Riverside Parking Management Plan

Client // Marrickville Council

Office // NSW

Reference // 15S1012000

Date // 03/05/16

Riverside

Parking Management Plan

Issue: A 03/05/16

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Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
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Executive Summary

Marrickville Council commissioned GTA Consultants to prepare a Parking Management Plan for the Riverside Precinct, which forms the southwest portion of Marrickville LGA. The Riverside Precinct 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. The on-street parking survey results indicate that in the vicinity of Dulwich Hill Station 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 which indicated that approximately half of respondents were "often" required to circle the area to find a space and 35% "sometimes" required to, with only 15% rarely needing to.

Of the approximately 2,100 car parking spaces, 19 are time restricted (1%) and 14 assigned for disabled parking (1%), with the remaining spaces unrestricted (98%). The car parking surveys and observations indicate that a portion of parking demands surrounding Dulwich Hill Station 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 the consultation process identified that 70% of respondents were supportive of the introduction of time restricted parking in combination with a resident permit scheme.

A number of future time restrictions have been identified for the study area and are reproduced in Table E1. The locations identified for future time restrictions have been determined based on community feedback and the car parking occupancy surveys.

Table E1: Overview of Parking Restriction Changes

Location	Parking Restriction			
	1P	2P (Permit Excepted)	2P	Unrestricted
Dudley Street (south)	+5	-	-	-5
Bayley Street (west)	-	+12	-	-12
Ewart Street (north)	-	+24	-	-24
Dibble Avenue (west)	-	+22	-	-22
School Parade (north)	-	+28	-	-28
Hill Street (south)	-	+37	-	-37
Wallace Street (south)	-	+17	-	-17
Harnett Avenue (north)	-	+37	-	-37
Beauchamp Street (south) [1]	-	-	+7	-7
Livingstone Road (west)	-	-	+5	-5
Total	**5**	**177**	**12**	**-194**

[1] Car parking spaces on the Marrickville West Public School frontage.

Table E1 indicates that it is recommended to convert 194 existing unrestricted spaces to time restricted spaces. The proposed changes would increase the proportion of time restricted spaces within the Riverside precinct from 1% to 10%.

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

The opportunity for conversion of parallel spaces to angled parking spaces on a number of roads was identified through the consultation process. However, it was deemed inappropriate to introduce angled parking to the identified streets for (a combination of) the following reasons:

- The streets earmarked for angled parking were typically less than the 12.8m minimum width required to adequately provide for one side of angled parking and for one side of parallel parking.
- A number of the earmarked streets accommodated bus movements where it was considered inappropriate to narrow the carriageway.
- The existing parking demands/ occupancies could be managed with time restrictions rather than creating additional supply.

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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Legend

- 2P
- 2P Permit Excepted
- 1P

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15S1012000
RIVERSIDE PARKING STRATEGY
TIME RESTRICTION PARKING
03 MAY 2016

15S1012000-RP-02P2

Table of Contents

Appendices

Figures

Tables

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 for Riverside has been previously prepared.

GTA Consultants was commissioned by Marrickville Council in October 2014 to prepare a Parking Management Plan for Riverside.

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 Existing Conditions report sets out an assessment of the existing transport conditions for Riverside and determines the future car parking requirements.

This report includes the following:

- 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 parking condition in the study area
- Estimation of future car parking demand based on anticipated land use growth areas.

This existing conditions report will inform the development of the Riverside Precinct Parking Management Plan.

1.4 Reference Documents

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

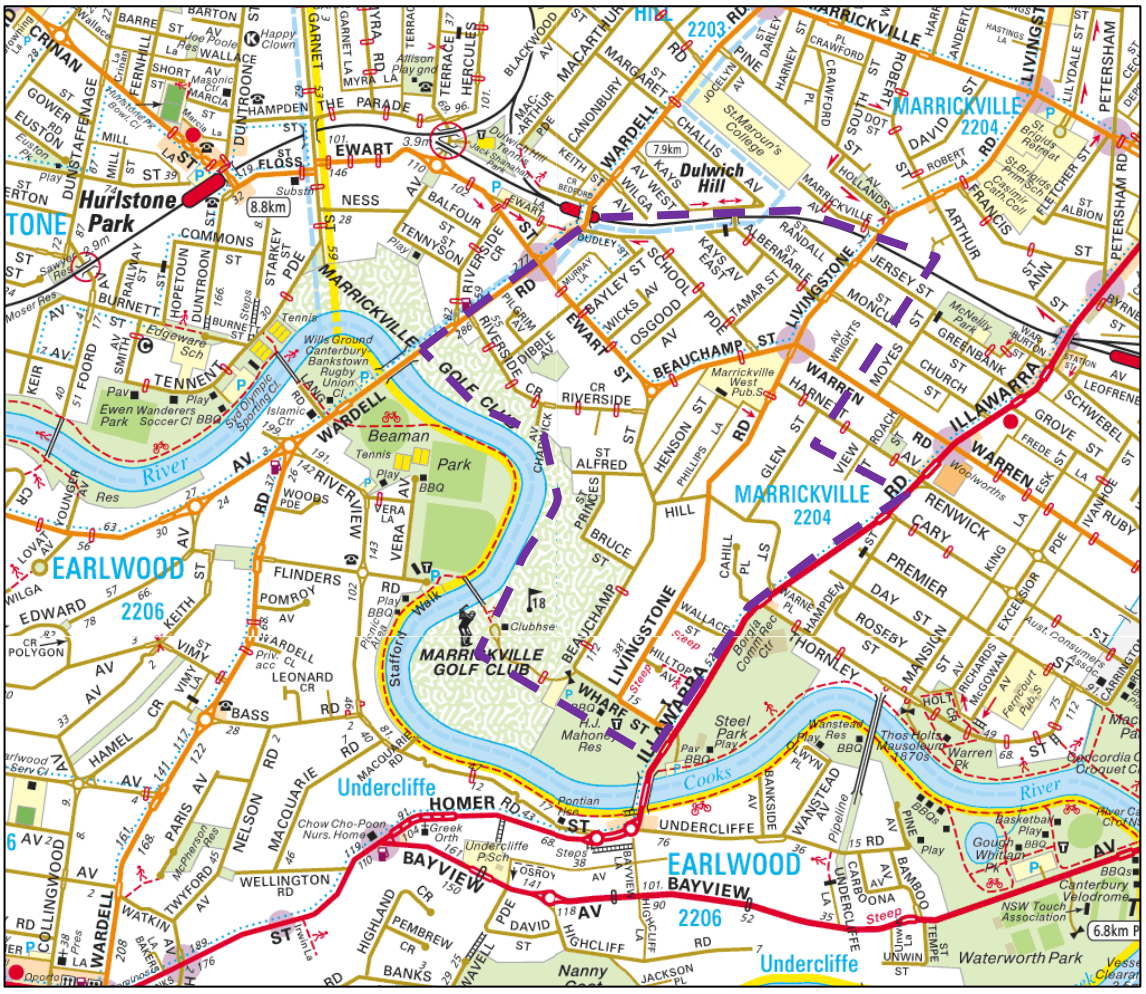
- A number of inspections of the study area
- Marrickville LEP 2011 (15 August 2014)
- Marrickville DCP 2011 2.10 Generic Provisions – Parking
- Roads and Maritime Services, Guide to Traffic Generating Developments 2002 and relevant Technical Directions.
- Australian Bureau of Statistics, Census 2011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

2. Existing Conditions

2.1 Study Area

Riverside, the south-west portion of the suburb of Marrickville, is located approximately seven kilometres south-west of the Sydney Central Business District. The study area is primarily bound by the Bankstown railway line and Wardell Road to the north, Illawarra Road to the east and Cooks River to the south and west. The extent of Riverside is shown in Figure 2.1.

Figure 2.1: Riverside

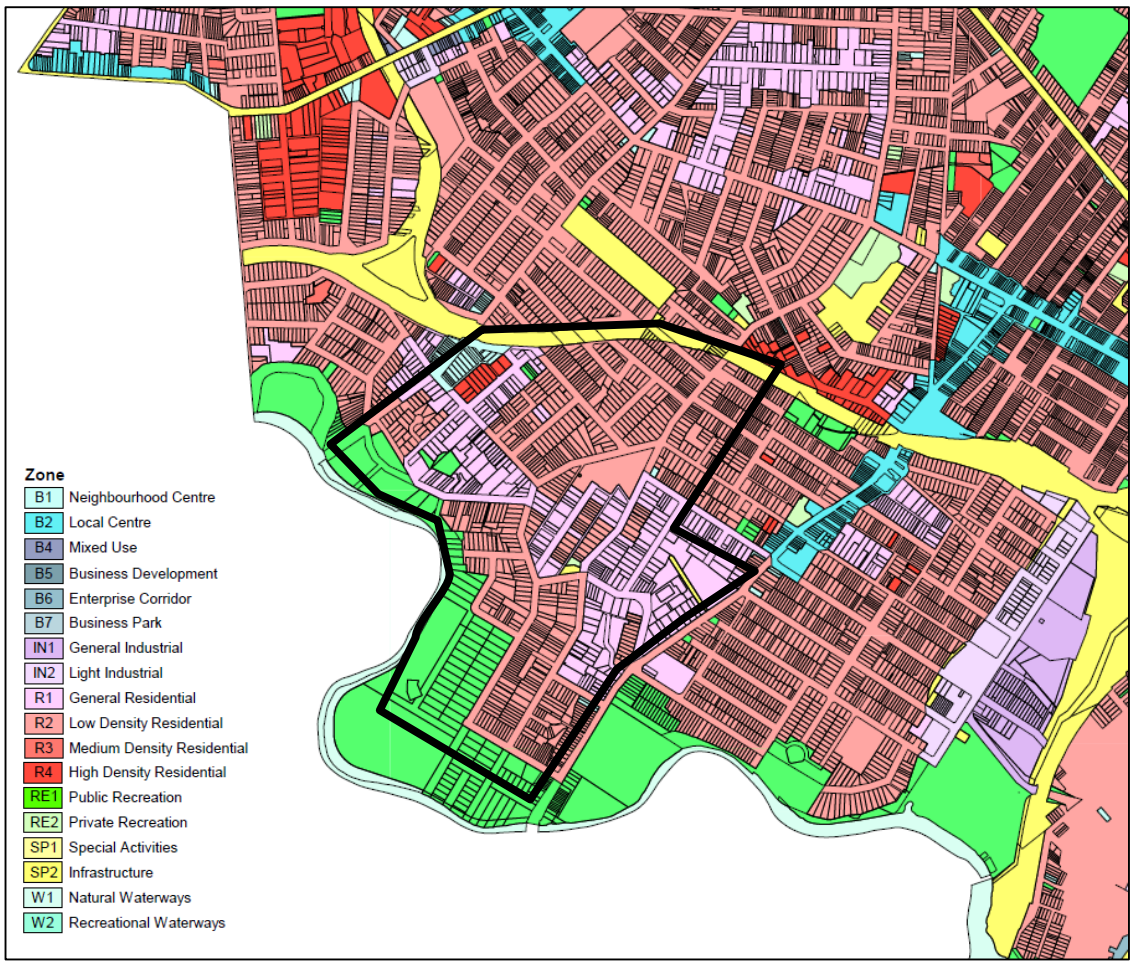


Basemap source: Sydways 2010

2.2 Existing Land Uses

Riverside predominantly comprises residential land uses with commercial land uses located on Wardell Road in the vicinity of Dulwich Hill Railway Station as illustrated in Figure 2.2. Marrickville West Public School is located centrally in the study area. Public recreation area (open space) is provided along the south and west of the study area generally along the banks of the Cooks River. Marrickville Golf Course is located in the southwest corner of the study area.

Figure 2.2: Existing Land Uses



2.3 Demographic and Travel Demand

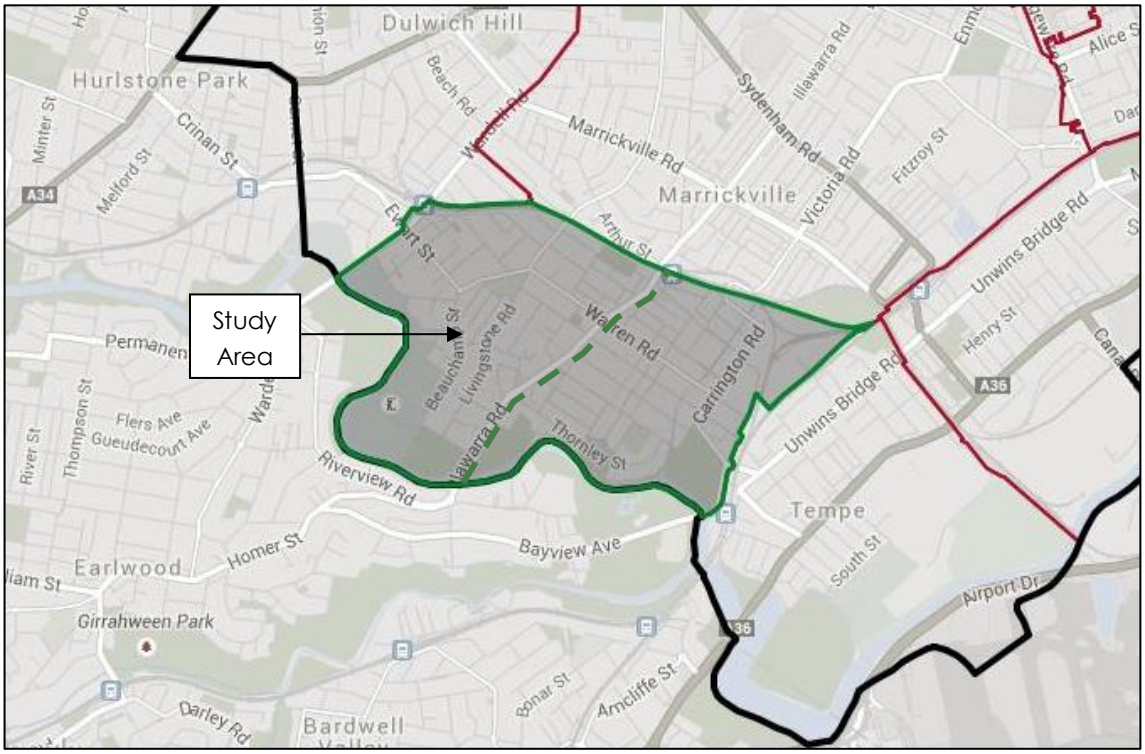
The 2011 Census by the Australian Bureau of Statistics (ABS) was reviewed in this section to understand the demographic and travel demand characteristic of Riverside. The analysis was undertaken for the Marrickville South District that includes Riverside and is expected to reflect the general characteristics of the area. The area was compared with the Southern Sydney Regional Organisation of Councils (SSROC) region[1] to appreciate how the characteristics of Dulwich Hill compares with the surrounding region.

2.3.1 Population

Marrickville South District has a population of approximately 9,600 people. It spans across 216 hectares, resulting in a population density of approximately 44 people per hectare. The Marrickville South District 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.

