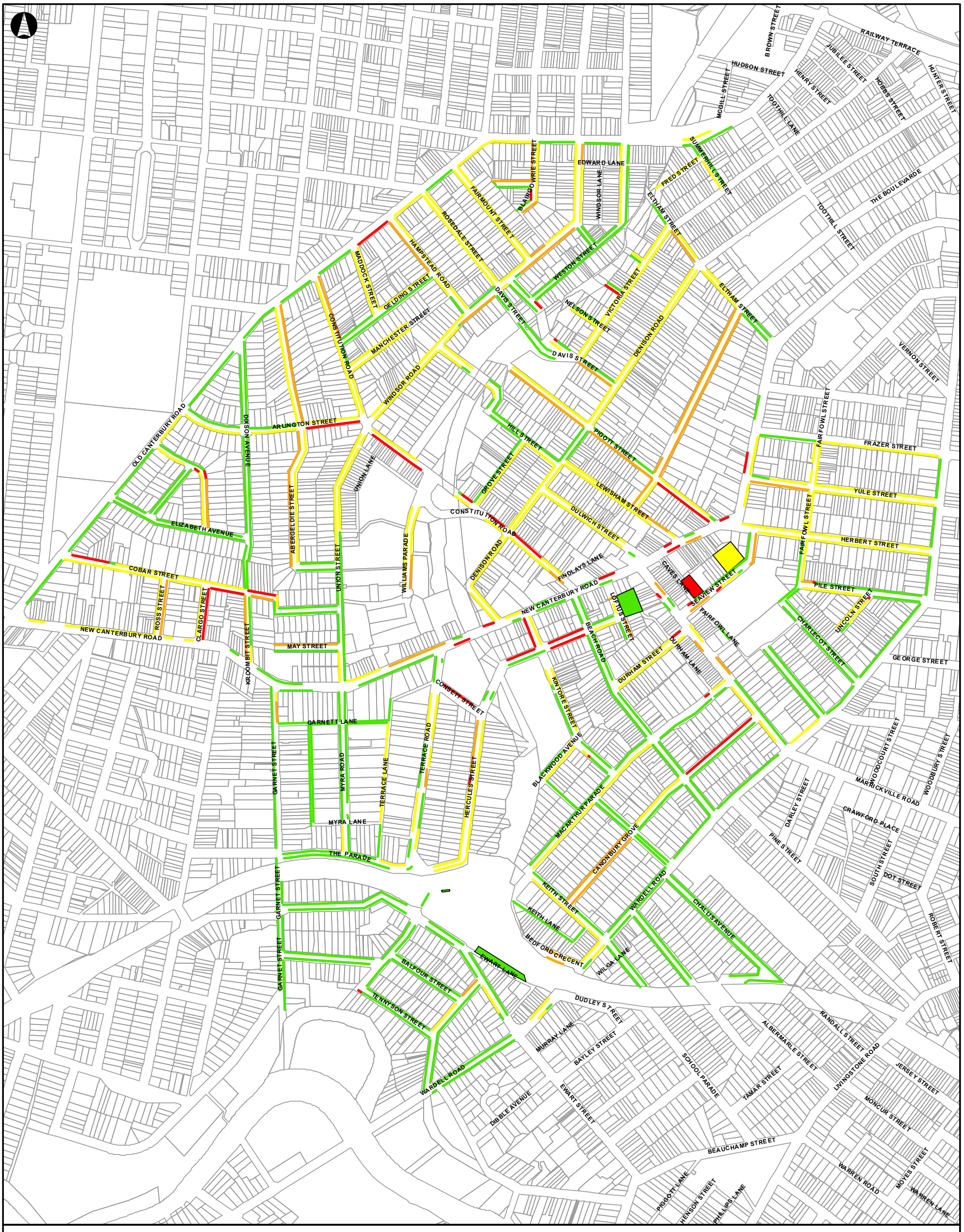
Scale at A3

1:7,500

Drawing Status

Preliminary

Job No	Drawing No	Issue
15S1012000	003-08	P1



Legend

Saturday 3:00pm

- 0 - 49%
- 50 - 74%
- 75 - 84%
- 85% +

Issue	Date	By	Chkd	Appd
P1	09-01-15	RLG	ADF	BDM

Client

Marrickville Council

Job Title

Dulwich Hill, Lewisham and Riverside Traffic Plan

Drawing Title

Dulwich Hill Car Parking Demand Saturday 3:00pm

Metres

0 100 200 400

GTAconsultants

www.gta.com.au

Scale at A3

1:7,500

Drawing Status

Preliminary

Job No	Drawing No	Issue
15S1012000	003-09	P1

Appendix C

Technical Note: Car Parking Restriction Changes

Preamble

Many of the parking measures identified below rely in part on the introduction of a resident permit parking scheme and assume that Council would be willing to expand the existing permit parking schemes. There are a number of permit parking areas throughout the Marrickville LGA (M1 to M16), including around Dulwich Hill Station (M13) located in the study area.

