

Draft Parking Plan

Greensborough Activity Centre Parking Plan

V171082

Prepared for
Banyule City Council

1 March 2019



Part 1: Background Report

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- Appendix A** Background Studies
- Appendix B** Greensborough Parking Precinct Plan 2006
- Appendix C** GMAC Land Use Zoning
- Appendix D** Survey Data

2 Introduction

2.1 Overview

Cardno has been engaged by Banyule City Council to prepare a Parking Plan to guide the management of car parking across the Greensborough Major Activity Centre and its immediate surrounds.

This Background Report has been prepared to outline the findings of a review of the existing conditions across the Greensborough Major Activity Centre study area, which included the following:

- > Reviewing relevant background documentation including state and local government policies and strategies and previously prepared parking studies;
- > Undertaking a site visit to further assess the existing car parking conditions and the general transport network within the study area; and
- > Collecting and analysing car parking occupancy and duration of stay data to understand existing parking behaviours and demand across the study area.

This report forms one of three work packages to be delivered as part of the Greensborough Parking Plan project, with the key intention of this report being to gain an in depth understanding of the localised car parking conditions specific to the study area, identify issues and opportunities within the area and reliably inform the development of:

- > The Greensborough Parking Plan Options and Strategy Analysis Report; and
- > The Greensborough Parking Plan Final Report.

2.2 Background & Project Context

Greensborough is located in the northern precinct of the City of Banyule, approximately 20 kilometres northeast of the Melbourne CBD, and has the largest population of all suburbs under Council jurisdiction.

The Greensborough Major Activity Centre (herein referred to as 'the GMAC') forms the commercial and retail heart of Greensborough, covering some 38 hectares including Greensborough Shopping Centre, Banyule Council Offices, WaterMarc Aquatic Centre, and the Greensborough Train Station.

In 2006, a Parking Plan was prepared for the GMAC by Cardno (then Grogan Richards), which informed the eventual incorporation of a parking overlay for the area with revised car parking rates for a number of land uses. A summary of the findings drawn from the 2006 study has been prepared and is attached as Appendix B to this report.

Parking management plans within an activity centre such as the GMAC aim to manage parking over a designated area rather than managing parking on a site by site basis. These plans measure the parking characteristics of their respective area and provide appropriate procedures for the evaluation of the number of spaces required on the basis of the characteristics identified as well as desired changes for the area. An examination of the approaches adopted within other Activity Centres / Districts undertaken by Cardno and other traffic engineering consultancies has been provided within Appendix A to this report.

Since the 2006 Greensborough Parking Plan, a number of additional developments, car parking areas, and improvements to public and active transport have occurred that will have had an impact on car parking demand. Significant development over the last 11 years, including iconic recreational facilities such as WaterMarc and the recently completed One Flintoff Banyule Council Office development, are such examples.

Resources and findings derived from the previous Parking Precinct Plan provide an opportunity to:

- > Assess the growth in development experienced between 2006 and 2017;
- > Provide Council with an insight into the changes in land use in and around the GMAC since 2006; and
- > Investigate the geographical and temporal changes to car parking demand resulting from these changes.

The development of this new Parking Plan aims to capitalise on these findings and provide an updated picture of car parking characteristics within the study area, to determine whether controls are required to ensure car parking supply and demand are managed appropriately.

2.3 Project Objectives

The primary objective of the Parking Plan is to determine the existing parking supply and demand characteristics and provide recommendations for the provision of car parking within GMAC for specific uses.

Specifically, the Parking Plan aims to achieve the following key objectives:

- > An analysis and review of current parking characteristics and parking facilities across the GMAC including:
 - Car parking supply;
 - Car parking demand;
 - Existing distribution of parking; and
 - Existing constraints and opportunities.;
- > Understand and assess the parking impact of current land uses;
- > Understand and assess the anticipated parking impact of future developments;
- > Provide thorough insight into the changes in car parking behaviour from 2006 to 2017, based on Cardno's previous work within the GMAC area;
- > Provide recommendations regarding potential opportunities to increase the publicly available parking supply; and
- > Provide recommendations and a Parking Management Plan to best manage the available parking resources within the GMAC via both supply and demand measures, to accommodate the current and future demand for car parking.

Should it be sought by Council, car parking provision rates defined in this report will be used to form a revised Parking Overlay or schedule to the Parking Overlay in the Planning Scheme.

2.4 Assumptions and Limitations

It is assumed that the data collected and used to prepare this report is a fair and suitable reflection of parking demand and trends within the identified study area.

3 Policy Context

3.1 Summary

There are a number of relevant State and Local Government policy documents, which provide guidance for the direction of the Car Parking Plan. Those that are most relevant in the context of transport planning are as follows:

- > Transport Integration Act;
- > Plan Melbourne (2017-2050);
- > Victorian Planning Provisions – Clause 18 (Transport);
- > Victorian Planning Provisions – Clause 52.06 (Car Parking);
- > Greensborough Activity Centre – Urban and Landscape Design Guidelines for Precincts 2, 5 and 6;
- > Greensborough Transport Masterplan;
- > Banyule Activity Centre Car Parking Policy and Strategy;
- > Banyule Residential Parking Permit Policy;
- > Banyule On-Street Parking Management Framework;
- > Banyule Municipal Strategic Statement – Clause 21.00 of the Banyule Planning Scheme;
- > Banyule Integrated Transport Plan 2015-2035; and
- > Guidelines associated with other Activity Centres/Districts

The documents above highlight that significant support exists at both state and local level for the adoption of tighter car parking controls and management within activity centres such as Greensborough. To this end, it is clear that a number of statutory mechanisms exist to facilitate this outcome.

Most specifically, a Parking Overlay represents a clear avenue for the formal implementation of particular recommendations determined by the Car Parking Plan.

3.2 State Policies

3.2.1 Transport Integration Act (2010)

A review of the broader planning framework indicates that sitting above state and local policy and central to the position of sustainability is the adopted Transport Integration Act (2010). This Act underpins a need to focus on the application of sustainable development practices by integrating land use and transport. The Act has an overarching status in the hierarchy of Victorian Planning Legislation. Part 2 - Section 6 of the Act sets out the following vision:

“The Parliament recognises the aspirations of Victorians for an integrated and sustainable transport system that contributes to an inclusive, prosperous and environmentally responsible State.”

The Act sets out a vision, objectives and principles for transport in Victoria. The objectives are set out under the following categories:

- > Social and economic inclusion;
- > Economic prosperity;
- > Environmental prosperity;
- > Environmental sustainability;
- > Integration of transport and land use;
- > Efficiency;
- > Coordination and reliability; and
- > Safety, health and wellbeing.

The Act highlights that the transport system needs to be integrated and sustainable and, as such, requires all Victorian transport agencies including the Department of Transport, Planning and Local Infrastructure, Transport for Victoria, VicRoads, VicTrack and V/Line to work together towards this common goal.

3.2.2 Plan Melbourne (2017 – 2050)

Melbourne's population is projected to grow from 4.5 million to almost 8 million by 2051 — with Victoria's total population set to top 10 million. The city's transport network will need to cater for approximately 10 million more trips a day, equating to an increase of more than 80% when compared to existing patronage.

Plan Melbourne is a separate five-year plan of actions, serving as a long-term strategy to respond to the state-wide, regional and local challenges and opportunities Victoria faces between now and 2050. The latest document is a revision of the 2014 version of Plan Melbourne, produced to reflect current policies and priorities—creating continuity, clarity and certainty for communities, businesses and governments.

Plan Melbourne aims to ensure people will be able to work/study closer to where they live, with job clusters in suburban Melbourne anticipated to grow and are linked by better public transport infrastructure and services. Getting around the city and suburbs is anticipated to become easier for people with the introduction of more integrated and efficient road and public transport networks. Ultimately, Melbourne residents will reside in '20-minute suburbs' as they will be granted the opportunity to walk, cycle or take a short public transport trip to access the majority of their everyday needs.

3.2.3 Victorian Planning Provisions – Clause 18 (Transport)

In respect of 'Land Use and Transport Planning', the objective of Clause 18.01-1 of the Victorian Planning Provision is:

"To create a safe and sustainable transport system by integrating land-use and transport."

Encouraging the use of public transport and walking/cycling as modes of transport is central to achieving this objective.

The GMAC lends itself to promote the vision of this objective by encouraging the use of public transport, cycling and walking and generally discouraging an abundance of car parking within the area, and in turn an over-use of motor vehicles.

3.2.4 Victorian Planning Provisions – Clause 52.06 (Car Parking)

Clause 52.06 Parking Overlay (with accompanying schedule) provides car parking requirements for a use listed as a product of the standard rates in Column A or the lower rates in Column B in Table 1. The lower rates provided in 'Column B' apply to those areas specified in a schedule to the Parking Overlay.

Decision guidelines exist to further waive or reduce the car parking requirements in either 'Column A' or 'Column B' and car parking design advice to the satisfaction of the Responsible Authority.

3.3 Local Government Policies

3.3.1 Greensborough Activity Centre – Urban and Landscape Design Guidelines for Precincts 2, 5 and 6

The 'Greensborough Activity Centre – Urban and Landscape Design Guidelines for Precincts 2, 5 and 6' report was prepared by David Lock Associates on behalf of Banyule City Council in November 2015. It is understood this report serves as an update of the Greensborough Structure Plan.

The purpose of the Urban Landscape and Design Guidelines ('the Guidelines') is primarily to reappraise the heights and setbacks in Precincts 2, 5 and 6 within the Greensborough Principal Activity Centre (GPAC). The guidelines were later translated into an update to Schedule 1 to the Activity Centre Zone (ACZ1) within the Banyule Planning Scheme on 01.06.2017.

ACZ1 sets out the following land use and development objectives which relate to this car parking study:

"Land Use

- > *To ensure the Greensborough Activity Centre continues to thrive as a regional retail centre, with a range of commercial, office, entertainment, leisure, cultural, community, service and residential uses.*
- > *To promote the civic role and function of the Greensborough Activity Centre.*

- > *To encourage a diverse range of accommodation uses including shop top housing and residential apartments that will take advantage of the broad range of services, public transport, amenities and features within and close to the Centre.”*

“Transport and access

- > *To promote a safe, convenient and sustainable traffic and transport network that assists walking, cycling and public transport use and maximises mobility for all.*
- > *To ensure the design of parking and access areas is safe, practical, easily maintained and allows for use of car parking space for multiple purposes.*
- > *To design any car parking within the centre to facilitate its use for multiple purposes throughout the week.*
- > *To improve directional signage and way finding measures for users of the activity centre.*
- > *To ensure key community nodes and Key Pedestrian Areas have good access to sunlight, weather protection and clear pathways which link elements throughout the activity centre.*
- > *To increase pedestrian permeability across large blocks, between major destinations and from the station to the rest of the activity centre particularly along Main Street and the Plenty River Valley parkland.*
- > *To improve the appearance and design of the station building and surrounds, and its connectivity with the activity centre, particularly Main Street.*
- > *To encourage development that maximises the operation of the station, while accessing views of the Plenty River Valley and surrounding hills, including opportunities for higher density residential development on land surplus to public transport requirements.*
- > *To provide for the improved integration and operation of public transport services through the development of a multi-modal interchange for rail and bus services.”*

3.3.2 Greensborough Transport Masterplan

In June 2017, Arup was commissioned by Banyule City Council to prepare the Greensborough Activity Centre Transport Masterplan (GTMP). The Plan was created to fully respond to the opportunities afforded by state government investment in the broader region.

The report delivers a plan for Greensborough’s transport and movement network which envisions the future Greensborough Activity Centre (GAC) as a vibrant local community that is enhanced by its role as a *“highly functional public transport hub for the northeast region”*.

The aim of the GTMP is to guide local transport and movement investment decisions and inform Council’s role in advocating for the best local outcomes from strategic infrastructure projects within the State Government’s control, both at present time and into the future.

The four (4) distinct objectives of the GTMP are listed as follows:

1. Improvement of public transport, including a new integrated Greensborough Transport Interchange, improved bus routes, stop locations, frequency and services within and to Greensborough, duplication of the Hurstbridge rail line between the suburbs of Greensborough and Eltham (currently under construction) and a 10-minute rail service frequency to Greensborough;
2. Manage through-traffic to facilitate pedestrian, cycling and public transport priority in the GAC;
3. Improve pedestrian access within the GAC; and
4. Improve cycle access to and within the GAC.

3.3.3 Banyule Activity Centre Car Parking Policy and Strategy

The Banyule Activity Centre Car Parking Policy is a long term (10-30 year) general policy which applies to all Activity Centres in Banyule. It is anticipated that specific parking plans will be developed for each centre over time, with a plan for Heidelberg already created.

The policy has been guided by the following three principles:

- > Enable sustainable development to meet the needs of the present without compromising the ability of future generations to meet their own needs;

- > Apply a hierarchy of transport needs: placing priority on pedestrian movements; and
- > Apply the precautionary principle: placing an importance on the assessment of detrimental impacts.

The policy objectives are as follows:

- > Create safe, attractive and easy to use activity centres;
- > Integrate parking policy with other transport and land use strategies to achieve a mutually supportive system;
- > Protect existing residential areas from commercial and other spill-over parking;
- > New residential developments within the Activity Centres shall not impact on parking availability for commercial and service users;
- > Provide car parking and vehicle access at an appropriate level and in appropriate locations to ensure vehicle connectivity and availability for retail, commercial and residential needs;
- > Utilise parking and parking management as an effective travel demand management tool for achieving wider transport planning objectives;
- > Ensure available car parking is best managed to enable appropriate turnover and usage of parking space;
- > Use parking controls to encourage the take-up of alternative modes of transport; walking, cycling and public transport;
- > Ensure there are high quality facilities for pedestrians, cyclists, people with mobility disability, public transport patrons and all other users of Activity Centres; and
- > Raise local community and business awareness of the impacts of parking choices and habits, in particular the social, environmental and economic impacts influencing sustainable transport and the provision of car parking.

3.3.4 Banyule Residential Parking Permit Policy

Banyule City Council currently provides residential car parking permits within the suburb of Greensborough, under the 'Banyule Place: Resident Parking Permit Policy 2016-2020', aimed to facilitate vehicle access for residents and their visitors, while preserving access for other legitimate road users including cyclists, public transport services, customers, traders, disabled persons and commuters.

The policy deals with residential vehicle parking permits and visitor parking permits, subject to adjacent on-street parking restrictions and has been included in the residential parking permit scheme.

Whilst a residential parking permit does not guarantee that a parking space will be available at all times, applicants must meet the following requirements:

1. *Be a resident of the municipality in a property adjacent to prohibitive parking restrictions (i.e. No Stopping, No Parking, or a Permit Zone) or adjacent to timed restrictions of one hour or greater.*
2. *The ground floor frontage of the building must be residential in nature.*
3. *For higher density development with an occupancy permit issued after 8 November 2010, there are four (4) or less dwellings on the lot.*

Under the policy, property owners who lease their property or vacant land will not be eligible to apply for a permit. Resident Parking Permits will not be issued to properties used for commercial purposes.

Permits are limited to the following numbers for select areas based on dwelling numbers/types:

- > Single dwelling on a lot – Up to 2 residential and 2 visitor parking permits;
- > Higher density developments (built before 8th Nov. 2010) – Up to 2 residential and 2 visitor parking permits;
- > Higher density developments (built after 8th Nov. 2010, ≤4 dwellings on the lot) – either 1 residential or 1 visitor parking permit; and
- > Higher density developments (built after 8th Nov. 2010, >4 dwellings on the lot) – not provided with parking permits.

The issuing and renewal of residential parking permits is subject to the following annual fees:

- | | |
|-----------------------------|---------------|
| > First residential permit | Free |
| > Second residential permit | \$25 per year |
| > First visitor permit | \$40 per year |
| > Second visitor permit | \$60 per year |

It is noted that Concession Card Holders and Disabled Parking Permit Holders are eligible for a reduced fee (\$10 per year) for the first Visitor Permit.

Within the study area, a variety of parking options are available including all day parking in off-street car parks and time-restricted on-street parking in the retail core and unrestricted parking in the outer areas.

3.3.5 Banyule On-Street Parking Management Framework

The Banyule On-Street Parking Management Framework was established in June 2017 and seeks to provide a transparent mechanism that ensures a consistent, equitable and balanced approach to the management of on-street public car parking facilities through the municipality. Importantly, the document provides guidance for the introduction of new parking restrictions or the modification of existing conditions where a road safety hazard has been identified, or where parking spaces are in high demand.

The policy recognises that parking demands around Banyule's activity centres, schools and railway stations is increasing, with traffic and parking concerns some of the key issues voiced by residents of the municipality. As a consequence, Council is required to ensure that car parking is managed appropriately within each municipality and available car parking be allocated appropriately to meet user demands, both within Activity Centres and residential areas.

The key objectives of the Framework are outlined as follows:

- > Provide a framework to manage parking to respond to the needs of the community;
- > Provide a transparent process for consultation and decision making;
- > Promote a safe, accessible and sustainable road environment for all users;
- > Protect residential amenity while providing equitable access to on-street parking, and safe access for all road users;
- > Facilitate access to commercial activities and other community facilities while balancing the needs of residents;
- > Ensure parking improves community safety, amenity and economic activity; and
- > Promote walking, cycling and the use of public transport.

The principles underpinning the management of on-street public car parking are:

- > On-street parking will be managed as a limited, shared resource;
- > Parking controls will be used to encourage residents and business operators to use alternative modes of transport such as walking, cycling and public transport;
- > The safety of all road users will be Council's highest priority when considering the allocation of kerbside space;
- > Due consideration will be given to the needs of all road users in the allocation of available on-street car parking spaces, prioritising on the needs of the abutting land uses;
- > On-street parking will be managed to achieve an average parking occupancy of 85% during peak demand periods;
- > Parking controls will be clearly signposted, and where possible, parking controls will be simple and locally consistent in order to minimise the risk of unintentional breaches;
- > Council will ensure that occupants of nearby properties will have an opportunity to comment on proposed changes to parking controls; and
- > Parking restrictions will only be implemented where there is a demonstrated need over a long period.

3.3.6 Banyule Municipal Strategic Statement – Clause 21.00 of the Banyule Planning Scheme

Under Clause 21.00 of the Banyule Planning Scheme, the Municipal Strategic Statement (MSS) identifies Greensborough as:

- > The major commercial centre in Banyule, serving the north-east region of outer metropolitan Melbourne;
- > Home to significant industrial areas; and
- > One of the three primary focus areas for office development.

In this regard, Greensborough has good access to main roads, public transport, proximity to an established shopping centre, good accessibility to other businesses and a suitable workforce.

The MSS identifies Greensborough and Briar Hill as significant industrial areas seen as important generators of employment and economic activity within the municipality, which require continuous and ongoing support. The same goes for the retail and commercial sector, which is largely represented by the Greensborough Activity Centre.

3.3.7 Banyule Integrated Transport Plan 2015-2035

On 19 October 2015, Council adopted the new Banyule Integrated Transport Plan 2015-2035, delivering strategic support to provide a long-term direction for transport and land use decisions in the wider municipality.

The Banyule Integrated Transport Plan (BITP) is a high level strategic document that provides an overall framework to address transport issues and create a more accessible, safe, sustainable and active community.

The strategic objectives of the BITP are to:

- > Support transport accessibility and mobility;
- > Encourage active and public transport use;
- > Prioritise sustainable transport modes before private vehicles on local streets; and
- > Advocate on transport issues to ensure the best local outcomes.

The development of the Greensborough Parking Plan is aligned with Action 54 within the Banyule ITP, which identifies the specific need for the development of Parking Plans and Parking Overlays for the Greensborough Activity Centre (amongst others). In accordance with the action schedule, these plans/overlays were set to be rolled out between 2015-2019.

Furthermore, the Banyule ITP identifies an increasing demand for parking around its activity centres. Banyule residents previously rated traffic and car parking concerns as some of the key issues in their local areas. Many of the streets within Banyule do not have enough space to provide all residents with an on-street car parking space, which provides challenges to ensure existing spaces are managed appropriately.

located adjacent to retail and educational precincts, under the guidance of Council and their experiences with parking characteristics in the area.

4.2 Parking Precincts – Zone A

A further description of parking precincts within Zone A (the GMAC) have been detailed below and in Figure 4-2.

4.2.1 Precinct A – Woolworths Shopping Centre

Precinct A encompasses the Woolworths Shopping Centre building, the dual level car park as well as the adjoining petrol station. The site is bounded by Grimshaw Street, Henry Street and Ester Street.

4.2.2 Precinct C - Henry Street Precinct

The precinct consists of a variety of mixed-use strip shops with a high proportion of cafes/restaurants. Precinct C is considered one of three main GMAC parking areas, with a large at-grade car parking area accounting for the majority of the precinct area.

4.2.3 Precinct D – Greensborough Plaza

Greensborough Plaza Shopping Centre makes up the majority of this precinct. The remainder of Precinct D comprises strip shops along Main Street and Grimshaw Street. Precinct D is bound by Grimshaw Street, Main Street and The Circuit and is considered one of the three main GMAC parking areas.

4.2.4 Precinct E – Eastern Precinct

The Eastern Precinct (also known as the Carter Reserve precinct) contains a mixture of land uses including retail uses, office uses, off-street multi-level car parking, the WaterMarc leisure centre, and the One Flintoff development housing Council offices. The retail component consists of strip shops fronting onto Main Street with access from a rear laneway. With an at-grade car park and multi-level car park, the Eastern Precinct is considered one of the three main GMAC parking areas.

4.2.5 Precinct F - Stubbley Court Area

Stubbley Court is located in the centre of Precinct F and is surrounded by Grimshaw Street, Howard Street, Warwick Road and Eldale Avenue. The area consists almost entirely of residential properties, with smaller medical uses located throughout.

4.2.6 Precinct G - Medical Precinct

Bound by Grimshaw Street, Eldale Avenue and Warwick Road, this precinct consists mainly of residential, medical and health care properties. The Banyule Health Service is the major property attracting considerable patronage within the precinct, with associated medical practices, a day care and aged care facility.

4.2.7 Precinct H - Residential/Office Area

This precinct includes medium and low density housing as well as some medium density offices. It is noted that a Centrelink facility is located along the southern boundary of Precinct H.

4.2.8 Precinct I – Residential Area

This precinct includes low density residential housing.

4.2.9 Precinct J - Greensborough Train Station

This area encompasses the Greensborough Train Station and the associated unrestricted at-grade parking area owned and operated by Metro Trains, designated for use by public transport commuters.

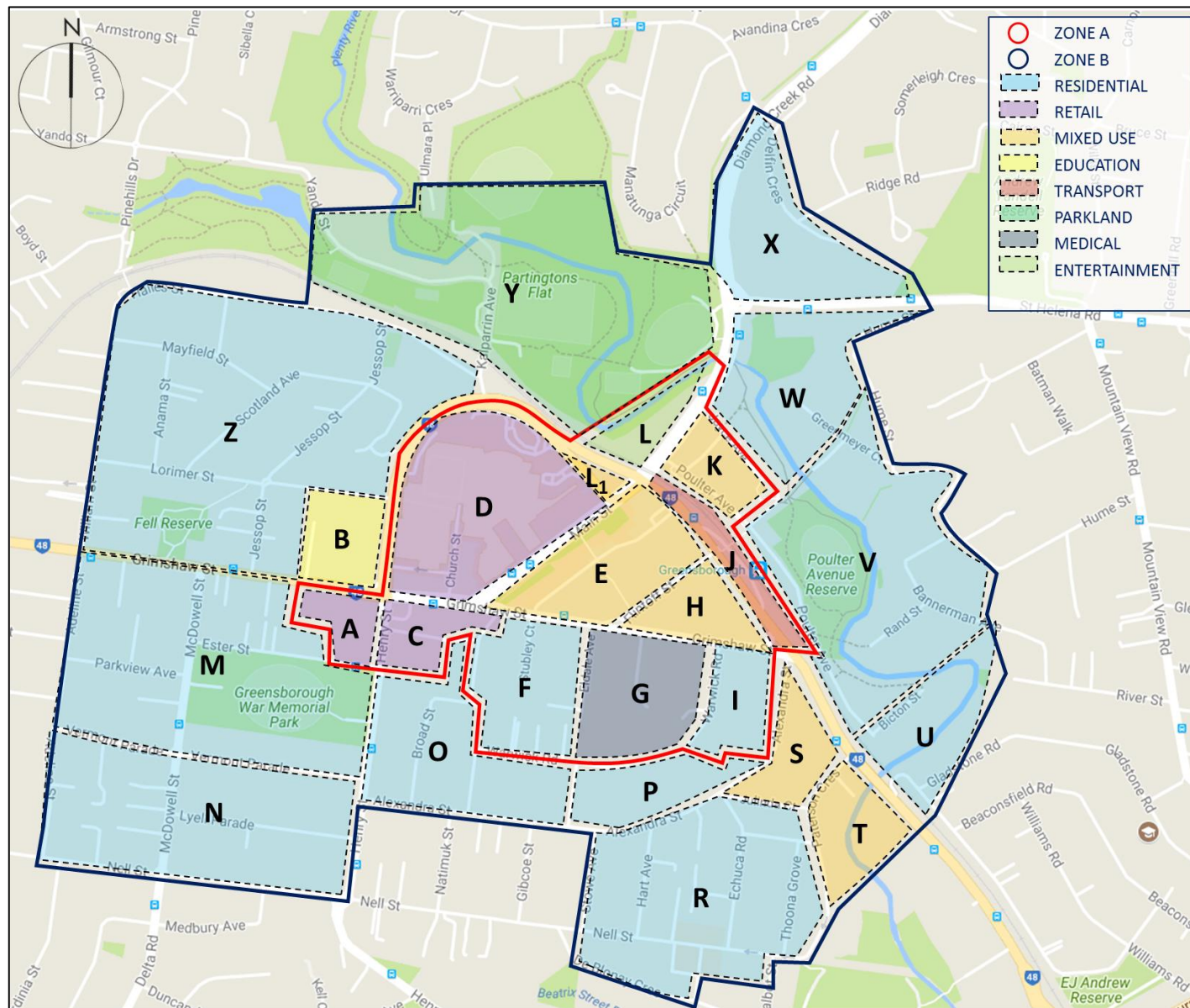
4.2.10 Precinct K - Mixed Uses

This precinct contains the north-eastern strip shops on Main Street which are provided with parking at the front and rear of these tenancies. Shops consist of a variety of retail uses.

4.2.11 Precinct L and L1 - RSL Area

The precinct is located north and south of the railway line. North of the railway, Precinct L comprises the RSL building on the corner of The Circuit and Main Street as well as some off street parking. South of the railway, Precinct L1 mainly consists of mixed-use strip shops with some rear parking and access provided.

Figure 4-2 Study Area – Greensborough Major Activity Centre and Surrounding Areas



5 Existing Car Parking Conditions

5.1 Existing Car Parking Supply

5.1.1 General

Cardno commissioned Matrix Traffic and Transport Data to undertake an inventory of the on and off-street parking supply within the GMAC study area (refer Figure 4-2). The total parking supply for each precinct within Zones A and B is outlined in Table 5-1, with a breakdown of the on and off-street parking supply included. The off-street car parking supply comprises a number of distinct categories including, but not limited to:

- > Council/Public Authority owned public car parks such as components of the WaterMarc multilevel car park and components of the Eastern Precincts;
- > Privately owned parking available to the public, such as Greensborough Plaza, Woolworths supermarket, KFC and adjacent tenancies;
- > Private staff parking spaces include secured spaces and informal parking located at the rear of shops throughout back-of-house areas; and
- > The informal gravel car park located at the corner of Para Road and Flintoff Street. Cardno's site observations indicate the car park is predominately utilised for parking by rail commuters and accommodates approximately 76 vehicles.

Table 5-1 incorporates all available parking to enable a true representation of car parking demand to be determined in the subsequent stages of this report.

Table 5-1 GMAC Car Parking Supply as at September 2017 – On Street vs. Off-Street

Zone	Precinct	On-Street	Off-Street	Total
A	A	-	221	221
	C	-	386	386
	D	39	2,664	2,703
	E	38	533	571
	F & G	121	171	292
	H	51	-	51
	I	50	-	50
	J	-	225	225
	K	26	79	105
	L	14	98	112
	L1	11	20	31
B	B	25	-	25
	M	237	180	417
	N	250	-	250
	O	218	-	218
	P	59	-	59
	R	351	-	351
	S	38	-	38
	T	13	-	13
	U	19	-	19
	V	204	-	204

Zone	Precinct	On-Street	Off-Street	Total
	W	72	-	72
	X	61	-	61
	Y	155	101	256
	Z	480	-	480
Total		2,532	4,678	7,210

Table 5-1 indicates that the total parking supply within the study area consists of 7,210 spaces during typical peak parking times, made up of 2,532 on-street spaces and 4,678 off-street spaces. Of the total parking supply, 4,747 spaces are located in Zone A, with the remaining 2,463 car parking spaces situated in Zone B.

As a guide, parking restriction types have been classified on the following time bands/parking typology:

- > **Very Short Term** P5, P10, 1/4P, 1/2P and 1P (inclusive) in duration
- > **Short Term** P90min, 2P and 3P (inclusive) in duration
- > **Medium Term** 4P and 5P (inclusive) in duration
- > **Long Term** Unrestricted parking
- > **Other** Includes private parking areas, disabled bays and permit zones
- > **Total** Excludes loading bays, bus bays, taxi bays and no standing zones

It is noted that in areas where more than one restriction type occurs, the restriction deemed as the most dominant (based on proportion of duration over a day/week) has been selected as the most appropriate restriction to apply in the analysis.

A breakdown of parking supply based on restriction types per precinct has been included in Table 5-2.

Table 5-2 GMAC Parking Supply September 2017 – Overall Restriction Types

Zone	Precinct	Very Short Term	Short Term	Medium Term	Long Term	Other	Total
A	A	-	221	-	-	-	221
	C	-	125	-	255	6	386
	D	49	2,521	105	-	28	2,703
	E	49	361	-	134	27	571
	F & G	12	87	26	150	17	292
	H	11	21	-	19	-	51
	I	-	-	-	50	-	50
	J	3	-	-	216	6	225
	K	-	-	84	-	21	105
	L	13	-	-	60	39	112
	L1	11	20	-	-	-	31
Zone A Subtotal		148 (3%)	3,356 (70%)	215 (5%)	884 (19%)	144 (3%)	4,747
B	B	-	-	-	24	1	25
	M	-	20	-	355	42	417
	N	-	-	-	250	-	250
	O	-	8	-	210	-	218
	P	-	-	-	59	-	59
	R	-	14	-	337	-	351
	S	9	-	-	29	-	38

	T	-	-	-	13	-	13
	U	-	12	-	7	-	19
	V	-	23	17	164	-	204
	W	-	-	16	56	-	72
	X	-	-	-	61	-	61
	Y	2	16	33	197	8	256
	Z	10	20	-	450	-	480
Zone B Subtotal		21 (1%)	113 (4%)	66 (3%)	2,212 (90%)	51 (2%)	2,463
Study Area Total		169 (2%)	3,469 (48%)	281 (4%)	3,096 (43%)	195 (3%)	7,210

Table 5-2 indicates that Zone A is primarily comprised of short term spaces (70%), indicative of the parking demands of the dominant retail presence in the zone. Furthermore, the Greensborough Plaza car parking supply attributes to approximately 75% of all short term spaces situated in Zone A. It is noted that the majority of 'Other' restriction types located in Zone A were found to be tenancy-specific private car parking for staff and visitors, as well as accessible parking bays distributed throughout the zone.

As was anticipated, 90% of the entire parking supply located in Zone B was found to be long-term in nature, commensurate to the dominant residential use of this portion of the study area.

Residential precincts located within Zone A provide on-street spaces which are typically protected by short-term parking restrictions to discourage overspill of parking demands into residential streets. Conversely, residential precincts located in the Zone B study area provide on-street spaces which largely offer long-term or unrestricted car parking with some short-term restrictions applied to the streets located closer to the GMAC core.

5.2 Car Parking Demand

5.2.1 General

Parking demands vary throughout the day and week with the busiest days within an Activity Centre typically occurring on a Thursday/Friday and Saturday. As such, to quantify car parking demand characteristics within the study area, Cardno commissioned Matrix Traffic and Transport Data to undertake occupancy and duration of stay surveys during the following dates and times:

- > Thursday 7th September 2017 at hourly intervals from 7:00am until 10:00pm; and
- > Saturday 9th September 2017 at hourly intervals from 7:00am until 10:00pm.

The chosen survey days are considered 'typical' days and specifically did not include days during school holiday periods. It is noted that in Activity Centre locations with high retail land uses such as Greensborough, there is naturally a higher level of activity close to and during holiday periods. In particular, additional peak activity can be expected to occur during December, which can be attributed to increasing retail car parking demand.

The duration of stay survey data provided to Cardo was also utilised to determine peak occupancies across the survey days. A summary of these surveys are shown in the following sections, with details of each precinct included. A detailed breakdown of the survey data has been included in Appendix D of this report.

N.B. It is noted that on Thursday 7th September, 2017, Metro Trains Melbourne Pty Ltd advised Cardno and Matrix Staff that a Visitors Permit was required to access the Metro-owned parking areas (the majority of the area defined as Precinct J). Consequently, surveys of the Greensborough Station off-street car parks were not able to be undertaken on the above survey dates, with visitor permits eventually granted on Wednesday 13th September, 2017.

Additionally, Cardno were advised by Matrix Traffic and Transport Data that the cameras set up at the Greensborough Plaza and WaterMarc access points across the originally designated survey periods experienced errors in successfully reading all numberplates.

In light of the above occurrences, Cardno recommissioned surveys to be undertaken the following week, mirroring the original survey periods as follows:

- > Thursday 14th September, 2017 at one hour intervals from 7:00am until 10:00pm; and

> Saturday 16th September, 2017 at one hour intervals from 7:00am until 10:00pm.

For the purposes of a simplified analysis, only the original survey period will be referenced in the following sections of this report.

5.2.2 Survey Findings

The survey results indicate that activity within the *overall* study area was greater on Thursday than Saturday as shown in Figure 5-1, with the overall peak parking demand occurring on Thursday at 12:00pm. At this time, 4,174 vehicles were recorded, including parking demand within private parking areas. This equates to a peak occupancy of 58% within the overall study area. During the Thursday peak occupancy period, the recorded demand within Zone A *only* equated to 3,683 vehicles (78% occupancy level). The peak occupancy within Zone B *only* at 12:00pm was recorded as 491 vehicles, equating to an occupancy level of only 20%.

Across the Saturday survey day, peak occupancy for the entire study area also occurred at 12:00pm with 3,413 vehicles recorded including parking demand within private parking areas. This equated to a peak occupancy of 47% at this time. During the Saturday peak occupancy period, the recorded demand within Zone A *only* equated to 3,087 vehicles (65% occupancy level). The peak occupancy within Zone B *only* at 12:00pm was recorded as 326 vehicles, equating to an occupancy level of only 13%. *It is noted that peak occupancy levels within Zone B only on the Saturday was recorded at 7:00pm, when a total of 462 spaces were occupied (17% occupancy level).*

Within the total supply of car parking in the study area, some areas/zones are not provided to be available to the general public, or instead are designated for special users such as Loading Zones and Bus Zones. Consequently, the total supply of car parking has been filtered to deduct these car parking spaces so that *only* car parking that is generally available to the public for short term or longer term durations is included in the analysis of supply and demand.

Parking demand profiles for the Thursday and Saturday survey peak periods have been shown in Figure 5-1.

Figure 5-1 Overall Survey Area Parking Demand Profile – Thursday 7th September, 2017 vs Saturday 9th September, 2017 (12:00pm)

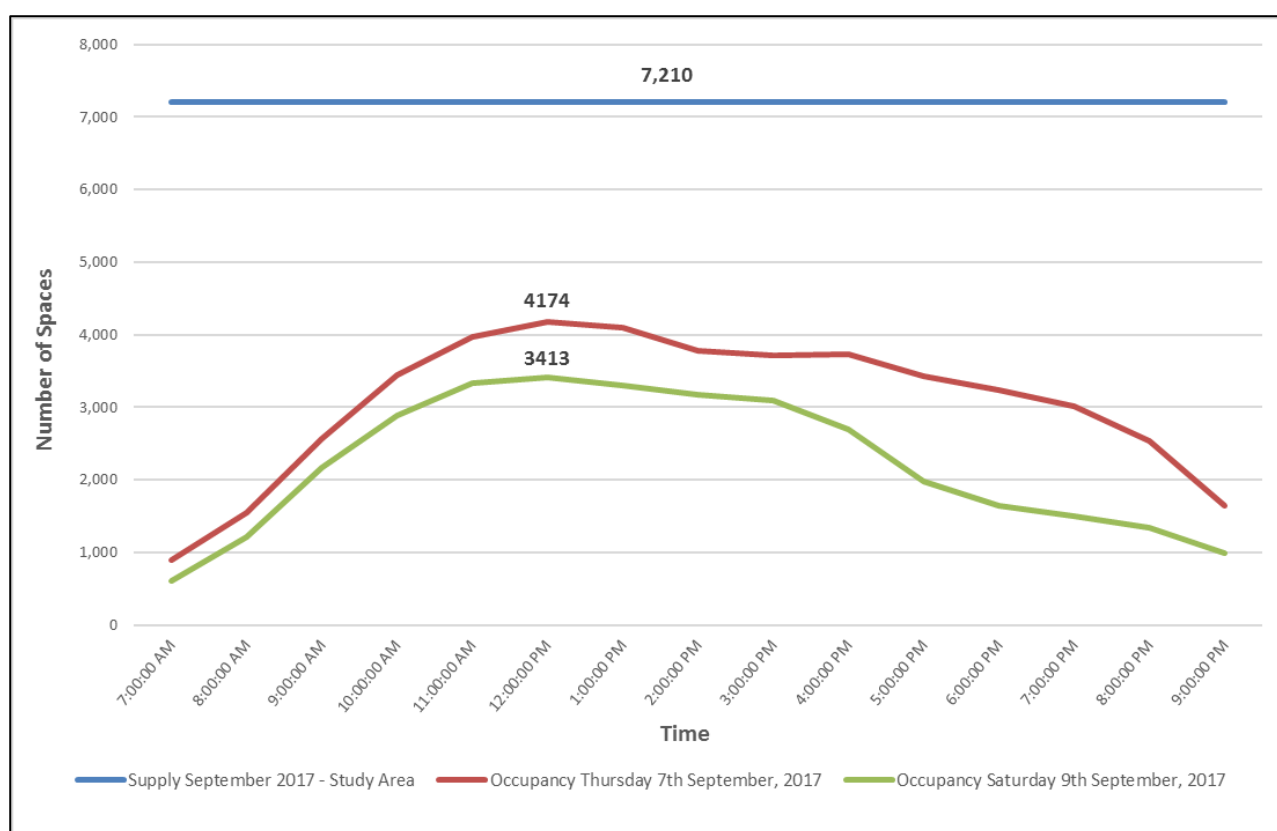


Figure 5-2 Zone A Parking Demand Profile – Thursday 7th September, 2017 vs Saturday 9th September, 2017 (12:00pm)

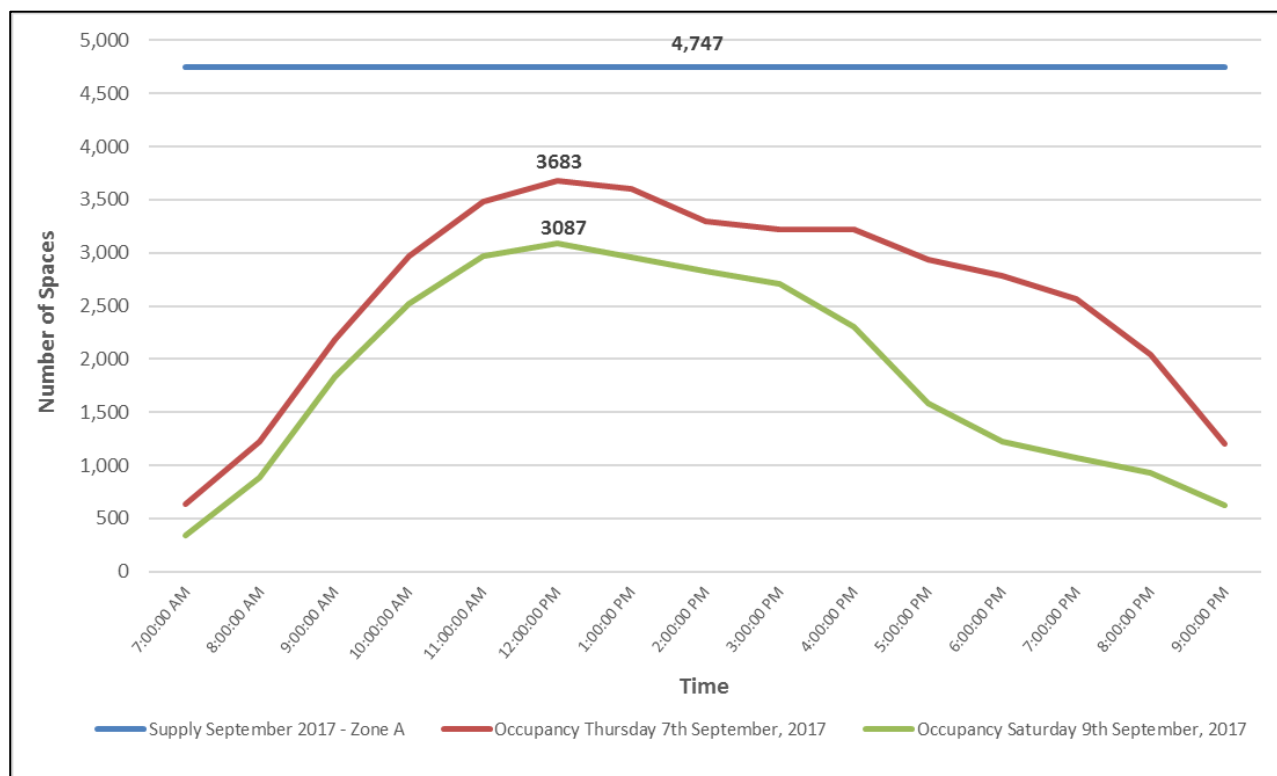


Figure 5-1 and Figure 5-2 both illustrate that the Thursday and Saturday demand curves are similar in shape and tend to reflect a typical retail based activity area (being the major land use occupying Zone A) with 9:00am to 5:00pm operating hours across both survey days, peaking at around midday. Similar demand curves are observed between Zone A only and the overall study area, noting the major differences in demand occurring between 3:00pm and the end of the survey period.

5.2.3 Parking Demand by Precinct at the Overall Peak Period

It is noted that the time of peak parking demand within individual precincts sometimes varies however the study focuses on the overall peak time whilst having regard for localised issues in each precinct.

Figure 5-3 shows car parking occupancies across the study area's precincts at the identified peak period, recorded on the Thursday at 12:00pm. By way of comparison, Figure 5-4 provides an indication of occupancy levels across precinct-specific peak periods, considering *both* the Thursday and Saturday survey periods.

Occupancy levels displayed within Figure 5-3 and Figure 5-4 have been assigned a colour to visually present demand levels. Car parking occupancy levels have been scaled in accordance with the following ranges outlined in Table 5-3.

Table 5-3 Car Parking Occupancy Ranges at Peak Period

	Very Low Demands	0 – 45% occupancy levels at peak periods
	Low Demands	46% – 60% occupancy levels at peak periods
	Moderate Demands	60% – 74% occupancy levels at peak periods
	High Demands	75% - 89% occupancy levels at peak periods
	Very High Demands	90% - 100% occupancy levels at peak periods

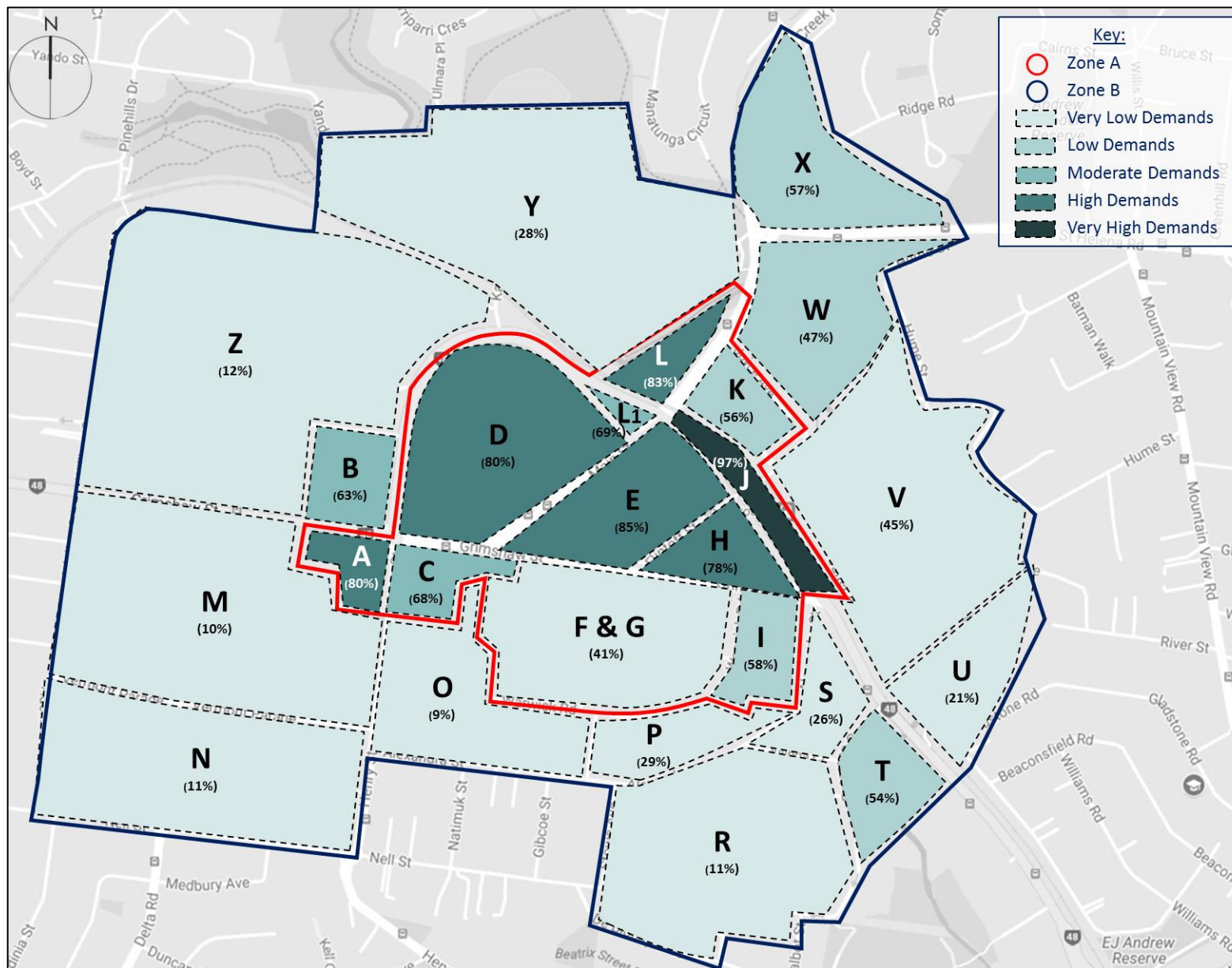
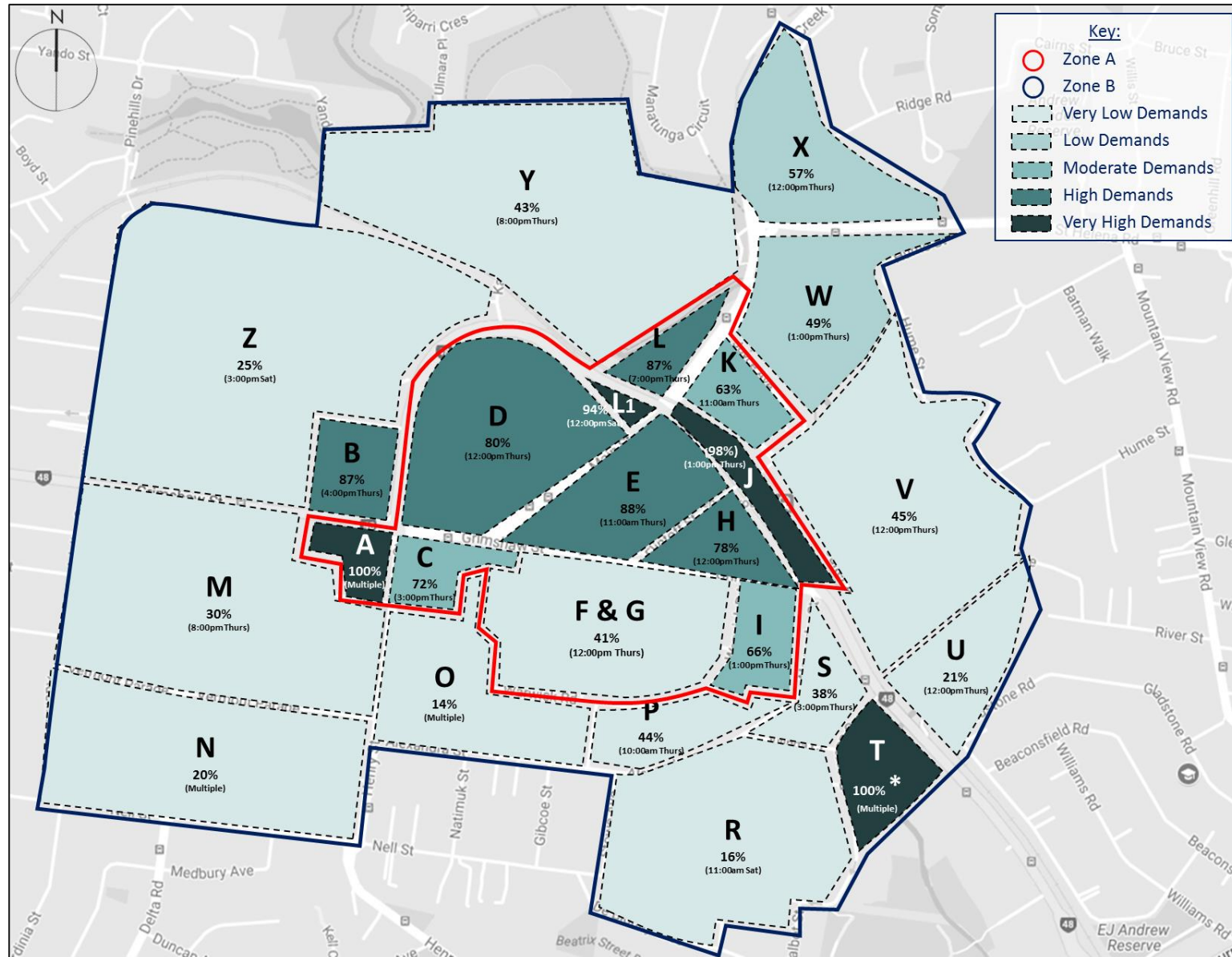
Figure 5-3 Parking Demands by Precinct During the Peak Period – Thursday 7th September, 2017 – 12:00pm


Figure 5-4 Parking Demands by Precinct-specific Peak Periods – Thursday and Saturday Survey Period



*Only 14 spaces were identified within the Precinct T overall car parking supply

5.2.4 Duration-Specific Parking Demands at the Peak Period

A summary of the very short, short, medium and long-term car parking demands at the identified survey peak period is provided in Table 5-4.

Table 5-4 Very Short, Short, Medium and Long-term Car Parking Demands – Thursday 7th September, 2017 (12:00pm)

Zone	Precinct	Very Short Term		Short Term		Medium Term		Long Term		Other		Total	
		Supply	Demand	Supply	Demand	Supply	Demand	Supply	Demand	Supply	Demand	Supply	Demand
A	A	-	-	221	177	-	-	-	-	-	-	221	177
	C	-	-	125	55	-	-	255	207	6	1	386	263
	D	49	32	2,521	2,018	105	96	-	-	28	21	2,703	2,167
	E	49	42	361	306	-	-	134	127	27	12	571	487
	F & G	12	9	87	28	26	10	150	62	17	10	292	119
	H	11	7	21	15	-	-	19	19	-	-	51	41
	I	-	-	-	-	-	-	50	29	-	-	50	29
	J	3	1	-	-	-	-	216	216	6	4	225	221
	K	-	-	-	-	84	48	-	-	21	12	105	60
	L	13	6	-	-	-	-	60	56	39	35	112	97
	L1	11	6	20	16	-	-	-	-	-	-	31	22
Zone A Subtotal		148 (3%)	103 (70%)	3,356 (70%)	2,599 (77%)	215 (5%)	154 (72%)	884 (19%)	716 (81%)	144 (3%)	95 (66%)	4,747	3,683 (78%)
B	B	-	-	-	-	-	-	24	17	1	0	25	17
	M	-	-	20	0	-	-	355	38	42	9	417	47
	N	-	-	-	-	-	-	250	26	-	-	250	26
	O	-	-	8	1	-	-	210	24	-	-	218	25
	P	-	-	-	-	-	-	59	21	-	-	59	21
	R	-	-	14	3	-	-	337	39	-	-	351	42
	S	9	0	-	-	-	-	29	15	-	-	38	15
	T	-	-	-	-	-	-	13	7	-	-	13	7
	U	-	-	12	0	-	-	7	4	-	-	19	4
	V	-	-	23	2	17	2	164	95	-	-	204	99
	W	-	-	-	-	16	1	56	36	-	-	72	37
	X	-	-	-	-	-	-	61	33	-	-	61	33
	Y	2	0	16	12	33	10	197	41	8	0	256	63
	Z	10	0	20	3	-	-	450	52	-	-	480	55
Zone B Subtotal		21 (1%)	0 (0%)	113 (5%)	21 (19%)	66 (3%)	13 (20%)	2,212 (90%)	448 (20%)	51 (2%)	9 (18%)	2,463	491 (20%)
Study Area Total		169 (2%)	103 (61%)	3,469 (48%)	2,620 (76%)	281 (4%)	167 (59%)	3,096 (43%)	1,164 (38%)	195 (3%)	104 (53%)	7,210	4,174 (58%)

Table 5-4 indicates that, during the identified survey peak, long-term parking space demands are relatively high throughout the majority of precincts located in Zone A, with approximately 4 out of every 5 spaces occupied at this time. Conversely, only 1 out of every 5 available long-term spaces in Zone B was occupied at this time, considered a very low level of occupancy.

Furthermore, reflective of the retail presence within Zone A, short-term spaces located within this portion of the study area were observed to generate 'high' demands during the recorded peak period, equivalent to an occupancy rate of 78%. To a slightly lesser extent, very short term spaces situated within Zone A only recorded an occupancy rate of 70% during the identified survey peak. The survey noted that, of the 21 very short term spaces situated within Zone B only, none were occupied at this time.

Survey results indicate that the majority of the 168 available long term spaces at the survey peak situated within Zone A *only* would be suitable in catering to, for example, train commuter or staff demands.

5.2.5 Summary

Overall, across the entire survey period, the higher car parking occupancy is observed generally within Precincts A, B, E, H, J and D, with individual peak occupancy periods recording 'high' to 'very high' demands. Recorded parking demands were generally reflective of the dominant land uses situated in each precinct, whereby it was noted:

- > Precinct A is solely made up of the Woolworths supermarket and associated car parking (short-term restrictions), with the adjoining petrol station currently closed due to renovations. As was anticipated, the peak demand periods were recorded at 6:00pm on the Thursday and at 1:00pm on the Saturday, when the car parking areas were fully occupied;
- > Precincts F & G and I primarily contain medical uses with surrounding residential properties. Surveys recorded occupancy levels of 41% and 66% at precinct specific peak periods, respectively. Although considered low levels of occupancy, it is noted that Cardno's site inspection noted a considerable number of cars parked along the southern side of Grimshaw Street in a No Stopping Zone, with other areas in the immediate vicinity of the medical uses highly occupied. Consequently, the low levels of demand recorded are likely due to low occupancy levels within residential pockets to the south of these precincts showing very low levels of occupancy, with usage of paid off-street parking in these precincts also notably low;
- > Car parking occupancy within Precincts C and E range from between moderate to high demand levels (72% - 88%) at precinct-specific peak periods. Occupancy levels within long-term spaces reached 86% in these precincts at the overall study peak period, with demands generally associated with retail/commercial off-site staff and train commuter parking; and
- > Precinct L (the RSL precinct) was noted to near capacity during lunch and evening meal periods on the Thursday only, operating well within capacity during other periods across the Thursday and all day throughout the Saturday.

The parking demands generated within each precinct across the identified survey peak period reveal that the *majority* of the precincts are reasonably well serviced by the existing on and off-street parking provision, with most operating with spare capacity during peak periods and at all other times. Zone B appears to be underutilised compared to Zone A, reflective of the 'residential' nature of this portion of the study area.

Exceptions to the above are precincts J (Railway Precinct) and surrounding precincts D, E, H and L, where it can be seen that the recorded parking occupancy levels are approaching capacity on the Thursday. This is consistent with the operating nature of these precincts, situated in the core of GMAC. Observations of the available all day parking surrounding the railway station indicate a potential under supply of parking for train commuters proximate to the station. This is further reinforced by the recorded peak period demands within residential Precincts to the immediate north of the station recording higher occupancy levels within long-term parking areas as compared to those situated further south. Furthermore, an abundant availability of parking within Precinct J was noted during the Saturday peak, with an occupancy rate of only 37% (as compared to 98% on the Thursday peak).

Consistent with the results of the parking occupancy surveys undertaken during April and August of 2006, the peak parking demand on Thursday was higher than the Saturday survey day. This is typical of Activity Centres due to the influence of office, commercial and commuters during a typical weekday period. It is, however, noted that the peak parking demand was found to occur at 12:00pm on both survey days. This may be due to the fact that approximately 31% of the overall parking supply is associated with the Greensborough Plaza Precinct, found to peak on both survey days at 12:00pm.

5.3 Car Parking Duration of Stay

5.3.1 Duration of Stay Trends

As part of the development of the Greensborough Parking Plan, it will be important to understand what classification of parking is available throughout the study area for a variety of users such as residents, employees, staff, train commuters and visitors to the retail, entertainment and medical precincts. As such, it will be important to understand whether existing restriction types surrounding key land uses throughout the study area are currently meeting the demands of the end user.

To the same effect, the subsequent analysis provides an insight into those parking zones within the study area where restriction periods are greater than the most frequently observed parking durations. As noted in Section 5.2.1, Cardno commissioned Matrix Traffic and Transport Data to undertake duration of stay surveys during the following dates and times:

- > Thursday 7th September 2017 at hourly intervals from 7:00am until 10:00pm; and
- > Saturday 9th September 2017 at hourly intervals from 7:00am until 10:00pm.

Duration of stay trends observed during both survey days have been identified in Table 5-5 and Table 5-6. As previously advised, parking restriction types have been classified on the following time bands:

- > **Very Short Term** P5, P10, 1/4P, 1/2P and 1P (inclusive) in duration
- > **Short Term** P90min, 2P and 3P (inclusive) in duration
- > **Medium Term** 4P and 5P (inclusive) in duration
- > **Long Term** Unrestricted parking

Table 5-5 Duration of Stay Trends – Thursday 7th September, 2017

Zone	Precinct	Common Parking Restriction Types(s) by % of Overall Supply	Common Parking Durations Recorded	Average Duration of Stay (h:mm)
A	A	Short-Term (100%)	Very Short-Term (62%)	1:32
	C	Long-Term (66%)	Very Short-Term (46%)	3:10
	D	Short-Term (93%)	Very Short-Term (48%)	2:26
	E	Short-Term (63%)	Short-Term (55%)	2:22
	F & G	Long-Term (51%)	Very Short-Term (47%)	2:51
	H	Short-Term (41%)	Very Short-Term (68%)	2:45
	I	Long-Term (100%)	Long-Term (46%)	6:10
	J	Long-Term (96%)	Long-Term (68%)	8:16
	K	Medium-Term (80%)	Very Short-Term (38%)	2:44
	L	Long-Term (54%)	Very Short-Term (43%)	2:16
	L1	Short-Term (65%)	Very Short-Term (65%)	1:36
B	B	Long-Term (96%)	Very Short-Term (40%)	3:15
	M	Long-Term (85%)	Short-Term (44%)	2:52
	N	Long-Term (100%)	Very Short-Term (36%)	3:46
	O	Long-Term (100%)	Short-Term (34%)	4:20
	P	Long-Term (100%)	Very Short-Term (57%)	2:48
	R	Long-Term (100%)	Very Short-Term (41%)	4:18
	S	Long-Term (76%)	Very Short-Term (32%)	4:14
	T	Long-Term (100%)	Short-Term (50%)	3:20
	U	Short-Term (63%)	Medium-Term (33%)	4:30

Zone	Precinct	Common Parking Restriction Types(s) by % of Overall Supply	Common Parking Durations Recorded	Average Duration of Stay (h:mm)
	V	Long-Term (80%)	Long-Term (60%)	7:07
	W	Long-Term (78%)	Long-Term (62%)	6:34
	X	Long-Term (100%)	Long-Term (70%)	7:14
	Y	Long-Term (77%)	Short-Term (42%)	2:45
	Z	Long-Term (94%)	Very Short-Term (43%)	3:13

Table 5-6 Duration of Stay Trends – Saturday 9th September, 2017

Zone	Precinct	Common Parking Restriction Types(s) by % of Overall Supply	Common Parking Durations Recorded	Average Duration of Stay (h:mm)
A	A	Short-Term (100%)	Short-Term (49%)	1:39
	C	Long-Term (66%)	Very Short-Term (55%)	2:05
	D	Short-Term (93%)	Short-Term (49%)	2:20
	E	Short-Term (63%)	Very Short-Term (53%)	1:53
	F & G	Long-Term (51%)	Very Short-Term (49%)	2:39
	H	Short-Term (41%)	Very Short-Term (74%)	1:26
	I	Long-Term (100%)	Long-Term (33%)	4:53
	J	Long-Term (96%)	Long-Term (50%)	5:45
	K	Medium-Term (80%)	Very Short-Term (44%)	2:43
	L	Long-Term (54%)	Short-Term (46%)	2:39
	L1	Short-Term (65%)	Very Short-Term (60%)	1:51
B	B	Long-Term (96%)	Short-Term (36%)	4:28
	M	Long-Term (85%)	Very Short-Term (38%)	3:12
	N	Long-Term (100%)	Very Short-Term (39%)	4:27
	O	Long-Term (100%)	Short-Term (33%)	4:37
	P	Long-Term (100%)	Long-Term (37%)	4:52
	R	Long-Term (100%)	Long-Term (31%)	5:14
	S	Long-Term (76%)	Very Short-Term (44%)	3:18
	T	Long-Term (100%)	Very Short-Term (54%)	2:13
	U	Short-Term (63%)	Very Short-Term (50%)	3:30
	V	Long-Term (80%)	Long-Term (38%)	5:43
	W	Long-Term (78%)	Short-Term (51%)	3:24
	X	Long-Term (100%)	Short-Term (36%)	4:51
	Y	Long-Term (77%)	Short-Term (44%)	2:13
	Z	Long-Term (94%)	Short-Term (35%)	3:26

Table 5-5 and Table 5-6 indicate that *very short-term* parking demands (up to and including 1 hour in duration) were the most common duration of stay periods recorded throughout all precincts across both survey days, reflective of the operating nature of an activity centre.

Short stay durations are typically representative of servicing retail shoppers, people running errands, pick-up and drop-off points, lunch time trade, hospital/medical visitors and the like. The benefit of short stay car parking is the higher turnover of car parking spaces.

It is, however, noted that the average durations of stay provided serve as a guide only, with average durations in particular areas (especially those experiencing low demands) skewed in the cases of:

- > Parking restrictions being most commonly observed as very short-term or short-term in nature within a precinct, with a high proportion of residual long-term demands recorded as very long-term (i.e. between 10 to 15 hour durations) within that precinct; and
- > Parking restrictions being most commonly observed as long-term in nature within a precinct, with a high proportion of residual short-term demands recorded as being within the very short-term duration bracket (i.e. only up to 1-hour duration of stay).

Examples of the above can be seen in Precincts W and X, as these areas experienced very short-term parking demands as the most common duration type on the Saturday (ranging between 36-51% of all recorded durations), but observed average durations of between 6:34 to 7:14 hours.

5.3.2 Parking Overstay

Understanding car parking shortfalls and / or surpluses within very short, short, medium and long term car parking areas is important to determine areas where there may be a more appropriate car parking restriction required. For example, traditionally short-term parking areas experiencing long-term demands may trigger a need for alterations to parking restrictions to better accommodate these demands. In essence, it is imperative to understand how various land uses within each precinct attract demands for short, medium and long term parking options.

A review of the duration of stay survey data indicates that, in general, parking overstay is only prevalent in a small number of precincts located in the study area, with 10 of the 25 precincts recording zero overstay vehicles across both survey days. Figure 5-5 and Figure 5-6 have been prepared to provide an overall summary of the number of overstay vehicles within each study area precinct as a percentage relative to the net demands observed.

Figure 5-5 Percentage of Parking Overstay per Precinct: Zone A – Thursday 7th September, 2017 vs Saturday 9th September, 2017

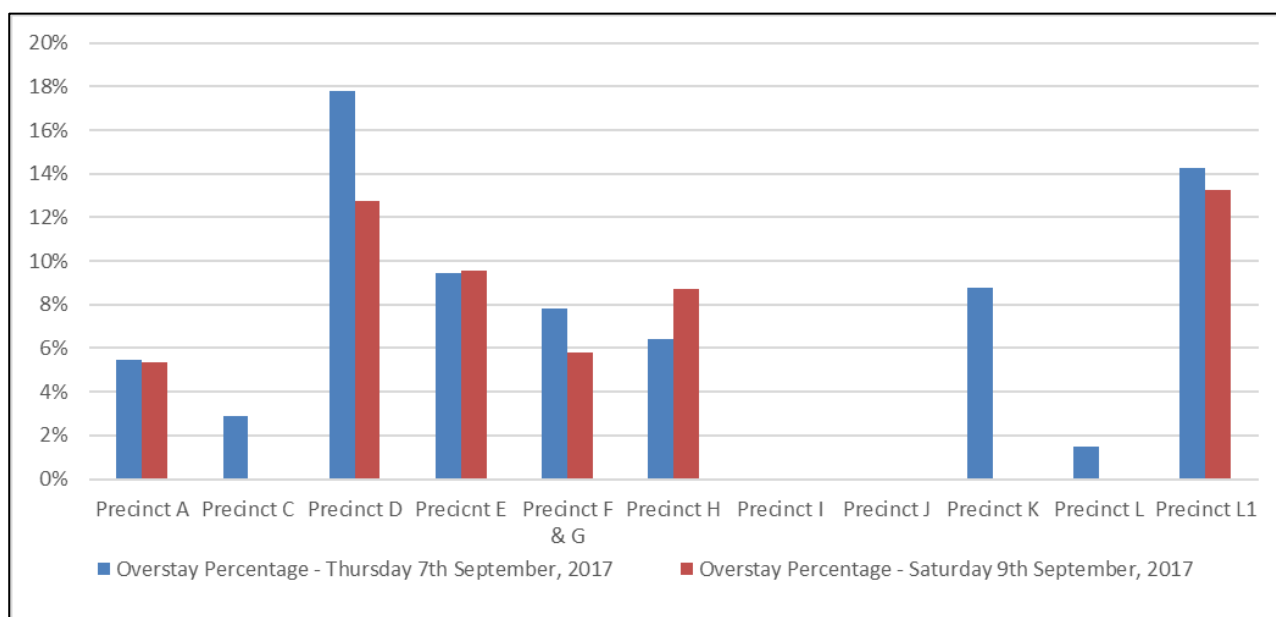
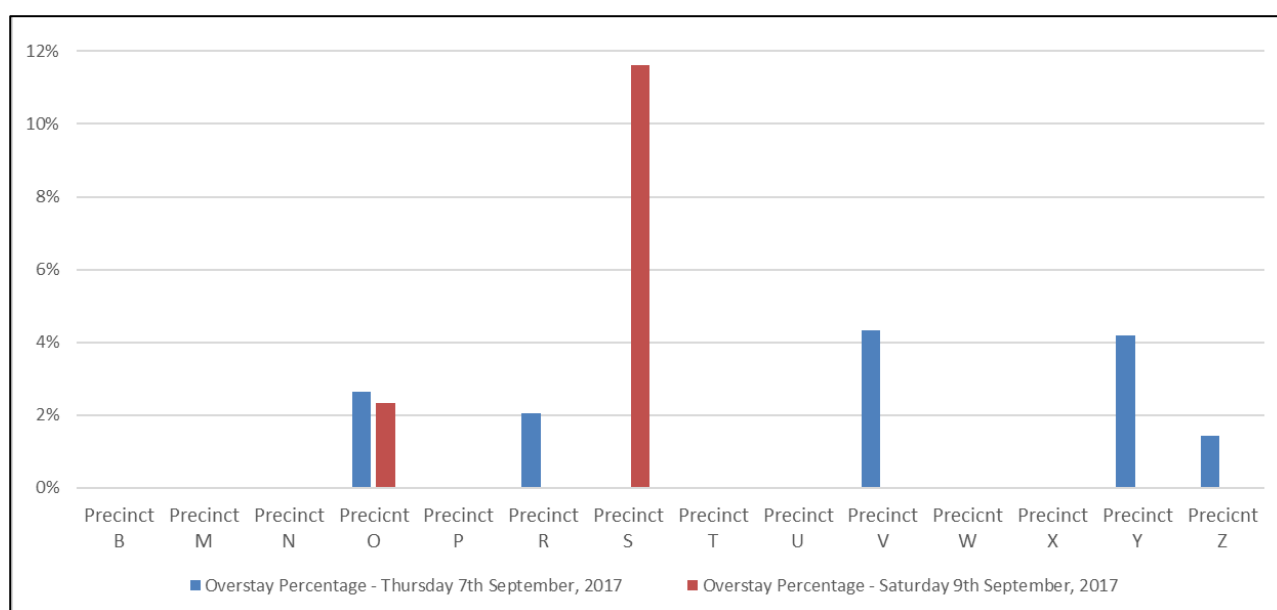


Figure 5-6 Percentage of Parking Overstay per Precinct: Zone B – Thursday 7th September, 2017 vs Saturday 9th September, 2017



It is difficult to ascertain the exact number of overstay vehicles situated within residential precincts as it is hard to determine, of the recorded vehicles, which vehicles were in possession of a residential parking permit (these were not recorded). An example of this is within Precinct S on the Saturday, where 5 out of 43 total vehicles parked within the precinct overstayed their respective parking restrictions.

The following is noted in regard to parking overstay observations:

- > Zone A recorded the largest overall overstay percentages per precinct, with only Precincts I and J recording no overstay vehicles. This is likely due to the long-term nature of the parking restrictions in effect within these two particular precincts;
- > Train commuter and commercial staff demands (long-term) are known to be higher during weekday periods as opposed to weekends, likely contributing to overstays noted in precincts situated in the vicinity of major destination points such as Greensborough Plaza and Greensborough Train Station;
- > Overstay percentages across the study area were generally recorded as being greater on the Thursday, with exceptions being Precincts H and S. An overstay percentage of approximately 12% was recorded on the Saturday survey period within Precinct S, likely due to high parking demands generated by peak activity at the swimming academy. As previously noted, the exact number of overstay vehicles in possession of a residential parking permit is not known;
- > A significant portion of short-term restriction types throughout the entire study area are in effect between Monday-Friday only. The reduction between overstay numbers (shown as a percentage of overall vehicles parked in a precinct) between the Thursday and Saturday suggests that the non-application of many short-term parking restrictions has resulted in a reduction in overstays.

N.B. Overstay calculations for Precinct D have not considered car parking durations observed within the Greensborough Plaza multi-deck car park, as the overall number of vehicles opting to pay for all day parking, staff vehicles and the like could not be determined from the data provided.

Additionally, as parking restrictions vary within the Carter Reserve multi-deck car park (up to and including 3-hour restriction types), it is difficult to gauge levels of overstay across each individual restriction bands. Consequently, durations of stay greater than or equal to 4 hours have been considered overstay vehicles.

Furthermore, staff parking (Banyule Council) was not able to be separated from the survey data. Consequently, the percentage of overstay vehicles shown for Precinct C in Figure 5-5 is estimated to be somewhat inflated that that currently observed.

6 Car Parking Rates

6.1 Background

Cardno has undertaken an assessment of the existing operating conditions of the study area, focusing on centre-wide demands as opposed to precinct-specific car parking usage. Likely car parking rates associated with the various land uses across the study area are able to be used to assess current parking trends, determine areas of underutilisation / overstay and estimate appropriate car parking rates for future developments within the GMAC consistent with current generation levels.

The proposed assessment will rely on the following inputs:

- > Land use data;
- > Current car parking rates for uses contained within the study area;
- > Land located within the Principle Public Transport Network (PPTN);
- > Car parking durations of stay; and
- > Existing car parking supply and demands across the GMAC study area.

6.1.1 Current Land Uses

Existing land use data provided by Banyule City Council indicates that the GMAC study area caters for a range of land categories under the descriptions of the Australian Valuation Property Classification Codes (AVPCC). The majority of these categories are classified as secondary and tertiary codes, whereby under the AVPCC some uses are placed into sub-classifications. For ease of interpretation, land categories have been grouped into more commonly referred to land use terms, that is those as described under Clause 52.06 of the Banyule Planning Scheme. A summary of land use categories and allocated groupings has been provided as Appendix B to this report.

Subsequently, the land use building areas (and other nominated uses) have been grouped by the precincts of the GMAC study area, as identified in Table 6-1 (Zone A) and Table 6-2 (Zone B).

Cardno have been provided with land use summaries from Banyule City Council (received 16th October 2017), assumed to accurately reflect current conditions. Consequently, the following sections of this report are dependent on the accuracy of this data.

N.B. it is noted that the 50,000m² of retail floor area made up by Greensborough Plaza has been sourced from the Economic Information Base Report and Activity Centre Assessment (2017) prepared by Urban Enterprise for the City of Banyule, given floor areas provided within the Council spreadsheet for this particular land use were deemed unusually low (~24,000m²).

Table 6-1 GMAC Study Area Summary of Key Land Use Areas: Zone A – September 2017

Land Use	Unit	Precinct A	Precinct C	Precinct D	Precinct E	Precinct F	Precinct G	Precinct H	Precinct I	Precinct J	Precinct K	Precinct L	Precinct L1	Total Area / No.
Dwelling														
Detached Dwelling	No.	-	-	-	-	29	12	-	12	-	6	-	-	59
Disability Housing		-	-	-	-	-	-	-	-	-	-	-	-	-
Individual Flat		-	-	-	-	-	-	16	2	-	-	-	-	18
OYO Subdivided Dwelling		-	-	-	-	-	-	-	-	-	-	-	-	-
Residential Investment Flats		-	-	-	-	3	-	-	-	9	-	-	-	12
Residential Land (Bldgs add no value)		-	-	-	-	-	-	1	-	-	-	-	-	1
Single Strat Unit / Villa Unit / Townhouse		-	-	-	-	52	21	8	22	-	2	-	-	105
Townhouse		-	-	-	-	-	-	-	-	-	-	-	-	-
Dwelling Total		-	-	-	-	84	33	25	36	-	17	-	-	195
Retail														
Regional	sq m	-	-	50,000	-	-	-	-	-	-	-	-	-	50,000
Retail Store / Showroom		-	-	-	-	-	-	-	-	-	-	248	-	248
Shop		-	833	1,541	2,166	-	-	-	-	-	54	572	258	5,424
Shop and Dwelling (single occupancy)		-	-	-	-	-	-	-	-	-	-	-	-	-
Supermarket		3,510	-	-	-	-	-	-	-	-	-	-	-	3,510
Subtotal		3,510	833	51,541	2,166	-	-	-	-	-	54	820	258	59,182
Food and Drink Premises														
Café	sq m	-	740	478	375	-	-	-	-	-	49	-	-	1,642
Convenience Store / Fast Food		-	280	-	-	-	-	-	-	-	-	-	-	280
Restaurant		-	1,226	-	873	-	-	-	-	-	-	-	-	2,099
Subtotal		-	2,246	478	1,248	-	-	-	-	-	49	-	-	4,021
Office														
Bank	sq m	-	-	373	170	-	-	-	-	-	-	-	-	543
Civic Buildings		-	-	-	4,980	-	-	-	-	-	-	-	-	4,980
Office / Office Premises		-	1,782	451	1,625	-	-	902	-	-	-	-	168	4,928
Office / Factory		-	-	-	-	-	-	-	-	-	-	-	-	-
Strata / Subdivided Office		-	-	421	-	-	-	439	-	-	-	242	248	1,350
Subtotal		-	1,782	1,245	6,775	-	-	1,341	-	-	-	242	416	11,801
Recreational														
Club, Gaming, Stand Alone	Sq m	-	-	-	-	-	-	-	-	-	-	2,460	-	2,460
Community Facility		-	-	125	-	-	-	-	-	-	-	-	-	125
Gymnasium / Health Club		-	343	-	148	-	-	-	-	-	-	-	-	491
Outdoor Park and Facilities		-	-	-	-	-	-	-	-	-	-	-	-	-
Outdoor Sport Grounds		-	-	-	-	-	-	-	-	-	-	-	-	-
Parks and Gardens		-	-	-	-	-	-	-	-	-	-	-	-	-
Swimming Pool / Aquatic Centre		-	-	-	7,000	-	-	-	-	-	-	-	-	7,000
Tennis Club		-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal		-	343	125	7,148	-	-	-	-	-	-	2,460	-	10,076
Place of Assembly														
Place of Worship	sq m	-	-	-	-	-	940	-	-	-	-	-	-	940.00
Religious Hall		-	-	-	-	-	-	-	-	-	-	-	-	-
Religious Residence		-	-	-	-	-	264	-	-	-	-	-	-	264.00
Subtotal		-	-	-	-	-	1,204	-	-	-	-	-	-	1,204
Other (where occupied)														
Aged Care Complex / Nursing Home	sq m	-	-	-	-	-	4,485	-	-	-	-	-	-	4,485
Commercial Land (Bldg add no value)		-	-	-	-	-	-	313	-	-	-	-	-	313
Community Health Centre / Health Clinic		-	-	-	-	263	3,509	-	558	-	-	-	-	4,330
Day Care Centre / Early Childhood Development Centre		-	-	-	-	-	-	-	-	-	-	-	-	-
Fuel Outlet / Garage / Service Station		70	-	-	-	-	-	-	-	-	-	-	-	70
Garage / Motor Vehicle Repairs		-	-	-	-	-	-	-	-	-	267	-	-	267
All Saints Anglican Church Greensborough		-	-	1,462	-	-	-	-	-	-	-	-	-	1,462
Workshop		-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal		70	-	1,462	-	263	7,994	313	558	-	267	-	-	10,927
													Total Sq m	97,211

Table 6-2 GMAC Study Area Summary of Key Land Use Areas: Zone B – September 2017

Land Use	Unit	Precinct M	Precinct N	Precinct O	Precinct P	Precinct R	Precinct S	Precinct T	Precinct U	Precinct V	Precinct W	Precinct X	Precinct Y	Precinct Z	Total Area / No.
Dwelling															
Detached Dwelling	No.	65	72	48	16	122	14	12	20	49	23	21	-	124	586
Disability Housing		1	-	-	-	-	-	-	-	-	-	-	-	1	2
Individual Flat		-	-	2	-	2	-	-	-	-	-	-	-	4	8
OYO Subdivided Dwelling		-	-	-	-	2	-	-	-	-	-	-	-	2	4
Residential Investment Flats		16	-	8	-	-	-	-	-	-	-	-	-	-	24
Residential Land (Bldgs add no value)		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Single Strat Unit / Villa Unit / Townhouse		107	139	44	29	59	21	4	-	-	4	-	2	160	569
Townhouse		-	-	-	-	3	-	-	-	-	-	-	-	-	3
Dwelling Total		189	211	102	45	188	35	16	20	49	27	21	2	291	1,196
Retail															
Regional	Sq m	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Retail Store / Showroom		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shop		-	-	-	-	237	408	-	-	-	-	-	-	-	645
Shop and Dwelling (single occupancy)		-	-	-	-	268	-	-	-	-	-	-	-	-	268
Supermarket		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal		-	-	-	-	505	408	-	-	-	-	-	-	-	913
Food and Drink Premises															
Café	Sq m	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Convenience Store / Fast Food		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Restaurant		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Office															
Bank	Sq m	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Civic Buildings		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Office / Office Premises		-	-	-	-	408	-	-	-	-	-	-	-	-	408
Office / Factory		-	-	-	-	-	-	4,587	-	-	-	-	-	-	4,587
Strata / Subdivided Office		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal		-	-	-	-	408	-	4,587	-	-	-	-	-	-	4,995
Recreational															
Club, Gaming, Stand Alone	Sq m	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Community Facility		-	-	-	-	-	-	-	-	-	-	-	225	-	225
Gymnasium / Health Club		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Outdoor Park and Facilities		-	-	-	-	-	-	-	-	-	36	-	-	-	36
Outdoor Sport Grounds		500	-	-	-	-	-	-	-	-	-	-	1,185	-	1,685
Parks and Gardens		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Swimming Pool / Aquatic Centre		-	-	-	-	-	483	-	-	-	-	-	-	-	483
Tennis Club		-	-	-	-	-	-	-	-	-	-	-	140	-	140
Subtotal		500	-	-	-	-	483	-	-	-	36	-	1,550	-	2,569
Place of Assembly															
Place of Worship	Sq m	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Religious Hall		668	-	-	-	-	-	-	-	-	-	-	-	-	668
Religious Residence		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal		668	-	-	-	-	-	-	-	-	-	-	-	-	668
Other (where occupied)															
Aged Care Complex / Nursing Home	Sq m	-	1,875	-	-	-	-	-	-	-	-	-	-	-	1,875
Commercial Land (Bldg add no value)		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Community Health Centre / Health Clinic		125	-	-	-	-	-	-	-	-	-	-	-	196	321
Day Care Centre / Early Childhood Development Centre		230	-	-	-	-	-	-	-	-	260	-	-	-	490
Fuel Outlet / Garage / Service Station		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Garage / Motor Vehicle Repairs		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Telecommunication Buildings / Maintenance Depots		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Workshop		-	-	-	-	-	60	-	-	-	-	-	-	-	60
Subtotal		355	1,875	-	-	-	60	-	-	-	260	-	-	196	2,746
														Total Sq m	11,891

Table 6-1 and Table 6-2 indicate that the majority of floor areas are accounted for by six (6) key overarching land uses, being: Residential, Retail, Food and Drink, Office, Recreational and Place of Assembly uses. Other common land uses identified include Aged Care, Health Clinic, Childcare Centre and Garage/Motor Vehicle Repairs uses.

As noted in the City of Banyule Activity Centre Assessment 2017, Greensborough Plaza consists of approximately 50,000 square metres of retail floor space and is the primary retail destination within the MAC. This accounts for approximately 83% of the overall retail (shop) use within the study area. In contrast, Zone B is primarily consisted of residential dwellings, with approximately 86% of all dwellings situated in the study area located in this Zone.

6.1.2 Travel Behaviour

6.1.2.1 ABS Census Data

Car Ownership Data

Further analysis of the study area, with respect to the 2016 Census ABS data for 10 Statistical Area Level 1 (SA1) regions as defined within Figure 6-1, is presented in Table 6-3. This review indicates that within the Greensborough Central Activities Area, car ownership rates decrease slightly when compared to the suburb of Greensborough as a whole.

SA1 regions are geographical areas built from Mesh Blocks which are defined as the smallest geographical area defined by the Australian Bureau of Statistics (ABS) which form the building blocks for the larger regions of the Australian Statistical Geography Standard (ASGS). SA1s generally have a population of 200 to 800 persons, with an average population of about 400 persons, and are designed to be either urban or rural.

It is noted that a number of areas within the Greensborough study area do not fall within the available SA1 boundary as indicated within Table 6-1. For the purpose of this assessment, only SA1 regions that are at least 50% encompassed within the study area are considered. Two SA1 regions to the north, which form part of the study area, have been excluded due to the nature of land use within the regions' boundaries.

Figure 6-1 Greensborough Study Area Statistical Area Level One Regions

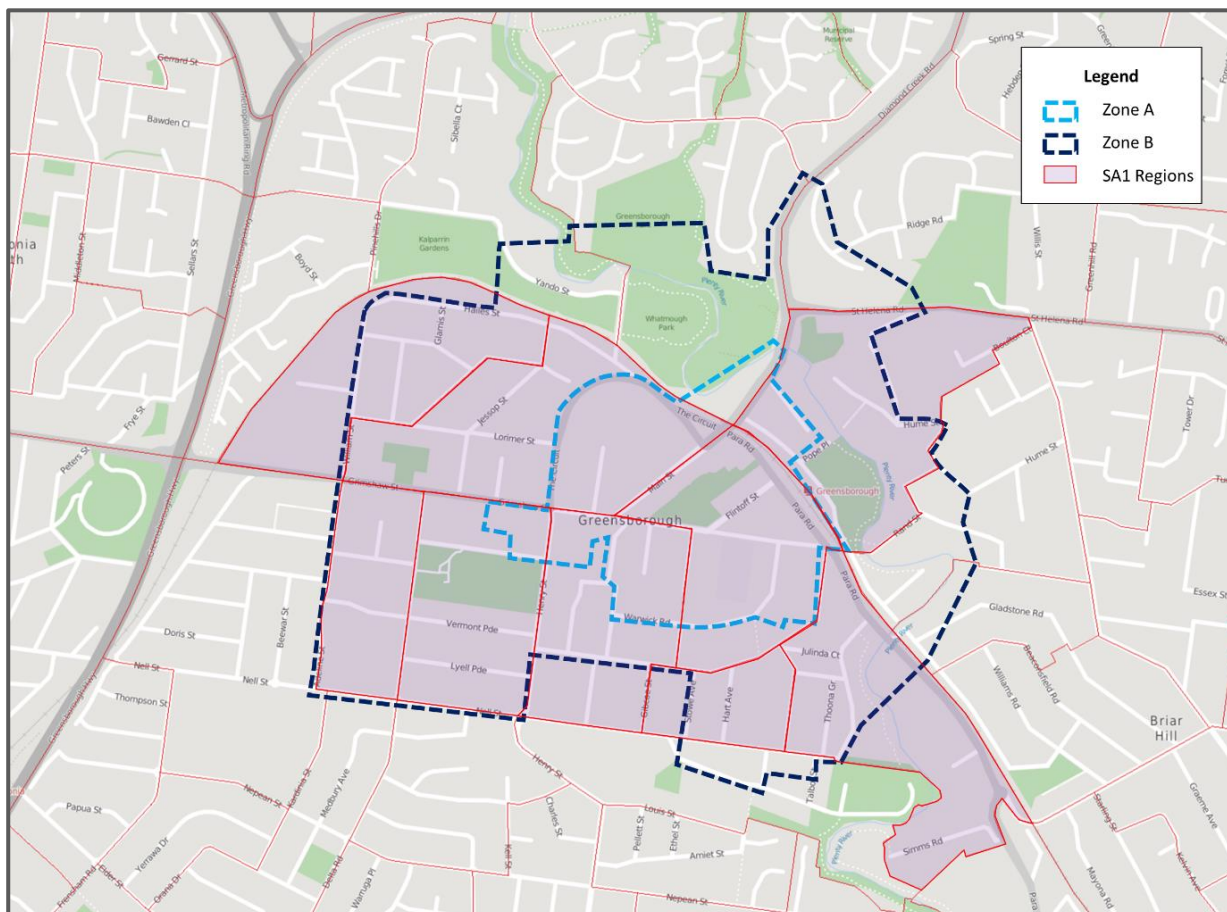


Table 6-3 Car Ownership Data 2016 Census – Greensborough Study Area (approximate SA1 matched)

Dwelling Type	No. Within Study Area	Average Car Ownership (vehicles per dwelling)	Residents with Zero Car Ownership
1 Bedroom Dwellings	52 (3%)	0.38	25%
2 Bedroom Dwellings	558 (35%)	1.00	11%
3 Bedroom Dwellings	736 (46%)	1.53	2%
4 Bedroom Dwellings	202 (13%)	1.85	2%
5 Bedroom Dwellings	38 (2%)	1.53	0%
6+ Bedroom Dwellings	7 (<1%)	2.29	0%
Total Dwellings	1,593		
Average		1.35	6%

Table 6-3 indicates that the study area has a relatively moderate-to-high car ownership level, with average car ownership rates ranging from 0.38 cars per one bedroom dwelling to 2.29 per six or greater bedroom dwelling. It is, however, noted that 1, 5 and 6 bedroom dwellings make up only approximately 6% of the overall dwelling types.