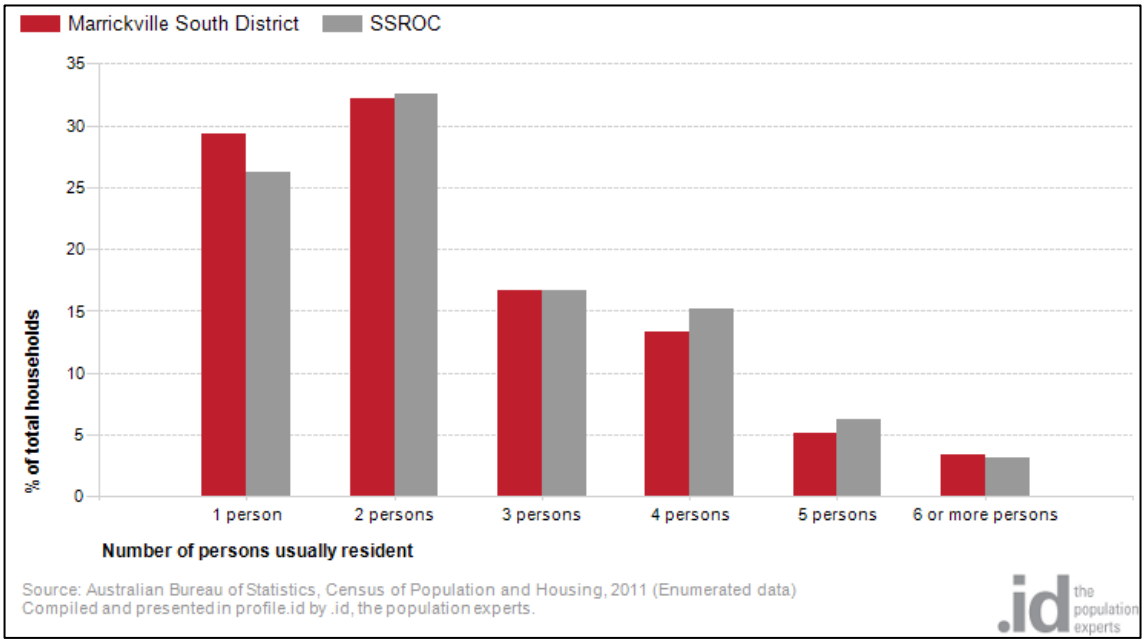
Figure 2.3: Marrickville South District Boundary in the 2011 Census by the ABS



Source: http://profile.id.com.au/

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

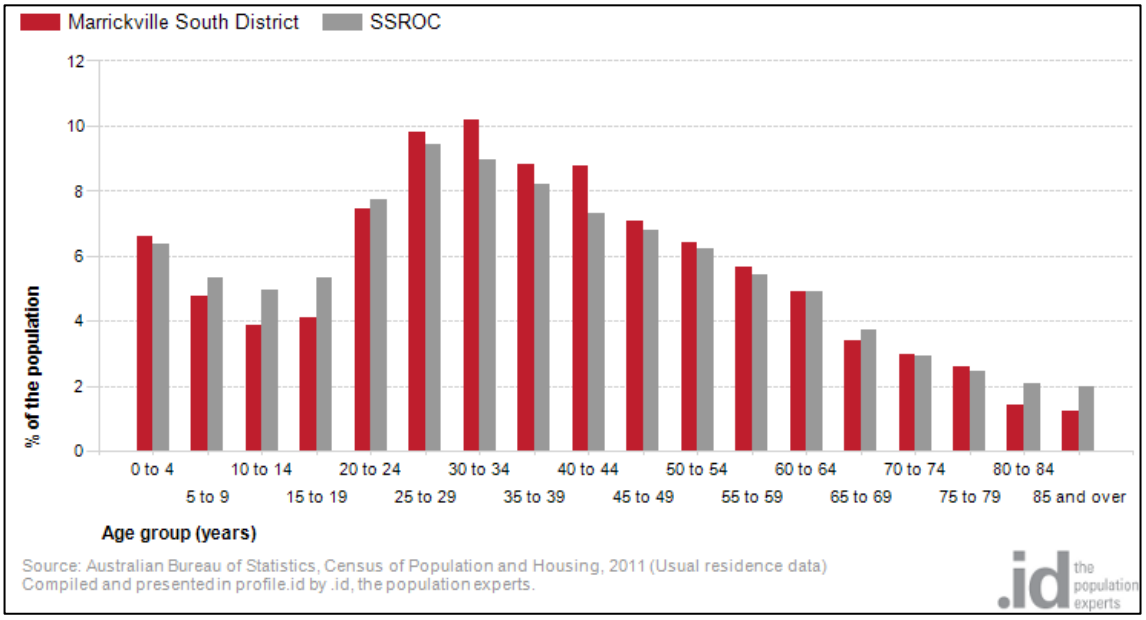
Figure 2.4: Household Size of the Marrickville South District and SSROC Region, Census 2011



Source: http://profile.id.com.au/

Figure 2.5 illustrates the age profile of the population in the Marrickville South District, compared with that of the SSROC region, based on the 2011 Census. It is noted that the Marrickville South District has a significantly higher proportion of population in the 0 to 4 and 25 to 60 age brackets.

Figure 2.5: Age Profile of the Marrickville South District and SSROC Region, Census 2011



Source: http://profile.id.com.au/

The household size and age profile review indicates that the Marrickville South District comprises of a higher proportion of couples and families with one child aged below five years.

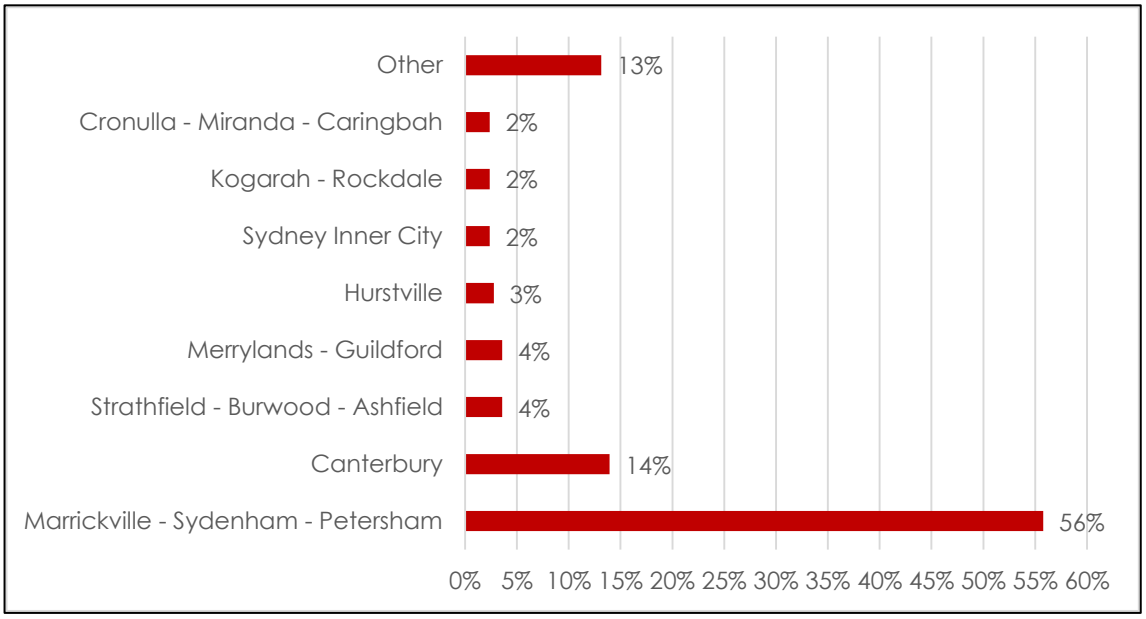
2.3.2 Employment

The 2011 Census indicates that a total of 251 workers were employed in the Riverside area[2]. Of these, 140, or 58.8% live within Marrickville, Sydenham and Petersham. The remainder living outside these areas predominantly live in nearby Council areas such as Canterbury (13.9%).

Figure 2.6 illustrates that Dulwich Hill works predominantly live in the region that is travel short distances to work.

[2] Travel Zones: 308 and 311.

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 the Marrickville South District gathered from the 2011 Census indicates that 69.3% of households own at least one car, compared with 21.5% that do not own a car (9.2% no response stated).

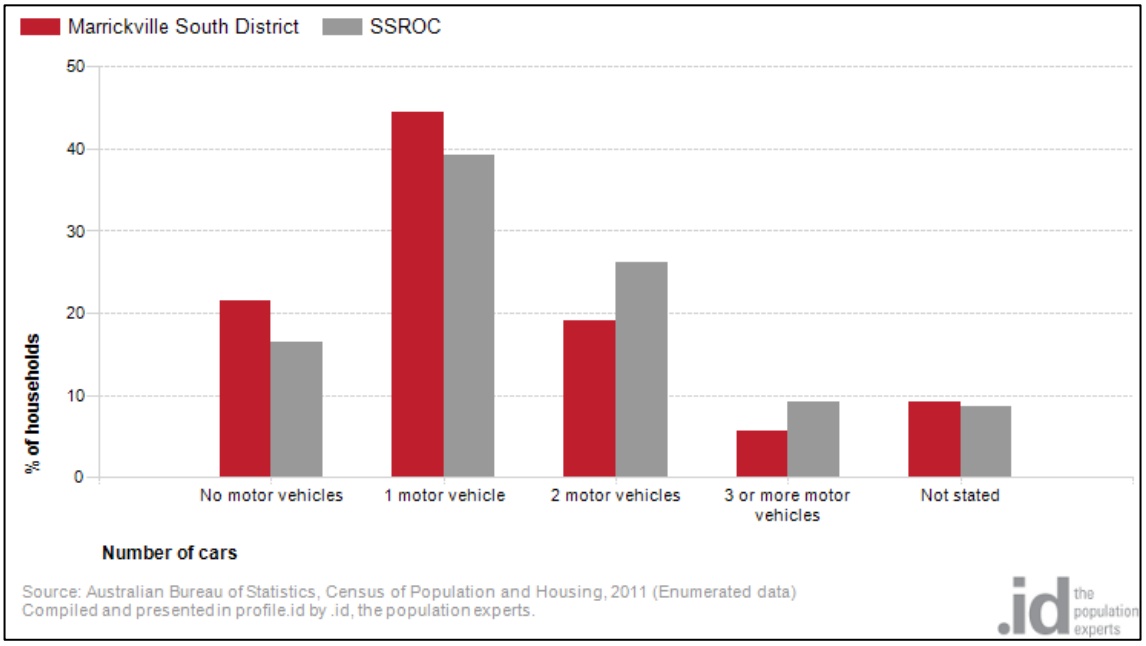
Of the total households, 44.4% own one car, 19.2% own two cars, and 5.7% own 3 or more cars, as presented in Figure 2.7. These statistics could be related to the structure of household sizes in the Marrickville South District.

The overall average car ownership for the Marrickville South District and the SSROC is provided below:

- Marrickville South District: 1.10 vehicles per dwelling
- SSROC: 1.31 vehicles per dwelling

Figure 2.7 illustrates the existing car ownership levels for residents of the Marrickville South District and SSROC. The data indicates that residents in the study area are more likely not to own a car or only own one car than residents in the SSROC.

Figure 2.7: Car Ownership in the Marrickville South District and SSROC Region, Census 2011



Source: http://profile.id.com.au/

The data for Marrickville (suburb) [3] 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 Marrickville (sample size = 3,756 dwellings) are provided below:

- Studio apartment: 1.0 spaces per dwelling (small sample size)
- 1-bedroom apartment: 0.68 spaces per dwelling
- 2-bedroom apartment: 0.92 spaces per dwelling
- 3-bedroom apartment: 1.2 spaces per dwelling.

The rates indicate that in medium and high density residential dwellings, residents require at least 1 car space, although the small sample size for studio apartments is skewing the results for such dwellings.

2.3.4 Journey to Work

Journey-to-Work data[4] for the Marrickville South District gathered from the 2011 Census and presented in Table 2.1 indicates that 41.7% of commuter trips from the Marrickville South District are by private vehicles, either as a driver or passenger, and 32.0% are by train. In comparison to 2006 Census, private vehicle commuter trips reduced by 4.7% and train commuter trips increased by 5.3%. Commuter trips by bus reduced by 0.3% in the period to 4.8%.

There was an increase of 1.1% between 2006 and 2011 for commuter trips by cycling to 2.7%, which represents a 169% increase over 5 years. Commuter trips by walking reduced by 0.4% in the same period (noting potential anomalies and influences associated with a single sample day for each year, including weather conditions).

[3] Specific data for Riverside or Marrickville South District data is not available.

[4] 4,615 and 4,301 persons employed in the Marrickville South District in 2011 and 2006 respectively.

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 the Marrickville South District and the Inner West region.

Table 2.1: Journey to Work Mode Share from the Marrickville South District

Main method of travel	Marrickville South District 2011	Marrickville South District 2006	SSROC Region 2011	SSROC Region 2006
Car - as driver	38.5	42.7	46.5	47.4
Train	32.0	26.7	17.0	14.9
Did not go to work	8.6	8.7	8.2	9.1
Bus	4.8	5.1	7.7	7.6
Worked at home	3.6	3.1	3.7	3.5
Car - as passenger	3.2	3.7	3.9	4.7
Walked only	3.2	3.6	6.7	6.5
Bicycle	2.7	1.6	1.3	0.9
Not stated	1.3	2.7	1.4	1.8
Motorbike	0.8	0.8	0.8	0.5
Other	0.5	0.3	1.0	1.0
Truck	0.4	0.3	0.8	1.0
Taxi	0.4	0.5	0.5	0.6
Tram or Ferry	0.0	0.0	0.4	0.4

Source: http://profile.id.com.au/

Table 2.1 indicates that private vehicle travel from the Marrickville South District is lower when compared to the SSROC region as a whole. The use of train travel for work trips also has a much higher share for the Marrickville South District as compared with the SSROC regional average. Bicycle trips in the Marrickville South District are double the SSROC average, whilst walking trips are less than half the SSROC average.

The results would imply that Marrickville South District residents have a broad range of alternative transport options available to them compared to the average resident within the SSROC region.

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.