It is noted that the characteristics of the M13 permit scheme are unique, given that many of the properties do not have a primary street frontage (only to Keith Lane at the rear of the site which has limited on-street parking) and the proximity to the station.

The recommendations have been separated into the following categories:

- Short-term recommendations (immediate)
- Medium-term recommendations (0 to 5 years)

Each category is discussed further below:

Short Term Recommendations (Immediate)

It is recommended that the following locations be considered immediately for revised on-street parking controls, noting that the existing car parking occupancies demonstrate a current need for change.

Town Centre

Parking in Peripheral Streets

Car parking demands in the retail core are relatively high during typical peak retail periods. These peak demands are exacerbated during PM clearways on New Canterbury Road (reduced supply) and Saturday mornings (increased demand). During these times, the retail car parking demands were observed to penetrate further into the side streets from New Canterbury Road. This is consistent with feedback received from business operators within the study area.

Short-term car parking restrictions are typically provided for a handful of spaces on the side streets intersecting with New Canterbury Road, while unrestricted parking is provided beyond. The following side streets have been identified to provide additional short-term parking:

North of Canterbury Road:

- Piggott Street
- Lewisham Street
- Dulwich Street
- Constitution Road

South of Canterbury Road:

- *Beach Road*
- *Hercules Street*
- *Kintore Street*
- *Yule Street*
- *Herbert Street (extension of existing 1P parking restriction)*

Extending short-term restrictions further along these side streets would increase the suitable car parking supply for shoppers during these periods (and discourage long-term parking).

Initially, short term parking restrictions (2P) could be introduced for approximately 50m to 70m on one side of the carriageway. In the future, and assuming car parking demands increase, the

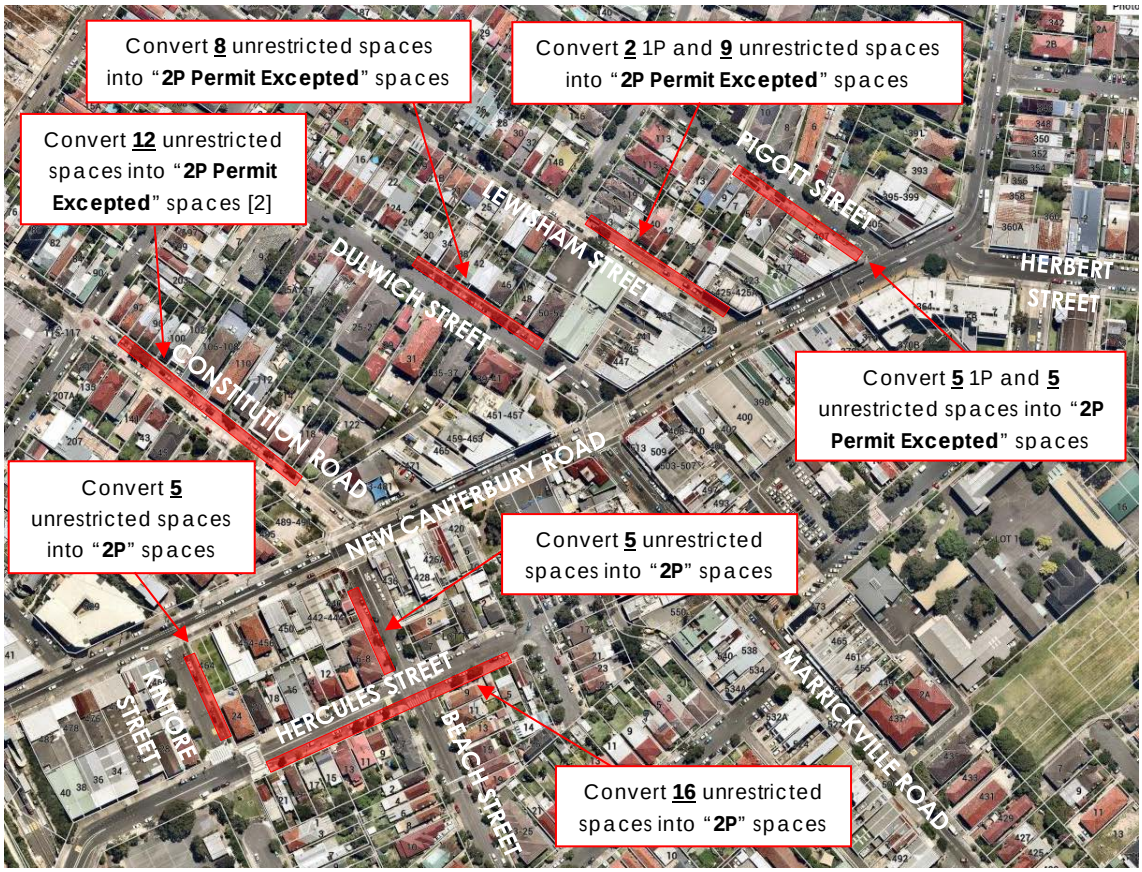
provision of short-term restrictions could be introduced to both sides of the carriageway or provided for a greater distance on one side of the street (refer to medium-term parking options presented later).