Census data indicates that only 25% of one bedroom dwellings were found to not own a car, it must be noted that the sample size for this dwelling type is considerably small, with only 52 (approx.) one-bedroom dwellings situated within the Greensborough study area. An average of only 6% of residents in the general study area were found to not own a private motor vehicle (as compared to ~4% for the overall suburb of Greensborough).

Furthermore, it is noted that a proportion of four-bedroom dwellings down to one-bedroom dwellings do not own a car, ranging from 2% to 25%, respectively. It should be noted that the ABS data is considered to provide an accurate reflection of the car ownership levels within the study area during the survey period, as responses were obtained from almost all residences in 2016.

In accordance with 'Idcommunity', a demographic public resource, analysis of car ownership from the 2016 Census data indicates that 58% of households within the suburb of Greensborough have access to two or more motor vehicles, compared to 54% in City of Banyule.

Journey to Work Data

Table 6-4 provides a comparison of Journey to Work data (Place of Work) for all employment categories for the neighbouring local government areas, as well as the City of Melbourne. It is noted that the below analysis utilises 2011 ABS Census data as the 2016 has not yet been made publically available.

Figure 6-2 illustrates the location of each surrounding Municipality in relation to Banyule, whilst Table 6-4 outlines the mode-split percentage to 'place of employment' by method of transport, indicating that approximately 82% of people working within the City of Banyule travel by car.

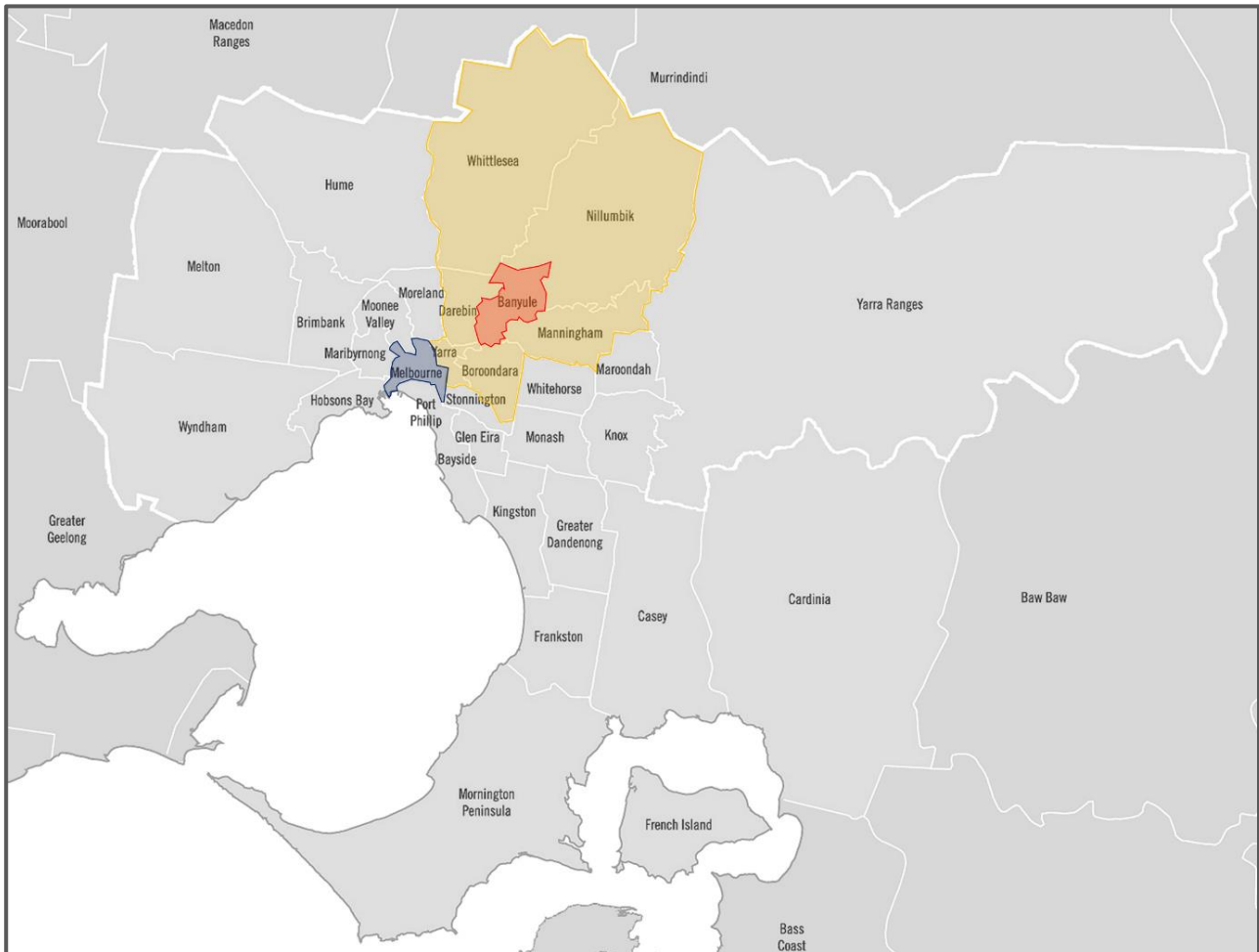
It is noted that the data is based on one-mode only, (i.e. a multi-mode trip, involving a car and train, is not included) and excludes 'car as a passenger' as a car mode.

Table 6-4 Journey to Work Data by Place of Employment: Method of Travel by Municipalities

Location	Car Driver	Walk	Bicycle	Public Transport	Other
Whittlesea	85.5%	1.6%	0.5%	2.7%	9.7%
Nillumbik	83.7%	3.8%	0.4%	1.9%	10.2%
Manningham	83.4%	2.7%	0.3%	3.4%	10.2%
Banyule	82.2%	4.2%	1.1%	3.9%	8.6%
Darebin	79.4%	3.4%	2.1%	5.2%	9.9%
Boroondara	76.1%	4.4%	1.3%	8.1%	10.1%
Yarra	61.4%	5.9%	4.4%	14.8%	13.5%
Melbourne	34.0%	5.5%	3.6%	36.2%	20.7%

In comparing 'Banyule' to other municipalities, Table 6-4 indicates that journey to work for 'car driver' is generally in line with neighbouring municipalities that are situated somewhat further away from the Melbourne CBD (as compared to municipalities such as Yarra).

Figure 6-2 Victorian Municipality Map: Highlighted Areas Adjacent the City of Banyule



6.2 Formulation of Car Parking Rates

6.2.1 General

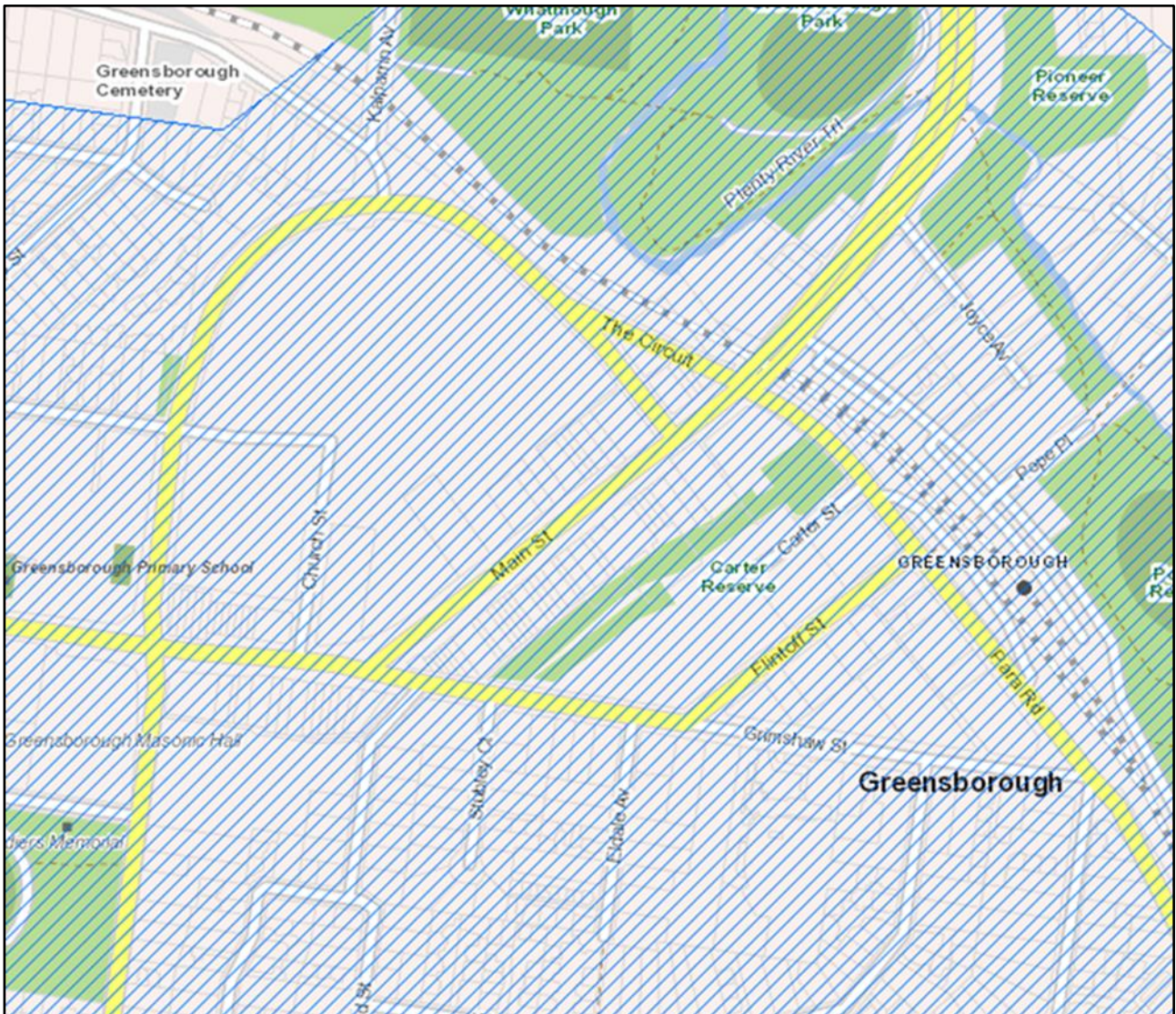
One of the primary objectives of this report is to define car parking rates for the dominant land uses within the GMAC study area, being Shop, Food and Drink, Restaurant, Office and Medical Centre uses. Residential and residential visitor parking demands are also provided in this section of the report. Other common land uses identified include Supermarket, Swimming Pool and Gymnasium uses. These will be further discussed in the later stages of this section of the report. Car parking for land uses that have not been itemised in this section of the report is recommended to be provided at the Column B rate within Clause 52.06-5 of the Banyule Planning Scheme. An action of this study will also be to remove Schedule 1 to the Parking Overlay for the Greensborough Activity Area.

6.2.2 Principle Public Transport Network

The Principal Public Transport Network (PPTN) reflects the routes where high-quality public transport services are or will be provided. The PPTN is a statutory land use planning tool that supports integrated transport and land use planning, by encouraging more diverse and dense development near high-quality public transport to help support public transport usage. It helps provide certainty to planners and the community about locations that are, or will be, served by high-quality public transport.

The PPTN is a key component of Plan Melbourne, and is reflected in planning schemes across Victoria. Figure 6-3 shows the subject site lies within 400m of the PPTN.

Figure 6-3 Greensborough Principle Public Transport Network



It is noted that Planning Scheme Amendment VC148 was gazetted on the 31st of July 2018, which introduced an update to Clause 52.06.

A car parking requirement in Table 1 of Banyule Planning Scheme is calculated by multiplying the figure in Column A or Column B (whichever applies) by the measure (for example square metres, number of patrons or number of bedrooms) in Column C.

Column B applies if:

- > Any part of the land is identified as being within the Principal Public Transport Network Area as shown on Figure 5-1 of the Principal Public Transport Network Area Maps provided by the State Government of Victoria in 2018.

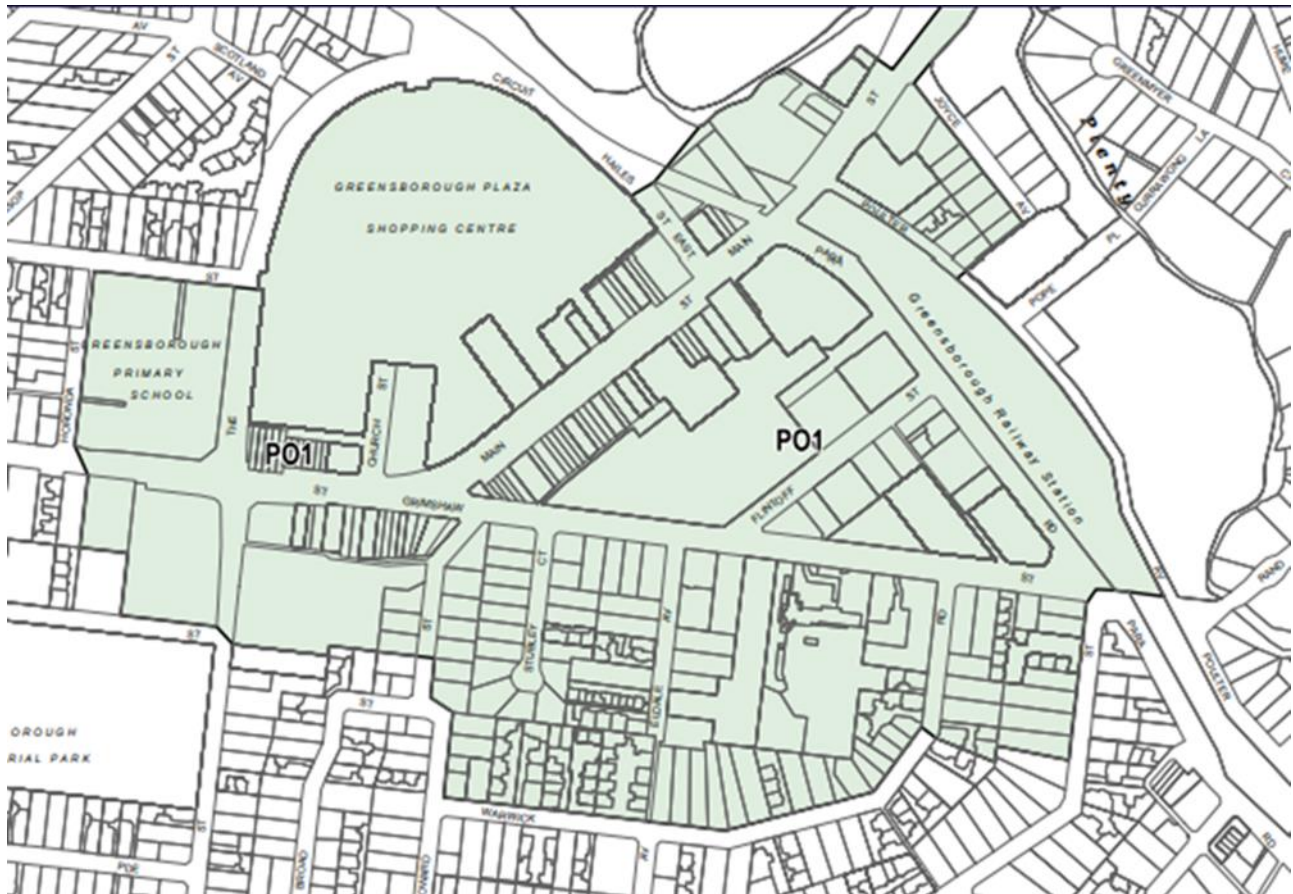
In this instance, the subject site is within 400m of the PPTN and as such Column B of Table 1 of the Banyule Planning Scheme is the applied parking rate.

6.2.3 Schedule 1 Banyule Parking Overlay

Existing statutory car parking requirements for the GMAC and its immediate surrounds are set out in Clauses 52.06 and 45.09 of the Banyule Planning Scheme.

The GMAC lies within Schedule 1 of Banyule's Parking Overlay as shown in Figure 6-4 below. It is recommended to remove the existing Schedule 1 to the parking overlay. The car parking requirement for new developments within the Greensborough Activity centre will be subject to the requirements of Clause 52.06, with the majority of the activity centre being subject to Column B car parking rates.

Figure 6-4 Schedule 1 Banyule Parking Overlay



A summary of the **existing** car parking rates applicable to overarching land uses situated within the Greensborough Activity Area have been described in Table 6-5.

Table 6-5 Existing Parking Rates – Overarching Land Uses

Land Use	Existing Parking Rate	Car Parking Measure	Rate Reference Document
Shop*	4.6	to each 100 sq m of leasable floor area	Schedule 1 to the Parking Overlay – Banyule Planning Scheme
Food & Drink	3.5	to each 100 sq m of leasable floor area	Column B rate within Table 1 of Clause 52.06-5 – Banyule Planning Scheme
Restaurant	0.4	to each seat	Schedule 1 to the Parking Overlay – Banyule Planning Scheme
Office	3	to each 100 sq m of net floor area	Column B rate within Table 1 of Clause 52.06-5 – Banyule Planning Scheme
Medical Centre	3	to each 100 sq m of leasable floor area	Column B rate within Table 1 of Clause 52.06-5 – Banyule Planning Scheme
Dwelling	1 2 0.2	to each one and two bedroom dwelling, plus to each three or more bedroom dwelling, plus visitor spaces to each dwelling	Schedule 1 to the Parking Overlay – Banyule Planning Scheme
Restricted Retail	2.5	To each 100 sq m of leasable floor area	Schedule 1 to the Parking Overlay – Banyule Planning Scheme

* Other than restricted retail premises

Table 6-6 provides a summary of the recommended car parking rates to be applied to the overarching land uses contained within the study area. The following sections derive recommended parking rates for each land use based on the available information and provide a breakdown of the methodology adopted in determining these rates, with a number of iterations performed in an attempt to model realistic supply and demand relationships.

Table 6-6 Recommended Parking Rates – Overarching Land Uses

Land Use	Recommended Parking Rate	Car Parking Measure	Planning Scheme Reference
Shop*	3.5	to each 100 sq m of leasable floor area	Column B rate within Table 1 of Clause 52.06-5 – Banyule Planning Scheme
Food & Drink	3.5	to each 100 sq m of leasable floor area	
Restaurant	3.5	to each 100 sq m of leasable floor area	
Office	3	to each 100 sq m of net floor area	
Medical Centre	3.5	to each 100 sq m of leasable floor area	
Dwelling	1 2 0^	to each one and two-bedroom dwelling, plus to each three or more-bedroom dwelling, plus no visitor car parking requirement	N/A Column B rate within Table 1 of Clause 52.06-5 – Banyule Planning Scheme N/A
Restricted Retail^	2.5	To each 100 sq m of leasable floor area	Car parking rates to be applied within the Structure Plan area of Greensborough

* Other than restricted retail premises

^ To be applied within the Structure Plan area of Greensborough

6.2.4 Rate Determination Method

Recommended parking rates for major and other common land uses have been formulated with consideration made to the following factors:

- > Consideration of Clause 52.06-5 of the Banyule Planning Scheme – Column B parking rates and car parking rates;
- > Locality to the Principle Public Transport Network (PPTN);
- > Consideration of car parking rates adopted for various land uses within Parking Overlays in Metropolitan Melbourne Planning Schemes where applicable;
- > Assessment of recommended car parking rates as part of the Greensborough Parking Plan previously prepared in 2006 by Cardno;
- > Car parking occupancy survey results undertaken in September 2017, in particular assessment of the current use of paid and unpaid parking areas;
- > Land use building areas summarised in Section 6.1.1 of this report; and
- > Assessment of the likelihood of multipurpose trips within each precinct and understanding how this is likely to reduce car parking rates associated with any one particular land use as a result.

The methodology adopted in deriving the above rates was generally undertaken as follows:

1. The largest cluster of 'major' land uses were identified as being located within the retail core of the study area. For the purpose of this analysis, the Activity Centre 1 Zone and associated car parking spaces within precincts A, C, D, E and L1 were utilised, with a total demand for 3,116 spaces within these precincts derived from parking occupancy survey results during the Thursday peak.
2. Considering the factors mentioned above, preliminary car parking rates were estimated for each of the major land uses listed above in order to derive a 'theoretical supply'. From this point, a number of iterations were carried out to balance the equation between theoretical and actual car parking supplies, comparing these numbers to the recorded occupancy rates in each precinct.
3. In this regard, the actual car parking supply of 3,650 was noted as being considerably higher as compared to the theoretical supply requirement of 2,984 based on adopted Cardno-derived car parking rates, noting the similarity between the recorded demand for 3,116 car parking spaces within these 5 precincts and the theoretical supply requirement. The reduced theoretical supply as compared to the actual supply is further supported by the likelihood of multipurpose trips; it is highly likely that patrons of various uses will also patronise one or more of the other businesses within the study area in a different precinct as part of the same trip.
4. The same analysis was adopted across each of the 5 precincts, whereby a trend was established that theoretical supplies were noted to be lower than both actual supplies and recorded demands.
5. Considerations were made to the likelihood of 'cross-precinct' parking demands. A typical example of a precinct likely to contain parking demands generated by used spaces situated in multiple precincts is Precinct C. It was assumed that, given its central location and long-term parking restrictions, approximately 40-50% of the overall supply is provided to cater for car parking demands generated by uses contained within bordering precincts or train commuters. Based on the prescribed rates in Table 6-6, a 'theoretical' supply for Precinct C's major land uses was calculated at approximately 177 car parking spaces which is approximately 46% of the actual recorded supply, thus supporting the assumptions noted above.

6.2.5 Major Land Uses

6.2.5.1 Shop (other than restricted retail premises)

The proposed shop car parking rate of **3.5 spaces** per 100 square metres of leasable floor area is noted as being within the range of recommended rates for this land use category adopted across Melbourne metropolitan municipalities (typically observed as 3.5 – 4.0), with Glen Eira adopting a Parking Overlay shop rate of 2.18 spaces per 100 sqm of leasable retail floor area in the Caulfield Mixed Use Area.

Furthermore, a review of numerous Parking Overlays revealed that the current shop rate contained within Schedule 1 to the Parking Overlay for the Greensborough Activity Centre typically adopts a rate of above 4.0 (currently 4.6). It is therefore considered that the suggested shop parking rate of 3.5 spaces is appropriate due to the area being within the PPTN.

A cross analysis was undertaken looking at the car parking survey results from Greensborough Plaza during the Thursday peak period. Comparing the peak recorded occupancy level of 1,789 spaces within Greensborough Plaza against the adopted 50,000 sq m of net leasable floor area at the site, a car parking rate of 3.58 spaces per 100 square metres of net leasable floor area can be derived, accurately corresponding to the recommended shop rate.

6.2.5.2 Food & Drink

It is recommended to maintain the existing car parking rate of **3.5 spaces** per 100 sq m for Food & Drink (Café) uses across the Study Area, in line with the Column B rate for this land use type within Clause 52.06-5 of the Banyule Planning Scheme.

6.2.5.3 Restaurant

The current Planning Scheme rate for restaurant use is 0.4 car parking spaces to each seat (*realistically referring to each patron permitted*), contained within Schedule 1 to the Parking Overlay for the Greensborough Activity Area. It is noted that the same rate was derived as part of the 2006 Greensborough Parking Plan prepared by Cardno. Despite this existing car parking rate being commensurate with Parking Overlay rates observed for restaurant uses across many Melbourne metropolitan municipalities, a review of parking demands vs theoretical and actual supplies within Precinct C revealed this rate to be too high.

Cardno case study suggests a typical methodology for determining seats available per square metre of overall restaurant floor area, where approximately 2/3 of the overall floor area is reserved for seating, with approximately 1 seat available to every 1.5 sqm of seating, 0.4 car parking spaces can be allocated to the resultant number of seats. Adopting Precinct C as a case study, application of this methodology to the 1,226 sq m of restaurant floor space would result in a requirement to provide 218 car parking spaces for restaurant land use alone. Precinct C contains a total of 386 parking spaces, and adopting the above methodology, restaurant use would account for 62% of the overall requirement when it only accounts for 24% of the overall floor area.

Furthermore, when adopting the current rate of 0.4 spaces per seat into the parking model for Precinct C, the derived theoretical supply for this precinct when considering land uses contained in this catchment only equates to 352 spaces. This would therefore suggest that, assuming the accuracy of other prescribed rates, a parking supply of approximately only 34 spaces is afforded to capture train commuter demands and demands generated from peripheral precincts.

It is recommended that a restaurant rate of **3.5 spaces** per 100 square metres of leasable floor area is provided for future uses of this nature, supported by the car parking model and commensurate with the current Column B rate for this land use within Clause 52.06-5 of the Banyule Planning Scheme.

6.2.5.4 Office

It is recommended to maintain the existing car parking rate of **3 spaces** per 100 square metres of leasable floor area as per the existing Column B rate for this land use within Clause 52.06-5 of the Banyule Planning Scheme. It is noted that this rate represents the office parking rate range of recommended rates for this land use category within Parking Overlays adopted across Melbourne metropolitan municipalities (typically observed as between 3.0 – 3.5 spaces per 100 sq m of net floor area), with Glen Eira and Whitehorse adopting Parking Overlay office rates as low as 2.0 spaces per 100 sq m of leasable floor area.

6.2.5.5 Medical Centre

It is recommended to maintain the existing car parking rate of 3.5 spaces per 100 sqm for medical centre uses across the Study Area for future developments as per the Column B rate for this land use type within Clause 52.06-5 of the Banyule Planning Scheme and is consistent with the rate recommended in the 2006 Greensborough Car Parking Plan prepared by Cardno.

It is anticipated that this parking rate will continue to support demands associated with this use, with Greensborough continuing to be recognised as one of outer Metropolitan Melbourne's major medical hubs.

6.2.6 Residential Parking Rates

6.2.6.1 Residents

In order to estimate the likely parking requirements for residential dwellings, private vehicle ownership rates from ABS Census data have been sourced and data collected relating to current on-street car parking conditions has been analysed.

As noted in Section 6.1.2, a review of the 2016 Census ABS data for 10 Statistical Area Level 1 (SA1) indicates that the study area has a relatively moderate-to-high car ownership level, with average car ownership rates of 1.35 vehicles per dwelling. Notwithstanding, with one and two bedroom dwellings recording average car parking ownership rates of 0.38 and 1.00 spaces per dwelling respectively (and noting only 25% of one bedroom dwellings do not own a vehicle space) scope exists to review car parking rates associated with these dwelling types.

A total of 1,593 residential dwellings have been identified as being located within statistical areas situated inside the identified study area, sharing approximately 2,473 on-street parking spaces with residential frontages. This correlates to a rate of 1.55 on-street parking spaces for every residential dwelling in the study area.

Clause 56 of ResCode recommends the provision of one (1) on-street parking space for every two (2) dwellings. While it appears that there is a considerably higher rate of supply of on-street parking in the study area compared to the ResCode requirements, on-street parking surveys within these residential precincts recorded a demand for 549 spaces at the identified survey period, equating to an on-street residential demand for 0.34 spaces per dwelling.

Car use in general within the GMAC and overall study area should be discouraged if possible, on the basis of good access to public transport and close proximity to places of employment. To this effect, it is recommended that **parking rates of 1 space for one and two-bedroom dwellings**. This rate is generally in line with the average car ownership range for one and two bedroom dwellings located within the study area.

It is recommended that the rate specified Column B rate for this land use within Clause 52.06-5 of the Banyule Planning Scheme for three or more bedroom dwellings be retained, being **2 resident spaces for each 3 or more-bedroom dwelling**.

The car parking rates for residential dwellings situated within the study area listed above are in line with those previously introduced within other Activity Centres located within the municipality of Banyule.

6.2.6.2 Residential Visitors

The study area contains a total of 12 precincts considered primarily as residential in nature. Of these precincts, Precinct Z is considered (for the most part) as a purely residential precinct situated a considerable distance from GMAC. Any non-residential uses within Precinct Z are understood to typically supply sufficient off-street parking to cater for anticipated use-specific car parking demands, leaving on-street parking to accommodate resident and residential visitor parking demands.

A review of the parking inventory data indicates that a supply of 510 spaces are provided in Precinct Z, with the total number of dwellings currently at 291. This indicates that a total of 1.75 spaces per dwelling are provided to cater for residential visitors and potential resident overspill on-street.

Saturday parking survey data indicates a peak on-street demand for 120 spaces, which occurred at 3:00pm and represented an occupancy level of 24%. It has been conservatively assumed that 25% of these demands were attributed to residential visitors, based on information derived from duration of stay data. In this regard, a resultant peak visitor parking demand for 0.06 spaces per dwelling has been derived.

Furthermore, application of the above methodology to Precinct N also derived an anticipated visitor car parking demand of approximately 0.06 spaces per dwelling.

The above suggests that there is merit in considering the reduction of the statutory visitor car parking requirement (currently 0.2 spaces per dwelling) currently applicable to residential developments situated within the study area. It is noted that the current residential visitor parking rate within Schedule 1 to the Parking Overlay does not trigger the need in visitor parking provision, as it states that the rate be applied to each dwelling. It would appear this is perhaps an oversight, with the current rate applicable to the study area likely to relate to dwellings for developments of *5 or more dwellings*.

Due to the accessibility of the area by public transport and existing availability of on-street parking supply used to derive the anticipated existing visitor parking demand it is recommended the Column B rate for this land use within Clause 52.06-5 of the Banyule Planning Scheme be adopted. **Therefore there is no requirement for visitor car spaces.**

6.2.7 Other Land Uses

A high-level assessment of the recommended car parking rates associated with other uses common to the study area has been included in the following sections, with a number of factors determining these rates.

6.2.7.1 Supermarket

Currently, the only supermarket operating within Precinct A is the Woolworths supermarket including associated at-grade car park. Consequently, it can be assumed that the demand recorded during the Thursday peak period of 177 spaces was solely associated with this use. Application of the demand for 177 spaces across the supermarket floor area of 3,510 sq m relates to a car parking rate of 5.04 spaces to each 100 sq m of leasable floor area. This rate generally represents the current Column B rate for this land use type within Clause 52.06-5 of the Banyule Planning Scheme (**5 spaces**), and is recommended to be implemented for future stand-alone supermarket developments.

6.2.7.2 Swimming Pool

A rate of 5.6 spaces to each 100 sq m of the site was conservatively adopted for swimming pool use (Watermarc facility) for the model, accounting for the potential shortfall in the allowance made for retail floor area within Precinct D and additional floor areas contained within the study area but not included in the land use spreadsheet provided to Cardno.

A site floor area of approximately 7,000 sq m was assumed for the calculations, resulting in the statutory requirement for 392 spaces. This car parking requirement is of course unrealistically high when considering recorded supply with respect to additional uses in Precinct E and operating nature of swimming centres in general.

Case study data previously collected by Cardno in relation to swimming pool areas has been reviewed to provide an indication of recommended car parking rates for this use.

Car parking demands exhibited by swimming pool complexes are typically dependent on the following factors:

- > The maximum number of people on site (additional to the normal school population);
- > The percentage of car driver patrons;
- > The number of staff in attendance; and
- > Staff driver percentages.

Surveys undertaken at pool complexes by Cardno and other firms show that between 60-80% of patrons/staff are car drivers. In this regard, an upper limit requirement of **0.8 spaces** per patron is typically recommended by Cardno.

6.2.7.3 Gymnasium

The New South Wales Roads and Traffic Authority's Guide to Traffic Generating Developments (RTA Guide) sets out general parking rates for a number of land uses, based on case studies undertaken at similar use developments in the Sydney region. While there is no Victorian equivalent of this document, it is generally accepted that the rates are still applicable for Victorian developments.

The RTA Guide specifies parking requirements in relation to Gymnasiums as being between 3 and 4.5 spaces per 100 sq m of GFA. As gymnasiums not located within shopping centres or along shopping strips typically operate as stand-alone uses (that is, not considered to typically form part of a multi-purpose trip), it is conservatively recommended that the upper limit range of **4.5 spaces** per 100 sq m of GFA be applied to these uses.

It is, however, noted that Cardno case study data suggests that fitness centres located within shopping centres typically generate a portion of their clientele from within the centre, i.e. from staff/office workers. These facilities therefore generate a lower parking demand than stand-alone sites, typically in the order of **2.0 spaces** per 100 sq m of GFA.

7 Comparisons between 2006 & 2017

7.1 General

Based on a comparison of the aerial images taken in 2006 and 2017 as shown in Figure 7-1, evident changes in land use are noted as follows:

- > The development of the One Flintoff and WaterMarc building has provided an additional 5,000 square metres of municipal office space and an additional 22,000 square metres of swimming pool/aquatic centre uses;
- > The development of the Centrelink building on Grimshaw Street has provided approximately 3,000 square metres of additional office space;
- > The creation of the Greensborough Walk, the raised walkway adjacent to WaterMarc, has also provided additional opportunities for office and retail land use development along Main Street; and
- > The addition of new car parking areas along Henry Street and Main Street.

It is considered that these changes in the land use, amongst other changes not visible from the aerial image comparison, would have corresponding implications for car parking demand and behaviours across the GMAC area.

Figure 7-1 Greensborough Major Activity Centre 2006 (top) vs. 2017 (bottom)



As shown, there are some distinct similarities and differences between the car parking demand profiles in 2006 and 2017, as follows:

- > Car parking demand was observed to reach a peak at 12:00pm during both the weekday and Saturday surveys in 2006 and 2017, indicating that the peak activity period within the GMAC has remained consistent;
- > The car parking demand during the weekday surveys was observed to be approximately 600 car parking spaces higher when compared to the demand during the Saturday surveys in 2006 and 2017, indicating that the relative levels of car parking activity remain consistent; and
- > The peak occupancy level across the GMAC area during the weekday surveys was observed to be approximately 78%, and approximately 65% during the Saturday surveys in 2006 and 2017, indicating that car parking availability has remained consistent.
- > The car parking demand profiles in 2017 indicate an earlier, more gradual rise in car parking demand when compared to the 2006 surveys, on the approach to the midday peak period. This is evident at 8:00am during both the weekday and Saturday surveys, when the 2017 surveys show greater occupancies than the 2006 surveys; and
- > The demand profiles in 2017 also indicate a later, more gradual drop in car parking demand when compared to the 2017 surveys, after the midday peak period. This is evident at 6:00pm during both the weekday and Saturday surveys, when the 2017 surveys indicate greater occupancies in comparison to the 2006 surveys.

7.4.2 Summary

Overall, it is evident that the demand for car parking within the GMAC has remained relatively consistent when comparing 2006 and 2017 car parking occupancy survey data, and has reduced in line with reductions in car parking supply. It is also noted here that the reduction in car parking demand could also be associated with improvements to walkability within the GMAC (i.e. the development of Greensborough Walk), improvements to the local bicycle network, and improvements to public transport facilities and frequency of services.

Notably, the increased demand for car parking in the early and later parts of the day in 2017 compared to 2006 are generally in line with changes in retail operating hours since the earlier study.

8 Future Conditions – Greensborough Growth and Development

8.1 Methodology

Car parking should be considered on a centre-wide basis rather than a precinct-by-precinct basis, to support the centre's long-term viability. Spare capacity in certain areas can provide for car parking needs while new shared car parking facilities are developed or extended. It can provide for car parking needs while financial contributions are collected. If this capacity is lost in an early phase of development of a centre, it may be difficult to support the future incremental growth of the centre.

To gain an understanding of future car parking conditions within Greensborough (and hence to ensure that the most appropriate car parking rates are developed from the Study), it is considered important to review key developments either currently under construction (i.e. to be shortly completed) or recently approved.

8.2 Land Use Growth Estimates

8.2.1 Greensborough Major Activity Centre Assessment (Urban Enterprise)

Information on future development within the Greensborough Major Activity Centre (MAC) has been sourced from the Economic Information Base Report and Activity Centre Assessment (2017) prepared by Urban Enterprise for the City of Banyule. Both documents have been used to determine future car parking demands anticipated to be generated by additional development within the Greensborough MAC up to the year 2036.

The following outlines future growth predictions for key land uses:

8.2.1.1 Retail Use

Future retail demand has been projected on the basis of anticipated population growth in the retail catchment and per capita growth in the retail spending (1% p.a.), assuming that the current market share will be maintained. Based on these, it is estimated that the additional supportable floorspace over the next 20 years is around 12,400 sqm.

Application of the recommended shop rate derived by Cardno (Section 6.2) to the projected increase of retail floor area listed above would equate to a requirement for up to **434 additional car spaces**.

8.2.1.2 Office & Medical Use

The Greensborough MAC has been identified as a growing employment hub. Employment and floorspace projections for the Banyule municipality as a whole indicate demand for an additional 69,000sqm of commercial office floorspace.

The Greensborough MAC currently accounts for approximately 12% of Banyule's employment in industries typically requiring office floorspace (ABS 2011). Assuming Greensborough will capture the same proportion of employment growth over the next 20 years, an additional 11,000 – 17,000 sqm of commercial and medical office floorspace would be required to be implemented by the year 2036.

Application of the recommended office rate derived by Cardno (Section 6.2) to the projected increase of commercial and medical use floor areas listed above would equate to a requirement for **between 330 – 510 additional car spaces** for commercial uses and **between 385 – 595 additional car spaces** for medical uses.

8.2.1.3 Dwelling

Between 2016 and 2036, the Greensborough area is projected to grow by 1,101 dwellings. This represents a growth rate of 55 dwellings per annum, representing 12% of Banyule's growth over the period. It is noted that no major residential developments have been constructed or granted building permits in the suburb of Greensborough to this date.

A total of 10 known development sites have been identified at present time, with an estimated dwelling yield of 465. The status of these development proposals vary from pre-planning, planning approved and planning assessment.

Given the evident capacities associated with on-street parking recorded across residential precincts situated within the study area, it is anticipated that residential and visitor parking demands associated with these dwellings will be comfortably accommodated on or off-site.

8.2.2 Car Parking Adequacy

Application of the recommended rates to projected increased in office, retail and medical floor areas by the year 2036 is projected to generate the requirement for additional parking within GMAC in the range of 1,149 and 1,539 car parking spaces.

Car Parking occupancy surveys undertaken in September 2017 indicate that Zone A operates with a total parking supply of 4,747 spaces. During the recorded Thursday survey peak, a total of 3,683 spaces were occupied, leaving no less than 1,064 spaces vacant for general public use.

Application of the abovementioned requirement ranges to the current derived car parking capacity within Zone A alone would indicate a **shortfall of available parking in the range of 85 – 475 spaces**.

It is, however, assumed that shortfall in parking required for future land use growth set to occur over the next 20 years will be towards the *lesser* end of this range. The above estimates are not able to, at present time, factor in likely future influences on car parking demands, such as:

- > Likelihood of some additional uses situated within Zone B;
- > Changes in car parking demand trends within the GMAC (increase or decrease);
- > Increased reliance on public transport and push towards sustainable travel alternatives;
- > Decentralisation of car parking demands due to capacities in fringe precincts;
- > Better management of existing car parking facilities; and
- > Development of car parking facilities within the heart of GMAC to cater for growth.

8.2.3 Significant Future Developments

8.2.3.1 Primary Health Care IVF and Medical Centre

The Council building at 9-13 Flintoff Street, which has been sold to Australian Unity representing Primary Health Care, will be redeveloped to an IVF and Medical Centre where the completion date is expected to be late November 2017. The proposed redevelopment will provide a laboratory, operating theatres supported by six patient beds, various processing and support rooms, and an ancillary food and drink premise. The internal car park will be upgraded with the addition of a designated ambulance bay.

8.2.4 Additional Parking Amenity

8.2.4.1 Free Public Parking in Greensborough

In late 2016, Council finalised construction of two additional off-street parking areas within and east of the Henry Street public car park, in order to accommodate increased demands anticipated to arise from major future developments.

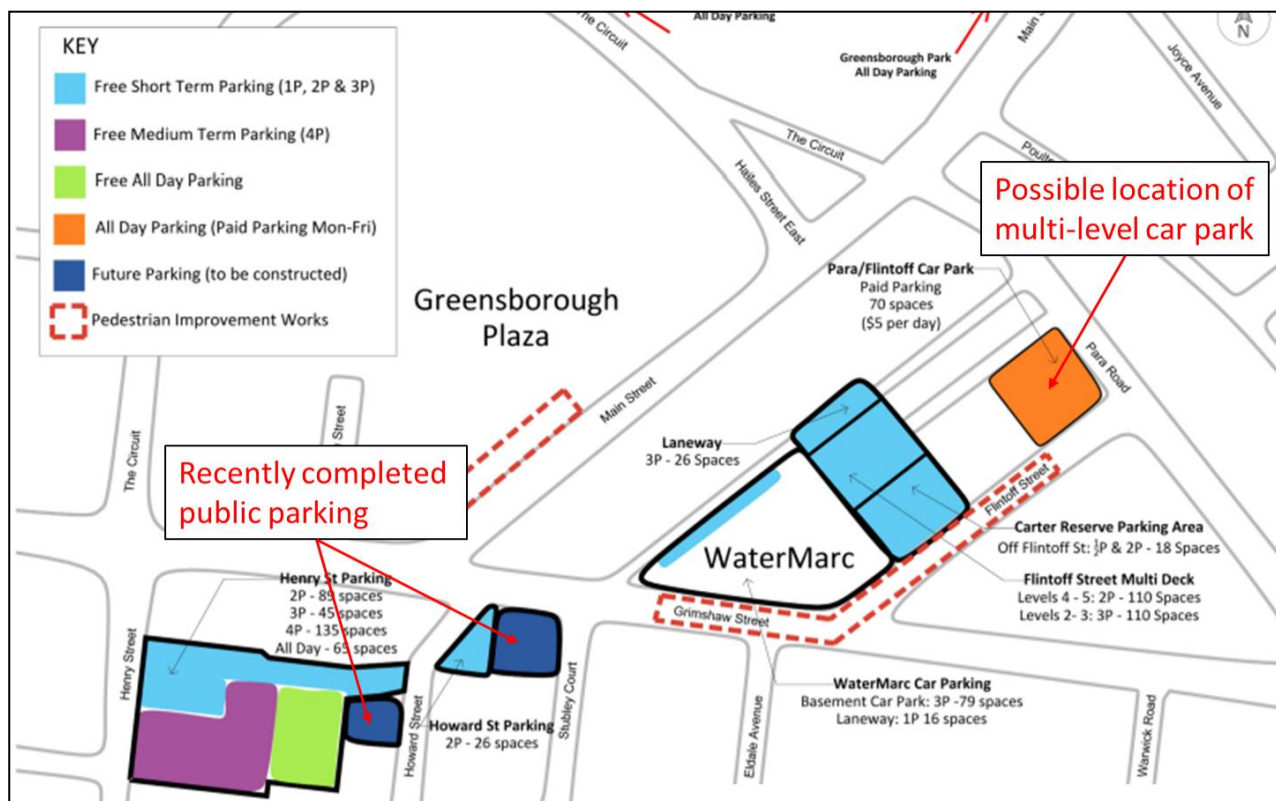
These new car parking areas provide approximately 81 additional off-street spaces. Council has also sought to improve parking within its existing Henry Street car park, bringing the number of Council-owned parking spaces to approximately 800 within the GMAC (as of December 2016).

8.2.4.2 Development of Para Road / Flintoff Street Car Park

Council have expressed interest in exploring the possibility of developing the existing Para Road / Flintoff Street at-grade car park into a multi-level decked car park, providing additional parking to cater for the significant demands generated primarily by train commuters and staff working within the Greensborough Walk commercial precinct and future Primary Health Care staff immediately south of this site.

Figure 8-1 represents the various Council-owned public parking areas, with an emphasis on recently completed and potential parking sites.

Figure 8-1 Council-owned Public Car Parking Map



9 Identification of Issues & Concerns

9.1 Site Visit Observations – Issues and Opportunities

In order to gain an understanding of the existing parking provisions within the study area and an understanding of the extent of parking infiltration into Zone B, Cardno undertook a comprehensive site visit of the study area on Thursday 7th September and Friday 8th September, 2017.

Relevant observations made during the inspection likely to guide the preparation of the Parking Plan have been described in the following sub-sections.

9.1.1 Pedestrian Access to Greensborough Train Station

The Metro-owned Greensborough Train Station car park is comprised of 3 car parking areas. A total of 4 access points to off-street station parking areas are provided to Poulter Avenue.

Cardno observed a significant proportion of train commuters approach the station's walkway overpass from the northern end of Poulter Avenue, approaching in platoons as shown in Figure 9-1. This is likely due to the location of the bus stop on Main Street some 25 metres north of the commencement of Poulter Avenue. Pedestrians were observed crossing Poulter Avenue to access the Station at times carelessly and without consideration for vehicles. Furthermore, as shown in Figure 9-1, no formal footpath is provided across a portion of the southwest side of Poulter Avenue, likely operating as a tripping hazard without sufficient separation between pedestrian and vehicle movements.

It is noted that regular pram ramp crossing points are typically provided at local road crossings within the study area.

Figure 9-1 Poulter Avenue, Facing Northwest Adjacent to Greensborough Station Car Park



9.1.2 Greensborough Train Station Parking Demands

Cardno commenced the site inspection on both days prior to 7:00am to capture typical train commuter parking demand trends in the morning peak periods.

The inspection determined:

- > By 7:00am, all car parking areas associated with Greensborough Train Station were fully saturated, as was anticipated;
- > Train commuters attempting to park within the on-site car parking areas continued to attempt to locate available spaces within these areas well after 7:00am;
- > Significant amount of train commuters were spotted being dropped off at the base of the walkway overpass within the main off-street car park; and

- > Subsequent occupancy checks during early afternoon hours on both inspection days revealed minimal number of available spaces (1 each on both days at 3:00pm). This reiterated the prediction that the off-street car parking areas associated with the train station are typically utilised by commuters seeking all-day parking over typical business hours.

The typical parking demands associated with the Greensborough Train Station's car parking areas have been visually represented in Figure 9-2 and Figure 9-3. It is noted that the third car parking area associated with the train station not shown below was also observed as being fully saturated by 7:00am.

Figure 9-2 Main Station Car Park Occupancy Levels – Thursday 7th September, 2017 (7:00am)



Figure 9-3 Main Station Car Park Occupancy Levels – Thursday 7th September, 2017 (7:00am)



9.1.3 Paid Parking Usage in the Vicinity of the Station Car Park

Cardno undertook an observation of the on-street parking provision along Poulter Avenue. Over the two inspection days, Cardno observed that train commuters tended to seek the unrestricted parking along the entire length of Poulter Avenue (to Bicton Street) before opting to utilise paid parking along the norther side of Poulter.

Given observations made in neighbouring residential streets to the north of the train line, it is likely that train commuters/people seeking long term parking are utilising unrestricted supplies in these areas before opting to pay for parking. This is not reflective of the parking conditions observed at the Para Road/Flintoff Street car park during the same morning period, which was observed as being fully occupied by 7:00am – 7:30am.

Paid parking along Poulter Avenue was observed as being more heavily utilised later in the morning period, when it is likely unrestricted parking amongst adjoining residential streets has become fully occupied.

An indication of the underutilisation of paid parking along the northern side of Poulter Avenue at 7:00am is shown in Figure 9-4.

Figure 9-4 Poulter Avenue, Facing Southeast Away from Greensborough Train Station



9.1.4 Medical Precinct and Surrounds Parking Demands

Cardno observed significant parking demands typically across most parts of the day (both survey days) within and on the peripheries of the 'Medical Precinct'.

Observations made that are considered significant to the project are listed as follows:

- > As shown in Figure 9-5, parking along the western side of Alexandra Street was identified to be fully occupied during multiple observation periods, resulting in a narrow northbound lane width which could potentially cause a passing vehicle to collide with a parked car and the potential for traffic congestion. Although outside of the area defined as the 'Medical Precinct', patrons associated with the medical centre's different clinics were observed parking in this location.

It is noted that Council have since informed Cardno that 'no standing' restrictions are in effect on the western side of Alexandra Avenue, but a review of site inspection photos and street view images revealed that the western side of the Alexandra Avenue carriageway is actually currently unrestricted due to an absence of signage. Notwithstanding, the residual width of Alexandra Avenue would likely be unsuitable for vehicles (especially larger vehicles) to pass parked cars. This goes against the strategic outcomes of the Banyule On-street Parking Management Framework, which seeks to maintain 3 metres clear width adjacent a parked vehicle along the road so traffic may pass.

- > Living Faith Church car park operates for community use, accessed solely off Grimshaw Street and offered for general community use. Cardno noted that despite the reasonable usage fee (\$2.00 entry fee, unrestricted stay length), the car park appeared to be considerably underutilised. Centrelink / Medical Precinct patrons in the vicinity were instead opting to park along the grassed areas along the western side of the car park access road.
- > Medical Precinct / Centrelink patrons are opting to park along the southern side of Grimshaw Street, despite 'No Standing' restrictions being in operation. Figure 9-6 depicts these parking conditions, with Cardno noting this tended to occur during the length of typical business hours across both inspection days. The recent introduction of the signalised intersection of Grimshaw Street / Flintoff Street and associated linemarked median as shown in Figure 9-6 has meant that westbound vehicles are forced to

traverse the median due to illegally parked cars. As a result, Cardno observed vehicles utilising the right-turn lane as a through lane instead of merging into the appropriate through lane. This causes the potential for these vehicles to collide with vehicles travelling east and also with westbound vehicles who have appropriately merged.

It is noted that Council have recently informed Cardno that since the commissioning of the signalised intersection of Grimshaw Street and Flintoff Street, the observed number of illegally parked vehicles in this location has decreased considerably. It is therefore likely that this will not be an issue moving forward.

- > Usage of the privately owned 'Diamond Valley Specialist Centre and Dental Group' is controlled by a car park attendee, with use restricted to patrons of the Centre only. Cardno noted that the carpark appeared to be underutilised across the various observation periods.

Examples of current parking conditions in the vicinity of the medical precinct have been shown in Figure 9-5 and Figure 9-6.

Figure 9-5 Parking along the western side of Alexandra Street at Capacity - Thursday 7th September, 2017 (12:00pm)



Figure 9-6 Parking within No Standing Areas Along the Southern Side of Grimshaw Street



9.1.5 Parking on Diamond Creek Road

It was brought to Cardno's attention by Council that members of the public (the majority of which were observed as train commuters) are opting to park along the eastern side of Diamond Creek Road, generally between St Helena Road and Plenty River Drive.

The far left lane on the northbound carriageway of Diamond Creek Road operates as a bike lane. Despite linemarking and signage, stating that the lane is for bicycles only (Figure 9-7), drivers are opting to park within this lane. It is likely that drivers are under the impression that the lane is able to be used for parking given it resembles the width of a typical parking lane, and this stretch of Diamond Creek Road is not provided with 'No Standing' signage.

Notwithstanding the above, Cardno noted an insignificant number of northbound cyclist movements on Diamond Creek Road.

It has since been brought about to Cardno's attention by Council that the abovementioned section of Diamond Creek Road is proposed to be formalised as paid kerbside parking as part of recommendations contained within the recently completed Greensborough Activity Centre Transport Masterplan (November 2017 Draft version).

Figure 9-7 Parking Along the Bicycle Lane on Diamond Creek Road (Northbound Carriageway) – Friday 8th September, 2017 (7:30am)



9.1.6 Zone B Observations – Residential Precincts

Figure 9-8 demonstrates an example of the parking demands within residential streets situated in Zone B, observed across various periods throughout both inspection days.

As was anticipated, it is likely parking demands within residential precincts are associated specifically with residents and occasional residential visitors, with no apparent reason to suggest residential precincts within the study are subject to infiltration from commuter / activity centre staff seeking long term parking opportunities.

Figure 9-8 Typical Example of Parking Demands Throughout the Residential Precincts Associated with Zone B



10 Summary & Conclusions

10.1 General

The Greensborough Major Activity Centre and surrounds presents a growing business, retail and recreational hub, with a highly walkable street network and a considerable level of car parking activity.

Through the assessment of the background information reviewed, the car parking duration of stay and occupancy survey data collected and analysed, and the review of the on-site characteristics across each of the precincts within the study area, the following conclusions and recommendations have been made:

The GMAC and surrounding area presents as a state-recognised activity centre with characteristics similar to centres such as Frankston and Ringwood, which in recent years have been subjected to a Parking Plan process.

Further, a Parking Plan presents a useful tool in progressing to implementation of a parking overlay or other car parking management mechanisms, the former of which presents the most appropriate tool in enforcing the outcomes of the Parking Plan. In this context, it is considered that a Parking Plan is useful and appropriate to use for the GMAC and surrounds.

10.2 Existing Car Parking Conditions

The key findings relating to existing car parking conditions within the GMAC are summarised generally as follows:

- > Across the study area, 7,210 car parking spaces are available, comprising 2,532 on-street spaces and 4,678 off-street spaces. Of these, Zone A comprises 4,747 spaces whilst Zone B contains 2,463 spaces;
- > Short-term parking forms the majority of the supply within Zone A (72%), whilst long-term parking is the majority parking type in Zone B (90%);
- > Car parking demand across the study area during the Thursday survey period was observed to peak at 12:00pm at approximately 60% occupancy (82% occupancy within Zone A), whilst the Saturday survey period was observed to peak at 12:00pm at approximately 49% occupancy (69% occupancy within Zone A);
- > Average car parking durations across Zone A were generally short term (3 hours or less) excluding Precinct J and I where long term durations were observed in close proximity to Greensborough Railway Station and industrial land uses;
- > Average car parking durations in Zone B were generally short to medium term (5 hours or less) excluding Precincts V, W and X where long term parking behaviour was observed, also in close proximity to Greensborough Railway Station; and
- > Within Zone A, proportions of vehicles overstaying the signed restrictions were observed up to 18% on the Thursday surveyed (Precinct D – Greensborough Plaza), whilst overstay in Zone B was observed up to 12% during the Saturday surveyed (Precinct S – commercial land uses).

10.3 Recommended Car Parking Rates

An iterative process was undertaken to determine car parking rates to be applied to future developments containing overarching land uses within the study area. Recommended parking rates for each land use were based on a wide range of available information and case study data, in an attempt to model a correlation between observed supply and demand relationships with due consideration to precinct operating characteristics. Once derived, car parking rates were cross-examined for accuracy across a number of precincts.

The recommended car parking rates for the major land uses contained within the study area are as follows:

- | | |
|---|---|
| > Shop (other than restricted retail premises): | 3.5 spaces to each 100 sq m of leasable floor area |
| > Food and Drink: | 3.5 spaces to each 100 sq m of leasable floor area |
| > Restaurant: | 3.5 spaces to each 100 sq m of leasable floor area |
| > Office: | 3 spaces per 100 sq m of net floor area |

- > Restricted Retail Premises: **2.5** to each 100 sq mm of leasable floor area
- > Medical Centre: **3.5** spaces to each 100 sq m of leasable floor area
- > Dwelling: **1** resident spaces for each 1 and 2-bedroom dwelling;
2 resident spaces for each 3 or more-bedroom dwelling; and
0 space required.

10.4 Moving Forward

The following stages of the project will involve the formation of a car parking strategy for the study area. In delving further into the findings of this Background Report relating to existing issues and parking constraints associated with the study area, an Options Paper will be formed. This document will offer suitable solutions to mitigate current issues associated with car parking throughout the GMAC.

From the Options Paper, an Implementation Plan will be provided, ensuring that car parking supply and demand is effectively managed to best address the needs of all stakeholders.

Greensborough Activity Centre Parking Plan

APPENDIX

A

BACKGROUND STUDIES

Background Studies

Other Activity Centre / District Parking Studies

An examination of the approaches adopted within other Activity Centres / Districts undertaken by Cardno and other traffic engineering consultancies has been provided under the following sub-sections.

Frankston Central Activities District (City of Frankston)

In 2010, Cardno (working as Cardno Grogan Richards at the time) was engaged by Frankston City Council in partnership with DPCD (now DELWP) to undertake a review of the draft Frankston CAD Car Parking Study and produce an overall document with recommendations with respect to the management and provision of existing and future car parking within the Frankston study area.

The report outlined a number of short and long-term recommendations but did not include specific advice with respect to reduced car parking rates. As a reference, some of the notable recommendations which have particular relevance for the Greensborough study area are reproduced as follows:

Short term parking:

- *“Consider the introduction of paid on-street parking which is typical for a CAD, i.e. already effective in the Melbourne CAD and recently introduced in the Footscray CAD...some pros, cons and further considerations for reintroducing paid on-street parking are listed below:*

Pros:

- *Will significantly reduce staff parking on street in prime visitor parking locations;*
- *Can achieve higher parking turnover i.e. increase probability of finding an on-street car space;*
- *Generate funds for the Council to utilise for other CAD improvements including transport initiatives;*
- *Encourages longer term parking in off-street car parks and outer areas of the CAD;*
- *...reduce(s) traffic congestion, increase(s) road safety and encourage(s) use of public transport;*
- *Fines can be issued instantly if drivers overstay.*

Cons:

- *Cost of installing parking equipment, changing of existing parking signage etc.;*
- *Perception of uncertainty from the community toward design making;*
- *Possible short-term effect on visitation to the CAD...;*
- *Disgruntled drivers including traders who are now used to the ‘free’ on-street parking;*
- *New parking fees would require significant stakeholder engagement.*
- *...Implement directional signage to guide drivers to destinations on the CAD road network...*

Long term parking:

- *Develop a Parking Provision Strategy for new development in the Frankston CAD...*
- *Encourage new development in CAD areas which could benefit from increased activity (and) take advantage of underutilised parking infrastructure.*

Footscray Central Activities Area (City of Maribyrnong)

In 2012, GTA consultants was engaged by Maribyrnong City Council to undertake a study on appropriate car parking rates within the Footscray Central Activities Area (CAA).

The objective of this Car Parking Study was to provide recommendations on appropriate levels of car parking to be provided for new developments / uses in the Footscray CAA and establish the appropriate mechanisms by which to supply the required car parking spaces.

In applying the findings to the study area, it was identified that a range of car parking rates would be appropriate. The measure used to identify which car parking rates were applicable was each site's location, as such a measure was easy to identify for all parties and allowed for more specific rates to be adopted.

In this regard, the following car parking rates were understood to be prescribed:

- *A car parking rate range be applied to future commercial development in the Inner Core as follows with appropriate decision guidelines developed and adopted which allow the consideration of reducing car parking requirements below the lower end of the range:*
 - Office 1.5 – 2.0 spaces per 100 sqm
 - Restaurant 0.05 – 0.1 spaces per patron
 - Restricted Retail 0.5 – 1.0 spaces per 100 sqm
 - Retail (Shop) 0.5 – 1.5 spaces per 100 sqm
 - Supermarket 2.0 – 2.5 spaces per 100 sqm
 - Medical Centre 1.0 – 2.3 spaces per practitioner
- *Minimum car parking rates to be applied to future commercial development outside the Inner Core as follows:*
 - Office 2.0 spaces per 100 sqm
 - Restaurant 0.1 spaces per patron
 - Restricted Retail 1.0 spaces per 100 sqm
 - Retail (Shop) 1.5 spaces per 100 sqm
 - Supermarket 2.5 spaces per 100 sqm
 - Medical Centre 2.3 spaces per practitioner
- *Car parking rate ranges for residential developments be adopted as follows:*
 - Residential Dwelling
 - 1 Bedroom Dwelling 0.5 – 1.0 space per dwelling
 - 2 Bedroom Dwelling 0.8 – 1.0 space per dwelling
 - 3+ Bedroom Dwelling 1.0 – 1.5 spaces per dwelling
 - Residential Hotel
 - 0.1 – 0.3 spaces to each lodging room
 - Residential College (student accommodation)
 - 0.05 – 0.25 spaces to each bed

Ringwood Central Activities Area (City of Maroondah)

In 2008, AECOM was engaged by Maroondah City Council to undertake a car parking study within the Ringwood AA.

This report was understood to be completed in September 2009 and was comprised of two parts; the 'Ringwood Central Activity District, Stage 1 – Parking Study' and the 'Ringwood Central Activity District, Stage 2 – Parking Strategy Report'. Within the Parking Strategy Report, the following is stated:

"Until the release of the DPCD parking rates, it is considered important for Council to make a move towards encouraging the update of lower parking rates that specifically reflect:

- *The likely future demographic profile of Ringwood.*
- *The significant level of envisaged growth.*
- *The proposed land use and activity patterns envisaged for Ringwood.*
- *The transport system servicing Ringwood.*

As such, Council are required to consider:

- *In contrast to many other areas, Ringwood is extremely well serviced by the arterial road network. Without sufficient measures in place, the high level of accessibility to Melbourne's inner and south-eastern suburbs provided by car will make it more difficult to promote more sustainable modes of transport. One possible way to address this is by setting parking rates that encourage reduced levels of car ownership. This approach has works successfully in Melbourne's Docklands where only one car parking space is allocated per dwelling..."*

Following the release of this Parking Strategy, Council will support lower parking rates for the following land uses:

- **Residential:** Adopt a maximum of 1 space per dwelling within the Ringwood CAD irrespective of dwelling size
- **Retail:** Adopt a minimum of 3.5 spaces per 100 sqm of leasable floor area
- **Office:** Adopt a minimum of 3 spaces per 100 sqm of leasable floor area".

The second report also states that the study area features a range of public transport services with multiple bus and train services centred on Ringwood Station and the bus interchange.

Parking Overlays within Melbourne Metropolitan Municipalities

A number of metropolitan municipalities in Melbourne provide guidance on car parking rates and arrangements which are embedded within their Planning Scheme as a Parking Overlay which provides statutory 'force' to car parking strategy recommendations.

A review of existing policies indicates that, of the total 32 metropolitan municipalities in Victoria, 16 have a Parking Overlay. Some of these municipalities have a specific cash-in-lieu arrangement included within the Overlay.

Statutory Context

A Car Parking Plan has no particular statutory power, however it provides essential advice and guidance to Council as to how to effectively manage existing and future car parking resources. The advice contained within a strategy provides the basis for the development of both statutory and non-statutory mechanisms.

In this regard, the Victorian Planning Provisions (VPP) practice note, reproduced in the figure below, shows the relationship between a Car Parking Plan and the mechanisms in place to implement specific findings of the plan.

Figure - Statutory Context



The implementation of the Car Parking Plan findings can occur in two forms: those that can be simply implemented by Council (such as changes to parking restrictions); and those that will require a statutory form to place requirements on developers or other third parties.

As a result, this report seeks to develop a car parking plan to best manage existing and future car parking demands. The strategies proposed as part of the plan are likely to require a mix of implementation techniques which will be examined throughout this report.

It is worth noting that a Parking Overlay typically represents the most appropriate tool at this time to supply statutory force to the strategy's outcomes.

Greensborough Activity Centre Parking
Plan

APPENDIX

B

GREENSBOROUGH PARKING
PRECINCT PLAN 2006

Greensborough Parking Precinct Plan (2006)

Summary

Council commissioned the formation of the Greensborough Project in March 2005. This was to be a significant project designed with the intent of revitalising the Greensborough town centre, and in doing so, providing a platform for future development of the Greensborough Major Activity Centre (GMAC).

Cardno, working as Grogan Richards at the time, was engaged by the Greensborough Project to complete a Parking Study to inform a Parking Precinct Plan for the GMAC. The plan included assessments of background information, compilation of land use data, surveys of existing car parking supply and demand, and recommendations regarding parking rates applicable to various land uses within the GMAC.

Subsequent to the completion of the Parking Precinct Plan, Council submitted Amendment C51 to the Planning Scheme in 2007, which was seeking to provide the planning framework to implement the recommendations of the plan. Notably, the amendment included an insertion into Clause 52.06 to include the car parking rates specified within the plan prepared by Cardno. The amendment was accepted and now forms part of the Banyule Planning Scheme.

Land Use

A breakdown of land use floor areas within the GMAC sourced during the previous study is provided in the below table. It is noted that Precincts B, F and J were excluded from the land use summary, as there were no commercial businesses within the precinct at the time.

Table - Summary of Land Use Areas by Precinct - April 2006

Category	Land Use	Precinct A	Precinct C	Precinct D	Precinct E	Precinct G	Precinct H	Precinct K	Precinct L	Total Area (m ²)
Recreational	RSL								1,310	1,310
	Hotel			1,200						1,200
	Cinema			2,962						2,962
	Gymnasium	180	920							1,100
	Sub Total	180	5,082					1,310		6,572
Place of Assembly	Pre-school				600					600
	Church		1,200		300					1,500
Food and Drink Premises	Restaurant	805		1,688						2,493
	Convenience Store/Fast Food	287		893			103			1,283
	Café		265							265
	Sub Total	1,092	265	2,581			103			4,041
Office	Office	2,949	3,502	1,604	306	1,914	225	539		11,039
	Medical Services		213	409		165				787
	Bank	269	1,351	146						1,766
	Government Offices			1,263						1,263
	Centrelink			1,545						1,545
	Sub Total	3,218	5,066	4,967	306	2,079	225	539		16,400
Retail	Strip Shops	1,104	1,569	6,405			49	1,340 (L ₁ =412)		10,467
	Supermarket	3,703								3,703
	Restricted Retail	504	122	1,361				248		2,235
	Shopping Centre			49,038						49,038
	Sub Total	3,703	1,608	50,729	7,766		49	1,588		65,443
Other	Vacant	609	892	243				179		1,923
	Petrol Station	105					101			206
	Car Wash	220								220
	Car Service Centre						322			322
	Sub-Total	325	609	892	243		423	179		2,671
Total										96,627

Table - Summary of Midday Car Parking Demands – April 2006

Day	Location	Supply	Demand	Occupancy
Friday 7th April 2006	On-Street	388	220	56%
	Off-Street	4,845	4,054	83%
	Total	5,463	4,273	78%
Saturday 8th April 2006	On-Street	388	115	30%
	Off-Street	4,845	3,439	71%
	Total	5,463	3,554	65%

The above table indicates that parking for the study area had an overall occupancy of 78% on the Friday and 65% on the Saturday at midday, with the survey area operating with spare capacity during these periods.

Car Parking Rates

Based on the findings of the parking study, Grogan Richards recommended that future developments within the Greensborough Principal Activity Centre would be required to provide car parking at revised rates as shown in the below table. It should be noted that the recommended peak parking rate for an office use remains the same as the current Planning Scheme rate.

Table - Parking Precinct Rates (2006)

Use	Car Parking Measure	Rate
Office	Car parking spaces per 100m ² of net floor area	3.5
Restaurant	Car parking spaces per seat	0.4
Shop	Car parking spaces per 100m ² of leasable floor area	4.6
Restricted Retail	Car parking spaces per 100m ² of leasable floor area	2.5

In addition, Grogan Richards recommended that the requirements of Clause 55 be applied for the construction of residential dwellings as follows:

- > 1 resident space for each 1 and 2-bedroom dwelling;
- > 2 resident spaces for each 3 or more-bedroom dwelling; and
- > 0.2 spaces per dwelling should be provided for visitor parking.

Grogan Richards advocated that a permit may be granted to vary the car parking requirements of the Greensborough Principal Activity Centre Parking Precinct Plan.

Greensborough Activity Centre Parking Plan

APPENDIX

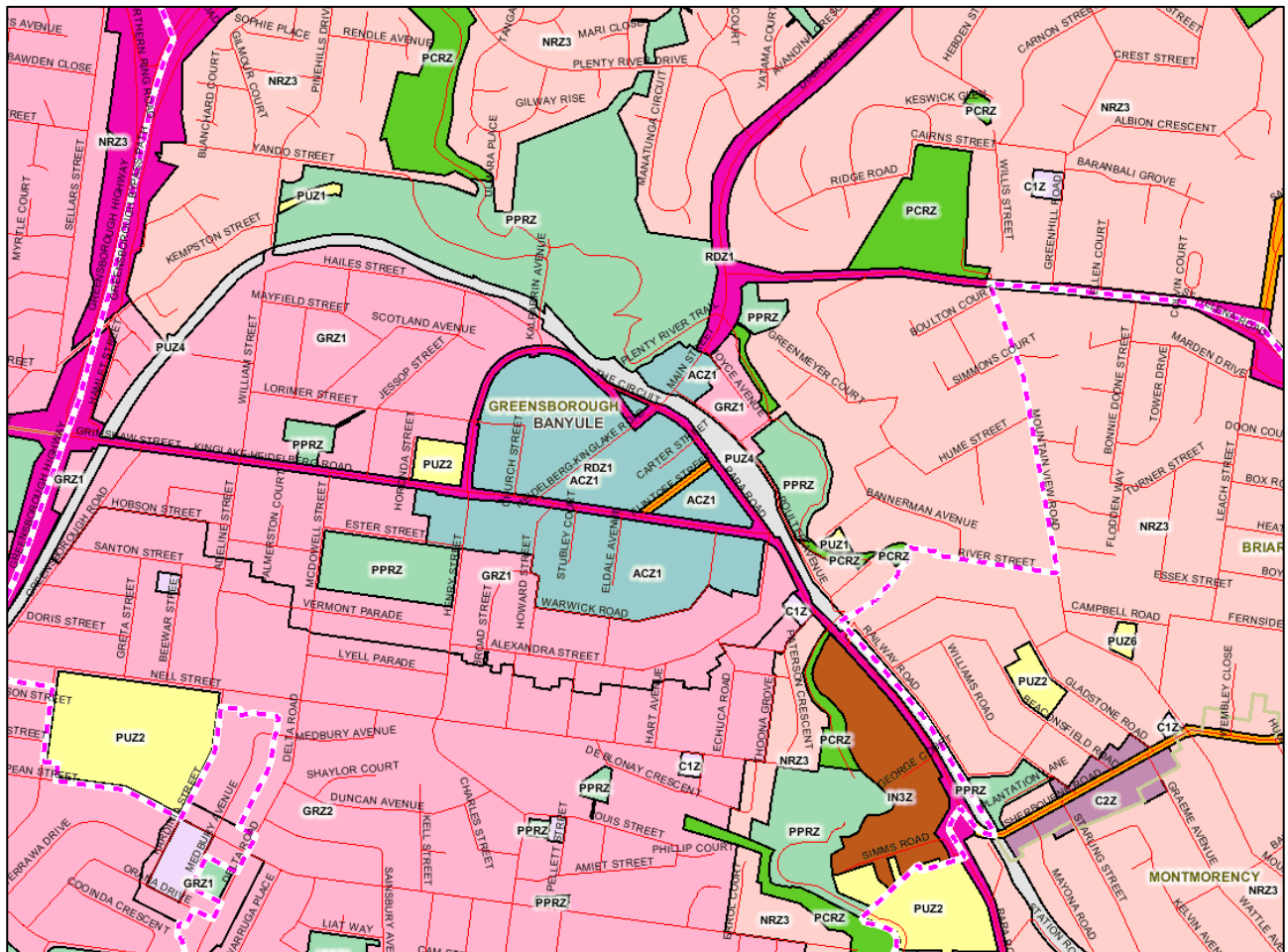
C

GMAC LAND USE ZONING

Land Use Zoning

A land use zoning map of the GMAC has been shown in the figure below to provide some greater context around the land use mix within the study area.

Figure - Land Use Zones Within the GMAC



Zones Legend		
ACZ - Activity Centre	IN1Z - Industrial 1	R1Z - General Residential
B1Z - Commercial 2	IN2Z - Industrial 2	R2Z - General Residential
B2Z - Commercial 1	IN3Z - Industrial 3	R3Z - General Residential
B3Z - Commercial 2	LDRZ - Low Density Residential	RAZ - Rural Activity
B4Z - Commercial 2	MUZ - Mixed Use	RCZ - Rural Conservation
B5Z - Commercial 1	NRZ - Neighbourhood Residential	RD1 - Road - Category 1
C1Z - Commercial 1	PCRZ - Public Conservation & Resource	RD2 - Road - Category 2
C2Z - Commercial 2	PDZ - Priority Development	RGZ - Residential Growth
CA - Commonwealth Land	PPRZ - Public Park & Recreation	RLZ - Rural Living
CCZ - Capital City	PUZ1 - Public Use - Service & Utility	RUZ - Rural
CDZ - Comprehensive Development	PUZ2 - Public Use - Education	SUZ - Special Use
DZ - Dockland	PUZ3 - Public Use - Health Community	TZ - Township
ERZ - Environmental Rural	PUZ4 - Public Use - Transport	UFZ - Urban Floodway
FZ - Farming	PUZ5 - Public Use - Cemetery/Crematorium	UGZ - Urban Growth
GRZ - General Residential	PUZ6 - Public Use - Local Government	
GWAZ - Green Wedge A	PUZ7 - Public Use - Other Public Use	
GWZ - Green Wedge	PZ - Port	
		--- Urban Growth Boundary
+++++ Railway	--- Tram	--- River, stream
		--- Lake, waterbody

As shown above, within the GMAC area the Activity Centre zone includes the majority of Zone A. Surrounding uses generally include a mix of general and neighbourhood residential uses.

Greensborough Activity Centre Parking Plan

APPENDIX

D

SURVEY DATA

Greensborough Parking Survey

Zone A

Thursday, 7th September 2017

Client Cardno

Location **Area A - Total

Date Thursday, 7th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area A - Total

Total Parking Spaces 221

Time restriction -

Peak Demand 232

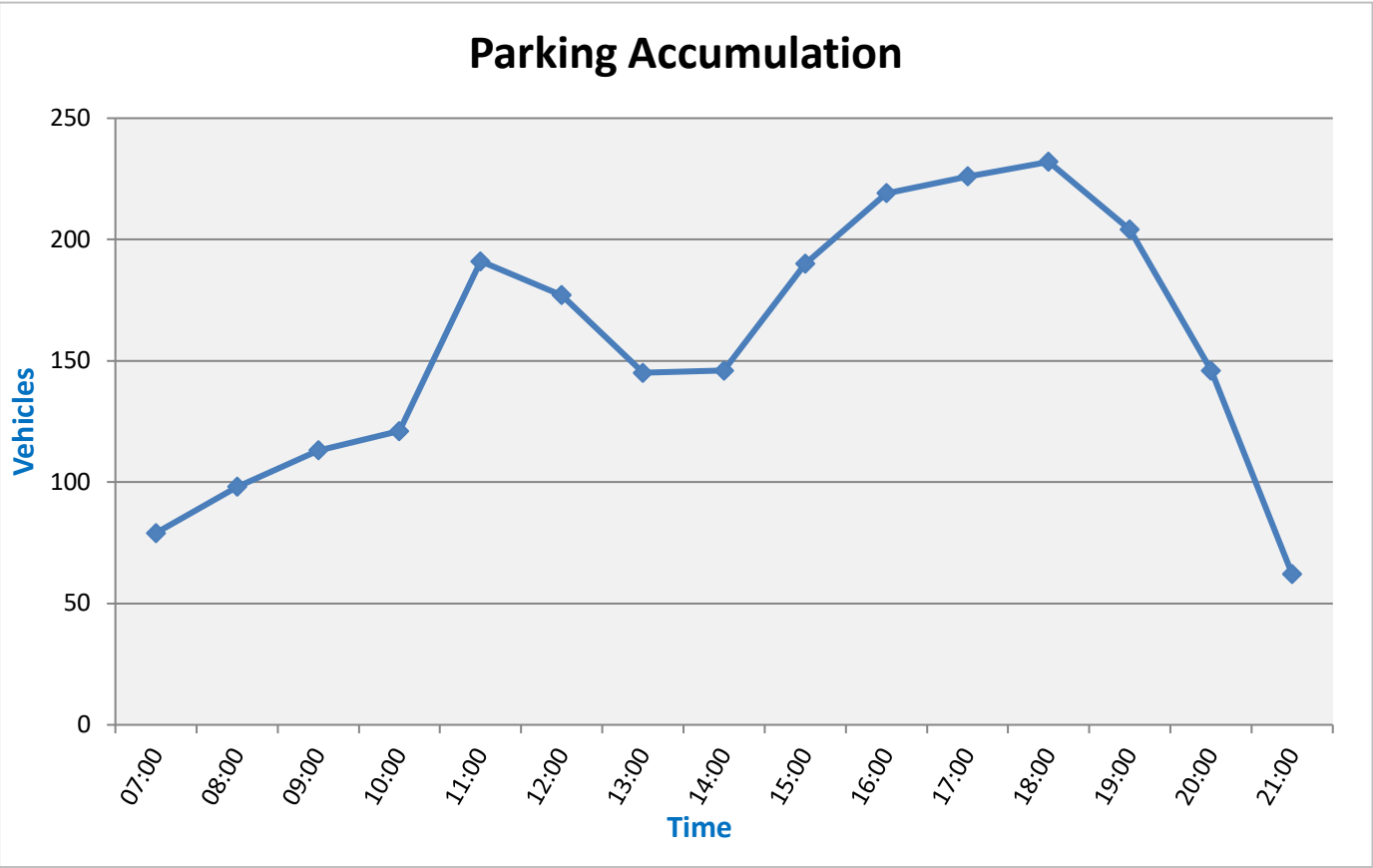
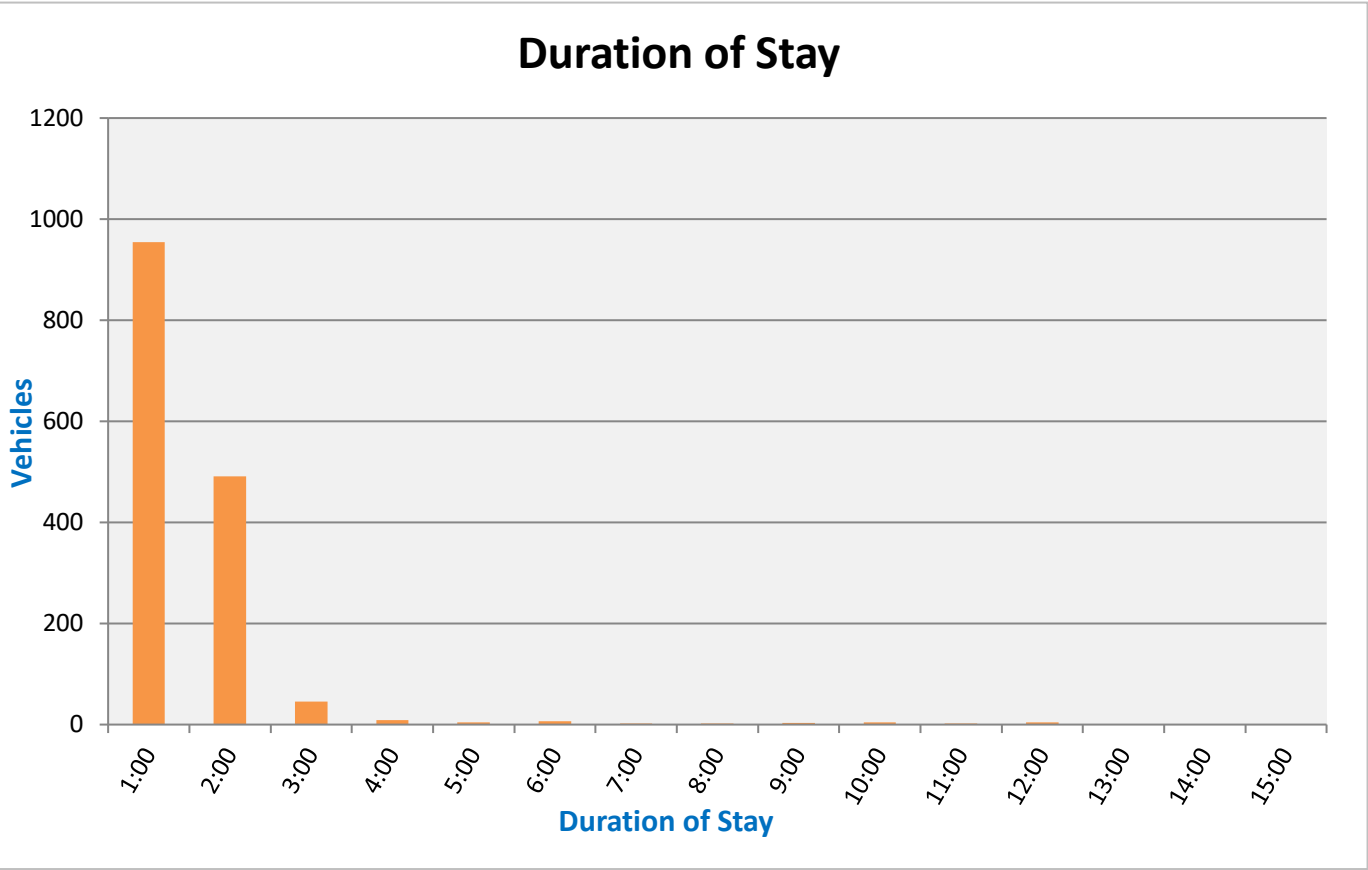
Peak Demand % 105%

Ave Duration of Stay (h:mm) 1:32

Total Vehicles 1528

[1hr intervals]

Total	954	491	45	9	4	7	2	2	3	4	2	4	1	0	0			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	38	18	11	2		3				1	2	3	1			79	79	36%
08:00	31	17		2	2	2			2	1						57	98	44%
09:00	32	22	7	1						1		1				64	113	51%
10:00	36	29				1	1			1						68	121	55%
11:00	86	41	1	1					1							130	191	86%
12:00	69	34	4	2		1										110	177	80%
13:00	50	28	2	1	1			2								84	145	66%
14:00	56	31					1									88	146	66%
15:00	75	55	3													133	190	86%
16:00	91	44	5													140	219	99%
17:00	107	49	1		1											158	226	102%
18:00	99	55	11													165	232	105%
19:00	89	40														129	204	92%
20:00	62	28														90	146	66%
21:00	33															33	62	28%



Client Cardno

Location **Area C - Total

Date Thursday, 7th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area C - Total

Total Parking Spaces 389

Time restriction -

Peak Demand 279

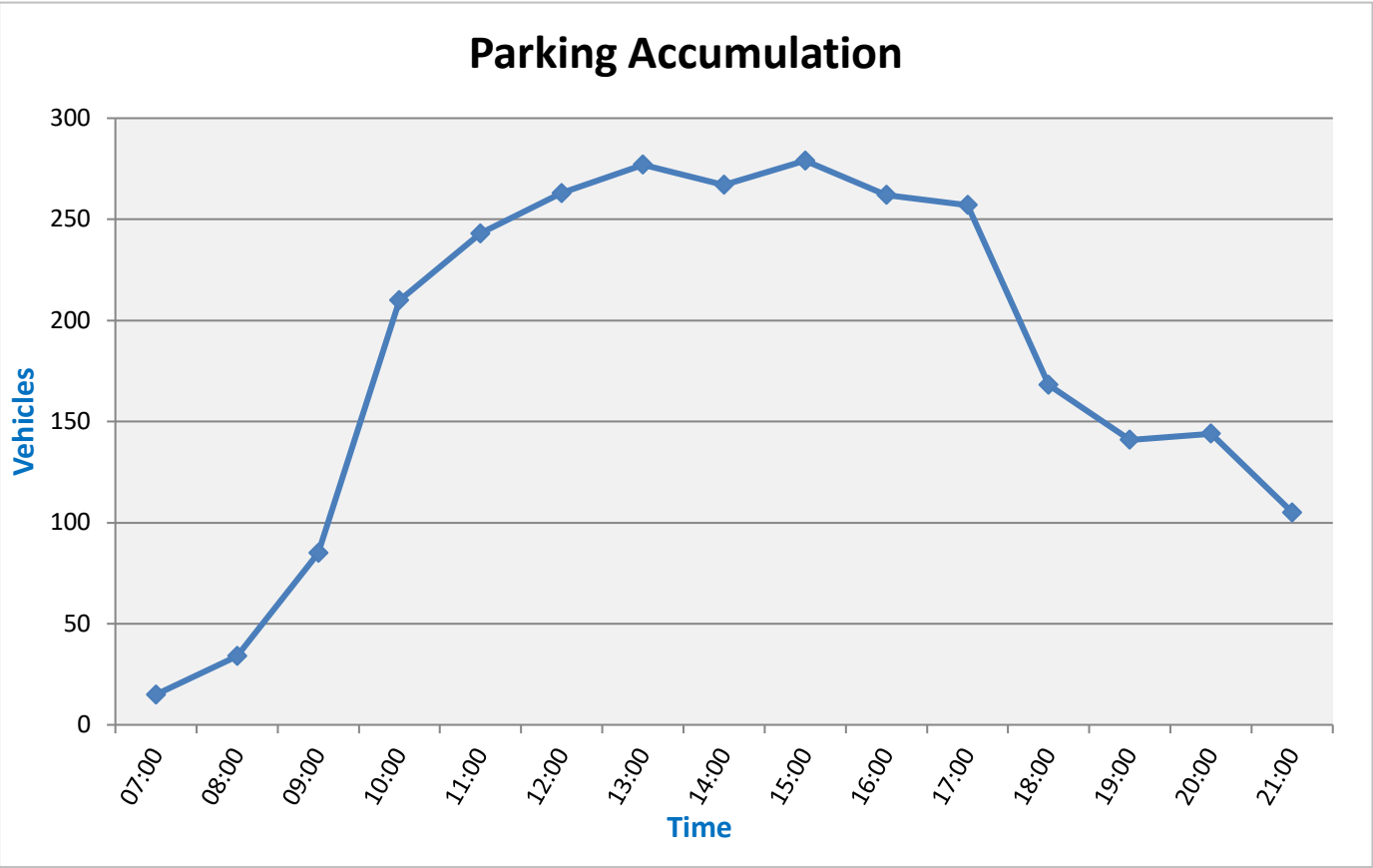
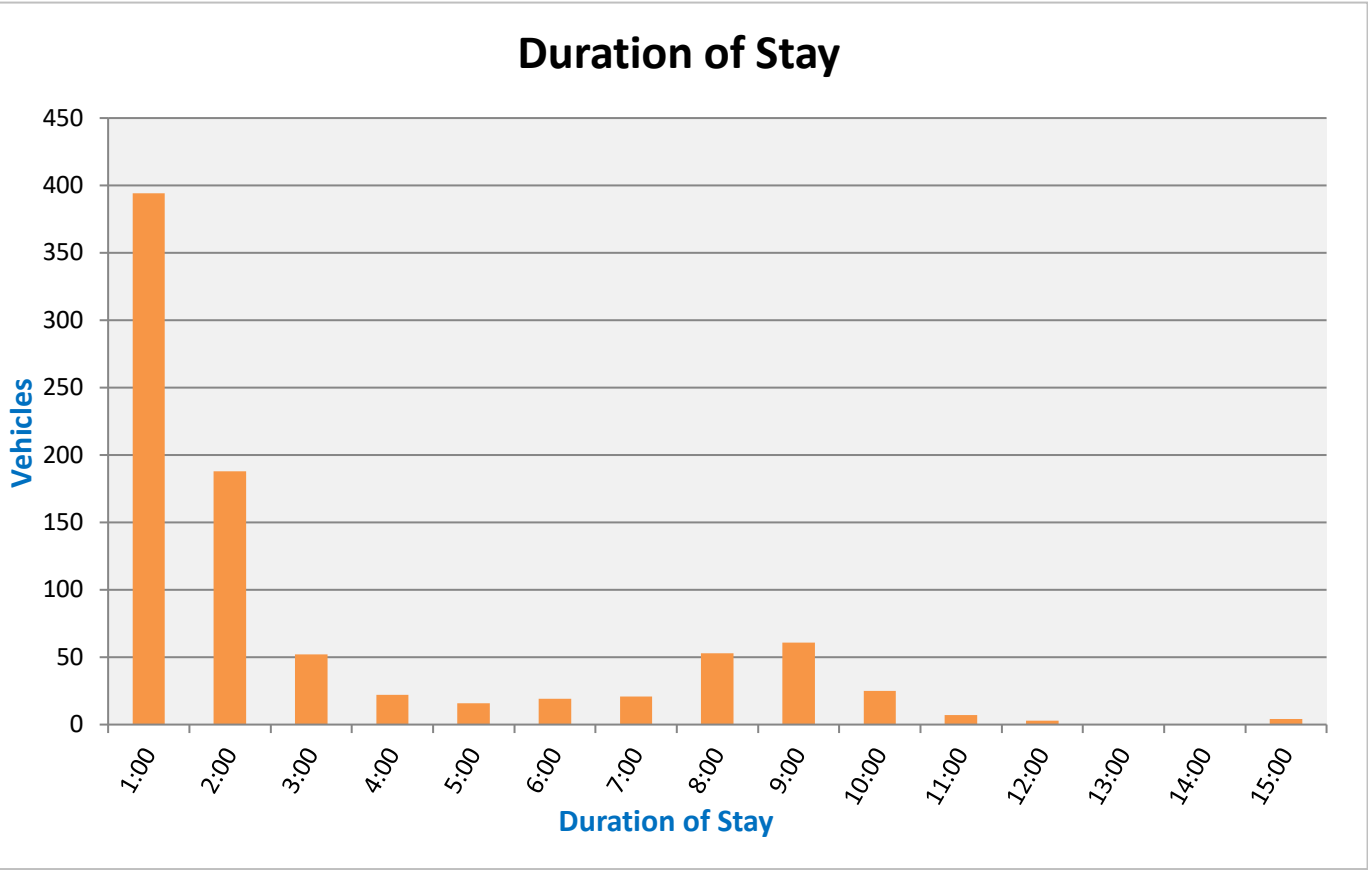
Peak Demand % 72%