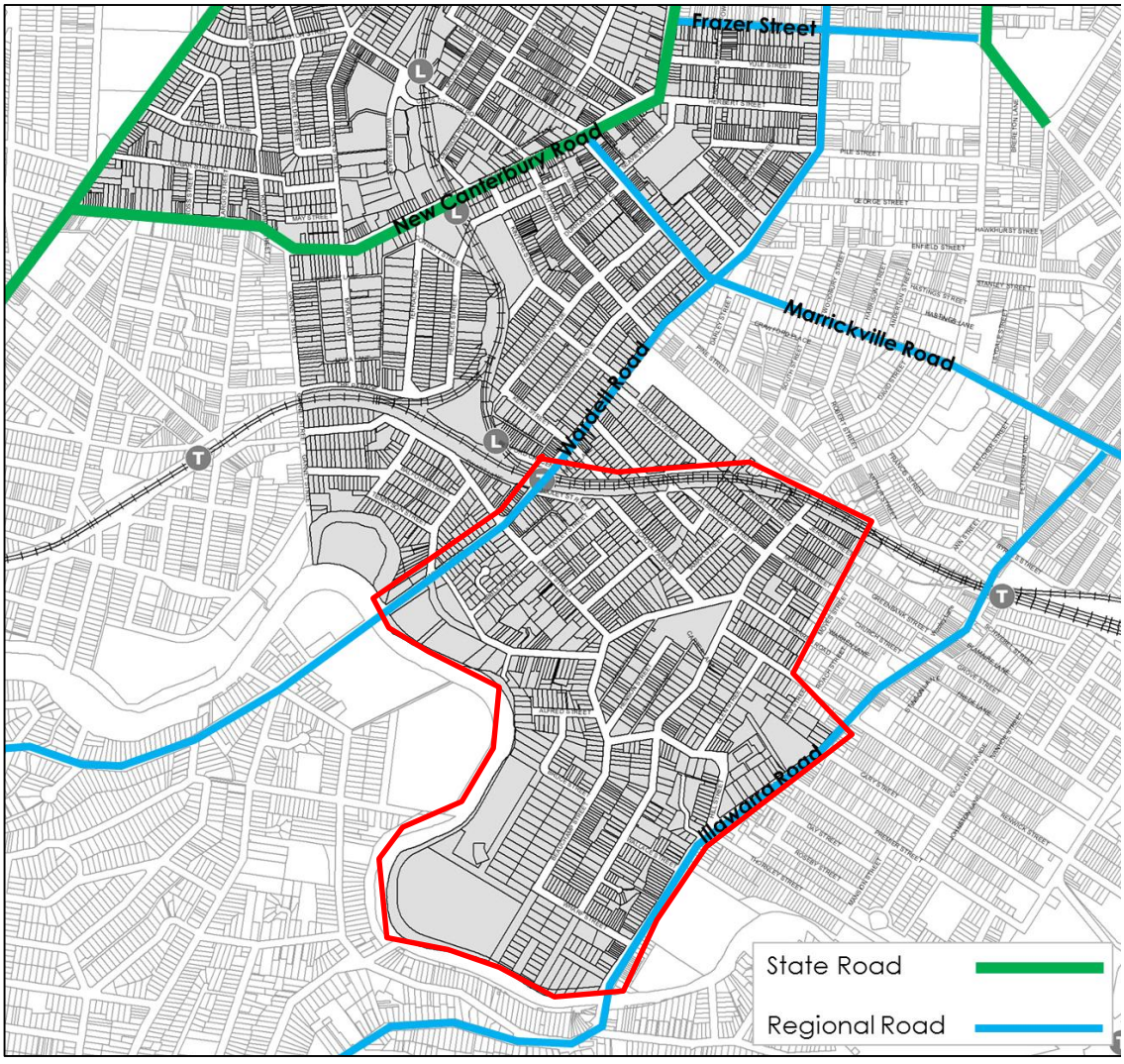
The following roads in the e study area, also shown in Figure 2.8, are Roads and Maritime funded Council roads:

Regional Roads

- Illawarra Road (Road No. 2021)
- Wardell Road (7053).

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 accessway, local street and local collector. The majority of the remaining roads are classified as local streets. 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 undertaken 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

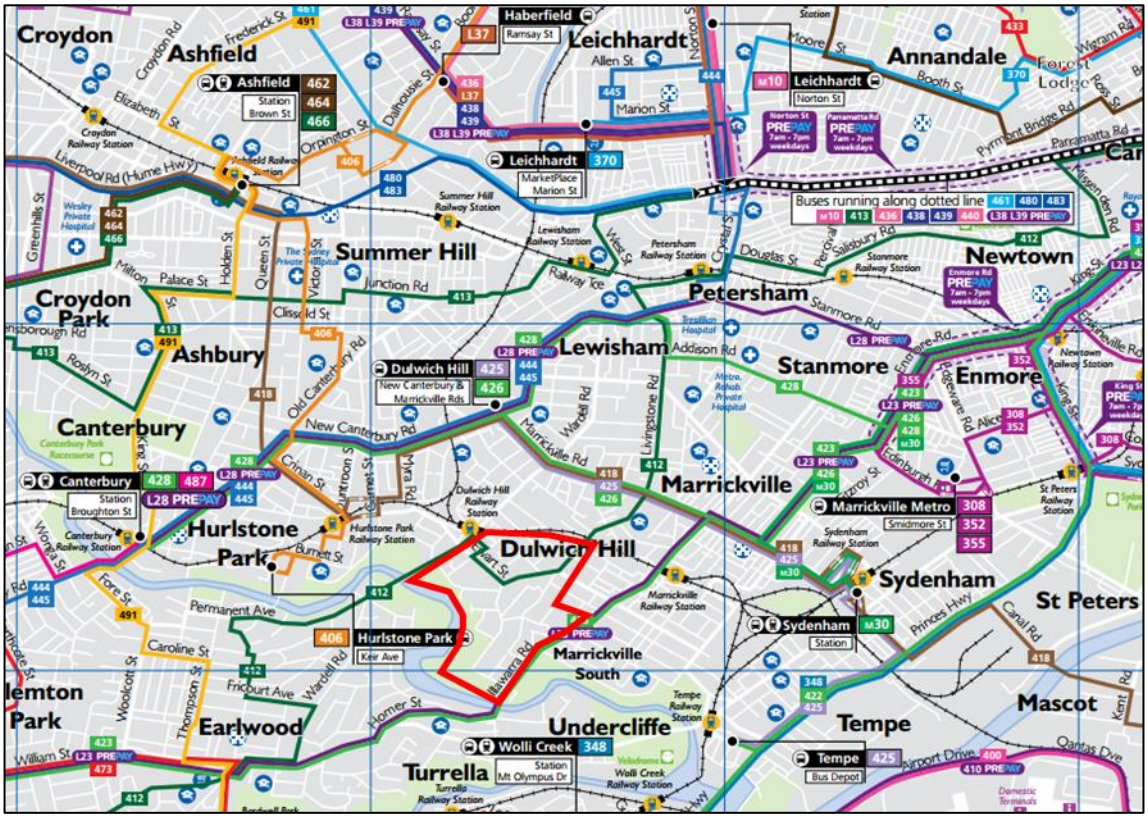
Service	Service Frequency per Hour		
	AM Peak Hour	Off-Peak	PM Peak Hour
Liverpool or Lidcombe to City Circle	5 (7:00am – 8:00am)	4	4 [1]
City Circle to Liverpool or Lidcombe	4 [1]	4	5 (6:00pm – 7:00pm)

[1] No defined peak hour

2.5.2 Buses

An overview of the bus network is presented in Figure 2.9.

Figure 2.9: Sydney Bus Network



Basemap source: Sydney Buses (February 2014)

Figure 2.9 indicates that Riverside is serviced by three bus routes operated by Sydney Buses. A description of these bus routes summarised in Table 2.3.

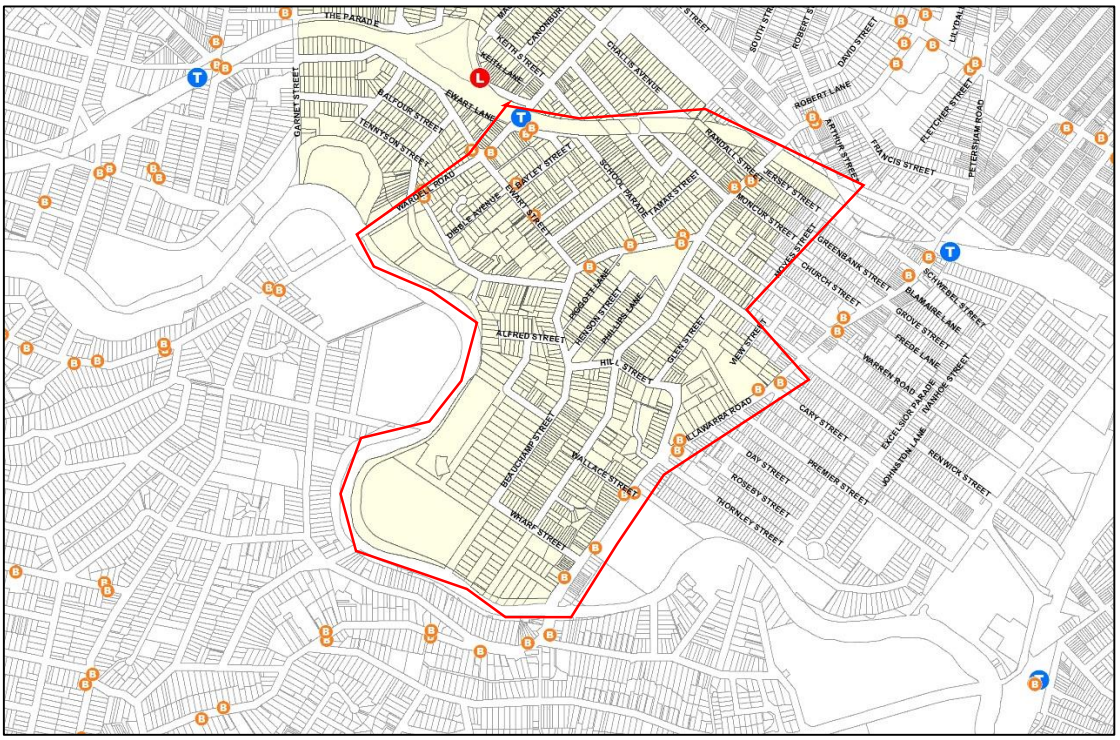
Table 2.3: Bus Route Descriptions

Route #	Route Description
412	Campsie Station – City via Earlwood
423	Kingsgrove – City via Earlwood
L23	Kingsgrove – City via Earlwood (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. Bus stops are primarily located along Wardell Road, Livingstone Road and Illawarra 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. The light rail terminus at Dulwich Hill is located to the north of the study area, within 100 metres of Dulwich Hill Railway Station.

Figure 2.11: Sydney Light Rail Network

Source: Transport for NSW

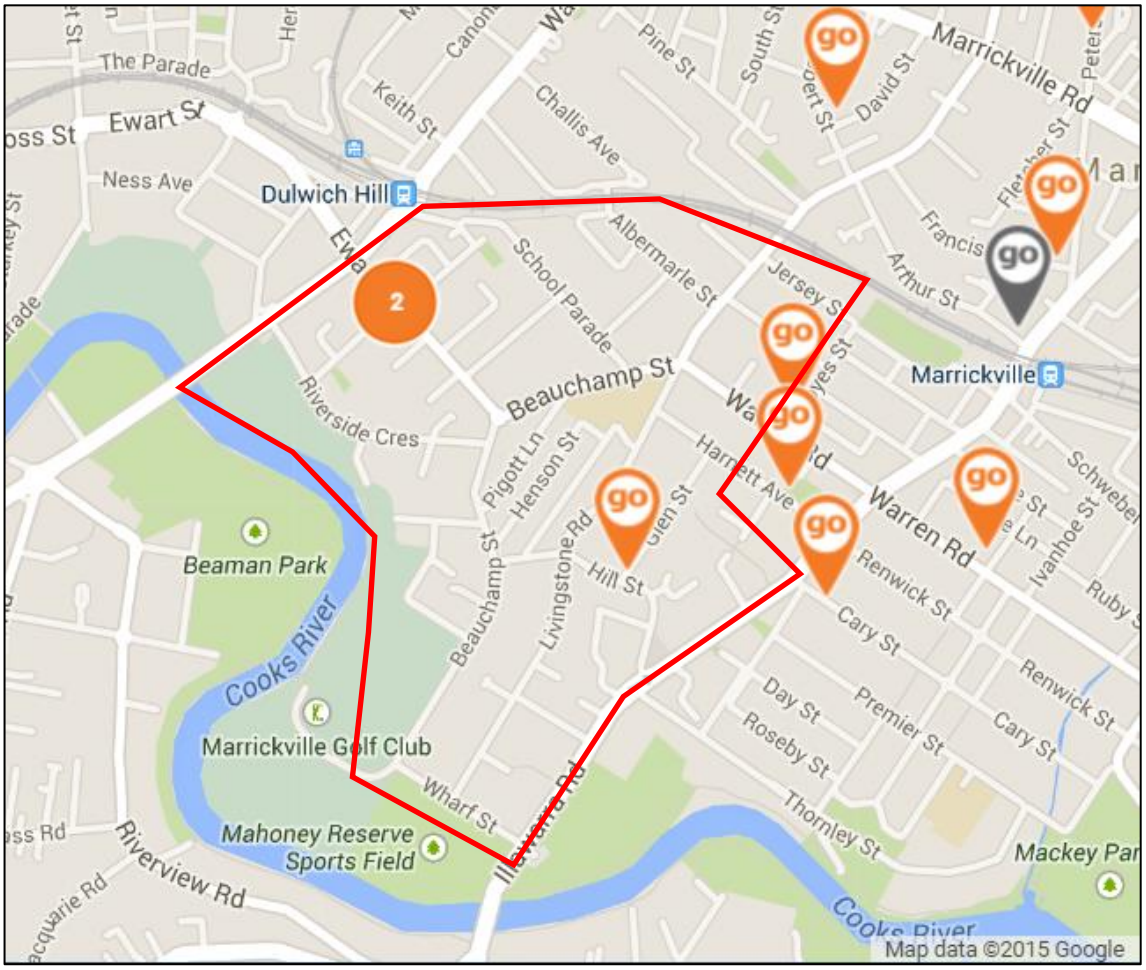
2.6 Local Car Sharing Initiatives

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.

Riverside 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 27/01/15 (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)

3. Parking Assessment

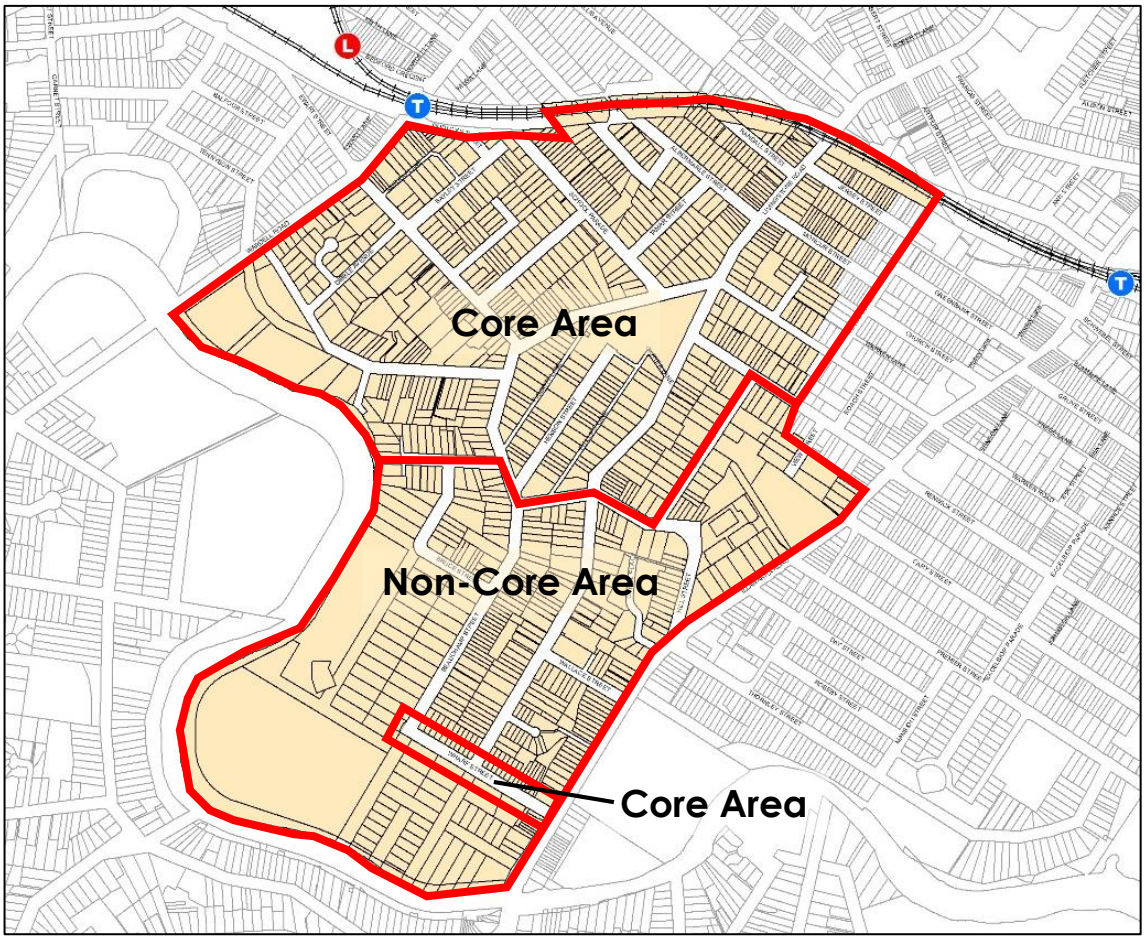
3.1 Overview

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.