Short-term restrictions would affect resident parking and as such, if this strategy were to be adopted on streets with residential frontages, it is recommended that a resident permit scheme also be introduced (i.e. "2P permit excepted" restriction). This would serve to provide a balance between protecting resident parking, and at the same time providing an increase in the amount of short-term customer parking spaces.

As previously outlined, while traditional residential areas are sought to be protected from commercial intrusion, those adjacent to a town centre cannot expect the same level of amenity as those in outer residential areas. The benefits of living close to a town centre such as Dulwich Hill must also be considered in the context of a lower level of parking amenity.

The location and quantum of recommended parking changes in the peripheral streets is illustrated in Figure C.1.

Figure C.1: Recommended Restriction Changes – Town Centre Periphery [1]



[1] Restrictions are also proposed on Yule Street and Herbert Street.
[2] Maintain two 10 minute spaces servicing the Dulwich Hill Preschool.
Basemap source: Nearmap (used under licence)

Restriction Types

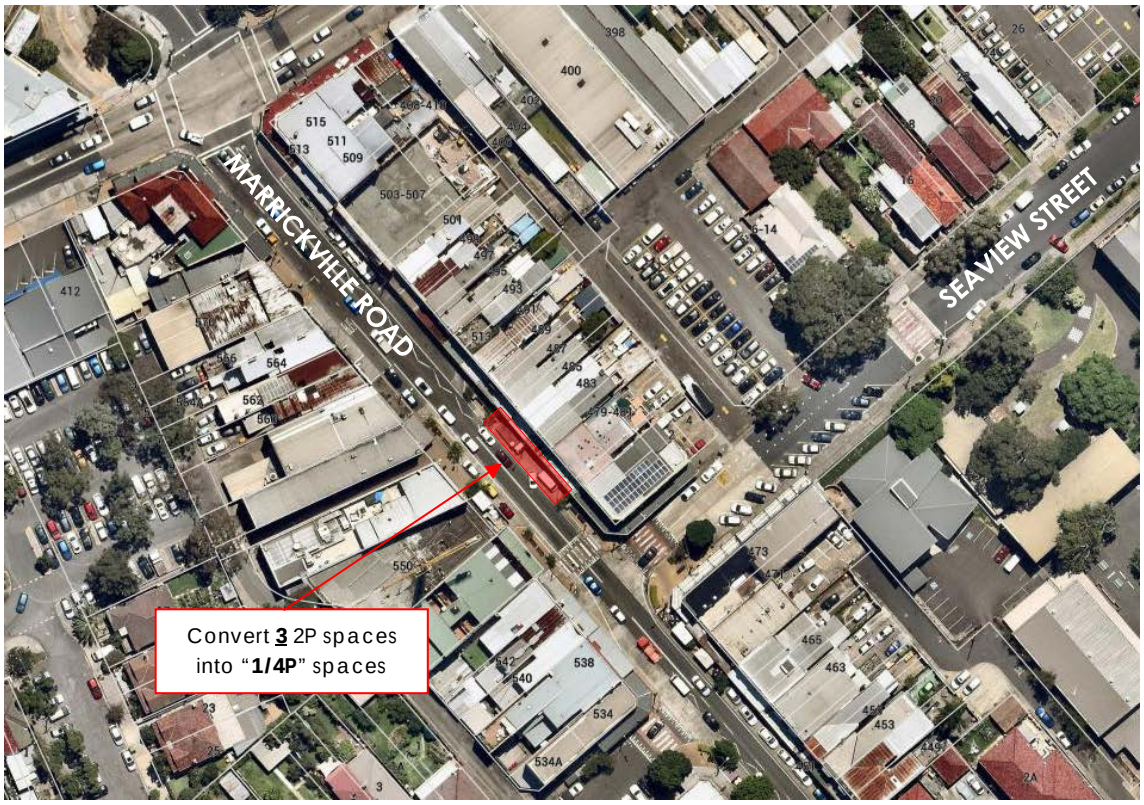
As identified above and within the parking principles, parking time limits are essential to manage parking turnover and generate parking availability in convenient areas for preferred users.

The existing time restrictions within the Dulwich Hill town centre typically cater for longer periods of parking (2P or greater). The only shorter term parking servicing the town centre is the 1P on-street parking provided on Marrickville Road.