Ave Duration of Stay (h:mm) 3:10

Total Vehicles 865

[1hr intervals]

Total	394	188	52	22	16	19	21	53	61	25	7	3	0	0	4			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00		4	1	1	1				1		3				4	15	15	4%
08:00	5	1				1		4	3	4	1					19	34	9%
09:00	12	1		3		2	1	2	26	9	2	2				60	85	22%
10:00	22	13	6	2	3	7	6	43	25	10	1	1				139	210	54%
11:00	26	12	4		2		7	1	4	1						57	243	62%
12:00	25	18	3	3	3	3	3	1		1						60	263	68%
13:00	22	17	7	2	4	1	3	2	2							60	277	71%
14:00	21	13	1	2												37	267	69%
15:00	44	3	4	2	1	4										58	279	72%
16:00	29	26	4	3	1	1	1									65	262	67%
17:00	30	7	6		1											44	257	66%
18:00	35	17	7	4												63	168	43%
19:00	37	15	9													61	141	36%
20:00	46	41														87	144	37%
21:00	40															40	105	27%



Client Cardno

Location **Area D - Total

Date Thursday, 7th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area D - Total

Total Parking Spaces 2448

Time restriction -

Peak Demand 2176

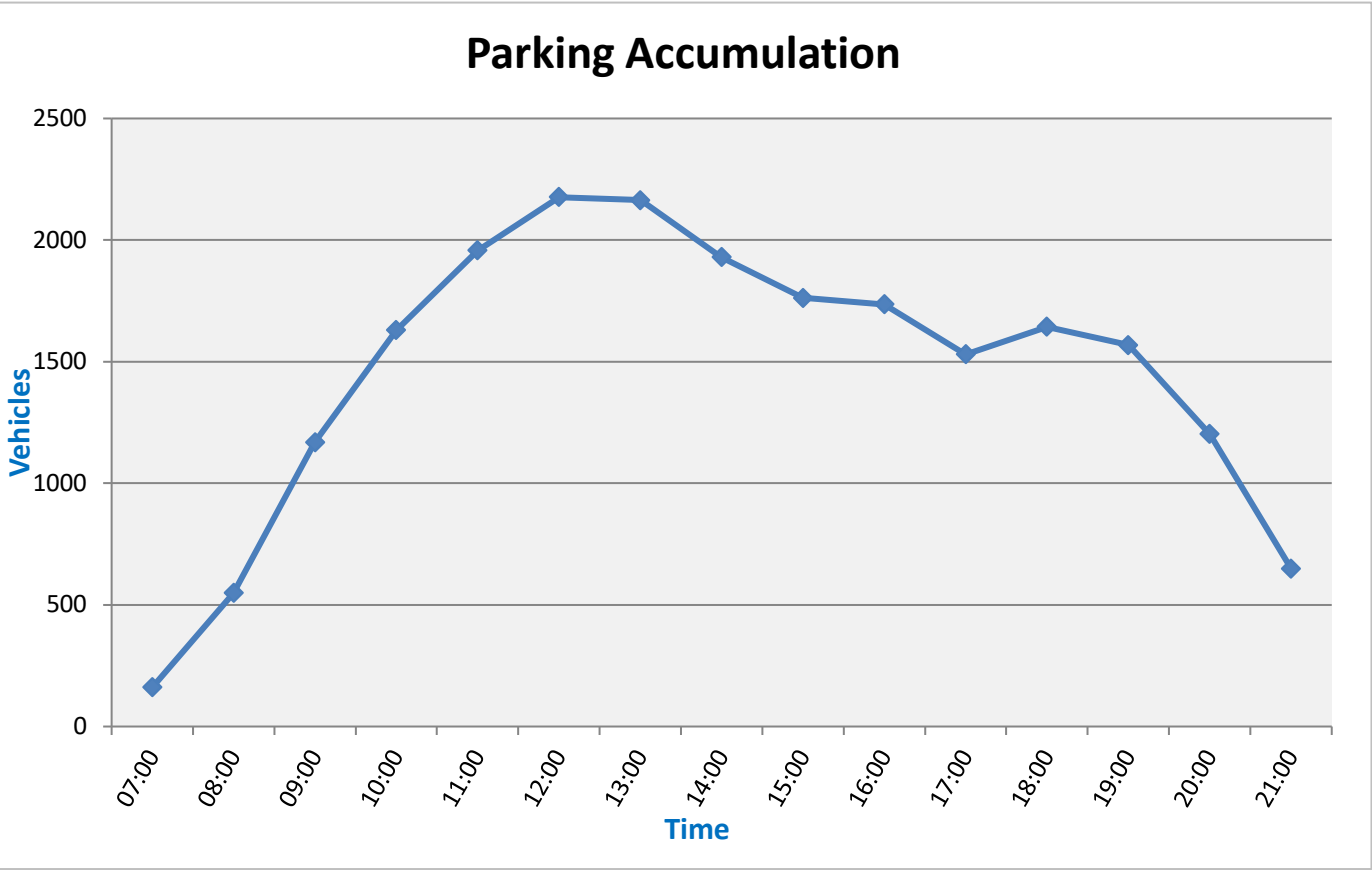
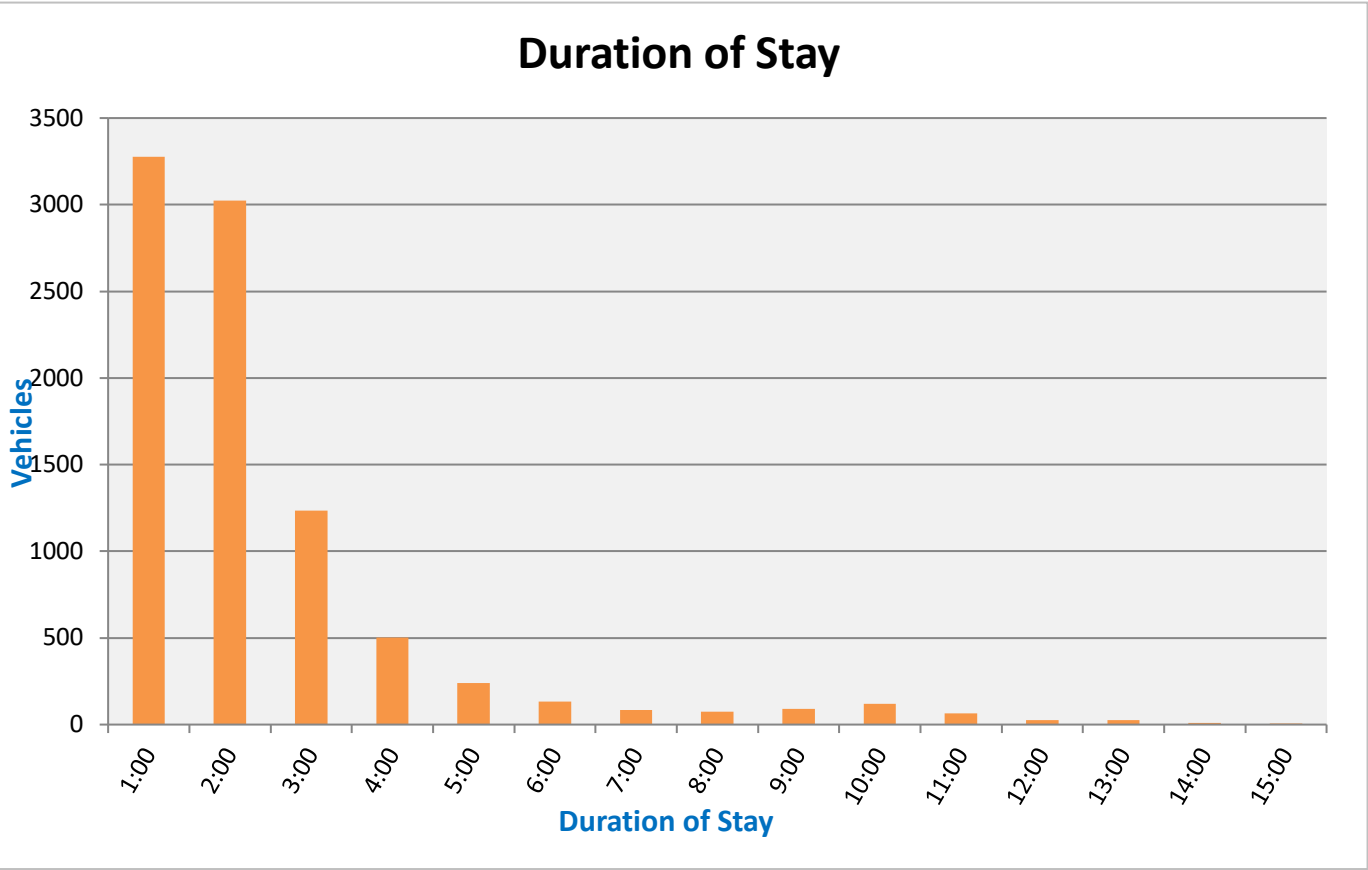
Peak Demand % 89%

Ave Duration of Stay (h:mm) 2:26

Total Vehicles 8912

[1hr intervals]

Total	3277	3024	1235	503	241	132	83	73	91	119	64	26	26	11	7			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	17	21	15	8	9	7	12	13	4	24	12	6	3	3	7	161	161	7%
08:00	32	74	50	20	17	17	13	17	47	64	32	5	9	8		405	549	22%
09:00	126	194	96	72	63	42	16	16	18	4	4	8	14			673	1169	48%
10:00	191	235	118	58	28	13	8	9	4	3	2	7				676	1630	67%
11:00	224	269	132	62	42	9	10	3	1	5	14					771	1958	80%
12:00	221	296	170	69	17	6	2	1	1	19						802	2176	89%
13:00	240	245	122	44	11	5	4	5	16							692	2164	88%
14:00	240	209	86	26	10		3	9								583	1929	79%
15:00	226	298	73	23	7	4	15									646	1762	72%
16:00	295	239	93	26	10	29										692	1736	71%
17:00	263	228	80	40	27											638	1530	63%
18:00	357	322	110	55												844	1643	67%
19:00	402	200	90													692	1568	64%
20:00	298	194														492	1202	49%
21:00	145															145	649	27%



Client Cardno

Location **Area E - Total

Date Thursday, 7th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area E - Total

Total Parking Spaces 578

Time restriction -

Peak Demand 508

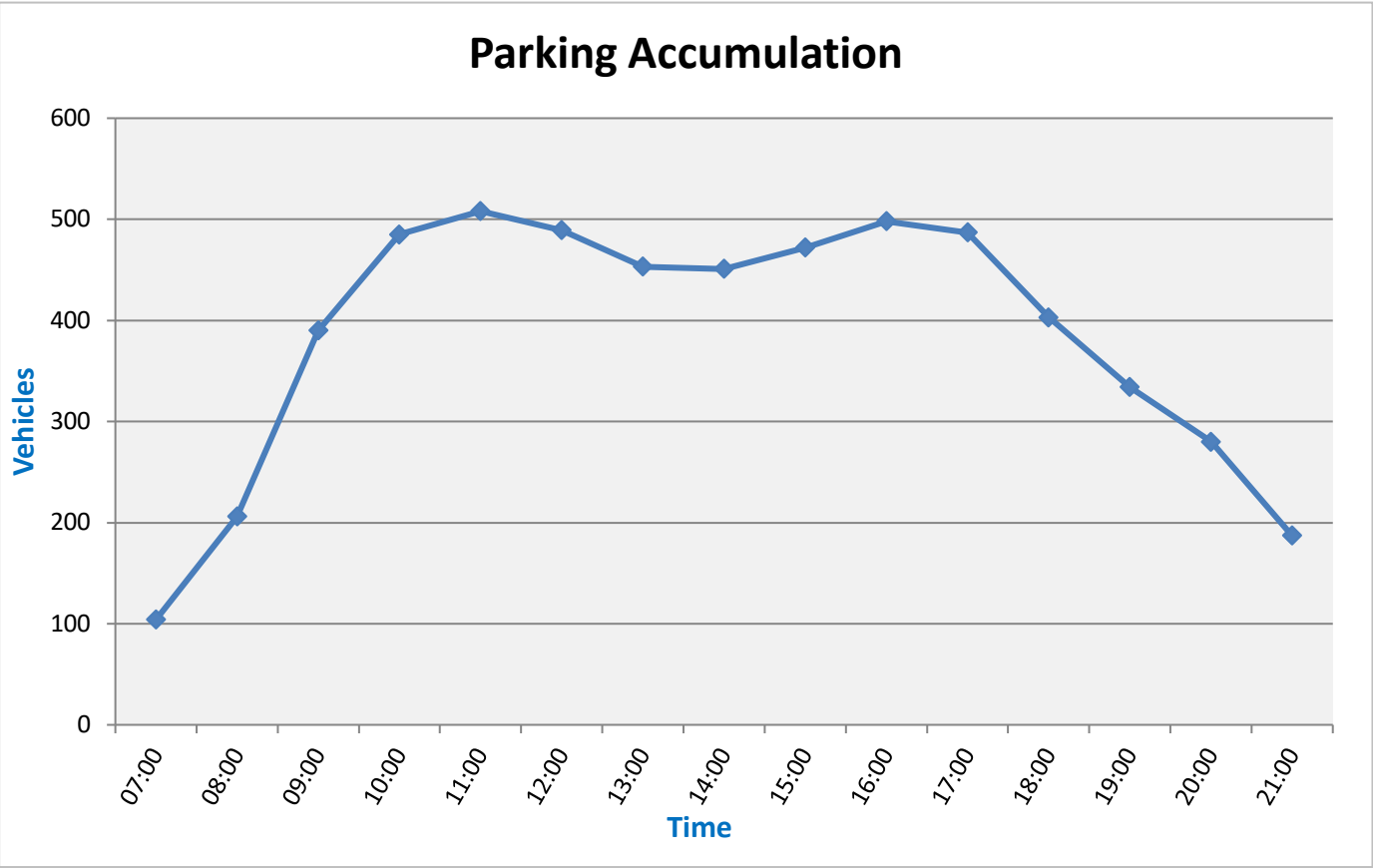
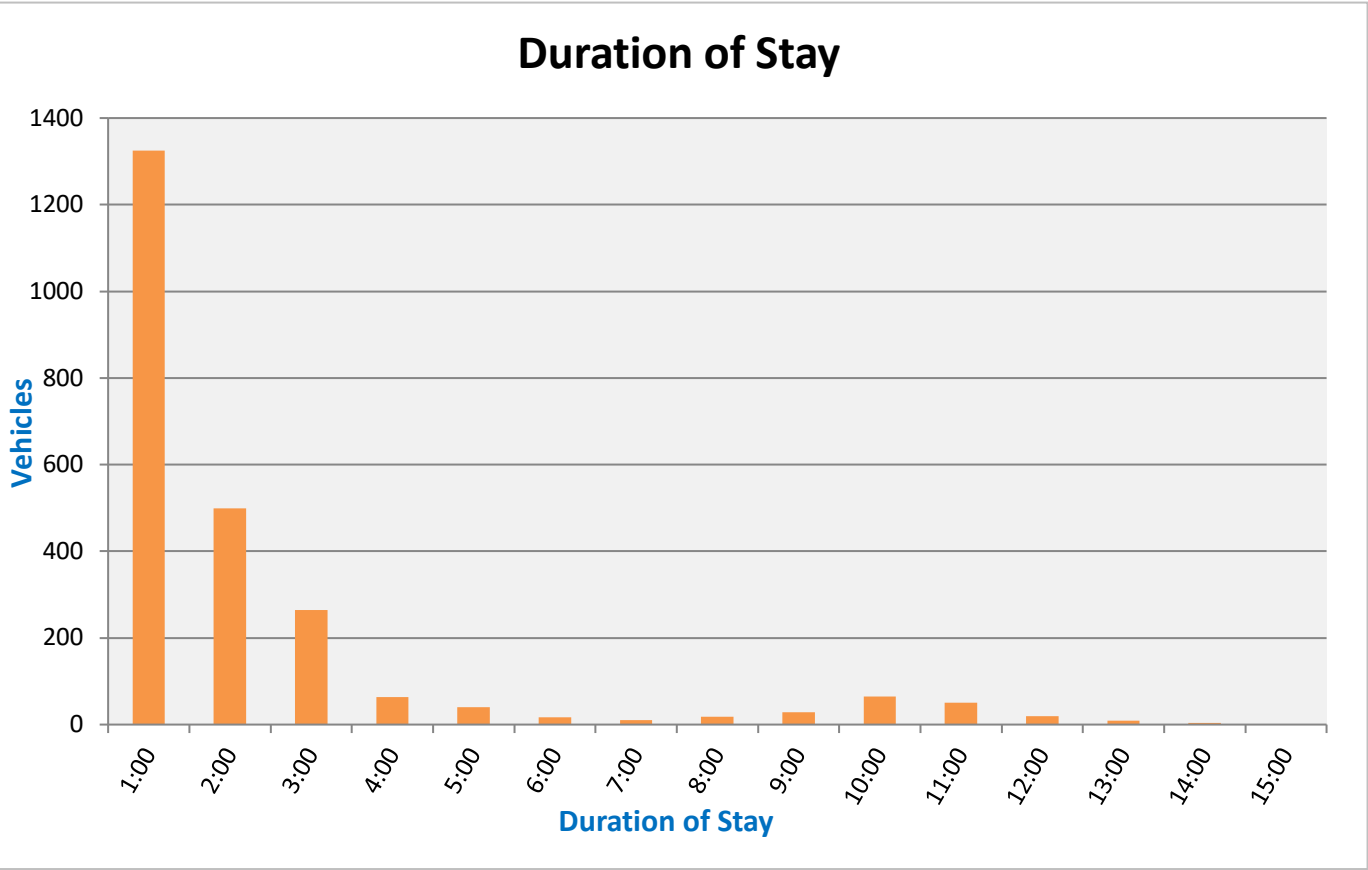
Peak Demand % 88%

Ave Duration of Stay (h:mm) 2:22

Total Vehicles 2412

[1hr intervals]

Total	1325	499	264	63	40	17	10	18	28	65	51	19	9	4	0			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	27	22	18	3	1	2		1	2	13	10	1		4		104	104	18%
08:00	24	21	22	4	6	1	2	4	9	20	8	4	4			129	206	36%
09:00	63	37	24	11	3	5	1	4	12	25	28	12	5			230	390	67%
10:00	103	42	20	5	3	2	2	5	4	5	4	2				197	485	84%
11:00	128	31	13	4	5	1	2	1	1	1	1					188	508	88%
12:00	114	32	19	5	3	3	2	1		1						180	489	85%
13:00	90	32	18	2	5			1								148	453	78%
14:00	94	25	15	4	2	1		1								142	451	78%
15:00	103	45	24	6	2		1									181	472	82%
16:00	125	38	23	3		2										191	498	86%
17:00	138	35	23	2	10											208	487	84%
18:00	106	36	21	14												177	403	70%
19:00	88	32	24													144	334	58%
20:00	67	71														138	280	48%
21:00	55															55	187	32%



Client Cardno

Location

**Area F&G - Total

Date Thursday, 7th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site**Area F&G - Total

Total Parking Spaces295

Time restriction-

Peak Demand122

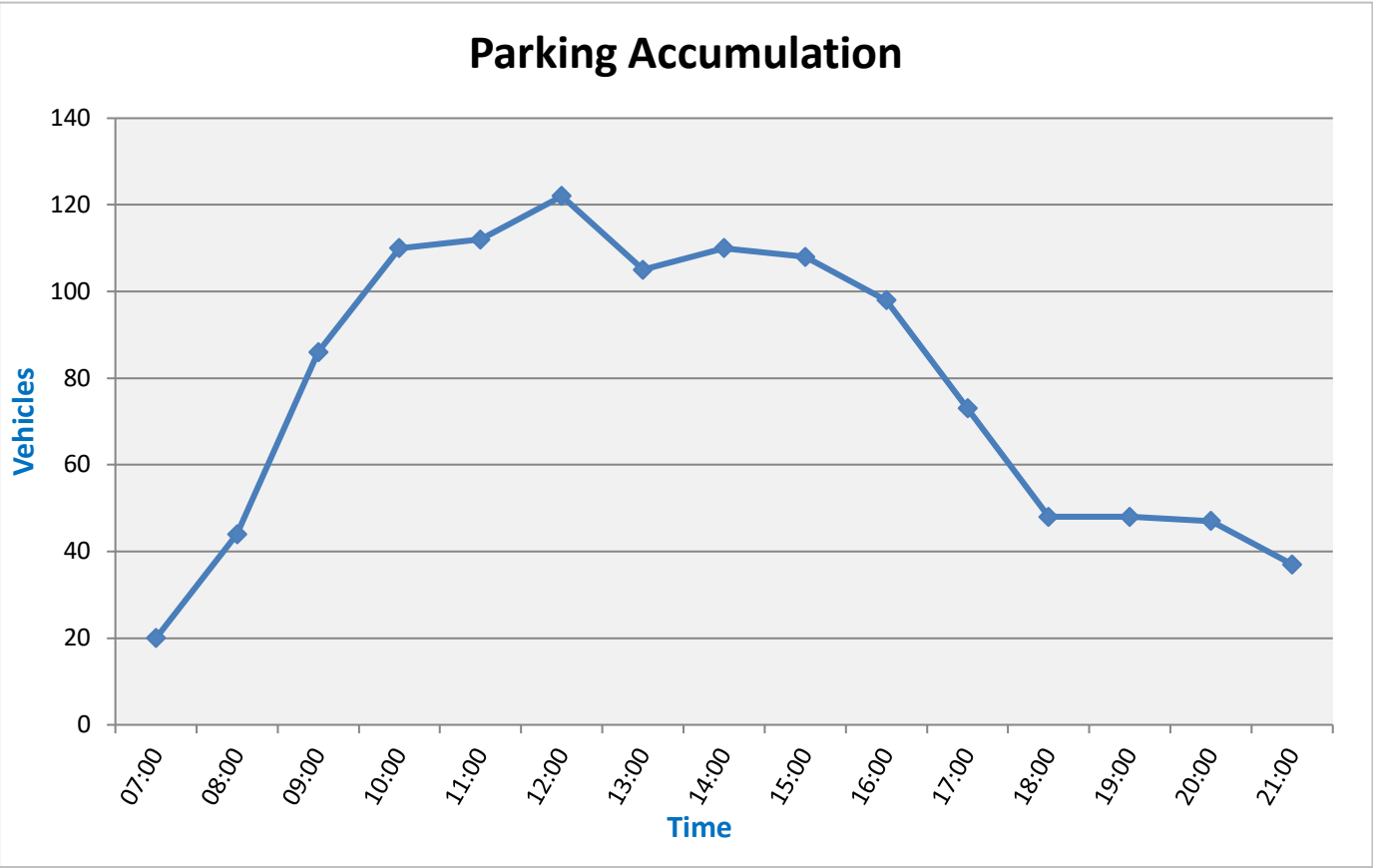
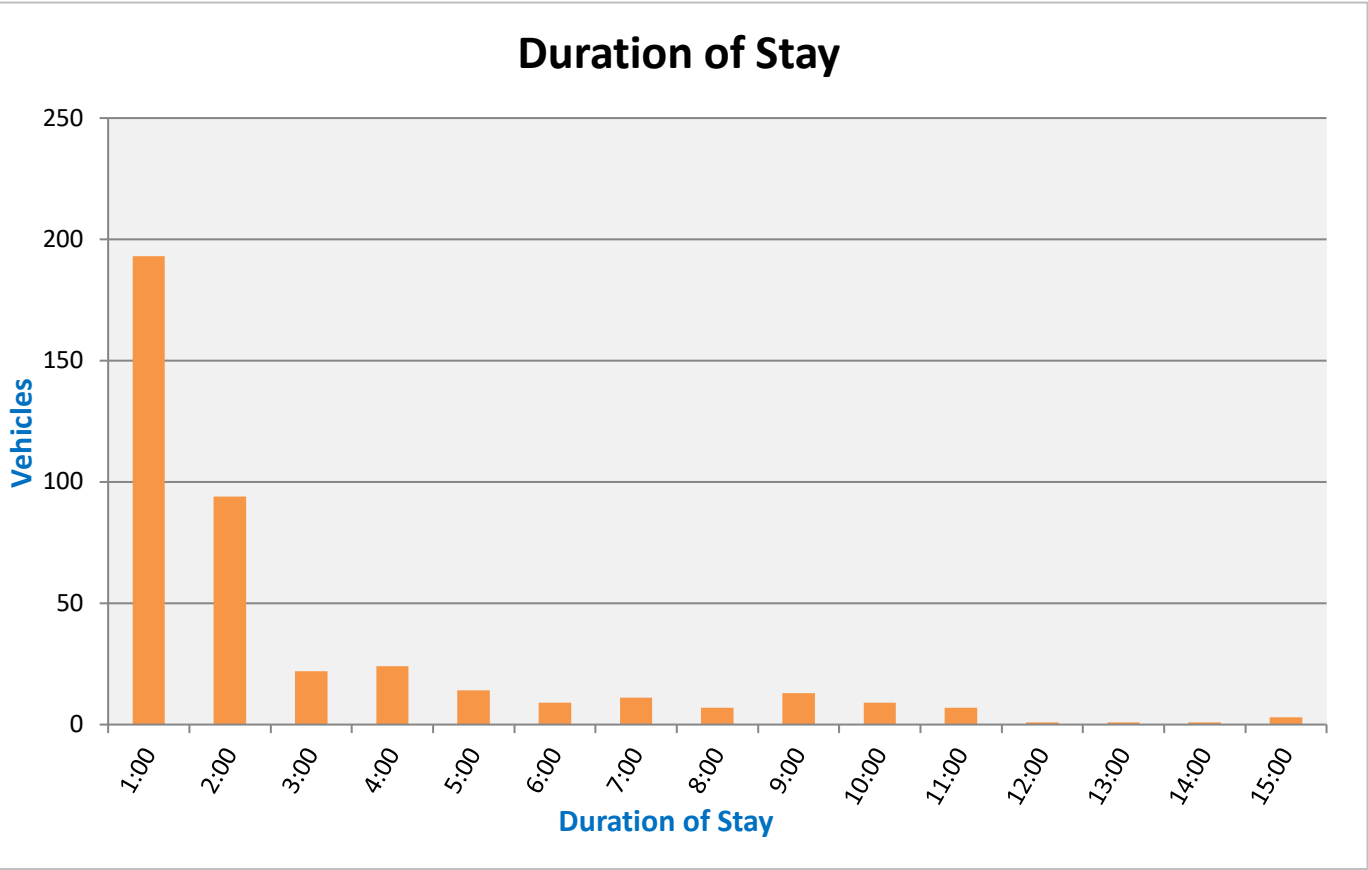
Peak Demand %41%

Ave Duration of Stay (h:mm)2:51

Total Vehicles409

[1hr intervals]

Total	193	94	22	24	14	9	11	7	13	9	7	1	1	1	3			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	4	3	1	2	1	1	5								3	20	20	7%
08:00	7	1	1		1	4		1	5	3	3	1		1		28	44	15%
09:00	17	6	1	7	4	1	1	1	6	3	4		1			52	86	29%
10:00	17	10	2	1	4		1	5	1	2						43	110	37%
11:00	15	6	3				2		1	1						28	112	38%
12:00	23	10	1		1	2										37	122	41%
13:00	13	3	3	4												23	105	36%
14:00	23	9	5	7		1										45	110	37%
15:00	14	12	1		1		2									30	108	37%
16:00	12	6														18	98	33%
17:00	14				2											16	73	25%
18:00	11	6	1	3												21	48	16%
19:00	6	9	3													18	48	16%
20:00	8	13														21	47	16%
21:00	9															9	37	13%



Client Cardno

Location **Area H - Total

Date Thursday, 7th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area H - Total

Total Parking Spaces 54

Time restriction -

Peak Demand 42

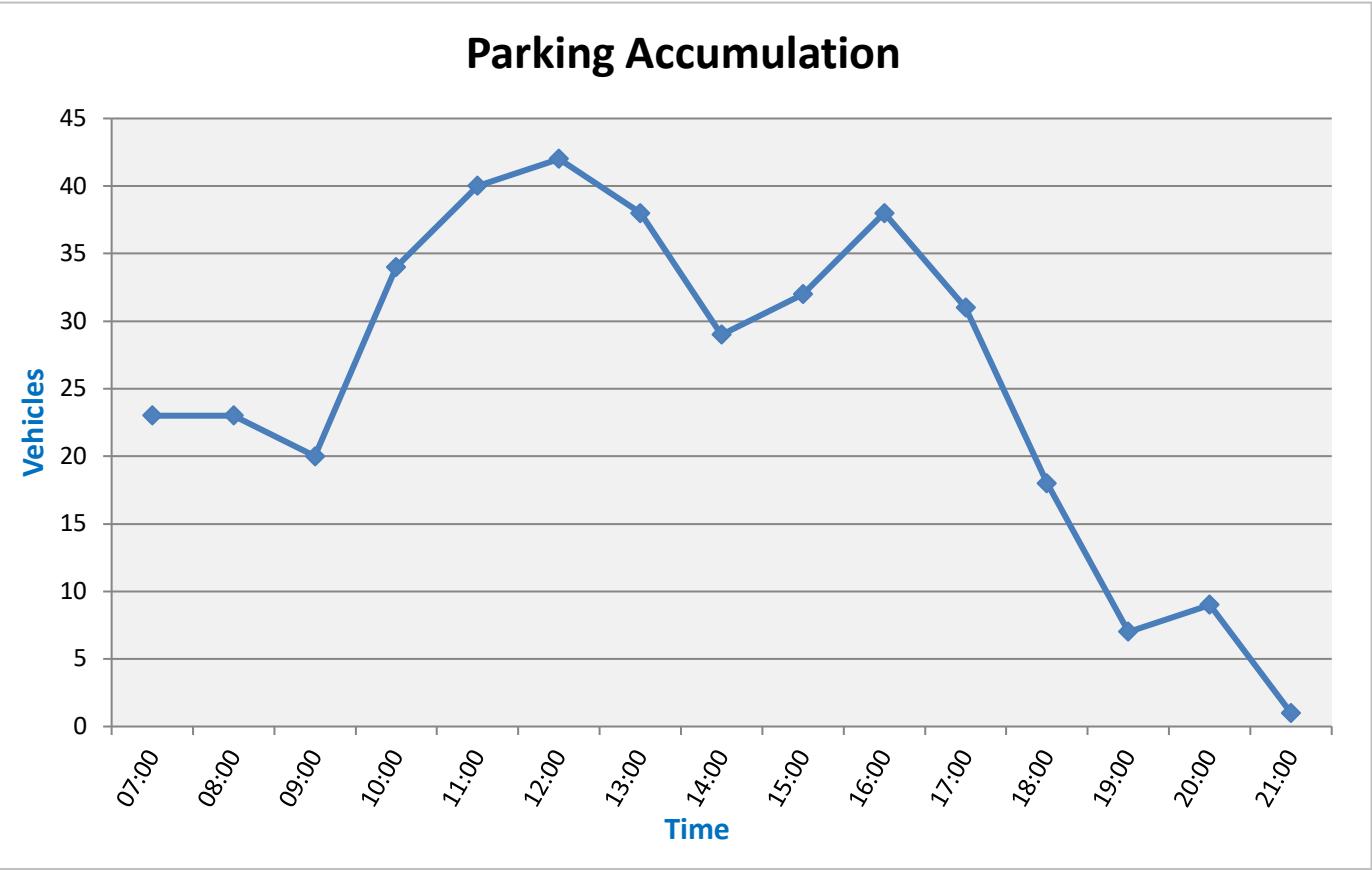
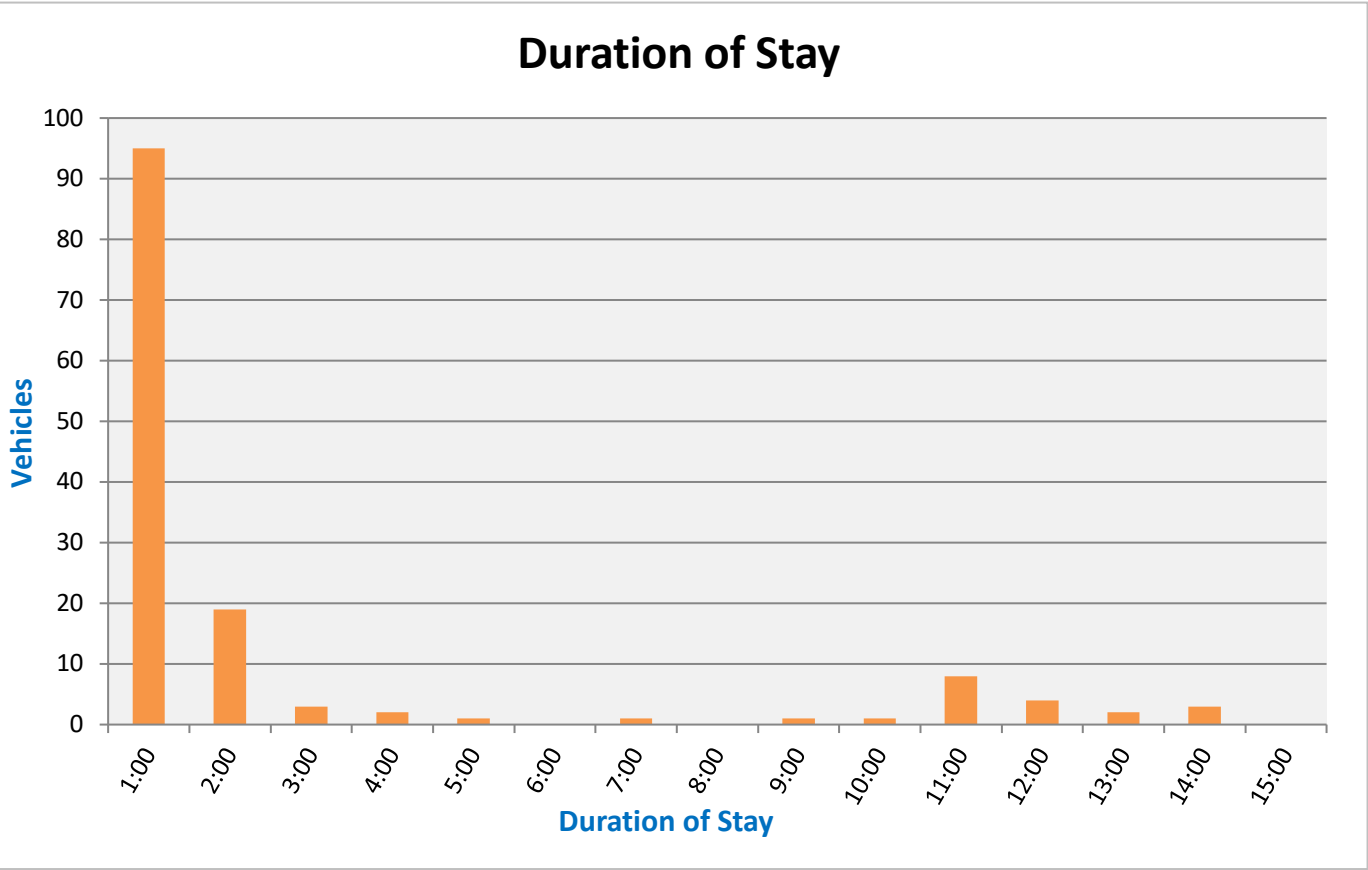
Peak Demand % 78%

Ave Duration of Stay (h:mm) 2:45

Total Vehicles 140

[1hr intervals]

Total	95	19	3	2	1	0	1	0	1	1	8	4	2	3	0			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00		4					1			1	8	4	2	3		23	23	43%
08:00																0	23	43%
09:00					1											1	20	37%
10:00	9	2	1	1					1							14	34	63%
11:00	14	1														15	40	74%
12:00	14	4														18	42	78%
13:00	10	2														12	38	70%
14:00	4	2	1	1												8	29	54%
15:00	9															9	32	59%
16:00	16	1														17	38	70%
17:00	9	2														11	31	57%
18:00	5		1													6	18	33%
19:00		1														1	7	13%
20:00	4															4	9	17%
21:00	1															1	1	2%



Client Cardno

Location **Area I - Total

Date Thursday, 7th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area I - Total

Total Parking Spaces 50

Time restriction -

Peak Demand 33

Peak Demand % 66%

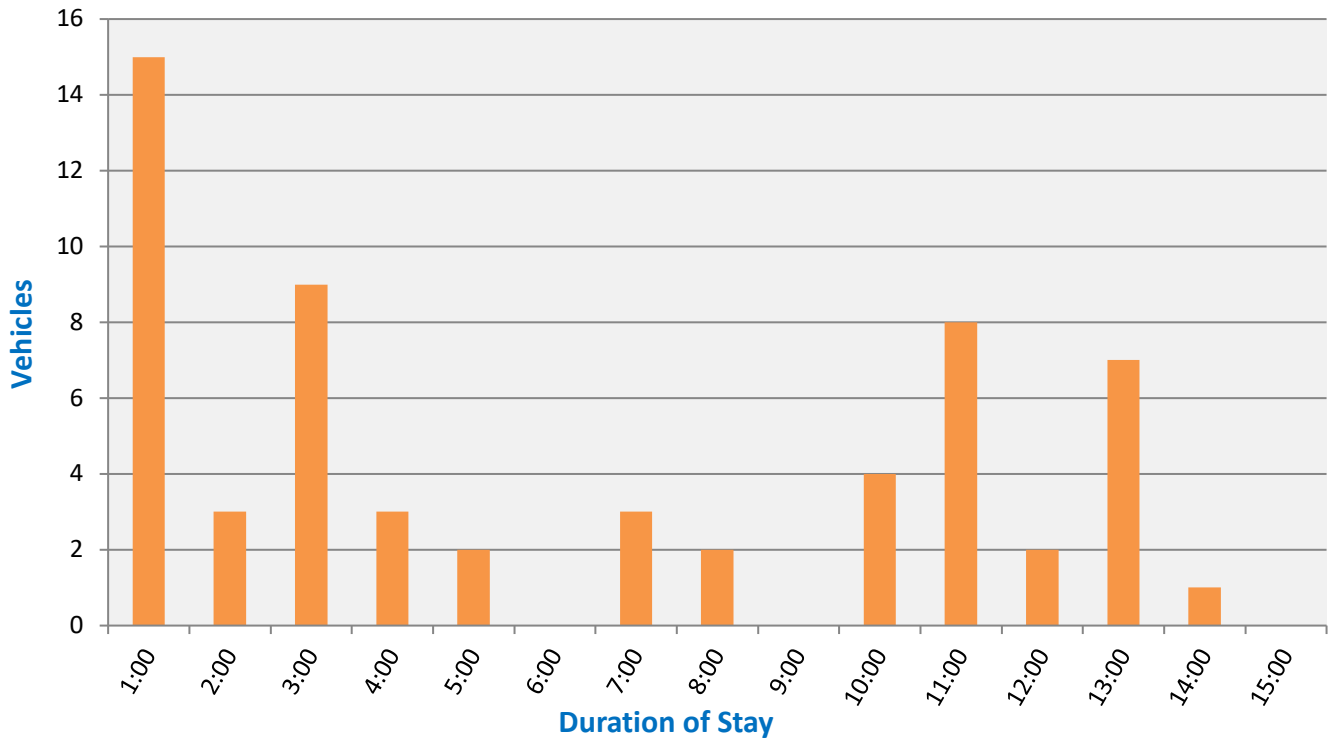
Ave Duration of Stay (h:mm) 6:10

Total Vehicles 59

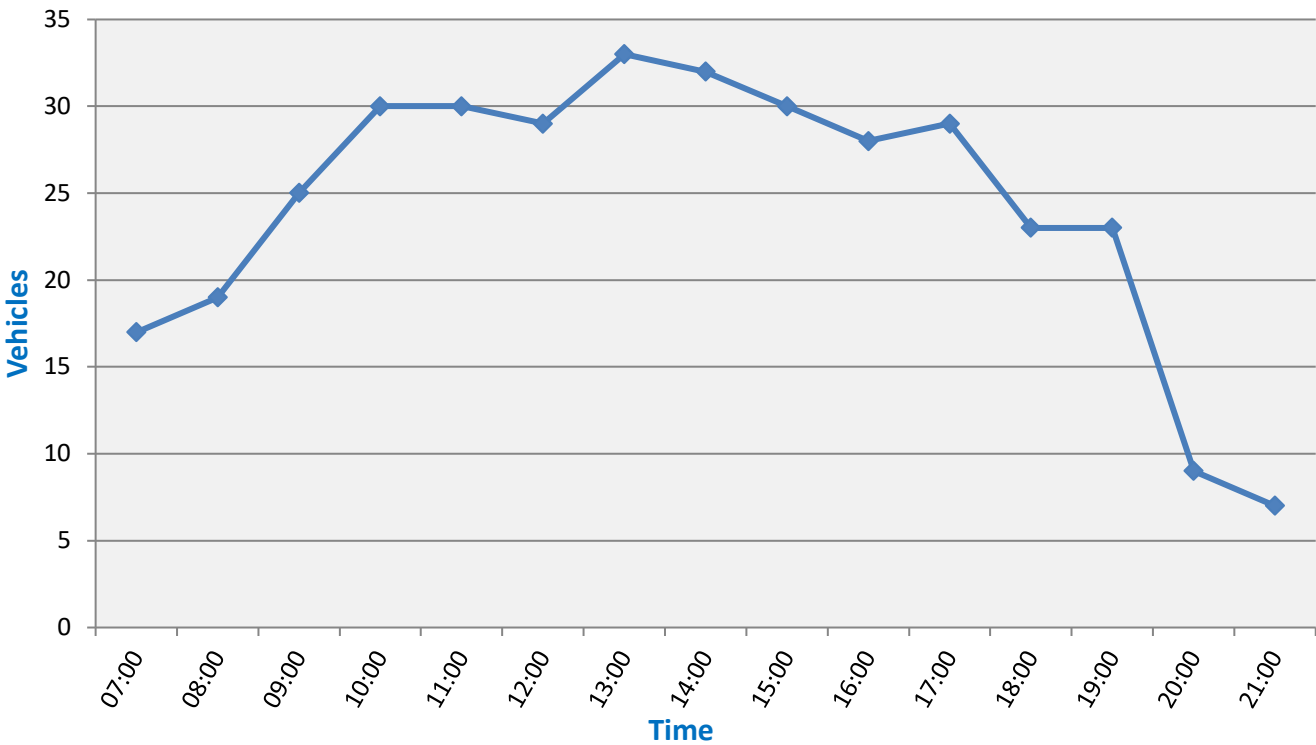
[1hr intervals]

Total	15	3	9	3	2	0	3	2	0	4	8	2	7	1	0			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00		3	2	2							3		6	1		17	17	34%
08:00							1					1				2	19	38%
09:00	1						1			2	4		1			9	25	50%
10:00	1		1					2		2	1	1				8	30	60%
11:00	1		1	1												3	30	60%
12:00																0	29	58%
13:00	3		1				1									5	33	66%
14:00	1		2													3	32	64%
15:00	1															1	30	60%
16:00	1															1	28	56%
17:00	2				2											4	29	58%
18:00	1															1	23	46%
19:00	1		2													3	23	46%
20:00	1															1	9	18%
21:00	1															1	7	14%

Duration of Stay



Parking Accumulation



Client Cardno

Location **Area J - Total

Date Thursday, 7th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area J - Total

Total Parking Spaces 228

Time restriction -

Peak Demand 224

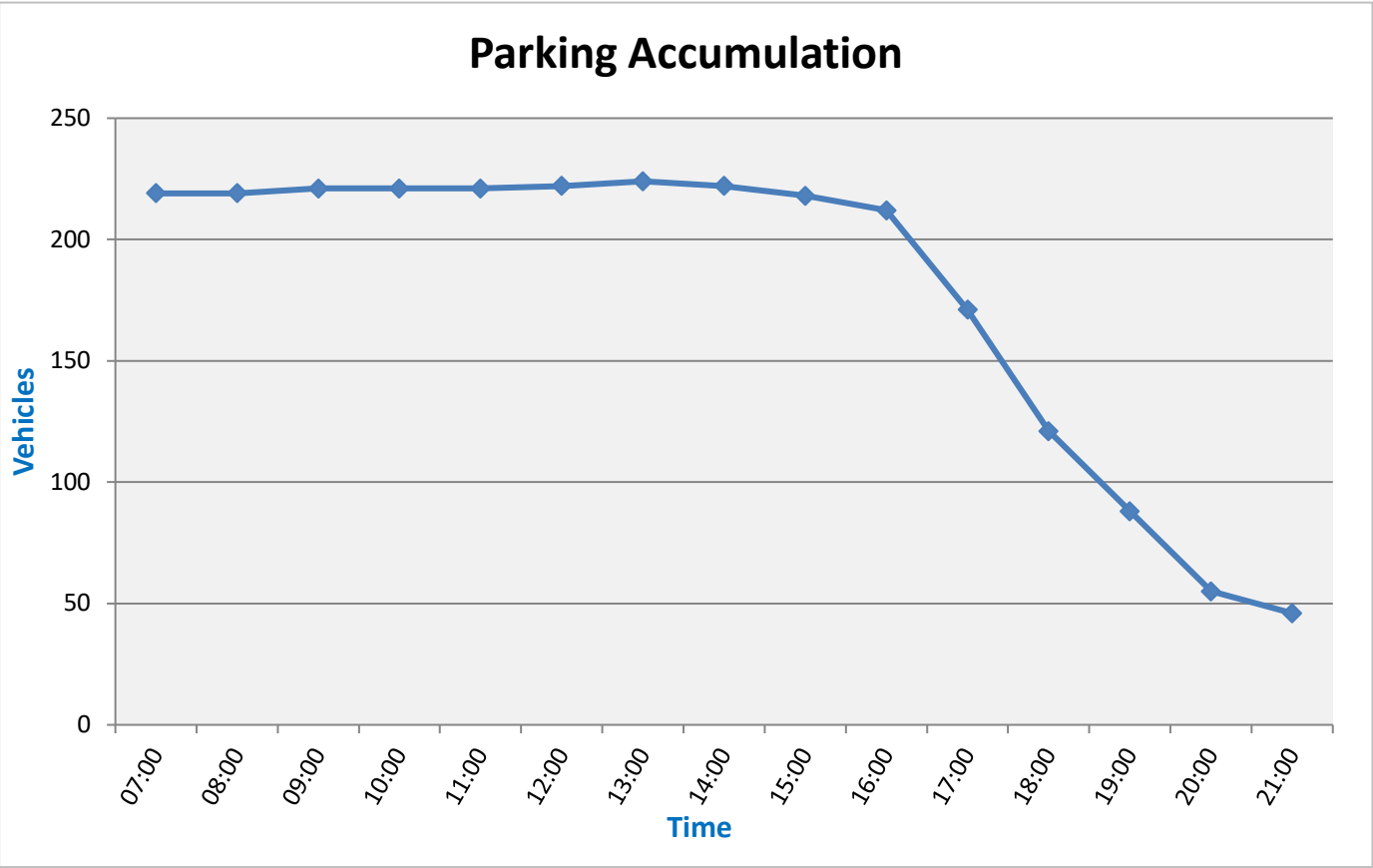
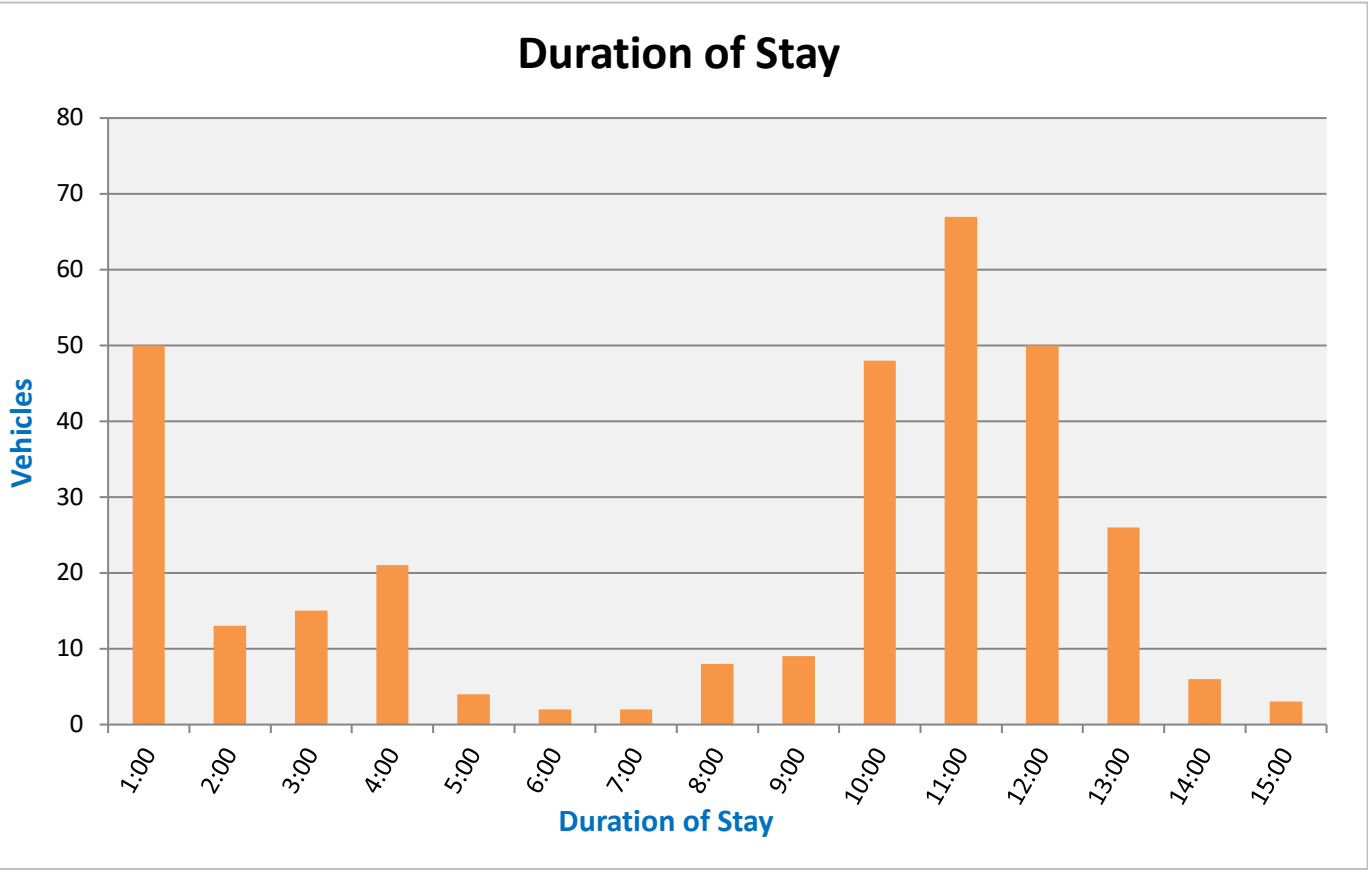
Peak Demand % 98%

Ave Duration of Stay (h:mm) 8:16

Total Vehicles 324

[1hr intervals]

Total	50	13	15	21	4	2	2	8	9	48	67	50	26	6	3			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	2			1			1	6	9	48	67	50	26	6	3	219	219	96%
08:00	2															2	219	96%
09:00	3							1								4	221	97%
10:00	1	1						1								3	221	97%
11:00	1			1												2	221	97%
12:00	1				1		1									3	222	97%
13:00	2		1													3	224	98%
14:00	1															1	222	97%
15:00	1		2		1											4	218	96%
16:00	1			2		2										5	212	93%
17:00	7			1	2											10	171	75%
18:00	8	2	1	16												27	121	53%
19:00	15		11													26	88	39%
20:00	3	10														13	55	24%
21:00	2															2	46	20%



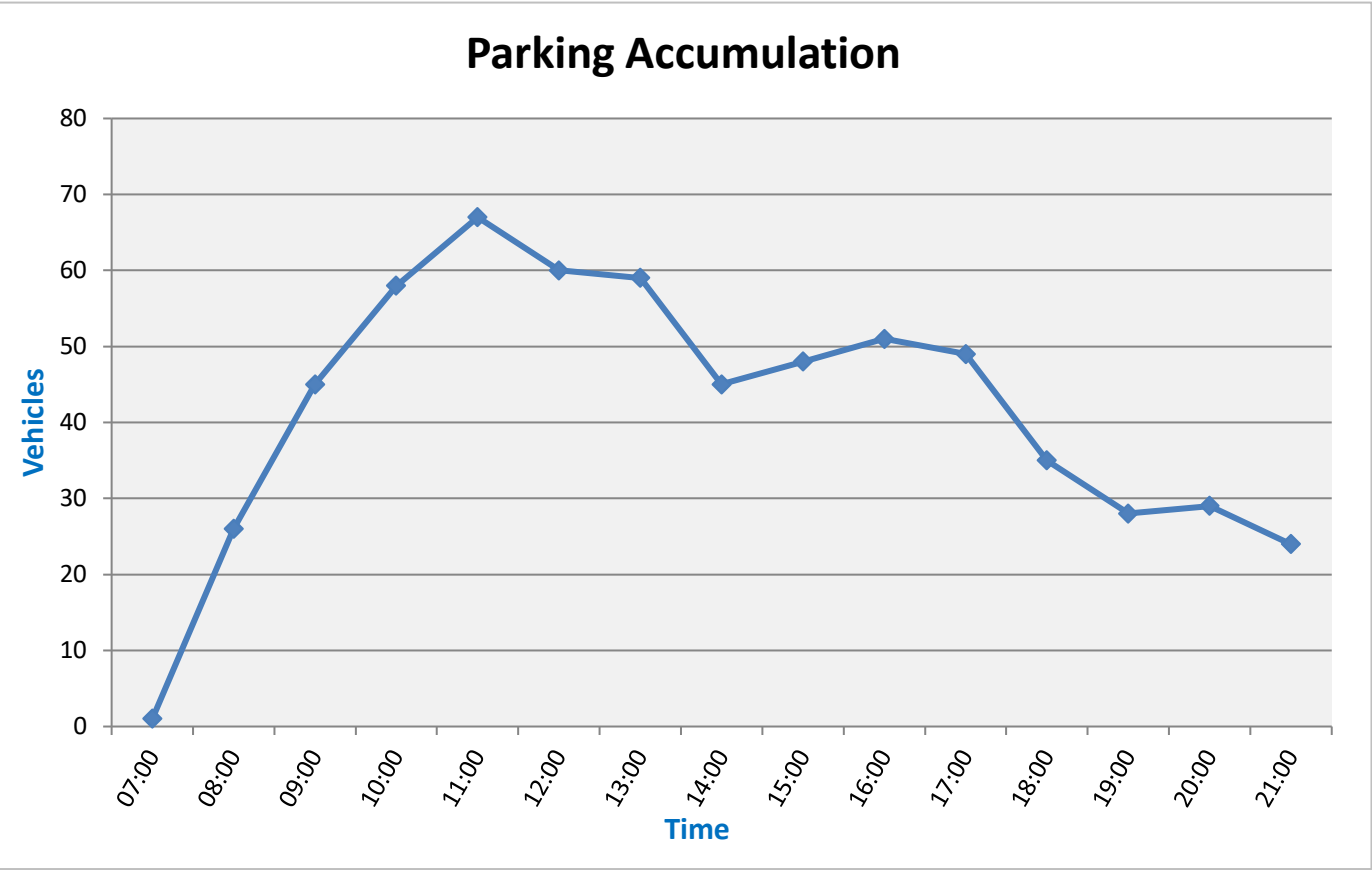
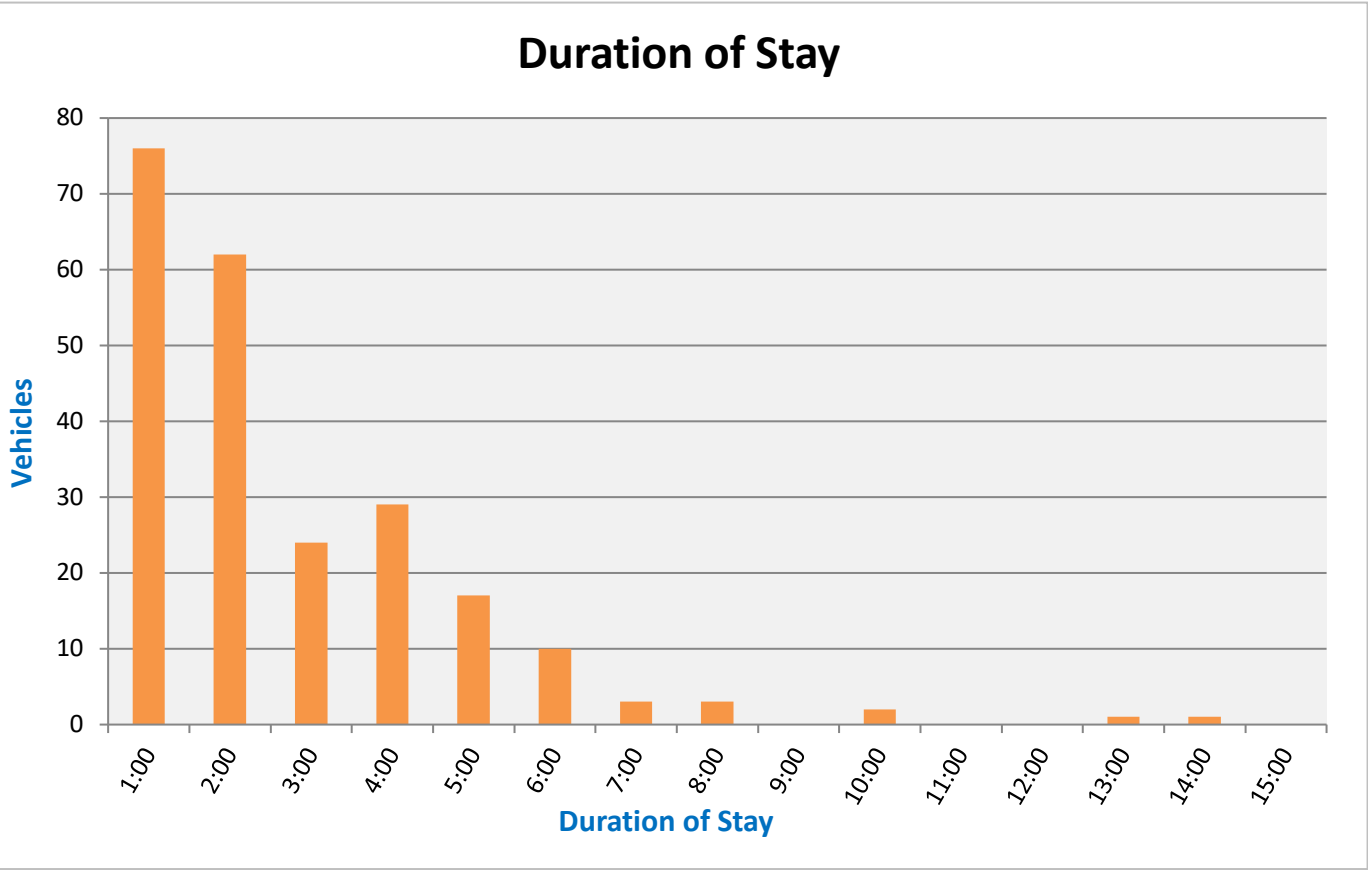
Client Cardno
Location **Area K - Total
Date Thursday, 7th September 2017 (7:00-21:00)
Description Greensborough Parking Survey



Site **Area K - Total
Total Parking Spaces 107
Time restriction -
Peak Demand 67
Peak Demand % 63%
Ave Duration of Stay (h:mm) 2:44
Total Vehicles 228

[1hr intervals]

Total	76	62	24	29	17	10	3	3	0	2	0	0	1	1	0			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	1															1	1	1%
08:00	7	6	2	6		3							1	1		26	26	24%
09:00	4	6	3	1	9	1	1			1						26	45	42%
10:00	6	7		8	2											23	58	54%
11:00	9	4	6	1	1	1	1									23	67	63%
12:00	4	9	2			1		1		1						18	60	56%
13:00	4	2			1			1								8	59	55%
14:00	9	7	1	7				1								25	45	42%
15:00	4	6	6	3			1									20	48	45%
16:00	8	2	2			4										16	51	48%
17:00	5	5			4											14	49	46%
18:00	5	1		3												9	35	33%
19:00	2	5	2													9	28	26%
20:00	3	2														5	29	27%
21:00	5															5	24	22%



Client Cardno

Location **Area L - Total

Date Thursday, 7th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area L - Total

Total Parking Spaces 117

Time restriction -

Peak Demand 102

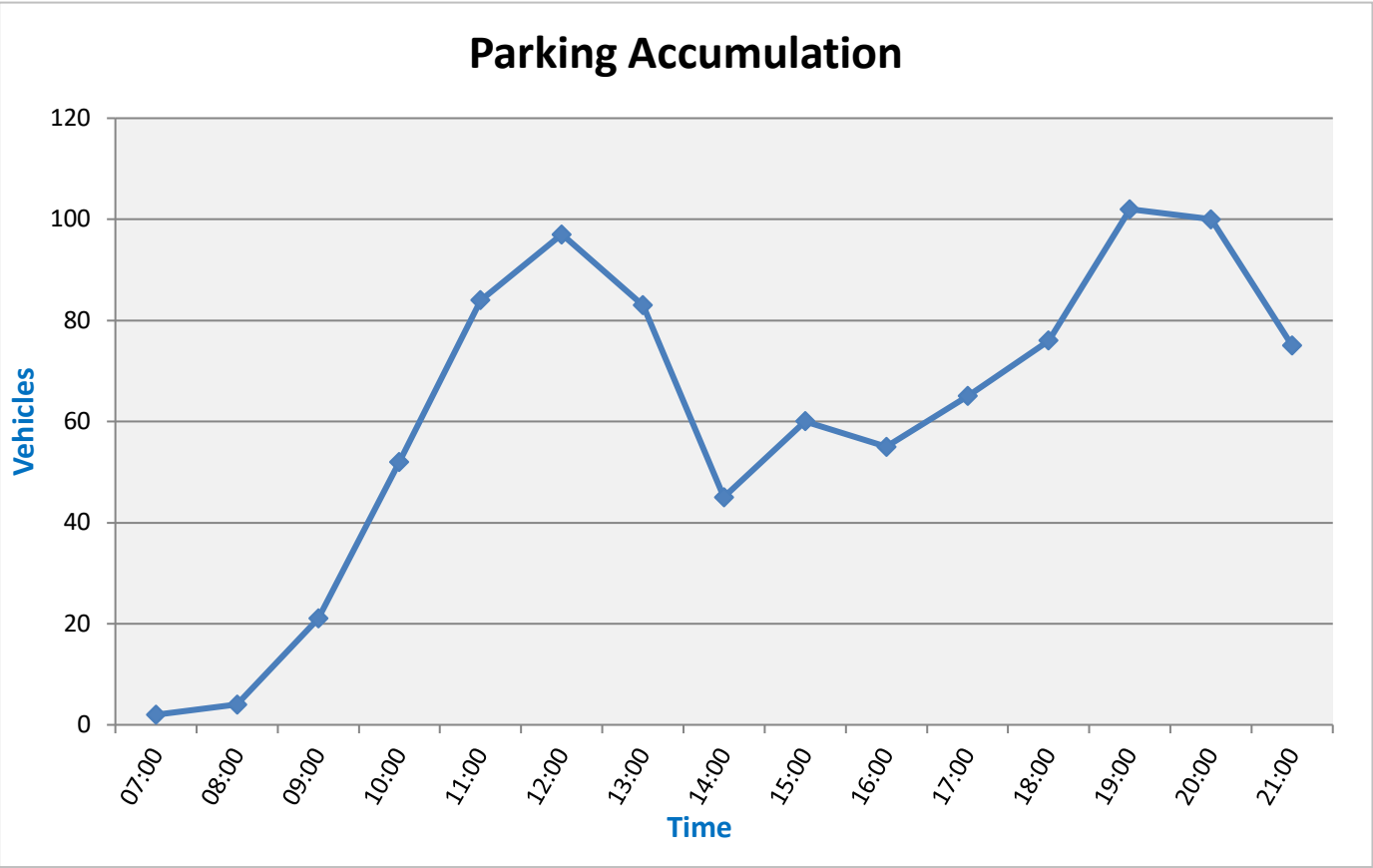
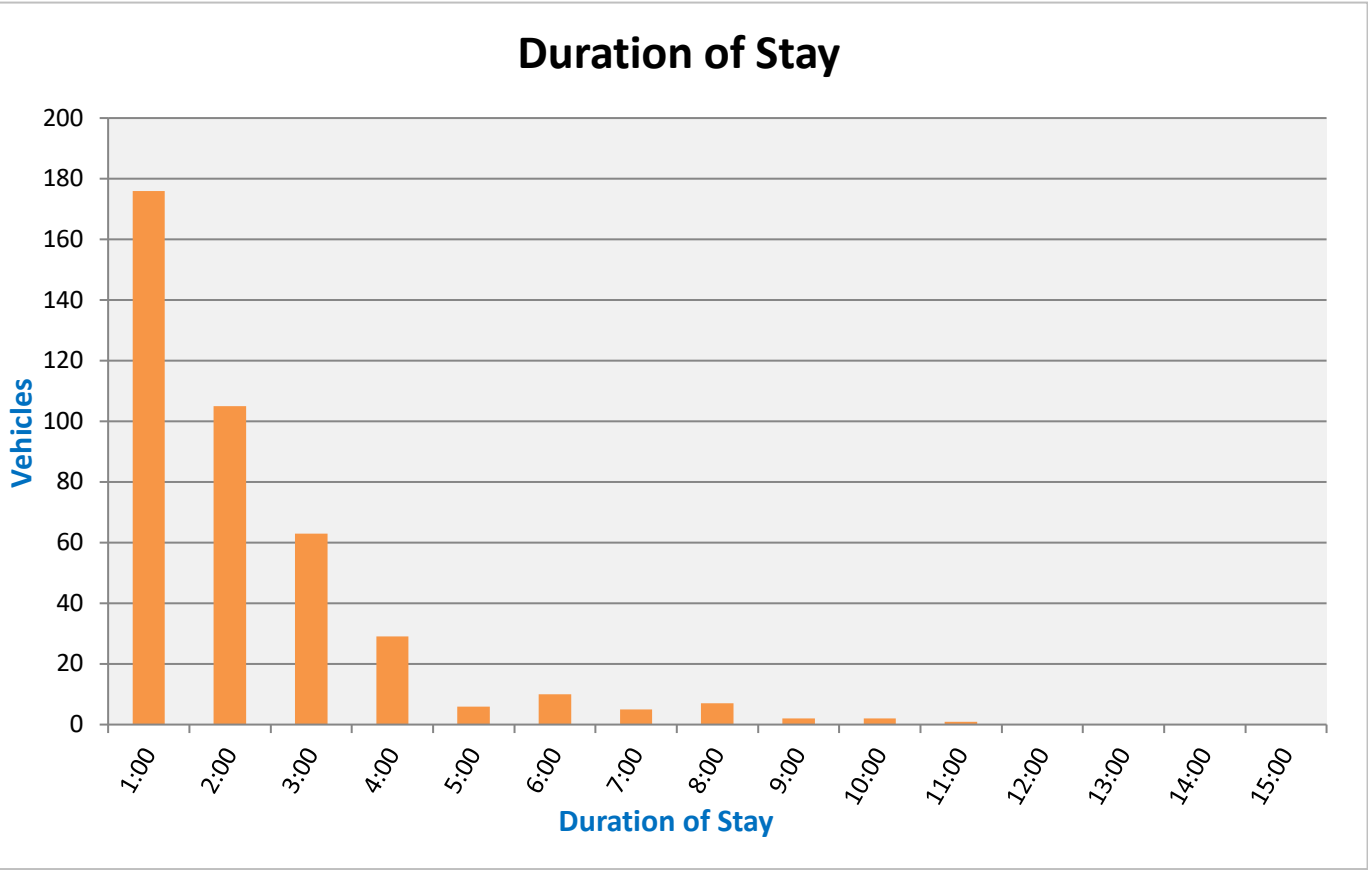
Peak Demand % 87%

Ave Duration of Stay (h:mm) 2:16

Total Vehicles 406

[1hr intervals]

Total	176	105	63	29	6	10	5	7	2	2	1	0	0	0	0			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00			1					1								2	2	2%
08:00				1		1										2	4	3%
09:00	6	1	2		2	2	1		2	1						17	21	18%
10:00	5	9	11	7		2		4								38	52	44%
11:00	9	18	4	1		2	3				1					38	84	72%
12:00	21	8	2			1		1		1						34	97	83%
13:00	20	10	6													36	83	71%
14:00	1	2						1								4	45	38%
15:00	20	8		3			1									32	60	51%
16:00	14	6	2	1	1	2										26	55	47%
17:00	23	3	2	3	3											34	65	56%
18:00	23	7	7	13												50	76	65%
19:00	19	13	26													58	102	87%
20:00	8	20														28	100	85%
21:00	7															7	75	64%



ClientCardno

Location

**Area L1 - Total

DateThursday, 7th September 2017 (7:00-21:00)

DescriptionGreensborough Parking Survey



Site

**Area L1 - Total

Total Parking Spaces32

Time restriction-

Peak Demand26

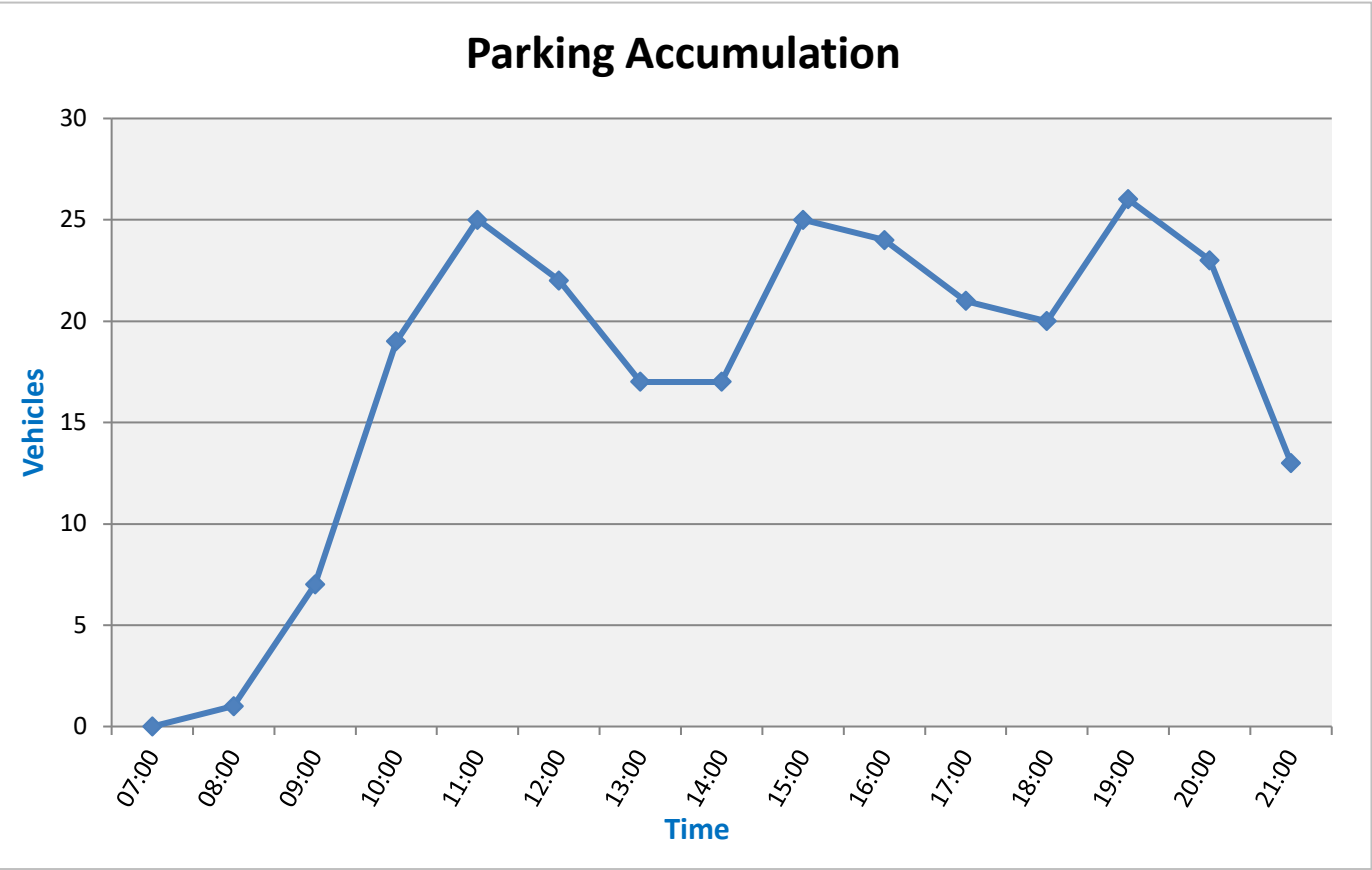
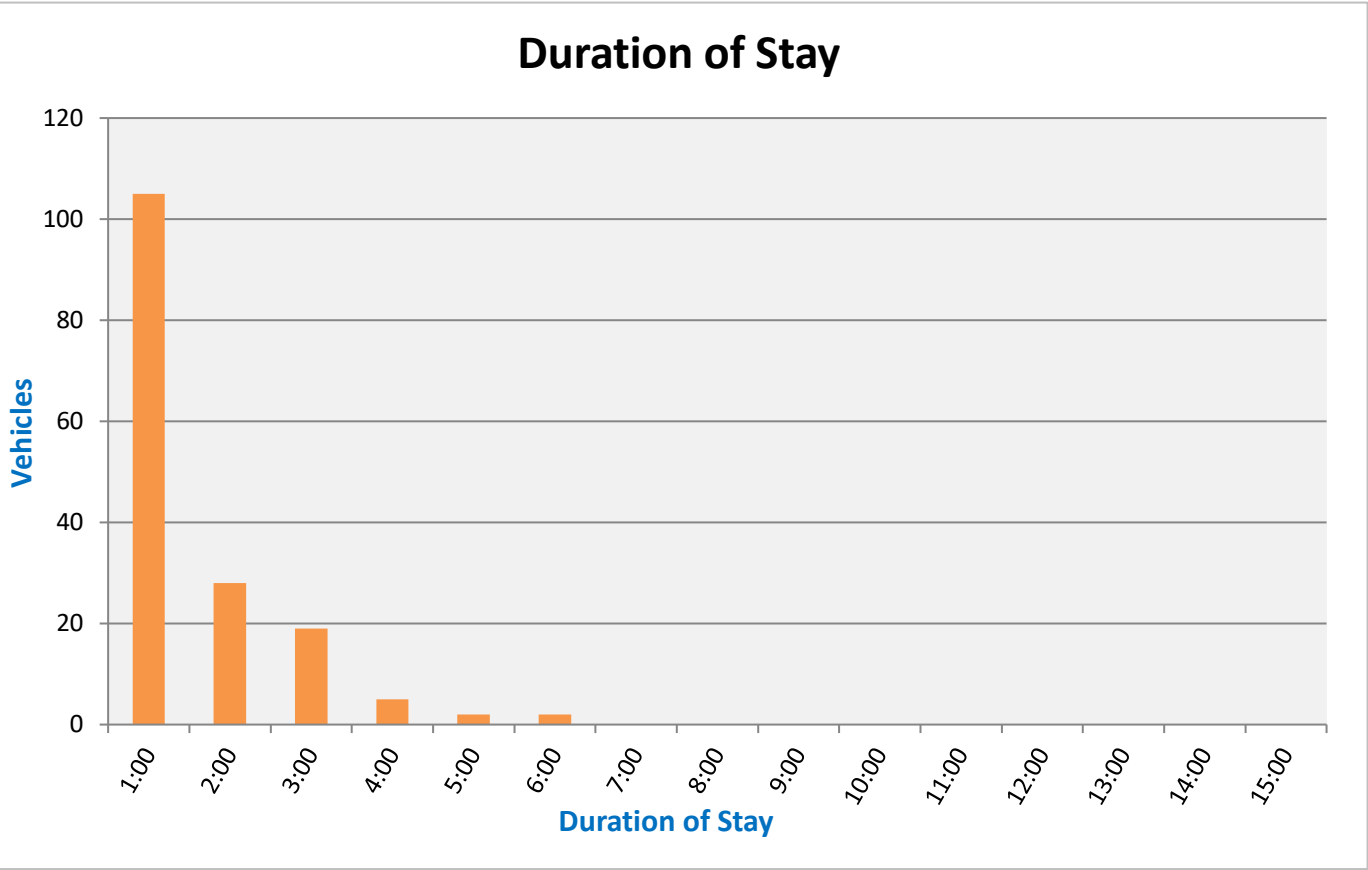
Peak Demand %81%

Ave Duration of Stay (h:mm)1:36

Total Vehicles161

[1hr intervals]

Total	105	28	19	5	2	2	0	0	0	0	0	0	0	0	0			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00																0	0	0%
08:00				1												1	1	3%
09:00	1	3	1	1												6	7	22%
10:00	9	2		2												13	19	59%
11:00	13	2	3													18	25	78%
12:00	9	5														14	22	69%
13:00	7															7	17	53%
14:00	1	9	4		2	1										17	17	53%
15:00	6		1	1		1										9	25	78%
16:00	12		2													14	24	75%
17:00	12	1														13	21	66%
18:00	9	1	2													12	20	63%
19:00	10	5	6													21	26	81%
20:00	9															9	23	72%
21:00	7															7	13	41%



Greensborough Parking Survey

Zone B

Thursday, 7th September 2017

Client Cardno

Location **Area B - Total

Date Thursday, 7th September 2017 (6:00-20:00)

Description Greensborough Parking Survey



Site **Area B - Total

Total Parking Spaces 30

Time restriction -

Peak Demand 26

Peak Demand % 87%

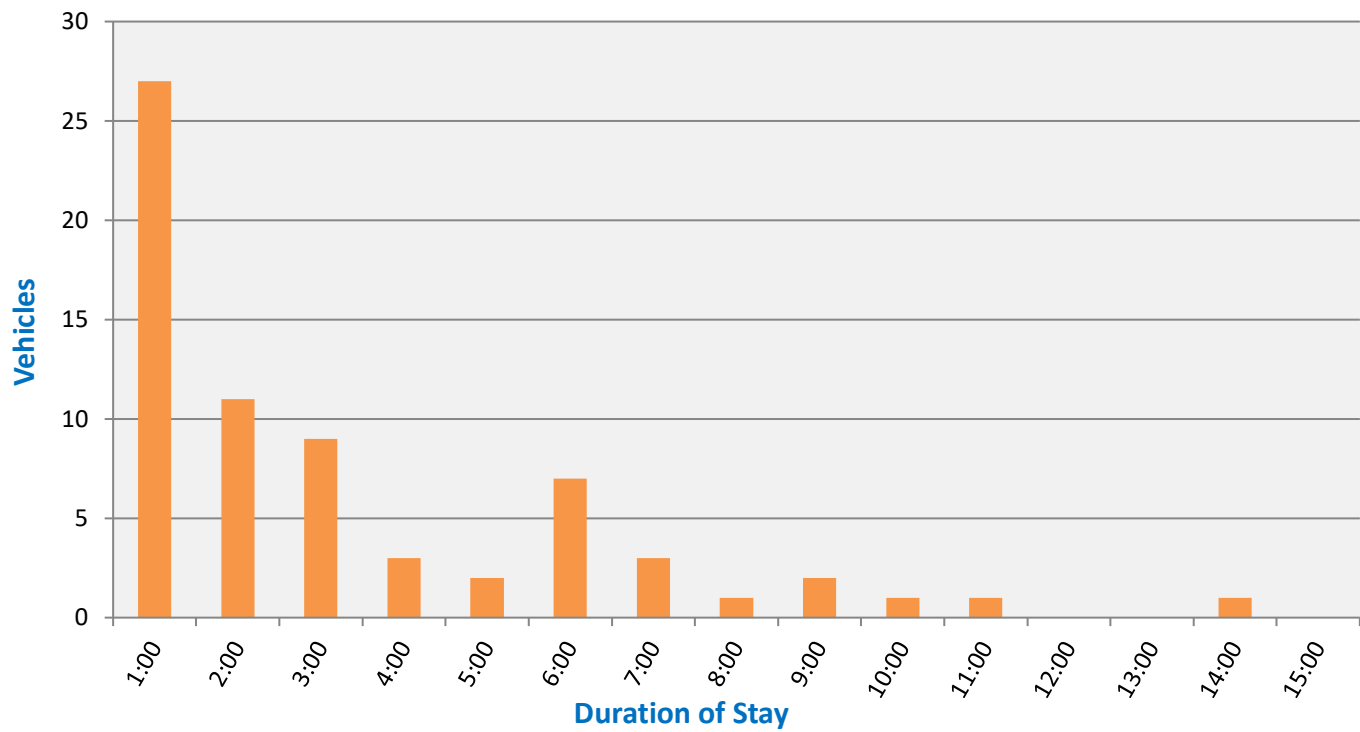
Ave Duration of Stay (h:mm) 3:15

Total Vehicles 68

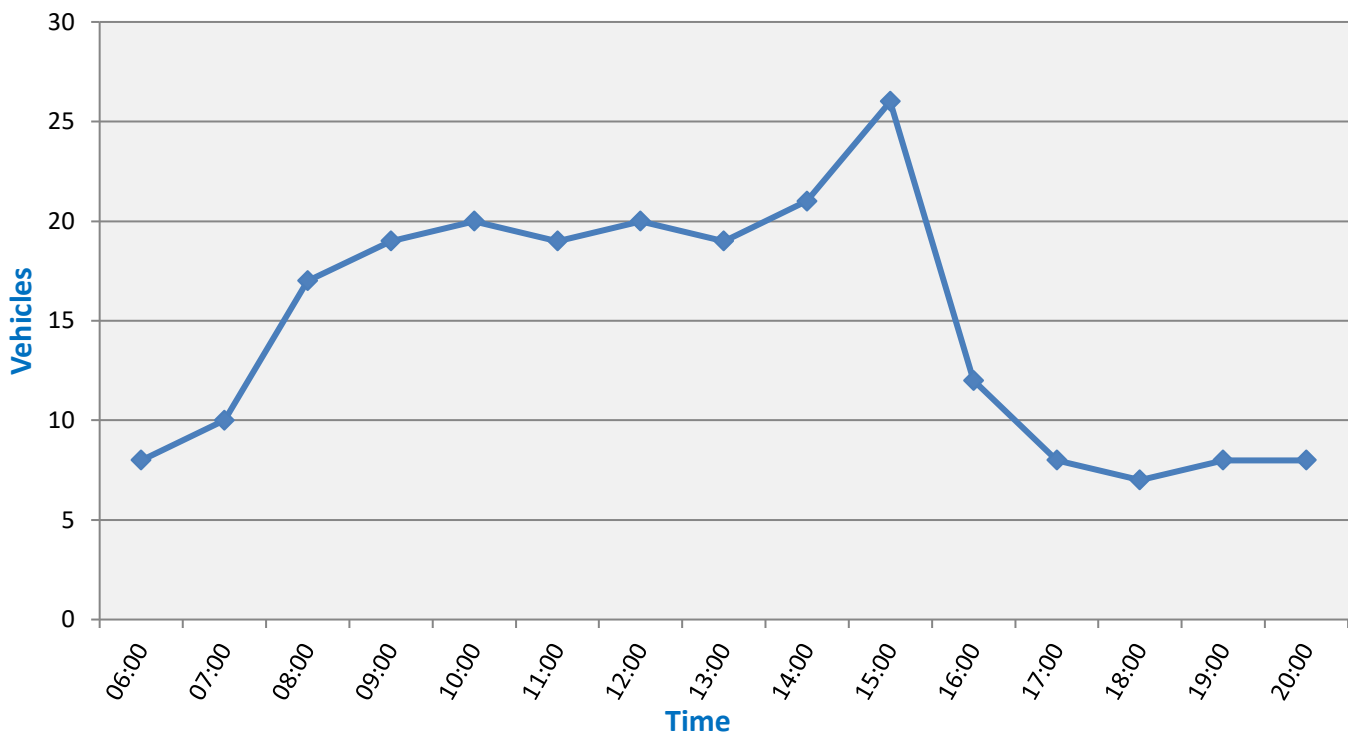
[1hr intervals]