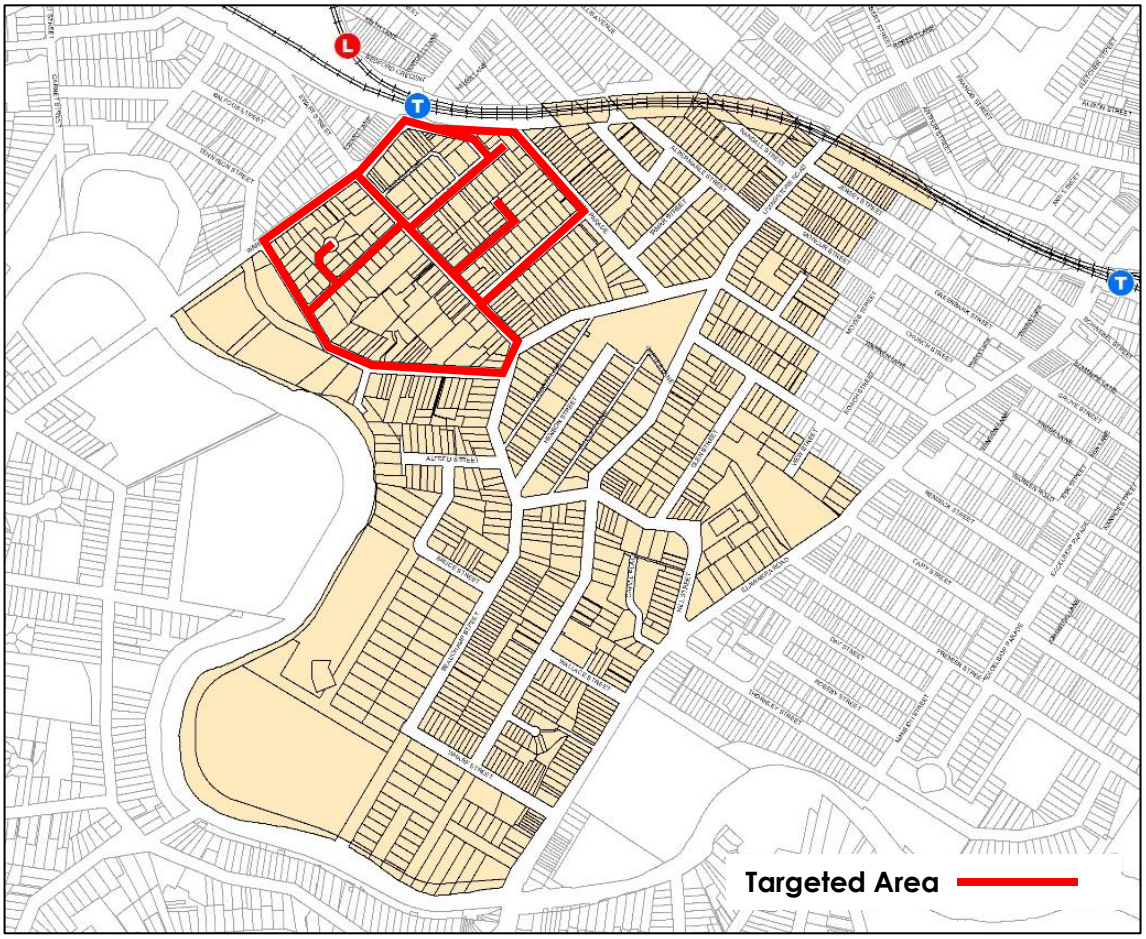
For the Saturday and Tuesday surveys, a non-core area, shown in Figure 3.1 was identified that contains unrestricted car parking spaces (with some accessible parking spaces also provided) and is majority residential in nature. Car parking occupancy for the non-core area was only collected at 8:00am, midday and 8:00pm, rather than hourly. No duration of stay data was recorded for the non-core area.

Figure 3.1: Core & Non-Core Areas



The Thursday survey was primarily focussed on the targeted areas shown in Figure 3.2 that includes car parking in the vicinity of Dulwich Hill Railway Station. The survey was undertaken to provide a second set of data around the key uses and understand whether the retail uses influence the car parking conditions on a Thursday.

Figure 3.2: Targeted Area



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

3.2 Supply

A total of 2,071 on-street car parking spaces are provided within the study area. There are no publicly accessible off-street car parking spaces in the study area. The non-core area contains 499 on-street spaces.

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

Table 3.1: Summary of Car Parking Types (Weekday)

Car parking Type	Parking Supply (proportion of spaces)
Unrestricted [1]	2,038 (98%)
Time-Restricted [1]	19 (1%)
Accessible Parking	14 (1%)
Total	**2,071 spaces**

[1] Includes spaces subject to peak period clearway and/ or bus zone restrictions.

Table 3.1 indicates that the majority of car parking in the study area is unrestricted. This is reflective of the low density residential uses that dominate the study area.

The time-restricted car parking are located in the vicinity of Dulwich Hill Railway Station and the retail strip on Illawarra Road. A breakdown by restriction 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 (proportion of spaces)
¼ P	4
½ P	2
1 P	13
Total	**19 spaces**

There is currently no residents parking permit scheme in the study area.

3.3 Survey Results

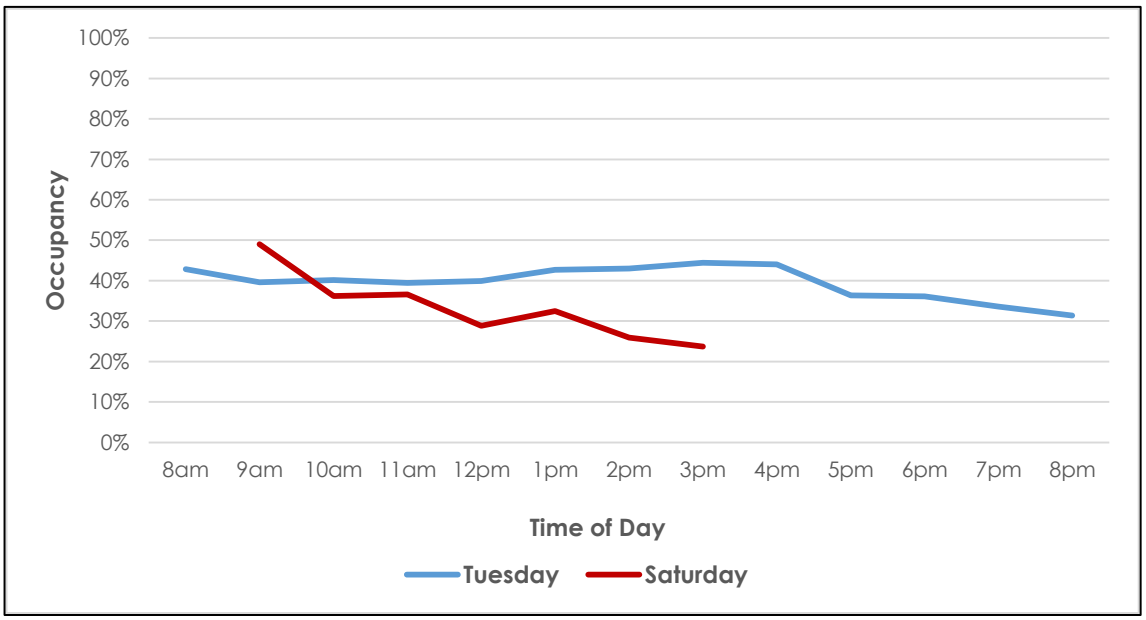
A summary of the car parking occupancy and duration of stay recorded for the study area is provided below. Full car parking survey results have been provided electronically as part of the project deliverable package.

3.3.1 Level of Occupancy

Typically, car parking occupancy levels greater than 85% are often considered to represent a situation where drivers are unable to find vacant spaces.

The car parking occupancy profiles for the Core Area are shown in Figure 3.3 for the Tuesday and Saturday.

Figure 3.3: Car Parking Occupancy Profile – Core Area



The occupancy profile illustrates that the occupancy in the study area does not exceed 50% on either the Tuesday or Saturday. Occupancies reduce by 13% between the peak at 4pm and the

lowest demand at 8pm indicating that there is a component of commuter car parking demand for the on-street parking.

Non-Core Area

The car parking occupancies in the non-core area is shown in Figure 3.4 for the Tuesday and Figure 3.5 for the Saturday. The occupancies in the core area is provided as a comparison, as is the combined occupancy (Riverside).

Figure 3.4: Car Parking Occupancy Summary - Tuesday

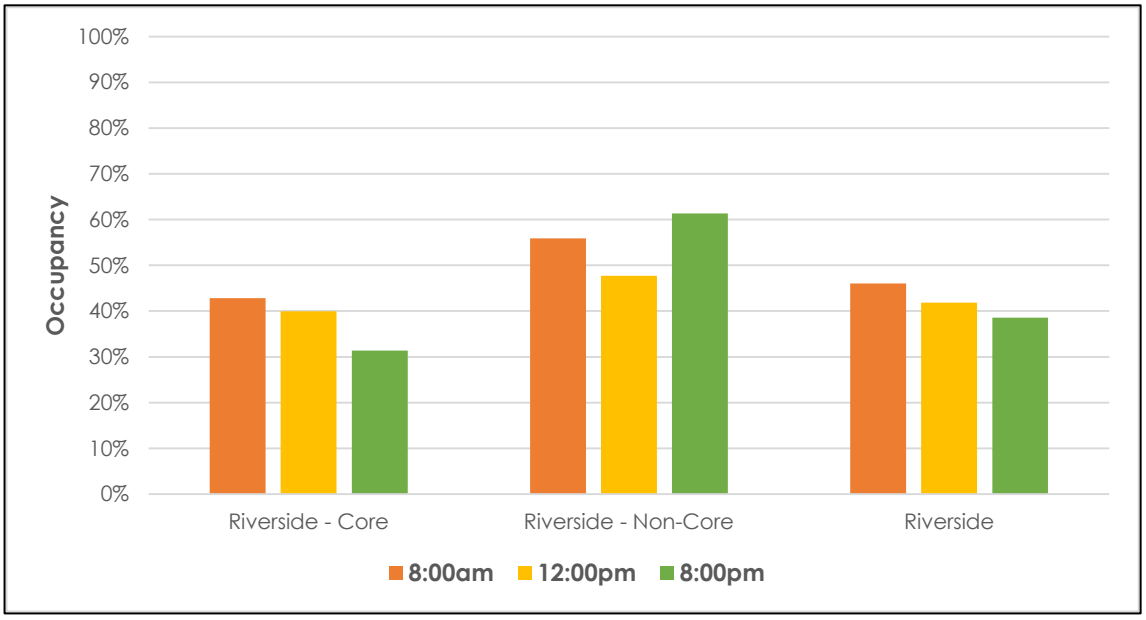
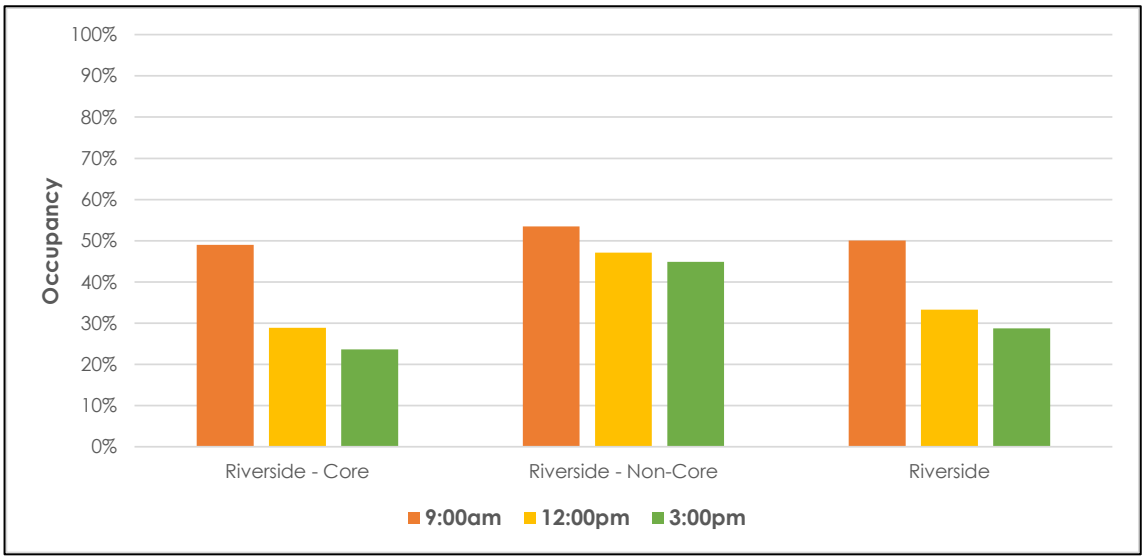


Figure 3.5: Car Parking Occupancy Summary - Saturday



The results for the non-core area illustrate that on both survey days, the occupancy is higher in the non-core area compared to the core area. The results on the Tuesday are typical of a residential area with low occupancy during the day (when residents are at work) compared to the morning and night (when residents and their cars are at home). This contrasts to the core area where demands peak during the day and tail off in the evening when commuter parkers leave the area.

Detailed Assessment Findings

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

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

- Side streets off Illawarra Road (Tuesday and Saturday morning)
- In the vicinity of Dulwich Railway Station, in particular Bayley Street, Dudley Street and Ewart Street (Tuesday and Saturday morning).

3.3.2 Duration of Stay

The level of compliance of time-restricted car parking in Riverside was assessed for the Tuesday.

Figure 3.6 presents the level of compliance for the 1-hour time-restricted on-street parking zones.