In this regard, there is an opportunity to provide 1/4P parking in the town centre to cater for short-stay high turnover parking demands (i.e. to visit the post office, newsagent, dry cleaners, bakery, etc.). The provision of additional short-stay parking in the town centre is consistent with the community feedback.

The bay of three 2P car parking spaces on the east side of Marrickville Road, immediately north of Seaview Street and as shown in Figure C.2, has been identified as being suitable to accommodate the short-term parking.

Figure C.2: Proposed 1/4P Parking Spaces on Marrickville Road



Basemap source: Nearmap (used under licence)

Dulwich Hill Station

The car parking surveys indicate that parking occupancies in the vicinity of the Dulwich Hill Railway Station are relatively high. The pre and post light rail car parking surveys reiterate this and also indicate that demands have increased since the opening of the light rail stop. Car parking demands in this precinct are primarily associated with resident and commuter demands, with some demand generated by the retail uses to the south of the station.

Referencing the hierarchy of users presented earlier in this report, it is recommended that the existing resident permit parking scheme be expanded to protect the parking requirements of existing residents. In order to maintain a level of parking supply for all road users, it is therefore recommended that permit parking be considered in combination with unrestricted parking (i.e. provide differing restrictions on each side of the road) on the following roads:

- Keith Street

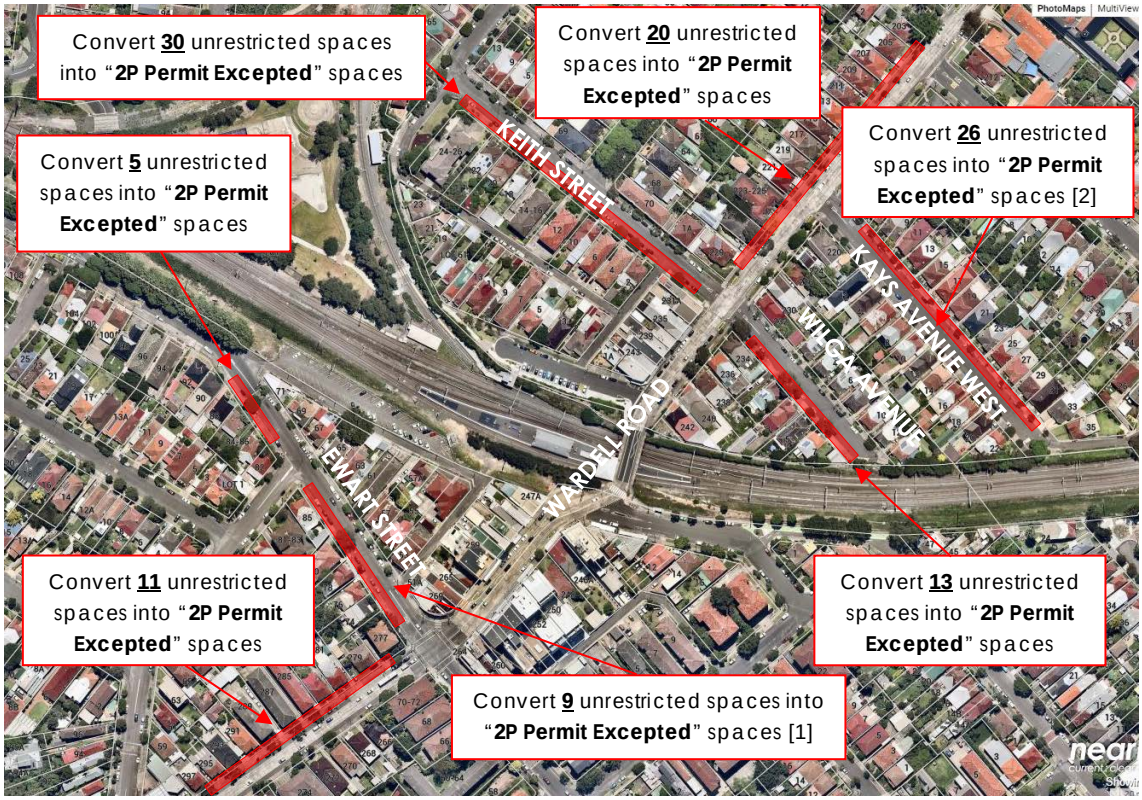
- Wardell Road
- Wilga Avenue
- Kays Avenue West
- Ewart Street

This could operate as an extension of the existing resident permit parking (M13) provided on Bedford Crescent. It is noted that residents of Kays Avenue West have previously expressed a desire to have a resident parking scheme introduced to their street.