Total	27	11	9	3	2	7	3	1	2	1	1	0	0	1	0			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
06:00	1	1	1	1		2			1		1					8	8	27%
07:00		1						1						1		3	10	33%
08:00	2	1				2	2		1							8	17	57%
09:00	2		1			3										6	19	63%
10:00	2		1		1		1									5	20	67%
11:00										1						1	19	63%
12:00	1	1	1	1												4	20	67%
13:00	1															1	19	63%
14:00	3	3														6	21	70%
15:00	13	2	2													17	26	87%
16:00	1	1			1											3	12	40%
17:00	1			1												2	8	27%
18:00			3													3	7	23%
19:00		1														1	8	27%
20:00																0	8	27%

Duration of Stay



Parking Accumulation



Client Cardno

Location **Area M - Total

Date Thursday, 7th September 2017 (6:00-20:00)

Description Greensborough Parking Survey



Site **Area M - Total

Total Parking Spaces 420

Time restriction -

Peak Demand 126

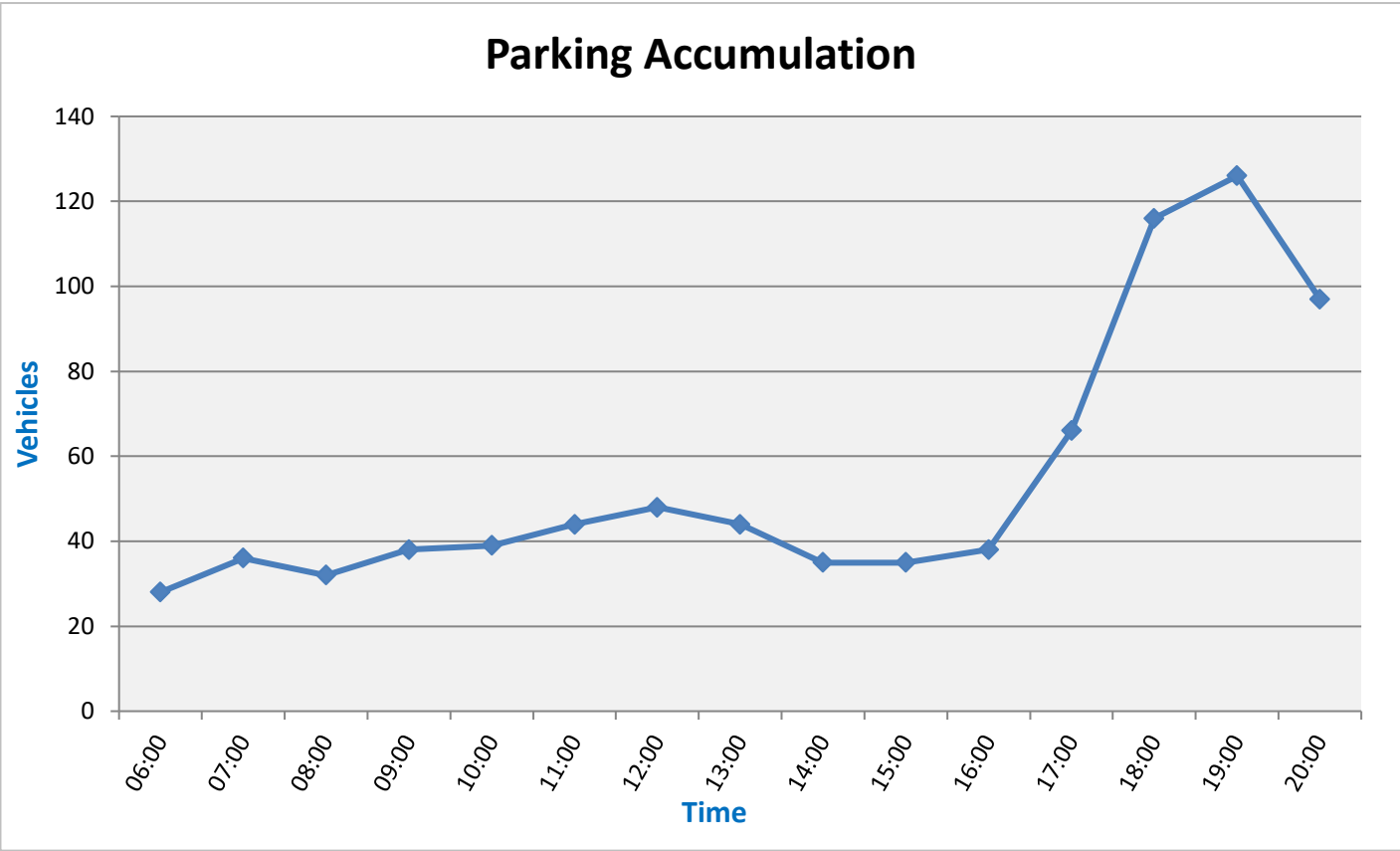
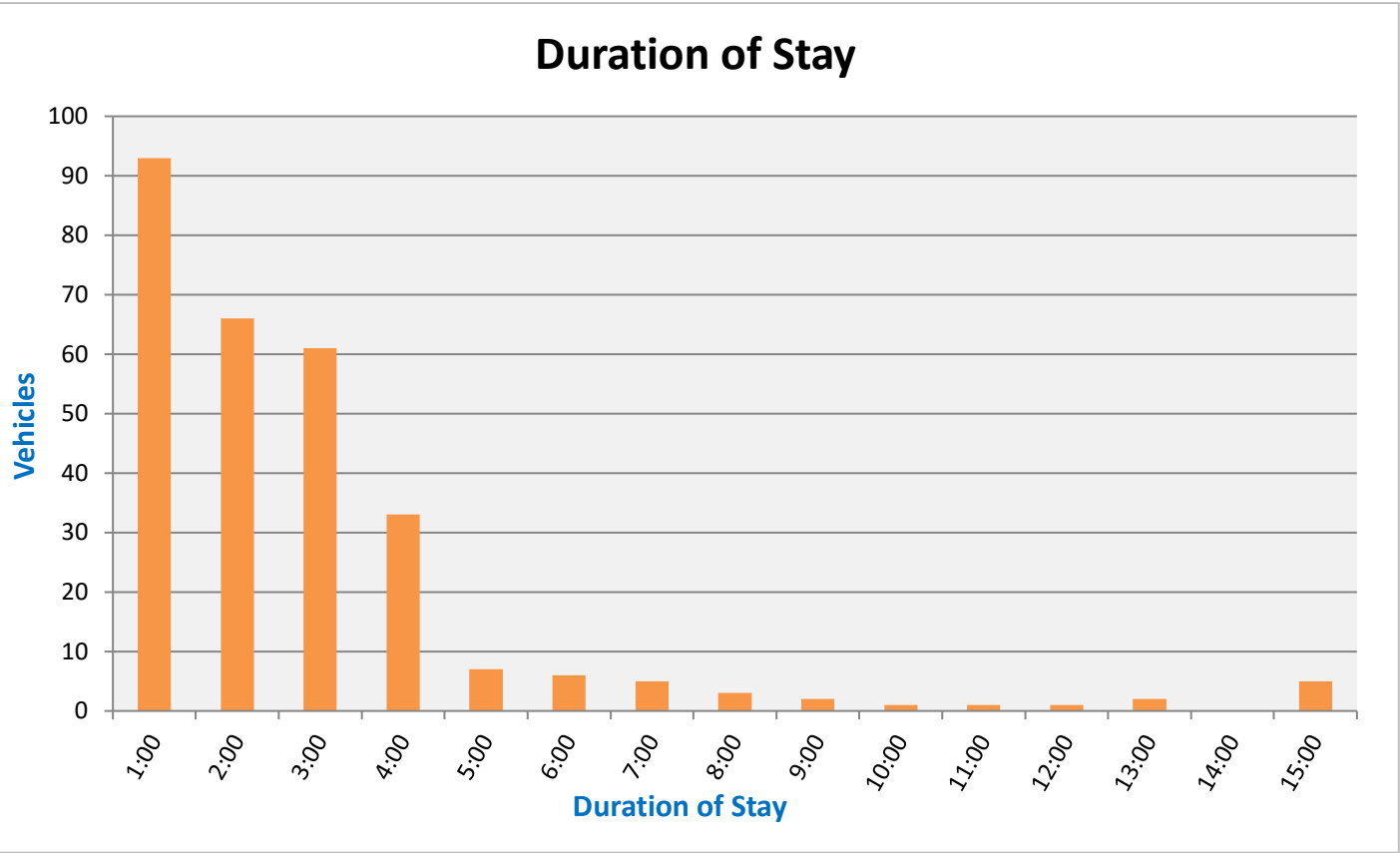
Peak Demand % 30%

Ave Duration of Stay (h:mm) 2:52

Total Vehicles 286

[1hr intervals]

Total	93	66	61	33	7	6	5	3	2	1	1	1	2	0	5			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
06:00	7	6	3	1			1	1	1		1	1	1		5	28	28	7%
07:00	7	2	1		2	1			1	1						15	36	9%
08:00	2	2					2	2					1			9	32	8%
09:00	3	2	3	3		2										13	38	9%
10:00	4	2		1			1									8	39	9%
11:00	6	4			1											11	44	10%
12:00	9		2	5			1									17	48	11%
13:00	10		2	1	1											14	44	10%
14:00	1	1	1													3	35	8%
15:00	5					3										8	35	8%
16:00	9	7	1		3											20	38	9%
17:00	7	2	11	22												42	66	16%
18:00	10	19	37													66	116	28%
19:00	6	19														25	126	30%
20:00	7															7	97	23%



Client Cardno

Location **Area N - Total

Date Thursday, 7th September 2017 (6:00-20:00)

Description Greensborough Parking Survey



Site **Area N - Total

Total Parking Spaces 270

Time restriction -

Peak Demand 52

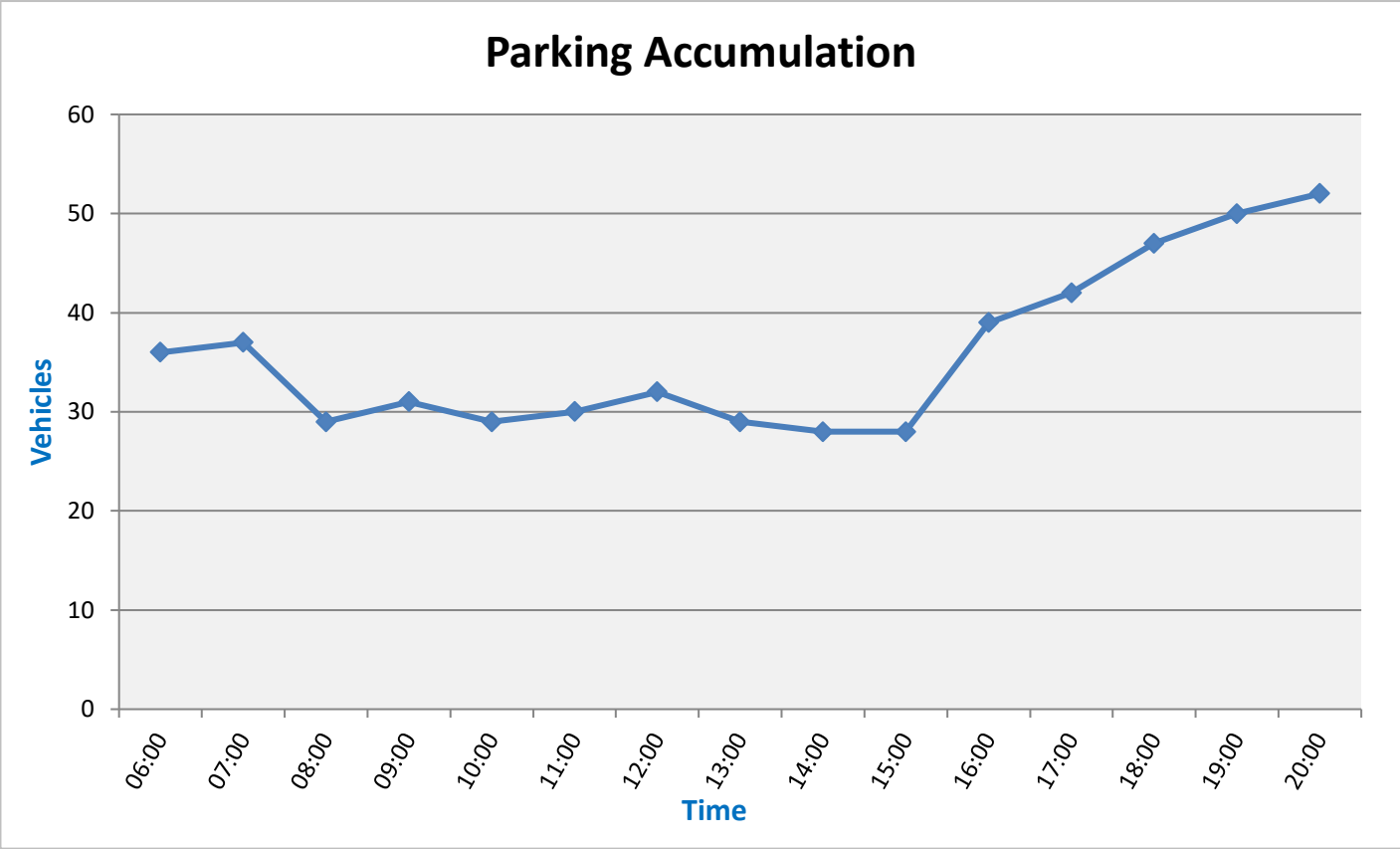
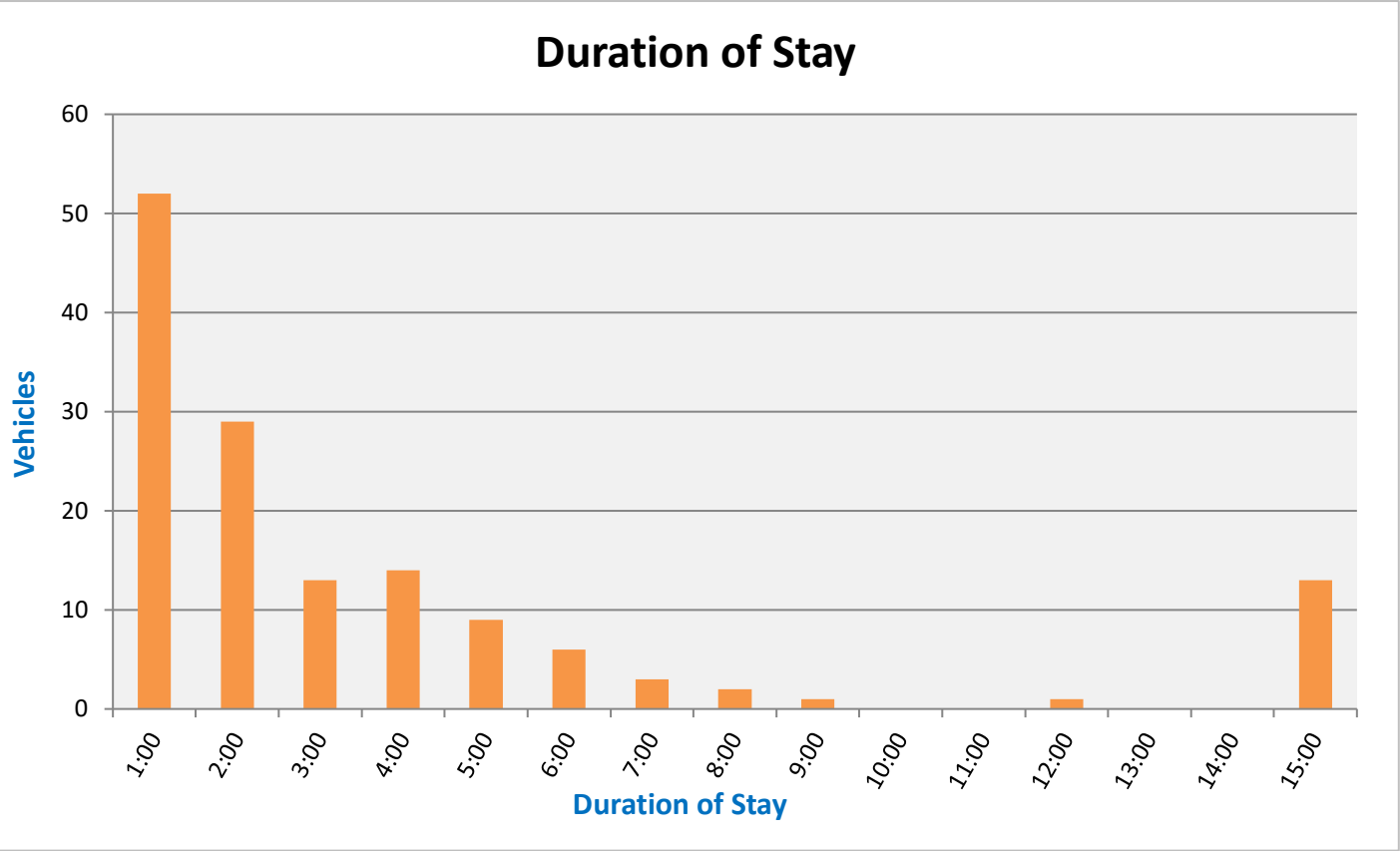
Peak Demand % 19%

Ave Duration of Stay (h:mm) 3:46

Total Vehicles 143

[1hr intervals]

Total	52	29	13	14	9	6	3	2	1	0	0	1	0	0	13			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
06:00	6	9	3	3				2							13	36	36	13%
07:00	2	1	1		1	2										7	37	14%
08:00	3															3	29	11%
09:00	5	1					1		1			1				9	31	11%
10:00	2	2	2				1									7	29	11%
11:00		2			1		1									4	30	11%
12:00	2	2		1												5	32	12%
13:00	4	1														5	29	11%
14:00	5	2														7	28	10%
15:00	2					4										6	28	10%
16:00	8	1	2		7											18	39	14%
17:00	1	1		10												12	42	16%
18:00	4		5													9	47	17%
19:00	3	7														10	50	19%
20:00	5															5	52	19%



Client Cardno

Location **Area O - Total

Date Thursday, 7th September 2017 (6:00-20:00)

Description Greensborough Parking Survey



Site **Area O - Total

Total Parking Spaces 218

Time restriction -

Peak Demand 29

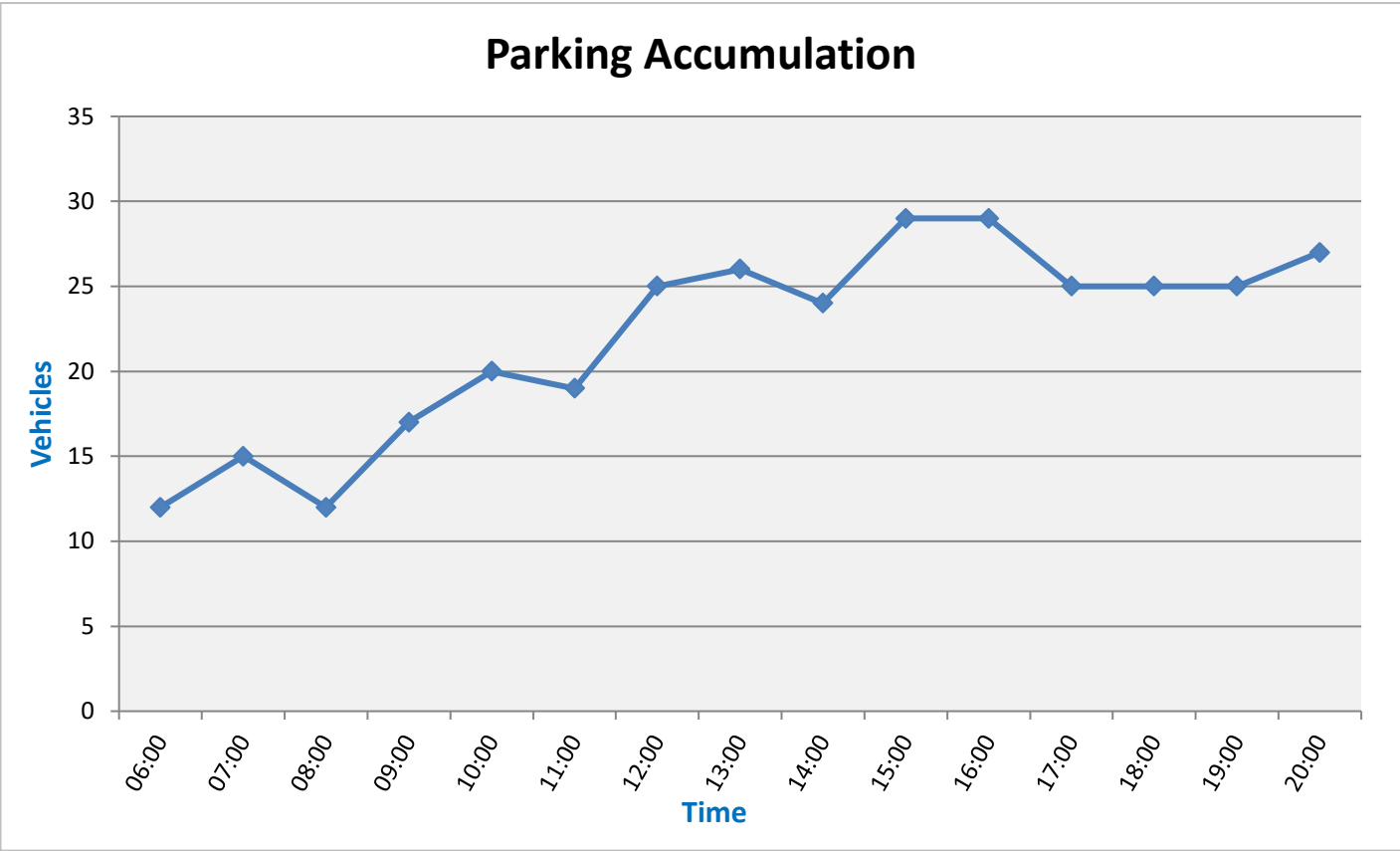
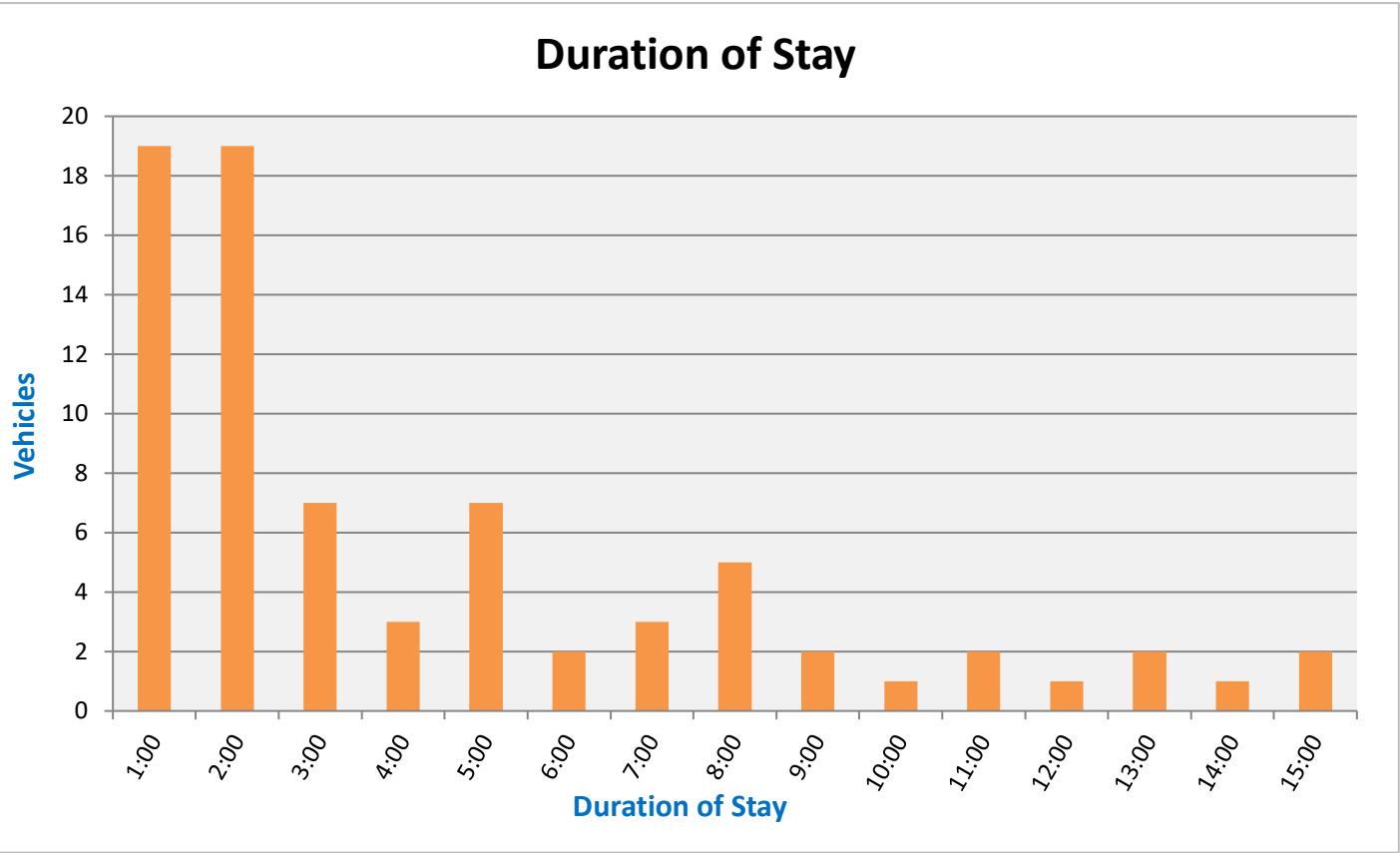
Peak Demand % 13%

Ave Duration of Stay (h:mm) 4:20

Total Vehicles 76

[1hr intervals]

Total	19	19	7	3	7	2	3	5	2	1	2	1	2	1	2			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
06:00	3	3			1			1				1	1		2	12	12	6%
07:00	2						1		1	1				1		6	15	7%
08:00			1										1			2	12	6%
09:00	2	2						1								5	17	8%
10:00	1	2									2					5	20	9%
11:00	1	1	1		1											4	19	9%
12:00	3	3		1	1				1							9	25	11%
13:00	1		1					3								5	26	12%
14:00		1	1		1		2									5	24	11%
15:00	1	2				2										5	29	13%
16:00	2	1			3											6	29	13%
17:00	1	1		2												4	25	11%
18:00			3													3	25	11%
19:00		3														3	25	11%
20:00	2															2	27	12%



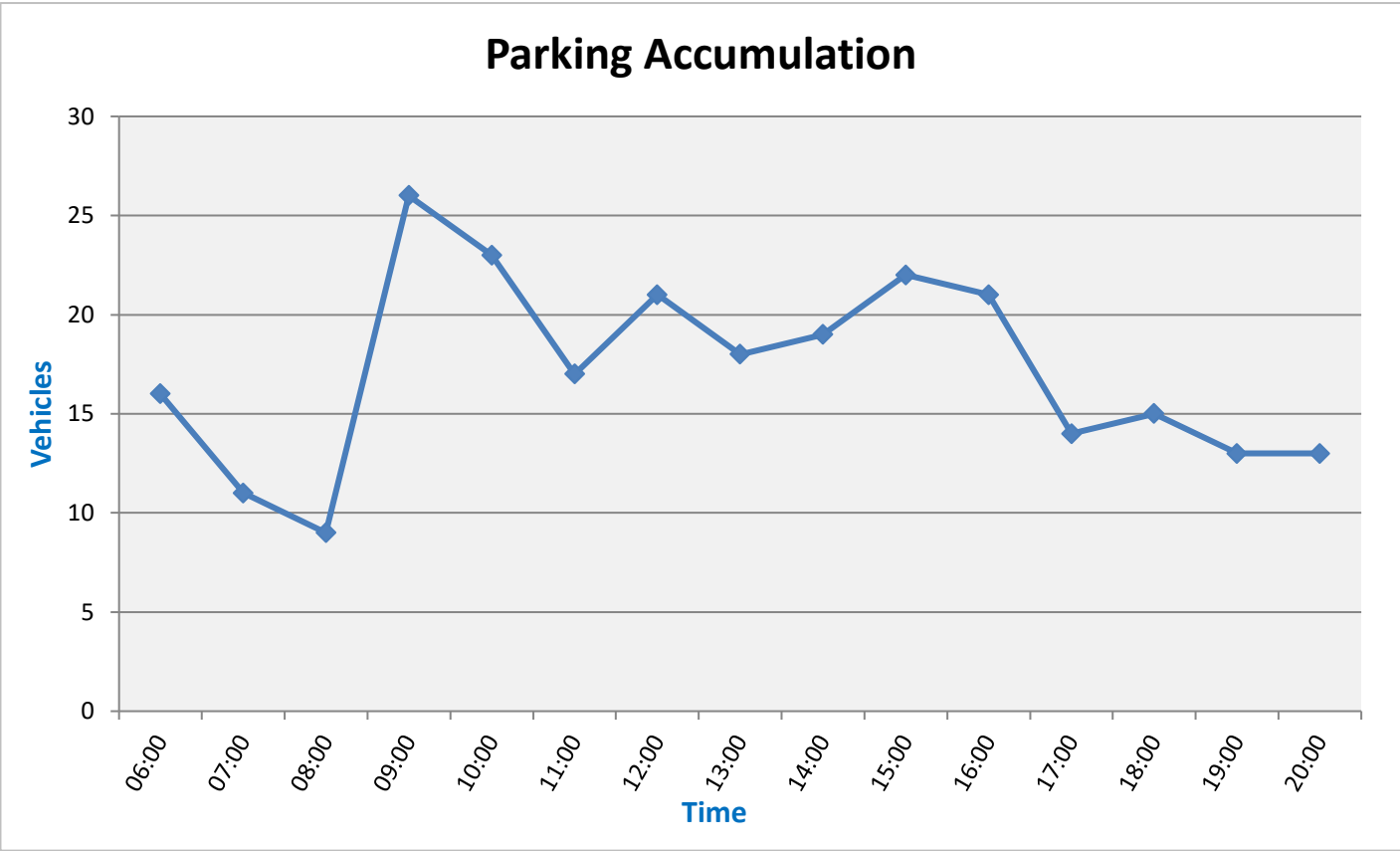
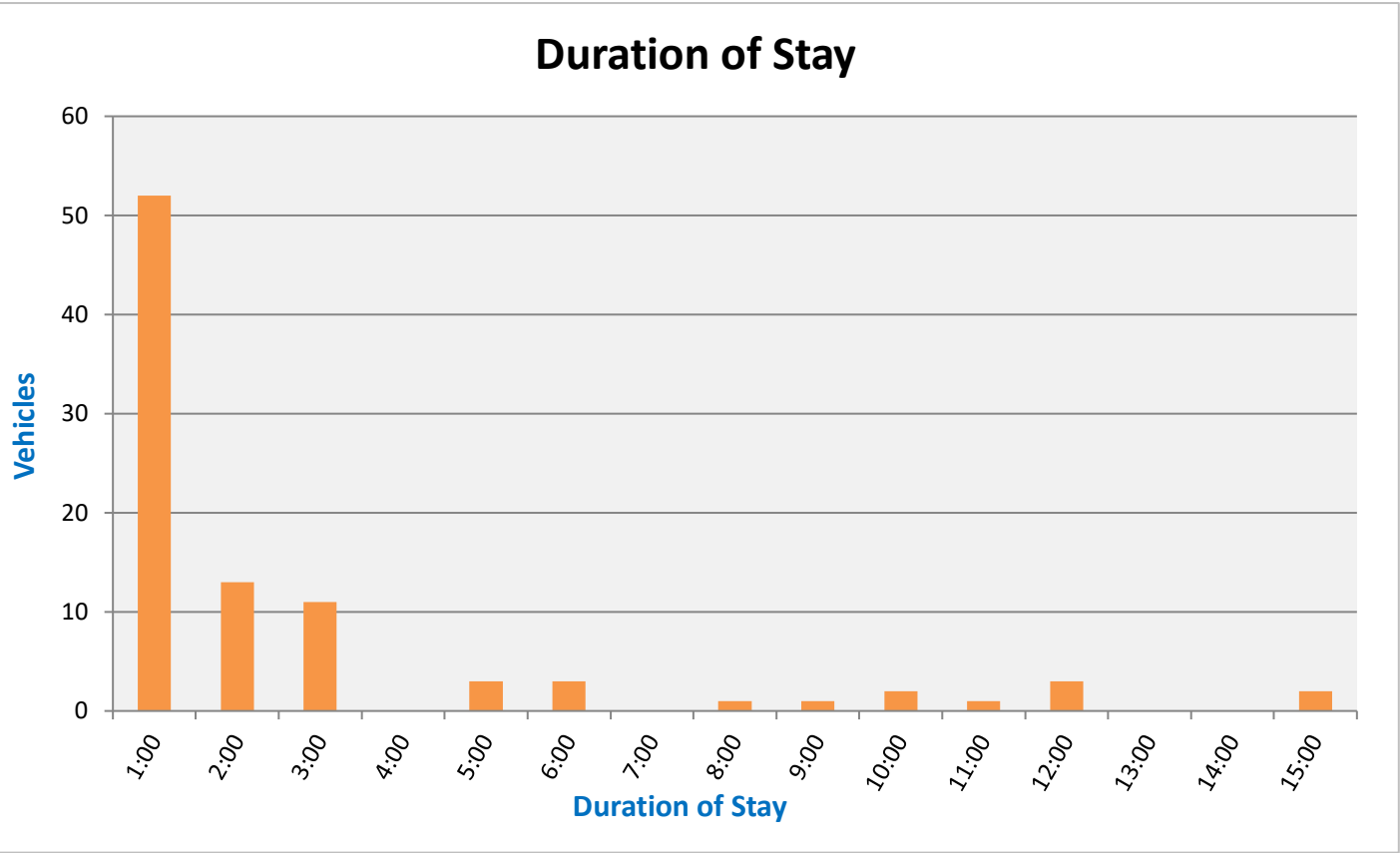
Client Cardno
Location **Area P - Total
Date Thursday, 7th September 2017 (6:00-20:00)
Description Greensborough Parking Survey



Site **Area P - Total
Total Parking Spaces 59
Time restriction -
Peak Demand 26
Peak Demand % 44%
Ave Duration of Stay (h:mm) 2:48
Total Vehicles 92

[1hr intervals]

Total	52	13	11	0	3	3	0	1	1	2	1	3	0	0	2			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
06:00	7		2		1			1		1	1	1			2	16	16	27%
07:00	2															2	11	19%
08:00																0	9	15%
09:00	9	6	1							1		2				19	26	44%
10:00	6															6	23	39%
11:00	5	2														7	17	29%
12:00	3		1		2	3			1							10	21	36%
13:00	2															2	18	31%
14:00	3	1														4	19	32%
15:00	7															7	22	37%
16:00	6	2														8	21	36%
17:00	1	1														2	14	24%
18:00		1	7													8	15	25%
19:00																0	13	22%
20:00	1															1	13	22%



Client Cardno

Location **Area R - Total

Date Thursday, 7th September 2017 (6:00-20:00)

Description Greensborough Parking Survey



Site **Area R - Total

Total Parking Spaces 351

Time restriction -

Peak Demand 54

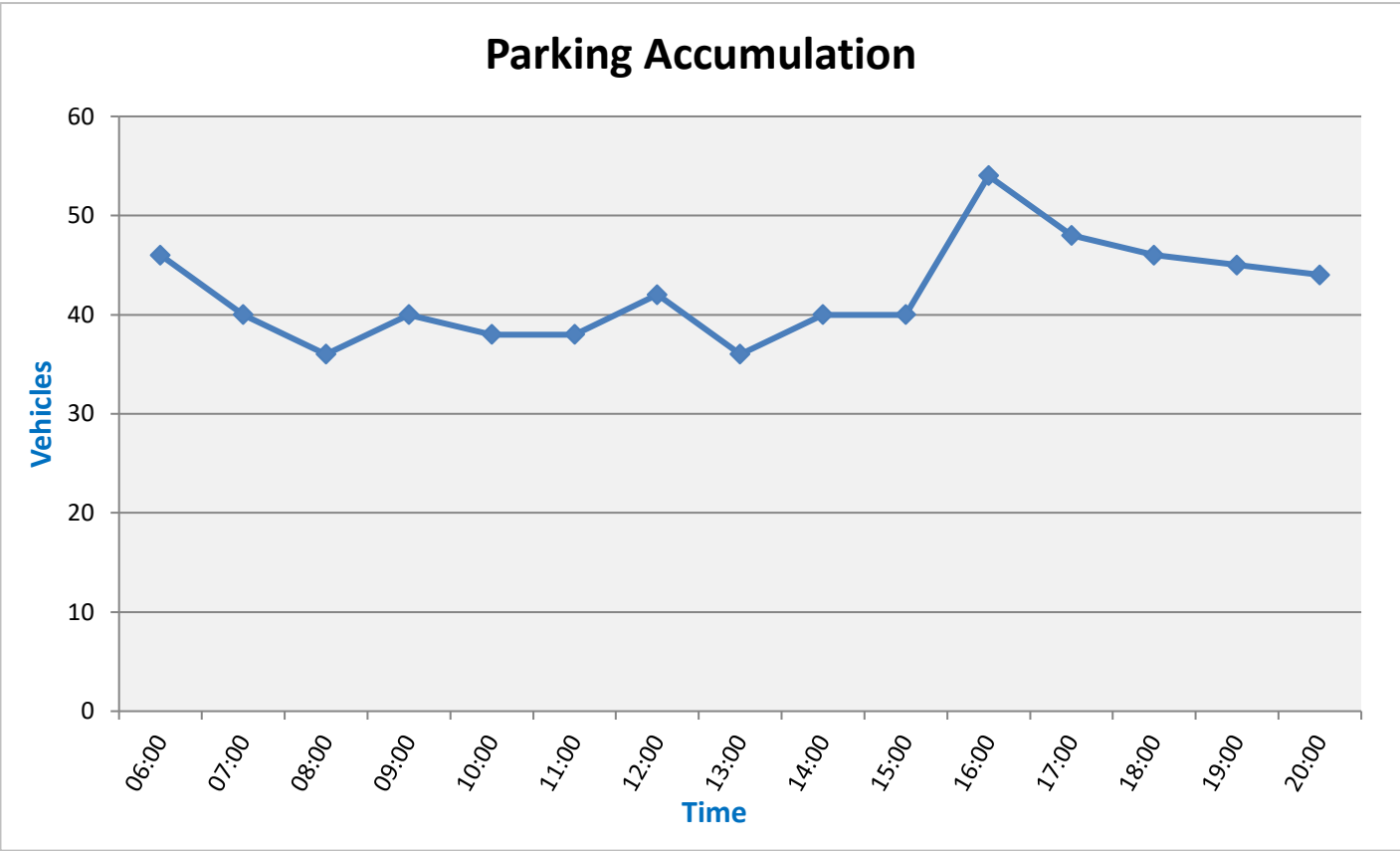
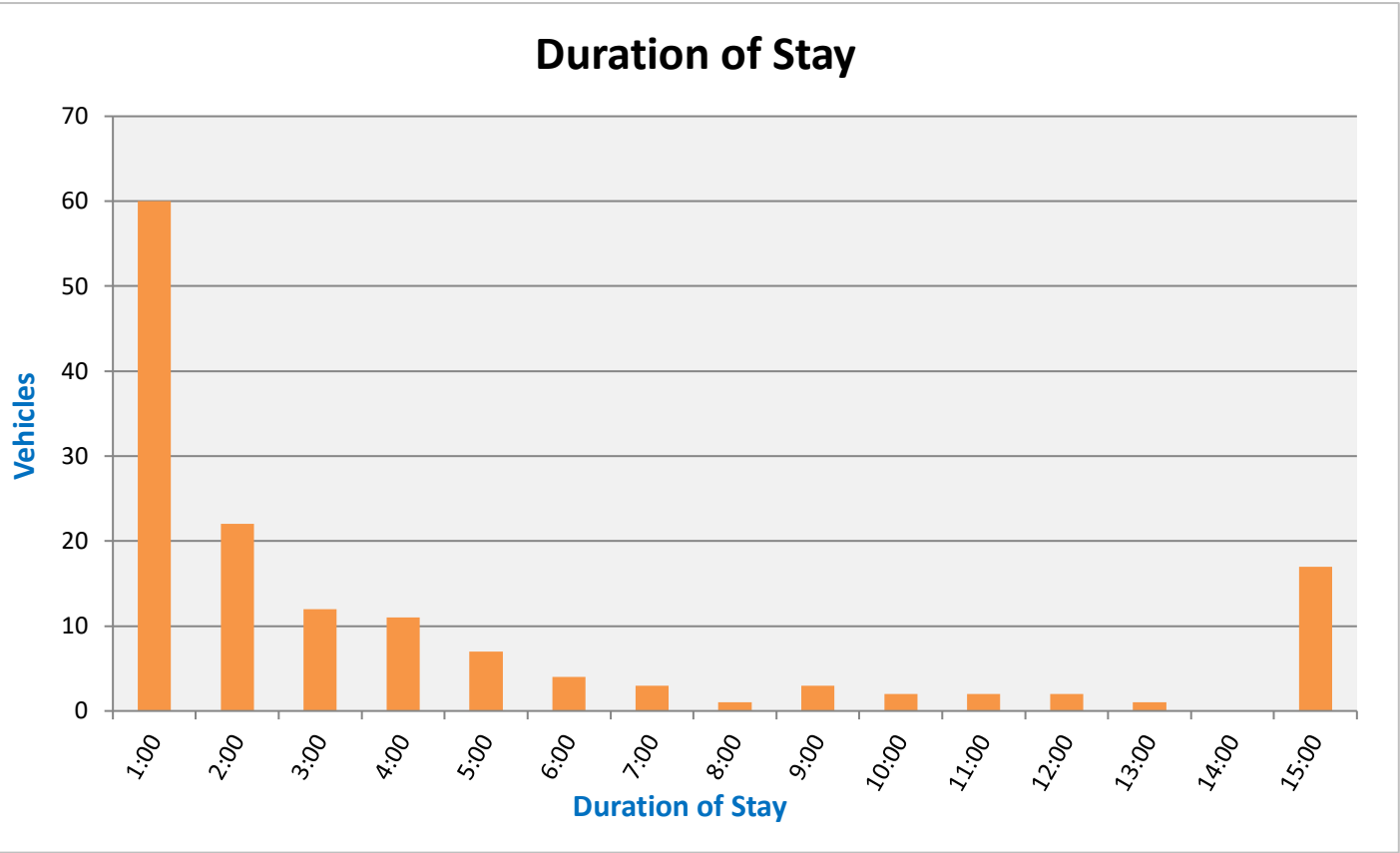
Peak Demand % 15%

Ave Duration of Stay (h:mm) 4:18

Total Vehicles 147

[1hr intervals]

Total	60	22	12	11	7	4	3	1	3	2	2	2	1	0	17			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
06:00	11	4		3	4	3			1		1	1	1		17	46	46	13%
07:00	1			1				1			1	1				5	40	11%
08:00				1												1	36	10%
09:00	2		1		1											4	40	11%
10:00	2					1										3	38	11%
11:00	3	2								2						7	38	11%
12:00	6	3		1					2							12	42	12%
13:00	1			1												2	36	10%
14:00	2	1	2	1			3									9	40	11%
15:00	1	1	1	1												4	40	11%
16:00	9	3	3	1	2											18	54	15%
17:00	5	1	1	1												8	48	14%
18:00	5	1	4													10	46	13%
19:00	5	6														11	45	13%
20:00	7															7	44	13%



Client Cardno

Location **Area S - Total

Date Thursday, 7th September 2017 (6:00-20:00)

Description Greensborough Parking Survey



Site **Area S - Total

Total Parking Spaces 39

Time restriction -

Peak Demand 15

Peak Demand % 38%

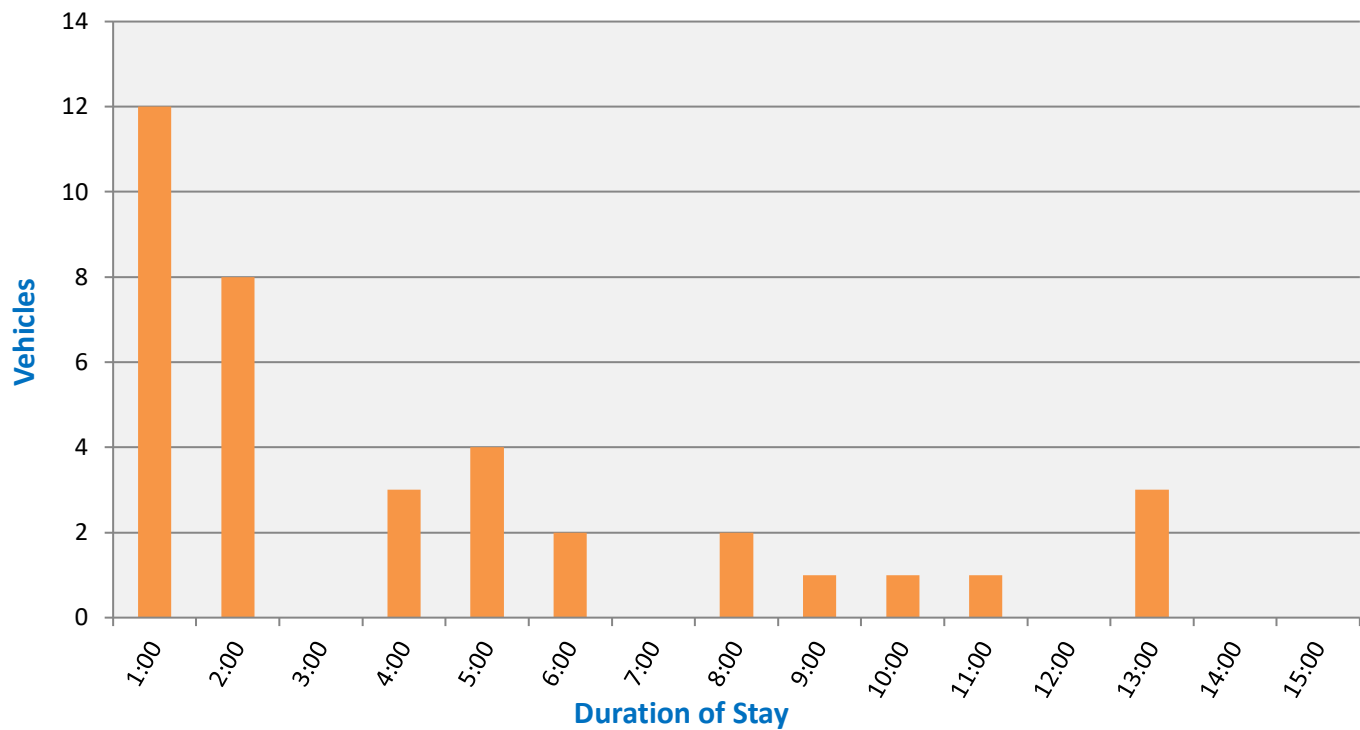
Ave Duration of Stay (h:mm) 4:14

Total Vehicles 37

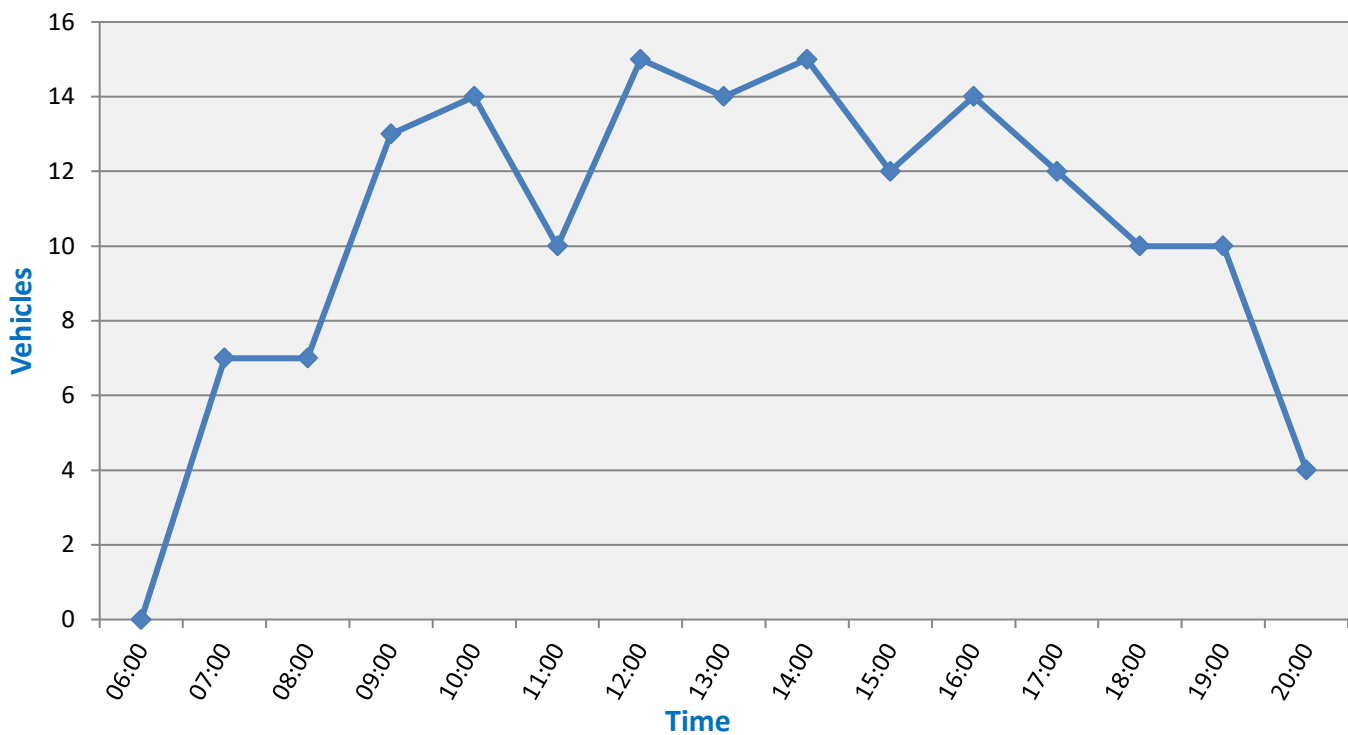
[1hr intervals]

Total	12	8	0	3	4	2	0	2	1	1	1	0	3	0	0			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
06:00																0	0	0%
07:00	2				1			1					3			7	7	18%
08:00									1	1						2	7	18%
09:00	1	4									1					6	13	33%
10:00	2															2	14	36%
11:00				1				1								2	10	26%
12:00	3				2	1										6	15	38%
13:00		2														2	14	36%
14:00	1															1	15	38%
15:00					1	1										2	12	31%
16:00	1	1														2	14	36%
17:00				2												2	12	31%
18:00	1															1	10	26%
19:00	1	1														2	10	26%
20:00																0	4	10%

Duration of Stay



Parking Accumulation



Client Cardno

Location **Area T - Total

Date Thursday, 7th September 2017 (6:00-20:00)

Description Greensborough Parking Survey



Site **Area T - Total

Total Parking Spaces 13

Time restriction -

Peak Demand 13

Peak Demand % 100%

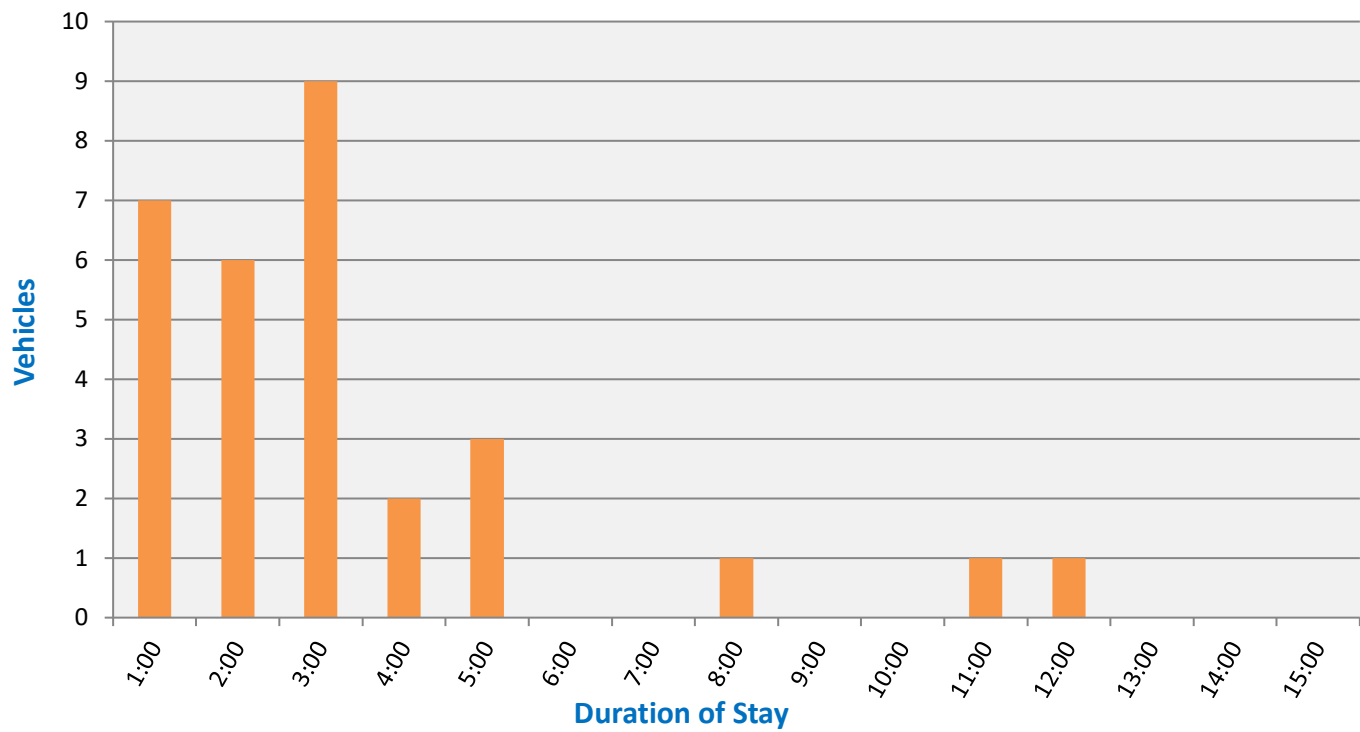
Ave Duration of Stay (h:mm) 3:20

Total Vehicles 30

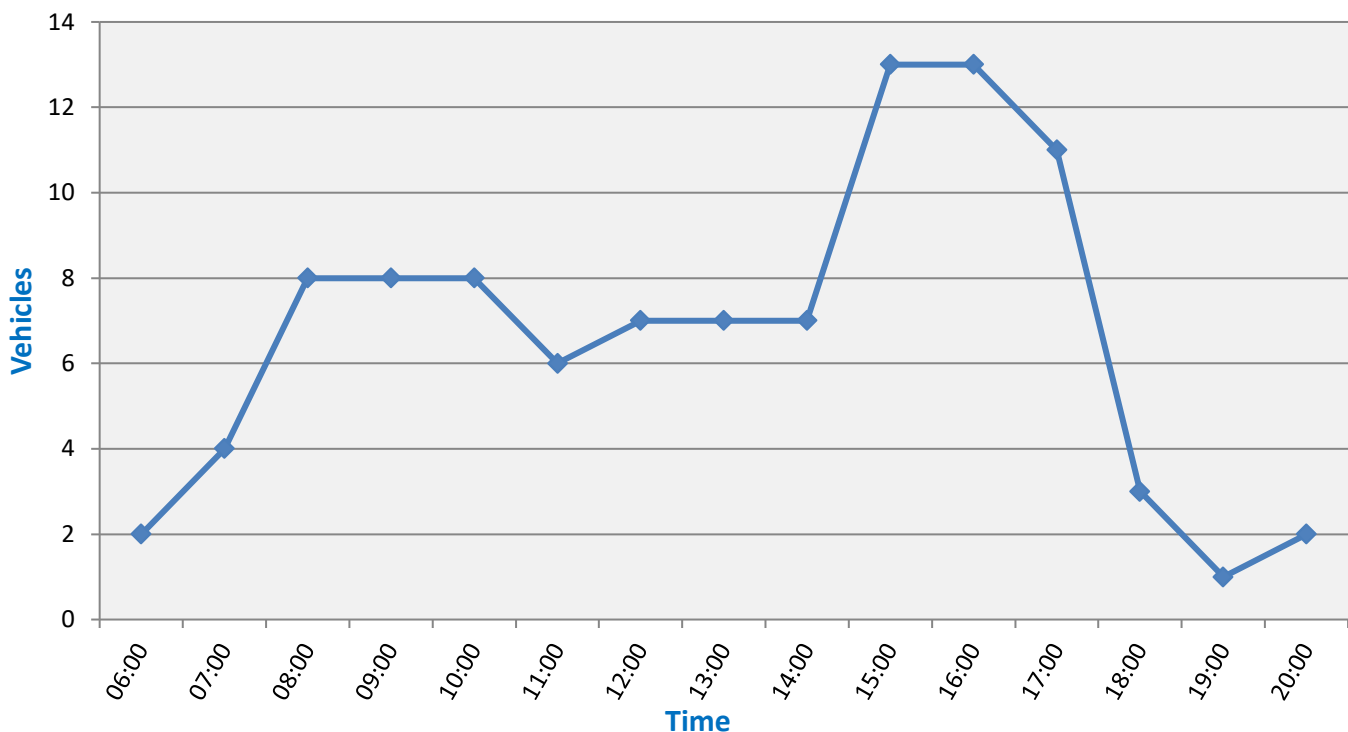
[1hr intervals]

Total	7	6	9	2	3	0	0	1	0	0	1	1	0	0	0			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
06:00					1							1				2	2	15%
07:00	1			1												2	4	31%
08:00		2		1	1						1					5	8	62%
09:00																0	8	62%
10:00	1							1								2	8	62%
11:00	1															1	6	46%
12:00			2		1											3	7	54%
13:00		1														1	7	54%
14:00																0	7	54%
15:00		2	7													9	13	100%
16:00																0	13	100%
17:00	1															1	11	85%
18:00	1	1														2	3	23%
19:00																0	1	8%
20:00	2															2	2	15%

Duration of Stay



Parking Accumulation



Client Cardno

Location **Area U - Total

Date Thursday, 7th September 2017 (6:00-20:00)

Description Greensborough Parking Survey



Site **Area U - Total

Total Parking Spaces 29

Time restriction -

Peak Demand 6

Peak Demand % 21%

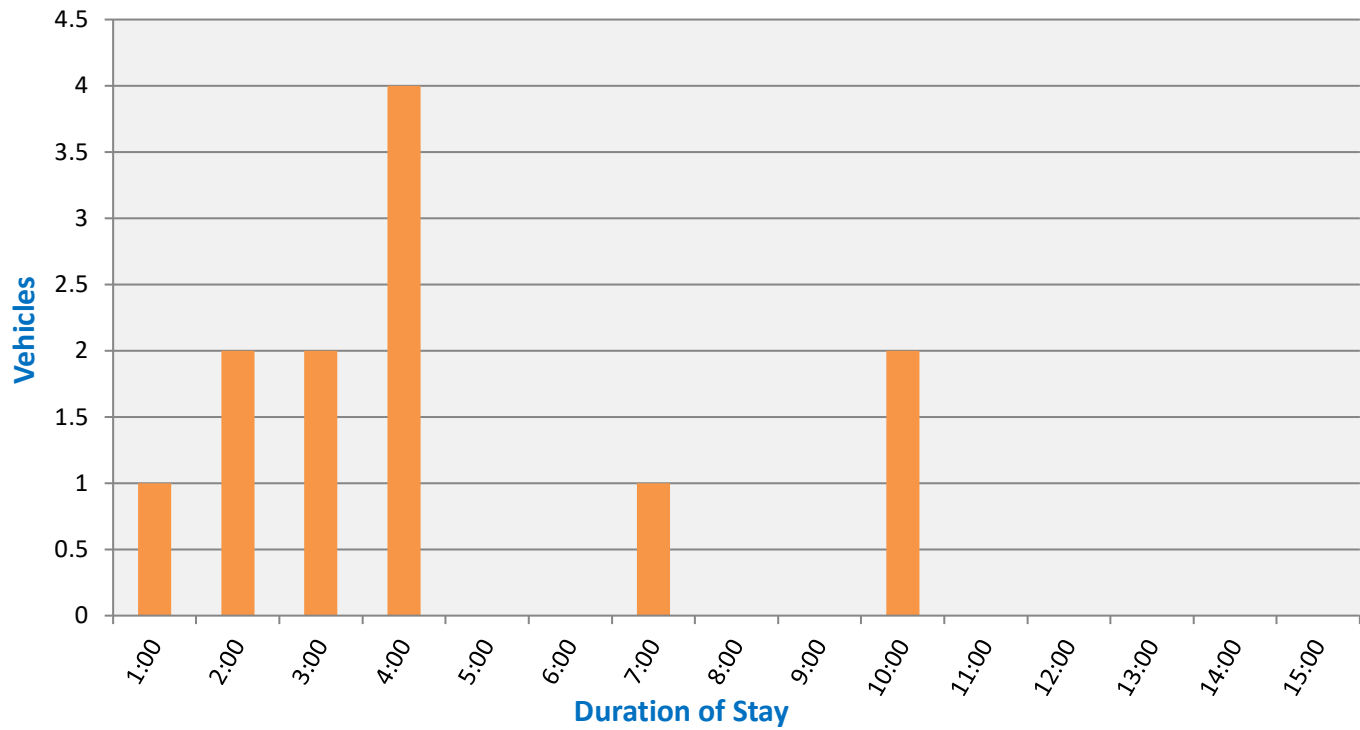
Ave Duration of Stay (h:mm) 4:30

Total Vehicles 12

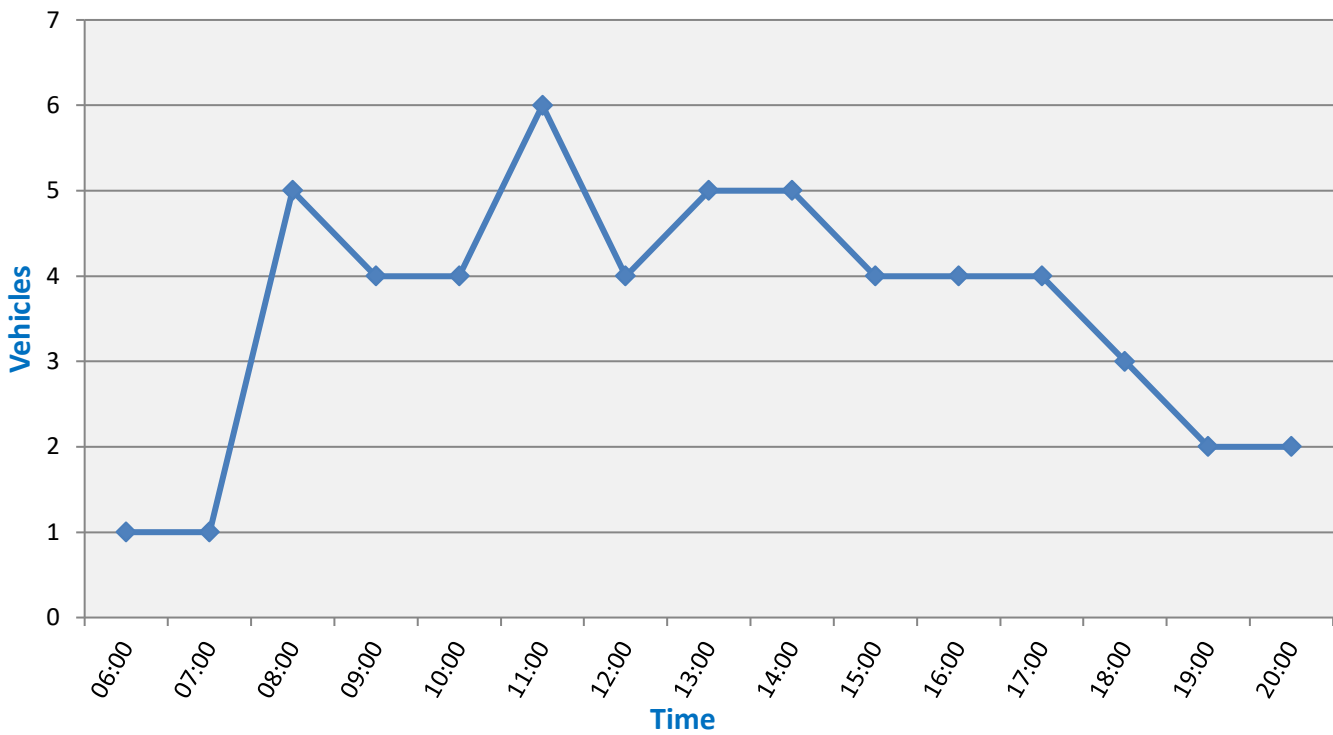
[1hr intervals]

Total	1	2	2	4	0	0	1	0	0	2	0	0	0	0	0			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
06:00			1													1	1	3%
07:00																0	1	3%
08:00				2						2						4	5	17%
09:00																0	4	14%
10:00																0	4	14%
11:00		1					1									2	6	21%
12:00																0	4	14%
13:00		1		1												2	5	17%
14:00																0	5	17%
15:00																0	4	14%
16:00																0	4	14%
17:00				1												1	4	14%
18:00	1		1													2	3	10%
19:00																0	2	7%
20:00																0	2	7%

Duration of Stay



Parking Accumulation



Client Cardno

Location **Area V - Total

Date Thursday, 7th September 2017 (6:00-20:00)

Description Greensborough Parking Survey



Site **Area V - Total

Total Parking Spaces 230

Time restriction -

Peak Demand 104

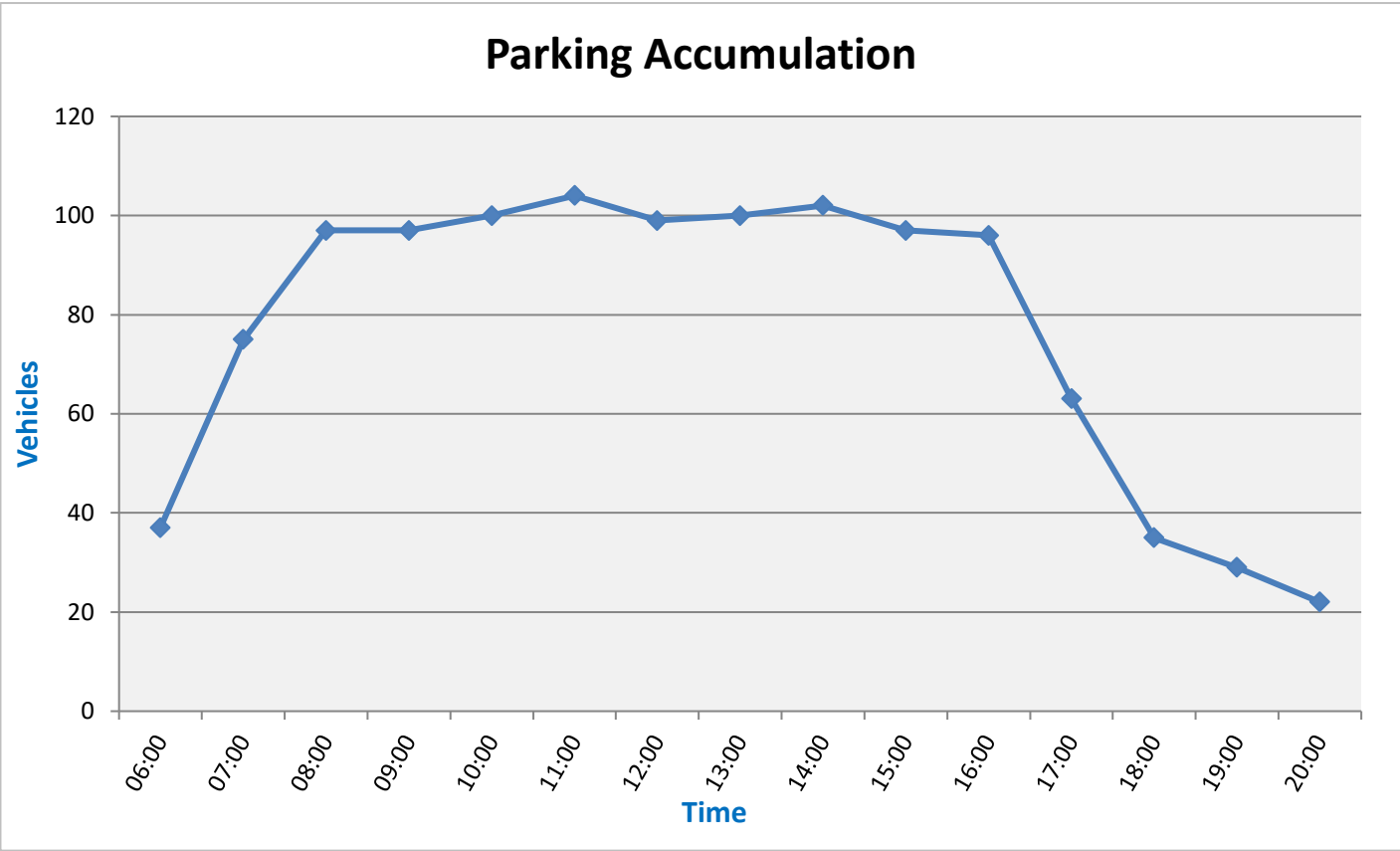
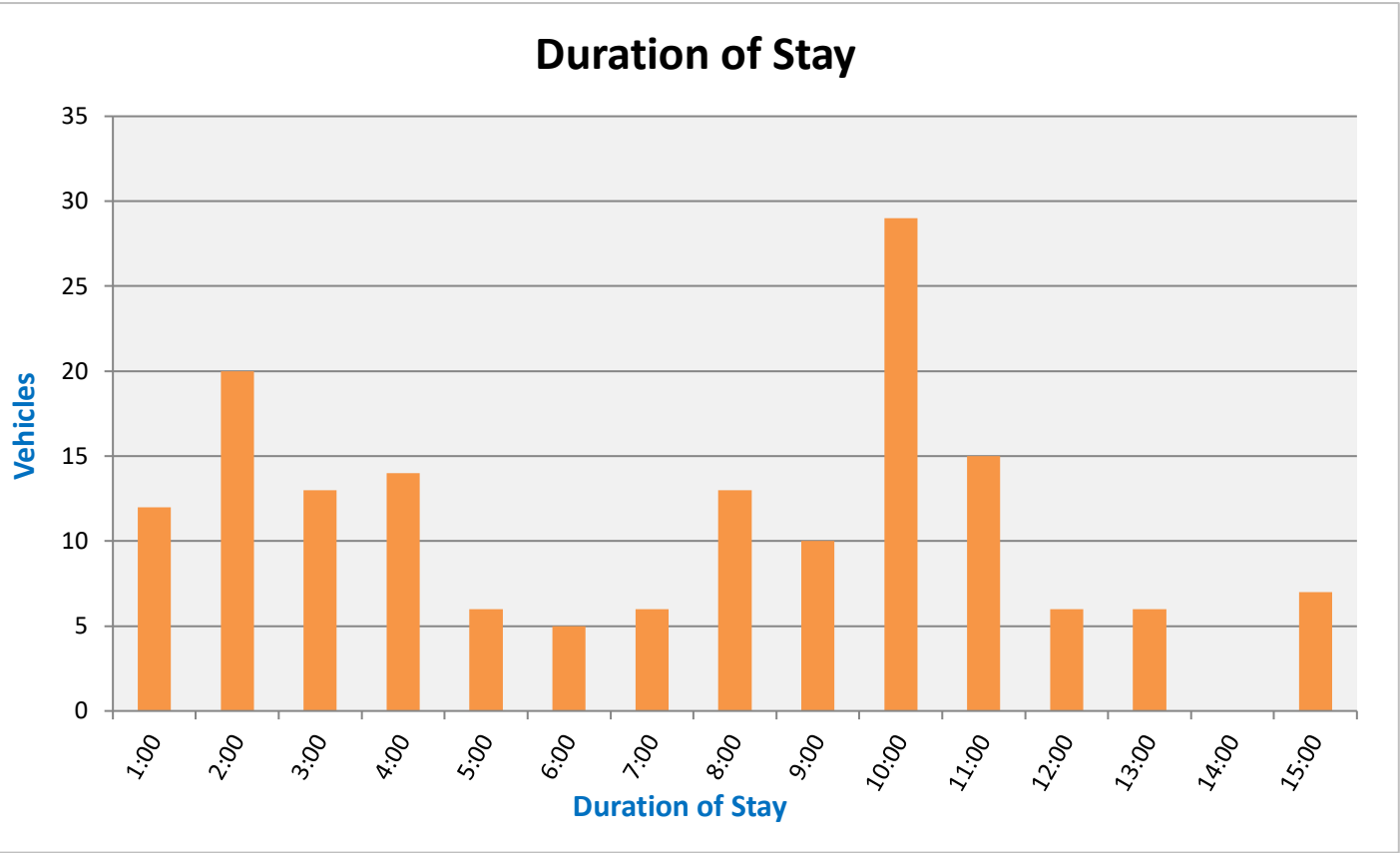
Peak Demand % 45%

Ave Duration of Stay (h:mm) 7:07

Total Vehicles 162

[1hr intervals]

Total	12	20	13	14	6	5	6	13	10	29	15	6	6	0	7			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
06:00	2	9	2	9	1	2	1		1			1	2		7	37	37	16%
07:00					2			5	1	19	12		1			40	75	33%
08:00		4				1	1	1	6	8	2	5	3			31	97	42%
09:00						1		1								2	97	42%
10:00	1	1	2		2		3	3	2	1	1					16	100	43%
11:00	2			1			1	1		1						6	104	45%
12:00			1			1										2	99	43%
13:00				2				2								4	100	43%
14:00			2	1												3	102	44%
15:00		4	2	1												7	97	42%
16:00					1											1	96	42%
17:00	3		1													4	63	27%
18:00	1		3													4	35	15%
19:00	1	2														3	29	13%
20:00	2															2	22	10%



Client Cardno

Location **Area W - Total

Date Thursday, 7th September 2017 (6:00-20:00)

Description Greensborough Parking Survey



Site **Area W - Total

Total Parking Spaces 79

Time restriction -

Peak Demand 39

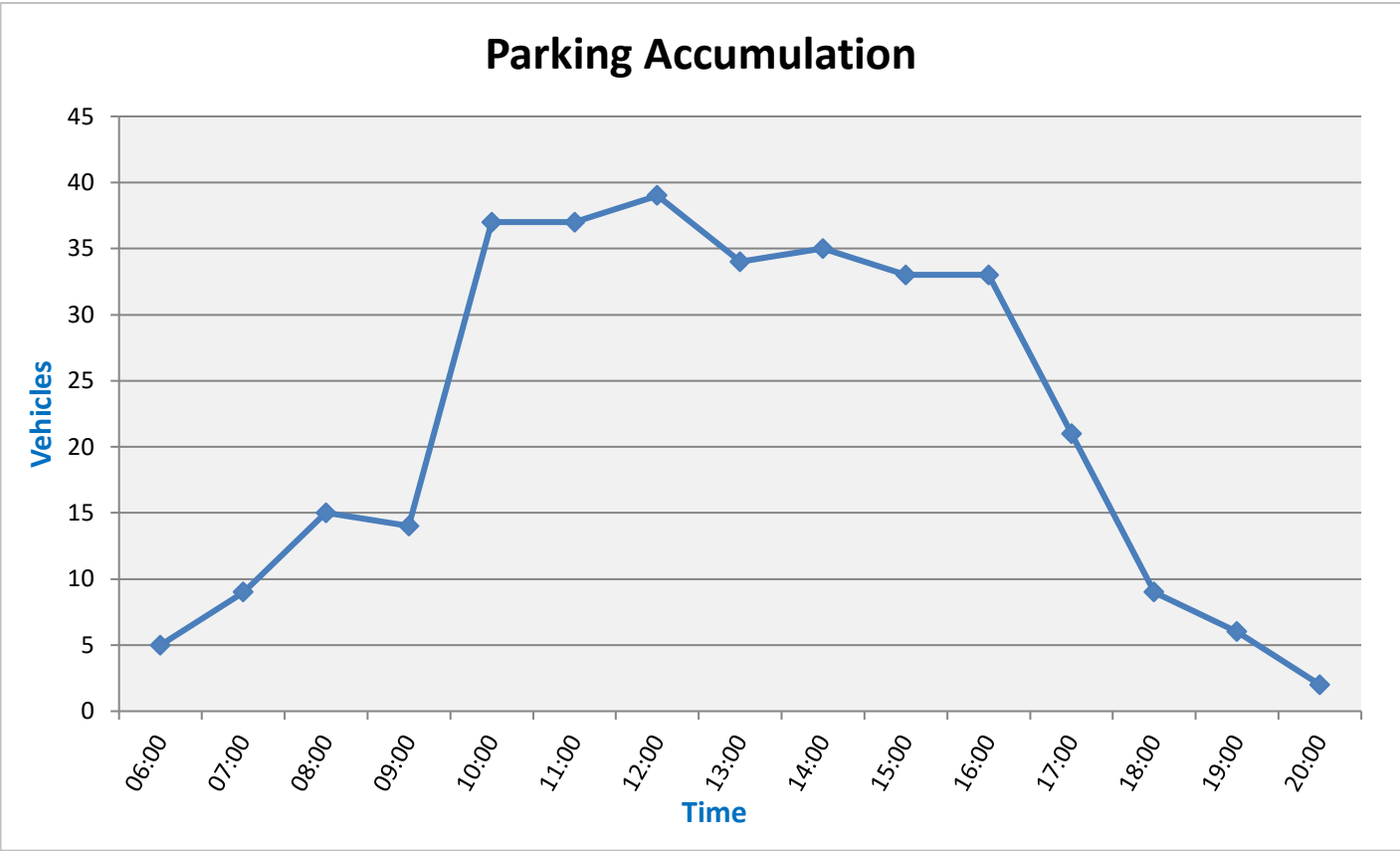
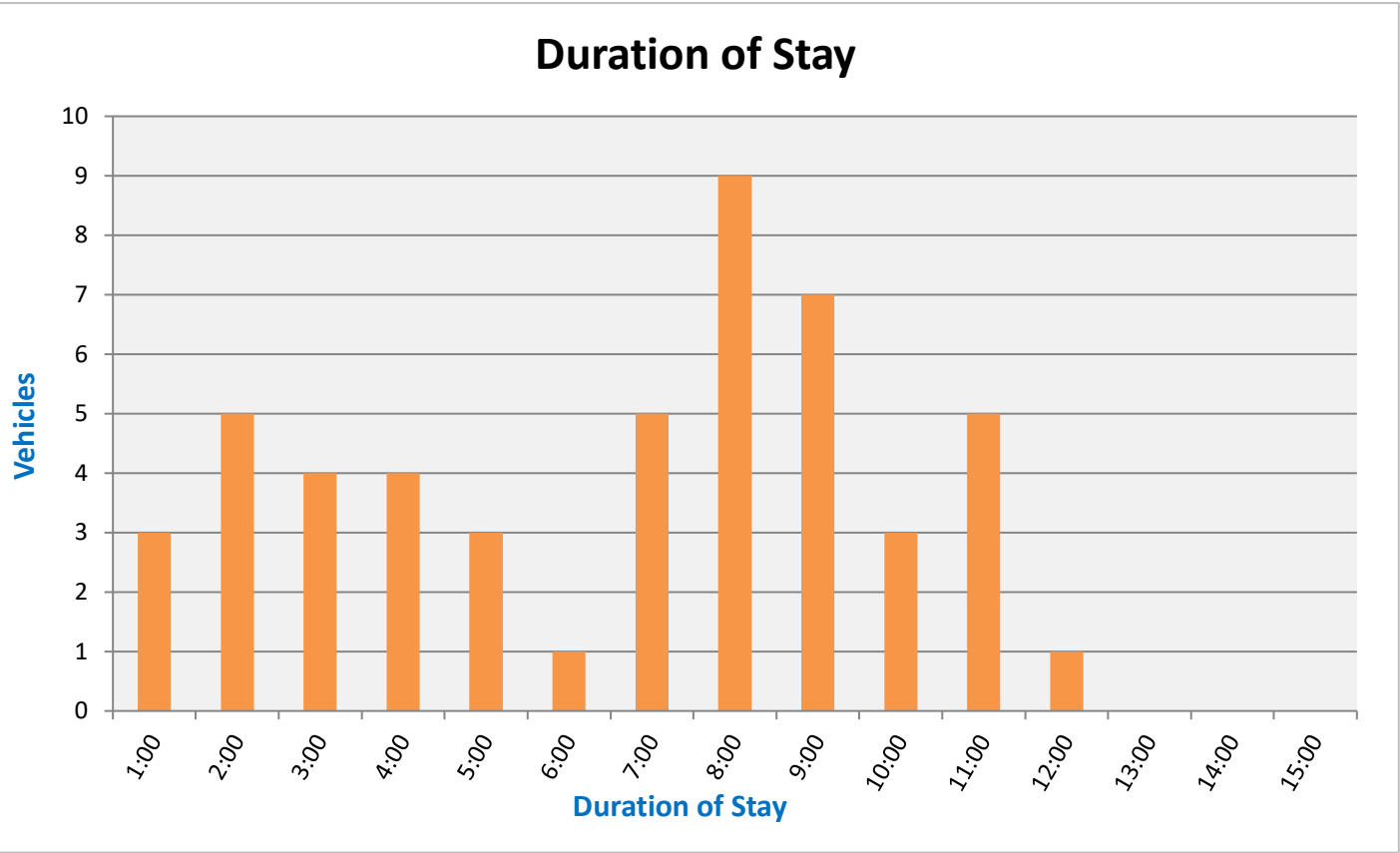
Peak Demand % 49%

Ave Duration of Stay (h:mm) 6:34

Total Vehicles 50

[1hr intervals]

Total	3	5	4	4	3	1	5	9	7	3	5	1	0	0	0			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
06:00		1		3							1					5	5	6%
07:00								1			3					4	9	11%
08:00	1								4	1		1				7	15	19%
09:00																0	14	18%
10:00	1	1	3		2		5	8	3	2	1					26	37	47%
11:00		1														1	37	47%
12:00	1		1		1											3	39	49%
13:00																0	34	43%
14:00						1										1	35	44%
15:00		2														2	33	42%
16:00																0	33	42%
17:00				1												1	21	27%
18:00																0	9	11%
19:00																0	6	8%
20:00																0	2	3%



Client Cardno

Location **Area X - Total

Date Thursday, 7th September 2017 (6:00-20:00)

Description Greensborough Parking Survey



Site **Area X - Total

Total Parking Spaces 63

Time restriction -

Peak Demand 36

Peak Demand % 57%

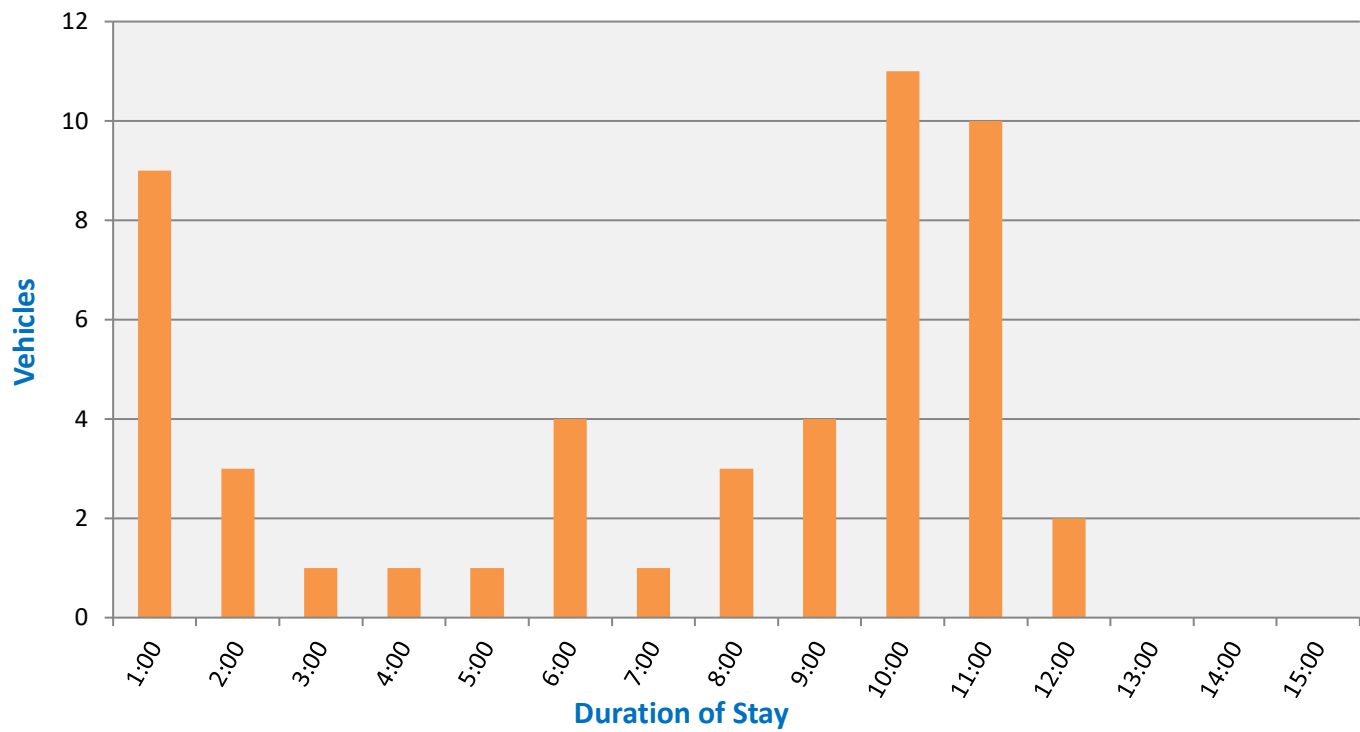
Ave Duration of Stay (h:mm) 7:14

Total Vehicles 50

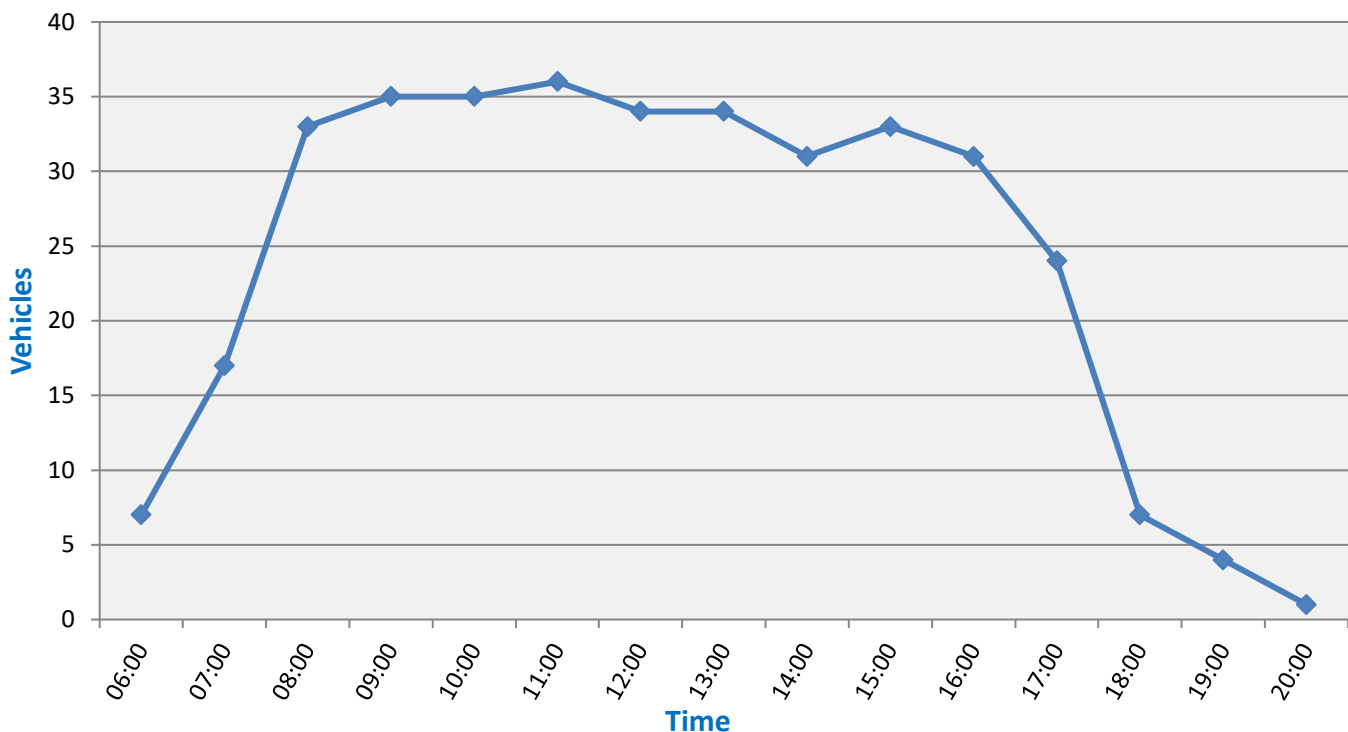
[1hr intervals]