Figure 3.6: 1-hour Restricted Parking

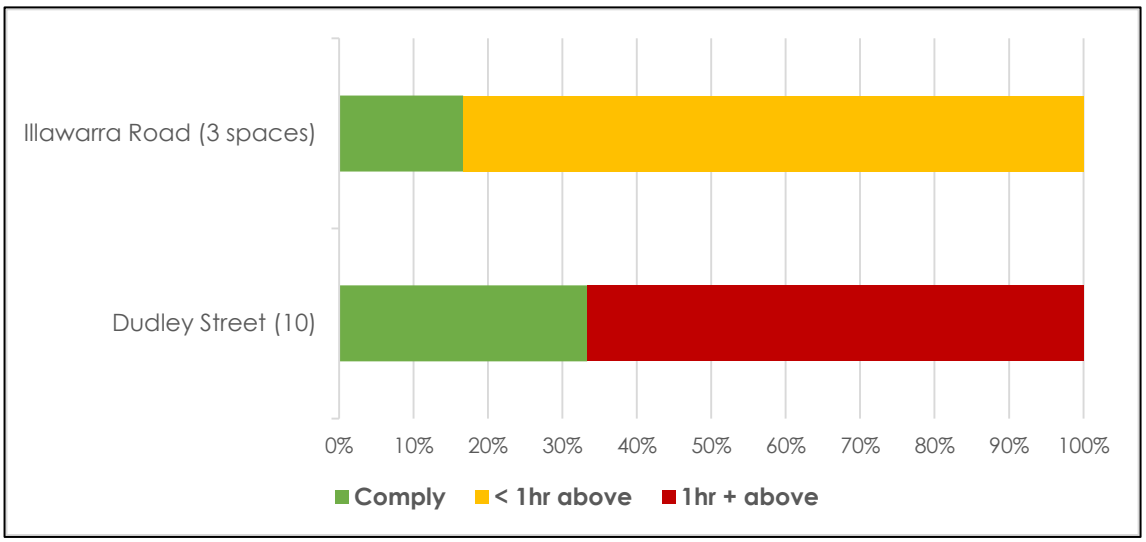


Figure 3.6 illustrates that there is low compliance of the time-restricted car parking on Illawarra Road and Dudley Street. There is a higher compliance on Dudley Street compared to Illawarra Road. However vehicles on Illawarra Road that overstayed the restriction parked for less than 2 hours whilst on Dudley Street all vehicles that overstayed the restriction parked for more than 2 hours.

The compliance results would potentially indicate that parkers must frequently park in these spaces knowing that demand for the spaces are typically low and that the spaces are not highly monitored by parking rangers.

3.4 Bike Parking

No on-street bicycle parking demands were observed within the study area. In this regard, it is noted that the study area is predominantly low density residential uses except for a small pocket of mixed use land area provided around the Dulwich Hill Railway Station.

4. Future Parking Requirements

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 of the LGA. The future land use estimates are set out in the 'Marrickville Section 94/94A Contributions Plan 2014' prepared by Council.

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 increase of 1,770 additional employees in the Marrickville LGA and a net reduction of 1,240sq.m of non-residential floor area. The data indicates a net increase of 234 jobs and 680sq.m of non-residential floor area in Marrickville. Based on the Marrickville LEP 2011, Riverside is to remain residential in nature. As such, for the purpose of this assessment, it is assumed that there would be negligible change in non-residential floor area in Riverside.

Residential Land Uses

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

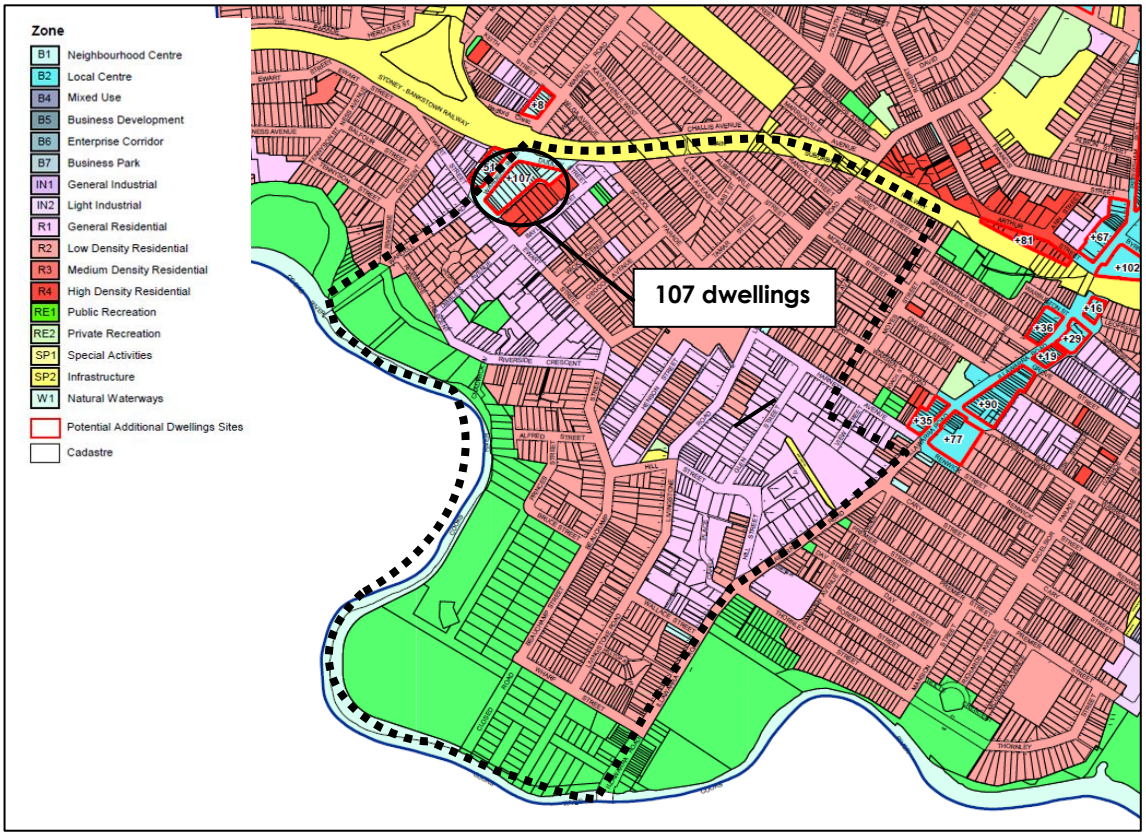
Table 4.2: Future Residential Dwelling Land Use Forecasts (+16 years)

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 1,722 dwellings for Marrickville. The anticipated distribution of additional residential dwellings for the Riverside area is defined in the Marrickville LEP 2010 (a total of 107 additional dwellings in the study area, the remaining dwellings for the Marrickville suburb are anticipated outside of the study area) and illustrated in Figure 4.1.

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:

"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	0.68 spaces per dwelling [1]
1-bedroom apartment	0.4 spaces per apartment	0.5 spaces per apartment	0.8 spaces per apartment	0.68 spaces per dwelling
2-bedroom apartment	0.8 spaces per apartment	1.0 spaces per apartment	1.2 spaces per apartment	0.92 spaces per dwelling
3+ bedroom apartment	1.1 spaces per apartment	1.2 spaces per apartment	1.2 spaces per apartment	1.2 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	-

[1] The 1-bedroom rate has been adopted for the studio apartments because of the small sample size skewing the studio data.

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:

- With the exception of the studio parking rate, the resident car parking rates are generally the same as the ABS car ownership data. However, the ABS data has been sourced for the entire Marrickville suburb and not just the study area. It is anticipated that the remainder of the suburb would have lower car ownership rates than the overall study area which is generally made up of lower density dwellings.
- For assessment purposes it is assumed that approximately 0.1 spaces per dwelling would be accommodated off-site.
- 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.
- There is no additional retail or office car parking demands anticipated for the study area.

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	0.1 spaces per dwelling	0.5-1.3 spaces per dwelling
Residential (visitors)	0.05 spaces per dwelling	0.05 spaces per dwelling	0.1 spaces per dwelling

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

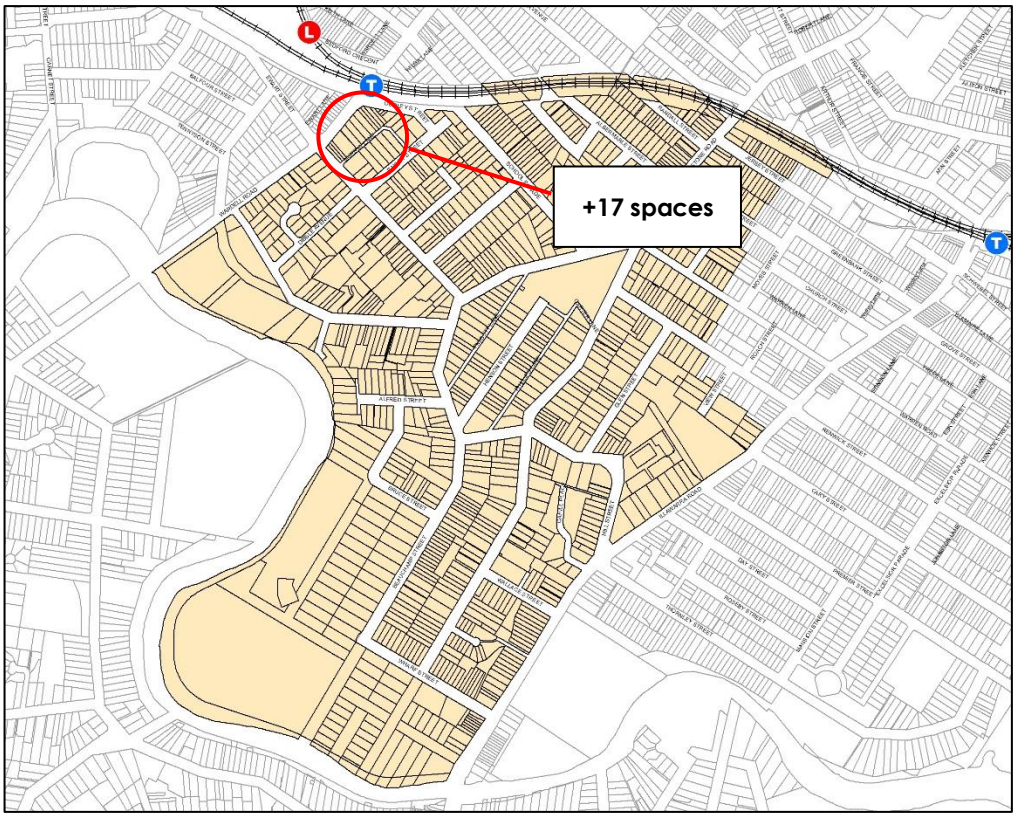
A summary of the anticipated future off-site car parking demands generated by each of the development precincts is provided in Table 4.5.

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

Residential Dwellings	Residential (Residents) [0.2 spaces per dwelling]	Residential (visitors) [0.05 spaces per dwelling]	Total
107	11	6	17

Table 4.5 indicates that an additional on-street car parking demand of 17 spaces could be generated by the forecast additional land uses. The distribution of the additional demand is illustrated in Figure 4.2.

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 Riverside, 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 local 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 local town centres and transport nodes is acceptable and manageable. ○ The benefits of living close to a local 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 (Limited Area Surrounding Dulwich Hill Station)

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

[2] 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 Deliveries and loading Emergency services Convenience store	Grocery store Professional services Medical clinic Residents	General retail Restaurant Employees Entertainment centre Religious institution	Airport parking Major sport or cultural event Overflow parking

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.

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.

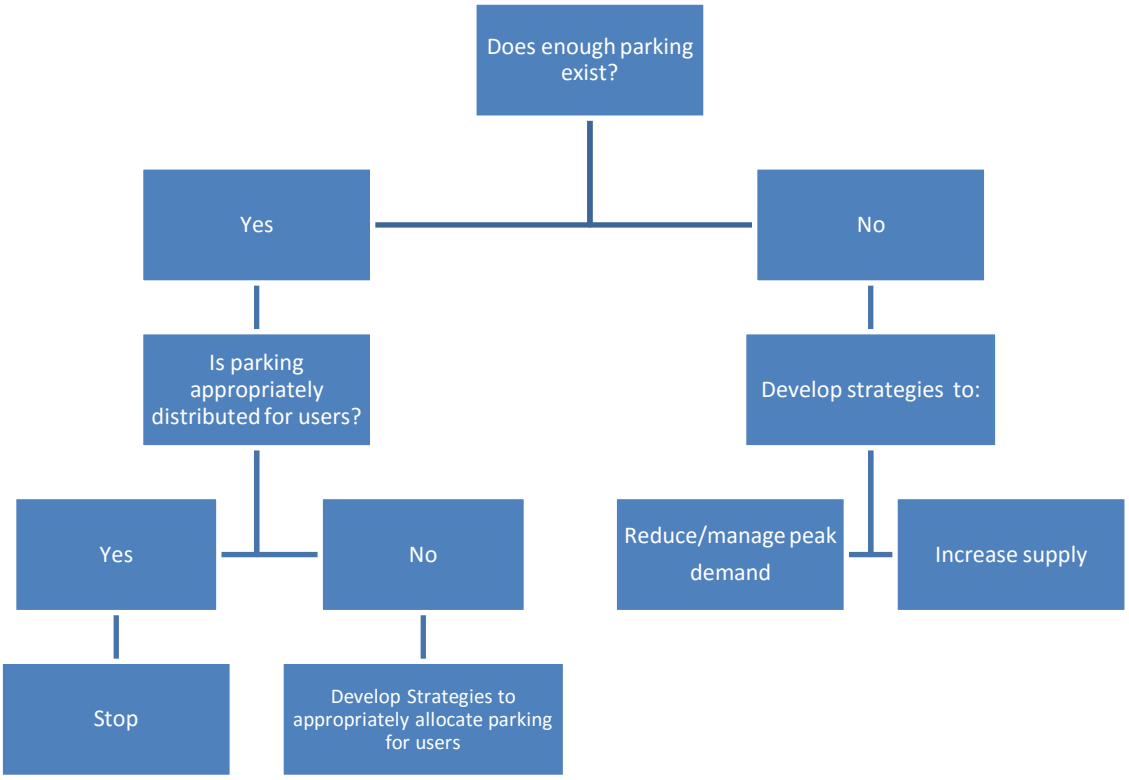
6. Car Parking Strategy

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 30% and 50% throughout the day, with localised peaks occurring 9:00am on Saturday mornings.

With regard to the theoretical capacity of parking (85%), it is evident that overall demands within the study area (50% occupancy) are not approaching capacity. However, further interrogation of the car parking demands (refer to Appendix A) 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 Currently Exceeding Theoretical Capacity

Street	Section	Context (Local Town Centre, Periphery, Residential)	Periods Occupancy Exceeds Theoretical Capacity
Harnett Avenue	Livingstone Road to Glen Street	School / Residential	Weekday mornings
Dudley Street	Wardell Road to Bayley Street	Periphery / Station	Weekday morning and lunchtime and Saturday mornings
Bayley Street	Ewart Street to Dudley Street	Periphery / Station	Weekday mornings
Ewart Street	Wardell Road to Beauchamp Street	Periphery / Station	Weekday morning and lunchtime and Saturday mornings
Dibble Avenue	Ewart Street to Riverside Crescent	Periphery / Station	Weekday lunchtimes
Harnett Avenue	Livingstone Road to Glen Street	School / Residential	Weekday mornings
Hill Street	Illawarra Road to Livingstone Street	Residential	Weekday mornings
Wallace Street	Illawarra Road to Livingstone Street	Residential	Weekday mornings and Saturday lunchtime

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 local 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 (and surrounding) the local 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

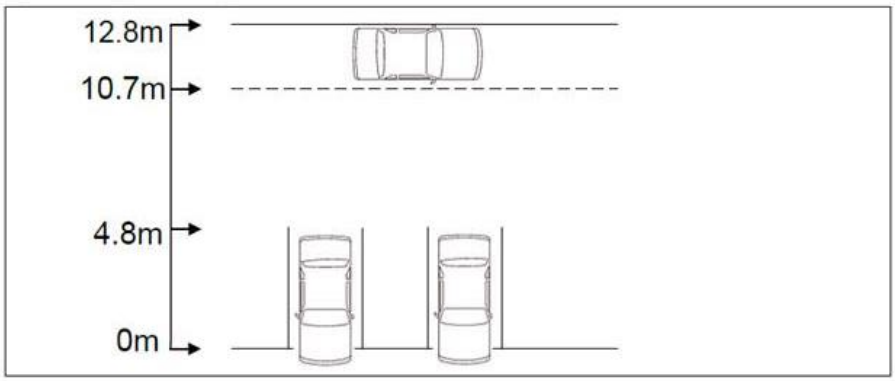


Figure 6.2 indicates that with a 600mm overhang on the kerb on one side of the road, approximately 5.9m is provided between parked cars, which is sufficient for two cars in oncoming directions to pass each other. Whilst not strictly meeting AS2890.5:1993, for roads with relatively low traffic volumes (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.