Alternatively, should resident permit parking be provided uniformly around the station, it is likely that commuter demands would be shifted to the streets beyond the immediate restrictions (i.e. shifting the problem down the road). By providing a combination of restrictions, the commuter parking load is "shared" amongst a number of streets, whilst maintaining a level of available parking for residents.

The location and quantum of recommended parking changes surrounding Dulwich Hill Station is illustrated in Figure C.3.

Figure C.3: Recommended Restriction Changes – Dulwich Hill Station



[1] Maintain existing disabled car parking space between Wardell Road and Riverside Crescent.
[2] Maintain existing disabled car parking space on the north side of Kays Avenue West.
Basemap source: Nearmap (used under licence)

Residential Areas

There are a number of residential streets within the study area that exhibit higher than normal car parking occupancies. Each of these streets are discussed in further detail below:

Ross Street, Clargo Street, Kroombit Street and Cobar Street

Unrestricted car parking is currently provided on each of these streets. The car parking surveys indicate that car parking demands are at or near capacity at various times throughout the day (including weekdays and Saturday).

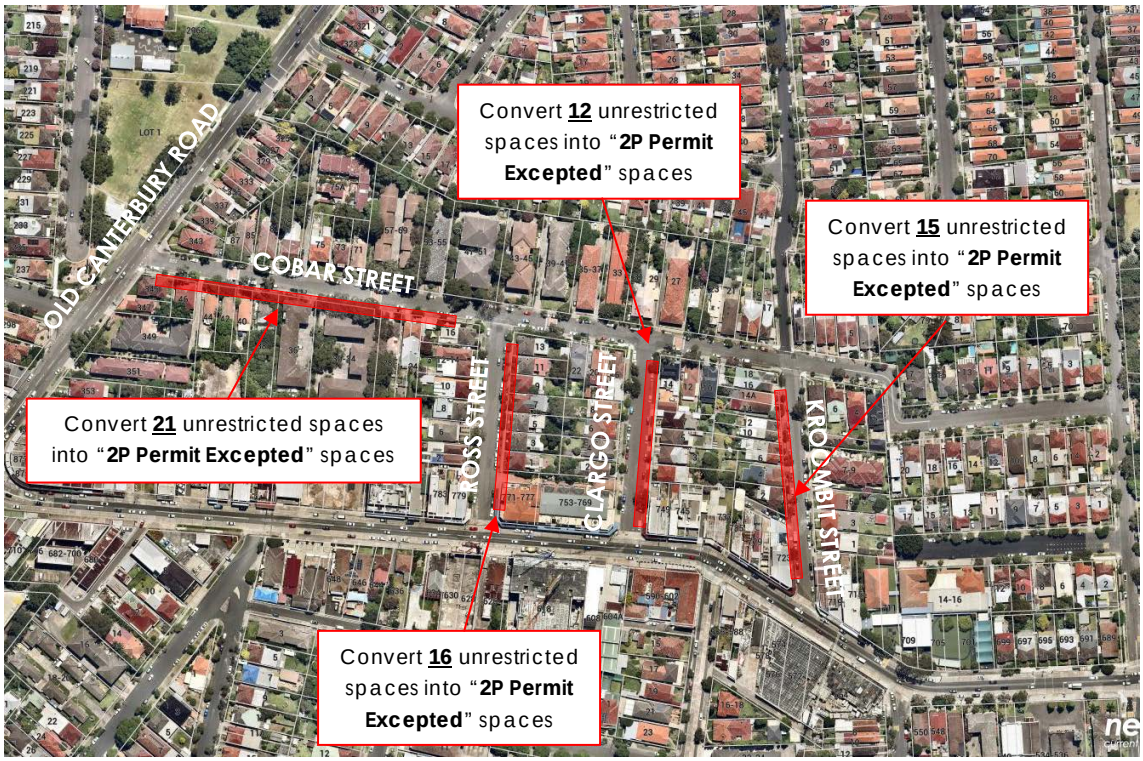
It is understood that the car parking demands are associated with residents of the low density dwellings (many of which are not provided any off-street parking), residents of the medium density dwellings, residential visitors and customers of the commercial properties fronting New Canterbury Road. Referencing the car parking priorities provided in Section 5, it is recommended that car parking for residents of the low density dwellings be protected.

In this regard, it is recommended that resident permit parking be considered for Ross Street, Clargo Street, Kroombit Street and the western end of Cobar Street. Similar to the solution identified for the residential streets surrounding Dulwich Hill Station, the permit parking could be introduced to one side of the road (in conjunction with a 2P restriction), with the opposite side continuing to provide unrestricted parking.

It is understood that residents of these streets have previously requested the introduction of a permit parking scheme.

The location and quantum of recommended parking changes on Ross Street, Clargo Street, Kroombit Street and Cobar Street is illustrated in Figure C.4.