Total	9	3	1	1	1	4	1	3	4	11	10	2	0	0	0			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
06:00	1			1		2		1			1	1				7	7	11%
07:00	2							1		1	6	1				11	17	27%
08:00	1					1	1		3	10	2					18	33	52%
09:00								1	1		1					3	35	56%
10:00	1															1	35	56%
11:00			1			1										2	36	57%
12:00																0	34	54%
13:00																0	34	54%
14:00																0	31	49%
15:00	2	1			1											4	33	52%
16:00																0	31	49%
17:00	1															1	24	38%
18:00	1	1														2	7	11%
19:00		1														1	4	6%
20:00																0	1	2%

Duration of Stay



Parking Accumulation



Client Cardno

Location **Area Y - Total

Date Thursday, 7th September 2017 (6:00-20:00)

Description Greensborough Parking Survey



Site **Area Y - Total

Total Parking Spaces 258

Time restriction -

Peak Demand 111

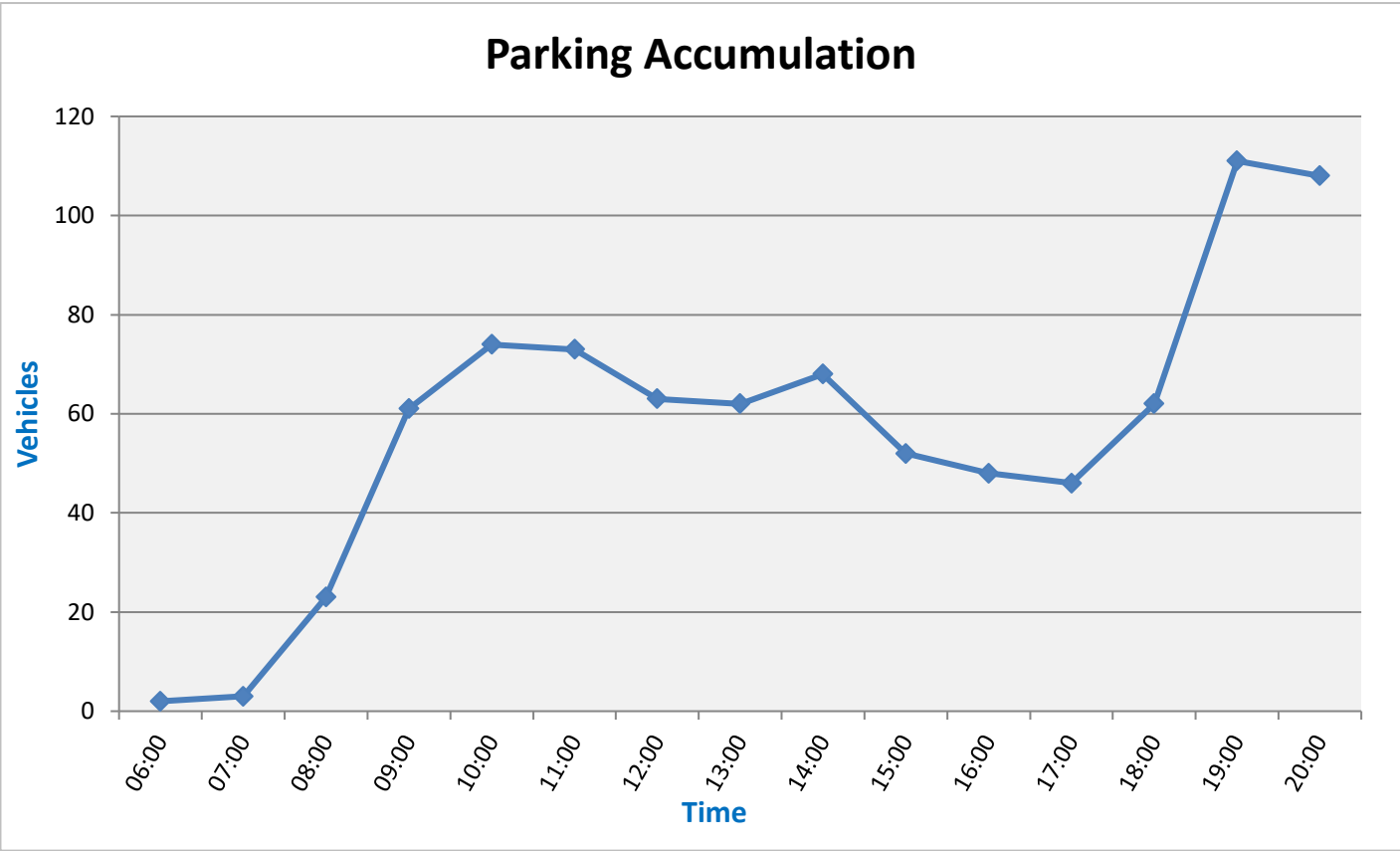
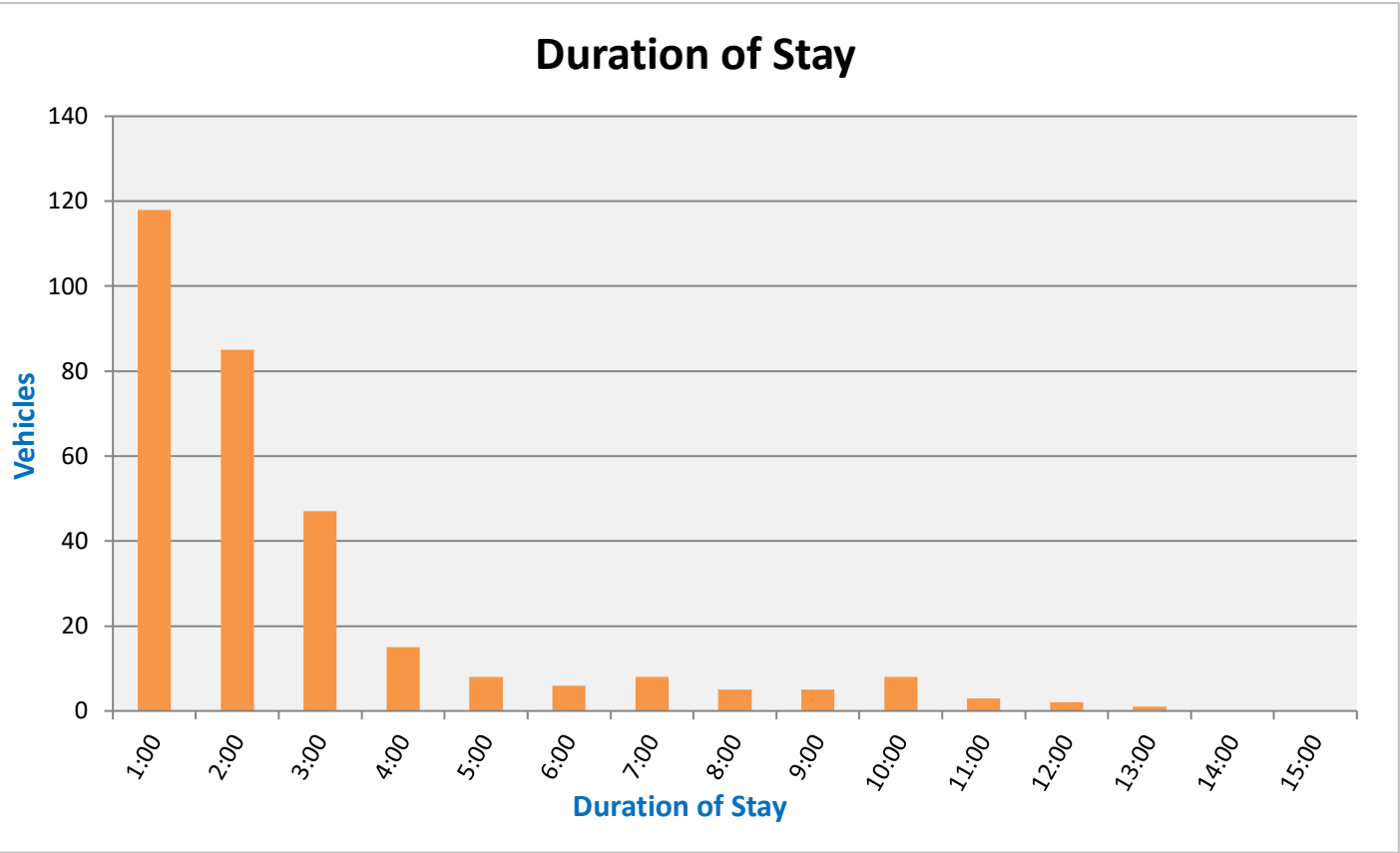
Peak Demand % 43%

Ave Duration of Stay (h:mm) 2:45

Total Vehicles 311

[1hr intervals]

Total	118	85	47	15	8	6	8	5	5	8	3	2	1	0	0			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
06:00			1	1												2	2	1%
07:00											1					1	3	1%
08:00	3		1		1	1	2	1	1	7	1	1	1			20	23	9%
09:00	4	11	11	4	1	1	2	3	4			1				42	61	24%
10:00	8	5	1		1	1	1				1					18	74	29%
11:00	10	3			3	1	1			1						19	73	28%
12:00	6	1	4	3	1	1										16	63	24%
13:00	6	5	1				1	1								14	62	24%
14:00	7	3	1	3			1									15	68	26%
15:00	2			1		1										4	52	20%
16:00	7	3		1	1											12	48	19%
17:00	9	1	1	2												13	46	18%
18:00	10	9	26													45	62	24%
19:00	18	44														62	111	43%
20:00	28															28	108	42%



Client Cardno

Location **Area Z - Total

Date Thursday, 7th September 2017 (6:00-20:00)

Description Greensborough Parking Survey



Site **Area Z - Total

Total Parking Spaces 485

Time restriction -

Peak Demand 78

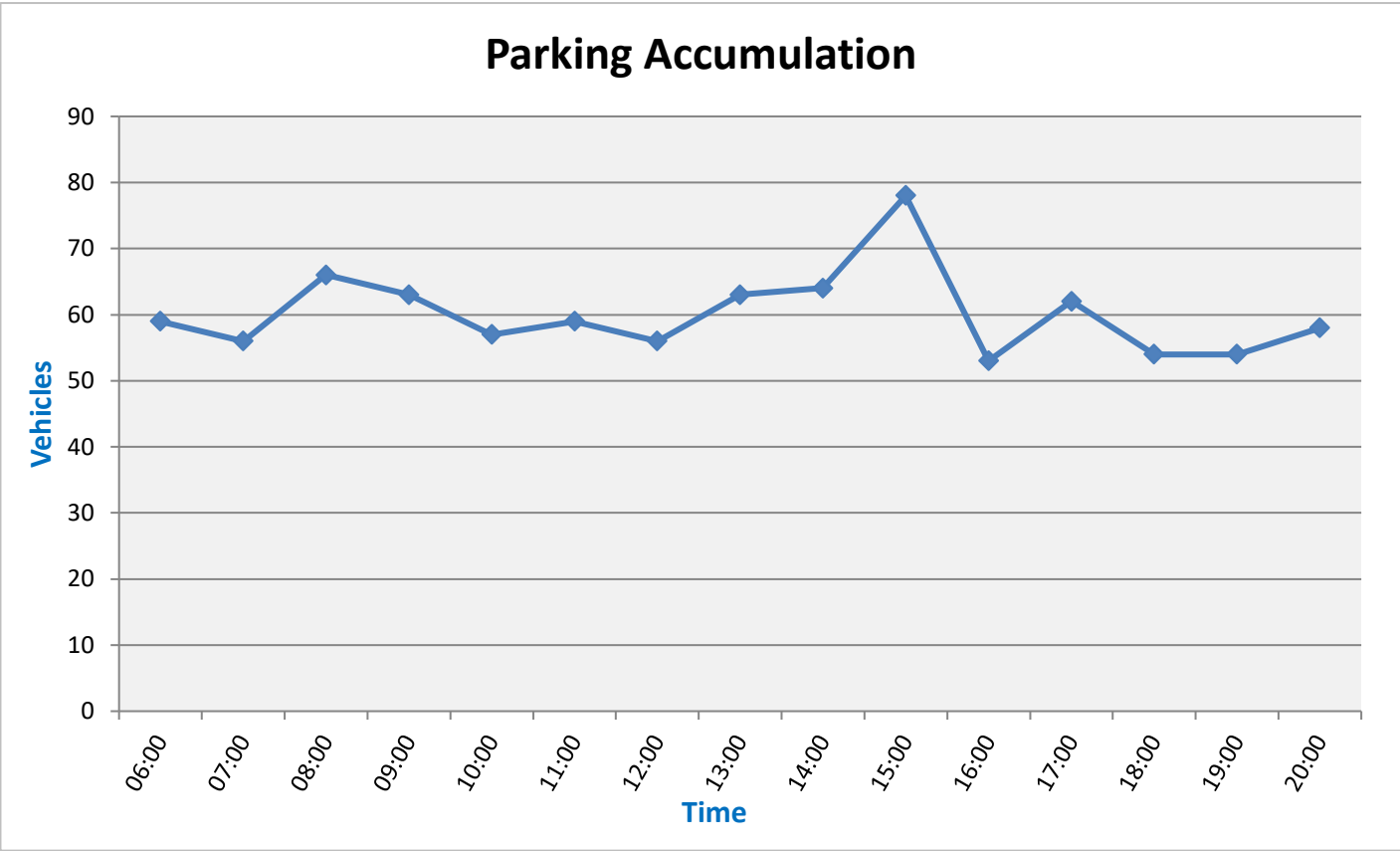
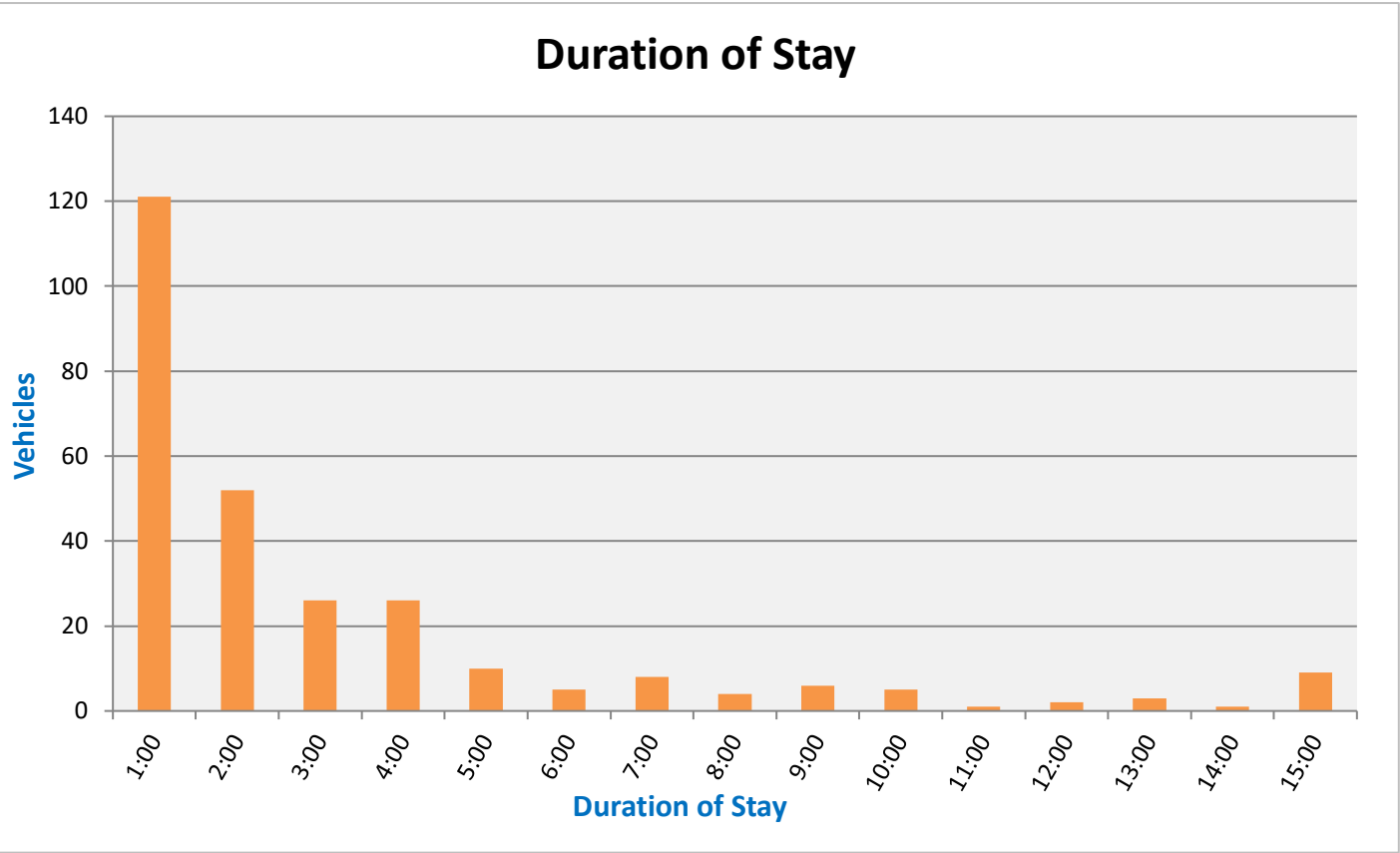
Peak Demand % 16%

Ave Duration of Stay (h:mm) 3:13

Total Vehicles 279

[1hr intervals]

Total	121	52	26	26	10	5	8	4	6	5	1	2	3	1	9			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
06:00	11	6	10	8	2	2	2	2	1	2		1	2	1	9	59	59	12%
07:00	2	1	1		1		1	1	1							8	56	12%
08:00	3	1	2	1		2	3	1	3	1			1			18	66	14%
09:00	7			2	1							1				11	63	13%
10:00	1	5	1	1	1		1				1					11	57	12%
11:00	3		1	1						2						7	59	12%
12:00	1	5		1			1		1							9	56	12%
13:00	3	4	3	1	2											13	63	13%
14:00	10	1	1	3	1	1										17	64	13%
15:00	30	3		2												35	78	16%
16:00	6	4		2	2											14	53	11%
17:00	15	3	2	4												24	62	13%
18:00	6	7	5													18	54	11%
19:00	3	12														15	54	11%
20:00	20															20	58	12%



Greensborough Parking Survey

Zone A

Saturday, 9th September 2017

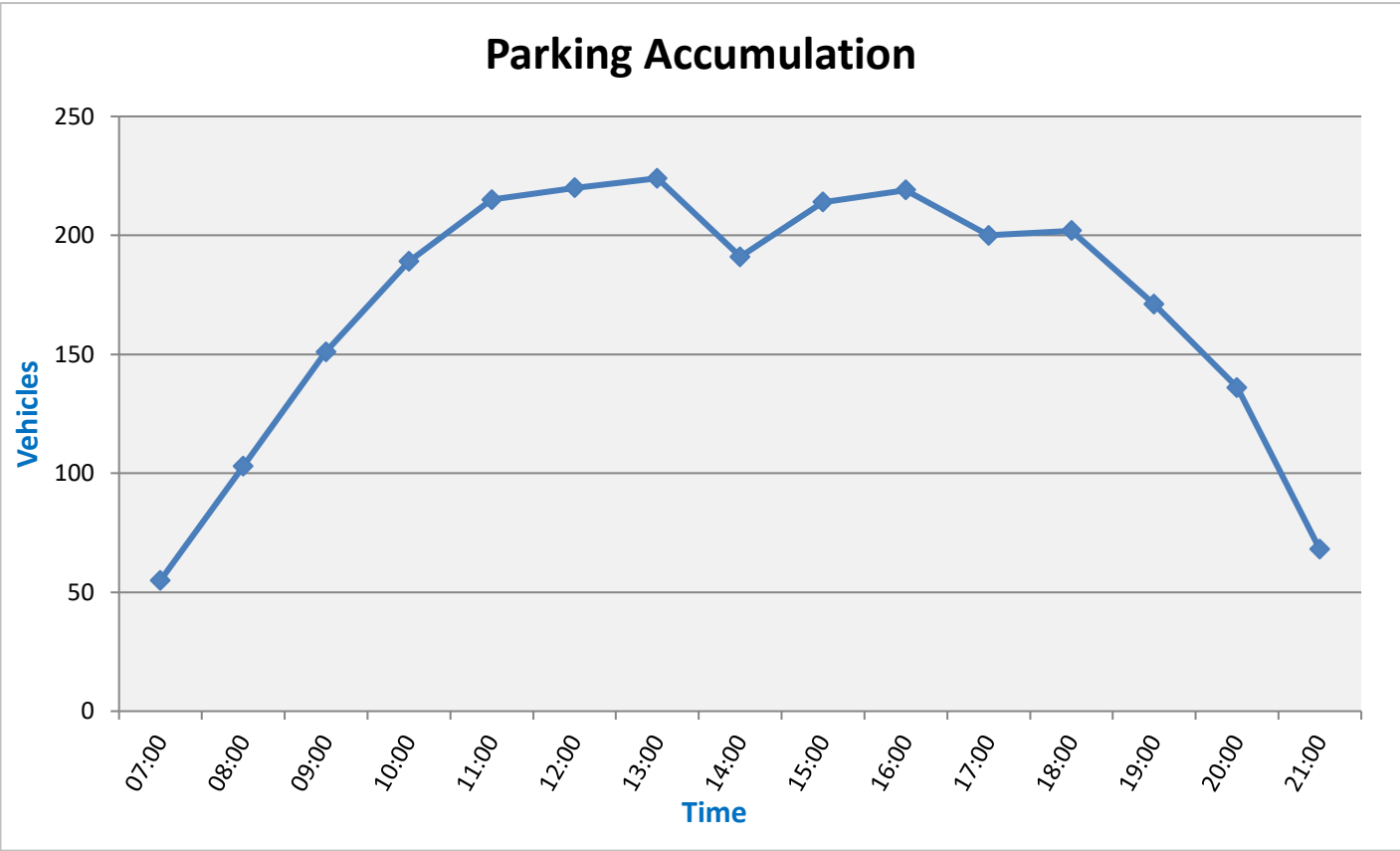
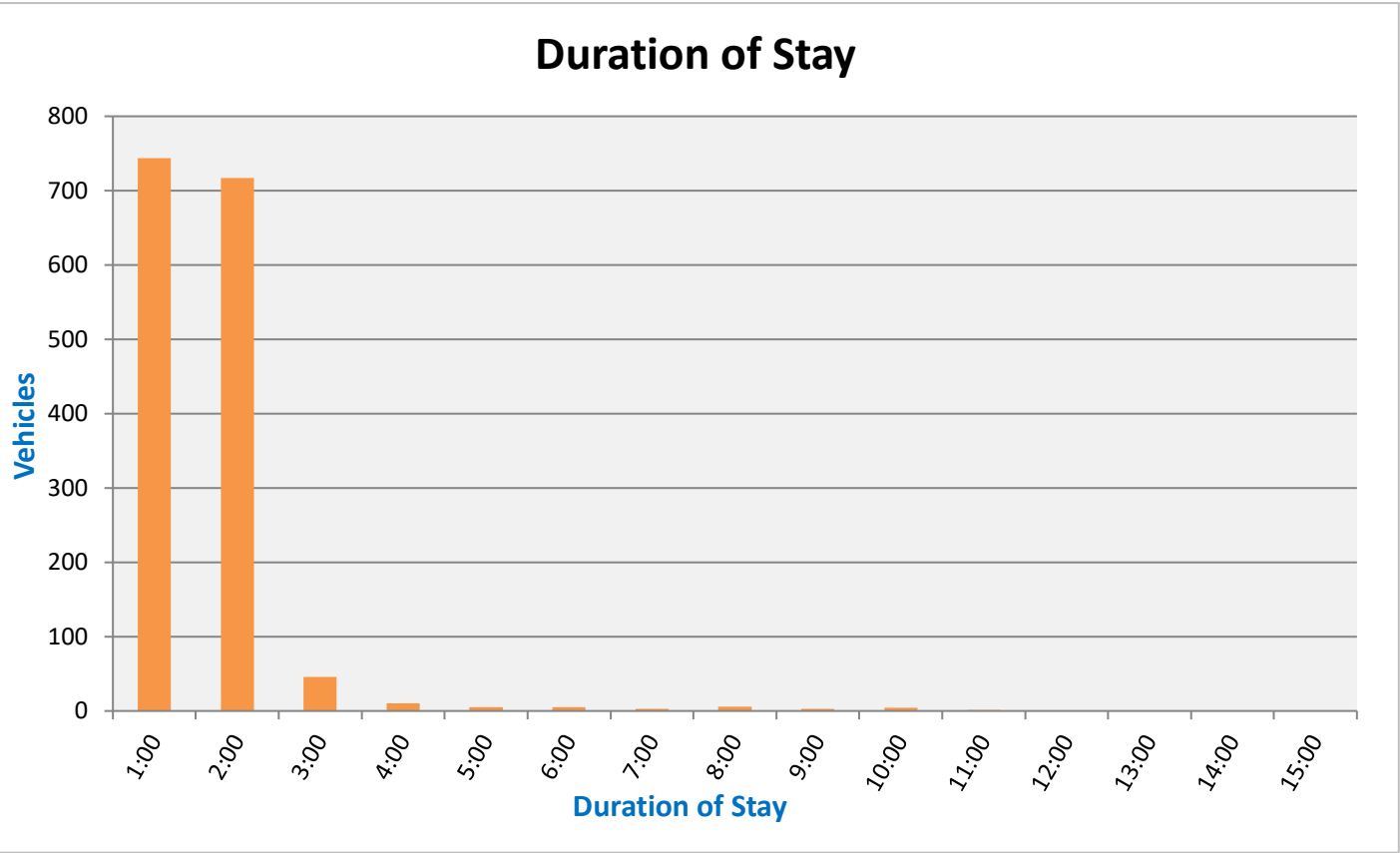
Client Cardno
Location **Area A - Total
Date Saturday, 9th September 2017 (7:00-21:00)
Description Greensborough Parking Survey



Site **Area A - Total
Total Parking Spaces 221
Time restriction -
Peak Demand 224
Peak Demand % 101%
Ave Duration of Stay (h:mm) 1:39
Total Vehicles 1544

[1hr intervals]

Total	744	717	46	10	5	5	3	6	3	4	1	0	0	0	0			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	22	21	4	2		1	1	2		1	1					55	55	25%
08:00	23	32	5	2	1	2	1		2	2						70	103	47%
09:00	34	45	11	1				1								92	151	68%
10:00	47	56	4							1						108	189	86%
11:00	60	53	9	1				1	1							125	215	97%
12:00	61	70	1	2												134	220	100%
13:00	57	62		1	1	2		2								125	224	101%
14:00	48	54	3				1									106	191	86%
15:00	68	66	1	1	2											138	214	97%
16:00	77	51	1													129	219	99%
17:00	69	58	4		1											132	200	90%
18:00	61	63	3													127	202	91%
19:00	43	50														93	171	77%
20:00	43	36														79	136	62%
21:00	31															31	68	31%



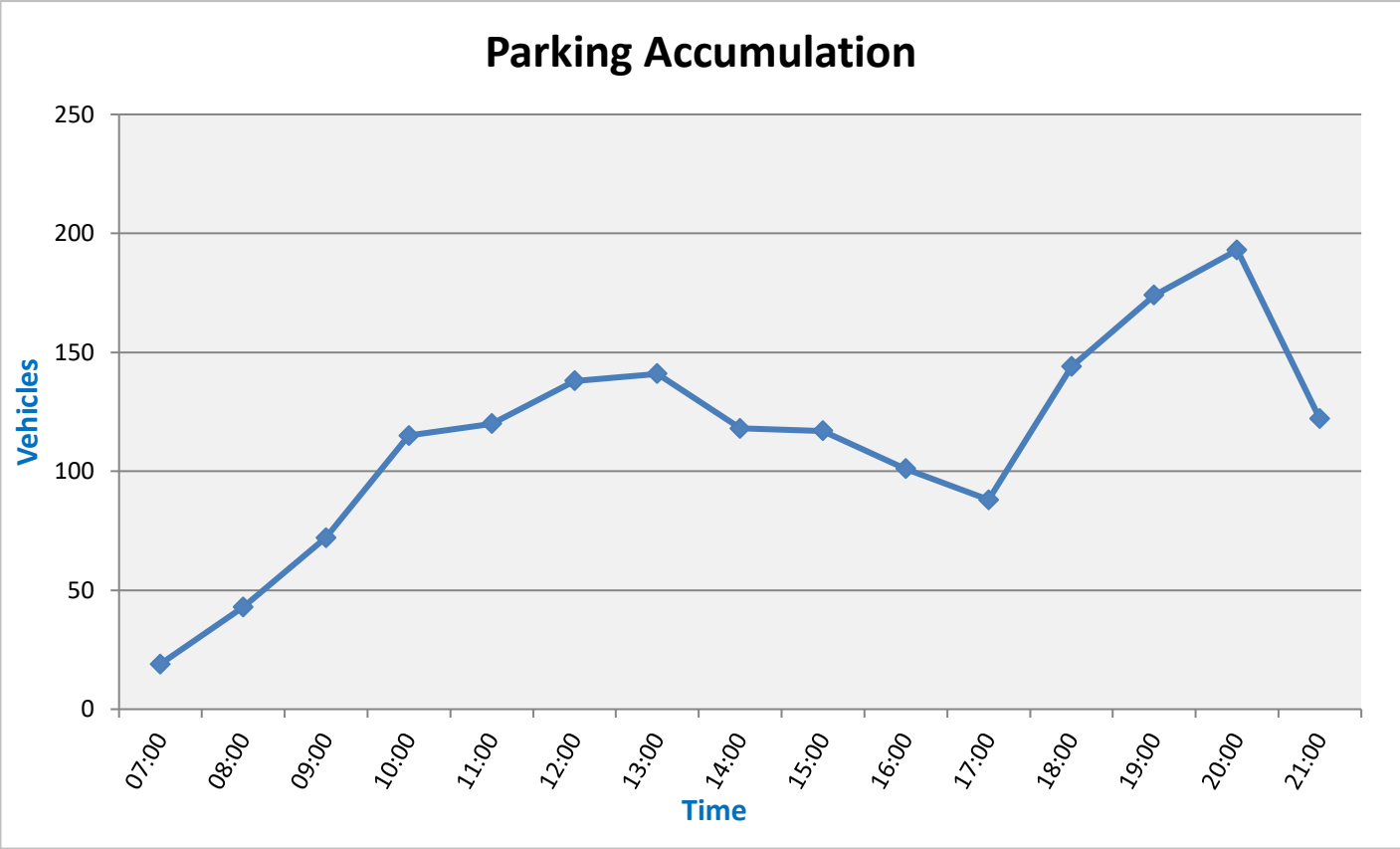
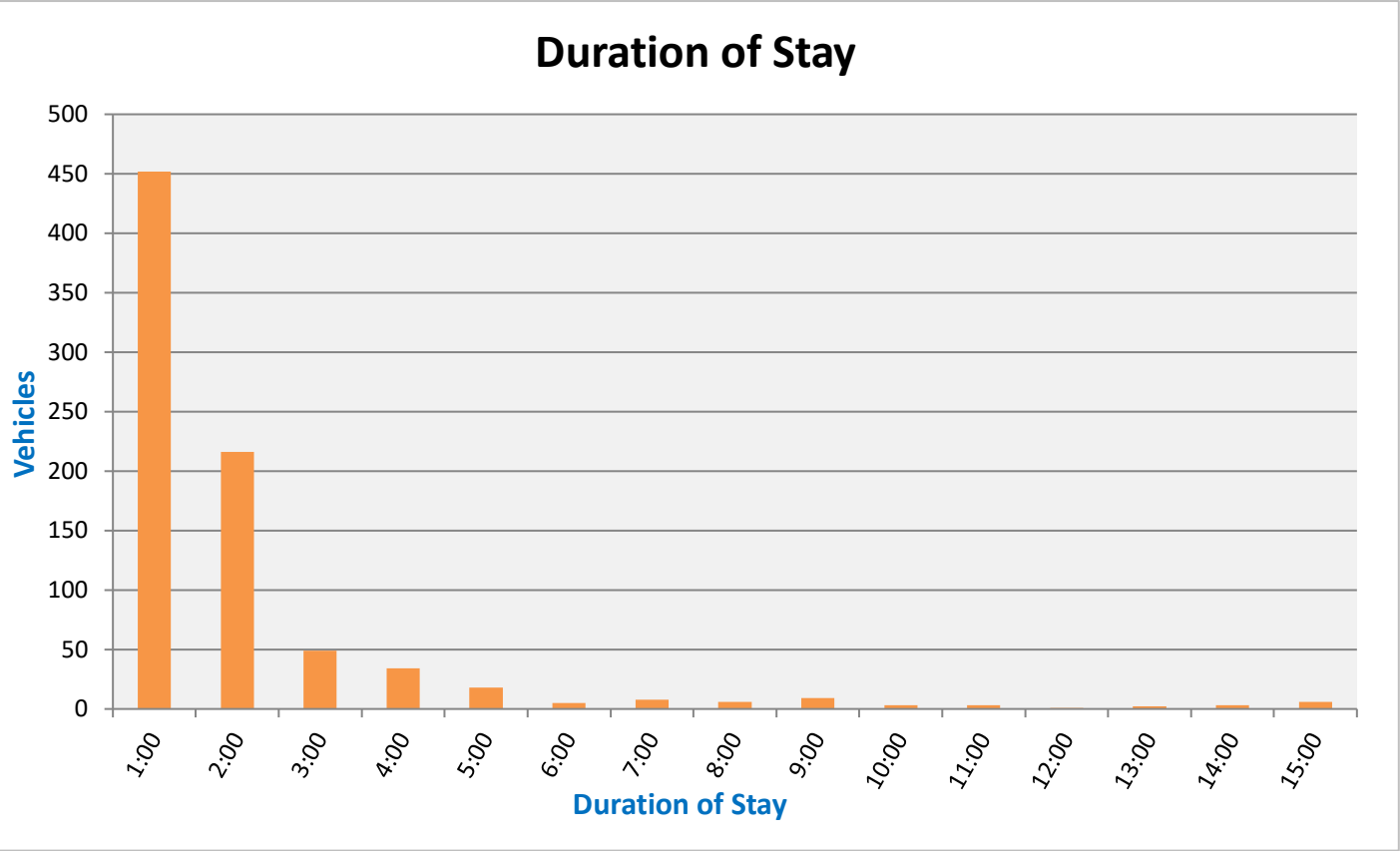
Client Cardno
Location **Area C - Total
Date Saturday, 9th September 2017 (7:00-21:00)
Description Greensborough Parking Survey



Site **Area C - Total
Total Parking Spaces 389
Time restriction -
Peak Demand 193
Peak Demand % 50%
Ave Duration of Stay (h:mm) 2:05
Total Vehicles 815

[1hr intervals]

Total	452	216	49	34	18	5	8	6	9	3	3	1	2	3	6			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	4			2	1				3		1			2	6	19	19	5%
08:00	10	6	1	3	1			1	3	1			1	1		28	43	11%
09:00	22	4	3	3	2			1	1	1	1		1			39	72	19%
10:00	46	18	3	1			1	1				1				71	115	30%
11:00	46	7	3		1						1					58	120	31%
12:00	51	22	7	3	2	2		1		1						89	138	35%
13:00	31	27	3	5					2							68	141	36%
14:00	24	5	2	1	1		1	2								36	118	30%
15:00	37	8	5	1			6									57	117	30%
16:00	21	8	2	1	2	3										37	101	26%
17:00	17	4		1	8											30	88	23%
18:00	47	25	8	13												93	144	37%
19:00	37	37	12													86	174	45%
20:00	39	45														84	193	50%
21:00	20															20	122	31%



Client Cardno

Location **Area D - Total

Date Saturday, 9th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area D - Total

Total Parking Spaces 2448

Time restriction -

Peak Demand 2075

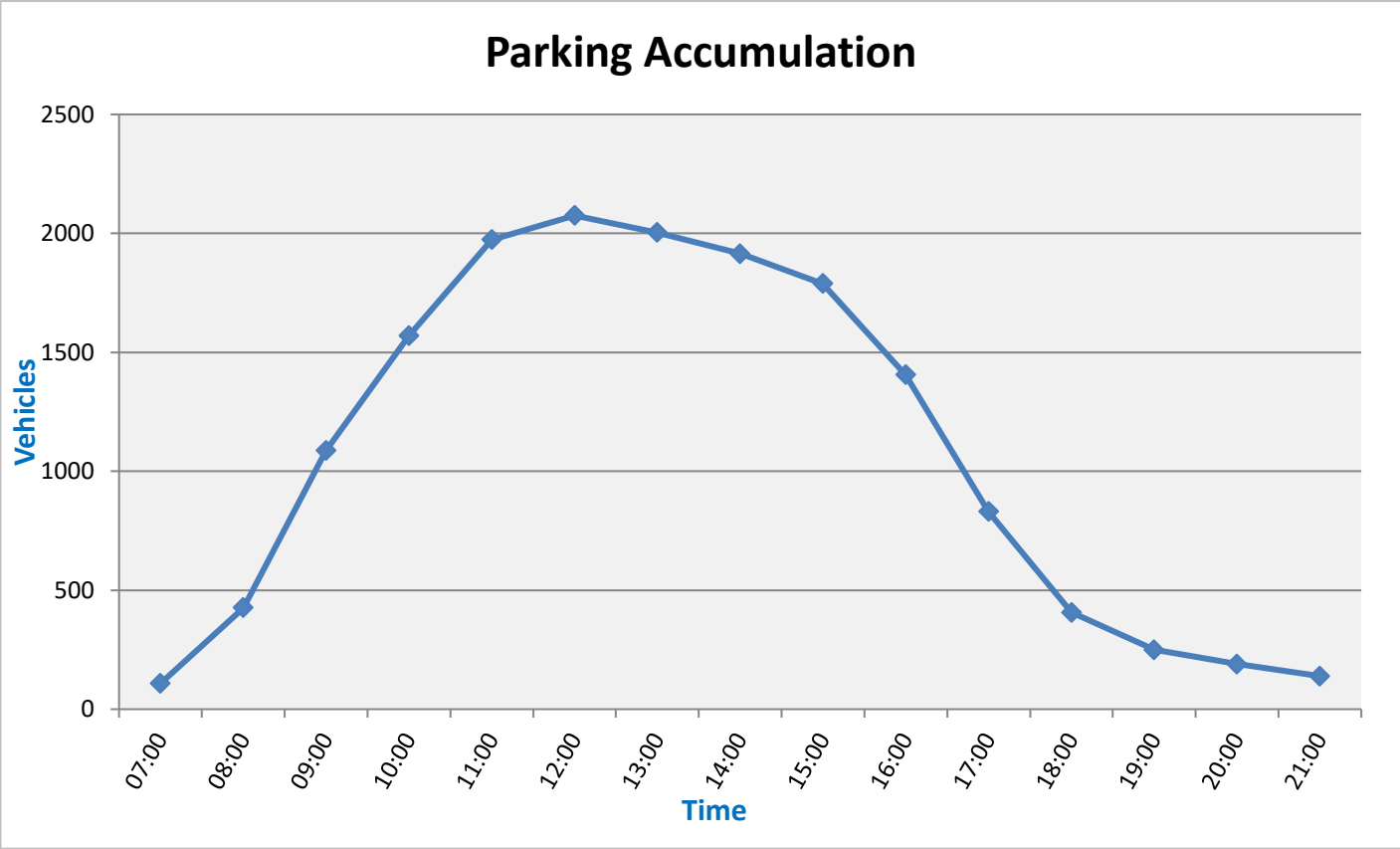
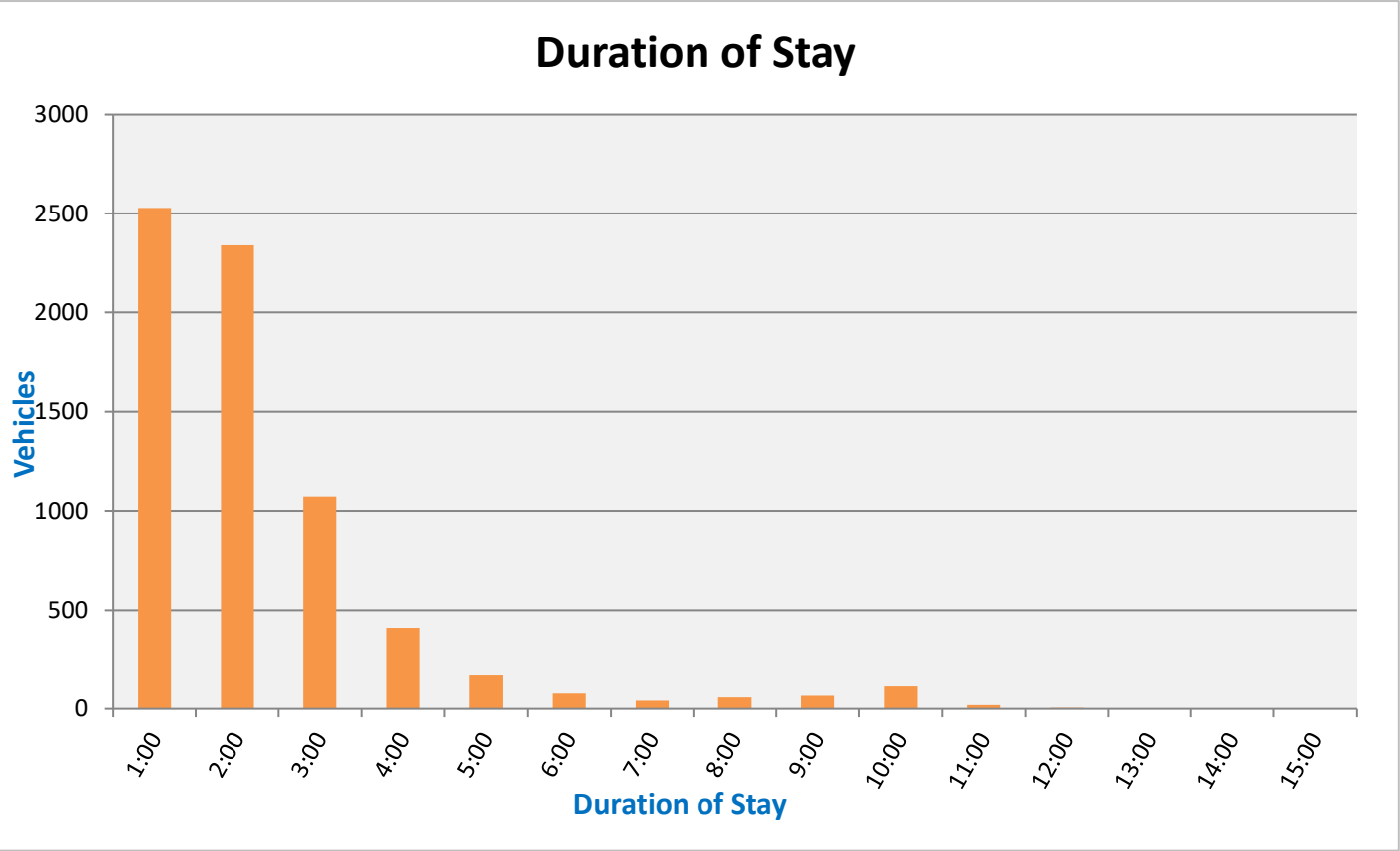
Peak Demand % 85%

Ave Duration of Stay (h:mm) 2:20

Total Vehicles 6901

[1hr intervals]

Total	2527	2339	1072	411	169	77	41	59	65	113	20	5	3	0	0			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	25	11	12	10	2	6	7	9	7	6	11	2				108	108	4%
08:00	50	60	38	23	5	14	8	11	21	101	9	2	1			343	426	17%
09:00	226	234	123	43	20	9	4	25	33	3			2			722	1087	44%
10:00	240	323	130	47	14	8	7	9	1			1				780	1569	64%
11:00	295	347	171	50	40	10	10	1		2						926	1973	81%
12:00	270	312	167	66	33	15	1	1	2	1						868	2075	85%
13:00	237	269	150	49	13	7	1	2	1							729	2003	82%
14:00	259	285	117	45	10	1	1	1								719	1914	78%
15:00	250	278	93	29	5	3	2									660	1789	73%
16:00	265	130	27	9	2	4										437	1405	57%
17:00	146	39	15	11	25											236	830	34%
18:00	121	21	12	29												183	407	17%
19:00	61	15	17													93	250	10%
20:00	41	15														56	190	8%
21:00	41															41	139	6%



Client Cardno

Location **Area E - Total

Date Saturday, 9th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area E - Total

Total Parking Spaces 578

Time restriction -

Peak Demand 409

Peak Demand % 71%

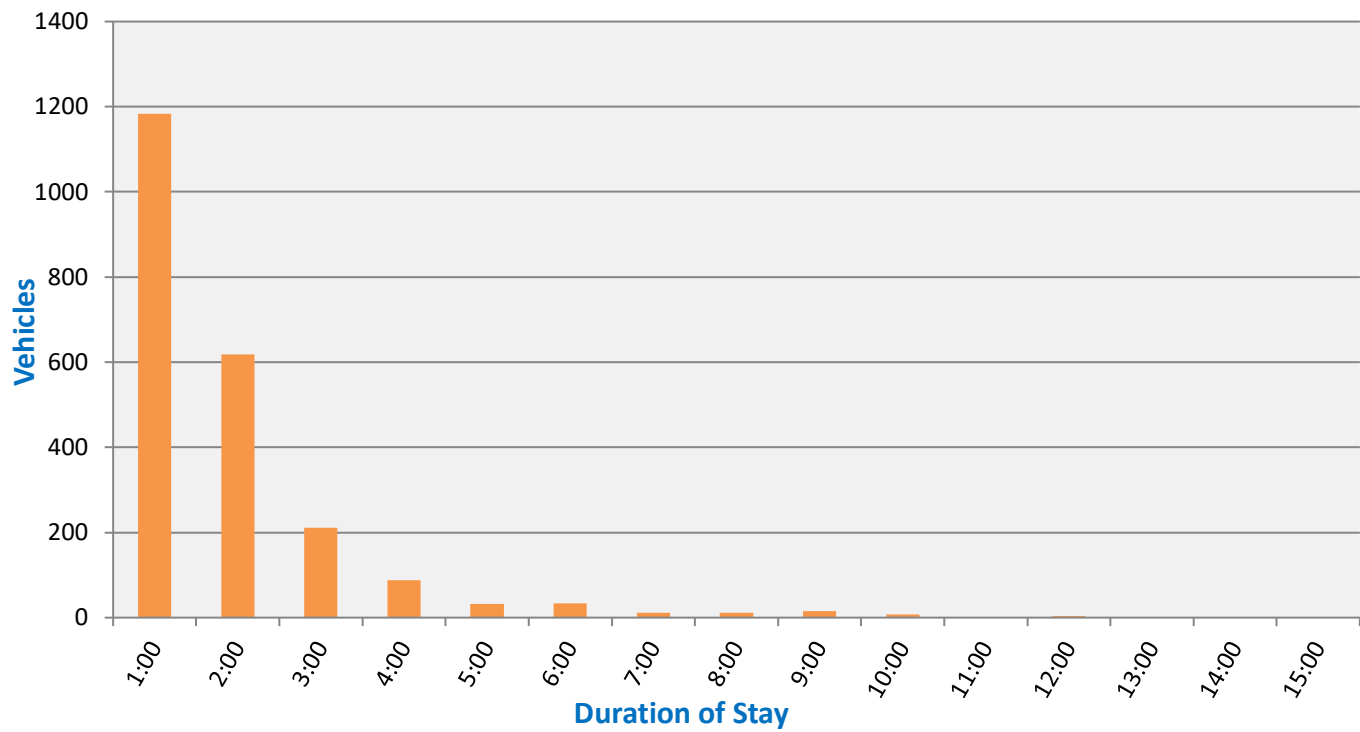
Ave Duration of Stay (h:mm) 1:53

Total Vehicles 2215

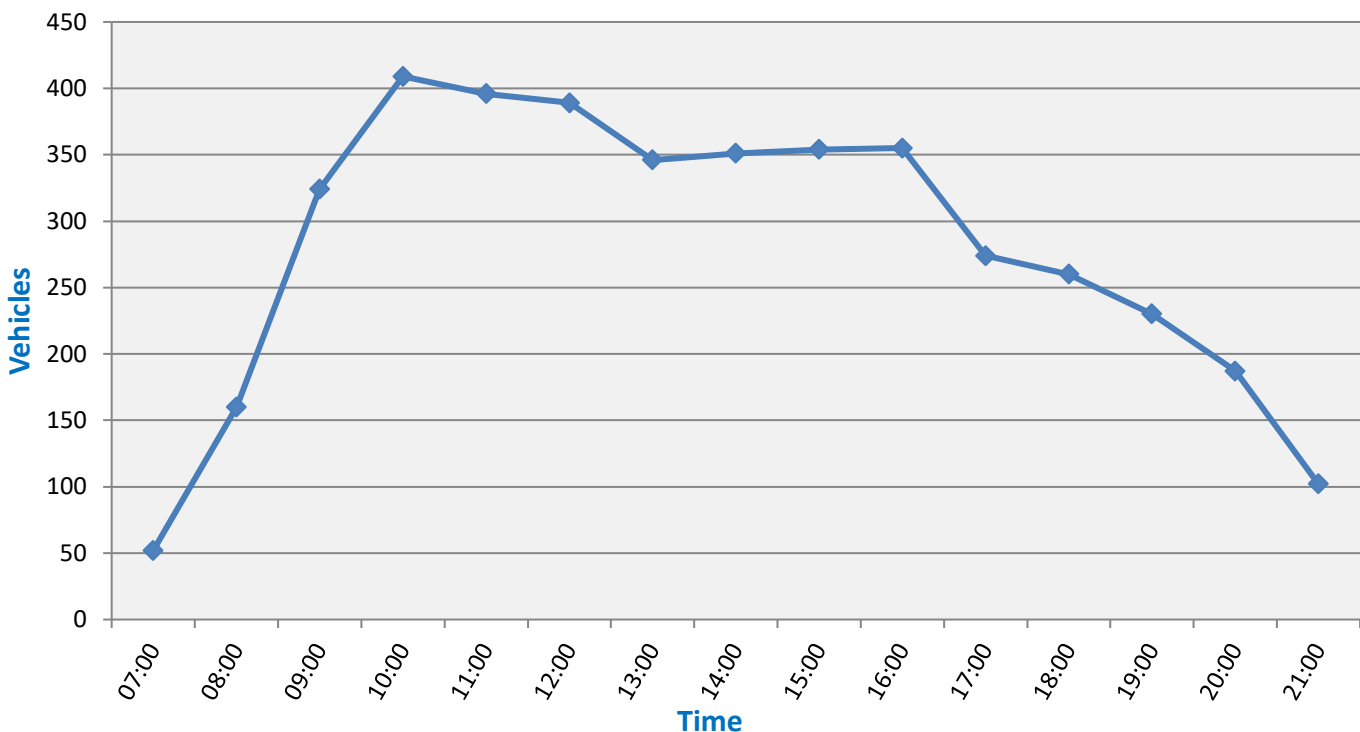
[1hr intervals]

Total	1184	618	211	88	32	33	11	12	15	7	0	4	0	0	0			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	14	21	6	8		2				1						52	52	9%
08:00	40	30	17	9	7	2	3	6	5	2		1				122	160	28%
09:00	89	66	25	15	6	8	3	3	7	3						225	324	56%
10:00	118	58	15	2	1	5	4	2	1	1		3				210	409	71%
11:00	113	54	14	4	3	7			1							196	396	69%
12:00	115	47	20	4	6	5			1							198	389	67%
13:00	101	43	15	4	1			1								165	346	60%
14:00	113	39	16	6	2	1										177	351	61%
15:00	109	59	17	8		1	1									195	354	61%
16:00	114	53	13	2	1	2										185	355	61%
17:00	74	46	9	4	5											138	274	47%
18:00	71	37	23	22												153	260	45%
19:00	58	35	21													114	230	40%
20:00	37	30														67	187	32%
21:00	18															18	102	18%

Duration of Stay



Parking Accumulation



Client Cardno

Location **Area F&G - Total

Date Saturday, 9th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area F&G - Total

Total Parking Spaces 296

Time restriction -

Peak Demand 68

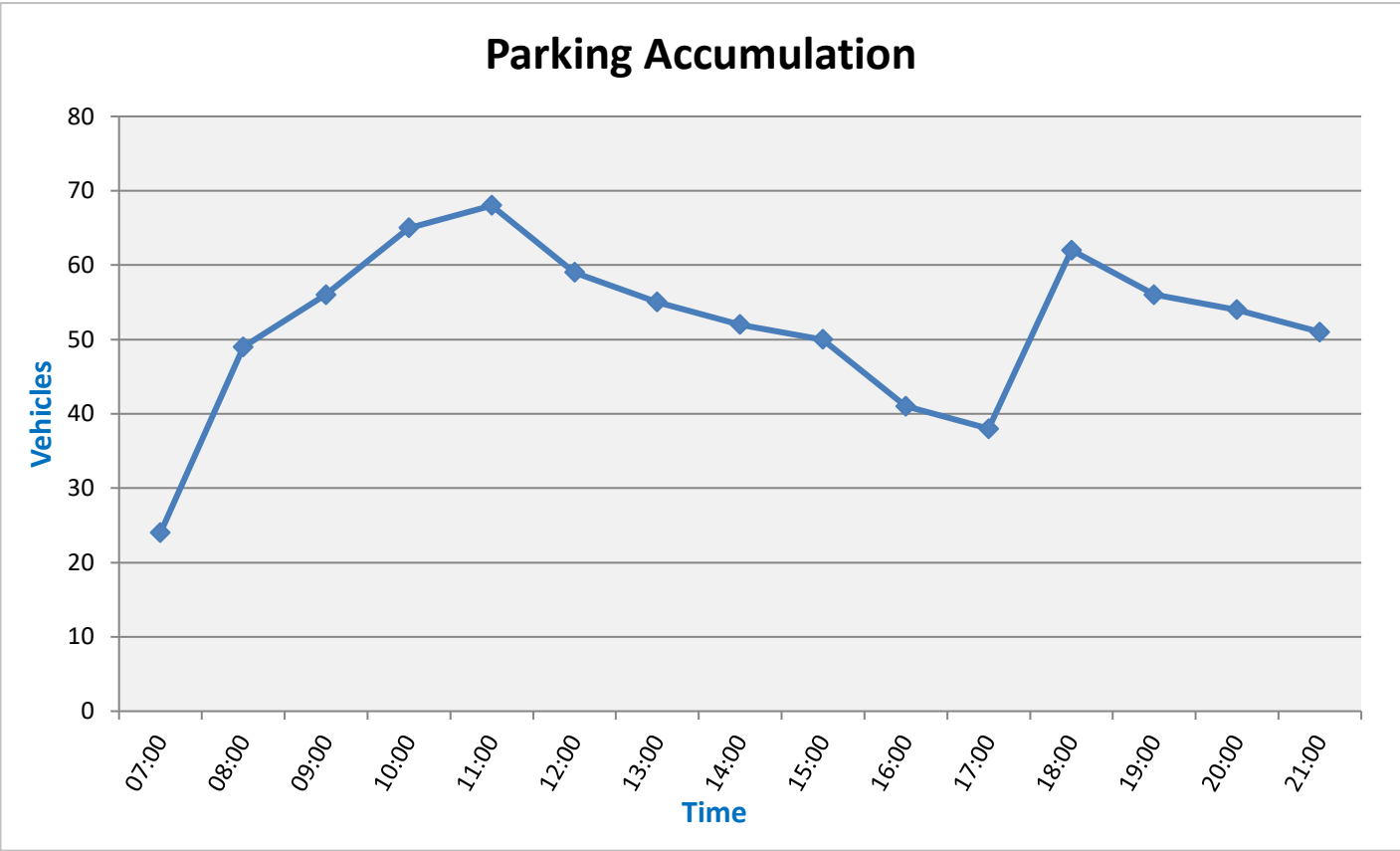
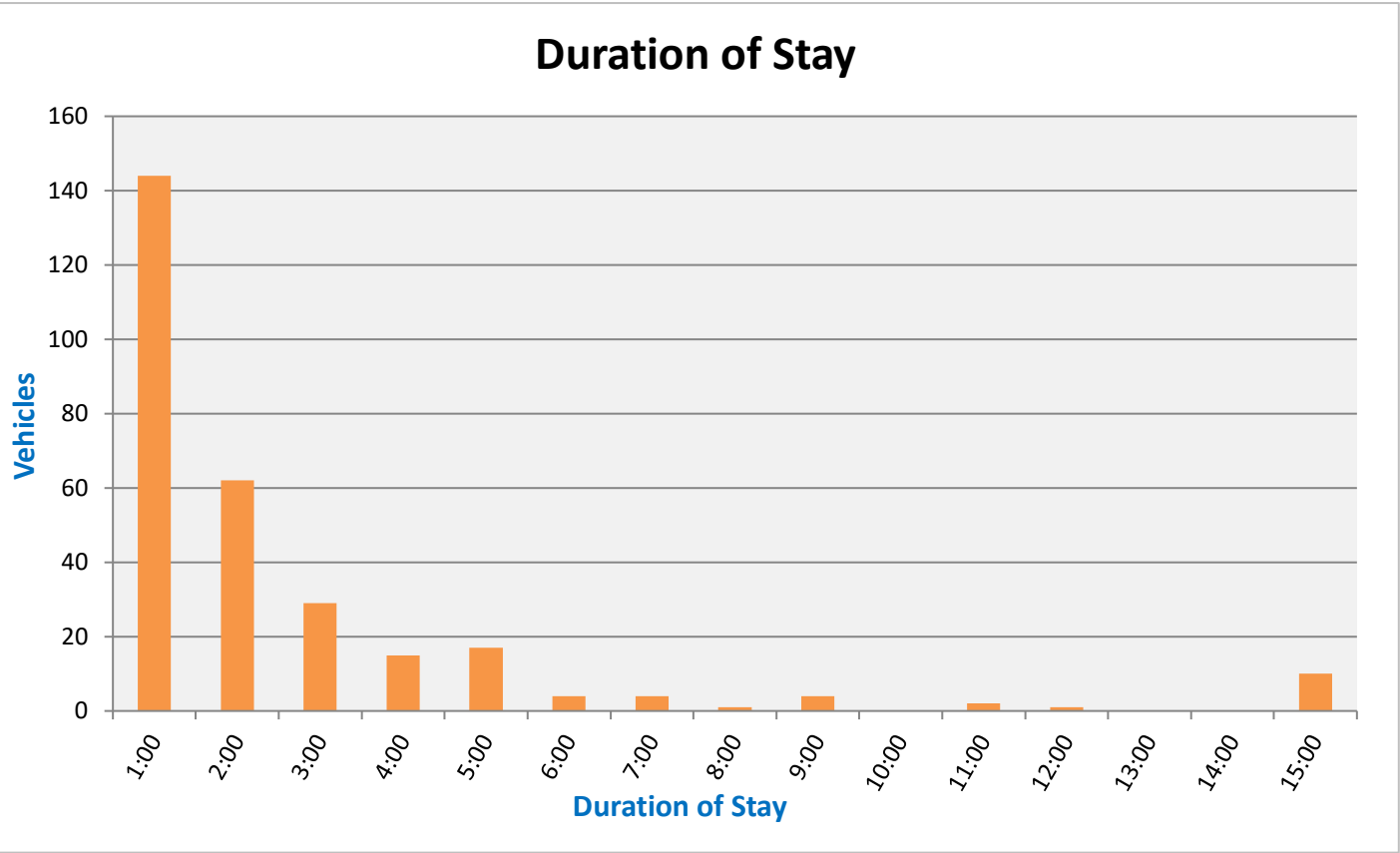
Peak Demand % 23%

Ave Duration of Stay (h:mm) 2:39

Total Vehicles 293

[1hr intervals]

Total	144	62	29	15	17	4	4	1	4	0	2	1	0	0	10			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	4		1	2	2	1		1	2		1				10	24	24	8%
08:00	13	2	4	3	6	1										29	49	17%
09:00	7	7	3	2	1											20	56	19%
10:00	12	3	2				1					1				19	65	22%
11:00	16	7	2		1	1					1					28	68	23%
12:00	11	5	1	1												18	59	20%
13:00	15	6	1				1		2							25	55	19%
14:00	10	7	3	1												21	52	18%
15:00	7	5	1		1		2									16	50	17%
16:00	6	2			1	1										10	41	14%
17:00	5	1	1	1	5											13	38	13%
18:00	24	4	1	5												34	62	21%
19:00	6	4	9													19	56	19%
20:00	2	9														11	54	18%
21:00	6															6	51	17%



Client Cardno

Location **Area H - Total

Date Saturday, 9th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area H - Total

Total Parking Spaces 51

Time restriction -

Peak Demand 10

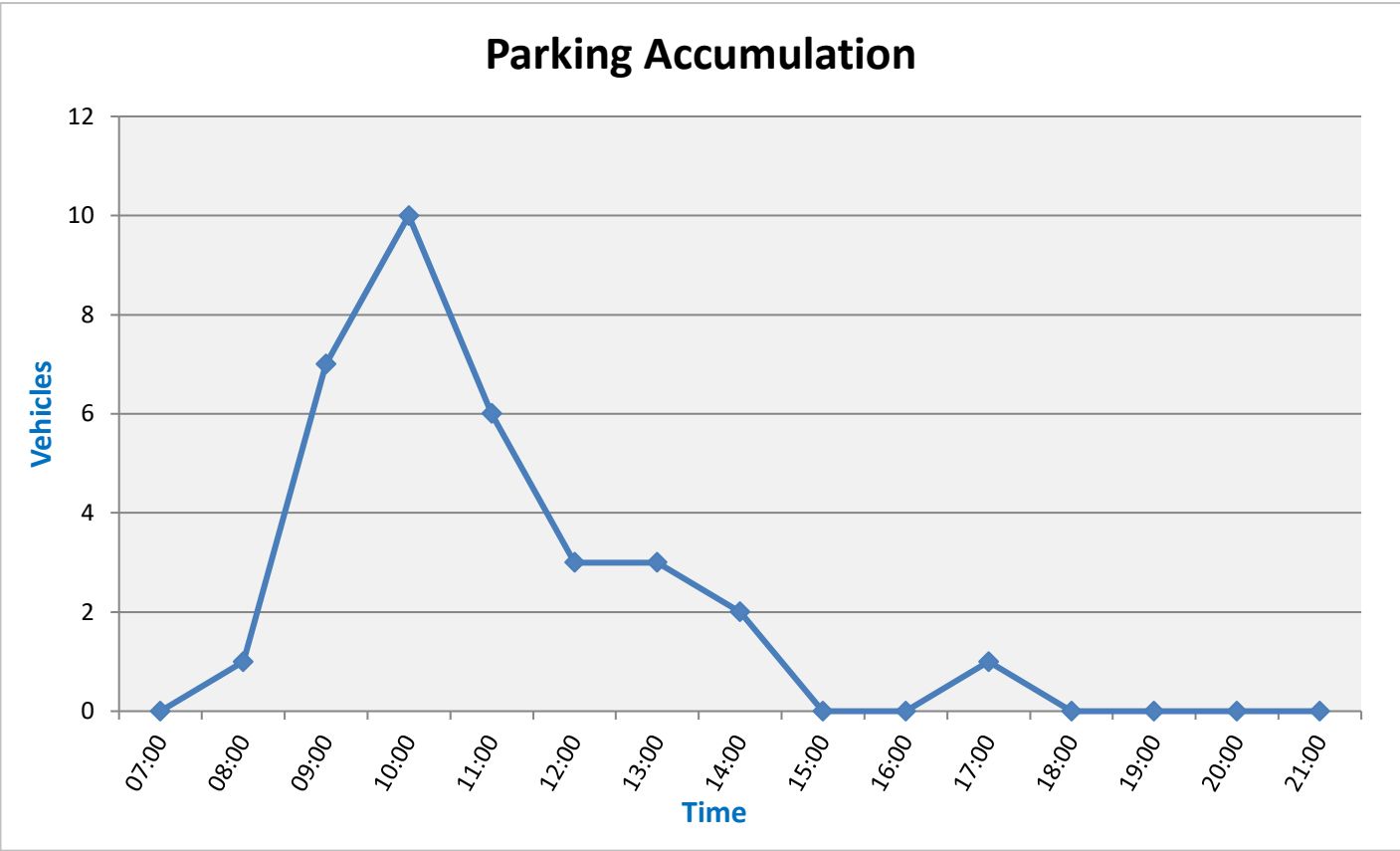
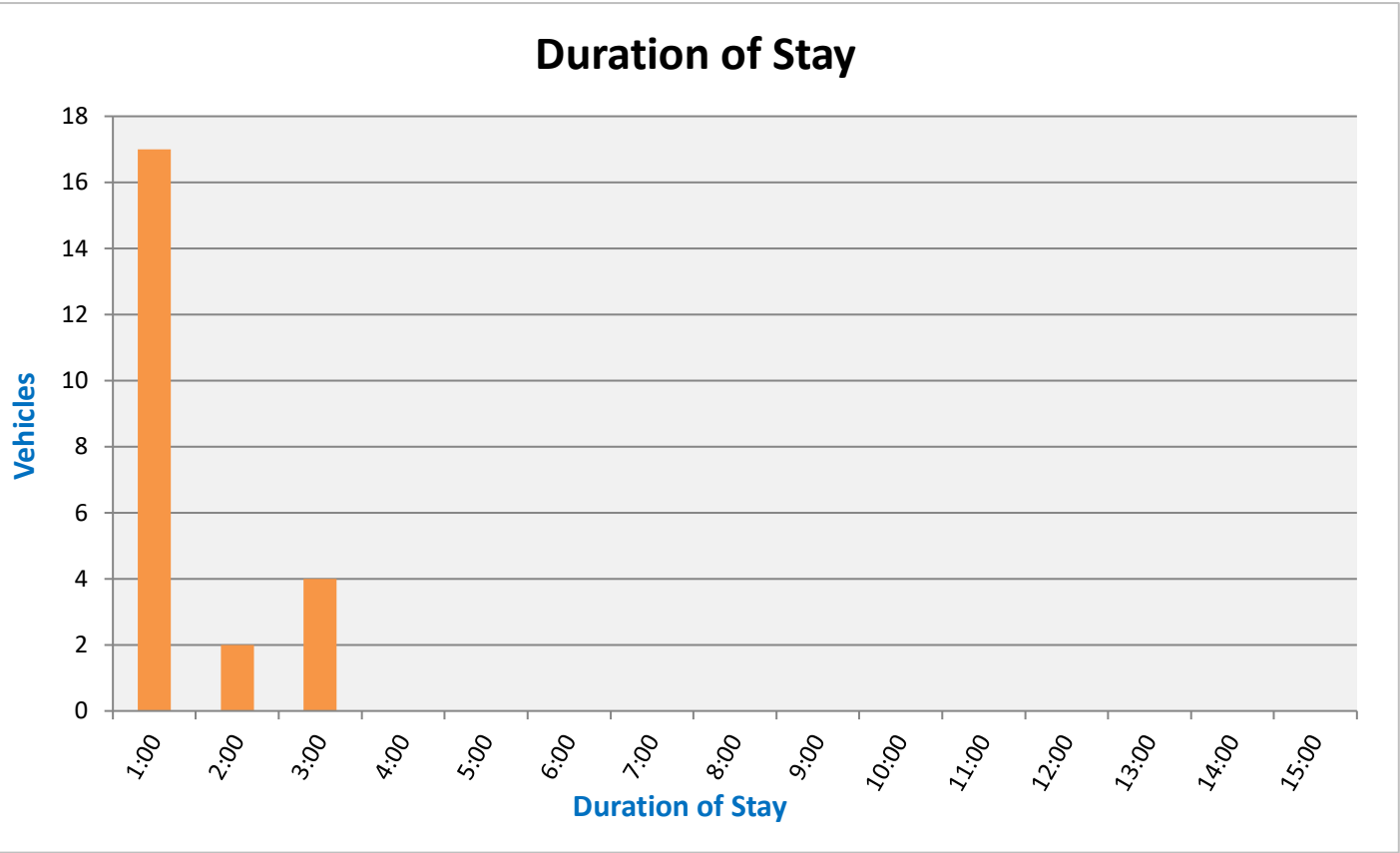
Peak Demand % 20%

Ave Duration of Stay (h:mm) 1:26

Total Vehicles 23

[1hr intervals]

Total	17	2	4	0	0	0	0	0	0	0	0	0	0	0	0			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00																0	0	0%
08:00	1															1	1	2%
09:00	5		2													7	7	14%
10:00	6		2													8	10	20%
11:00	2															2	6	12%
12:00		1														1	3	6%
13:00	1	1														2	3	6%
14:00	1															1	2	4%
15:00																0	0	0%
16:00																0	0	0%
17:00	1															1	1	2%
18:00																0	0	0%
19:00																0	0	0%
20:00																0	0	0%
21:00																0	0	0%



Client Cardno

Location **Area I - Total

Date Saturday, 9th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area I - Total

Total Parking Spaces 50

Time restriction -

Peak Demand 22

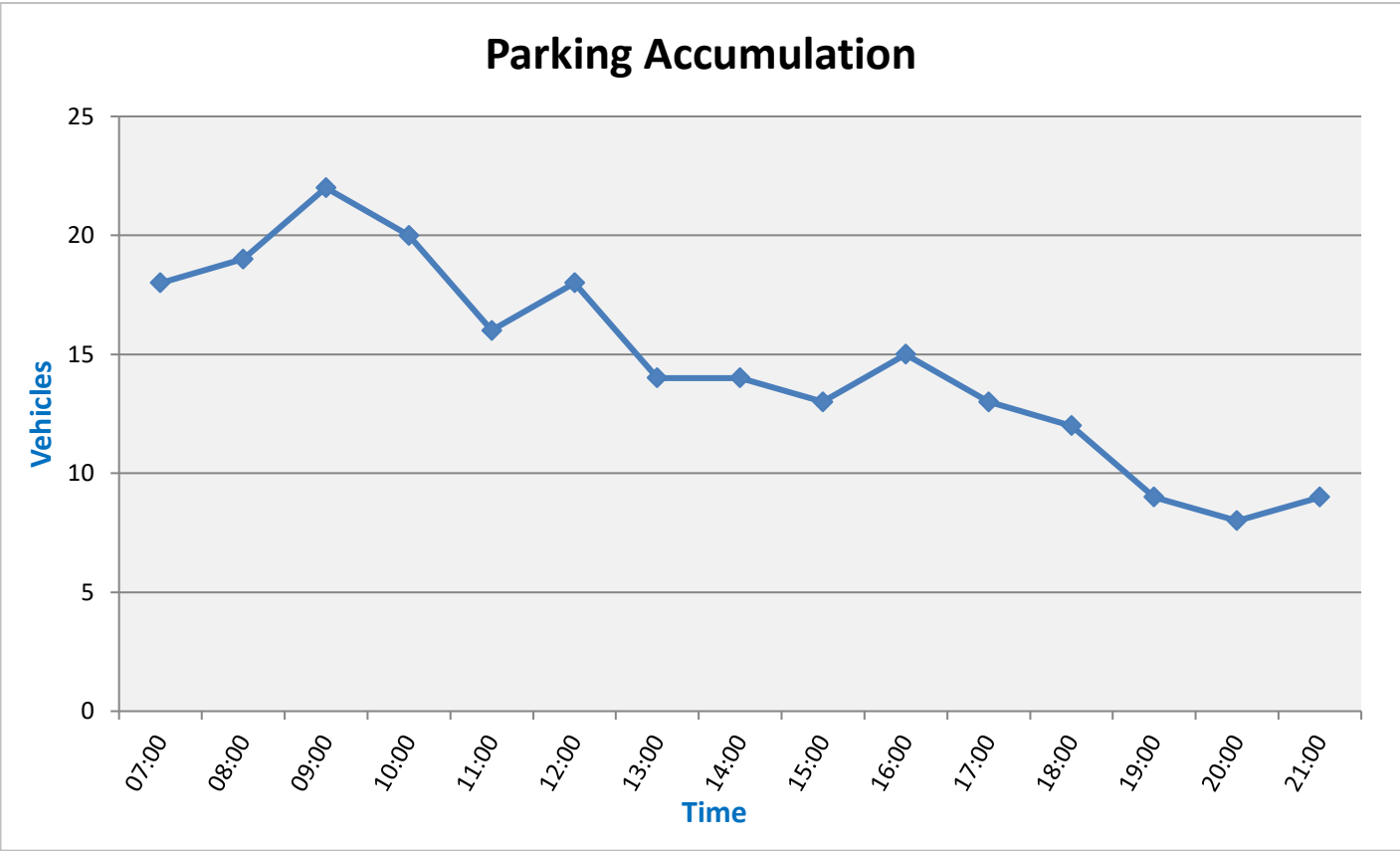
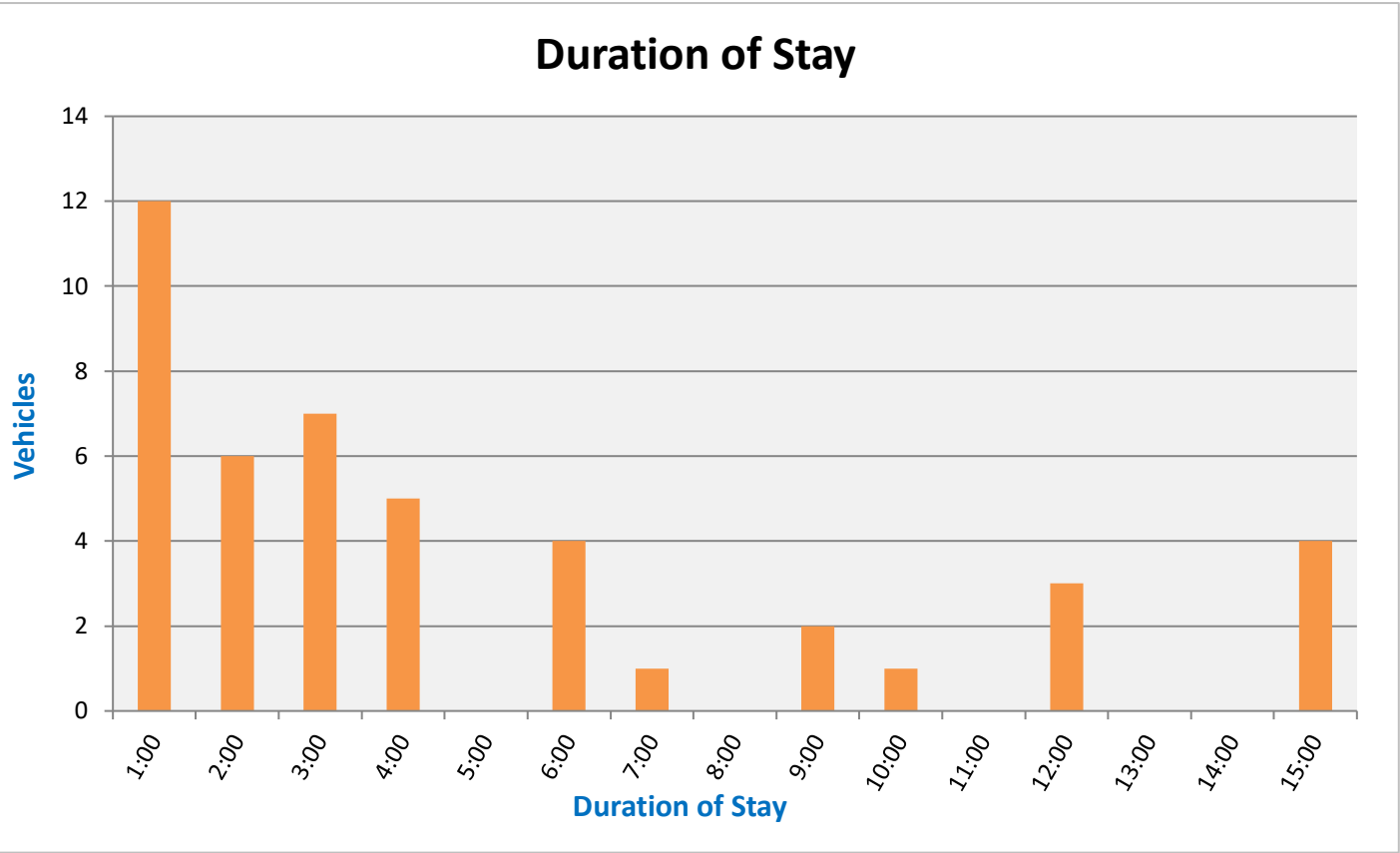
Peak Demand % 44%

Ave Duration of Stay (h:mm) 4:53

Total Vehicles 45

[1hr intervals]

Total	12	6	7	5	0	4	1	0	2	1	0	3	0	0	4			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	3		2	2		4	1					2			4	18	18	36%
08:00		1	3													4	19	38%
09:00	2								1							3	22	44%
10:00	2											1				3	20	40%
11:00		1	1	1												3	16	32%
12:00	1									1						2	18	36%
13:00				1					1							2	14	28%
14:00		2														2	14	28%
15:00																0	13	26%
16:00	2	1	1													4	15	30%
17:00		1														1	13	26%
18:00				1												1	12	24%
19:00	1															1	9	18%
20:00																0	8	16%
21:00	1															1	9	18%



ClientCardno

Location

**Area J - Total

DateSaturday, 9th September 2017 (7:00-21:00)

DescriptionGreensborough Parking Survey



Site**Area J - Total

Total Parking Spaces225

Time restriction-

Peak Demand87

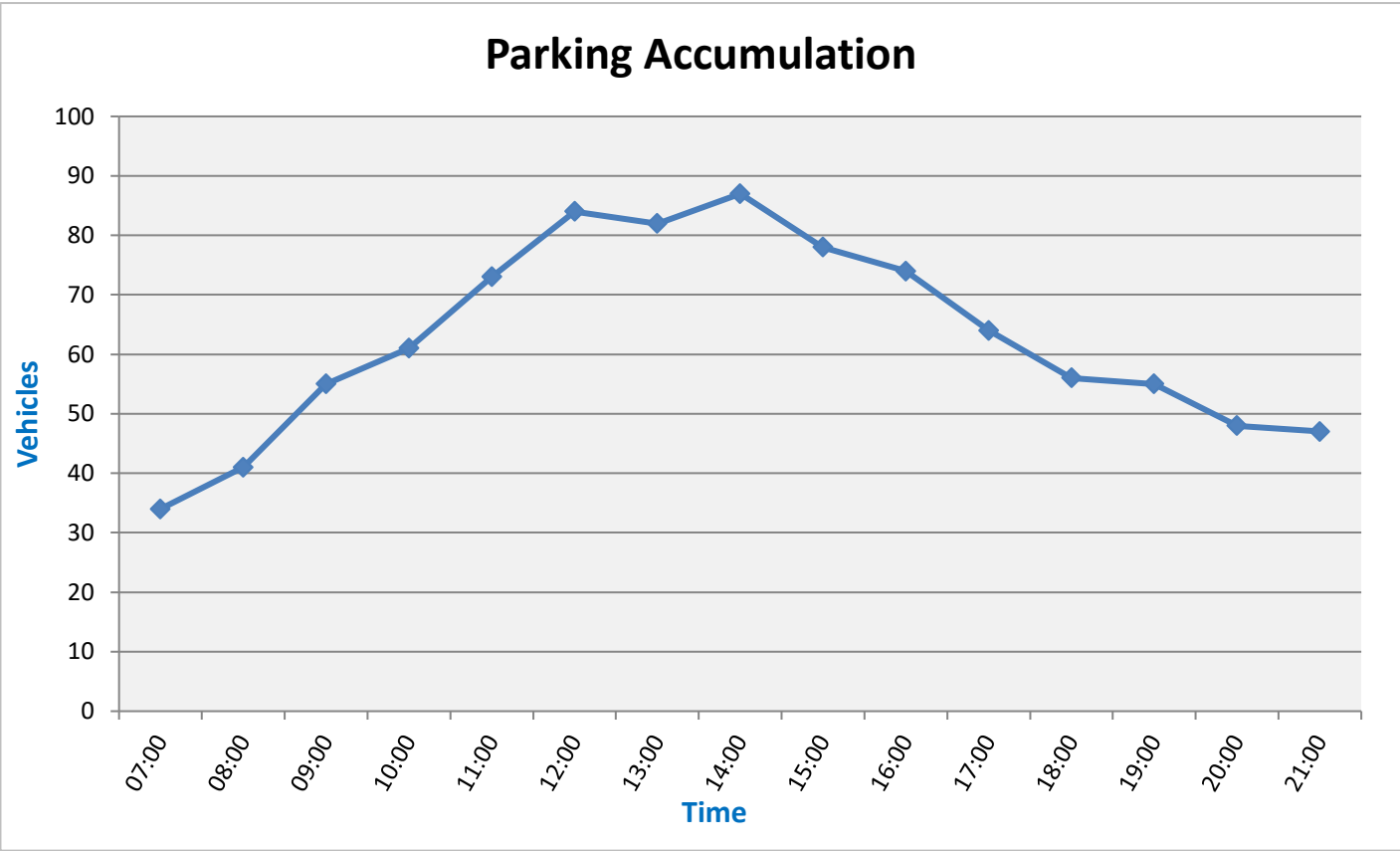
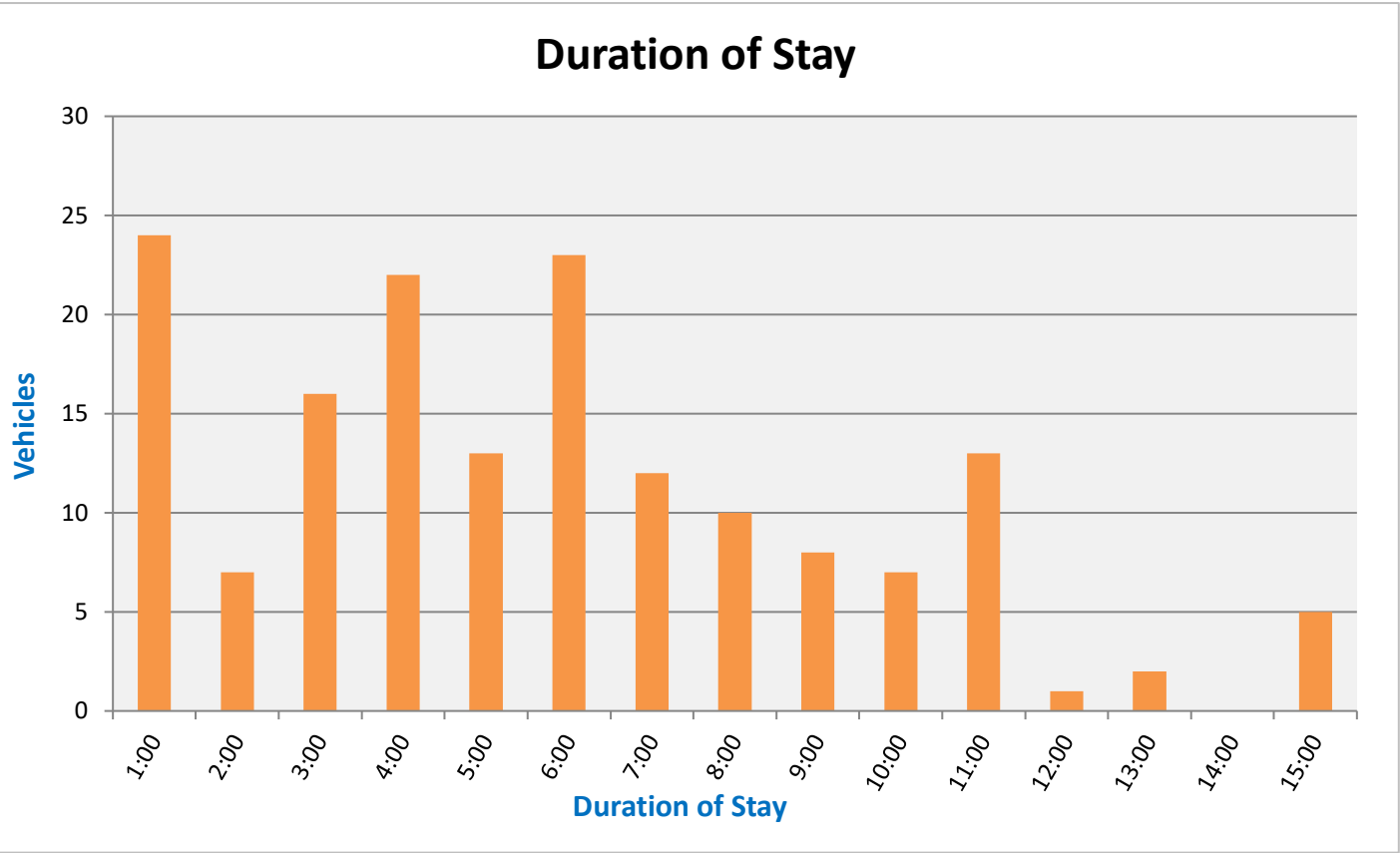
Peak Demand %39%

Ave Duration of Stay (h:mm)5:45

Total Vehicles163

[1hr intervals]