Community feedback indicates that a proportion of residents are keen to see the introduction of angled car parking within the study area, particularly on streets surrounding Dulwich Hill Station where occupancies are high.

A review of the streets in the study area indicates that the majority of streets are configured with 12.4m wide carriageways and as such, would not be capable of introducing 90-degree parking on one side of the road and maintaining parallel parking on the other side.

Given the above it is recommended that car parking management measures, other than increasing the supply of available parking, be considered to manage car parking demands.

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 commercial uses and station. As identified within the parking objectives and principles, the use of parking within residential streets can and should be balanced between the local 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 and commuters. It is noted that a number of dwellings surrounding the commercial land uses and station are not provided any off-street parking and as such, are reliant on on-street parking.

Further discussion regarding potential opportunities to accommodate non-residential 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 study area. Mode shift initiatives are further considered later in this report.

Strategy Recommendation 1

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

Strategy Recommendation 2

Modify parking restrictions within surrounding residential streets of the town centre and station precinct 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 B.

An overview of the proposed car parking changes is summarised in Table 6.2 and illustrated in Appendix B.

Table 6.2: Overview of Parking Restriction Changes

Location	Parking Restriction			
	1P	2P (Permit Excepted)	2P	Unrestricted
Dudley Street (south)	+5	-	-	-5
Bayley Street (west)	-	+12	-	-12
Ewart Street (north)	-	+24	-	-24
Dibble Avenue (west)	-	+22	-	-22
School Parade (north)	-	+28	-	-28
Hill Street (south)	-	+37	-	-37
Wallace Street (south)	-	+17	-	-17
Harnett Avenue (north)	-	+37	-	-37
Beauchamp Street (south) [1]	-	-	+7	-7
Livingstone Road (west)	-	-	+5	-5
Total	**5**	**177**	**12**	**-194**

[1] Car parking spaces on the Marrickville West Public School frontage.

Table 6.2 indicates that immediate parking control changes are recommended to 194 spaces within the study area, including the introduction of 177 resident permit spaces (2P), five 1P spaces and twelve 2P spaces.

Strategy Recommendation 3

Provide additional time restricted car parking spaces as detailed in Table 6.2 and in Appendix B.

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 commercial areas 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.

The introduction of paid parking to the relatively small commercial centre within the study area would likely result in customers visiting alternate commercial centres. Furthermore, existing car parking demands (peak and duration of peak demands) within the study area and surrounding the commercial areas do not warrant the introduction of paid parking.

Strategy Recommendation 4

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.

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 local 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 5

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

Strategy Recommendation 6

Continue to provide end of trip facilities for cyclists, including bicycle hoops at strategic locations throughout the study area.

Strategy Recommendation 7

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 study area.

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 study area, it is recommended that developer contributions partly go toward the improvement of public transport facilities.

Strategy Recommendation 8

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

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.

There are 14 disabled parking spaces provided in the study area. Surveys of these spaces indicates that 8 of the 14 spaces did not generate a demand during any of the surveyed times on the Tuesday (8am to 8pm) or Saturday (9am to 3pm) surveys. Specifically the following disabled parking spaces were observed to have zero demand during the surveys:

- Tamar Street, westside, between School Parade and Albermarle Street
- Livingstone Road, westside, between Beauchamp Street and Albermarle Street
- Livingstone Road, eastside, between Moncur Street Warren Road
- Wharf Street, southside, between Illawarra Road and Beauchamp Street (2 spaces)
- Illawarra Road, westside, between Wharf Street and Wallace Street
- Warren Rd, btw Roach Street and Livingstone Road
- Harnett Avenue, southside, between View Street and Glen Street

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 9

Periodically 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 commercial area 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 no formal on-street loading zones provided in the study area.

Anecdotally, the current loading arrangements servicing the commercial uses 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 (or lack of) 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 10

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 11

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 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 (not applicable for Riverside Precinct)
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 12

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

6.4.4 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 currently low levels of compliance for the existing time restricted car parking in the study area (i.e. Illawarra Road Dudley Street). This is likely as a result of less rigorous surveillance by Council officers of this area given the isolated nature of the restrictions compared to other areas of the Council (where enforcement is more efficient).

It is recommended that enforcement be increased to ensure appropriate turnover of car parking spaces and that spaces are being used as intended, particularly if the new time restricted spaces recommended in Section 6.3.2 are implemented.

Ongoing enforcement would also be required where new restrictions are provided as part of this study, to ensure that the spaces are used as intended.

Strategy Recommendation 13

It is recommended that enforcement be increased in the time restricted areas, particularly if the recommended new time restrictions are introduced.

6.4.5 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 (surrounding Dulwich Hill railway station), where vehicles regularly park closer to intersections and pedestrian crossings than the legislative restrictions require.

Strategy Recommendation 14

Introduce formal (signposted) '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).

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 the identified future development location and as such, the additional car parking cannot simply be accommodated within the existing supply. In this regard car parking management strategies have been identified above to manage car parking at this location.

A summary of the future demands, locations and car parking strategies developed are provided in Table 6.3.

Table 6.3: Car Parking

Location	Predicted Additional Car Parking Demand	Existing Car Parking Occupancy	Identified Strategy
Precinct 1 (surrounding Dulwich Hill Station)	+17 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) ○ The 6 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 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 C.

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:

- Bicycle parking (around Railway stations, light rail stops, near bus stops)
- 15 minute drop-off zones (outside railway stations)
- Accessible parking (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.

7.2 Tomorrow's Dulwich Hill – Stakeholder Group Priorities

Council prepared a questionnaire that was posted on the 'Your Say Marrickville' website for residents and other stakeholders to understand parking issues experienced in the Riverside area. The questionnaire was available to the public for three weeks ending mid December 2015 and received 156 responses.

A summary of the parking issues raised is provided below:

- Of the 156 that responded to the survey, 89 (58%) lived in a detached dwelling and 66 (42%) lived in a unit.
- Half of the households (51%) in the precinct only own one car, with 37% of households owning two.
- It was found that 56% (87) of respondents had off-street parking available to them. Of these respondents 23% (19) stated that they did not park their cars in the available off-street parking.
- The vast majority of respondents (95%) worked outside the precinct.
- On average, 42% of respondents that parked on-street found a spot within less than 100m (1 block) of their residence, 37% within 100m to 200m (1 to 2 blocks) and 5% had to walk more than 200m (2 blocks).
- Half of respondents that did not park off-street "often" had to circle the area to find an on-street parking space, 35% "sometimes" did, with the remainder "rarely" needing to.
- In response to inadequacy of on-street parking, respondents identified parking to be most limited at night on all days of the week. Parking on the weekend was felt to be limited than during the week.
- When considering parking restrictions within the precinct, respondents were split three ways with 40% (63) opting for time restrictions with residents exempted (via permit). 30%

(49) favoured unrestricted parking in precinct, even at the expense of parking scarcity, and 30% (47) opted for a middle ground option where time restriction are provided only in critical locations.

- Parking available near Marrickville West Public School is considered valuable space with 81% (121) of respondents favouring restricted parking. The largest proportion of respondents opted for restrictions to be limited to 2 hours.
- Near Dulwich Hill Station respondents generally favoured time restricted parking. 30% (47) favoured 2 hour restricted parking, 21% (32) favoured 4 hour restricted parking whilst 24% (36) favoured unrestricted parking.
- Near Dulwich Hill Shops, 90% (138) of respondents favoured time restricted parking, with 47% (72) opting for 2 hour restrictions.
- Respondents were split regarding what they consider to be the main issue in the precinct. The largest proportions of respondents identified a lack of parking near local shops or their place of residence. Complaints were also made for local employees parking in on-street within residential areas.

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[5]
  - 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	Rely on existing parking supplies within the surrounding residential areas to accommodate the short term existing parking demands of the centre and overflow commuter demands.	M	-
2	Modify parking restrictions within surrounding residential streets of the town centre and station precinct to appropriately manage demands and needs of all users (refer to Section 6.3).	-	-
3	Provide additional time restricted car parking spaces as detailed in Table 6.3 and in Appendix B.	S	L
4	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.	L	H
5	Review the network of pedestrian connections to the Dulwich Hill station from surrounding residential areas, to ensure these are safe and amenable in order to reduce the key barriers presented to walking such as major roads.	M	M
6	Continue to provide end of trip facilities for cyclists, including bicycle hoops at strategic locations throughout the study area.	M	L
7	Ensure end of trip facilities for cyclists (showers, lockers, change rooms and bicycle storage) are provided in major developments.	S	L
8	Continue to lobby TfNSW to ensure that the best possible public transport facilities are provided in the study area.	M	L
9	Periodically review inventory of residential parking spaces for people with disabilities to ensure efficient use of on-street parking provisions.	M	L
10	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

[5] 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	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
12	Introduce a car share parking requirement for larger developments into the DCP.	M	L
13	It is recommended that enforcement be increased in the time restricted areas, particularly if the recommended new time restrictions are introduced.	S	L
14	Introduce formal (signposted) '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).	S	M

Appendix A

Car Parking Supply and Occupancy

Legend

Restriction at 12:00pm Mon-Fri

- 1/4P
- 1P
- Disabled
- 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

Riverside Car Parking Restriction Weekday 12:00pm

Metres

0 80 160 320

GTAconsultants

www.gta.com.au

Scale at A3

1:6,000

Drawing Status

Preliminary

Job No	Drawing No	Issue
15S1012000	004-01	P1

Legend

Tuesday 8:00am

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

Issue	Date	By	Chkd	Appd
P1	17-12-14	RLG	ADF	BDM

Client

Marrickville Council

Job Title

Dulwich Hill, Lewisham and Riverside Traffic Plan

Drawing Title

Riverside Car Parking Demand Tuesday 8:00am

Metres

0 75 150 300

GTAconsultants

www.gta.com.au

Scale at A3

1:8,000

Drawing Status

Draft

Job No	Drawing No	Issue
15S1012000	003-04	P1

Legend

Tuesday 2:00pm

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

Issue	Date	By	Chkd	Appd
P1	17-12-14	RLG	ADF	BDM

Client

Marrickville Council

Job Title

Dulwich Hill, Lewisham and Riverside Traffic Plan

Drawing Title

Riverside Car Parking Demand Tuesday 2:00pm

Metres

0 75 150 300

GTAconsultants

www.gta.com.au

Scale at A3

1:8,000

Drawing Status

Draft

Job No	Drawing No	Issue
15S1012000	003-05	P1

Legend

Tuesday 3:00pm

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

Issue	Date	By	Chkd	Appd
P1	17-12-14	RLG	ADF	BDM

Client

Marrickville Council

Job Title

Dulwich Hill, Lewisham and Riverside Traffic Plan

Drawing Title

Riverside Car Parking Demand Tuesday 3:00pm

Metres

0 75 150 300

GTAconsultants

www.gta.com.au

Scale at A3

1:8,000

Drawing Status

Draft

Job No	Drawing No	Issue
15S1012000	003-06	P1

Legend

Saturday 9:00am

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

Issue	Date	By	Chkd	Appd
P1	17-12-14	RLG	ADF	BDM

Client

Marrickville Council

Job Title

Dulwich Hill, Lewisham and Riverside Traffic Plan

Drawing Title

Riverside Car Parking Demand Saturday 9:00am

Metres

0 75 150 300

GTAconsultants

www.gta.com.au

Scale at A3

1:8,000

Drawing Status

Draft

Job No	Drawing No	Issue
15S1012000	003-01	P1

Legend

Saturday 12:00pm

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

Issue	Date	By	Chkd	Appd
P1	17-12-14	RLG	ADF	BDM

Client

Marrickville Council

Job Title

Dulwich Hill, Lewisham and Riverside Traffic Plan

Drawing Title

Riverside Car Parking Demand Saturday 12:00pm

Metres

0 75 150 300

GTAconsultants

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Scale at A3

1:8,000

Drawing Status

Draft

Job No	Drawing No	Issue
15S1012000	003-02	P1

Legend

Saturday 3:00pm

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

Issue	Date	By	Chkd	Appd
P1	17-12-14	RLG	ADF	BDM

Client

Marrickville Council

Job Title

Dulwich Hill, Lewisham and Riverside Traffic Plan

Drawing Title

Riverside Car Parking Demand Saturday 3:00pm

Metres

0 75 150 300

GTAconsultants

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Scale at A3

1:8,000

Drawing Status

Draft

Job No	Drawing No	Issue
15S1012000	003-03	P1

Appendix B

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 neighbouring Dulwich Hill Parking Strategy 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.

Dulwich Hill Station / Commercial Centre

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:

- Dudley Street (continuation of existing 1P restriction)
- Bayley Street
- Ewart Street
- Dibble Avenue
- Ewart Street

This could operate as an extension of the existing resident permit parking (M13) provided on Bedford Crescent (within the Dulwich Hill Parking Strategy study area). It is noted that residents of a number of the above streets have previously expressed a desire to have a resident parking scheme introduced to their streets.

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 B.1.

Figure B.1: Recommended Restriction Changes – Dulwich Hill Station

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, including Hill Street, Wallace Street and Harnett Avenue.

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 and particularly on weekday mornings.

It is understood that the car parking demands are associated with residents of the low density dwellings (some of which are not provided any off-street parking), residents of the medium density dwellings and residential visitors. 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 Hill Street, Wallace Street and Harnett Avenue. 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 some residents of these streets have previously requested the introduction of a permit parking scheme.

The location and quantum of recommended parking changes on Hill Street, Wallace Street and Harnett Avenue is illustrated in Figure B.2. It is noted that part of the changes recommended for Harnett Avenue fall outside of the study area.

Figure B.2: Recommended Restriction Changes – Hill Street and Wallace Street

Basemap source: Nearmap (used under licence)

Figure B.3: Recommended Restriction Changes – Harnett Avenue

Basemap source: Nearmap (used under licence)

School Parking

There are currently dedicated pick up and set down parking spaces on Beauchamp Street and Livingstone Road abutting the Marrickville West Public School. Beyond these dedicated pick up and set down spaces parking surrounding the school is unrestricted.

As could reasonably be expected the car parking demand surveys identify that car parking demands surrounding the school are high at school pick up and drop off times. The parking surveys identified that there were a number of long stay vehicles parked abutting the school which reduce the parking opportunities for overflow pick up and set down activity, as well as visitor parking for the school.

Furthermore, the community consultation identified that more than 80% of respondents supported time restricted parking surrounding the school. The bulk of respondents recommended that the time restrictions be limited to 2 hours.

Based on the above it is recommended that 2P parking restrictions be introduced to complement the existing pick up and set down spaces on Beauchamp Street and Livingstone Road. The time restricted spaces would be limited to the schools frontage and would not include resident permit parking.

The location and quantum of recommended parking changes surrounding Dulwich Hill Station is illustrated in Figure B.4.