Figure C.4: Recommended Restriction Changes – Ross Street, Clargo Street, Kroombit Street and Cobar Street



Basemap source: Nearmap (used under licence)

The Boulevard

Unrestricted 90 degree parking separated by landscaping is currently provided along the length of The Boulevard. The parking surveys indicate that the existing car parking demands are approaching capacity for the vast majority of the survey period.

It is understood that the car parking demands along The Boulevard are primarily associated with residents of the adjacent medium density dwellings.

Providing some short-term parking on The Boulevard to cater for residential visitor demands could be considered. However, this would likely shift the long-term residential parking demands to the adjacent streets. Given that the parking on The Boulevard does not service the needs of any other users, it is not considered necessary to change the existing arrangements.

Denison Road

Unrestricted car parking is currently provided on Denison Road in the study area. The parking surveys indicate that car parking demands are near capacity on Denison Road between Piggott Street and Eltham Street. Anecdotal evidence from residents (albeit not necessarily reflected in the car parking surveys) suggests that car parking on Denison Road is often at capacity during the day on weekdays.

It is understood that car parking demands are potentially associated with residents of the low density dwellings (some of which are not provided any off-street parking), residents of the medium density dwellings (including those fronting The Boulevard), residential visitors and parking associated with the schools (x2) to the northeast. It is understood that the school has repeatedly been advised to instruct parents not to use Denison Road to pick up and drop off students.

Interestingly, parking demands on this section of Denison Road peaked at 9:00am on the Saturday morning, suggesting that the peak parking demands are not necessarily related to overflow parking from the nearby education facilities.

Therefore, it would appear that the peak car parking demands are primarily generated by the adjacent residents. If this were to be the case the introduction of a permit parking scheme may have little impact in increasing parking availability (noting that it could assist where residents currently have several vehicles parked on-street).

Feedback from the Denison Road Group indicates that they would be supportive of a permit parking scheme on Denison Road. The residential permit parking would be provided in combination with a 2P time restriction, which would continue to allow residential visitor parking to take place. The residential permit restriction in combination with the 2P restriction would prohibit long-stay staff and student demands associated with the schools and resident parking from non-permit holders. The proposed restriction would not restrict parents from picking up and dropping off students on Denison Road. Instead, it is recommended that Council reinforce this to the schools to relay onto parents.

In accordance with Council policy, any resident parking scheme would need to be supported by 50% or more of affected residents prior to implementation.

The location and quantum of recommended parking changes on Denison Road is illustrated in Figure C.5.

Figure C.5: Recommended Restriction Changes – Denison Road

Basemap source: Nearmap (used under licence)

Union Street

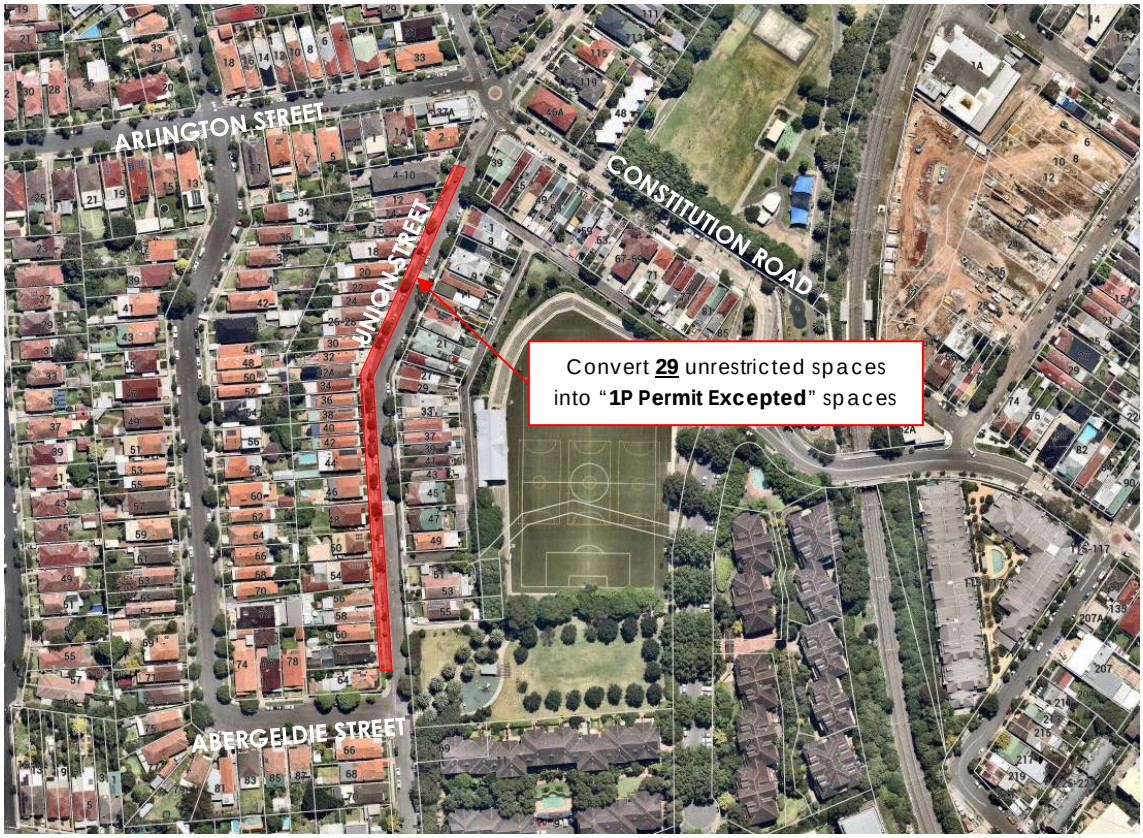
Unrestricted car parking is currently provided on Union Street between Abergeldie Street and Arlington Street. The parking surveys indicate that car parking demands are nearing capacity particularly on weekday evenings.