Total	24	7	16	22	13	23	12	10	8	7	13	1	2	0	5			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00		1	1	3	1	4	2	4	3	3	6		1		5	34	34	15%
08:00	1							1		1	2	1	1			7	41	18%
09:00	1		2		2	3	3	2	2	1						16	55	24%
10:00	4				1	1		1	1							8	61	27%
11:00	2	2		2	2	3	2			1	5					19	73	32%
12:00	1	1	1	2		6	4			1						16	84	37%
13:00	1			1	1				2							5	82	36%
14:00	5			2	1	1		2								11	87	39%
15:00		2	1		3		1									7	78	35%
16:00	2	1				5										8	74	33%
17:00	1				2											3	64	28%
18:00	1		3	12												16	56	25%
19:00	1		8													9	55	24%
20:00																0	48	21%
21:00	4															4	47	21%



Client Cardno

Location

**Area K - Total

Date **Saturday, 9th September 2017 (7:00-21:00)**

Description Greensborough Parking Survey



Site ****Area K - Total**

Total Parking Spaces 107

Time restriction -

Peak Demand 31

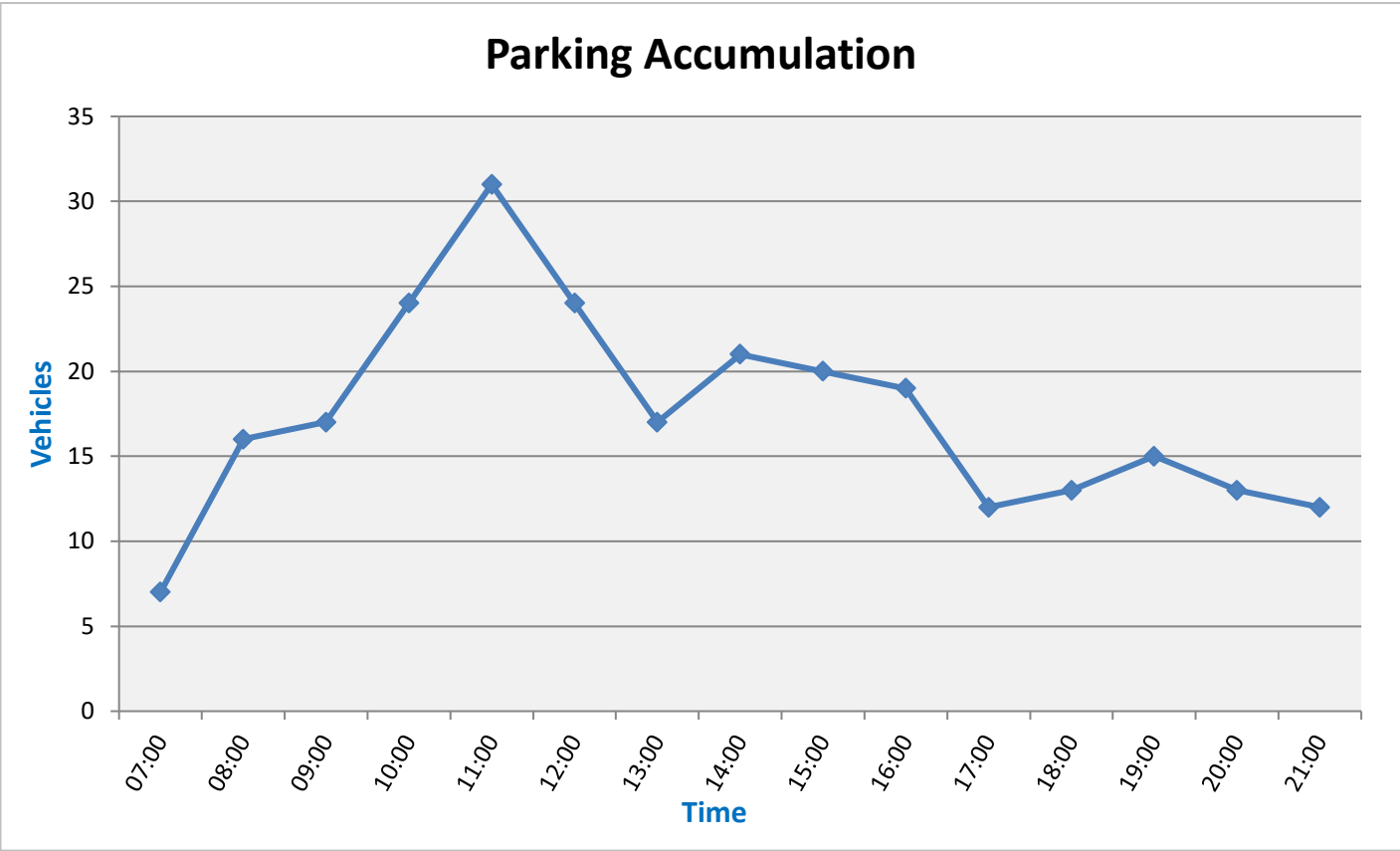
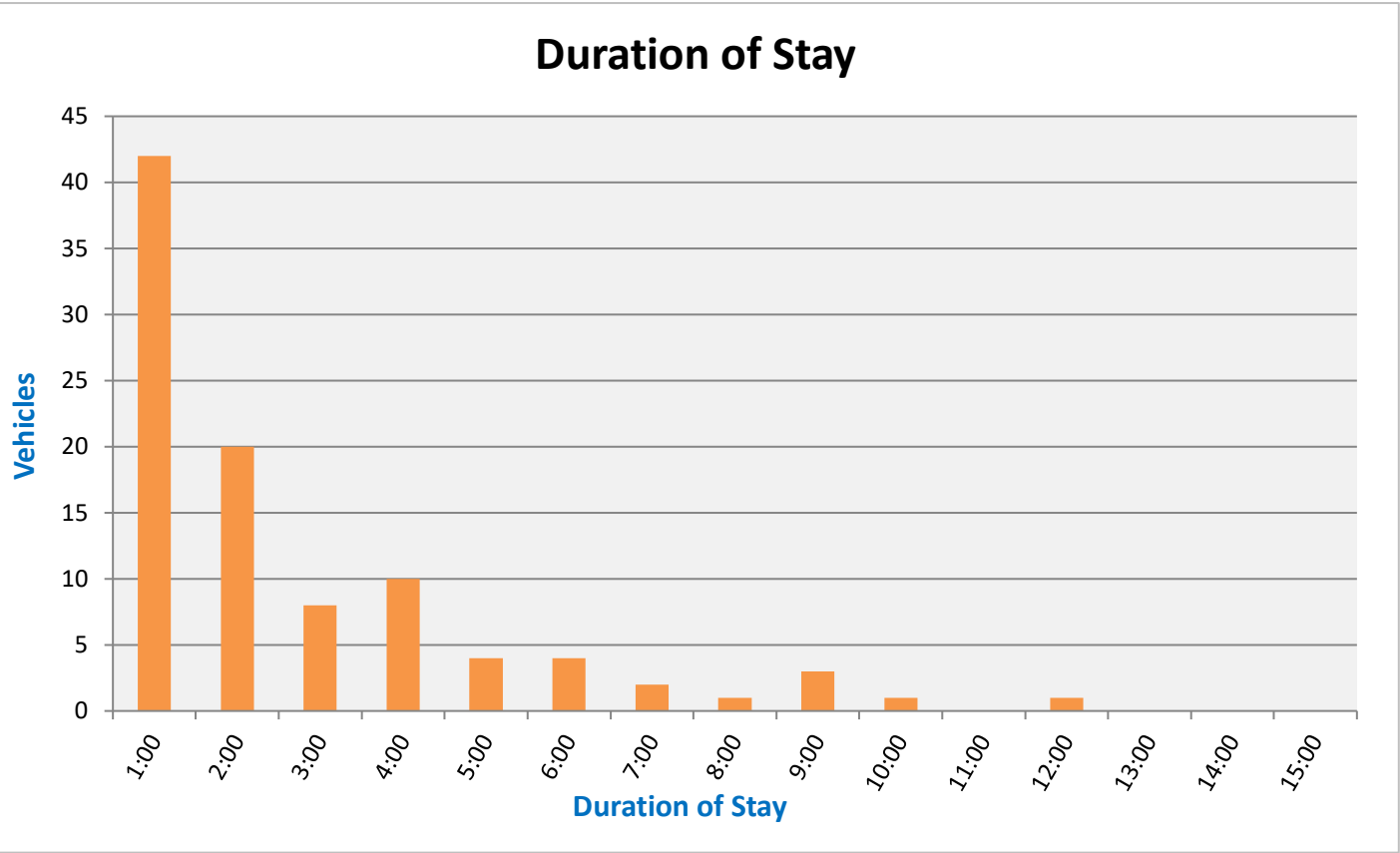
Peak Demand % 29%

Ave Duration of Stay (h:mm) 2:43

Total Vehicles 96

[1hr intervals]

Total	42	20	8	10	4	4	2	1	3	1	0	1	0	0	0			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	3	1			1	1						1				7	7	7%
08:00	5		2	3					2							12	16	15%
09:00	1	3	1	1				1								7	17	16%
10:00	2	3	2							1						8	24	22%
11:00	9	4			1											14	31	29%
12:00	5		1	1	1	2										10	24	22%
13:00	1	1	1	2					1							6	17	16%
14:00	2	1			1		1									5	21	20%
15:00	2						1									3	20	19%
16:00	3			1		1										5	19	18%
17:00	2															2	12	11%
18:00	1	2		2												5	13	12%
19:00	3	1	1													5	15	14%
20:00	1	4														5	13	12%
21:00	2															2	12	11%



Client Cardno

Location **Area L - Total

Date Saturday, 9th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area L - Total

Total Parking Spaces 117

Time restriction -

Peak Demand 89

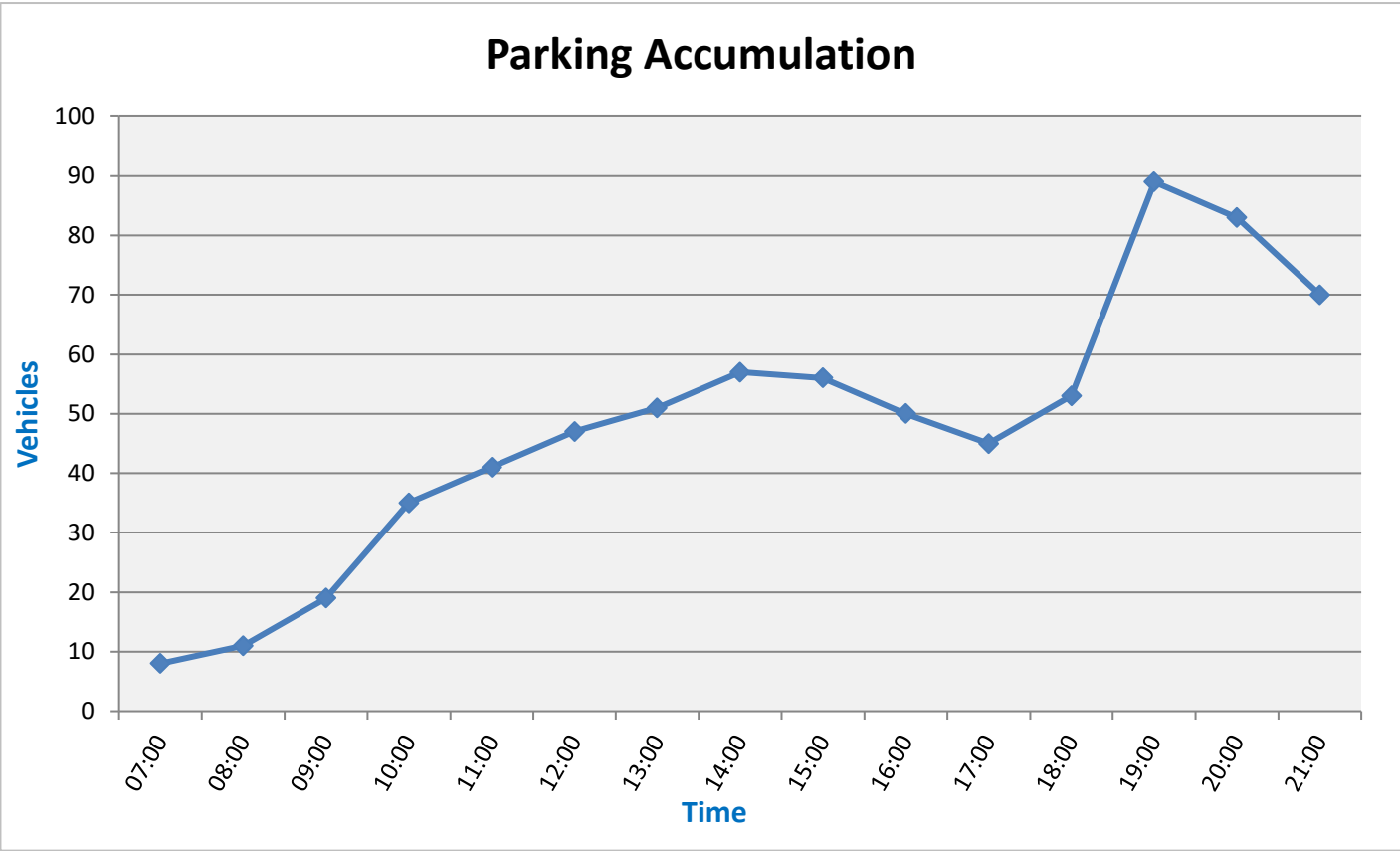
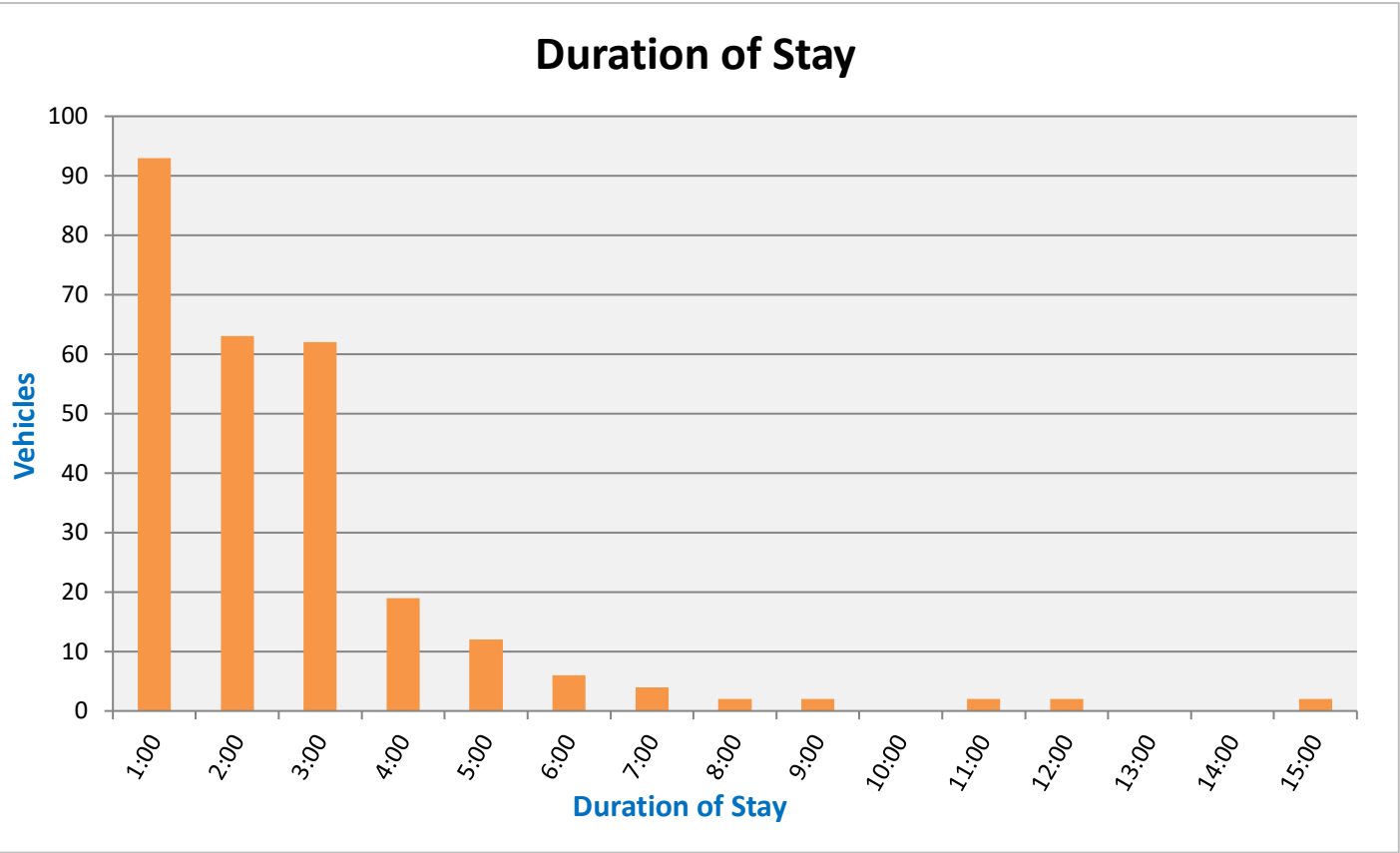
Peak Demand % 76%

Ave Duration of Stay (h:mm) 2:39

Total Vehicles 269

[1hr intervals]

Total	93	63	62	19	12	6	4	2	2	0	2	2	0	0	2			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00			1	2		1					2				2	8	8	7%
08:00			1	1	1											3	11	9%
09:00		3		5												8	19	16%
10:00	8		2			2	1	2				2				17	35	30%
11:00	10	4	2	2	2											20	41	35%
12:00	13	1		1	2											17	47	40%
13:00	11	8	4	3	1		1		2							30	51	44%
14:00	6	12	2													20	57	49%
15:00	8	1	1	1	2		2									15	56	48%
16:00	13	5	2			3										23	50	43%
17:00	3	6	3	1	4											17	45	38%
18:00	7	6	6	3												22	53	45%
19:00	4	10	38													52	89	76%
20:00	3	7														10	83	71%
21:00	7															7	70	60%



Client Cardno

Location **Area L1 - Total

Date Saturday, 9th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area L1 - Total

Total Parking Spaces 32

Time restriction -

Peak Demand 30

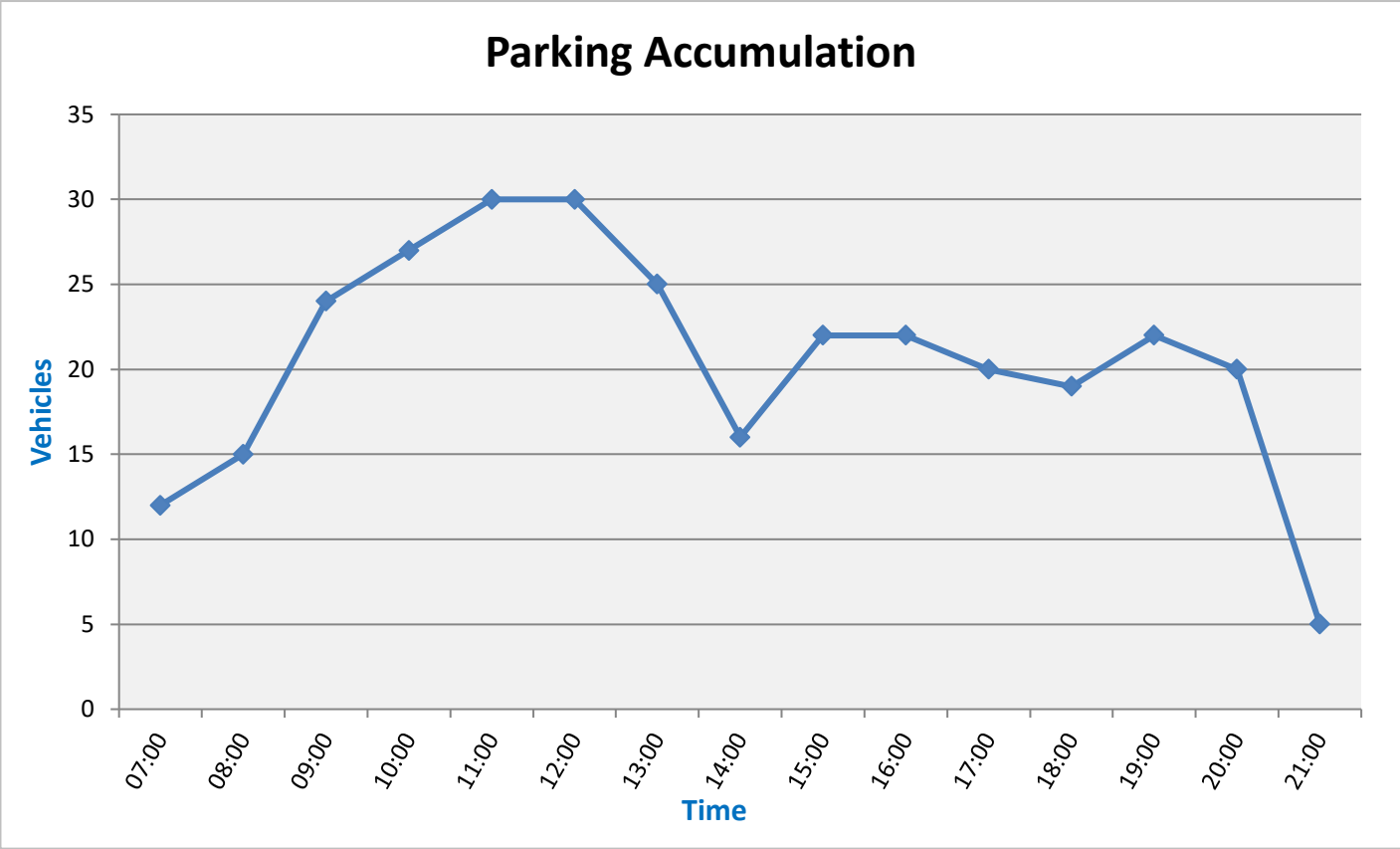
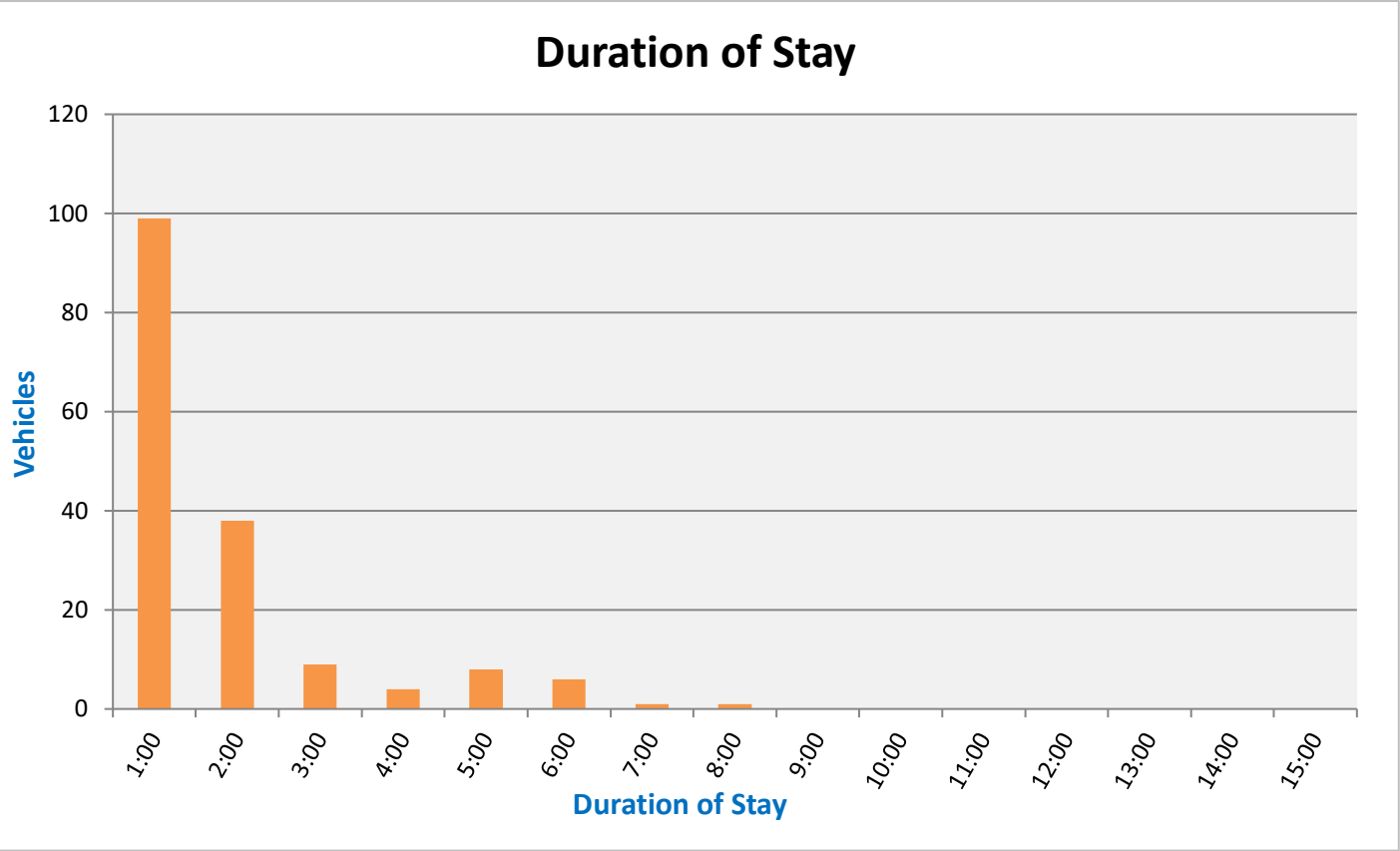
Peak Demand % 94%

Ave Duration of Stay (h:mm) 1:51

Total Vehicles 166

[1hr intervals]

Total	99	38	9	4	8	6	1	1	0	0	0	0	0	0	0			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00			4	1	3	4										12	12	38%
08:00	2	1														3	15	47%
09:00	6	3		2												11	24	75%
10:00	13				1											14	27	84%
11:00	9	9	2													20	30	94%
12:00	11	1														12	30	94%
13:00	17	1	2			1										21	25	78%
14:00	5	3			1		1	1								11	16	50%
15:00	6	4	1	1		1										13	22	69%
16:00	9	1			1											11	22	69%
17:00	8	1			2											11	20	63%
18:00	3	6														9	19	59%
19:00	4	6														10	22	69%
20:00	6	2														8	20	63%
21:00																0	5	16%



Greensborough Parking Survey

Zone B

Saturday, 9th September 2017

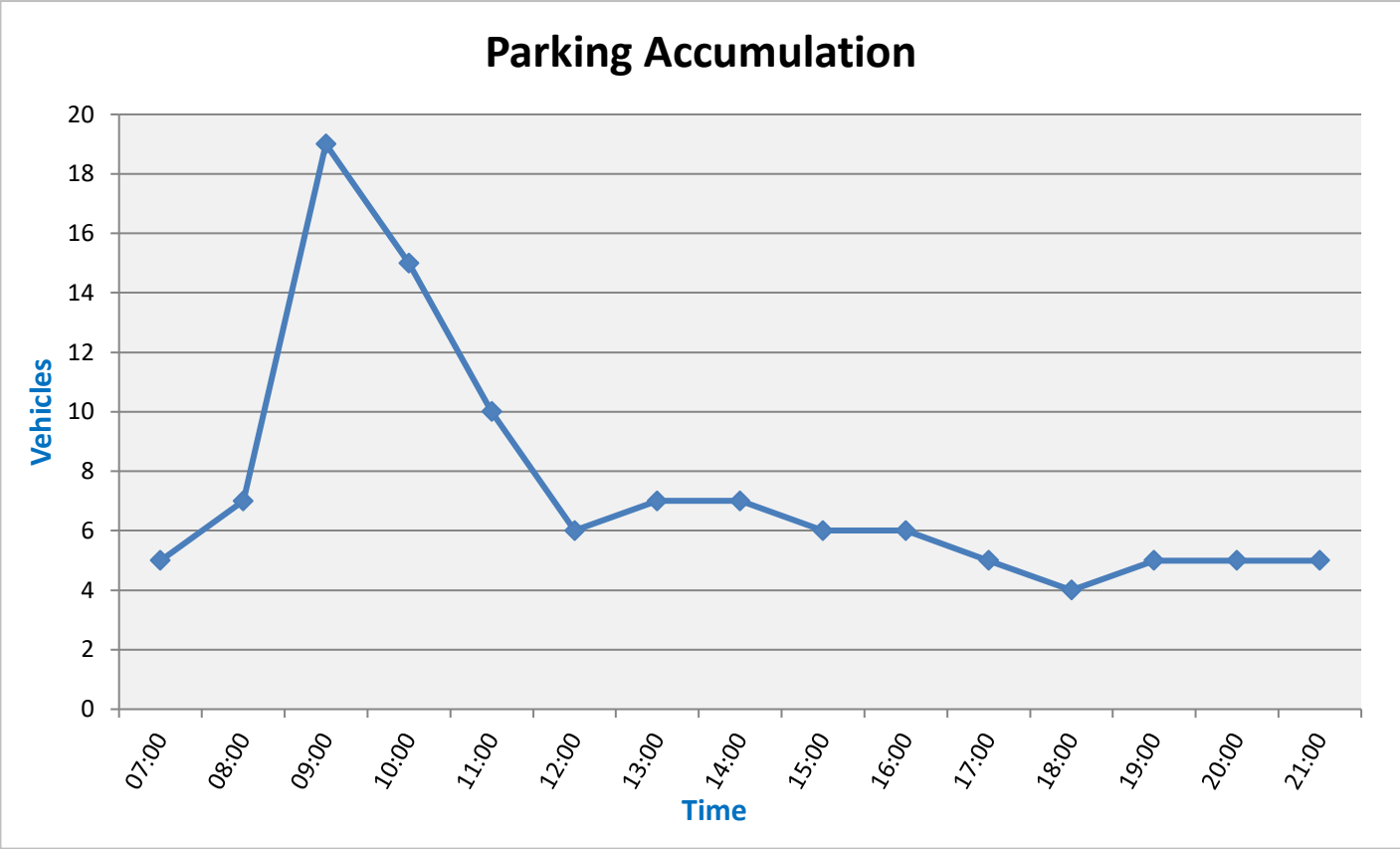
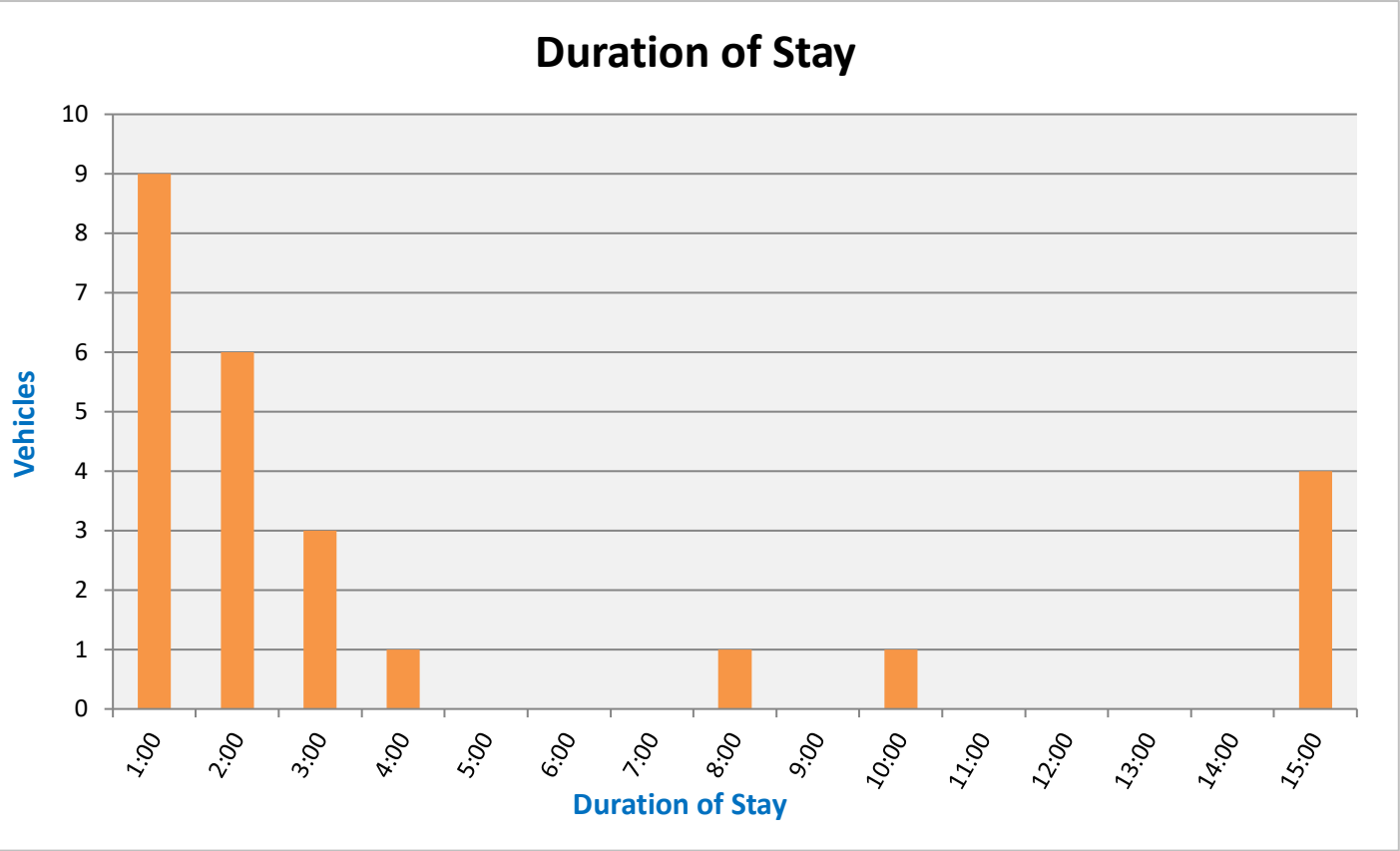
Client Cardno
Location **Area B - Total
Date Saturday, 9th September 2017 (7:00-21:00)
Description Greensborough Parking Survey



Site **Area B - Total
Total Parking Spaces 25
Time restriction -
Peak Demand 19
Peak Demand % 76%
Ave Duration of Stay (h:mm) 4:28
Total Vehicles 25

[1hr intervals]

Total	9	6	3	1	0	0	0	1	0	1	0	0	0	0	4			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00										1					4	5	5	20%
08:00		1		1												2	7	28%
09:00	7	3	2													12	19	76%
10:00	2	1						1								4	15	60%
11:00																0	10	40%
12:00																0	6	24%
13:00		1														1	7	28%
14:00																0	7	28%
15:00																0	6	24%
16:00																0	6	24%
17:00																0	5	20%
18:00																0	4	16%
19:00			1													1	5	20%
20:00																0	5	20%
21:00																0	5	20%



Client Cardno

Location **Area M - Total

Date Saturday, 9th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area M - Total

Total Parking Spaces 419

Time restriction -

Peak Demand 103

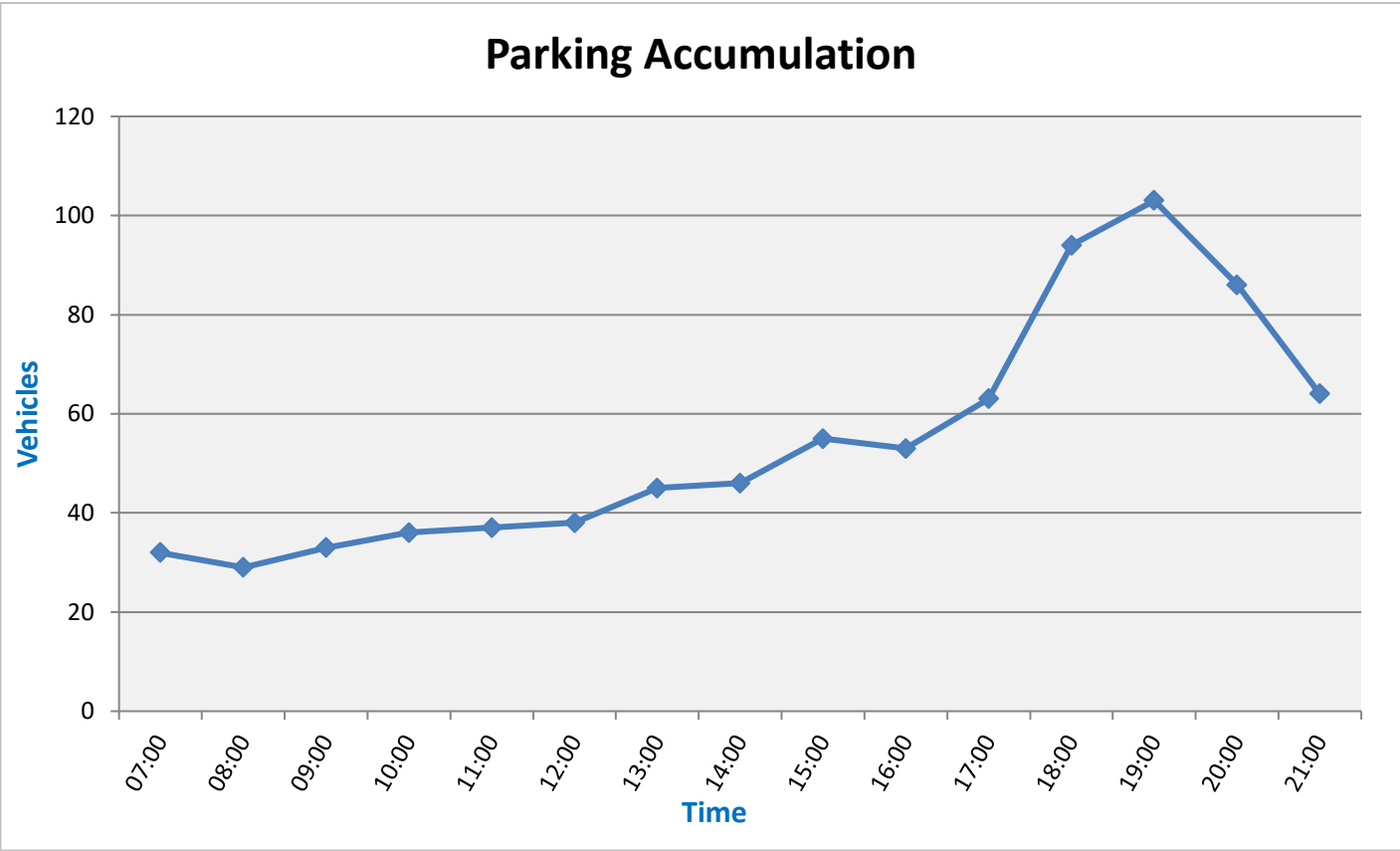
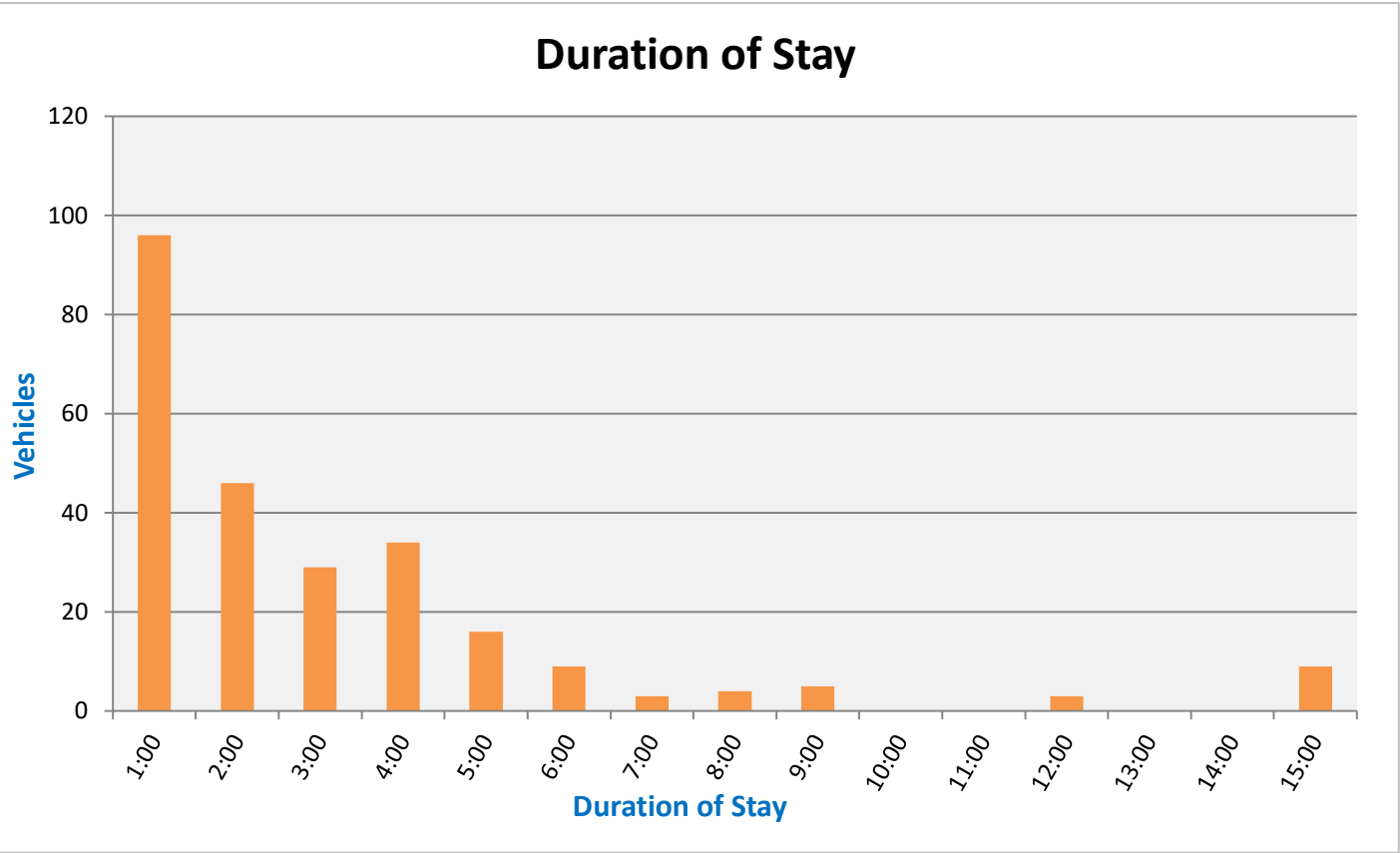
Peak Demand % 25%

Ave Duration of Stay (h:mm) 3:12

Total Vehicles 254

[1hr intervals]

Total	96	46	29	34	16	9	3	4	5	0	0	3	0	0	9			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	4	3	3	5	3	2	2					1			9	32	32	8%
08:00	1															1	29	7%
09:00	3	2	2				1									8	33	8%
10:00	3	1	1	1	1							2				9	36	9%
11:00	5	2	1		2	1										11	37	9%
12:00	3		4	1	2	1		1								12	38	9%
13:00	5	1	1	1	1	1			5							15	45	11%
14:00	4	1		2				3								10	46	11%
15:00	11	5	1	1		1										19	55	13%
16:00	7	4	1			3										15	58	13%
17:00	13		2	4	7											26	63	15%
18:00	4	21	9	19												53	94	22%
19:00	9	4	4													17	103	25%
20:00	14	2														16	86	21%
21:00	10															10	64	15%



Client Cardno

Location **Area N - Total

Date Saturday, 9th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area N - Total

Total Parking Spaces 269

Time restriction -

Peak Demand 54

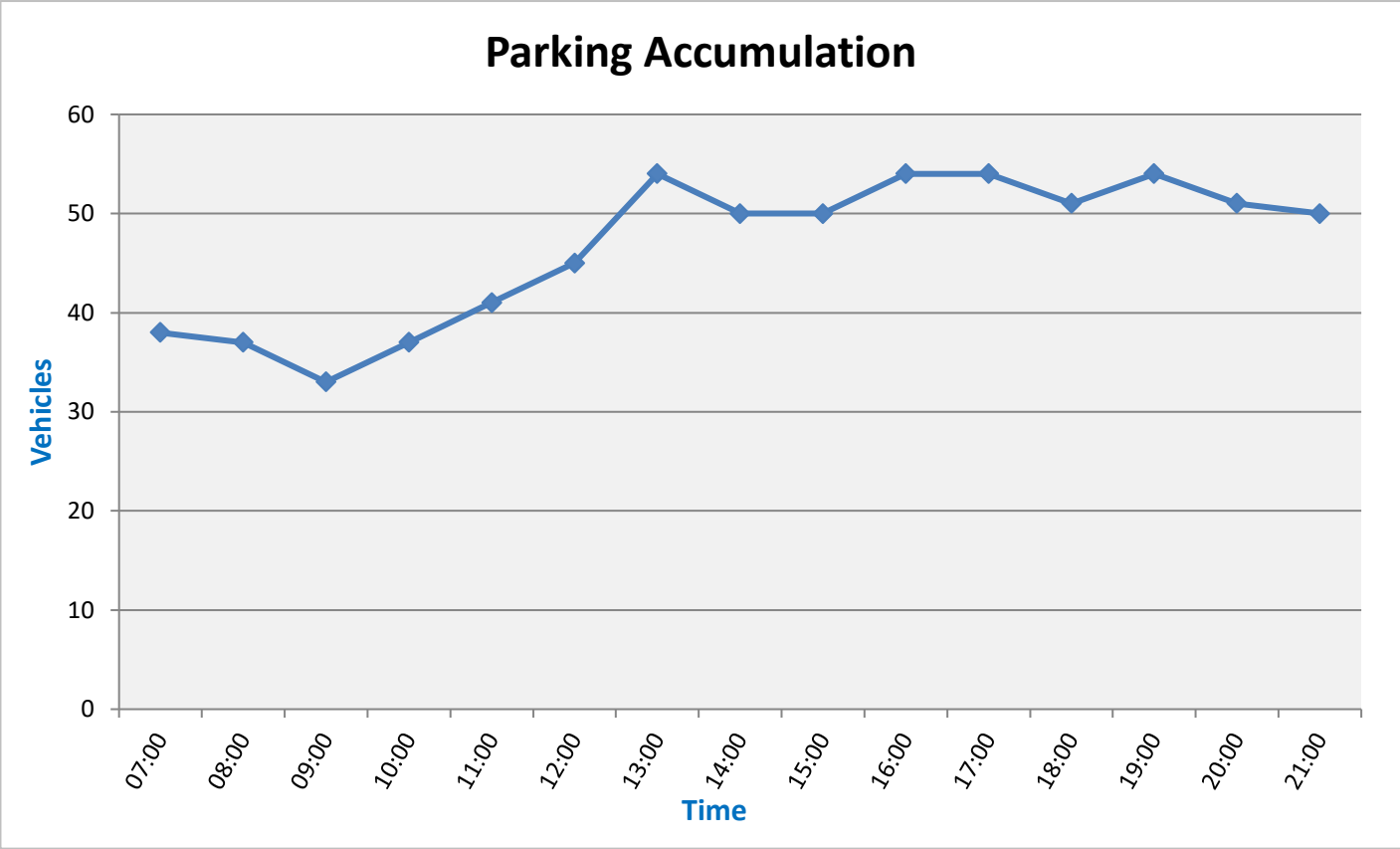
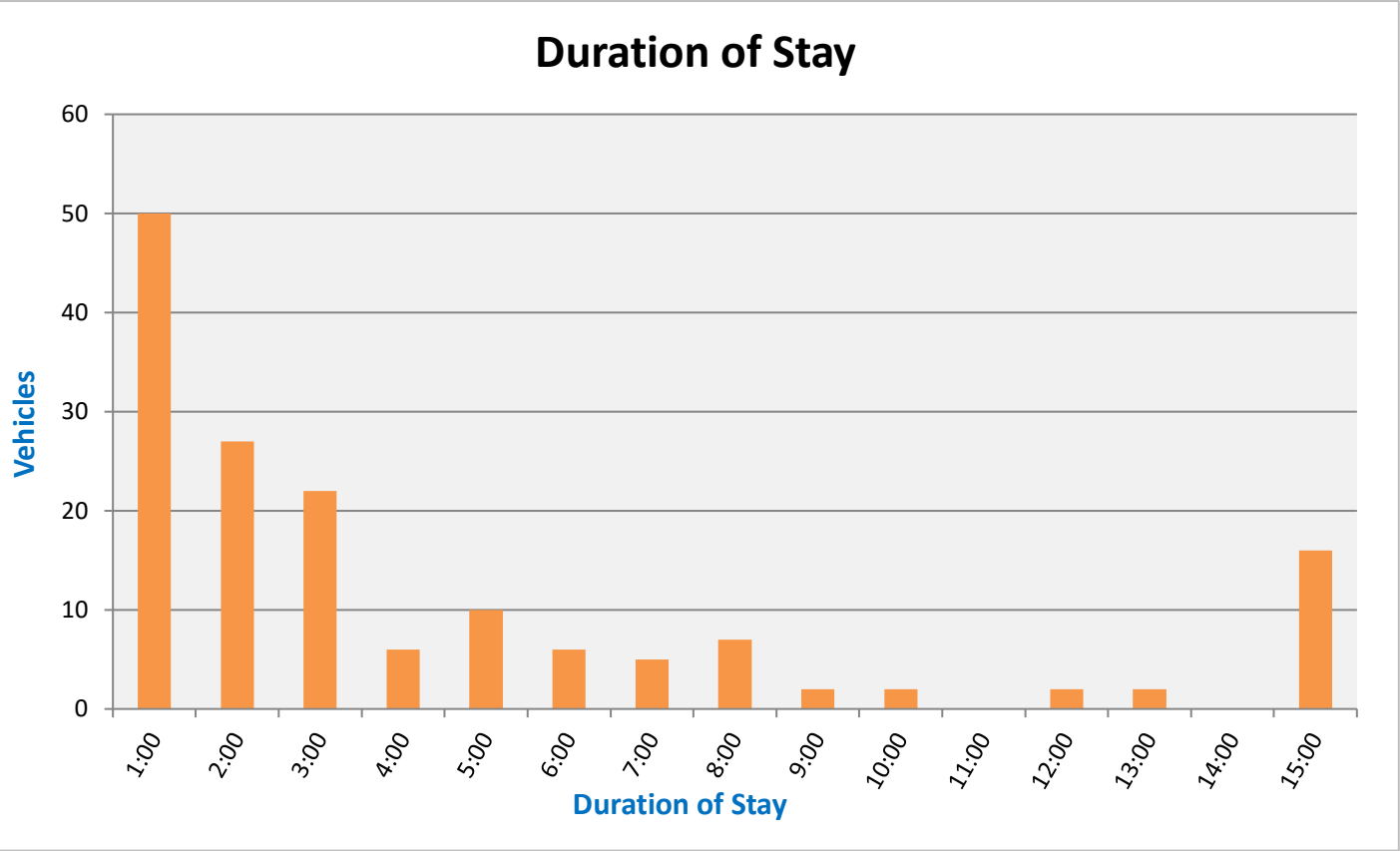
Peak Demand % 20%

Ave Duration of Stay (h:mm) 4:27

Total Vehicles 157

[1hr intervals]

Total	50	27	22	6	10	6	5	7	2	2	0	2	2	0	16			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	4	7	2		3	1		4					1		16	38	38	14%
08:00	1			1				1								3	37	14%
09:00	1	1	1										1			4	33	12%
10:00	2	2					1					2				7	37	14%
11:00	1	2	2			1				1						7	41	15%
12:00	5		3			1	1	1		1						12	45	17%
13:00	10	3	1			1			2							17	54	20%
14:00	3		2	1	1			1								8	50	19%
15:00	3	3	1	2	1		3									13	50	19%
16:00	6		1			2										9	54	20%
17:00	4	2	2		5											13	54	20%
18:00		2		2												4	51	19%
19:00	3	1	7													11	54	20%
20:00	3	4														7	51	19%
21:00	4															4	50	19%



Client Cardno

Location **Area O - Total

Date Saturday, 9th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area O - Total

Total Parking Spaces 218

Time restriction -

Peak Demand 31

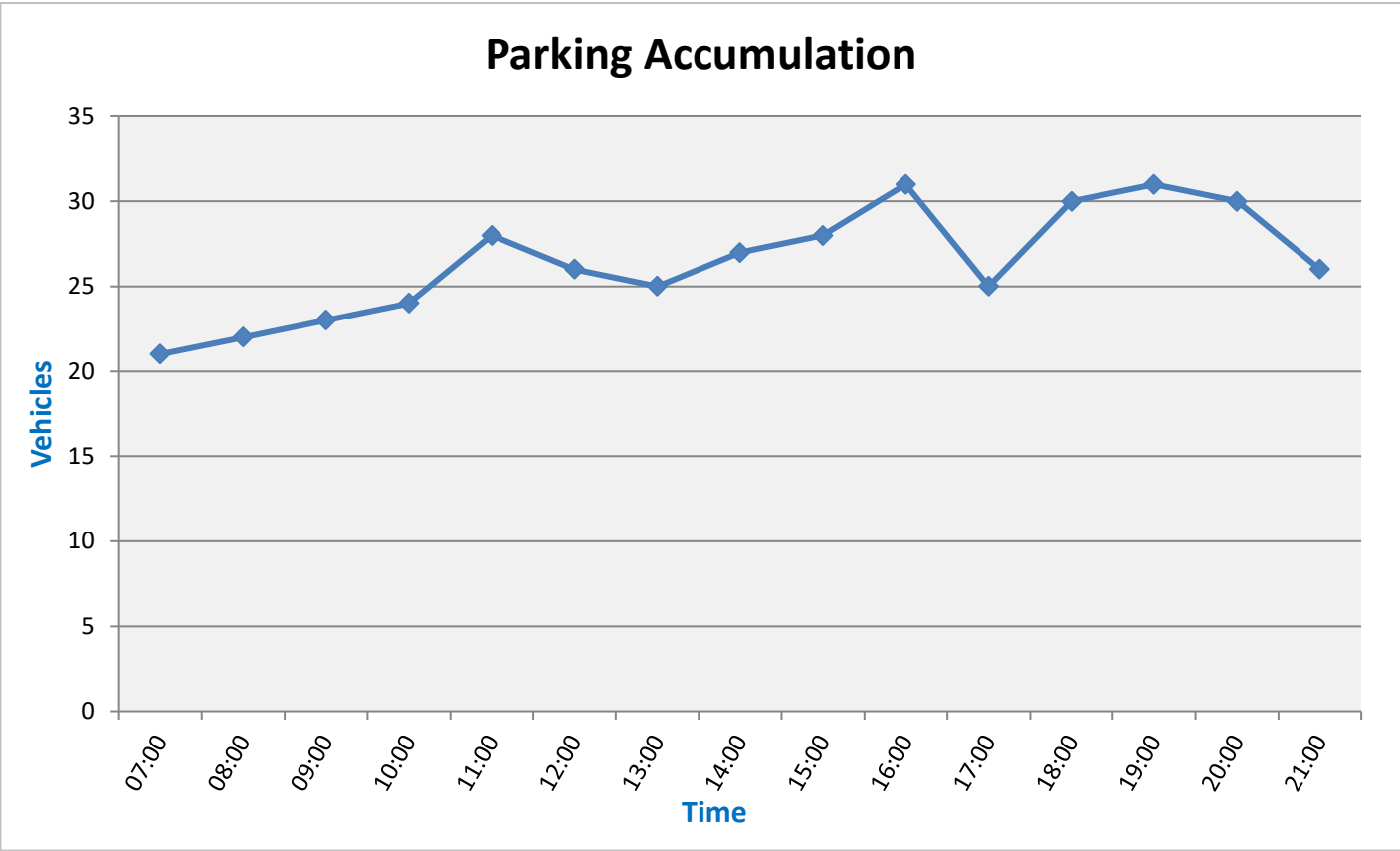
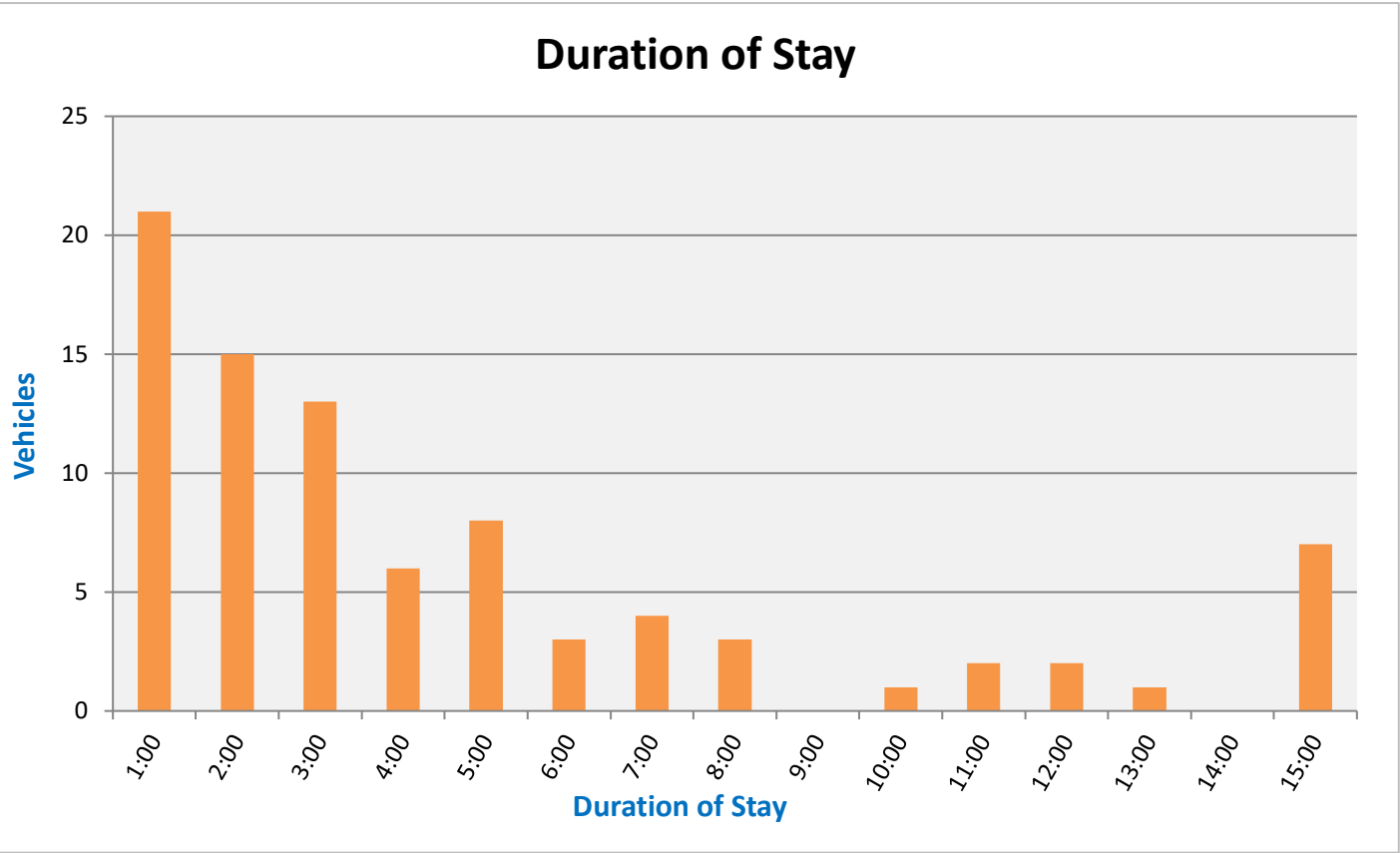
Peak Demand % 14%

Ave Duration of Stay (h:mm) 4:37

Total Vehicles 86

[1hr intervals]

Total	21	15	13	6	8	3	4	3	0	1	2	2	1	0	7			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	1	3	2		4	1		1			1	1			7	21	21	10%
08:00		1			1											2	22	10%
09:00	1	1						1					1			4	23	11%
10:00	2	2										1				5	24	11%
11:00	2	2		1		1					1					7	28	13%
12:00	5				1											6	26	12%
13:00	2	2	1	2						1						8	25	11%
14:00	2				1			1								4	27	12%
15:00		1		1	1		4									7	28	13%
16:00	1		2			1										4	31	14%
17:00	1															1	25	11%
18:00	3	1	1	2												7	30	14%
19:00		2	7													9	31	14%
20:00	1															1	30	14%
21:00																0	26	12%



Client Cardno

Location **Area P - Total

Date Saturday, 9th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area P - Total

Total Parking Spaces 59

Time restriction -

Peak Demand 14

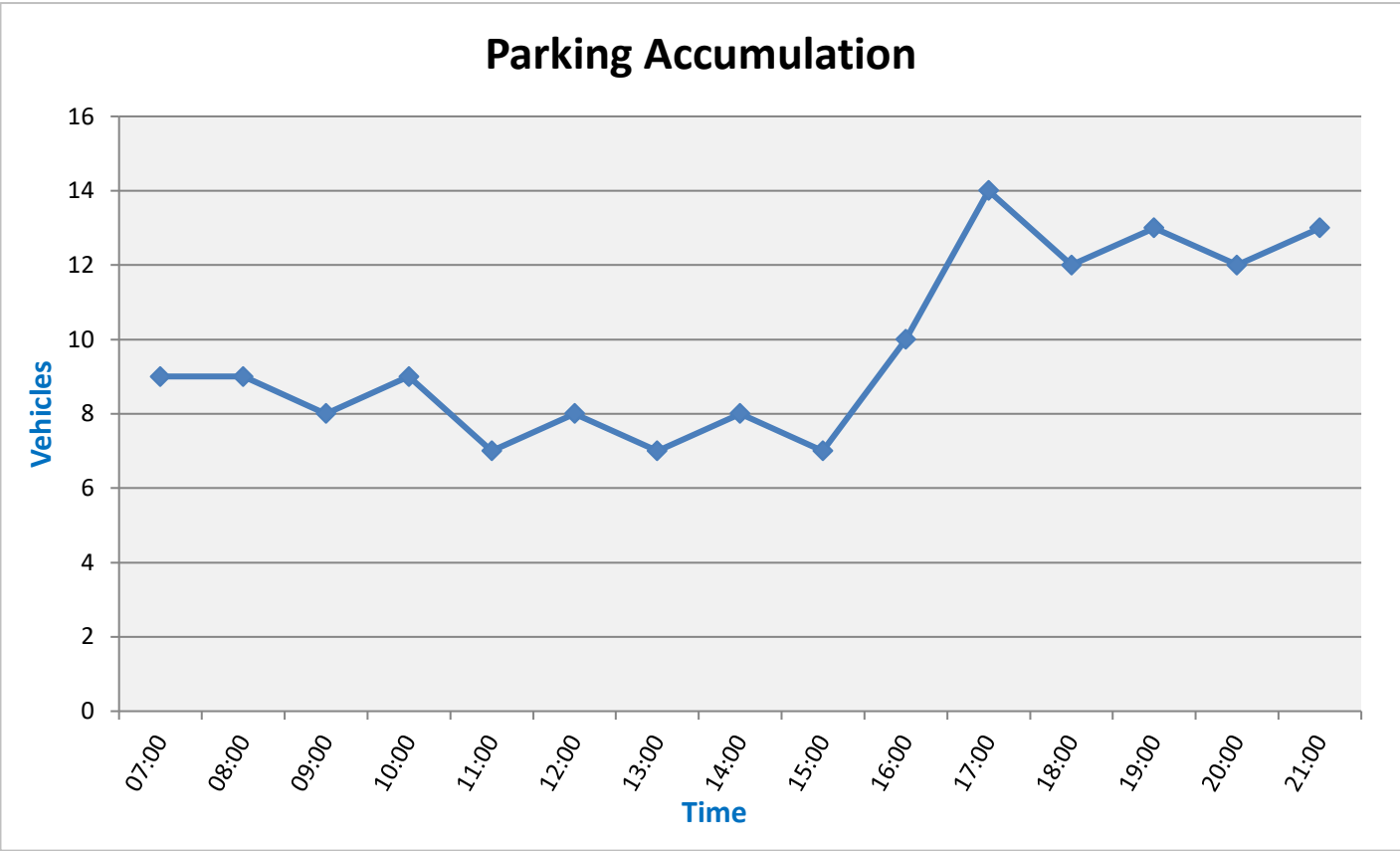
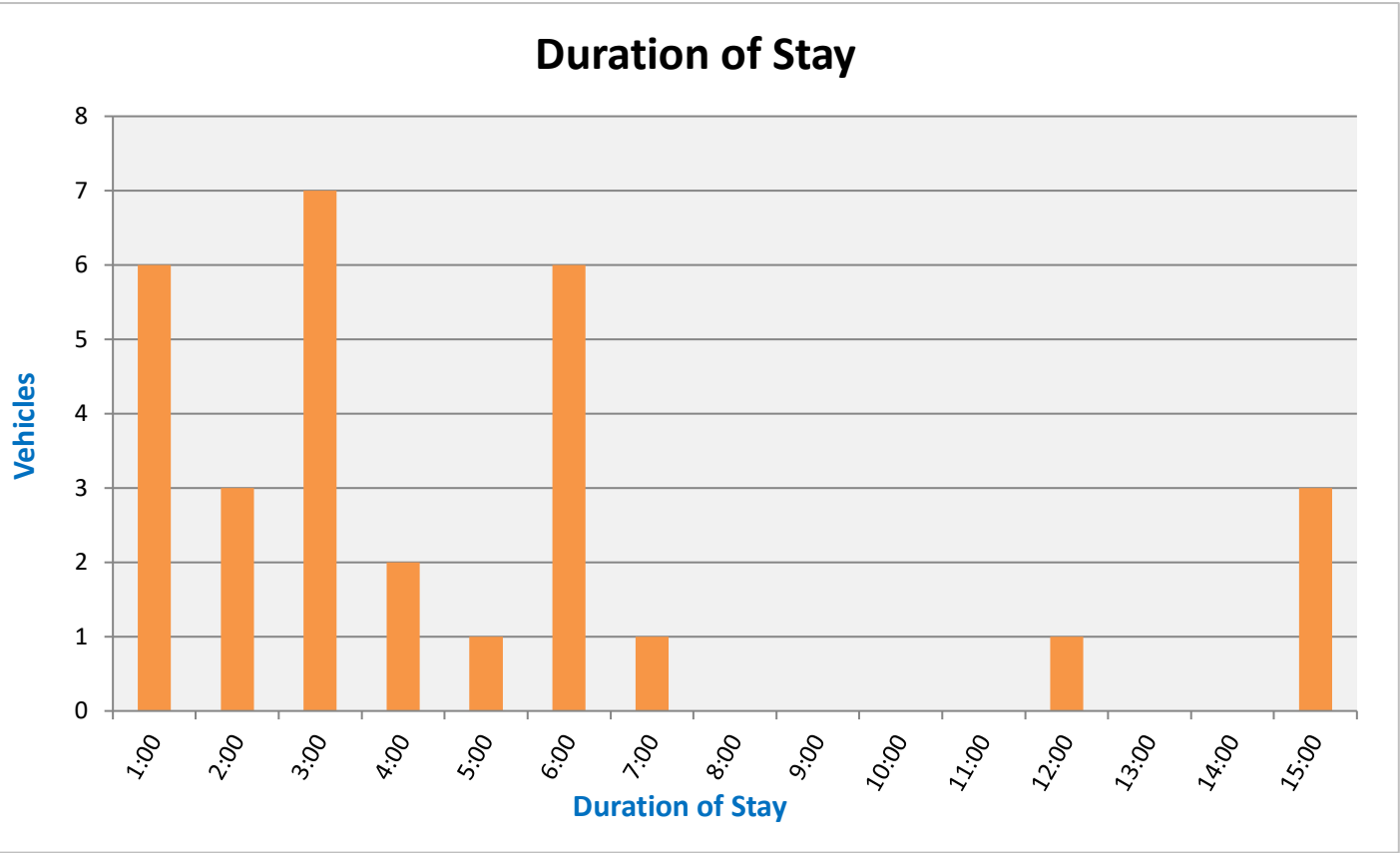
Peak Demand % 24%

Ave Duration of Stay (h:mm) 4:52

Total Vehicles 30

[1hr intervals]

Total	6	3	7	2	1	6	1	0	0	0	0	1	0	0	3			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00		1	1	2		2									3	9	9	15%
08:00																0	9	15%
09:00																0	8	14%
10:00	1											1				2	9	15%
11:00	1															1	7	12%
12:00	1		1													2	8	14%
13:00					1	1										2	7	12%
14:00	1															1	8	14%
15:00							1									1	7	12%
16:00						3										3	10	17%
17:00	1	1	2													4	14	24%
18:00																0	12	20%
19:00			3													3	13	22%
20:00		1														1	12	20%
21:00	1															1	13	22%



Client Cardno

Location **Area R - Total

Date Saturday, 9th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area R - Total

Total Parking Spaces 351

Time restriction -

Peak Demand 56

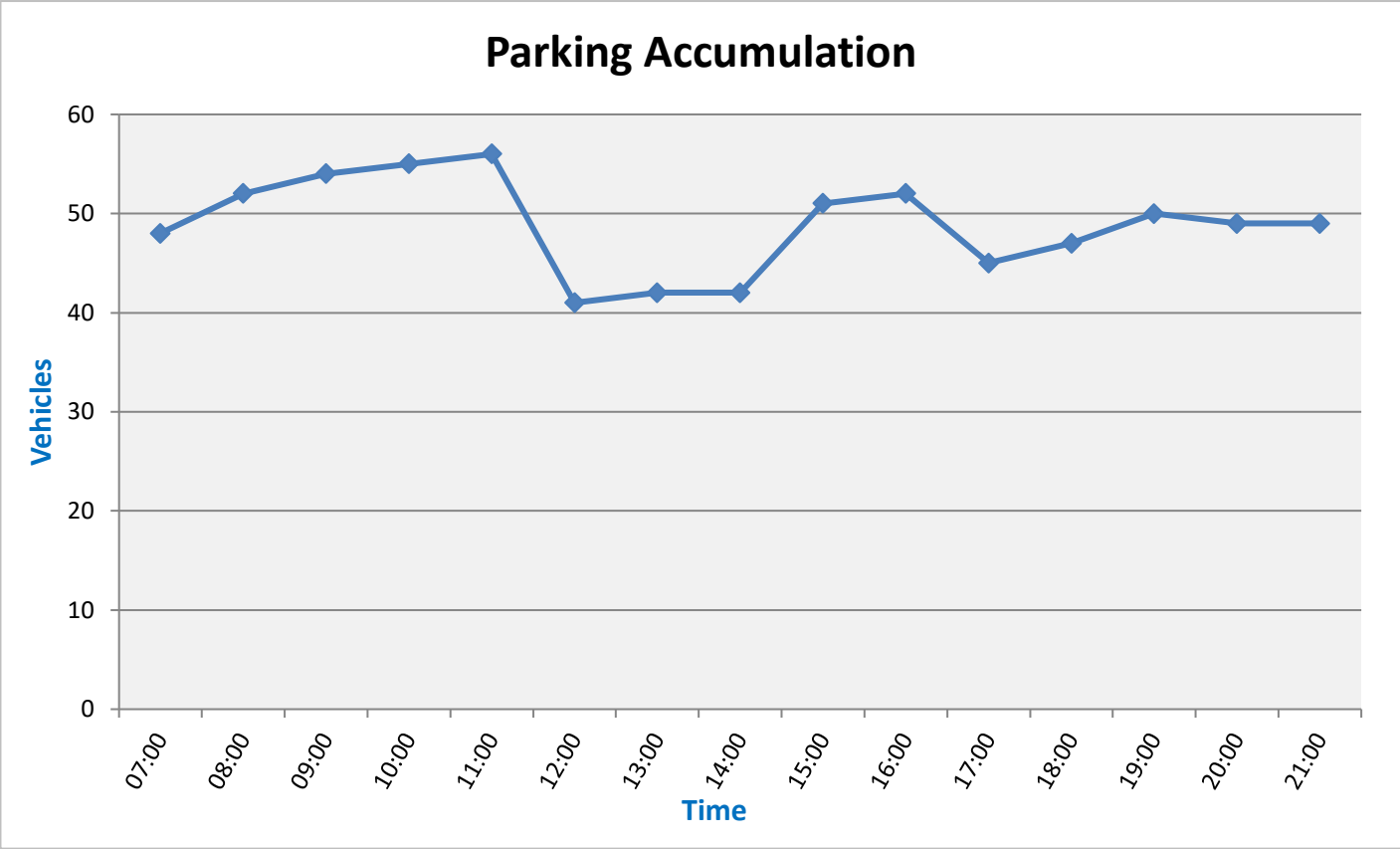
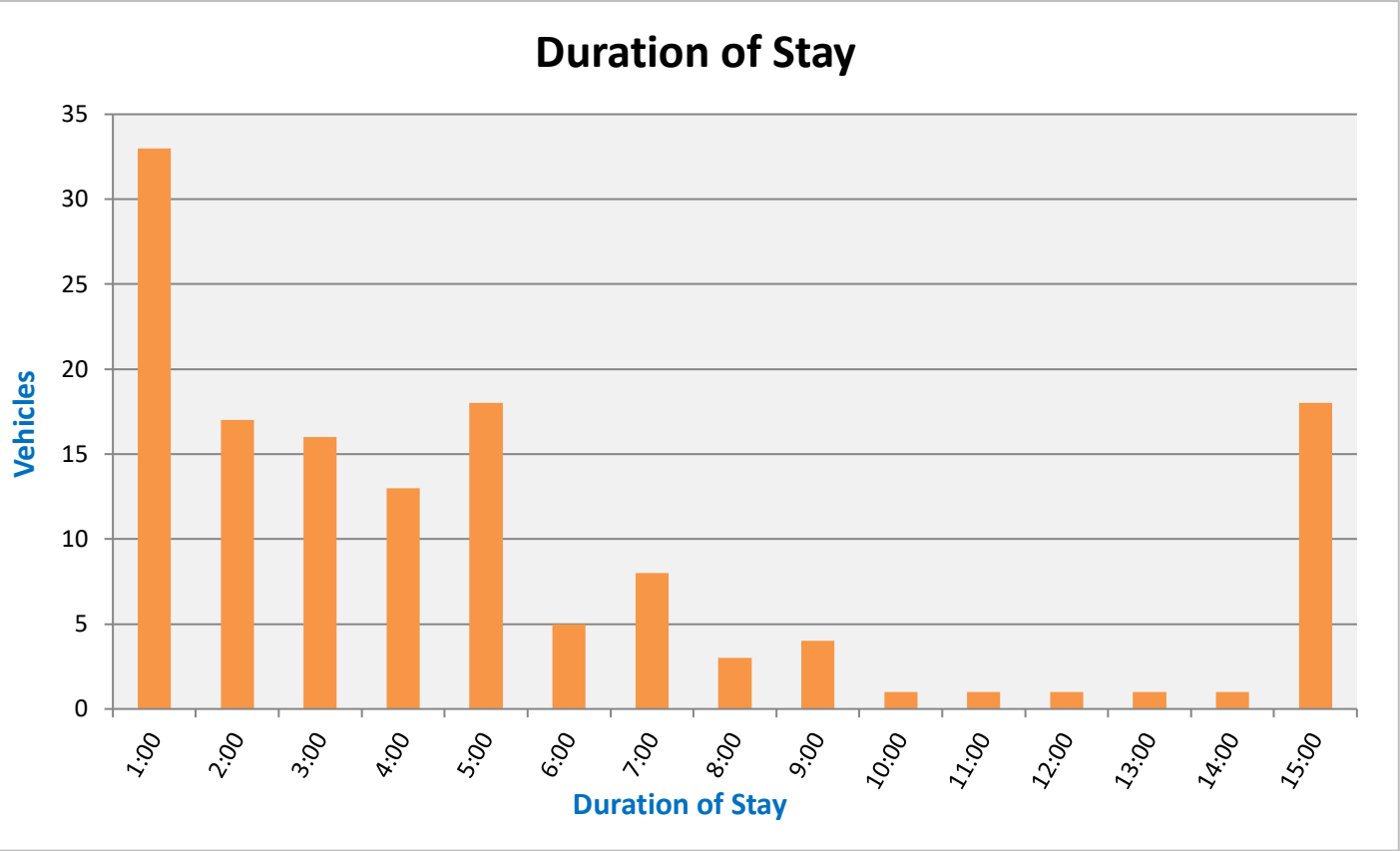
Peak Demand % 16%

Ave Duration of Stay (h:mm) 5:14

Total Vehicles 140

[1hr intervals]

Total	33	17	16	13	18	5	8	3	4	1	1	1	1	1	18			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	1	2	3	6	9	2	3	2		1		1			18	48	48	14%
08:00	1	1	1	1										1		5	52	15%
09:00	2		1		1								1			5	54	15%
10:00	4	3														7	55	16%
11:00	8	2					1				1					12	56	16%
12:00	4		1		2											7	41	12%
13:00	1		1	1	1		1		4							9	42	12%
14:00	2	1			1			1								5	42	12%
15:00	3	5	1	1	1		3									14	51	15%
16:00	2				1	3										6	52	15%
17:00	1	1			2											4	45	13%
18:00	1		1	4												6	47	13%
19:00		1	7													8	50	14%
20:00		1														1	49	14%
21:00	3															3	49	14%



Client Cardno

Location **Area S - Total

Date Saturday, 9th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area S - Total

Total Parking Spaces 39

Time restriction -

Peak Demand 15

Peak Demand % 38%

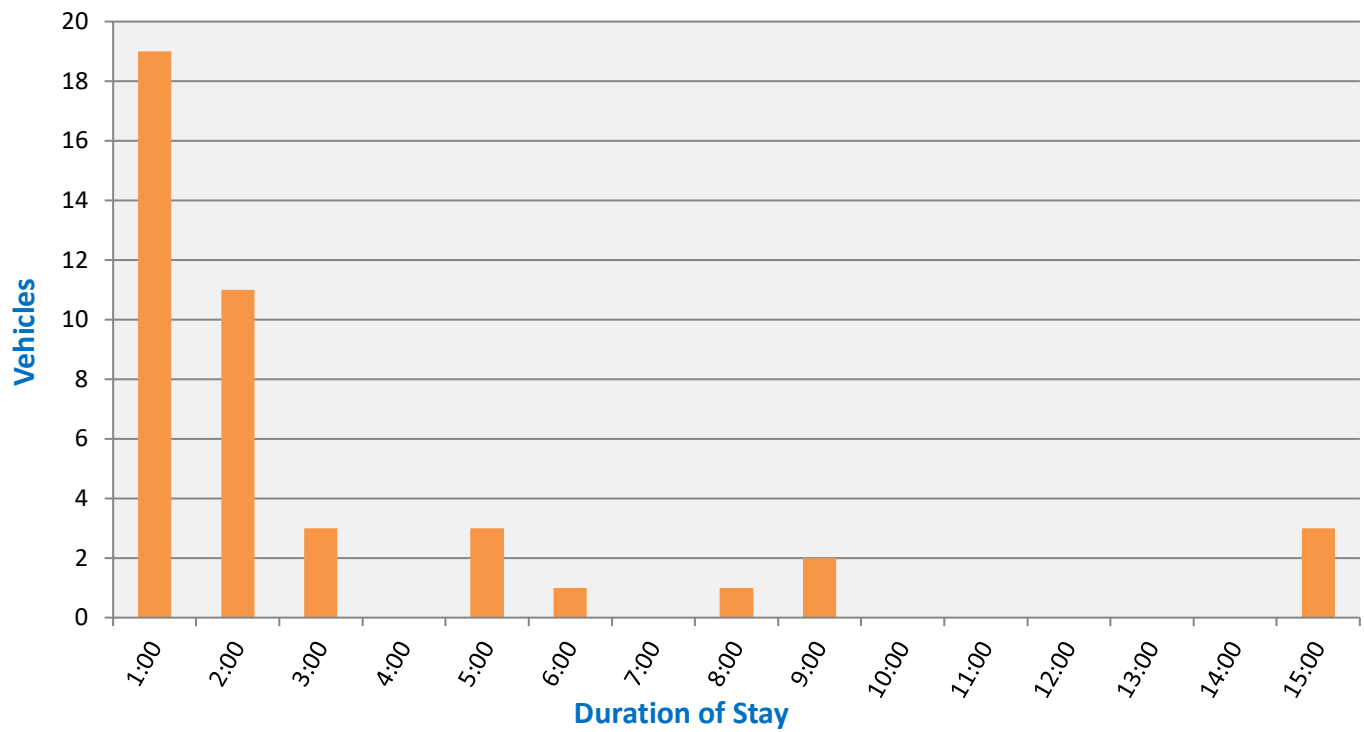
Ave Duration of Stay (h:mm) 3:18

Total Vehicles 43

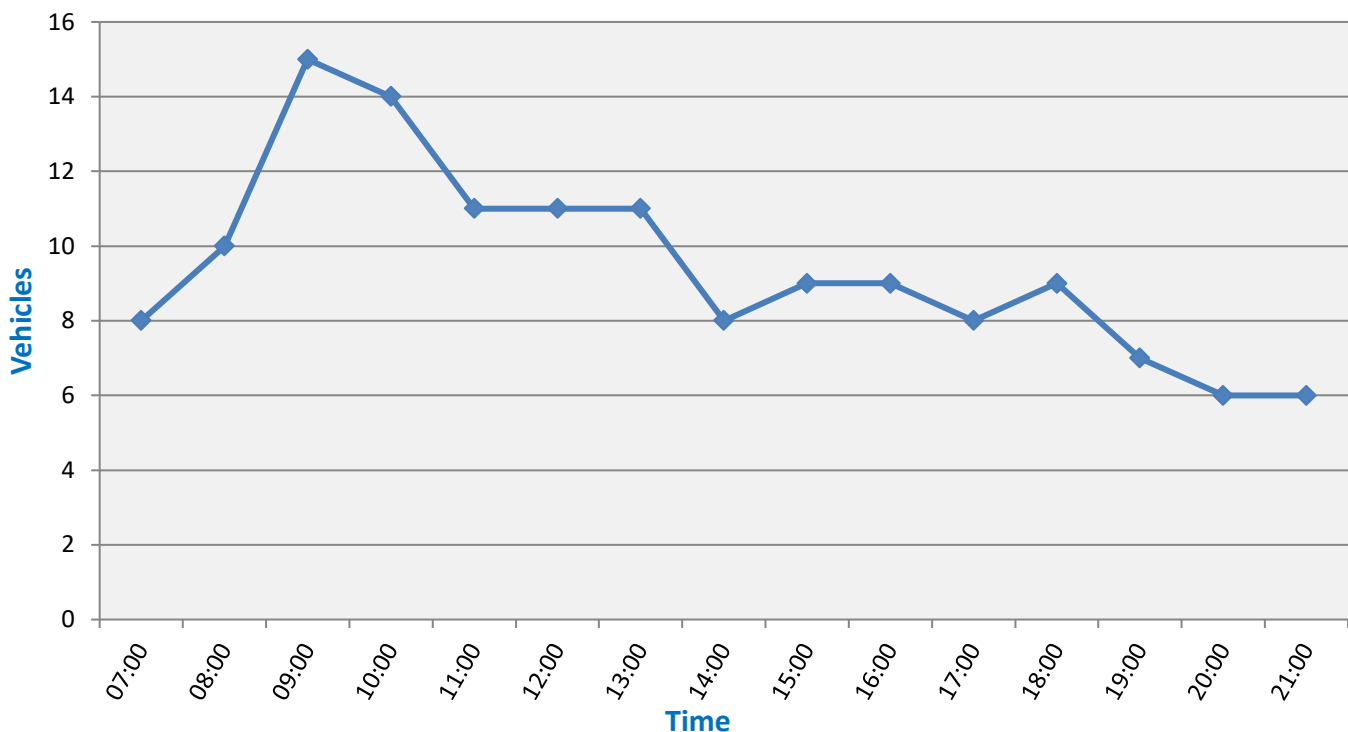
[1hr intervals]

Total	19	11	3	0	3	1	0	1	2	0	0	0	0	0	3			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	1	1	1		1	1									3	8	8	21%
08:00	2		1													3	10	26%
09:00	3	5														8	15	38%
10:00	3															3	14	36%
11:00	5	1														6	11	28%
12:00	1	2			2			1								6	11	28%
13:00	1								2							3	11	28%
14:00																0	8	21%
15:00		1														1	9	23%
16:00																0	9	23%
17:00		1	1													2	8	21%
18:00	1															1	9	23%
19:00																0	7	18%
20:00	1															1	6	15%
21:00	1															1	6	15%

Duration of Stay



Parking Accumulation



Client Cardno

Location **Area T - Total

Date Saturday, 9th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area T - Total