Figure B.4: Recommended Restriction Changes – Marrickville West Public School

Basemap source: Nearmap (used under licence)

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Legend

- 2P
- 2P Permit Excepted
- 1P

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15S1012000
RIVERSIDE PARKING STRATEGY
TIME RESTRICTION PARKING
03 MAY 2016

15S1012000-RP-02P2

Appendix C

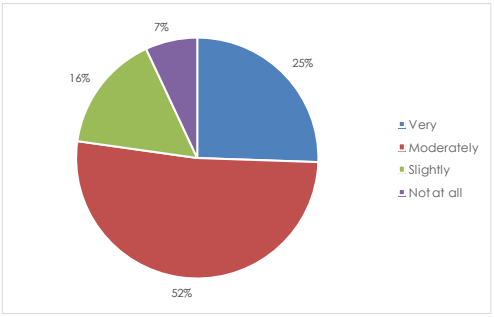
Community Consultation Findings

Community Consultation Survey – Transport Findings

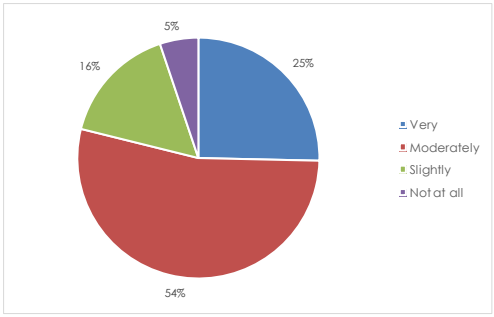
1. General

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

Marrickville LGA

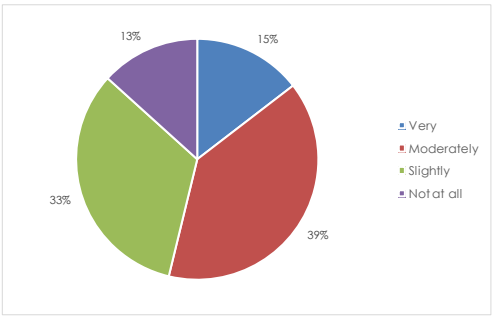


Dulwich Hill, Lewisham & Riverside

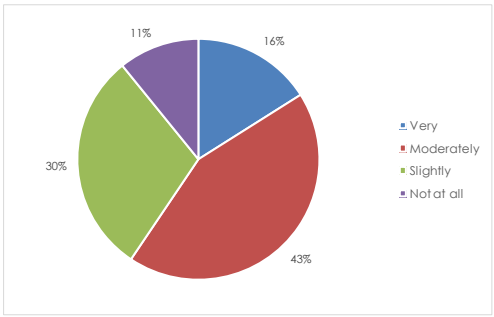


1.2 My street (including the footpath, nature strip and road) feels – Well-Maintained

Marrickville LGA



Dulwich Hill, Lewisham & Riverside



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

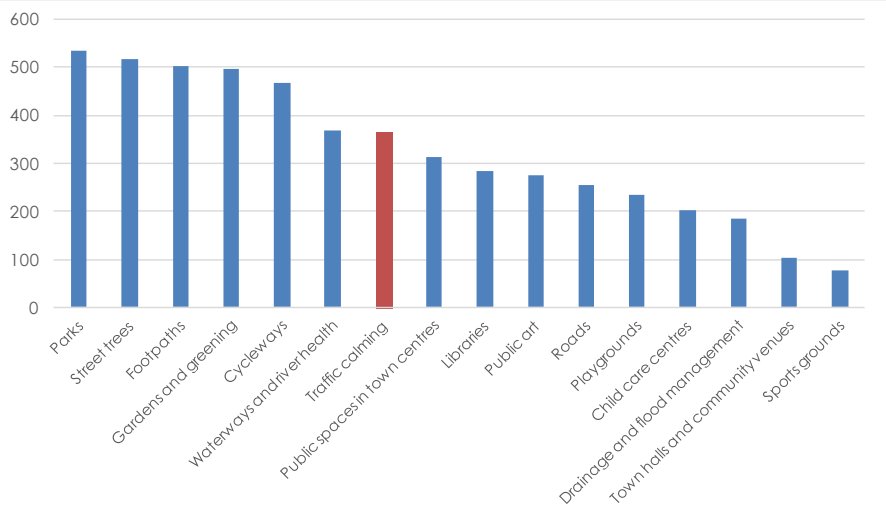
- Improve/ introduce car parking linemarking particularly for angled parking spaces
- Resident parking scheme in busy areas
- Alternative traffic calming to speed humps (noisy) to deter speeding
- Maintenance of roadways and footpaths
- Improve street lighting.

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?

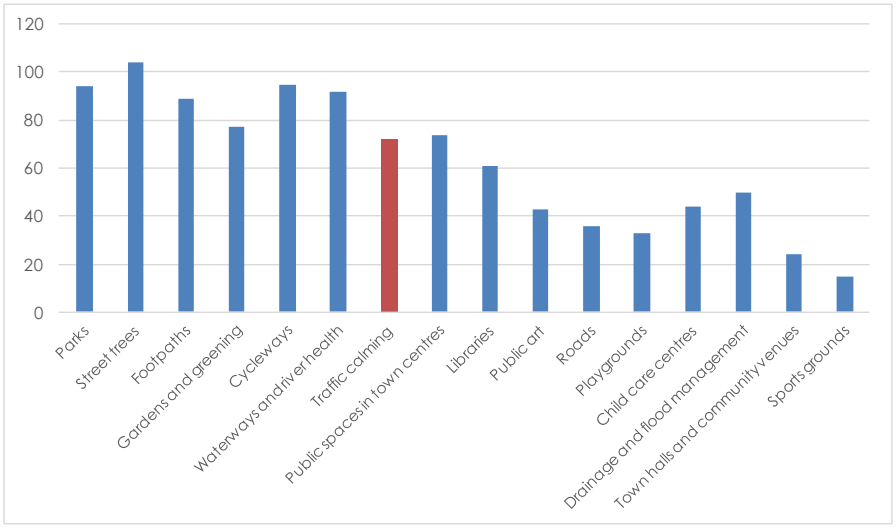
- Separated cycleways
- Link cycleways with rail and light rail
- Well maintained and wider network of footpaths
- Safer pedestrian crossing on Toothill Street
- More street trees
- Improved street lighting near Waratah Mills light rail stop
- Shared zones in shopping areas
- Traffic calming that prioritises 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



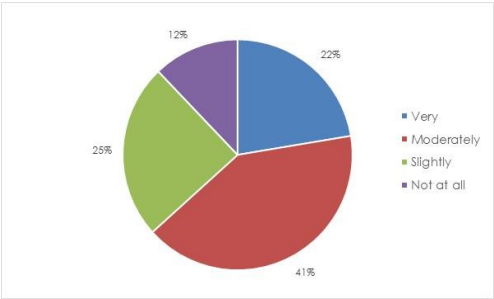
Dulwich Hill, Lewisham & Riverside



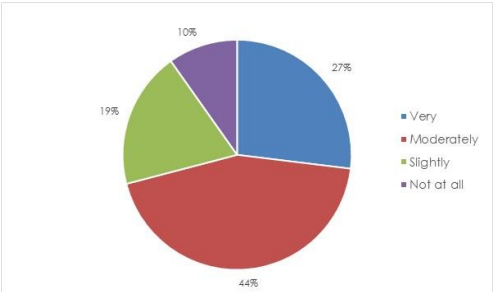
2. Pedestrian

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

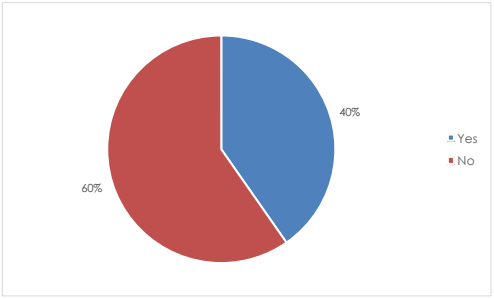


Dulwich Hill, Lewisham & Riverside

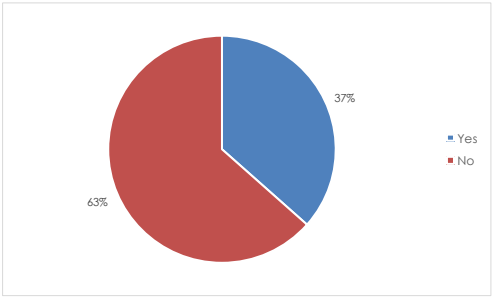


2.2 Are there barriers that prevent you and your family/ household walking more in your neighbourhood?

Marrickville LGA

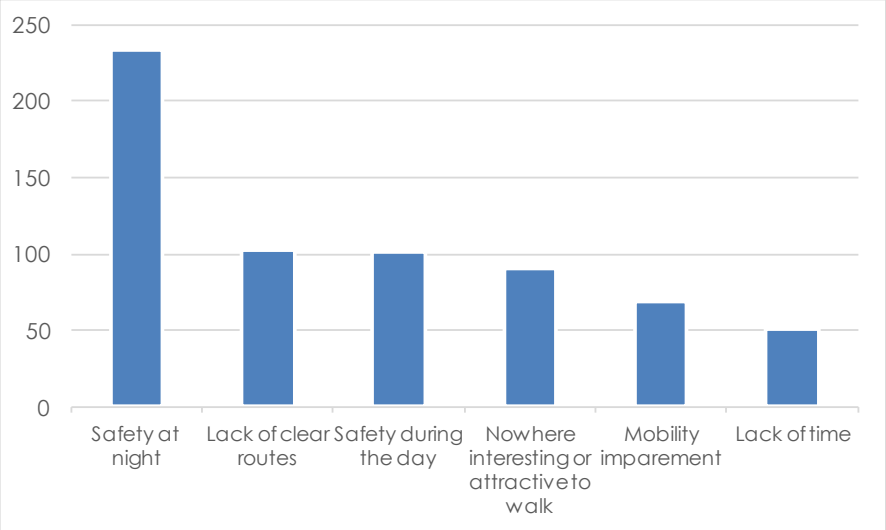


Dulwich Hill, Lewisham & Riverside

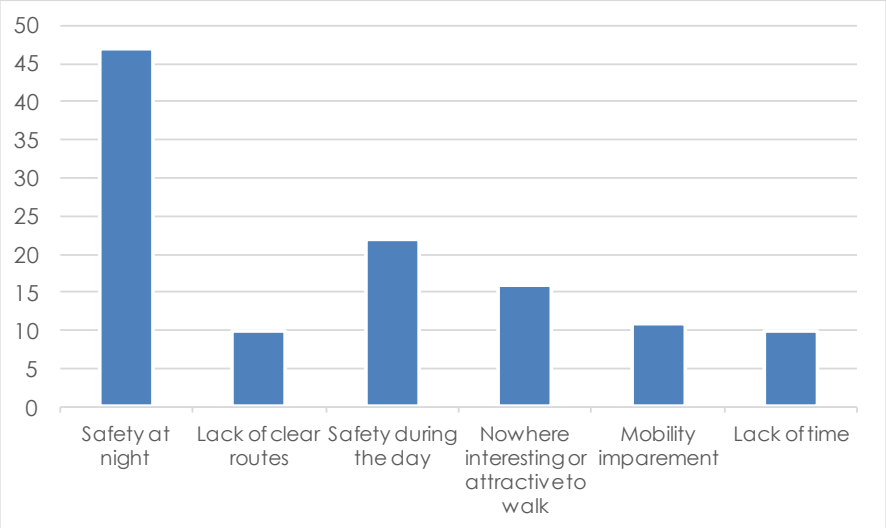


2.2.1 What are the barriers?

Marrickville LGA



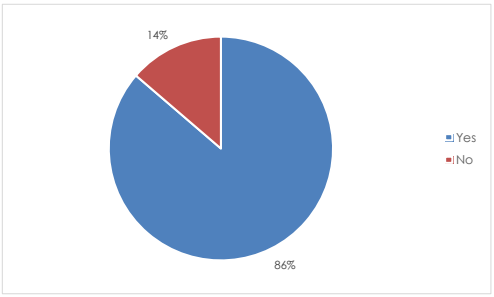
Dulwich Hill, Lewisham & Riverside



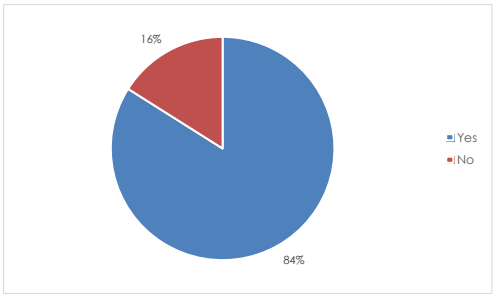
- Other common barriers mentioned?
    - Quality of footpaths causing trip hazards (uneven surface and obstructions on footpaths)
    - Limited street lighting
    - Speeding cars.

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

Marrickville LGA



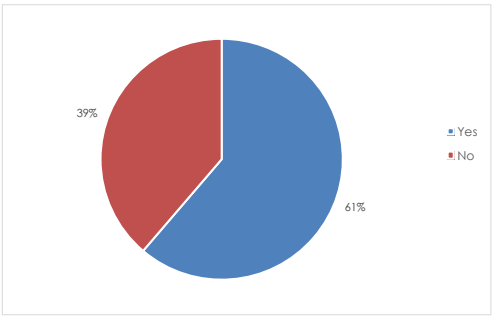
Dulwich Hill, Lewisham & Riverside



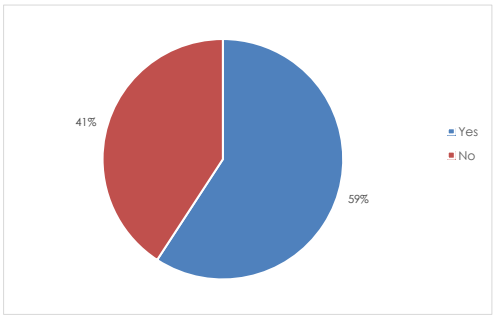
- How? (Where in Dulwich Hill, Lewisham & Riverside?)
  - Improve footpaths (New Canterbury Road, Victoria Street, Denison Road, Hercules Street, Dixson Avenue)
  - Improve street scaping, including shading (Wardell Road, New Canterbury Road, Denison Road, Yule Street)
  - Improve or addition safe crossing 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



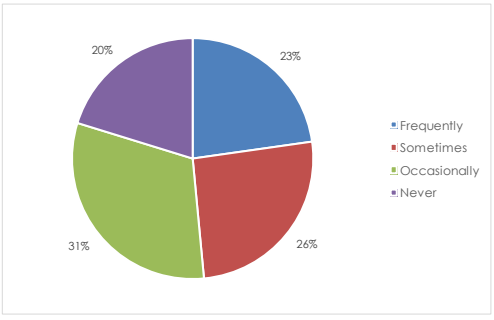
- How? (Where – Dulwich Hill, Lewisham & Riverside only)
    - Improve street lighting (Lewisham light rail stops, bus stops)
    - Improve access to Lewisham West light rail stop across Old Canterbury Road
    - Direct walking routes at Waratah Mills light rail stop from the corner of Frazer Street 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?

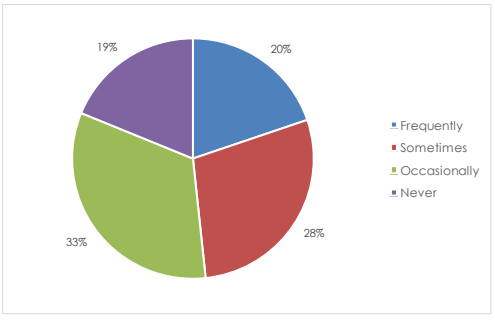
- The Greenway shared path (Cooks River to Iron Cove) along the light rail line – safety and convenience.
- Lewisham/ Dulwich Hill to Newtown/ Enmore – connecting to entertainment hub
- All laneways – more inviting walking experience.