It is understood that the car parking demands along Union Street are primarily associated with residents of the adjacent low density dwellings. The majority of properties on the western side of Union Street are not provided any off-street parking and as such, it is anticipated that the majority of on-street parking is associated with these residents (this is evidenced by the peak occurring at 7pm on weekdays). Car parking demands on Union Street are also exacerbated during sporting events at Arlington Reserve.

In this regard, it is recommended that a permit parking scheme be considered for the west side of Union Street between Abergeldie Street and Arlington Street. The permit parking could be provided in conjunction with a 1P parking restriction, which should also deter parking demands associated with Arlington Reserve.

The location and quantum of recommended parking changes on Union Street is illustrated in Figure C.6.

Figure C.6: Recommended Restriction Changes – Union Street



Basemap source: Nearmap (used under licence)

Myra Road

Unrestricted car parking is currently provided along the length of Myra Road. The parking surveys indicate that the existing car parking demands are at or near capacity during the day on weekdays and Saturday.

It is understood that the car parking demands along Myra Road are primarily associated with residents of the adjacent medium density dwellings. The parking demands also extend into Garnett Lane.

Providing some short-term parking on Myra Road to cater for residential visitor demands could be considered. However, this would likely shift the long-term residential parking demands to the adjacent streets. Given that the parking on Myra Road does not service the needs of any other users, it is not considered necessary to change the existing arrangements. The situation should continue to be monitored to ensure that car parking demands from the medium density dwellings do not penetrate into the surrounding streets.

Medium Term Recommendations (0 to 5 years)

Town Centre

As detailed above, should car parking demands surrounding the town centre continue to grow, it is recommended that the proposed resident permit scheme be expanded. Typically, it is suggested that the scheme be extended on each of the roads specified previously and introduced to Durham Street and Marrickville Road. A summary of the streets and number of spaces that could be considered for additional residential permit schemes ("2P Permit Excepted") in the future are summarised in Table C.1.

Table C.1: Additional Restriction Changes – Town Centre Periphery

Location	Between	No. of Spaces
Piggot Street (south)	East of Denison Road	47
Lewisham Street (north)	The Boulevard to Denison Road	24
Dulwich Street (north)	East of Denison Road	18
Yule Street (south)	West of Fairfowl Street	35
Herbert Street (north)	West of Fairfowl Street	33
Marrickville Road (east)	Wardell Road to Fairfowl Street	21
Durham Street (south)	Beach Road to Durham Lane	18
Beach Road (west)	Hercules Street to Macarthur Parade	32
Total		**228**

Table 6.4 indicates that an additional 228 spaces surrounding the town centre could be considered in the future for additional parking control.

Light Rail Stations

There are four light rail stops in the study area. With the exception of Dulwich Hill Station, the existing car parking occupancies surveyed by GTA indicate that car parking demands in the vicinity of each of the stops are moderate.

Reference to the Parsons Brinckerhoff pre and post light rail surveys indicates that daytime (commuter) occupancies have remained relatively unchanged at the Waratah Mills and Dulwich Grove stops, and increased at the Arlington and Dulwich Hill stops. It is, however, noted that the parking occupancies at each of the stops is still greatest during either the early morning (before 7am) or later in the evening (after 7pm) when resident demands dominate rather than commuter demands.

At this stage it is not considered necessary to implement any parking controls to deter commuter parking at the Waratah Mills, Arlington and Dulwich Grove light rail stops. It is however noted that significant land use intensification is forecast at the Dulwich Hill and Arlington light rail stops which is predicted to increase car parking demands at these locations. Specific car parking restrictions for these locations have been identified elsewhere in this study.