Total Parking Spaces 13

Time restriction -

Peak Demand 13

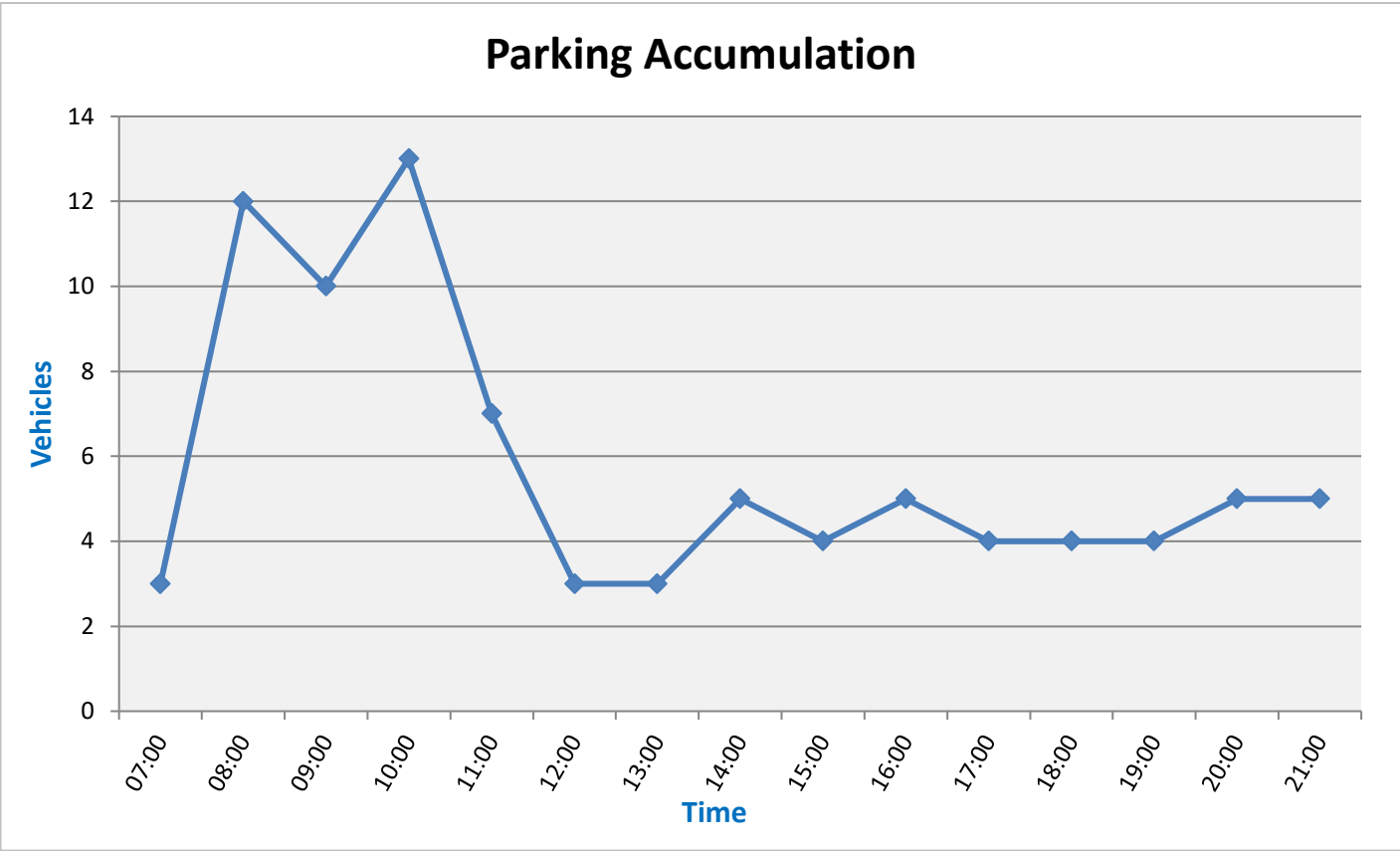
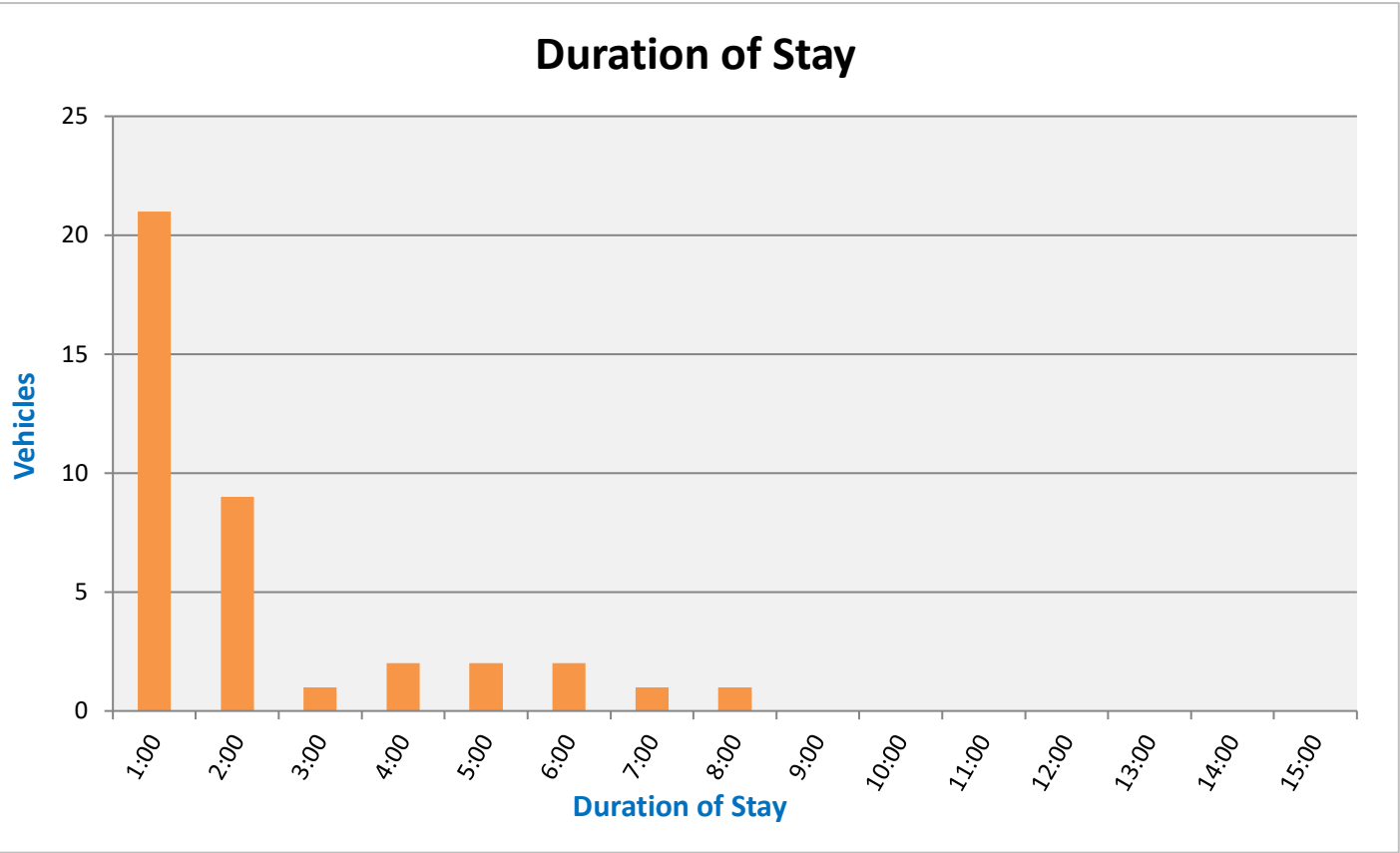
Peak Demand % 100%

Ave Duration of Stay (h:mm) 2:13

Total Vehicles 39

[1hr intervals]

Total	21	9	1	2	2	2	1	1	0	0	0	0	0	0	0	Total	Accumulation	% Capacity
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00			
07:00		1		1		1										3	3	23%
08:00	8				1											9	12	92%
09:00	2	5														7	10	77%
10:00	5															5	13	100%
11:00	4					1										5	7	54%
12:00																0	3	23%
13:00		2														2	3	23%
14:00	1							1								2	5	38%
15:00				1			1									2	4	31%
16:00	1															1	5	38%
17:00					1											1	4	31%
18:00																0	4	31%
19:00			1													1	4	31%
20:00		1														1	5	38%
21:00																0	5	38%



Client Cardno

Location **Area U - Total

Date Saturday, 9th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area U - Total

Total Parking Spaces 29

Time restriction -

Peak Demand 4

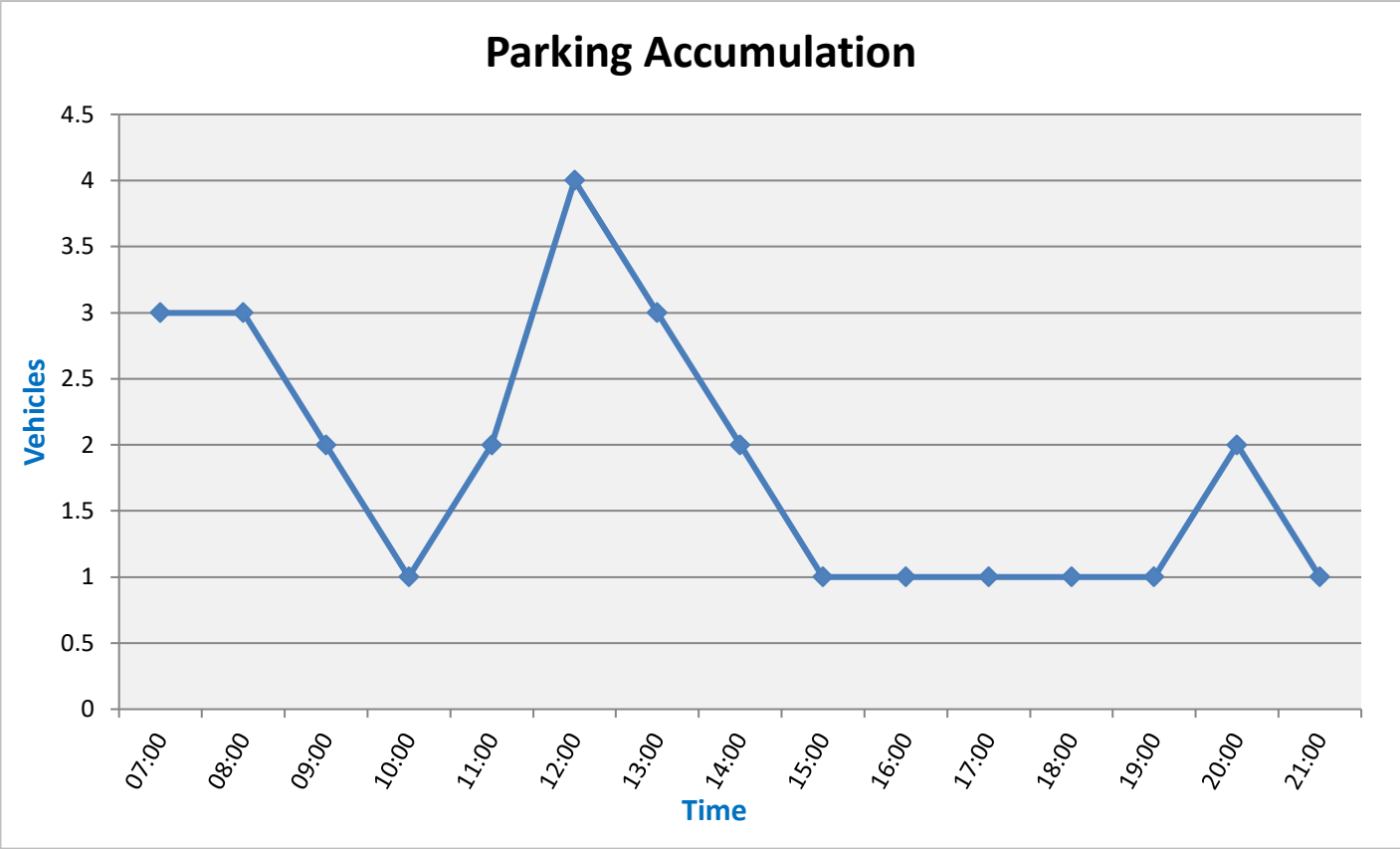
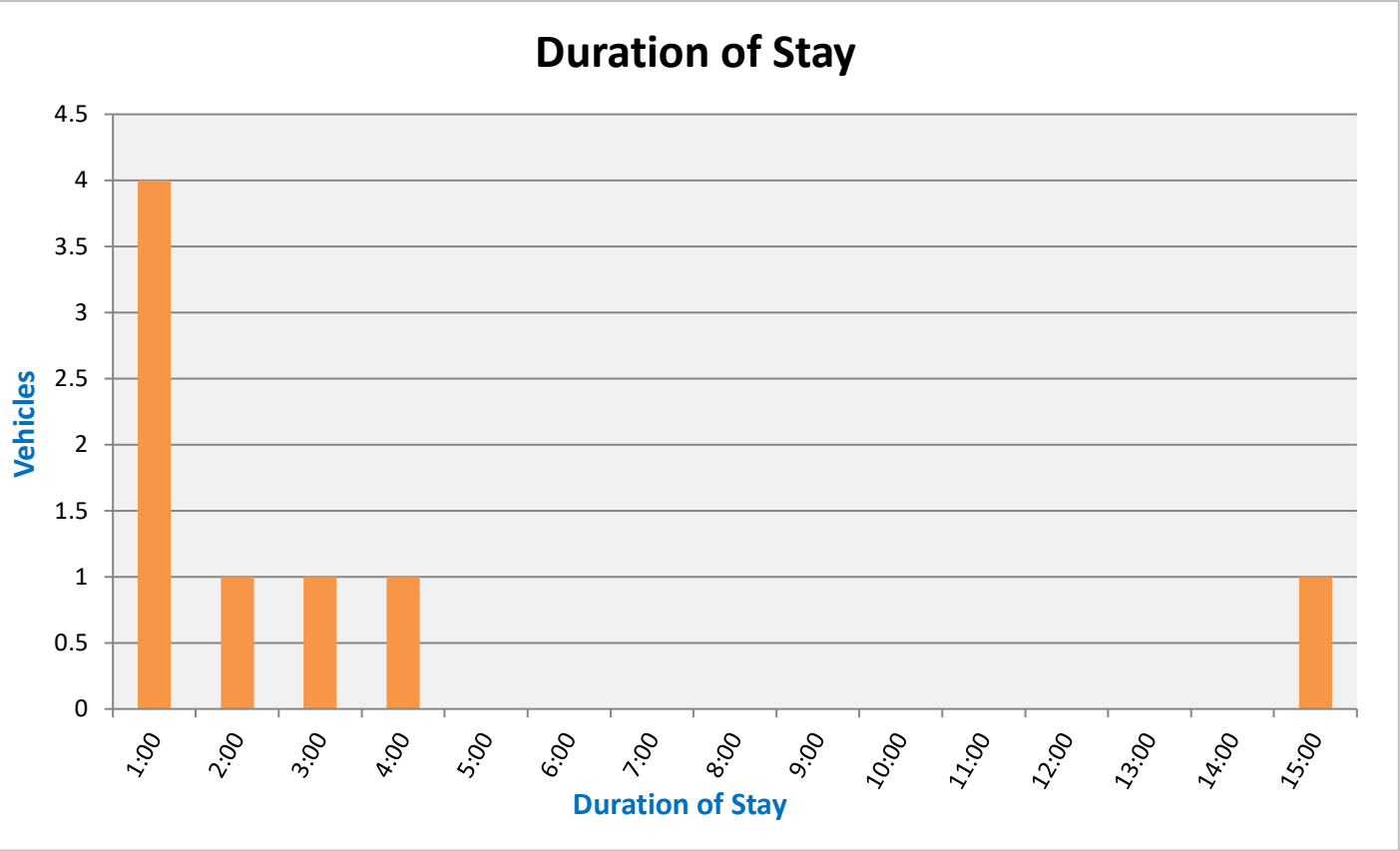
Peak Demand % 14%

Ave Duration of Stay (h:mm) 3:30

Total Vehicles 8

[1hr intervals]

Total	4	1	1	1	0	0	0	0	0	0	0	0	0	0	1			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00		1	1												1	3	3	10%
08:00																0	3	10%
09:00																0	2	7%
10:00																0	1	3%
11:00				1												1	2	7%
12:00	2															2	4	14%
13:00	1															1	3	10%
14:00																0	2	7%
15:00																0	1	3%
16:00																0	1	3%
17:00																0	1	3%
18:00																0	1	3%
19:00																0	1	3%
20:00	1															1	2	7%
21:00																0	1	3%



Client Cardno

Location **Area V - Total

Date Saturday, 9th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area V - Total

Total Parking Spaces 230

Time restriction -

Peak Demand 35

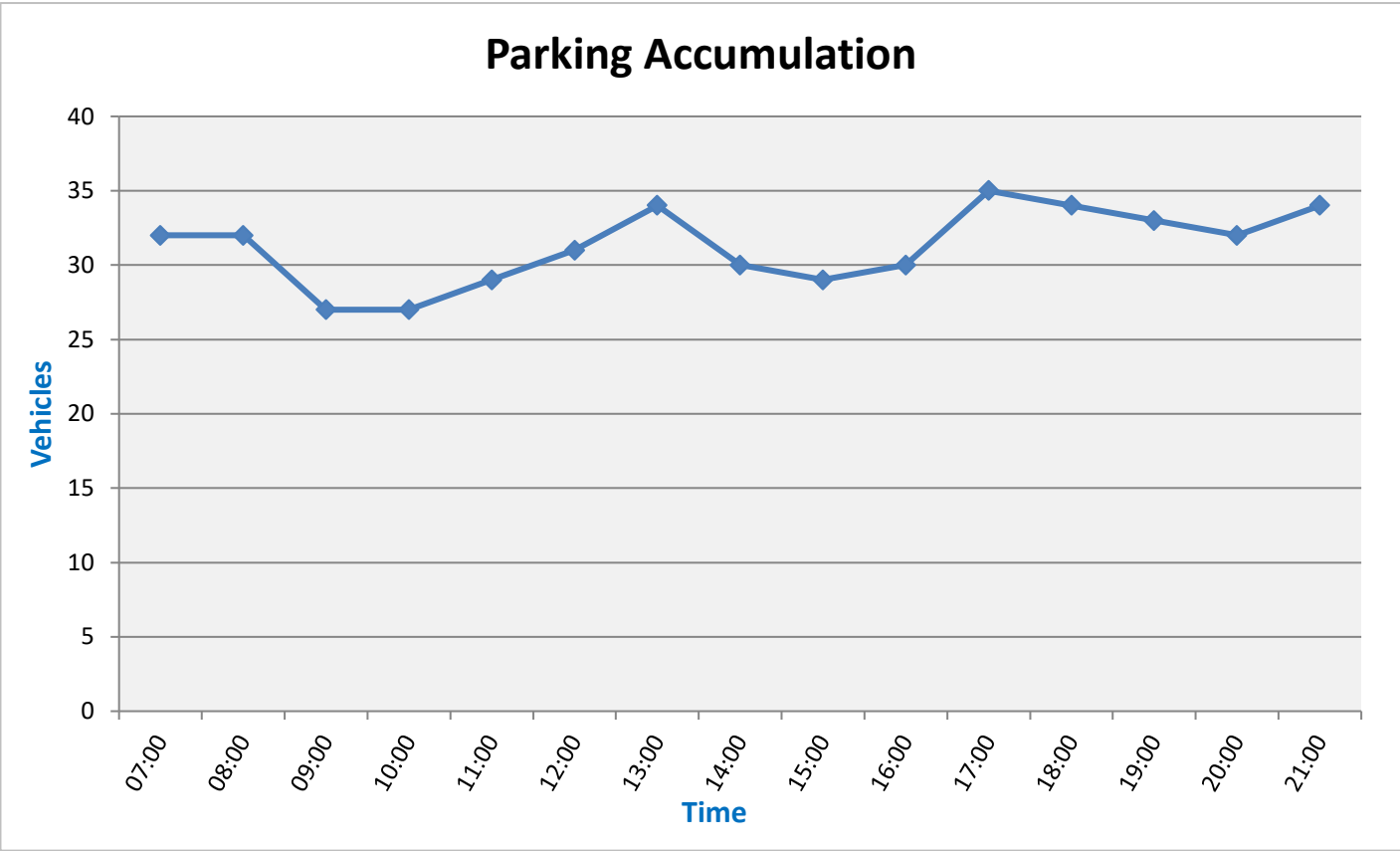
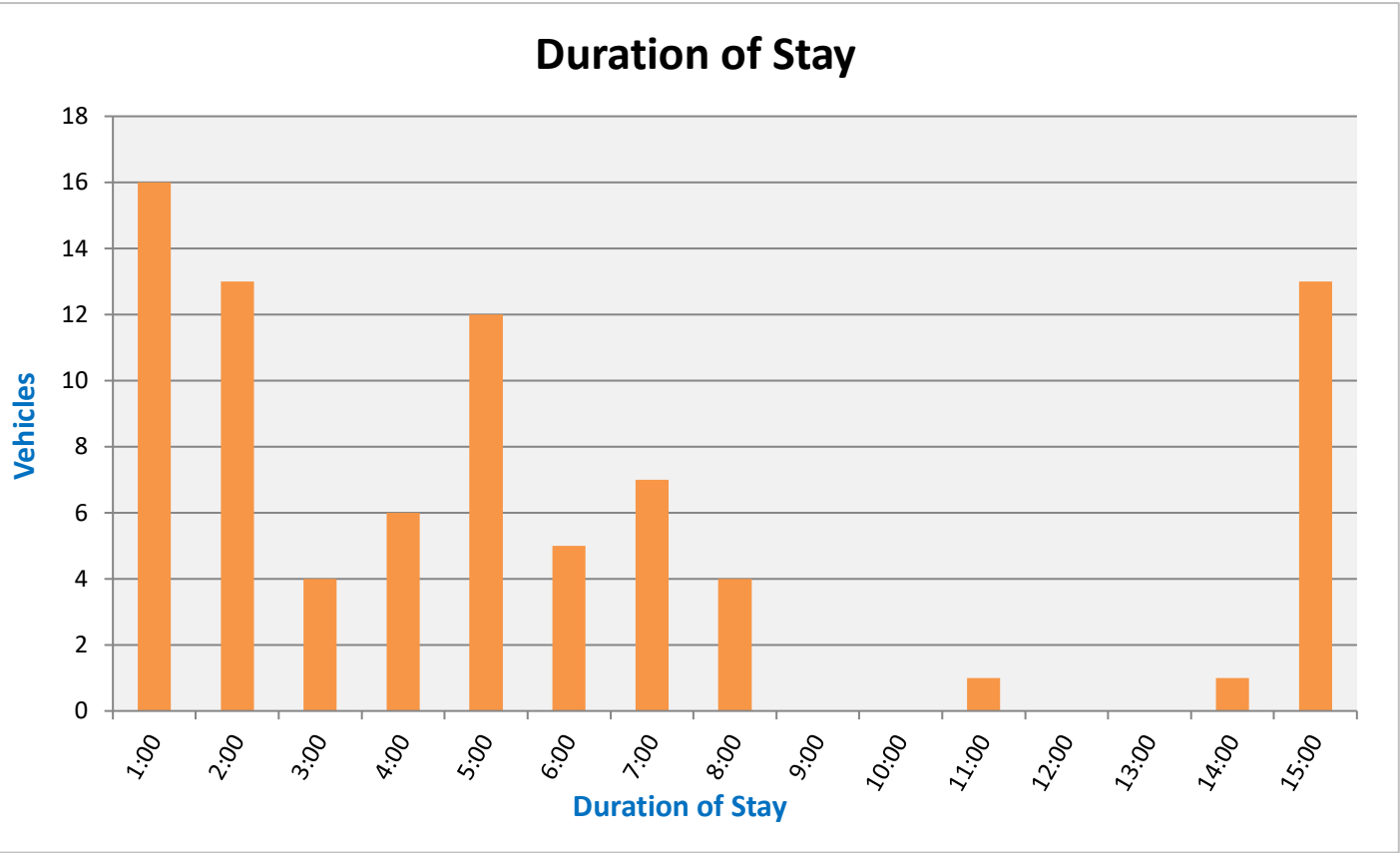
Peak Demand % 15%

Ave Duration of Stay (h:mm) 5:43

Total Vehicles 82

[1hr intervals]

Total	16	13	4	6	12	5	7	4	0	0	1	0	0	1	13			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	4	5	1	1	1	1	3	3							13	32	32	14%
08:00	1				1	1								1		4	32	14%
09:00						1										1	27	12%
10:00	1															1	27	12%
11:00	1		1				1				1					4	29	13%
12:00	1	2			1											4	31	13%
13:00	2	1			2	1										6	34	15%
14:00	1		1	1	1			1								5	30	13%
15:00		2					3									5	29	13%
16:00						1										1	30	13%
17:00	2	1			6											9	35	15%
18:00		1		4												5	34	15%
19:00	1		1													2	33	14%
20:00		1														1	32	14%
21:00	2															2	34	15%



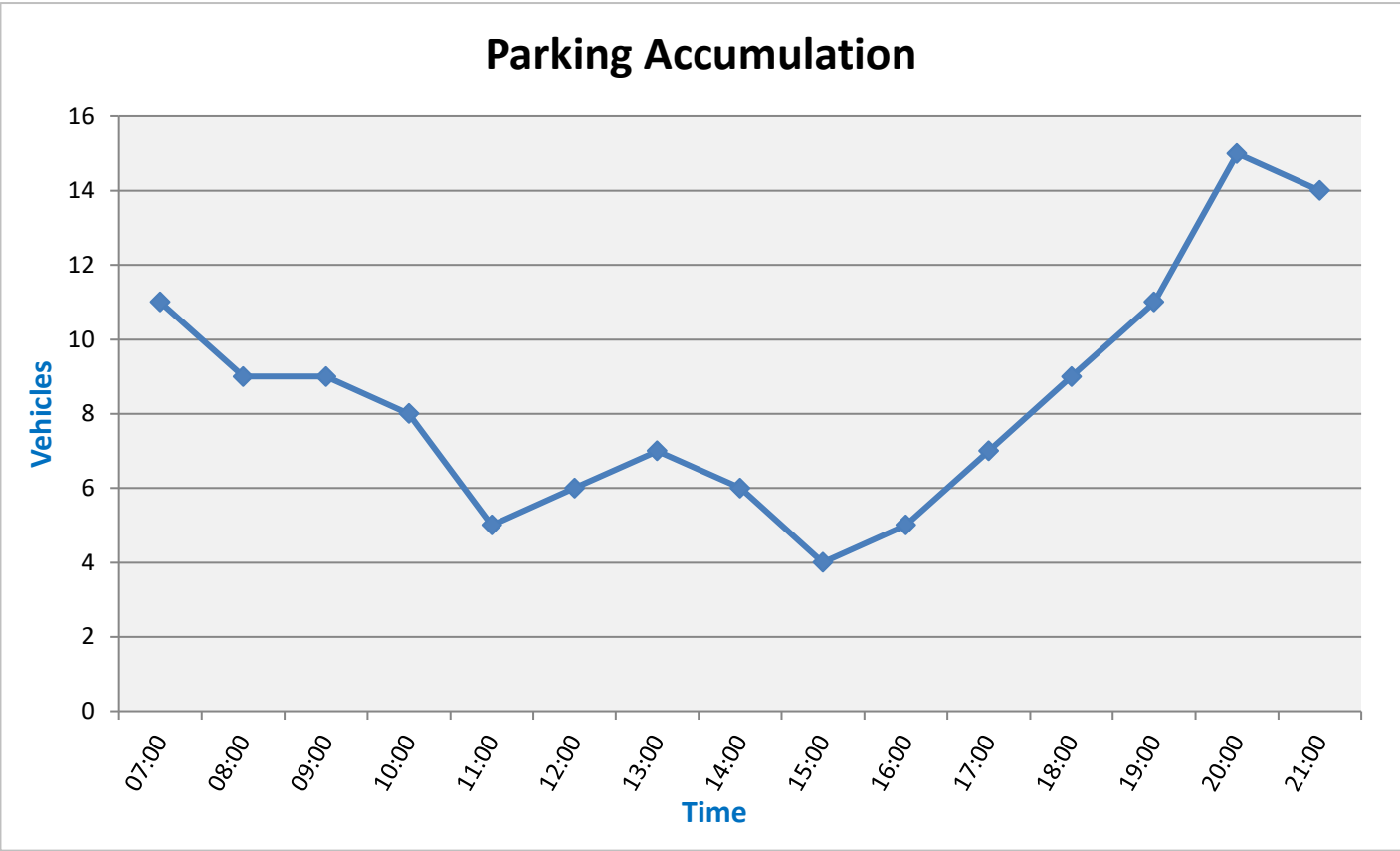
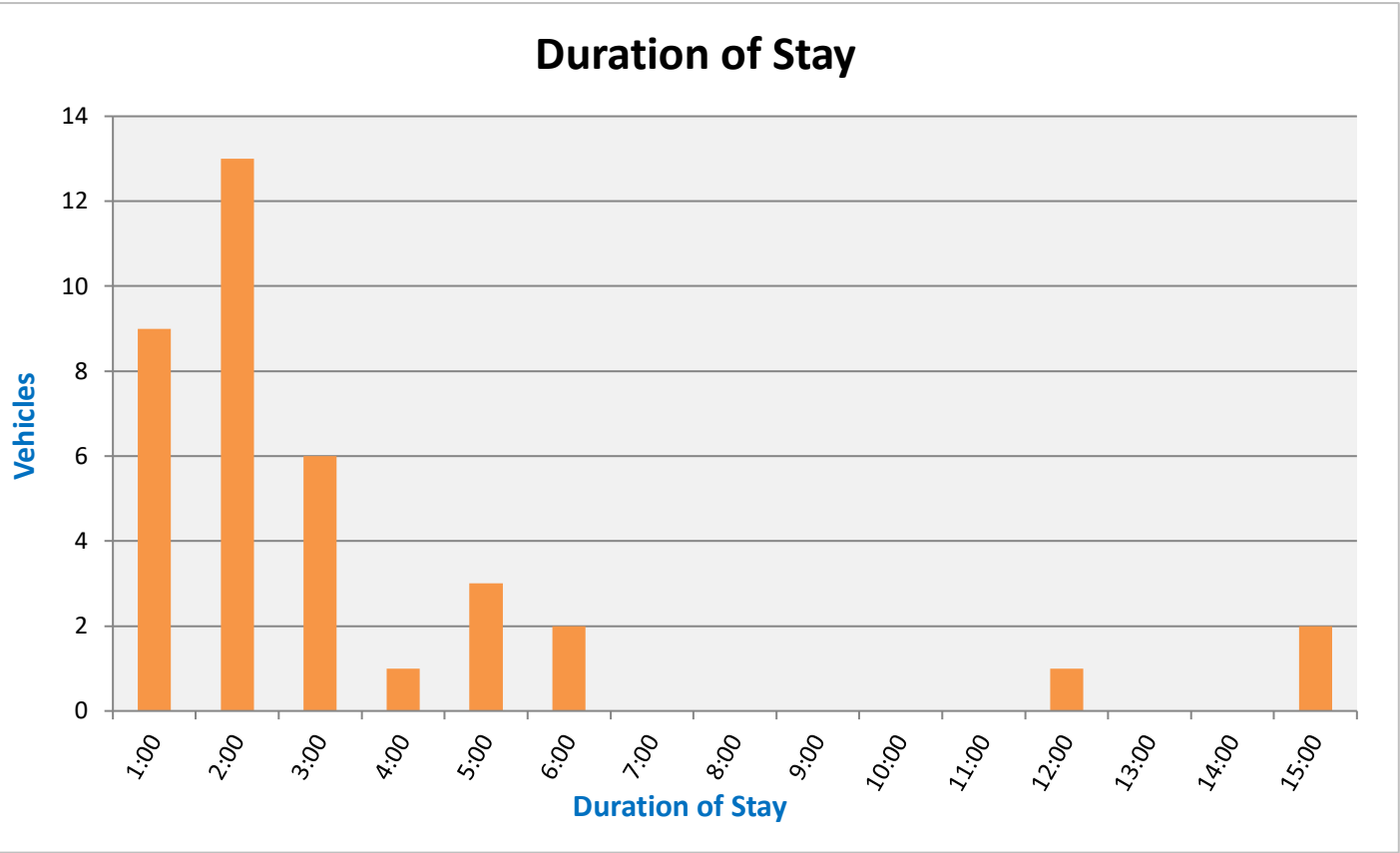
Client Cardno
Location **Area W - Total
Date Saturday, 9th September 2017 (7:00-21:00)
Description Greensborough Parking Survey



Site **Area W - Total
Total Parking Spaces 78
Time restriction -
Peak Demand 15
Peak Demand % 19%
Ave Duration of Stay (h:mm) 3:24
Total Vehicles 37

[1hr intervals]

Total	9	13	6	1	3	2	0	0	0	0	0	1	0	0	2			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	2	2	4		1										2	11	11	14%
08:00																0	9	12%
09:00		2														2	9	12%
10:00	1				1							1				3	8	10%
11:00																0	5	6%
12:00		2														2	6	8%
13:00	1															1	7	9%
14:00	1					1										2	6	8%
15:00																0	4	5%
16:00						1										1	5	6%
17:00			1		1											2	7	9%
18:00	1			1												2	9	12%
19:00	1	1	1													3	11	14%
20:00	1	6														7	15	19%
21:00	1															1	14	18%



Client Cardno

Location **Area X - Total

Date Saturday, 9th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area X - Total

Total Parking Spaces 65

Time restriction -

Peak Demand 7

Peak Demand % 11%

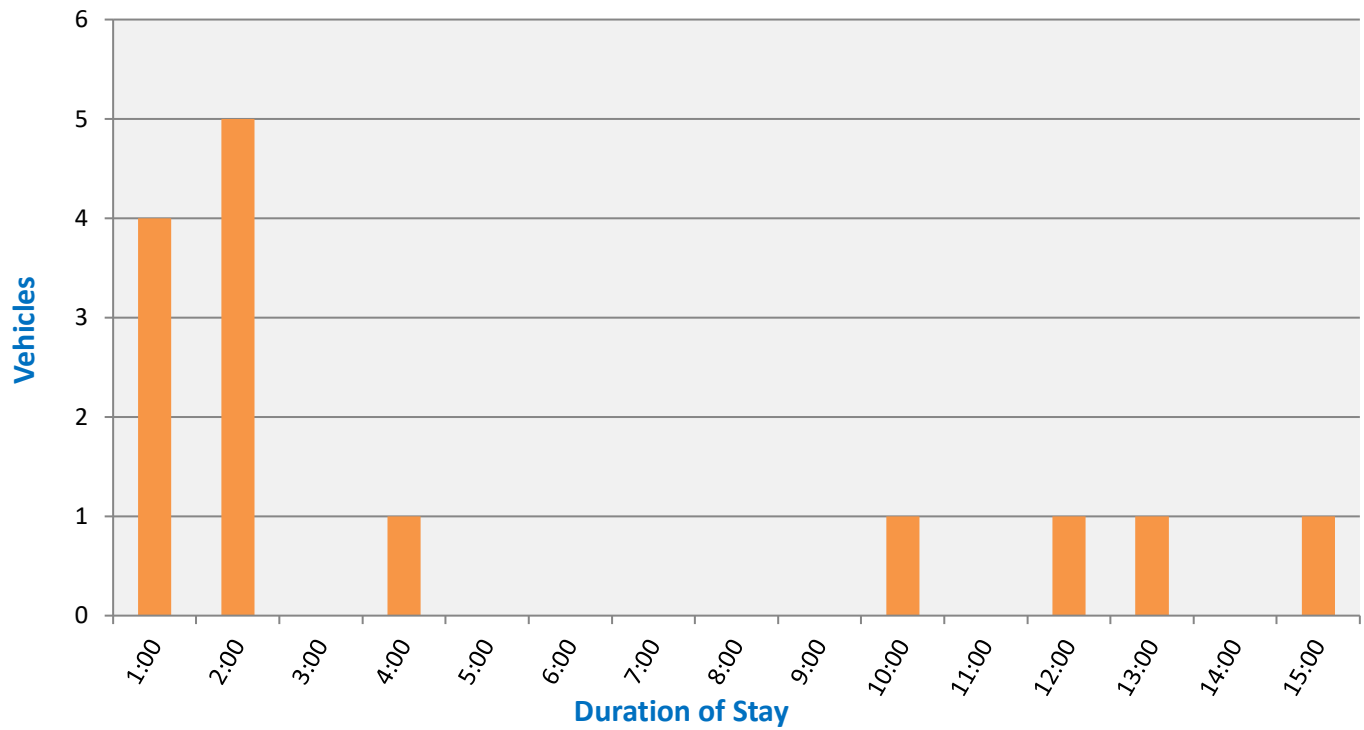
Ave Duration of Stay (h:mm) 4:51

Total Vehicles 14

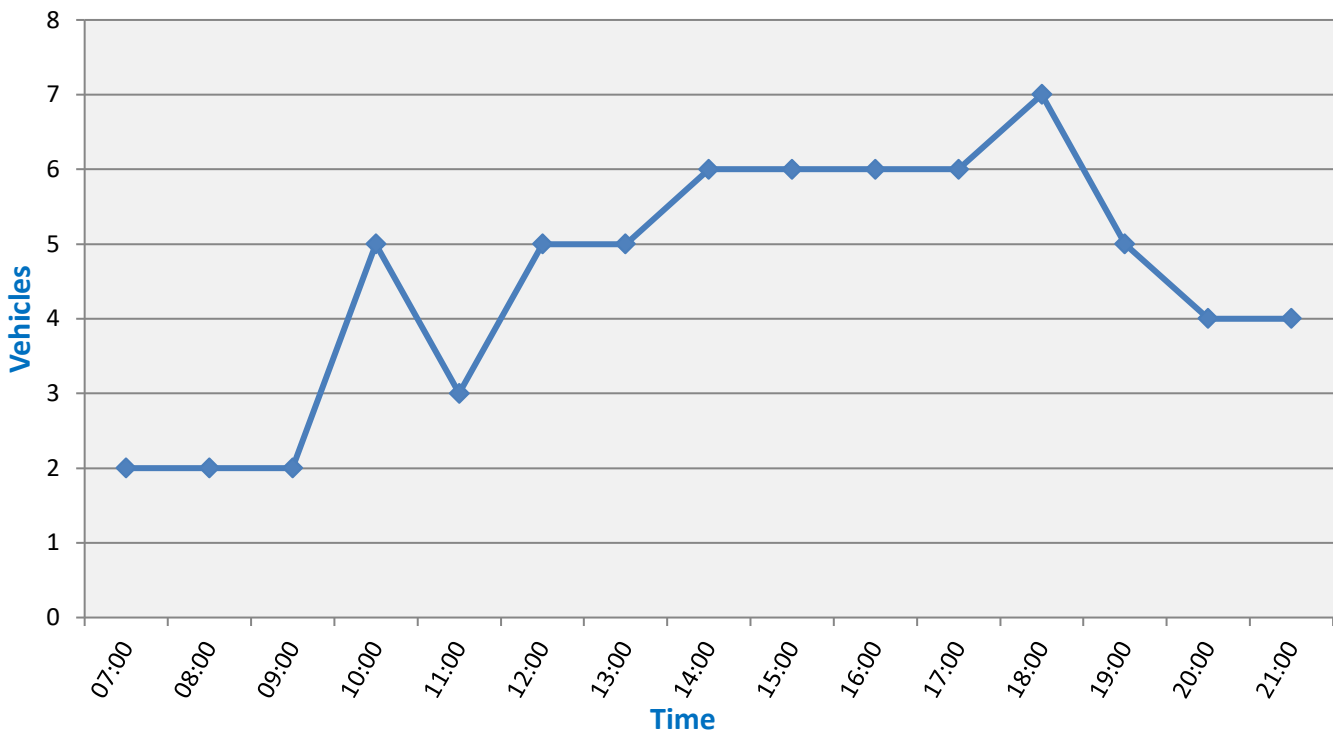
[1hr intervals]

Total	4	5	0	1	0	0	0	0	0	1	0	1	1	0	1			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00		1													1	2	2	3%
08:00																0	2	3%
09:00													1			1	2	3%
10:00	2											1				3	5	8%
11:00										1						0	3	5%
12:00	1															2	5	8%
13:00		1														1	5	8%
14:00		1														1	6	9%
15:00				1												1	6	9%
16:00	1															1	6	9%
17:00		1														1	6	9%
18:00		1														1	7	11%
19:00																0	5	8%
20:00																0	4	6%
21:00																0	4	6%

Duration of Stay



Parking Accumulation



Client Cardno

Location **Area Y - Total

Date Saturday, 9th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area Y - Total

Total Parking Spaces 258

Time restriction -

Peak Demand 61

Peak Demand % 24%

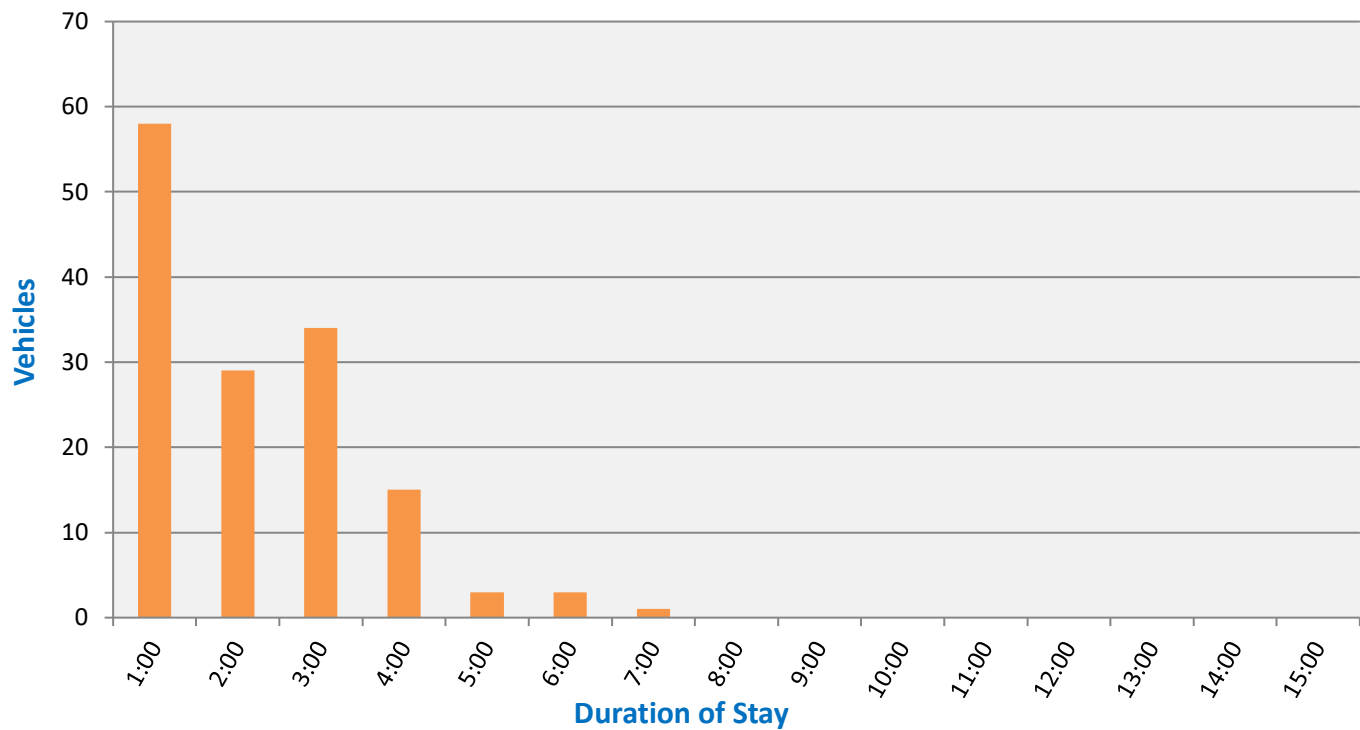
Ave Duration of Stay (h:mm) 2:13

Total Vehicles 143

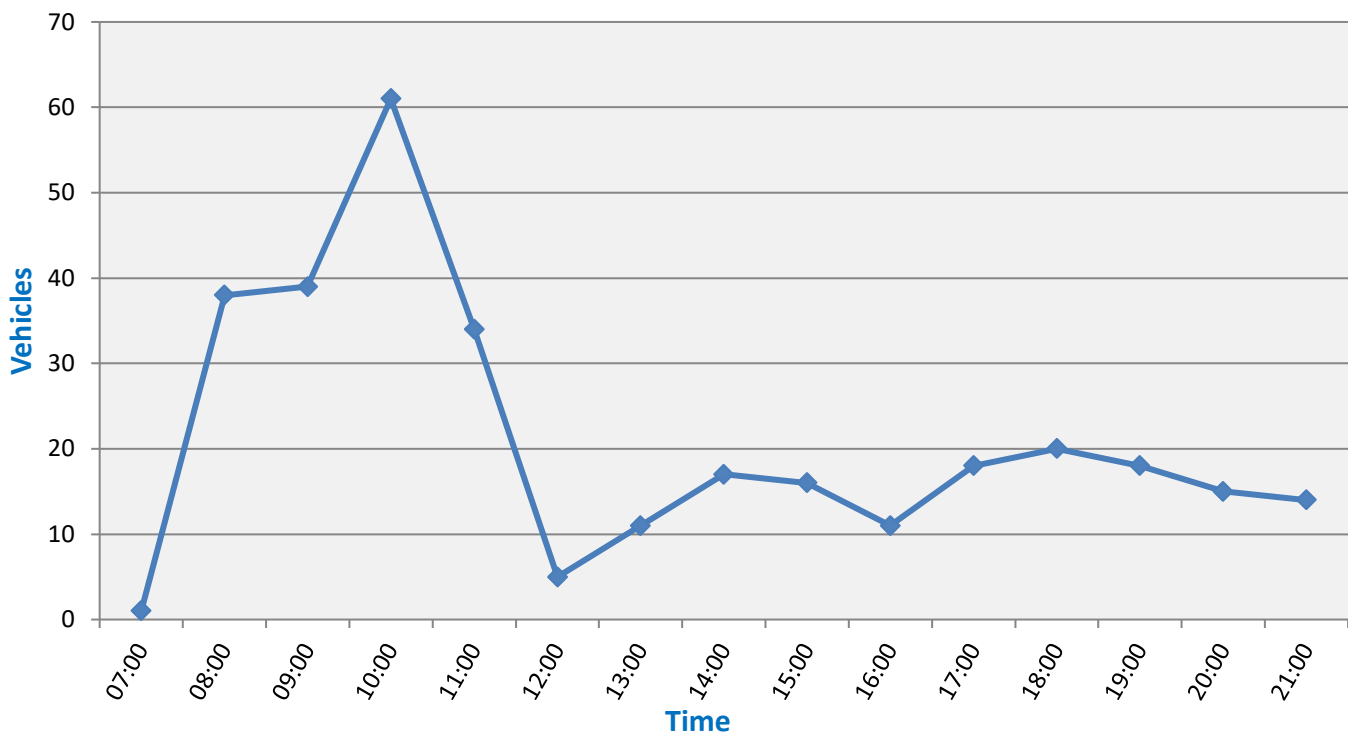
[1hr intervals]

Total	58	29	34	15	3	3	1	0	0	0	0	0	0	0	0			
	Duration of Stay																	
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	1															1	1	0%
08:00	5	1	24	8												38	38	15%
09:00	3	1	1	1												6	39	15%
10:00	10	15				1										26	61	24%
11:00	8															8	34	13%
12:00	2				1											3	5	2%
13:00	3	1	4			1										9	11	4%
14:00	6	2	1													9	17	7%
15:00	3	1		1			1									6	16	6%
16:00	4					1										5	11	4%
17:00	6	3	2	1	2											14	18	7%
18:00	1	2	1	4												8	20	8%
19:00	2	1	1													4	18	7%
20:00	1	2														3	15	6%
21:00	3															3	14	5%

Duration of Stay



Parking Accumulation



Client Cardno

Location **Area Z - Total

Date Saturday, 9th September 2017 (7:00-21:00)

Description Greensborough Parking Survey



Site **Area Z - Total

Total Parking Spaces 510

Time restriction -

Peak Demand 121

Peak Demand % 24%

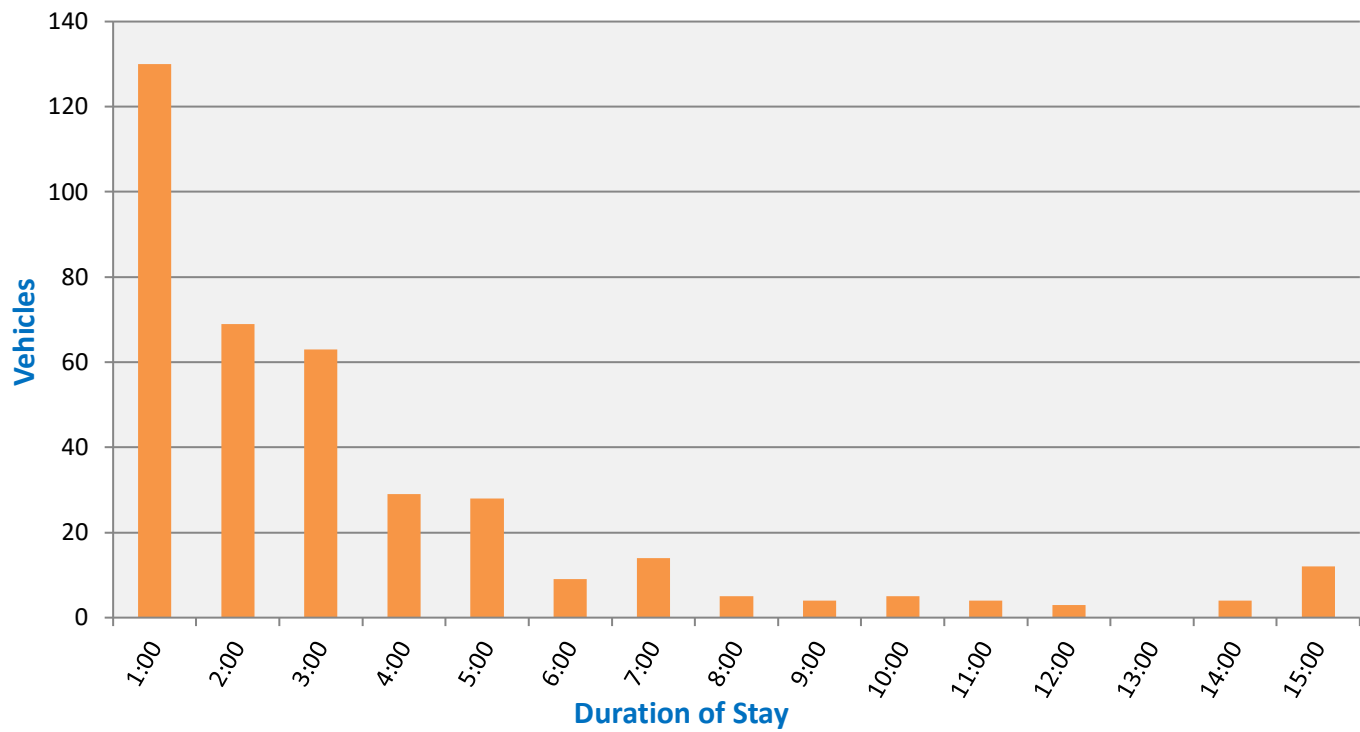
Ave Duration of Stay (h:mm) 3:26

Total Vehicles 379

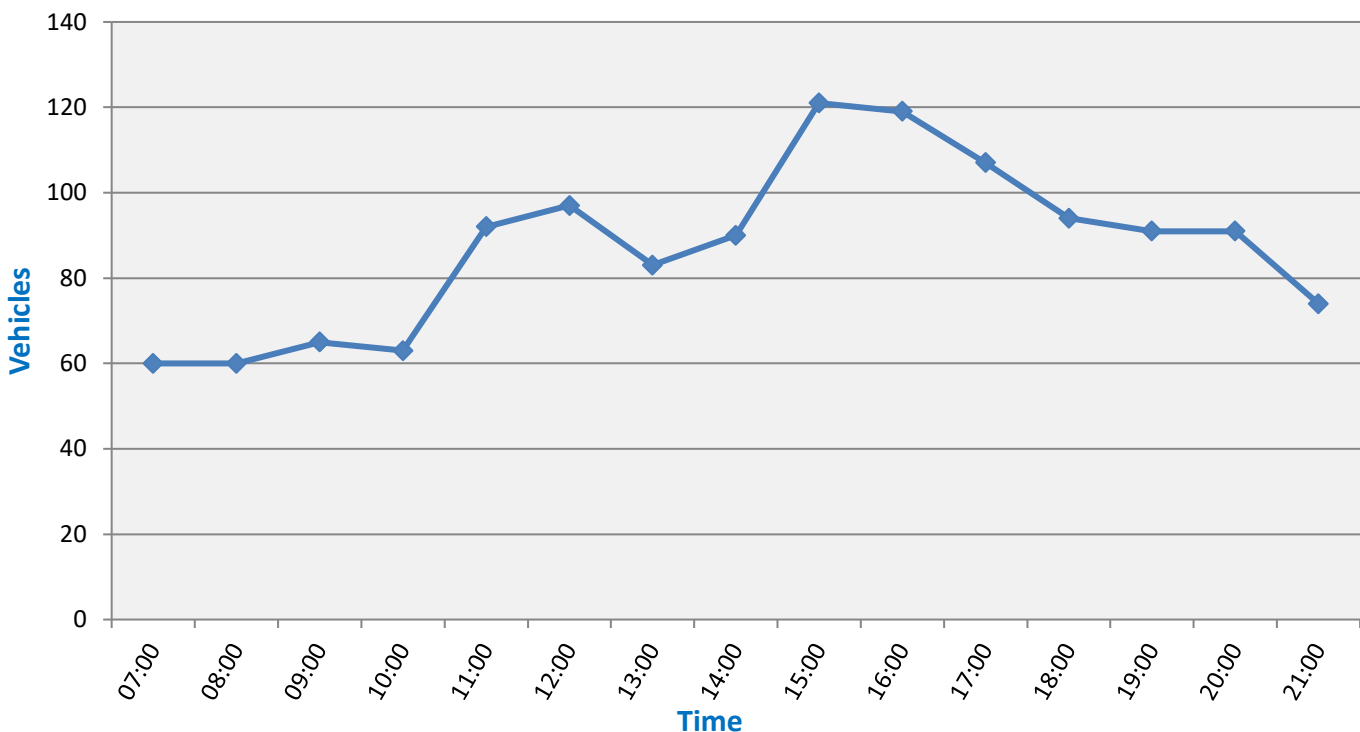
[1hr intervals]

Total	130	69	63	29	28	9	14	5	4	5	4	3	0	4	12			
Duration of Stay																		
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	Total	Accumulation	% Capacity
07:00	2	3	7	5	12	2	2	1	1	4	2	3		4	12	60	60	12%
08:00		1					1									2	60	12%
09:00	2	3	1	1	1											8	65	13%
10:00	1	3	1	2	1											8	68	12%
11:00	18	6	7	1		2		1	1		2					38	92	18%
12:00	21	12	4	1						1						39	97	19%
13:00	7	2	1	1			3	1	2							17	83	16%
14:00	10	3	8	7	7		1	2								38	90	18%
15:00	12	9	13	6	3	1	7									51	121	24%
16:00	10		2			4										16	119	23%
17:00	7	7	2	2	4											22	107	21%
18:00	10	1	2	3												16	94	18%
19:00	11	7	15													33	91	18%
20:00	9	12														21	91	18%
21:00	10															10	74	15%

Duration of Stay



Parking Accumulation



Part 2: Options & Strategy Analysis Report

Greensborough Activity Centre Parking Plan

V171082



Prepared for
Banyule City Council

1 March 2019

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1 Introduction

Having consideration of the findings derived from the Background Report, Cardno has conducted an Options and Strategy Analysis. The analysis provides an objective-based approach to address the car parking issues identified in the Background Report in a justifiable, standardised manner.

Together with Council, Cardno will address the car parking issues identified within the Greensborough Major Activity Centre (GMAC). Once each issue has been processed in this manner, the proposed solutions will be integrated into a parking strategy for the study area.

It is noted that this report is to be read in conjunction with the “*Part 1: Background Report – Greensborough Activity Centre Parking Plan*” (V171082REP002F04) prepared by Cardno dated 1 March 2019, referenced as ‘The Background Report’ throughout the following report.

2 Existing Parking Conditions

2.1 Car Parking Demands

Existing car parking conditions within the Study Area have been described in Section 5 of the Background Report, which noted a total supply of 7,210 publically available spaces throughout Zones A and B. Car parking surveys of the Study Area recorded a peak car parking demand for 4,174 spaces (or an overall occupancy level of approximately 58%). In Zone A alone, car parking occupancy levels reached 78% during the identified survey peak period, being Thursday 7th September at 12:00pm.

2.2 Car Parking Rates

Section 6.2 of the Background Report defined the key car parking rates for the Greensborough Major Activity Centre (GMAC) as determined by Cardno. Considering the established existing car parking rates, a comparison was made to the standard car parking requirements set out with the Victorian Planning Provisions (Clause 52.06), Schedule 1 to the Parking Overlay within the Banyule Planning Scheme and locality to the Principle Public Transport Network (PPTN).

This assessment indicated that for the key land uses nominated, the car parking rates for the identified Study Area are the same as or lower than those specified within the Schedule 1 to the Parking Overlay or Column B rates as defined in Clause 52.06.

It is noted that ABS Census data generally provided an accurate reflection of resident car ownership levels in the Study Area. Duration of stay data was analysed in order to determine the likely number of visitors within residential precincts.

2.3 Summary

In the development of car parking strategies for the GMAC Study Area, the issues raised through consultation with Council will be supplemented by the analysis undertaken of existing car parking conditions.

The car parking strategies for the GMAC will seek to provide a balanced solution for all stakeholders including Council, traders and the wider community.

3 Proposed Car Parking Rates

3.1 General

As part of the overall parking study, new parking rates for various land uses in the Study Area have been proposed. The proposed rates have been identified and described in detail within Section 6.2 of the Background Report, and are largely based on the following sources of information:

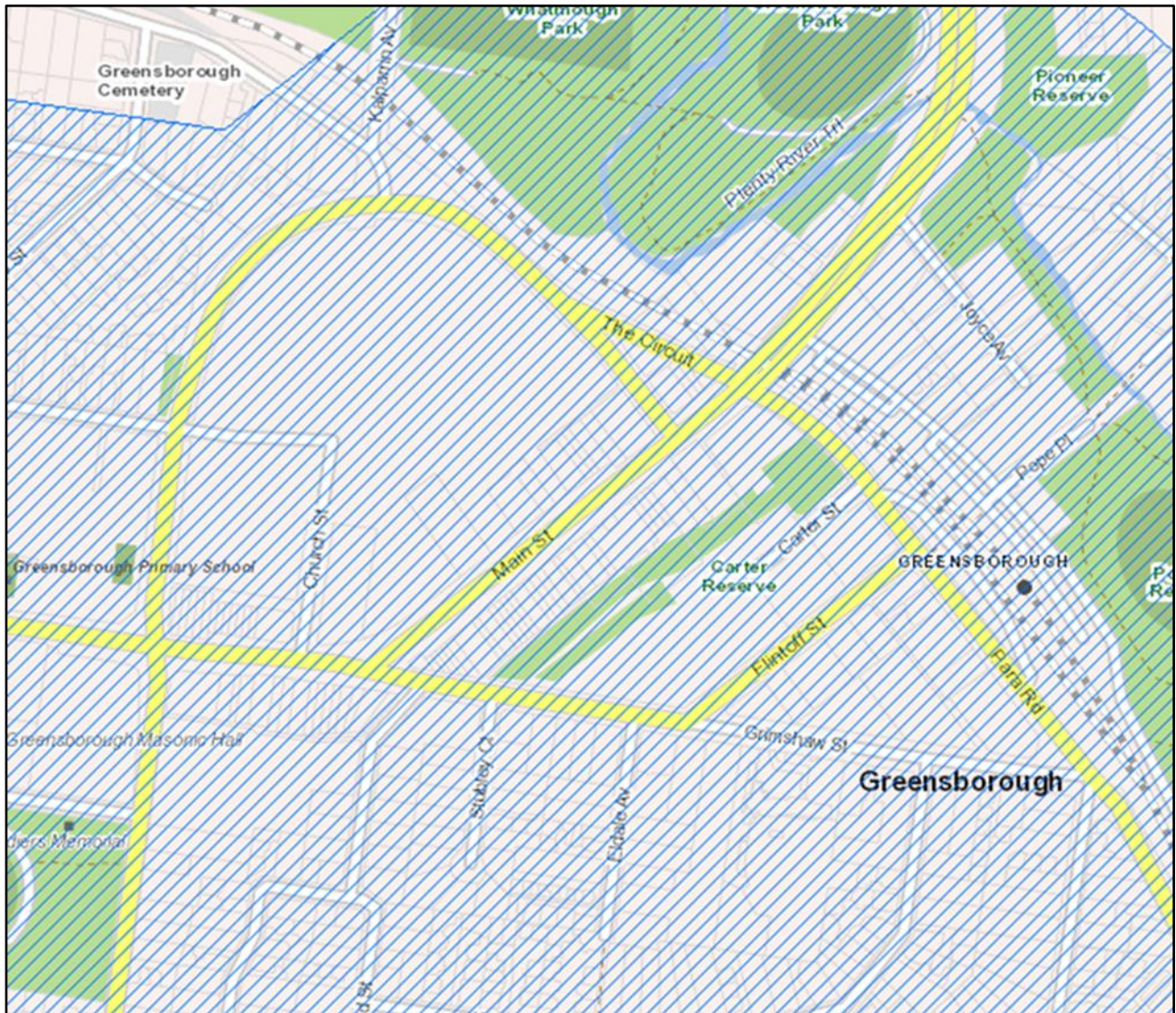
- > Parking occupancy and duration of stay survey data collected and analysed;
- > ABS Census data relating to residential car parking ownership levels;
- > Locality to the Principle Public Transport Network;
- > Existing car parking rates adopted within other activity centre parking overlays in outer metropolitan Melbourne; and
- > Case study data to cross check and support the derived rates.

3.2 Principle Public Transport Network (PPTN)

The Principal Public Transport Network (PPTN) reflects the routes where high-quality public transport services are or will be provided. The PPTN is a statutory land use planning tool that supports integrated transport and land use planning, by encouraging more diverse and dense development near high-quality public transport to help support public transport usage. It helps provide certainty to planners and the community about locations that are, or will be, served by high-quality public transport.

The PPTN is a key component of Plan Melbourne, and is reflected in planning schemes across Victoria. Figure 5-1 shows the subject site lies within 400m of the PPTN.

Figure 3-1 Greensborough Principle Public Transport Network



It is noted that Planning Scheme Amendment VC148 was gazetted on the 31st of July 2018, which introduced an update to Clause 52.06.

A car parking requirement in Table 1 of Banyule Planning Scheme is calculated by multiplying the figure in Column A or Column B (whichever applies) by the measure (for example square metres, number of patrons or number of bedrooms) in Column C.

Column B applies if:

- > Any part of the land is identified as being within the Principal Public Transport Network Area as shown on Figure 5-1 of the Principal Public Transport Network Area Maps provided by the State Government of Victoria in 2018.

In this instance, the subject site is within 400m of the PPTN and as such Column B of Table 1 of the Banyule Planning Scheme is the applied parking rate.

3.3 Banyule Planning Scheme Rates

Car parking rates for various uses operating within the Study Area are currently based on Schedule 1 to the Parking Overlay or Column B rates within Clause 52.06-5 of the Banyule Planning Scheme as the area is within the PPTN.

Clause 52.06 sets out the standard Planning Scheme requirements for parking in Victoria. Table 1 of Clause 52.06-5 outlines the minimum car parking requirements for a given land use. These car parking provisions apply to new land uses or where there is an increase in floor area, number of patrons, seats, practitioners, residents or staff of an existing land use.

The existing rates for shop, food & drink, restaurant, office, medical centre and dwelling have been shown in Table 3-1. These are largely classified as being the “primary” land uses in the GMAC being those that will likely be contained within the parking overlay. Rates for other land uses will continue to be based on the standard Column A rates, suggested for activity centres.

Clause 45.09 allows the rates in Clause 52.06 to be varied to meet the unique requirements of an area, with the rates specified in a parking overlay typically overriding the standard requirements Column A or Column B requirements specified within Clause 52.06-5.

Most recently, the Heidelberg Schedules to the Parking Overlay have been formally adopted into the Banyule Planning Scheme. These include the Heidelberg Precinct Core Area, Bell Street Mall and Heidelberg West Core Area, the Social Housing Renewal in Bellbardia Estate and the Public Housing Renewal in Tarakan Estate forming Schedules 2, 3, 4 and 5 to the Parking Overlay, respectively.

Table 3-1 Clause 45.09 – PO1 Rates

Land Use	Existing Parking Rate	Car Parking Measure	Rate Reference Document
Shop*	4.6	to each 100 sq m of leasable floor area	Schedule 1 to the Parking Overlay – Banyule Planning Scheme
Food & Drink	3.5	to each 100 sq m of leasable floor area	Column B rate within Table 1 of Clause 52.06-5 – Banyule Planning Scheme
Restaurant	0.4	to each seat	Schedule 1 to the Parking Overlay – Banyule Planning Scheme
Office	3	to each 100 sq m of net floor area	Column B rate within Table 1 of Clause 52.06-5 – Banyule Planning Scheme
Medical Centre	3.5	to each 100 sq m of leasable floor area	Column B rate within Table 1 of Clause 52.06-5 – Banyule Planning Scheme
Dwelling	1 2 0.2	to each one and two bedroom dwelling, plus to each three or more bedroom dwelling, plus visitor spaces to each dwelling	Schedule 1 to the Parking Overlay – Banyule Planning Scheme
Restricted Retail	2.5	to each 100 sq m of leasable floor area	Schedule 1 to the Parking Overlay – Banyule Planning Scheme

* Other than restricted retail premises

3.4 Proposed Rates

Table 3-2 provides a summary of the recommended car parking rates to be applied to the overarching land uses contained within the study area. Section 6.2 within the Background Report derived recommended parking rates for each land use based on the available information and provided a breakdown of the methodology adopted in determining these rates, with a number of iterations performed in an attempt to model realistic supply and demand relationships.

Table 3-2 Recommended Parking Rates – Overarching Land Uses

Land Use	Recommended Parking Rate	Car Parking Measure	Planning Scheme Reference
Shop*	3.5	to each 100 sq m of leasable floor area	Column B rate within Table 1 of Clause 52.06-5 – Banyule Planning Scheme
Food & Drink	3.5	to each 100 sq m of leasable floor area	
Restaurant	3.5	to each 100 sq m of leasable floor area	
Office	3	to each 100 sq m of net floor area	
Medical Centre	3.5	to each 100 sq m of leasable floor area	
Dwelling	1	to each one and two-bedroom dwelling, plus	N/A
	2	to each three or more-bedroom dwelling, plus	Column B rate within Table 1 of Clause 52.06-5 – Banyule Planning Scheme
	0	for visitors to every 10 dwellings for developments of 10 or more dwellings	N/A
Restricted Retail^	2.5	to each 100 sq m of leasable floor area	Car parking rates to be applied within the Structure Plan area of Greensborough

^ To be applied within the Structure Plan area of Greensborough

* Other than restricted retail premises

4 Future Developments & Associated Parking Implications

Although Greensborough has attracted a smaller level of growth and investment in recent years than other major centres in the south of Banyule City Council (i.e. Heidelberg and Ivanhoe), there are a number of factors that position Greensborough for future growth and development.

To gain an understanding of anticipated future car parking conditions within Greensborough (and hence to ensure that the most appropriate management techniques are applied), it is considered important to review land use growth estimates as well as key developments either currently under construction (i.e. to be shortly completed) or recently approved.

4.1 Land Use Growth Estimates

4.1.1 Greensborough Major Activity Centre Assessment (Urban Enterprise Report)

Information on future development within the Greensborough Major Activity Centre (MAC) has been sourced from two separate documents prepared by Urban Enterprise in June 2017 for the City of Banyule, being an Economic Information Base Report and an Activity Centre Assessment report. Both documents have been used to determine future car parking demands anticipated to be generated by additional development within the Greensborough MAC up to the year 2036.

The following sections outline future growth predictions for key land uses.

4.1.1.1 Shop (other than restricted retail premises)

Future retail (shop) demand has been projected based on anticipated population growth in the retail catchment and per capita growth in retail spending (1% p.a.), assuming that the current market share will be maintained. Based on these, it is estimated that the additional supportable floor space over the next 20 years is around 12,400 sqm.

Application of the recommended retail rate derived by Cardno (within the Background Report) of 3.5 spaces per 100 sq m of leasable floor area to the projected increase of shop floor area listed above would equate to a future requirement for up to **434 additional car spaces**.

4.1.1.2 Office & Medical Use

The Greensborough MAC has been identified as a growing employment hub. Employment and floor space projections for the Banyule municipality as a whole indicate demand for an additional 69,000 sqm of commercial office floor space.

The Greensborough MAC currently accounts for approximately 12% of Banyule's employment in industries typically requiring office floor space (ABS 2011). Assuming Greensborough will capture the same proportion of employment growth over the next 20 years, an additional 11,000 – 17,000 sqm of commercial and medical office floor space would be required by the year 2036.

Application of the recommended office and medical centre rates derived by Cardno (within the Background Report) of 3 spaces per 100 sq m of net floor area and 3.5 spaces per 100 sq m of leasable floor area (respectively) to the projected increase of commercial and medical use floor areas listed above equates to a requirement for **between 330 – 510 additional car spaces** for commercial uses and **between 385 – 595 additional car spaces** for medical uses.

4.1.1.3 Dwelling

Between 2016 and 2036, the Greensborough area is projected to grow by 1,101 dwellings. This represents a growth rate of 55 dwellings per annum, representing 12% of Banyule's growth over the period. It is noted that no major residential developments have been constructed or granted building permits in the suburb of Greensborough to this date.

A total of 10 known development sites have been identified at present time, with an estimated yield of 465 dwellings. The status of these development proposals vary from pre-planning, planning approved and planning assessment. It is noted that the characteristics of these dwellings is unknown.

Given the evident capacities associated with on-street parking recorded across residential precincts situated within the study area, it is anticipated that residential and visitor parking demands associated with these dwellings will be comfortably accommodated on or off-site.

The projected increase in net floor areas within the Study Area and the corresponding projected increased in car parking demands have been summarised in Table 4-1.

Table 4-1 GMAC projected increase in floor areas and associated car parking demands

Land Use	Anticipated Applicable Rate and Car Parking Measure	Projected Increase in Net Floor Area (sq m)	Projected Increase in Car Parking Demands (No.)
Retail (shop)	3.5 to each 100 sq m of leasable floor area	12,400	434
Office	3 to each 100 sq m of net floor area	11,000 – 17,000	330 – 510
Medical Centre	3.5 to each 100 sq m of leasable floor area	11,000 – 17,000	385 – 595
Total		34,400 – 46,400 sq m	1,149 – 1,539 spaces

4.1.2 Car Parking Implications

Application of the recommended rates to projected increased in office, shop and medical floor areas by the year 2036 is projected to generate a requirement for additional parking within GMAC in the range of 1,149 and 1,539 car parking spaces.

Car parking occupancy surveys undertaken in September 2017 indicate that Zone A includes a total parking supply of 4,747 spaces. During the recorded Thursday survey peak, 3,683 spaces were occupied, leaving no less than 1,064 spaces vacant for general public use.

Application of the abovementioned requirement range to the current derived car parking capacity within Zone A alone would indicate a **shortfall of available parking in the range of 85 – 475 spaces**. In this regard, it is recommended that future developments provide for their anticipated parking demands by:

- > Providing for parking on-site where possible; or
- > Introducing measures to reduce the reliance on on-street parking for individual developments.

It is assumed that shortfall in parking required for future land use growth set to occur over the next 20 years will be towards the *lesser* end of this range. At present time, the above estimates are not able to factor in likely future influences, which would typically lower these projected demands, such as:

- > Likelihood of not *all* additional projected uses being situated specifically/wholly within Zone A *only*;
- > Changes in car parking demand trends within the GMAC (increase or decrease);
- > Increased reliance on public transport and push towards sustainable travel alternatives;
- > Decentralisation of car parking demands due to capacities in fringe precincts;
- > Better management of existing car parking facilities; and
- > Development of car parking facilities within the heart of GMAC to cater for growth.

4.2 Significant Future Developments

4.2.1 Primary Health Care IVF and Medical Centre

The Council building at 9-13 Flintoff Street, which has been sold to Australian Unity representing Primary Health Care, is proposed to be redeveloped to an IVF and Medical Centre with expected completion late November 2017. The proposed redevelopment will provide a laboratory, operating theatres supported by six patient beds, various processing and support rooms, and an ancillary food and drink premise. The internal car park will be upgraded with the addition of a designated ambulance bay.

4.2.2 273 – 275 Para Road, Greensborough

Based on discussions with Council it is understood that the vacant site at 273-275 Para Road, Greensborough is under consideration to develop a multi-level residential use.

4.3 Additional Parking Amenity

4.3.1 Free Public Parking in Greensborough

In late 2016, Council finalised construction of two additional off-street parking areas within and east of the Henry Street public car park, in order to *“accommodate increased demands anticipated to arise from major future developments.”*

These new car parking areas provide approximately 81 additional off-street spaces. Council has also sought to improve parking within its existing Henry Street car park, bringing the number of Council-owned parking spaces to approximately 800 within the GMAC (as of December 2016).

4.3.2 Development of Para Road / Flintoff Street Car Park

Council have expressed interest in exploring the possibility of developing the existing Para Road / Flintoff Street at-grade gravel car park into a multi-level car park. The additional parking would cater for the significant demands generated primarily by train commuters and staff working within the Greensborough Walk commercial precinct and future Primary Health Care staff immediately south of this site.

5 Car Parking Management Techniques

5.1 Introduction

In order to determine the basis for any applied car parking strategies, it is relevant to first understand some of the fundamental, overarching principles that relate to car parking and car park planning.

5.2 Banyule Activity Centre Visions

While the below sections of this report outline some general car parking principles, it is also important in developing a parking strategy to understand the vision for the area to which the strategy applies as the adopted vision for the area can have significant impacts on the direction of the car parking strategies.

In this respect, reference has been made to the Banyule Activity Centre Car Parking Policy and Strategy, which states the following key objectives concerning transport and accessibility:

- > *Protect existing residential areas from commercial and other spill-over parking;*
- > *New residential developments within the Activity Centres shall not impact on parking availability for commercial and service users;*
- > *Provide car parking and vehicle access at an appropriate level and in appropriate locations to ensure vehicle connectivity and availability for retail, commercial and residential needs;*
- > *Utilise parking and parking management as an effective travel demand management tool for achieving wider transport planning objectives;*
- > *Ensure available car parking is best managed to enable appropriate turnover and usage of parking space; and*
- > *Use parking controls to encourage the take-up of alternative modes of transport; walking, cycling and public transport.*

Other relevant local government policies, such as the Greensborough Transport Masterplan and Banyule Integrated Transport Plan 2015-2035 define a number of objectives and strategies in respect to car parking. In particular, these policies define the importance of the use of sustainable transport modes as a means of managing car parking demands.

5.3 Priority Allocation of Spaces

Council recognise that car parking is a finite resource and as such, considerations need to be given to the priority order in which drivers should have access to car parking. The considerations give regard to the mobility of drivers accessing a centre, the desire to promote sustainable and active modes of travel and servicing of businesses.

In this regard, Banyule's Parking Management Framework indicates the priority allocation of parking within and around the Study Area, as indicated in Figure 5-1.

Figure 5-1 'Commercial' area parking priorities (kerbside)



5.4 Definitions of Car Parking ‘Problems’ and Solutions

Parking ‘problems’ are often a motorists’ impression that parking is perhaps inadequate, inconvenient or expensive. This implies that the best solution is to increase parking supply and facilities without directly charging users.

A paper on ‘Shared Parking Facilities Among Multiple Users’ prepared by The Victorian Transport Policy Institute (updated 21 December 2015) suggests that there are other ways to define parking problems that propose practical car parking solutions.

The study suggested that parking issues might stem from:

- > Inadequate information for motorists on parking availability and price. The solution could be to improve use information;
- > Inadequate user options. The solution could be to improve parking options, such as letting motorists choose between convenient, priced parking and less convenient, free/inexpensive parking;
- > Inconvenient parking pricing methods, such as mechanical meters that require users to predict how long they will be parked and only accept certain coins. The solution could be to improve pricing systems;
- > Inefficient use of existing parking capacity. The solution could be to use Parking Management strategies that result in more efficient use of parking facilities;
- > Excessive automobile use. The solution could be to reduce Automobile Dependency and encourage transportation alternatives;
- > Concerns over overspill parking congestion in nearby areas if parking supply is inadequate or priced. The solution could be to provide parking management and enforcement in impacted areas; and
- > Economic, environmental and aesthetic impacts of parking facilities. The solution could be to reduce parking supply and improve parking facility design.

Table 5-1 summarises these different perspectives and the solutions they imply.

Table 5-1 Comparisons between perspectives on car parking issues

Perspective	Problem	Potential Solution/s
Supply-orientated	Inadequate supply and/or excessive price	<ul style="list-style-type: none"> – Have governments, businesses and residents supply more parking via financial contribution schemes. – Review minimum parking requirements in effect.
Information-orientated	Inadequate user information	<ul style="list-style-type: none"> – Create signs, brochures and other information resources indicating parking availability and price.
Choice-orientated	Inadequate consumer options	<ul style="list-style-type: none"> – Increase the range of parking convenience and price levels available to consumers.
Pricing/convenience-orientated	Pricing is inconvenient	<ul style="list-style-type: none"> – Develop more convenient payment and time options.
Efficiency-orientated	Inefficient use of existing parking capacity	<ul style="list-style-type: none"> – Promote the use of shared parking facilities. – Implement transport and parking demand management. – Price parking. – Provide shuttle services to parking facilities.
Demand-orientated	Excessive automobile use	<ul style="list-style-type: none"> – Improve access and transport choice. – Implement transport and parking demand management programs
Overspill impacts	Inadequate parking causes problems in other locations	<ul style="list-style-type: none"> – Use management strategies to respond to overspill problems. – Improve enforcement of parking regulations.

5.5 Walkability

Acknowledgement must be given to appropriate walking distances between car parking locations and a user's intended destination.

The time and distance which drivers are prepared to walk is directly proportionate to the length of time that will be spent at their destination. The acceptable walking distance can also be impacted by the quality of the pedestrian environment, climate, available sight lines (i.e. is the destination visible from the parking location) and friction (such as barriers needing to be negotiated when crossing busy roads).

Providing car parking within a proximate distance to a given destination has an impact on its desirability for staff and visitors to drive there. Furthermore, if car parking is within a proximate distance to a more general precinct it can enable multi-purpose trips and thus reduce the number of trips within the precinct. This is much the case for many precincts located within Zone A of the study area.

The paper on 'Shared Parking Facilities Among Multiple Users' prepared by The Victorian Transport Policy Institute (Updated 21 December 2015) indicates the following walking distances as a guide for various activities as set out in Table 5-2.

Table 5-2 Acceptable walking distances based on end activities

Adjacent (Up to approx. 30m)	Short Walk (Less than approx. 250m)	Medium Walk (Less than approx. 400m)	Long Walk (Less than approx. 500m)
<ul style="list-style-type: none"> > People with disabilities > Deliveries and loading > Emergency services > Convenience store 	<ul style="list-style-type: none"> > Grocery stores > Professional services > Medical clinics > Residents 	<ul style="list-style-type: none"> > General retail > Restaurant > Employees > Entertainment centre > Religious institution 	<ul style="list-style-type: none"> > Major sport or cultural event > Overflow parking

Table 5-2 indicates 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 increases, the longer they find it acceptable to walk.

Much of the Study Area falls within a 400m (medium) walking radius between extremities. It is noted however that given the topography of Greensborough, the walkability of the area is limited. For example, a generally short walk up from the station to the shops can be difficult considering the particularly steep nature of Greensborough.

5.6 Theoretical Parking Capacity

Typically, parking utilisation in publically available on-street car parking areas greater than 85% represents a situation where drivers are unable to identify where vacant spaces exist and subsequently represents effective capacity.

For off-street public car parks, a level of 90% is more likely to represent the theoretical capacity, particularly when car parks are not excessively large, the density of car spaces are higher when compared with typical on-street layouts. Based on this, the theoretical capacity of the Study Area is based on 85% for on-street spaces and 90% of off-street spaces.

Demands above these theoretical capacities can and do exist, including within the Study Area during precinct-specific peak periods. Generally, such levels of demand result in extra local traffic movements as vehicles circulate in search of a vacant car space. It is noted that the theoretical capacity (of 85% and 90%) is an aspirational target for broad level strategies such as this, and is in line with the target occupancy level of 85% capacity (measured during regular peak demand periods) described in the Banyule Parking Management Framework.

In more specific cases (i.e. development applications), the use of spare capacity can be appropriate in localised areas surrounding a site where vacancies are more readily defined as suitable for purpose.

5.7 Car Parking Demand Management Techniques

5.7.1 General

A high-level discussion regarding car parking management techniques is provided below as reference to the development of the Car Parking Strategy, noting that GMAC currently utilises some of these techniques. It is anticipated that an investigation into supply and demand control measures will assist in implementing strategies to reduce current private motor vehicle reliance.

Management techniques that have been considered appropriate to support a reduction in car parking demands throughout the Study Area potentially causing traffic congestion and promoting a change to sustainable travel habits have been outlined below:

- > Reduction of Car Parking Rates;
- > Parking Restrictions;
- > Parking Permit Schemes;
- > Parking Enforcement;
- > Parking Guidance Signage;
- > Parking Improvement;
- > Parking Pricing;
- > Reduction of Existing Car Parking Supply;
- > Behaviour Change Programs; and
- > Incentives for Sustainable Transport Modes

These various techniques are further described in the following sections of this report.

5.7.2 Reduction of Car Parking Rates

The Background Report prepared by Cardno identified a number of car parking rates for overarching land uses typically situated within GMAC that are in line with or **below** the current parking provision rates.

The provision of reduced car parking rates compared to what the precinct currently generates may be a useful tool in reducing current road network congestion and assist in a modal shift when considering the way in which people travel to and from the Study Area. It is likely that reduced car parking provision rates alone will not be adequate to manage the existing and future car parking demands, considering reduced rates applicable to future development can only be applied to reduce the *amount* of parking that is provided. Consequently, it is recommended that additional demand management techniques be explored to modify and reduce existing car parking demands within the Study Area.

5.7.3 Increase in Parking Restrictions

Car parking restrictions are generally fundamental for appropriate management of car parking.

Parking restrictions have the capability of defining parking areas for specific user groups (providing priority for certain user types if and when required), and importantly creating a turnover of parking within spaces to allow for a greater number of motorists to use the same space. Conversely, the incorrect use of car parking restrictions can have negative carry-on effects to vehicle turnover and can often cause excessive vehicle circulation in search of a car park and/or overspill into the surrounding areas.

Where relevant, car parking restrictions can also assist in reducing the likelihood of car parking overspill into surrounding land uses, which may result in a loss of amenity for surrounding land owners and/or residents.

It is acknowledged that car parking within an Activity Centre is typically a shared public resource where often it would appear 'inefficient' to dedicate parking to a single user type. As a result, a balanced parking approach ought to be adopted when introducing/changing parking restrictions in a particular area.

5.7.4 Parking Permit Schemes

The purpose of a parking permit scheme is to provide a management mechanism for distributing the benefits of publicly available parking resources to residents or businesses in the area during known times of peak parking demand. At the same time, the intention of parking permit schemes is to minimise the possibility of adverse impacts on commercial activities, particularly during peak business hours. Parking Permits also serve to provide exemptions from parking restrictions where applicable.

It is noted that Banyule City Council currently provides residential car parking permits within the suburb of Greensborough, under the 'Banyule Place: Resident Parking Permit Policy 2016-2020'. The policy aims to facilitate vehicle access for residents and their visitors, while preserving access for other legitimate road users including cyclists, public transport services, customers, traders, disabled persons and commuters.

5.7.5 Parking Enforcement

Car parking restriction enforcement is critical to the implementation and ongoing maintenance of a given car parking system. Without consistent and appropriate enforcement, particularly in areas such as Activity Centres where parking demands are substantial, car parking restrictions risk being ignored.

Parking enforcement is critical to ensure that:

- > Parking is occurring in line with its intended allocation;
- > Parking activities are occurring in a safe manner; and
- > Illegal parking activities do not impact on commuter safety by potentially interfering with traffic circulation.

In order to maintain compliance with the nominated parking restrictions, there needs to be a suitable level of enforcement applied. This is typically achieved by implementing an appropriate level of surveillance and issuing penalties for non-compliance.

In this regard, it is noted that it is possible to introduce technology for the surveillance, ticketing and processing of parking offences. By way of example, sensors embedded in the pavement can detect when a car has over-stayed the associated restriction and alert a nearby parking officer who can then issue an infringement notice. Evidently, despite this type of technology incurring a high implementation cost, it can reduce operational costs, improve the coverage of officers and improve the responsiveness to illegal parking. The use of technology also allows a greater and more frequent coverage of key areas to maintain effective turnover and operations of parking.

5.7.6 Parking Guidance Signage

Parking guidance (way finding) signage has traditionally been important for:

- > Identifying car parking areas to ensure the most effective use of all available spaces, particularly areas which may not be initially visible or generally known to the average driver;
- > Potentially reducing road network congestion caused by vehicles circulating to find an available car space; and
- > Assist drivers with quick and easy car space access.

In addition, and further to the standard (static) way finding signage, dynamic car parking signage allows the number of vacant car parking spaces in a given area to be continuously displayed and updated on electronic signs located at key driver decision points. Typically, dynamic parking signage is implemented within large off-street car parking facilities. The Greensborough Plaza off-street multi-deck car park could be considered a good candidate for implementation of dynamic way finding signage.

This type of technology is known to improve the utilisation of car parking areas, particularly as they reach capacity where it becomes more difficult for a driver to identify the locations of vacant spaces. They can also assist in reducing road network congestion as vehicle circulation and time spent in search of a vacant space is reduced, in turn improving pedestrian safety.

These systems operate through the detection of a vehicle parked in a space or entering and exiting a car parking area. This information is fed to a controlling computer system and then relayed to the associated electronic signage. Signs are located at positions that give users sufficient time to decide whether they enter the associated car parking area or not.

5.7.7 Improvements to Car Parking

Maintenance of car parking areas is important to ensure that parking is safe, efficient and attractive to its intended users.

While a review of parking areas to this level of detail is not part of this investigation's scope, it is recommended that Council continually work with private car parking owners to ensure that parking facilities meet with current design standards, and are maintained at an appropriate level.

5.7.8 Reduction of Existing Car Parking Supply

The provision of an available car parking resource is regularly correlated to car parking demands and vehicle trips on a road network.

By reducing the available parking provision within an area, it is possible to effectively manage or even reduce the car parking demands associated with that car parking. An example of this can be seen when comparing the recorded car parking supply and related occupancy levels during the 2006 Greensborough Parking Plan project and the same results obtained during the 2017 project. Results show that, despite the considerable decrease in car parking supply situated within Zone A, car parking demand levels have remained the same.

In the context of the identified Study Area, a reduction in car parking supply could be considered a useful tool to assist in shifting travel habits to sustainable and active travel modes, a key objective defined in the Greensborough Transport Masterplan. In this regard, it is noted that the appropriateness of a reduction of existing car parking within an activity centre should be carefully considered as it has the potential to reduce the commercial attractiveness of the area.

5.7.9 Driver Behavioural Change Initiatives

5.7.9.1 Green Travel Plans

Green Travel Plans (GTP) are often prepared for major developments to assist in reducing private vehicle dependency and to encourage the use of public and active modes of travel. Green Travel Plans may be required as part of planning applications for new major developments situated in the Study Area.

Clause 52.36 of the Banyule Planning Scheme's Integrated Transport Planning Policy is useful to guide the determination of what defines a "major" development, which typically provides the trigger for the preparation of a Green Travel Plan:

- > *A residential development comprising 60 or more dwellings or lots.*
- > *A residential building comprising 60 or more lodging rooms.*
- > *A residential village comprising 60 or more dwellings.*
- > *A retirement village comprising 60 or more dwellings or lots.*
- > *A new retail premises of 4000 or more square metres of leasable floor area.*
- > *An increase of more than 1000 square metres to the leasable floor area of an existing retail premises which is 4000 or more square metres leasable floor area.*
- > *An office development of 10,000 or more square metres of leasable floor area.*
- > *A place of assembly comprising 400 or more seats or 600 or more square metres of gross floor area.*
- > *An education centre.*
- > *A major sports and recreation facility.*
- > *Any alteration or development of public transport infrastructure or stops.*

It is anticipated that GTPs prepared for major developments will explore a site's accessibility to surrounding amenities and public transport services. It should outline how a proposed development will seek to maximise and encourage the use of these services by its tenants and/or residents. The GTP should also consider how car sharing and/or carpooling could be provided on the site, and any other relevant matters.

In this regard, a GTP may include (but not be limited to) the following items:

- > Maps outlining practical walking, public transport and cycling routes guiding occupants to general amenities and key land uses in the vicinity of the site;
- > The provision of lockers, showers and change rooms (i.e. end-of-trip facilities) for employees;

- > The provision of public transport tickets at the workplace for work travel during the day;
- > The supply of a workplace bicycle toolkit and other frequently required spare equipment potential stored in a secure bicycle compound;
- > Active advertising for the participation in annual sustainable transport events i.e. Ride to work day; and
- > The use of a car sharing system (typically either a registered service or through the use of a company vehicle).

5.7.9.2 *Bicycle Parking*

Clause 52.34 of the Planning Scheme aims to encourage cycling as a mode of transport with the provision of secure, accessible and convenient bicycle parking spaces and associated end-of-trip facilities.