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

Marrickville LGA

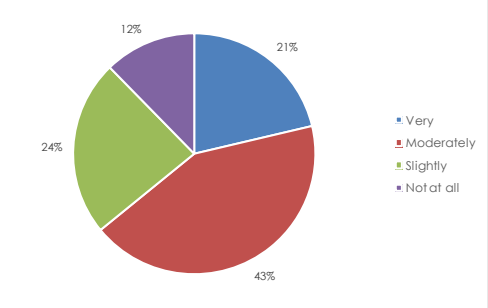


Dulwich Hill, Lewisham & Riverside

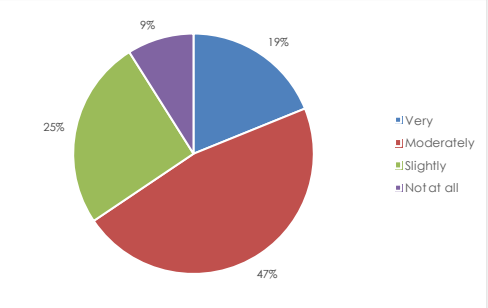


2.7 My street (including the footpath, nature strip and road) feels? – Pedestrian friendly.

Marrickville LGA



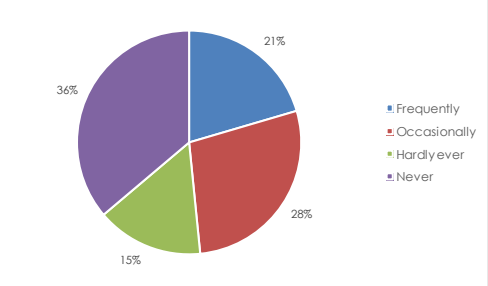
Dulwich Hill, Lewisham & Riverside



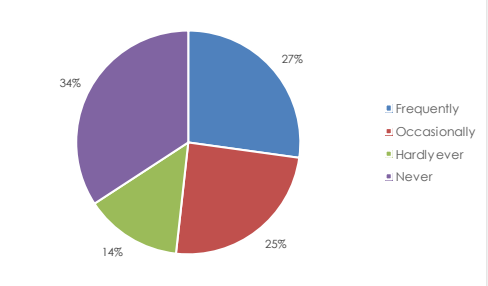
3. Cyclists

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

Marrickville LGA

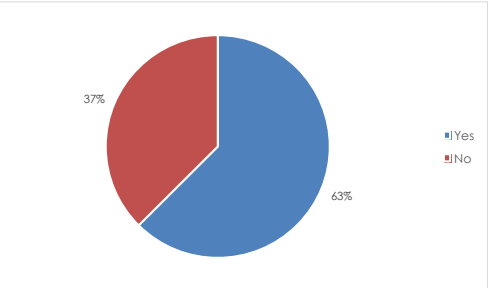


Dulwich Hill, Lewisham & Riverside

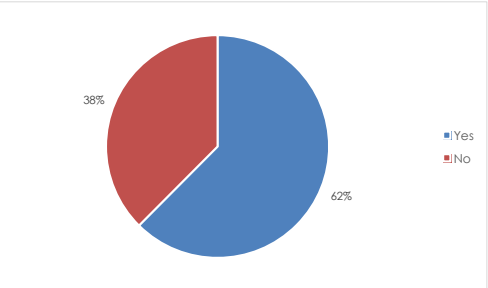


3.2 Are there barriers that prevent you and your family/ household cycling or cycling more often in your neighbourhood

Marrickville LGA

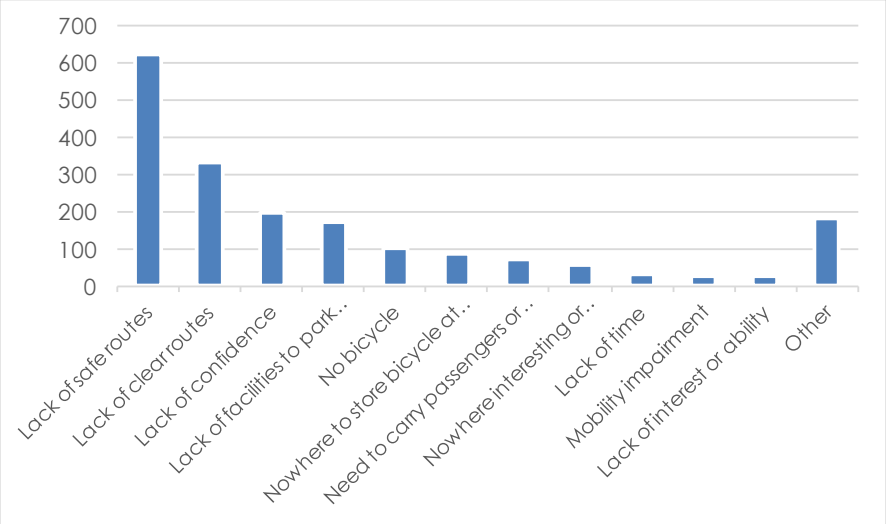


Dulwich Hill, Lewisham & Riverside

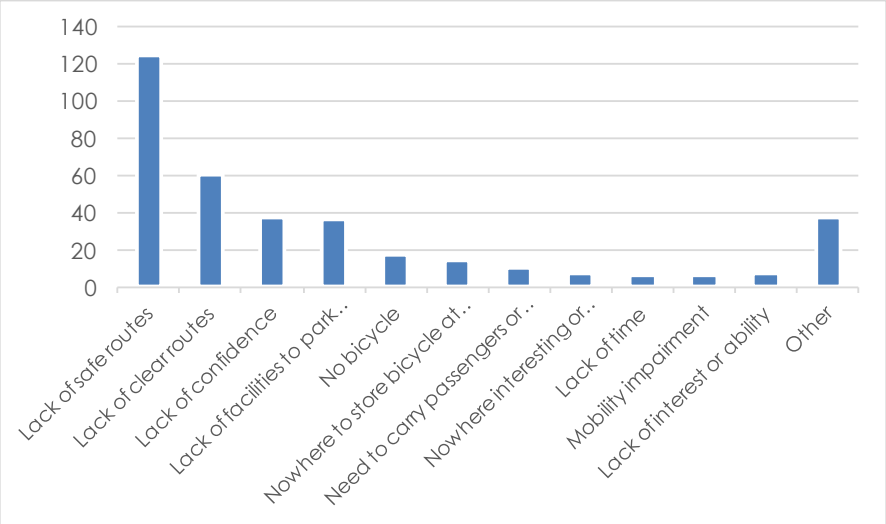


3.2.1 What are the barriers?

Marrickville LGA



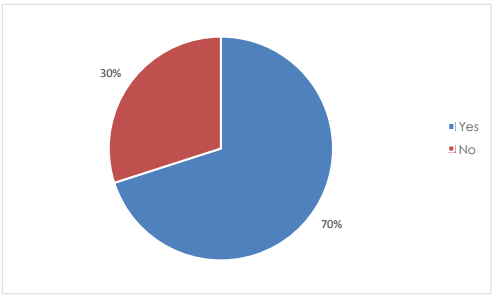
Dulwich Hill, Lewisham & Riverside



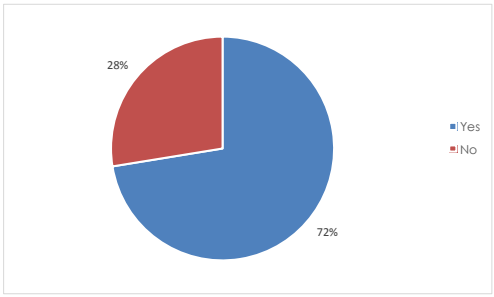
- Other common barriers mentioned?
  - Speeding cars
  - Too dangerous.

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



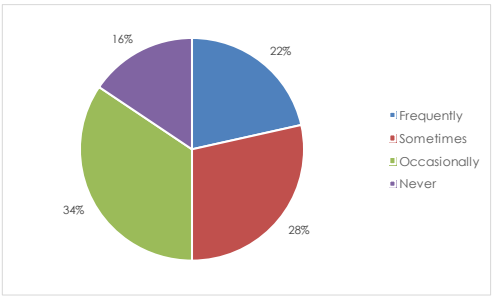
- What? (Where in Dulwich Hill, Lewisham & Riverside?)
    - Dedicated separated cycle paths (on all main roads and near railway stations)
    - Direct cycle routes to the city
    - Driver awareness.

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?

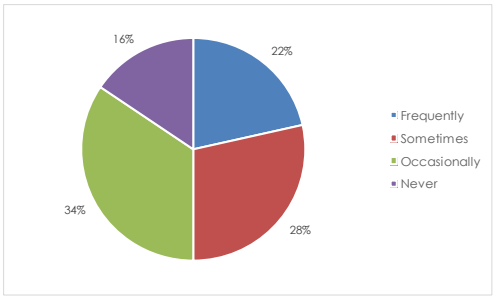
- The Greenway shared path (Cooks River to Iron Cove) along the light rail line – safety, convenience and connectivity
- Dulwich Hill to Sydenham Station – access rail services
- Dulwich Hill to Newtown – access to entertainment and leisure.

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

Marrickville LGA

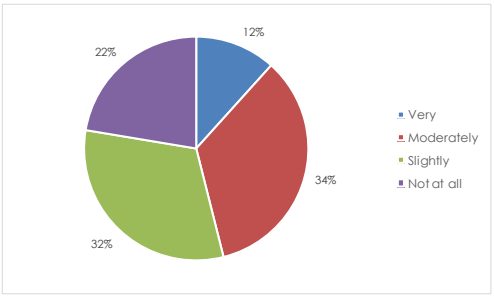


Dulwich Hill, Lewisham & Riverside

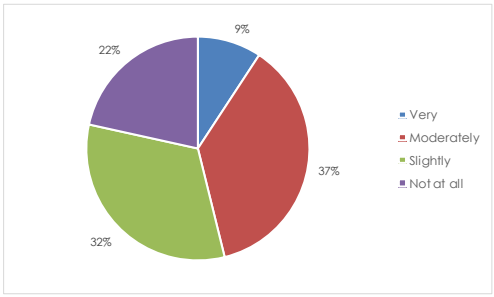


3.6 My street (including the footpath, nature strip and road) feels.... – Bike friendly.

Marrickville LGA



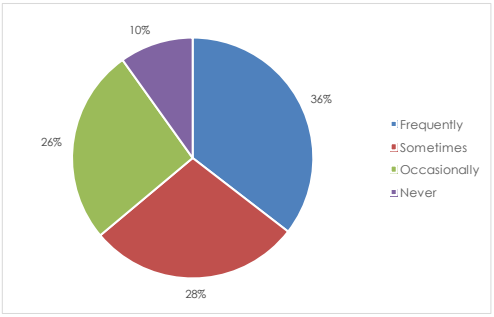
Dulwich Hill, Lewisham & Riverside



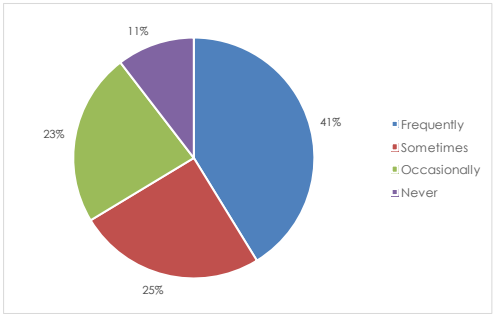
4. Traffic

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

Marrickville LGA

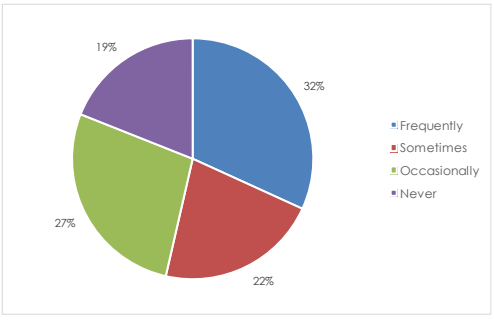


Dulwich Hill, Lewisham & Riverside

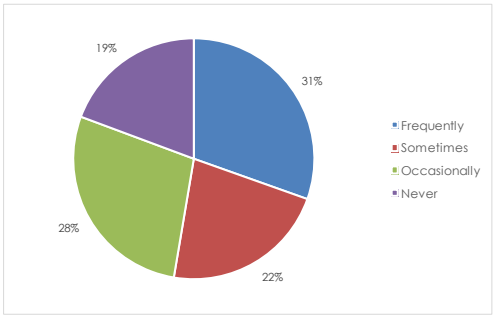


4.2 How often do the following happen in your street? – Too much traffic or 'rat-running'

Marrickville LGA



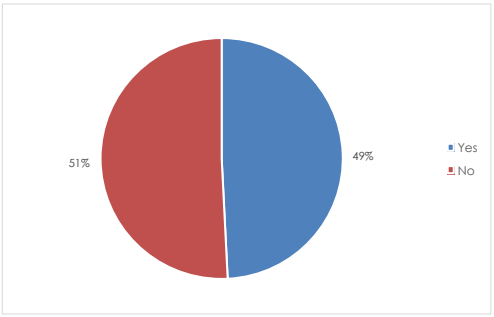
Dulwich Hill, Lewisham & Riverside



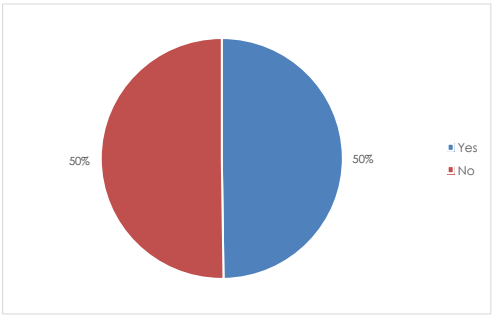
5. Parking

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



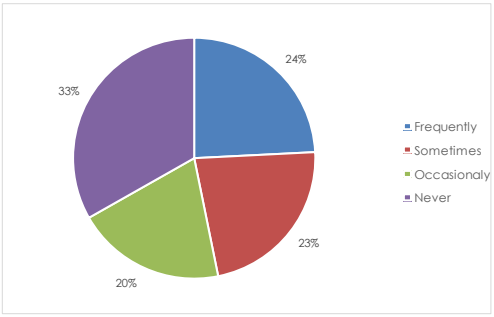
Dulwich Hill, Lewisham & Riverside



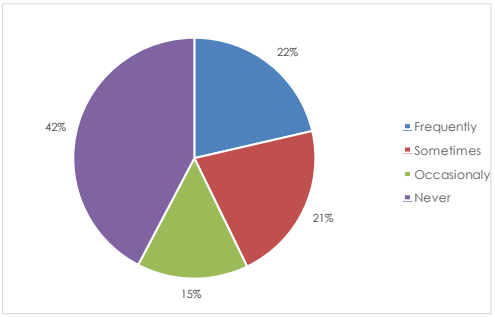
- What? (Where in Dulwich Hill, Lewisham & Riverside)
  - Car share spaces (Old Canterbury Road, Frazer Street)
  - Bicycle parking (around Railway stations, light rail stops, near bus stops, near shops along Marrickville Road)
  - Resident parking (near light rail stops and sporting grounds)
  - 15 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



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