Notwithstanding the above, the car parking situation around each of the light rail stops should continue to be monitored to determine whether car parking demands increase as light rail patronage increases (and in-turn commuter car parking demands).

Future Development

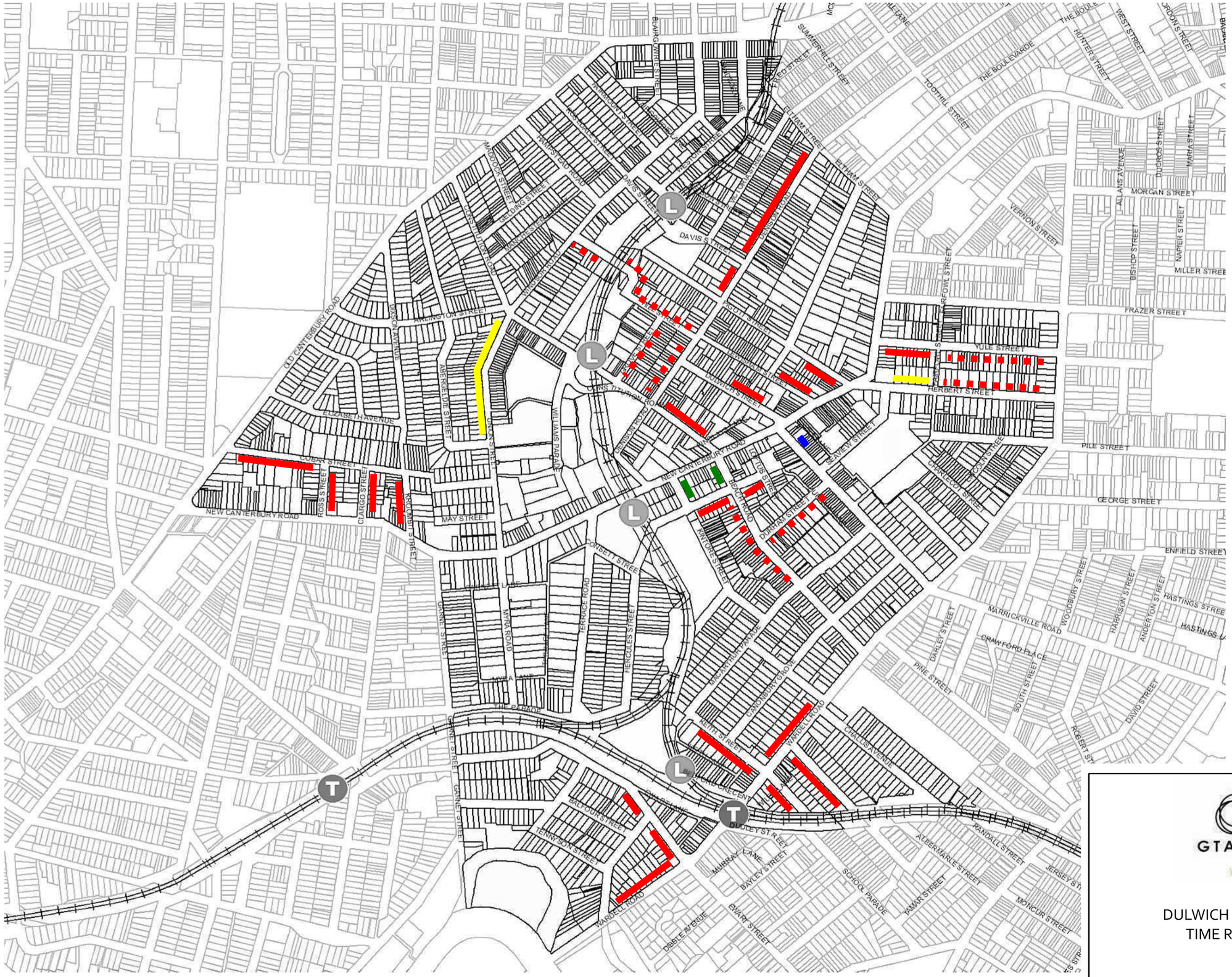
Significant land use intensification is forecast in the vicinity of the Arlington stop, which will likely increase car parking demands on the surrounding road network. In this regard, it is noted that a number of residential properties on Grove Street (and surrounding roads) do not have off-street

parking and are required to park on-street. As such, the introduction of a resident permit parking scheme is considered an appropriate parking control mechanism. It is noted that residents of Grove Street have previously expressed a desire to have a resident parking scheme introduced to their street particularly once the adjacent development is occupied.

The location and quantum of recommended parking changes on Terry Road, Grove Street, Hill Street and Denison Road is illustrated in Figure C.7.

Figure C.7: Recommended Restriction Changes – Grove Street, Hill Street, Terry Road & Denison Road

Basemap source: Nearmap (used under licence)



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