As new development occurs, end-of-trip facilities will be provided for both staff and customers. It is Council's responsibility to enforce the implementation of these facilities where possible, except where it is not practical to access the site by bicycle or where staff and customers are restricted due to the type of goods being sold.

Should additional end-of-trip facilities be provided, along with any other initiatives that are likely to result in the increased use of alternate modes of transport, then reductions in the minimum number of car parking spaces required to be provided should be considered at the very least.

5.7.9.3 *Motorcycle Parking*

While Clauses 52.06 and 52.34 outline the statutory car and bicycle parking requirements of development proposals respectively, no consideration is given within the Planning Scheme to facilitate the provision of motorcycle (or scooter) parking within developments.

It is recommended that motorcycle parking be considered for all new public and private car parks constructed in the Study Area.

5.7.9.4 *Car Share Initiatives*

Public car sharing facilities, such as those provided by Flexi Car, Green Share Car and Go Get (as well as smaller registered companies) should be encouraged within the Study Area as development increases, particularly within mixed-use developments featuring residential apartments, as a means to further reduce the car dependency within the Study Area.

6 Strategy Recommendations

6.1 Introduction

The following section of this report describes the process undertaken to develop a set of car parking strategy recommendations for the Study Area.

These recommendations have been developed to suitably manage existing and future car parking provisions and land use car parking demands whilst providing a balanced solution which considers the needs of all stakeholders.

6.2 Objectives

The recommendations of this strategy have been developed having regard for the following set of objectives. These objectives relate to the findings contained within *Part 1: Background Report – Greensborough Activity Centre Parking Plan* prepared by Cardno.

The key objectives for this strategy have been outlined below:

- > Manage car parking demand and supply to satisfy user needs using sustainable techniques;
- > Locate and manage car parking so as to minimise traffic generated by the search for a parking space;
- > Reduce vehicle trips by minimising the parking provision where appropriate through the review of existing car parking provision rates;
- > Encourage the use of active and sustainable travel modes where appropriate; and
- > Improve general amenity for pedestrians within the Study Area in particular in locations serving as key pedestrian connections to public transport services, whilst realistically keeping in mind the topography of the Study Area.

6.3 Overall Study Area Recommendations

Upon review of Section 5 – *Existing Car Parking Demands* of the Background Report, it was observed that the highest levels of car parking demand during the survey periods occurred during typical weekday commercial and retail business hours (12:00pm – 1:00pm). At this time, an overall parking occupancy level of 58% was recorded, noting an occupancy level of 78% recorded in Zone A alone.

With an overall car parking occupancy of 58% within the Study Area, it is apparent that suitable capacity exists within the study area when compared to the 'theoretical' car parking capacity of 85%. It is however important to note that the current parking resources *in select areas* can certainly be managed to provide a suitably 'balanced' allocation and location of car parking for users.

In analysing the appropriateness of car parking restrictions, it is noted that no particular guidelines or standards exist which specify how car parking restrictions within an Activity Centre should be allocated. Instead, Activity Centres require a mix of parking restriction durations and durations dependant on the individual uses contained within the centre. By way of example, the retail-dominant GMAC is likely to require ample supply of very-short to short-term restrictions in order to encourage turnover of spaces. Consequently, to determine the most suitable mix of parking restrictions, duration of stay data and issues observed during Cardno's site inspection referenced within the Background Report will be drawn upon.

Appropriate management of car parking can be used to increase turnover of spaces to allow a greater number of drivers to use the same parking space or ensure that specific user groups can park in appropriate locations. An example of this is the provision of car parking along residential streets designed to be shared during daytime (business) hours but conversely restricted to residential permit parking only in the evening. Residential visitor demands are likely to typically occur outside of business hours or on weekends generally when short-term restrictions do not apply (in select pockets within residential precincts on the fringe of Zone A). Car parking within the Study Area should be provided proximate to the land user which they intend to service and restricted accordingly (e.g. long term parking within Precinct J or the vicinity of Greensborough Train Station, very short-term to short-term parking along Main Street servicing retail customers).

In order to control parking, parking enforcement within the Study Area should be at least maintained with additional resources recommended to focus on areas found to experience the highest levels of overstay (as identified within Section 5.3 of the Background Report). Parking enforcement is important to ensure the parking system is used as per its intended design, encouraging car parking turnover and the efficient use of

parking spaces for multiple users in short term parking areas as well as maintaining safe and functional road networks.

To offset any recommended changes from long-term to short-term car parking restrictions (and vice-versa), a way finding signage strategy should be developed to highlight the existence of underutilised off-street car parking areas (i.e. Henry Street Car Park). These are anticipated to be particularly useful for motorists to identify convenient parking locations.

Although static signage is prevalent throughout GMAC (acknowledging this is often recommended), electronic (variable) signage could be considered for improved management of available spaces in selected existing off-street car parks. Signs are to be installed at locations that give users sufficient time to decide whether they enter the associated car parking area or not, and avoids motorists circulating car parks when already at full capacity.

The existing structure of on-street fee parking should be reviewed to ensure that fee-based off-street car parking is most 'attractive' to users rather than on-street opportunities, in particular in areas where alternative parking options were found to spill into residential precincts.

Remove the existing Schedule 1 to the parking overlay. The car parking requirement for new developments within the Greensborough Activity centre will be subject to the requirements of Clause 52.06, with the majority of the activity centre being subject to Column B car parking rates

6.4 Precinct Specific Recommendations

With respect to the above and in regard to car parking demand management techniques previously outlined in Section 5 of this report, the following strategies are further detailed for each precinct under the following sub-sections where applicable.

6.4.1 Zone A

6.4.1.1 Precinct A

Precinct A contains the Woolworths supermarket and associated car parking (short-term restrictions), with the adjoining petrol station currently closed due to renovations. Generally typical of supermarkets, the peak demand periods were recorded at 6:00pm on the Thursday and at 1:00pm on the Saturday survey days, when the car parking areas were fully occupied.

It is noted that parking demands recorded at the Woolworths car park were considerably lower at other periods of the survey days.

Cardno undertook an inspection of the Woolworths car park during the lunchtime peak period on the Thursday survey day (observations revealed that Woolworths patrons are typically choosing to park within the on-site car park as opposed to parking immediately east in the Henry Street car park or along Ester Street).

In this regard, no precinct-specific issues were recognised which suggest that the current short-term restrictions within the Woolworths off-street car park are suitably managed at present time and appropriate in nature given duration of stay survey results were aligned with the parking restriction type.

6.4.1.2 Precinct C

Precinct C consists of a variety of mixed-use strip shops with a high proportion of cafes/restaurants. Precinct C is considered one of three main GMAC parking areas, with an off-street car park accounting for the majority of the precinct area.

Cardno's site inspections revealed that restriction signage appears to be limited throughout the Henry Street car park, often at times difficult to visually identify. In this regard, drivers are likely to be unaware of the restrictions in effect within the area they park in and consequently risk overstaying. Further, drivers seeking short-term parking availability may opt to park in unrestricted spaces, rendering them unavailable to drivers who require long term parking.

An example of the lack of restriction signage throughout this car park has been shown in Figure 6-1.

Figure 6-1 Henry Street car park facing east



With respect to the above discussions, the following strategy is recommended for the Precinct.

Strategy Item 1 – Precinct C:

Undertake a review of existing parking restriction signage provision within the Henry Street car park and consider additional signage throughout.

6.4.1.3 Precinct D

Greensborough Plaza Shopping Centre makes up the majority of this precinct. The remainder of Precinct D comprises strip shops along Main Street and Grimshaw Street. Precinct D is bound by Grimshaw Street, Main Street and The Circuit and is considered one of the three main GMAC parking areas.

The Background report prepared by Cardno identified overstay parking within the 90-minute at-grade area situated along the northern side of Greensborough Plaza. Overstay calculations for this area were conservatively modified to account for the likely number of staff vehicles parking in this area displaying permits.

Consequently, the following strategy is recommended for the Precinct.

Strategy Item 2 – Precinct D:

Discuss the possibility of increasing car parking enforcement throughout the 90-minute car parking area within Greensborough Plaza with Centre Management. Requirement for increased monitoring to be reviewed on a regular basis (to be assessed against quantity of overstay vehicles recorded).

As noted in The Background Report, car parking durations of stay recorded throughout the remainder of Precinct D (specifically the Greensborough Plaza multi-deck car park) have not been considered in order to calculate overstay levels, as the overall number of vehicles opting to pay for all day parking, staff vehicles and the like was not included in the parking survey scope.

6.4.1.4 Precinct E

Precinct E (also known as the Carter Reserve precinct) contains a mixture of land uses including retail uses, office uses, off-street multi-level car parking, the WaterMarc leisure centre, and the One Flintoff development housing Council offices. The retail component consists of strip shops fronting onto Main Street with access from a rear laneway. This precinct contains an at-grade car park and multi-level car park, and is considered one of the three main GMAC parking areas.

Parking survey results indicated that, during the identified overall peak period, short-term parking spaces provided within the Carter Reserve multi-deck car park were recorded as being highly occupied (85%), noting occupancy levels in this car park peaked at 10:00am, when the car park was very highly occupied

(~95%). It is noted that high to very high occupancy levels were generally recorded between approximately 9:00am until 5:00pm.

Duration of stay trends were supportive of the allocated restrictions, albeit it was estimate that approximately 10% of vehicles overstayed the parking restriction.

In this regard, the following strategies are recommended for implementation within Precinct E.

Strategy Item 3 – Precinct E:

Investigate the installation of electronic (variable) signage at the Carter Reserve multi-deck car park for better management of available spaces given consistently high to very high occupancy levels recorded.

Signs are to be installed at locations that give users sufficient time to decide whether to enter the car park or not. This reduces the likelihood of vehicles excessively circulating areas containing significant levels of pedestrian foot traffic such as the back-of-house access road running parallel to Main Street and the Carter Reserve multi-deck car park itself (often parents with young children as observed during Cardno’s site inspection).

A visual example of an indicative variable signage board displaying the number and location of available spaces situated at the Carter Reserve car park Flintoff Street entry is shown in Figure 6-2.

Figure 6-2 Example of a variable signage board



Strategy Item 4 – Precinct E:

Increase car parking enforcement throughout the Carter Reserve multi-deck car park.

6.4.1.5 Precinct F & G

Stubley Court is located in the centre of Precinct F and is surrounded by Grimshaw Street, Howard Street, Warwick Road and Eldale Avenue. The area consists almost entirely of residential properties, with smaller medical uses located throughout. Precinct G is bound by Grimshaw Street, Eldale Avenue and Warwick Road, consisting mainly of residential, medical and health care properties. The Banyule Health Service is the major property attracting considerable patronage within the precinct, with associated medical practices, a day care and aged care facility.

The study has combined these two precincts given their similarities in regard to dominating land uses (being medical and residential).

Parking survey results previously analysed within The Background Report indicated that, during the precinct-specific peak period (Thursday at 12:00pm), parking occupancy levels were recorded at 41%, classified within the 'very low' range. Despite a majority of off-street car parks experiencing very low demands at this time and all other times, on-street demands within the northern portion of the precinct were observed as being very high in nature during typical working hours. An example of this was noted when observing parking along the western side of Alexandra Street, identified to be fully occupied during multiple observation periods. This resulted in the narrowing of the northbound lane width which could potentially cause a passing vehicle to collide with a parked car and the potential for traffic congestion. Although outside of the area defined as the 'Medical Precinct', patrons associated with the medical centre's different clinics were observed parking in this location. Although it is acknowledged that Alexandra Street technically divides Precincts I and S, parking demands within this street were found to be generated by medical patrons frequenting uses within Precinct F&G.

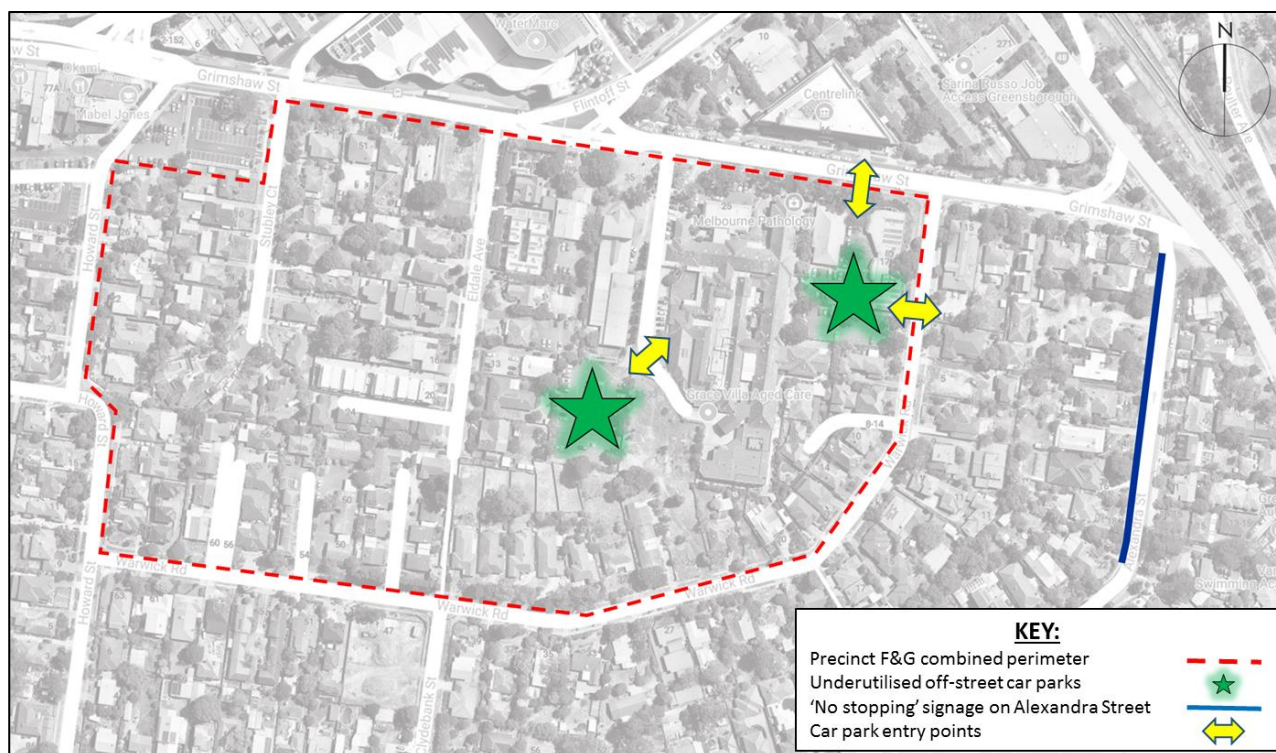
The underutilisation of the *majority* of long-term spaces located within the southern portion of the precinct resulted in overall very low occupancy rates.

Living Faith Church car park operates for community use, accessed solely off Grimshaw Street and offered for general community/public use. Cardno noted that despite the reasonable usage fee (\$2.00 entry fee, unrestricted stay length), the car park appeared to be considerably underutilised. Centrelink / Medical Precinct patrons in the vicinity were instead opting to park along the grassed areas along the western side of the car park access road. Further, usage of the privately owned 'Diamond Valley Specialist Centre and Dental Group' is controlled by a car park attendee, with use restricted to patrons of the Centre only. Cardno noted that the carpark appeared to be significantly underutilised across the various observation periods.

Following discussions with these private car park owners in the aim of finding a solution to benefit all stakeholders and consequently reduce existing substantial reliance in on-street parking in the immediate area, the public usage of these car parks *could* be promoted and a way finding signage strategy *could* be developed to highlight these off-street car parking areas.

In consideration of the above influences, the following strategies are recommended to be implemented within Precinct F&G, as shown in Figure 6-3.

Figure 6-3 Precinct F&G recommended parking strategies



Strategy Item 5 – Precinct F & G:

Discuss the possibility of promoting the 'Living Faith Church' public car park with the relevant stakeholders via the installation of way finding signage, including proposed charges and operating hours.

Strategy Item 6 – Precinct F & G:

Discuss the possibility of promoting the 'Diamond Valley Specialist Centre and Dental Group' off-street car park with the relevant stakeholders via the installation of way finding signage, including proposed charges and operating hours.

6.4.1.6 Precinct H

Precinct H includes medium and low density housing as well as some medium density offices. It is noted that a Centrelink facility is located along the southern boundary of Precinct H.

No precinct-specific issues were recognised which suggests that the current restrictions and demand are suitably managed at present time.

It is noted that Council have recently informed Cardno that since the commissioning of the signalised intersection of Grimshaw Street and Flintoff Street, the observed number of illegally parked vehicles along the southern side of Grimshaw Street fronting Centrelink has decreased considerably. It is therefore likely that this will not be an issue moving forward.

6.4.1.7 Precinct I

No precinct-specific issues were recognised within Precinct I which suggests that the current restrictions and demand are suitably managed at present time, noting the recommended installation of "No Stopping" signage along the western side of Alexandra Street is outlined and discussed in Section 6.4.1.5.

6.4.1.8 Precinct J

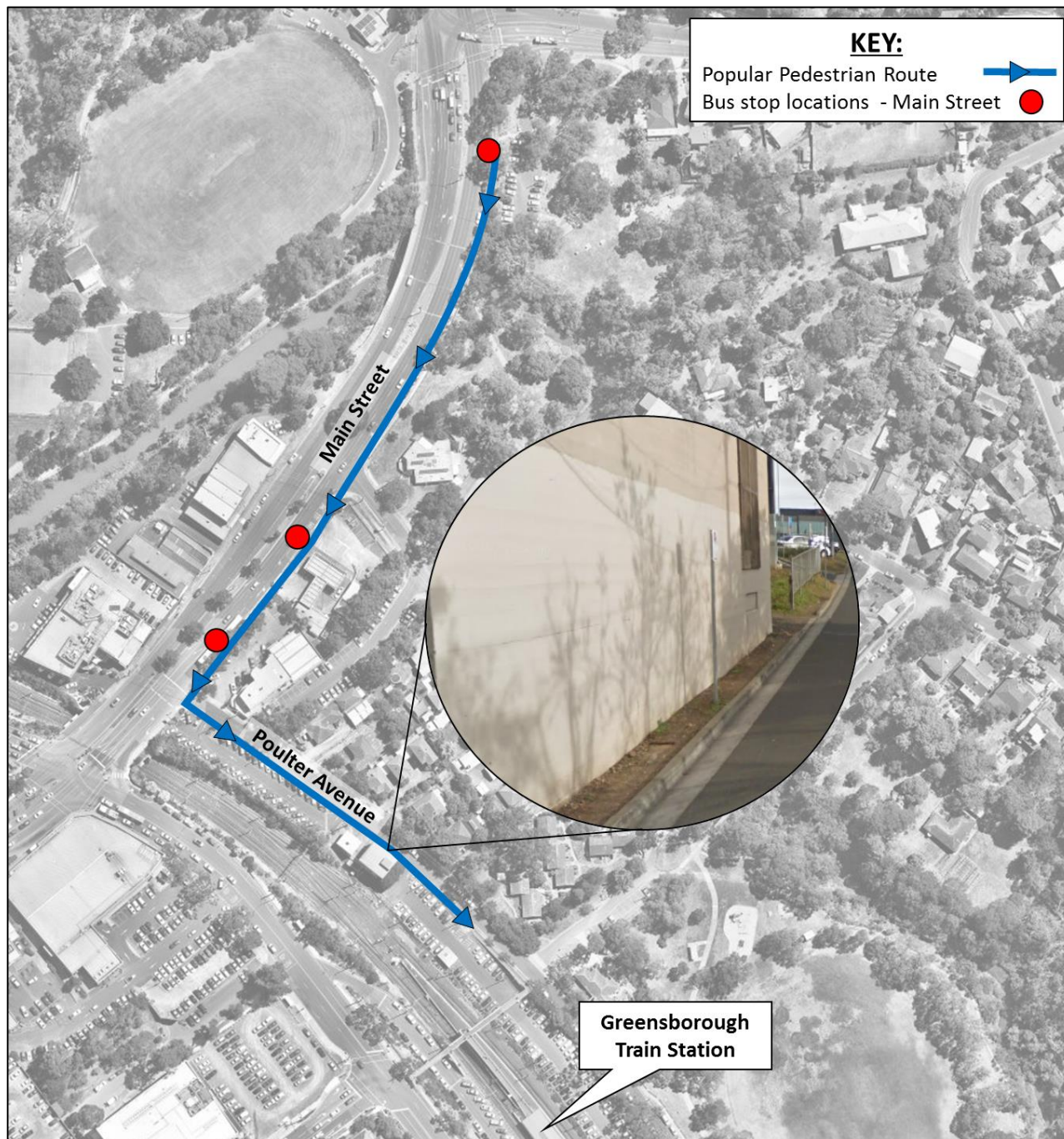
Precinct J encompasses the Greensborough Train Station and associated unrestricted at-grade parking area owned and operated by Metro Trains, designated for use by public transport commuters.

Car parking occupancy results and duration of stay surveys indicate that, in line with anticipated demands generated by train commuters, Precinct J is currently fully saturated throughout most weekdays, with minimal turnover of spaces throughout the day during typical business hours.

Cardno undertook an observation of the on-street parking provision along Poulter Avenue. Over the two inspection days, Cardno observed that train commuters tended to seek the unrestricted parking along the length of Poulter Avenue (to Bicton Street) before opting to utilise paid parking along the northern side of Poulter Avenue. Given observations made in neighbouring residential streets to the north of the train line, it is likely that train commuters and motorists seeking long term parking are utilising unrestricted supplies in these areas before opting to pay for parking. This is not reflective of the parking conditions observed at the Para Road/Flintoff Street car park during the same morning period, which was observed as being fully occupied by 7:00am – 7:30am. Paid parking along Poulter Avenue was observed as being more 'heavily' utilised later in the morning period, when it is likely unrestricted parking amongst adjoining residential streets has become fully occupied.

Cardno observed a significant proportion of train commuters approach the station's walkway overpass from the northern end of Poulter Avenue, approaching in platoons from the Main Street. This is likely due to the location of the bus stop on Main Street some 25 metres north of the commencement of Poulter Avenue. Pedestrians were observed crossing Poulter Avenue to access the Station at times carelessly and without consideration for vehicles. As shown in Figure 6-4, no formal footpath is provided across a portion of the southwest side of Poulter Avenue, without sufficient separation between pedestrian and vehicle movements.

Figure 6-4 Popular Pedestrian Route – train commuters



The following strategy is recommended to be implemented within Precinct J.

Strategy Item 7 – Precinct J:

Advocate to State Government authorities for the provision of pedestrian access facilities at Greensborough Station, particularly from Main Street along the southern side of Poulter Avenue.

6.4.1.9 Precinct K

This precinct contains the north-eastern strip shops on Main Street which are provided with parking at the front and rear of these tenancies.

No precinct-specific issues were recognised which suggests that the current restrictions and demand are suitably managed at present time.

6.4.1.10 Precinct L

Precinct L is located on the northwest side of the intersection of The Circuit and Main Street. This precinct primarily comprises the RSL building and associated off-street parking areas. A small number of retail and commercial tenancies front Main Street and include rear parking areas.

No precinct-specific issues were recognised which suggests that the current restrictions and demand are suitably managed at present time.

6.4.1.11 Precinct L1

South of the railway line, Precinct L1 mainly consists of mixed-use strip shops with some rear parking.

The Background report prepared by Cardno identified overstay parking within the at-grade off-street car park comprising the majority of Precinct L1. Up to 14.5% of vehicles were found to overstay the 2P restriction periods on the Thursday survey day, with overstay percentage dropping slightly to approximately 12.5% on the Saturday survey day.

Consequently, the following strategy is recommended for Precinct L1.

Strategy Item 8 – Precinct L1:

Increase car parking enforcement throughout the off-street car park. Requirement for increased monitoring to be reviewed on a regular basis (to be assessed against quantity of overstay vehicles recorded).

6.4.2 Zone B

Generally speaking, it is likely parking demands within residential precincts are associated specifically with residents and occasional residential visitors, with no apparent reason to suggest residential precincts within the study are subject to *significant* levels of infiltration from commuter / activity centre staff seeking long-term parking opportunities.

6.4.2.1 Precinct B

Precinct B is solely made up of Greensborough Primary School along with the on-street car parking supply along Lorimer Street and Horonda Street. As is typical of primary school pick-up / drop-off activity, the peak demand periods were recorded at 3:00pm on the Thursday (87% occupancy).

It is noted that the peak occupancy period referenced above represents the 'worst-case' scenario from a parking demand perspective, with parking demands recorded across the precinct considerably lower across other periods of the survey days.

No precinct-specific issues were recognised which suggest that the current short-term restrictions and overall car parking supply within vicinity of the school are suitably managed at present time and appropriate for the major land use.

6.4.2.2 Precinct M

Precinct M is generally made up of residential areas, and also contains Greensborough War Memorial Park. Parking provisions within this precinct are generally on-street and unrestricted, with some short-term restricted parking located along Ester Street and off-street car parking provisions located within the park and the adjacent commercial land use. Car parking occupancy was observed to remain low across the survey period, with peak parking occupancy observed at 7:00pm on the Thursday survey day (30%) and 7:00pm on the Saturday (25%).

No precinct-specific issues were recognised from the survey results or site inspection observations, suggesting that the current car parking supply throughout the precinct within/in vicinity of the Greensborough War Memorial Park and throughout residential streets are suitably managed at present time.

6.4.2.3 Precinct N

Precinct N is generally made up of residential areas. No precinct-specific issues were recognised which suggests that the current restrictions and demand are suitably managed at present time.

6.4.2.4 Precinct O

Precinct O is generally made up of residential areas. No precinct-specific issues were recognised which suggests that the current restrictions and demand are suitably managed at present time.

6.4.2.5 Precinct P

Precinct P is generally made up of residential areas. No precinct-specific issues were recognised which suggests that the current restrictions and demand are suitably managed at present time.

6.4.2.6 Precinct R

Precinct R is generally made up of residential areas, with a small number of shop and office tenancies situated along Hopkins Street.

No precinct-specific issues were recognised which suggests that the current restrictions and demand are suitably managed at present time.

6.4.2.7 Precinct S

This precinct is primarily made up of residential dwellings and a swimming academy at the corner of Para Road and Paterson Crescent.

Duration of stay surveys recorded an overstay percentage of approximately 12% during the Saturday survey period within Precinct S, likely due to high parking demands generated by peak activity at the swimming academy. Consequently, the following strategy is recommended to be implemented within Precinct S.

Strategy Item 9 – Precinct S:

Increase car parking enforcement throughout the Precinct, with particular emphasis on on and off-street parking spaces in the vicinity of Van Dyk's Swimming Academy.

Requirement for increased monitoring to be reviewed on a regular basis (to be assessed against quantity of overstay vehicles recorded).

6.4.2.8 Precinct T

This precinct is primarily made up of residential dwellings and office tenancies along the western side of Para Road. No precinct-specific issues were recognised which suggests that the current restrictions and demand are suitably managed at present time.

6.4.2.9 Precinct U

Precinct U is generally made up of residential areas. No precinct-specific issues were recognised which suggests that the current restrictions and demand are suitably managed at present time.

6.4.2.10 Precinct V

Precinct V is generally made up of residential areas. No precinct-specific issues were recognised which suggests that the current restrictions and demand are suitably managed at present time.

6.4.2.11 Precinct W

Precinct W is generally made up of residential areas. No precinct-specific issues were recognised which suggests that the current restrictions and demand are suitably managed at present time.

6.4.2.12 Precinct X

Precinct X is generally made up of residential areas.

Cardno's site inspection revealed that vehicles (likely train commuters) are opting to park along the eastern side of Diamond Creek Road, generally between St Helena Road and Plenty River Drive. The outer lane on the northbound carriageway of Diamond Creek Road operates as a bike lane. Despite linemarking and signage, stating that the lane is for bicycles only, drivers are opting to park within this lane. It is likely that drivers are under the impression that the lane is able to be used for parking given it resembles the width of a typical parking lane, and this stretch of Diamond Creek Road is not provided with 'No Standing' signage.

Notwithstanding the above, Cardno noted an insignificant number of northbound cyclist movements on Diamond Creek Road.

It has since been brought about to Cardno's attention by Council that **formalised kerbside parking is proposed** to be introduced within this section of Diamond Creek Road as part of recommendations

contained within the recently completed Greensborough Activity Centre Transport Masterplan (November 2017 Draft version).

6.4.2.13 Precinct Y

Precinct Y primarily comprises parkland areas (Whatmough Park and surrounds, various sporting clubs etc.) and the Kalparrin Early Intervention Centre on the western side of Kalparrin Avenue.

Duration of stay surveys recorded an overstay percentage of almost 30% during the Thursday survey day within spaces restricted to 3P durations fronting the Kalparrin Early Intervention Centre. These overstay vehicles are likely staff vehicles that have chosen to park in these spaces as opposed to adjacent unrestricted areas for convenience purposes only. In this instance, short-term spaces designed to accommodate parent pick-up/drop-off demands are instead being occupied by staff. The clear availability of unrestricted parking in the immediate vicinity of the centre at all times should render 3P spaces available for their intended users.

It is understood that a satisfactory car parking arrangement has been formed between Council and management of the Centre.

6.4.2.14 Precinct Z

Precinct Z is generally made up of residential areas. No precinct-specific issues were recognised which suggests that the current restrictions and demand are suitably managed at present time.

6.5 Car Parking Rates

As discussed in Section 6.2 of the Background Report, an iterative process was undertaken to determine the car parking rates to be applied to future developments containing overarching land uses within the study area. The recommended parking rates for each land use were based on a wide range of available information and case study data, in an attempt to model a correlation between observed supply and demand relationships with due consideration to precinct operating characteristics. Once derived, car parking rates were cross-examined for accuracy across a number of precincts.

6.5.1 Major Land Uses

6.5.1.1 Retail (Shop)

The proposed shop car parking rate of **3.5 spaces** per 100 square metres of leasable floor area is noted as being within the range of recommended rates for this land use category adopted across Melbourne metropolitan municipalities (typically observed as 3.5 – 4.0), with Glen Eira adopting a Parking Overlay shop rate of 2.18 spaces per 100 sqm of leasable retail floor area in the Caulfield Mixed Use Area.

Furthermore, a review of numerous Parking Overlays revealed that the current shop rate contained within Schedule 1 to the Parking Overlay for the Greensborough Activity Centre typically adopts a rate of above 4.0 (currently 4.6). It is therefore considered that the suggested shop parking rate of 3.5 spaces is appropriate due to the area being within the PPTN.

A cross analysis was undertaken looking at the car parking survey results from Greensborough Plaza during the Thursday peak period. Comparing the peak recorded occupancy level of 1,789 spaces within Greensborough Plaza against the adopted 50,000 sq m of net leasable floor area at the site, a car parking rate of 3.58 spaces per 100 square metres of net leasable floor area can be derived, accurately corresponding to the recommended shop rate.

6.5.1.2 Food & Drink

It is recommended to maintain the existing car parking rate of **3.5 spaces** per 100 sq m for Food & Drink (Café) uses across the Study Area, in line with the Column B rate for this land use type within Clause 52.06-5 of the Banyule Planning Scheme.

6.5.1.3 Restaurant

The current Planning Scheme rate for restaurant use is 0.4 car parking spaces to each seat (*realistically referring to each patron permitted*), contained within Schedule 1 to the Parking Overlay for the Greensborough Activity Area. It is noted that the same rate was derived as part of the 2006 Greensborough Parking Plan prepared by Cardno. Despite this existing car parking rate being commensurate with Parking Overlay rates observed for restaurant uses across many Melbourne metropolitan municipalities, a review of parking demands vs theoretical and actual supplies within Precinct C revealed this rate to be too high.

Cardno case study suggests a typical methodology for determining seats available per square metre of overall restaurant floor area, where approximately 2/3 of the overall floor area is reserved for seating, with approximately 1 seat available to every 1.5 sqm of seating, 0.4 car parking spaces can be allocated to the resultant number of seats. Adopting Precinct C as a case study, application of this methodology to the 1,226 sq m of restaurant floor space would result in a requirement to provide 218 car parking spaces for restaurant land use alone. Precinct C contains a total of 386 parking spaces, and adopting the above methodology, restaurant use would account for 62% of the overall requirement when it only accounts for 24% of the overall floor area.

Furthermore, when adopting the current rate of 0.4 spaces per seat into the parking model for Precinct C, the derived theoretical supply for this precinct when considering land uses contained in this catchment only equates to 352 spaces. This would therefore suggest that, assuming the accuracy of other prescribed rates, a parking supply of approximately only 34 spaces is afforded to capture train commuter demands and demands generated from peripheral precincts.

It is recommended that a restaurant rate of **3.5 spaces** per 100 square metres of leasable floor area is provided for future uses of this nature, supported by the car parking model and commensurate with the current Column B rate for this land use within Clause 52.06-5 of the Banyule Planning Scheme.

6.5.1.4 Office

It is recommended to maintain the existing car parking rate of **3 spaces** per 100 square metres of leasable floor area as per the existing Column B rate for this land use within Clause 52.06-5 of the Banyule Planning Scheme. It is noted that this rate represents the office parking rate range of recommended rates for this land use category within Parking Overlays adopted across Melbourne metropolitan municipalities (typically observed as between 3.0 – 3.5 spaces per 100 sq m of net floor area), with Glen Eira and Whitehorse adopting Parking Overlay office rates as low as 2.0 spaces per 100 sq m of leasable floor area.

6.5.1.5 Medical Centre

A rate of 3.5 spaces per 100 square metres for medical centre uses is considered to be appropriate to adopt across the study area for future developments, consistent with the current Column B rate for this land use type and the rate recommended in the 2006 Greensborough Car Parking Plan prepared by Cardno.

It is anticipated that the recommended rate will continue to support demands associated with this use, with Greensborough continuing to be recognised as one of outer Metropolitan Melbourne's major medical hubs.

6.5.1.6 Summary

In consideration of the above influences, recommended car parking rates for future developments have been grouped into Strategy Item 14.

Strategy Item 10 – Study Area:

Car parking rates to be applied within the Structure Plan area of Greensborough to future major land uses as follows:

- | | |
|---------------------|--|
| > Shop | 3.5 to each 100 sq m of leasable floor area |
| > Food & Drink | 3.5 to each 100 sq m of leasable floor area |
| > Restaurant | 3.5 to each 100 sq m of leasable floor area |
| > Office | 3.0 to each 100 sq m of net floor area |
| > Medical Centre | 3.5 to each 100 sq m of leasable floor area |
| > Restricted Retail | 2.5 to each 100 sq m of leasable floor area |
| > All other | Refer to Column B of Table 1 to Clause 52.06-5 (where specified) |

6.5.2 Residential Developments

The Planning Scheme Column A requirement for residential dwellings is 1.0 car parking space per one and two bedroom dwellings, 2.0 car parking spaces per three-or-more bedroom dwellings and 1.0 visitor space per five dwellings. The Activity Centre rate as represented by Column B is the same for residents, with the exception of visitors where there is no requirement for on-site car parking.

It is noted that unlike commercial land uses, the desire to own a car does not necessarily equate to the need to use the vehicle during peak traffic periods. As such, it could be considered to be appropriate to allow the market to determine the appropriate level of car parking which should be provided for private residential dwellings rather than defining strict limits on the level of car parking which can be provided. However, it is recognised that with greater provision of car parking, there is a greater likelihood of vehicle trips being generated by the dwelling.

Accordingly, reference is made to the Australian Bureau of Statistics (ABS) 2011 Census Data outlined in Section 6.2.4 of the Background Report to estimate the likely future parking requirements for residential dwellings (based on existing car ownership statistics). In this regard, the average car ownership data indicates 1.35 vehicles per dwelling, with one and two bedroom dwellings recording average car parking ownership rates of 0.38 and 1.00 spaces per dwelling respectively. Furthermore, car use in general within the GMAC and overall study area should be discouraged if possible just on the basis of good access to public transport and close proximity to places of employment.

Based on the preceding discussion, it is considered appropriate that parking rates of 0.8 spaces for one and two-bedroom dwellings are introduced, noting a reduced rate from that currently stated in Schedule 1 to the Parking Overlay within the Banyule Planning Scheme for these dwelling types.

It is recommended that the current rate of 2 resident spaces for each 3 or more-bedroom dwelling be retained, as specified in Schedule 1 to the Parking Overlay within the Banyule Planning Scheme.

With regards to the residential visitors, the likely parking requirements were determined based on the parking inventory and survey data collected for the 12 precincts considered primarily as residential in nature.

Due to the accessibility of the area by public transport and existing availability of on-street parking supply used to derive the anticipated existing visitor parking demand it is recommended the Column B rate for this land use within Clause 52.06-5 of the Banyule Planning Scheme be adopted. Therefore there is no requirement for visitor car spaces.

In consideration of the above influences, recommended car parking rates for future developments have been summarised in Strategy Item 15.

Strategy Item 11 – Study Area:

Car parking rates to be applied within the Structure Plan area of Greensborough for new residential developments as follows:

- > 1 resident spaces for each one and two-bedroom dwelling
- > 2 resident spaces for each three or more-bedroom dwelling
- > 0 no visitor car parking requirement

6.6 Sustainable Transport Modes

Encouraging the use of alternative transport modes will aid in reducing existing parking demands, therefore creating greater parking vacancies for people who depend on a car as a mode of transport. Alternative modes are considered to be particularly important to encourage short-trips, such as those from apartments to shops, to be completed by modes other than car.

The study area is well serviced by public transport services, with train and bus services operating throughout the area. The public transport services connect the Study Area with key origins/destinations including the Melbourne CBD and other activity centres.

The provision of these transport services and continued investment provides a great opportunity to further reduce car parking dependency of the Study Area, particularly along the rail corridor and bus routes. These objectives have been clearly identified in the Greensborough Transport Masterplan.

It is noted that the recommended rate for motorcycle parking has been determined with respect to existing ABS 2011 Journey to Work data.

In consideration of the above influences, the following strategy items are recommended to be implemented.

Strategy Item 12 – Study Area:

Active and public transport improvement projects be completed to support the lower car parking rates identified within this report as identified within the Greensborough Transport Masterplan.

Strategy Item 13 – Study Area:

Where a reduction to statutory car parking requirement for a residential development is approved in accordance with clause 52.06-7 of the planning scheme, bicycle parking is to be provided at a rate of 1 bicycle space to each car space waived, regardless of scale or height of the development. In addition, bicycle parking is to be provided within the development for waived residential car spaces, or on the developments frontage/footpath if a visitor car space is waived.

Strategy Item 14 – Study Area:

Encourage the provision of 1 motorcycle or scooter parking space for every 50 car parking spaces constructed within any car park within the Study Area, designed in accordance with the requirements of the relevant Australian Standard for Off-street Parking Facilities.

6.7 Monitoring

This Strategy Report reflects the current car parking conditions within the Study Area. It is anticipated that as a result of changes in land-uses (such as increased commercial, retail and medical centre development within the activity centre and new public and sustainable transport strategies), car parking characteristics and travel patterns may alter in the future.

It is therefore recommended that the study area is surveyed regularly to ensure that car parking demands associated with development within the Study Area is increasing in line with the levels predicted within the *Economic Information Base Report and Activity Centre Assessment (2017)* (prepared by Urban Enterprise). Ongoing survey of the Study Area will also ensure that the strategy prepared remains current and appropriate. This level of monitoring will allow the policies and guidelines to be regularly updated as required.

In addition, given the recommended changes associated with the development of car parking strategies, and therefore possible changes to peoples travel habits, it would be recommended that the observation of car parking demands be reinvestigated following the changes, to understand the impacts that these changes have had to staff and customer's mode of travel and parking choices.

In consideration of the above influences, the following strategies are recommended for further investigation with regard to ongoing monitoring.

Strategy Item 15 – Study Area:

Encourage the provision of 1 motorcycle or scooter parking space for every 50 car parking spaces constructed within any car park within the Study Area, designed in accordance with the requirements of the relevant Australian Standard for Off-street Parking Facilities.

Strategy Item 16 – Study Area:

The car parking strategy be reviewed and updated regularly to reassess car parking demand levels and ensure it reflects local conditions and relevant policies.

6.8 Parking Overlay

A Car Parking Plan has no particular statutory power, however it provides essential advice and guidance to Council as to how to effectively manage existing and future car parking resources. The advice contained within a strategy provides the basis for the development of both statutory and non-statutory mechanisms.

In this regard, the Victorian Planning Provisions (VPP) Practice Note 57, reproduced in the figure below, shows the relationship between a Car Parking Plan and the mechanisms in place to implement specific findings of the plan.

Figure 6-5 Statutory Context – Car Parking Plan and Parking Overlay



The implementation of the Car Parking Plan findings can occur in two forms: those that can be simply implemented by Council (such as changes to parking restrictions); and those that will require a statutory form to place requirements on developers or other third parties.

In regard to a Parking Overlay, Practice Note 57 states:

“Once prepared, a car parking plan can provide the basis for, and be implemented by, a Parking Overlay or other appropriate implementation mechanism, such as:

- > *Parking permits for residents, workers and visitors*
- > *Management of public and private parking (for example, through time restrictions or fines)*
- > *Special rate charges – a requirement for land owners to pay towards the related provision of new spaces*
- > *Shared car parking requirements.*

Specifically, the recommendations proposed as part of this parking strategy that would be required to be incorporated into a Parking Overlay are listed as follows:

Strategy Item 10:

Car parking rates to be applied within the Structure Plan area of Greensborough to future major land uses as follows:

- > *Shop* 3.5 to each 100 sq m of leasable floor area
- > *Food & Drink* 3.5 to each 100 sq m of leasable floor area
- > *Restaurant* 3.5 to each 100 sq m of leasable floor area
- > *Office* 3.0 to each 100 sq m of net floor area
- > *Medical Centre* 3.5 to each 100 sq m of leasable floor area

- > *Restricted Retail* 2.5 to each 100 sq m of leasable floor area

Strategy Item 11:

Car parking rates to be applied within the Structure Plan area of Greensborough for new residential developments as follows:

- > *1 resident space for each one and two-bedroom dwelling*
- > *2 resident spaces for each three or more-bedroom dwelling*
- > *0 no visitor car parking requirement*

Strategy Item 13:

- > Where a reduction to statutory car parking requirement for a residential development is approved in accordance with clause 52.06-7 of the planning scheme, bicycle parking is to be provided at a rate of 1 bicycle space to each car space waived, regardless of scale or height of the development. In addition, bicycle parking is to be provided within the development for waived residential car spaces, or on the developments frontage/footpath if a visitor car space is waived.

Strategy Item 14:

- > Encourage the provision of 1 motorcycle or scooter parking space for every 50 car parking spaces constructed within any car park within the Study Area, designed in accordance with the requirements of the relevant Australian Standard for Off-street Parking Facilities.

Strategy Item 17 – Study Area:

Remove the existing Schedule 1 to the parking overlay. The car parking requirement for new developments within the Greensborough Activity centre will be subject to the requirements of Clause 52.06, with the majority of the activity centre being subject to Column B car parking rates.

7 Summary and Implementation

Having consideration of the findings derived from the Background Report, this Options and Strategy Analysis Report has been prepared to develop a number of recommendations for the ongoing management of parking demands and utilisation throughout the Study Area.

The preceding analysis provides an objective-based approach to address the car parking issues identified in the Background Report in a justifiable, standardised manner.

Cardno have addressed the car parking issues identified within the Greensborough Major Activity Centre (GMAC), with the proposed solutions integrated into specific strategies.

The final stage of the project will follow, with an Implementation Plan (i.e. final Parking Plan) to be provided. The plan will assist in ensuring that car parking supply and demand is effectively managed to best address the needs of all stakeholders.

Draft Parking Plan

Greensborough Activity Centre Parking Plan

V171082

Prepared for
Banyule City Council

1 March 2019



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D03	04/02/2019	Draft Parking Plan – Third Draft Issue	Luke Smith	Matt Mudge
D04	12/02/2019	Minor updates	Luke Smith	Matt Mudge
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1 Purpose of the Plan

1.1 General

Cardno has been engaged by Banyule City Council to assist in the preparation of the Greensborough Activity Centre Parking Plan.

Preceding assessments, including a Background Report and Options & Strategy Analysis Report, provided a review of existing issues/constraints and opportunities regarding car parking demand and supply within the Study Area and its immediate surrounds.

The purpose of the Greensborough Activity Centre Parking Plan is to identify appropriate future car parking rates for various 'overarching' land uses within the Study Area. In effect, the Plan seeks to provide the Study Area with an overall vision and framework for the ongoing management of existing and future car parking.

The Greensborough Activity Centre Parking Plan has been prepared in three (3) parts:

- > Part 1: Background Report;
- > Part 2: Options & Strategy Analysis Report; and
- > Draft Parking Plan.

This document forms the final component of the Greensborough Activity Centre Parking Plan, with the preparation of a Final Parking Plan to follow. It is noted that this report should be read in conjunction with the two (2) preceding reports noted above previously prepared by Cardno.

1.2 Objectives

The primary objective of the Parking Plan is to determine the existing parking supply and demand characteristics and provide recommendations for the provision of car parking within GMAC for specific uses.

Specifically, the Parking Plan aims to achieve the following key objectives:

- > An analysis and review of current parking characteristics and parking facilities across the GMAC including:
 - Car parking supply;
 - Car parking demand;
 - Existing distribution of parking; and
 - Existing constraints and opportunities.
- > Understand and assess the parking impact of current land uses;
- > Understand and assess the anticipated parking impact of future developments;
- > Provide thorough insight into the changes in car parking behaviour from 2006 to 2017, based on Cardno's previous work within the GMAC area;
- > Provide recommendations regarding potential opportunities to increase the publicly available parking supply; and
- > Provide recommendations and a Parking Plan to best manage the available parking resources within the GMAC and immediate surrounds via both supply and demand measures, to accommodate the current and future demand for car parking.

Should it be sought by Council, the proposed car parking provision rates defined in the series of reports prepared by Cardno will be used to form an amendment to or removal of Schedule 1 of the Parking Overlay within the Banyule Planning Scheme.

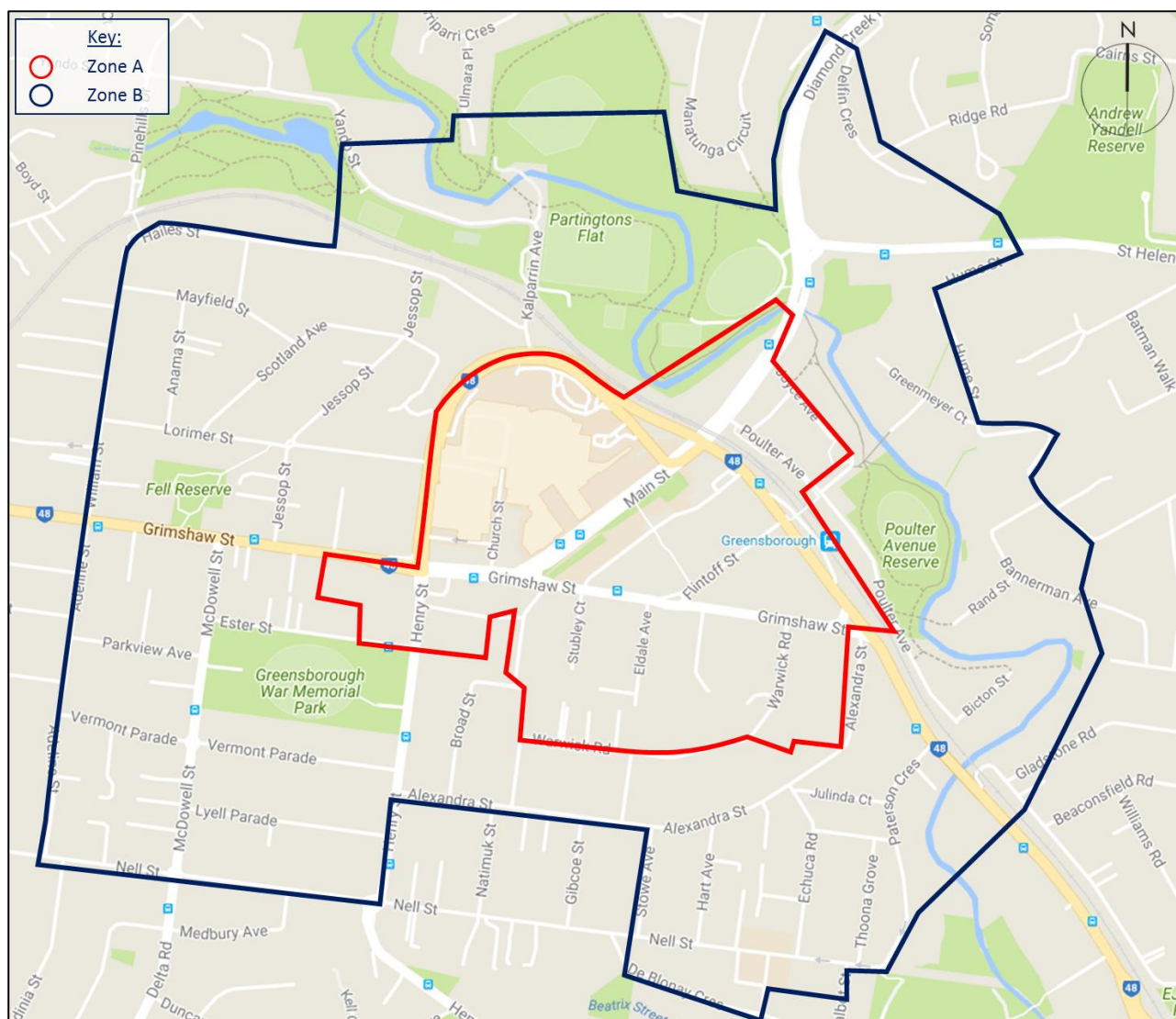
2 Area Covered by the Parking Plan

2.1 Greensborough Major Activity Centre (GMAC)

The GMAC is located in Greensborough within the City of Banyule, and comprises a variety of uses including retail, office, commercial, educational and recreational. The Study Area has been defined by Banyule City Council and encompasses the majority of the GMAC principal business area and the surrounding locality.

A map of the central Greensborough area is presented as Figure 2-1.

Figure 2-1 Greensborough Map showing Study Area



Source: Nearmap 2017

2.2 Study Area Boundaries

The Study Area is divided into two distinct zones, being Zone A (outlined in red) and Zone B (outlined in blue) in Figure 2-1. Within the Study Area, 27 'precincts' have been identified based on the predominant local land use (shown in more detail in Figure 2-2) and topography.

Zone A is enclosed by The Circuit, Para Road, Grimshaw Street, Warwick Road, Howard Street and Henry Street, and represents the Greensborough Major Activity Centre Core Area. This zone comprises retail, mixed-use office and commercial areas, Greensborough Train Station (J), Greensborough RSL (L) and the medical precinct (G).

Zone B generally comprises the locality within approximately 400 metres of Zone A, such that this area may be subjected to car parking overflow from the core area (primarily due to demands associated with train commuters) and therefore warrants investigation. This zone comprises residential areas, commercial areas (S and T), and parkland areas (Y).

Within Zone A, this report investigates the changes in on-street and off-street car parking supply and land use since 2006, collecting up-to-date car parking occupancy data, and analysing in detail the implications of these findings. Looking further to Zone B, this report will investigate precincts associated with car parking infiltration, such as precincts V and W near the Greensborough Train Station, and precincts M, O and Z located adjacent to retail and educational precincts, under the guidance of Council and their experiences with parking characteristics in the area.

1.1 Parking Precincts – Zone A

Further descriptions of parking precincts within Zone A (the GMAC) have been detailed below.

1.1.1 Precinct A – Woolworths Shopping Centre

Precinct A encompasses the Woolworths Shopping Centre building, the dual level car park as well as the adjoining petrol station. The site is bounded by Grimshaw Street, Henry Street and Ester Street.

1.1.2 Precinct C - Henry Street Precinct

The precinct consists of a variety of mixed-use strip shops with a high proportion of cafes/restaurants. Precinct C is considered one of three main GMAC parking areas, with a large at-grade car parking area accounting for the majority of the precinct area.

1.1.3 Precinct D – Greensborough Plaza

Greensborough Plaza Shopping Centre makes up the majority of this precinct. The remainder of Precinct D comprises strip shops along Main Street and Grimshaw Street. Precinct D is bound by Grimshaw Street, Main Street and The Circuit and is considered one of the three main GMAC parking areas.

1.1.4 Precinct E – Eastern Precinct

The Eastern Precinct (also known as the Carter Reserve precinct) contains a mixture of land uses including retail uses, office uses, off-street multi-level car parking, the WaterMarc leisure centre, and the One Flintoff development housing Council offices. The retail component consists of strip shops fronting onto Main Street with access from a rear laneway. With an at-grade car park and multi-level car park, the Eastern Precinct is considered one of the three main GMAC parking areas.

1.1.5 Precinct F - Stubbley Court Area

Stubbley Court is located in the centre of Precinct F and is surrounded by Grimshaw Street, Howard Street, Warwick Road and Eldale Avenue. The area consists almost entirely of residential properties, with smaller medical uses located throughout.

1.1.6 Precinct G - Medical Precinct

Bound by Grimshaw Street, Eldale Avenue and Warwick Road, this precinct consists mainly of residential, medical and health care properties. The Banyule Health Service is the major property attracting considerable patronage within the precinct, with associated medical practices, a day care and aged care facility.

1.1.7 Precinct H - Residential/Office Area

This precinct includes medium and low density housing as well as some medium density offices. It is noted that a Centrelink facility is located along the southern boundary of Precinct H.

1.1.8 Precinct I – Residential Area

This precinct includes conventional density residential housing.

1.1.9 Precinct J - Greensborough Train Station

This area encompasses the Greensborough Train Station and the associated unrestricted at-grade parking area owned and operated by Metro Trains, designated for use by public transport commuters.

1.1.10 Precinct K - Mixed Uses

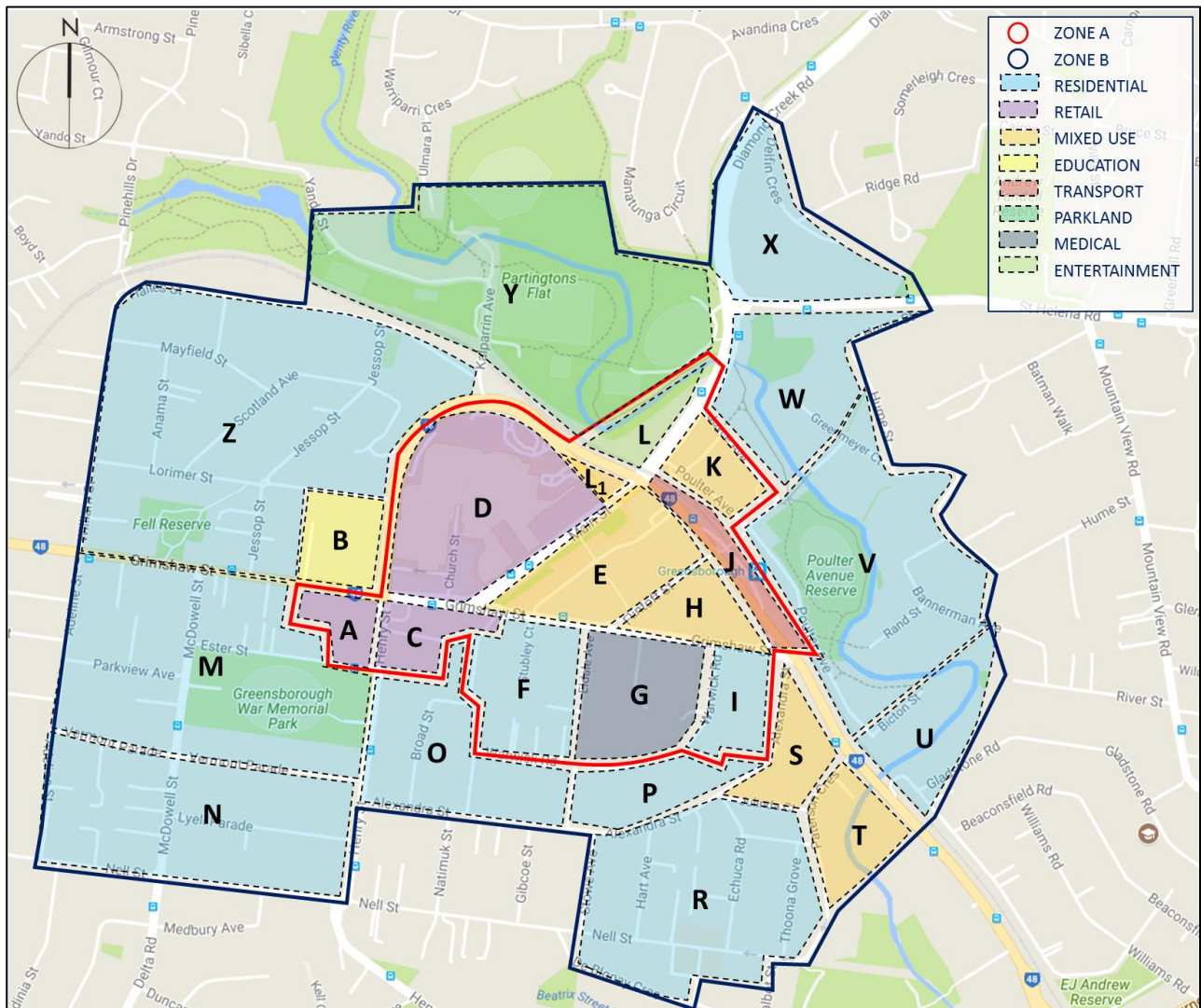
This precinct contains the north-eastern strip shops on Main Street which are provided with parking at the front and rear of these tenancies. Shops consist of a variety of retail uses.

1.1.11 Precinct L and L1 - RSL Area

The precinct is located north and south of the railway line. North of the railway, Precinct L comprises the RSL building on the corner of The Circuit and Main Street as well as some off street parking. South of the railway, Precinct L1 mainly consists of mixed-use strip shops with some rear parking and access provided.

The precincts comprising the Study Area are presented in Figure 2-2.

Figure 2-2 Study Area – Greensborough Major Activity Centre and Surrounding Areas



3 Study Methodology

The study largely presents an overview of the existing parking provisions in the GMAC and its immediate surrounds. It identifies the main issues and deficiencies, and develops proposals to improve parking management and support future car parking demands due to developments likely to eventuate within the Study Area.

The adopted study methodology is generally summarised as follows:

- > Undertake a comprehensive review of existing car parking conditions;
- > Commission car parking data collection including an inventory of existing car parking restrictions, peak patronage levels and durations of stay;
- > Analysis of existing peak parking demands associated with the overall Study Area as well as individual precincts;
- > Develop parking supply and demand management strategies;
- > Liaison and identification of existing issues with Banyule City Council representatives; and
- > Development of recommendations and solutions in consultation with Banyule City Council, inclusive of proposed amendments to future car parking rates associated with overarching land uses.

4 Parking Demand and Supply in the Study Area

4.1 Existing Car Parking Supply

Cardno commissioned Matrix Traffic and Transport Data to undertake an inventory of the on and off-street parking supply within the GMAC Study Area. The total parking supply for each precinct within Zones A and B is outlined in Table 4-1 and is broken up into restriction types classified based on the following time bands / parking typology:

- > **Very Short Term** P5, P10, 1/4P, 1/2P and 1P (inclusive) in duration
- > **Short Term** P90min, 2P and 3P (inclusive) in duration
- > **Medium Term** 4P and 5P (inclusive) in duration
- > **Long Term** Unrestricted parking
- > **Other** Includes private parking areas, disabled bays and permit zones
- > **Total** Excludes loading bays, bus bays, taxi bays and no standing zones

It is noted that in areas where more than one restriction type occurs, the restriction deemed as the most dominant (based on proportion of duration over a day/week or typically based on a restriction operational during business hours) has been selected as the most appropriate restriction to apply in the analysis.

Table 4-1 GMAC Parking Supply September 2017 – Overall Restriction Types

Zone	Precinct	Very Short Term	Short Term	Medium Term	Long Term	Other	Total
A	A	-	221	-	-	-	221
	C	-	125	-	255	6	386
	D	49	2,521	105	-	28	2,703
	E	49	361	-	134	27	571
	F & G	12	87	26	150	17	292
	H	11	21	-	19	-	51
	I	-	-	-	50	-	50
	J	3	-	-	216	6	225
	K	-	-	84	-	21	105
	L	13	-	-	60	39	112
	L1	11	20	-	-	-	31
Zone A Subtotal		148 (3%)	3,356 (70%)	215 (5%)	884 (19%)	144 (3%)	4,747
B	B	-	-	-	24	1	25
	M	-	20	-	355	42	417
	N	-	-	-	250	-	250
	O	-	8	-	210	-	218
	P	-	-	-	59	-	59
	R	-	14	-	337	-	351
	S	9	-	-	29	-	38
	T	-	-	-	13	-	13
	U	-	12	-	7	-	19
	V	-	23	17	164	-	204
	W	-	-	16	56	-	72

	X	-	-	-	61	-	61
	Y	2	16	33	197	8	256
	Z	10	20	-	450	-	480
Zone B Subtotal		21 (1%)	113 (4%)	66 (3%)	2,212 (90%)	51 (2%)	2,463
Study Area Total		169 (2%)	3,469 (48%)	281 (4%)	3,096 (43%)	195 (3%)	7,210

Table 4-1 indicates that Zone A is primarily comprised of short-term spaces (70%), indicative of the parking demands of the dominant retail presence in the zone. Furthermore, the Greensborough Plaza car parking supply attributes to approximately 75% of all short-term spaces situated in Zone A. It is noted that the majority of 'Other' restriction types located in Zone A were found to be tenancy-specific private car parking for staff and visitors, as well as accessible parking bays distributed throughout the zone.

As was anticipated, 90% of the entire parking supply located in Zone B was found to be long-term in nature, commensurate to the dominant residential use of this portion of the Study Area.

Residential precincts located within Zone A provide on-street spaces which are typically protected by short-term parking restrictions to discourage overspill of parking demands into residential streets. Conversely, residential precincts located in the Zone B Study Area provide on-street spaces which largely offer long-term or unrestricted car parking with some short-term restrictions applied to the streets located closer to the GMAC core.

4.2 Car Parking Demand

Parking demands vary throughout the day and week with the busiest days within an Activity Centre typically occurring on a Thursday/Friday and Saturday. As such, to quantify car parking demand characteristics within the Study Area, Cardno commissioned Matrix Traffic and Transport Data to undertake occupancy and duration of stay surveys during the following dates and times:

- > Thursday 7th September 2017 at hourly intervals from 7:00am until 10:00pm; and
- > Saturday 9th September 2017 at hourly intervals from 7:00am until 10:00pm.

The chosen survey days are considered 'typical' days and specifically did not include days during school holiday periods.

4.2.1 Survey Findings

The survey results indicate that activity within the *overall* Study Area was greater on Thursday than Saturday as shown in Figure 4-1, with the overall peak parking demand occurring on Thursday at 12:00pm. At this time, 4,174 vehicles were recorded, including parking demand within private parking areas. This equates to a peak occupancy of 58% within the overall Study Area. During the Thursday peak occupancy period, the recorded demand within Zone A *only* equated to 3,683 vehicles (78% occupancy level). The peak occupancy within Zone B *only* at 12:00pm was recorded as 491 vehicles, equating to an occupancy level of only 20%.

Across the Saturday survey day, peak occupancy for the entire Study Area also occurred at 12:00pm with 3,413 vehicles recorded including parking demand within private parking areas. This equated to a peak occupancy of 47% at this time. During the Saturday peak occupancy period, the recorded demand within Zone A *only* equated to 3,087 vehicles (65% occupancy level). The peak occupancy within Zone B *only* at 12:00pm was recorded as 326 vehicles, equating to an occupancy level of only 13%. It is noted that peak occupancy levels within Zone B *only* on the Saturday was recorded at 7:00pm, when a total of 462 spaces were occupied (17% occupancy level).

Within the total supply of car parking in the Study Area, some areas/zones are not provided to be available to the general public, or instead are designated for special users such as Loading Zones and Bus Zones. Consequently, the total supply of car parking has been filtered to deduct these car parking spaces so that *only* car parking that is generally available to the public for short term or longer term durations is included in the analysis of supply and demand.

Parking demand profiles for the overall Study Area and Zone A *only* during the Thursday and Saturday survey peak periods have been shown in Figure 4-1 and Figure 4-2, respectively.

Figure 4-1 Overall Survey Area Parking Demand Profile – Thursday 7th September, 2017 vs Saturday 9th September, 2017 (12:00pm)

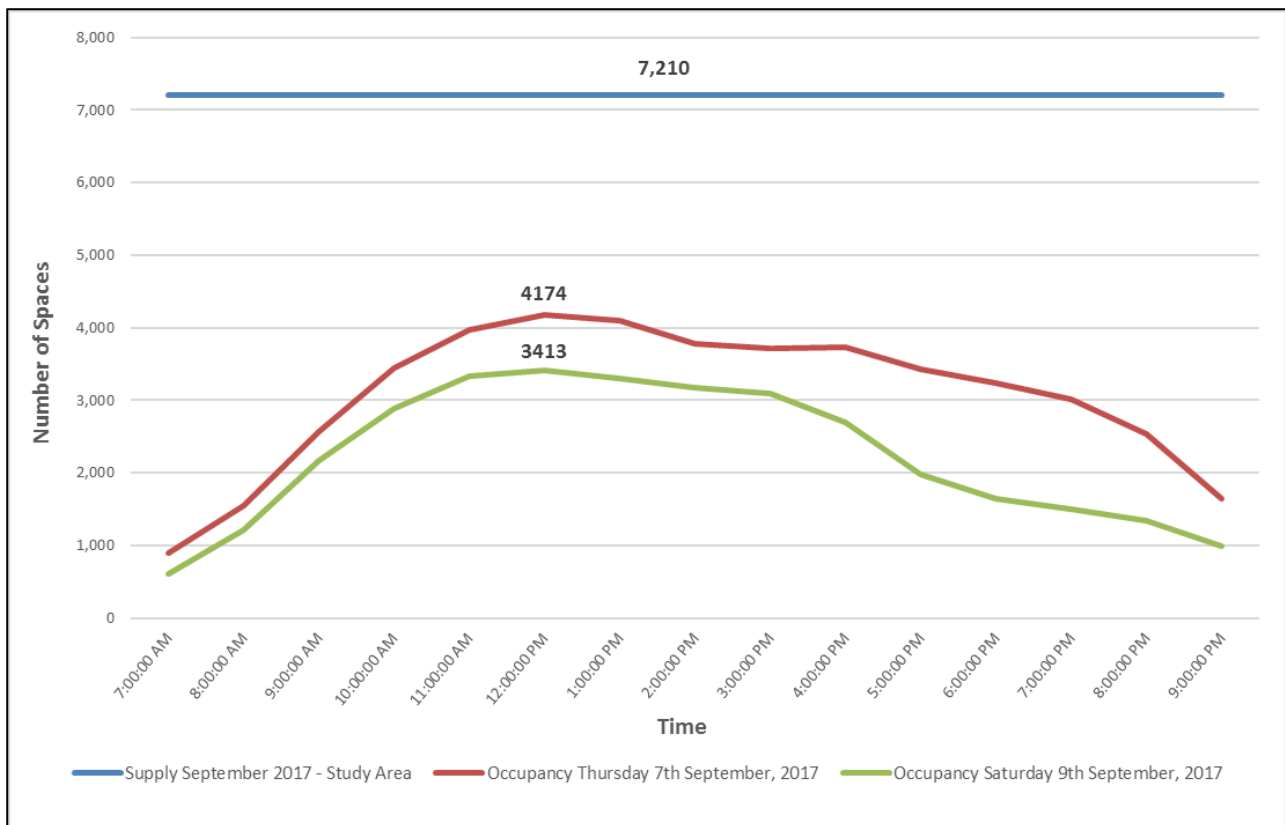


Figure 4-2 Zone A Parking Demand Profile – Thursday 7th September, 2017 vs Saturday 9th September, 2017 (12:00pm)

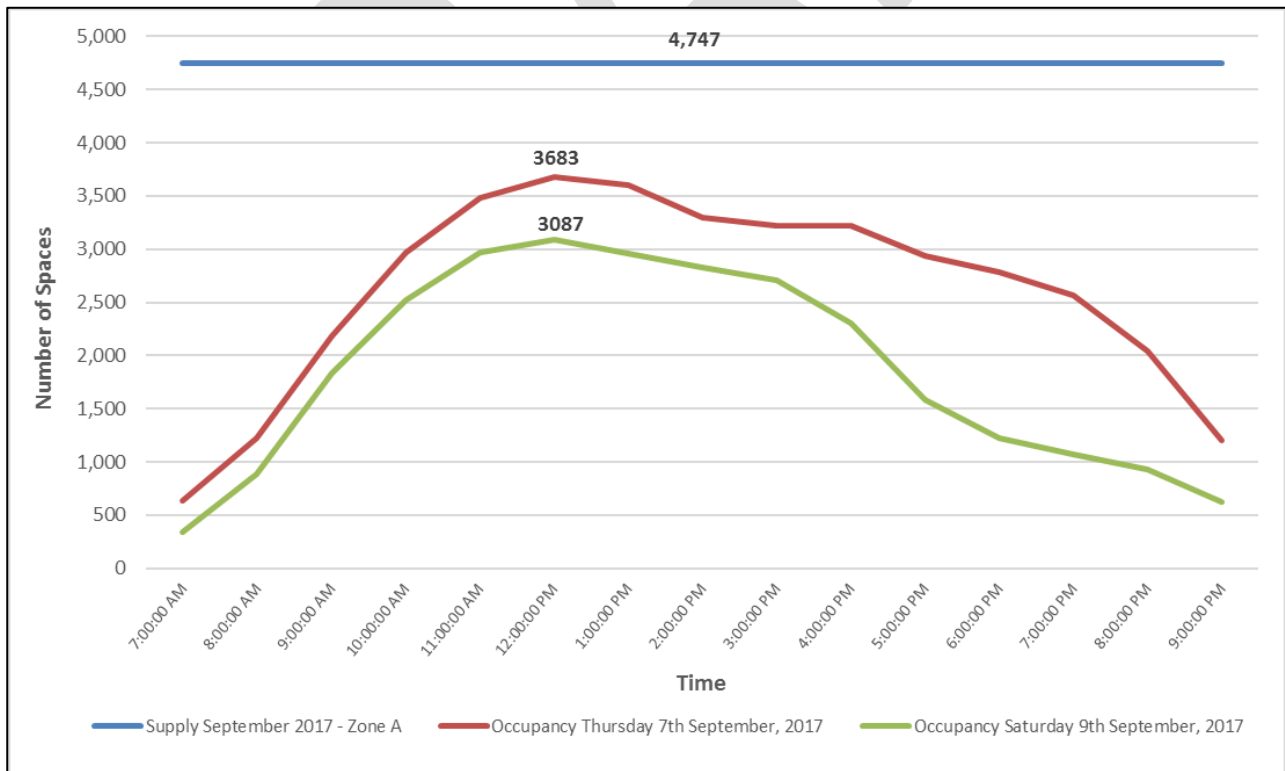


Figure 4-1 and Figure 4-2 both illustrate that the Thursday and Saturday demand curves are similar in shape and tend to reflect a typical retail based activity area (being the major land use occupying Zone A) with 9:00am to 5:00pm operating hours across both survey days, peaking at around midday.

Similar demand curves are observed between Zone A only and the overall Study Area, noting the major differences in demand occurring between 3:00pm and the end of the survey period.

4.3 Duration of Stay Trends

4.3.1 General

Duration of stay data sourced and summarised in Section 5.3 of the '*Part 1: Background Report*' indicate that *very short-term* parking demands (up to and including 1 hour in duration) were the most common duration of stay periods recorded throughout all precincts across both survey days, reflective of the operating nature of an activity centre.

Short stay durations are typically representative of servicing retail shoppers, people running errands, pick-up and drop-off points, lunchtime trade, hospital/medical visitors and the like. The benefit of short stay car parking is the higher turnover of car parking spaces.

It is, however, noted that the average durations of stay provided serve as a guide only, with average durations in particular areas (especially those experiencing low demands) skewed in the cases of:

- > Parking restrictions being most commonly observed as very short-term or short-term in nature within a precinct, with a high proportion of residual long-term demands recorded as very long-term (i.e. between 10 to 15 hour durations) within that precinct; and
- > Parking restrictions being most commonly observed as long-term in nature within a precinct, with a high proportion of residual short-term demands recorded as being within the very short-term duration bracket (i.e. only up to 1-hour duration of stay).

Examples of the above can be seen in Precincts W and X, as these areas experienced very short-term parking demands as the most common duration type on the Saturday (ranging between 36-51% of all recorded durations), but observed average durations of between 6:34 to 7:14 hours.

4.3.2 Parking Overstay

A review of the duration of stay survey data indicated that, in general, parking overstay is only prevalent in a small number of precincts located in the Study Area, with 10 of the 25 precincts recording zero overstay vehicles across both survey days.

The following observations are noted regarding parking overstay within the Study Area:

- > Zone A recorded the largest overall overstay percentages per precinct, with only Precincts I and J recording no overstay vehicles. This is likely due to the long-term nature of the parking restrictions in effect within these two particular precincts;
- > Train commuter and commercial staff demands (long-term) are known to be higher during weekday periods as opposed to weekends, likely contributing to overstays noted in precincts situated in the vicinity of major destination points such as Greensborough Plaza and Greensborough Train Station;
- > Overstay percentages across the Study Area were generally recorded as being greater on the Thursday, with exceptions being Precincts H and S. An overstay percentage of approximately 12% was recorded on the Saturday survey period within Precinct S, likely due to high parking demands generated by peak activity at the swimming academy. As noted in previous reports, the exact number of overstay vehicles in possession of a residential parking permit is not known;
- > A significant portion of short-term restriction types throughout the entire Study Area are in effect between Monday-Friday only. The reduction between overstay numbers (shown as a percentage of overall vehicles parked in a precinct) between the Thursday and Saturday suggests that the non-application of many short-term parking restrictions has resulted in a reduction in overstays.

4.3.3 Impacts of Future Infrastructure Projects

4.3.3.1 M80 Upgrade

The M80 upgrade will improve traffic conditions in the Greensborough area. Currently the capacity of the Greensborough Highway / Grimshaw Street intersection is constrained, with significant capacity provided to right turning vehicles. Coupled with the existing delays at the M80 interchange results in drivers favouring to travel through the activity centre if heading north.

By providing additional capacity for northbound movements on the Greensborough Highway from Grimshaw Street passed the M80 interchange will allow traffic to bypass Greensborough in lieu of a through route. In summary, the potential benefits of the M80 upgrade for the Greensborough Activity Centre include:

- > A reduction in through traffic within the activity centre;
- > An improvement to bus movements into and around the activity centre; and
- > An improvement to pedestrian and cycling safety and amenity due to reduced vehicle traffic.

4.3.3.2 *Hurstbridge Rail Line Duplication (Stage 2)*

The level Crossing Authority is currently duplicating the Hurstbridge rail line between Rosanna and Heidelberg.

A second stage of the Hurstbridge Rail line Duplication is currently in planning and involves the duplication of the single track to double track between Greensborough and Eltham.

The works will eliminate a significant bottleneck in the current rail network and simplify the rail timetable to a more frequent and reliable service, increasing the attractiveness of public transport use to and within Greensborough.

It is expected that these improvements will increase the attractiveness of rail services at Greensborough, and hence the demand for car parking. The state Government has indicated that they will fund the provision of 100 additional car parking spaces at the rail station, which will help meet this demand.

4.3.3.3 *North East Link*

The North East Link Authority has identified a corridor for the Link that will run from the end of the M80 Ring Road at Greensborough along the Greensborough Highway road reserve to meet the Eastern Freeway in Bulleen. The North East Link is proposed to include:

- > Three new interchanges including Grimshaw Street and the M80 Ring Road;
- > A five kilometre, six lane tunnel beneath Banyule Flats, the Yarra River, and lower plenty Road to emerge north of Lower Plenty Road; and
- > New and upgraded walking and cycling links from the M80 to the Eastern Freeway and Yarra Trail.

The new interchange at Grimshaw Street is approximately 1km to the west of the Greensborough Activity Centre,

The primary through traffic route in the Greensborough Activity Centre is via The Circuit and Para Road.

The proximity of a major freeway interchange to the Greensborough Activity Centre will potentially increase demand for through traffic within the activity centre.

4.4 Stakeholder Engagement

Stakeholder consultation / engagement sessions were undertaken by Banyule City Council in November 2018 to understand the key car parking concerns within the Greensborough Activity Centre. The following organisation have provided comments by email, letter or in person at stakeholder workshops to provide feedback for the purposes of this study.

- > St Mary's Primary School and Parish
- > Greensborough Primary School
- > Greensborough Chamber of Commerce
- > Living Faith Church
- > Greensborough RSL
- > WaterMarc
- > Joyce Avenue Children's Centre (Council run)
- > Kalparrin Early Intervention Centre

A comprehensive review of the stakeholder feedback revealed that the key car parking concerns in the area are associated with the lack of long-term parking. Refer to Table 4-2 for a summary of the concerns with a rating to demonstrate the level of importance.

Table 4-2 Stakeholder engagement matrix

No.	Issues	Level of Importance	Solutions / Comments
1	Inadequate long term parking availability for staff / commuters	High	Provision of a wayfinding map will assist employees / commuters locate long-term parking areas.
2	Inadequate disabled car parking spaces	Medium	Consider reviewing parking restrictions adjacent to key activity centres to improve accessibility for people with disabilities.
3	Inadequate parking available for patrons accessing WaterMarc	High	Provision of a wayfinding map, on the WaterMarc website and within the facility would assist staff / patrons accessing the site to find parking.
4	Inadequate parking available for shop customers	High	Provision of a wayfinding map at officers in the area would encourage more patrons to utilise long-term parking areas rather than the short-term parking areas. This would increase the opportunities for customer parking.
5	Inappropriate parking restrictions adjacent to businesses	Low	
6	Illegal parking (i.e. parking at driveways, adjacent to Carter Reserve off-street car park)	High	Implement / enforce parking restrictions
7	Safety concerns	High	Provide adequate lighting to create a safer pedestrian environment
8	Pedestrian access (i.e. between WaterMarc and Savers car parks)	Medium	Implement pedestrian footpaths
9	Inappropriate operational speeds within off-street car parks (i.e. WaterMarc car park)	Low	

Assessment of the stakeholder comments revealed that one of the key parking concerns in the area is the perceived lack of long-term parking for commuters and employees. This has led to a number of issues including:

- > Employees utilising short-term parking spaces, reducing the car parking opportunities for local businesses and swimming / fitness centre;
- > Loss off businesses / customers / members due to the lack of parking in the area; and
- > Low employee utilisation rates due to employees having to change parking during work hours.

Assessment of the Greensborough Activity Centre area revealed that there are a number of locations within the precinct to accommodate additional long-term parking, particularly along McDowell Street, Vermont Parade, Lyell Parade, Henry Street, Alexandra Street, Broad Street, Howard Street, Warwick Road, Clydebank Street, Nutimuk Street, Gibcoe Street and Stowe Avenue.

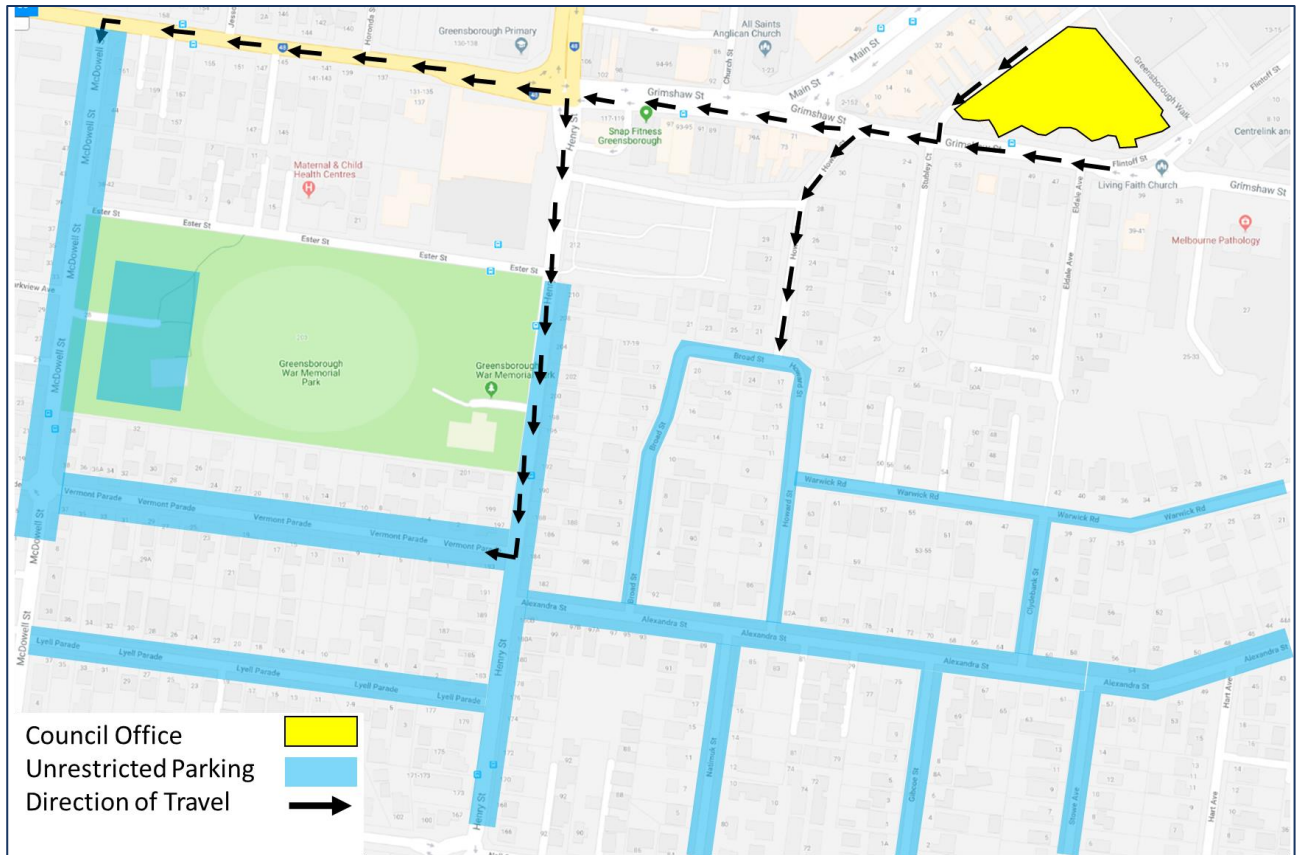
A wayfinding map has been prepared by Cardno highlighting the key locations with unrestricted car parking areas. Refer to Figure 4-3 for the Wayfinding map. Similar maps could be prepared to guide staff / customers to available car parking areas.

Overall, the stakeholder engagement process indicated that:

- > Wayfinding maps be introduced at offices / facilities within the area to direct staff / customers to parking areas;
- > Ensure appropriate parking restrictions are implemented and enforced to maintain access to driveways and off-street car parking facilities;

- > Ensure adequate parking is provided for people with disabilities adjacent to the appropriate land uses; and
- > Provide adequate lighting and pedestrian footpaths to ensure accessibility to / from parking areas.

Figure 4-3 Wayfinding map indicating locations with unrestricted parking



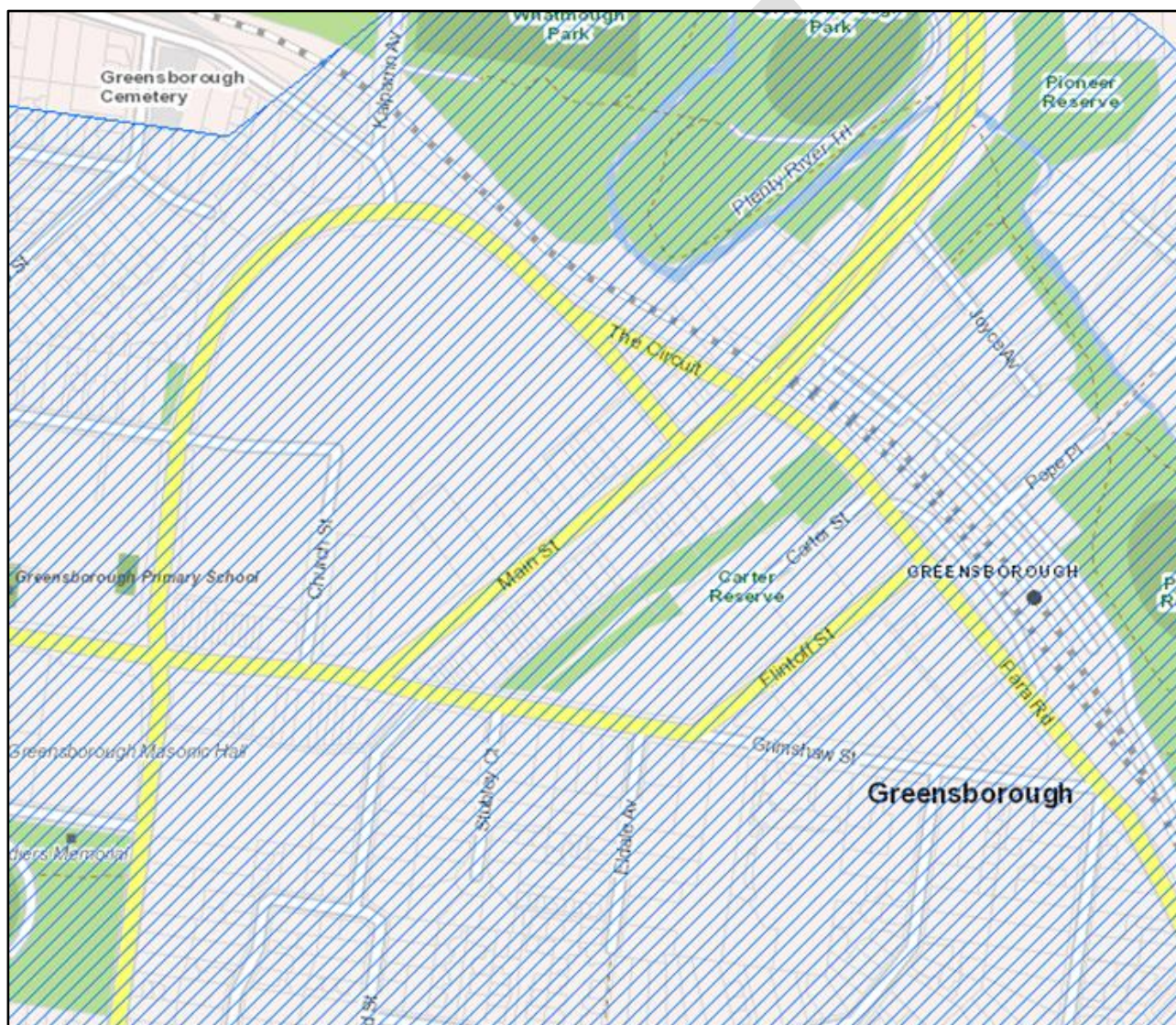
5 Outcomes of the Plan

5.1 Principle Public Transport Network

The Principal Public Transport Network (PPTN) reflects the routes where high-quality public transport services are or will be provided. The PPTN is a statutory land use planning tool that supports integrated transport and land use planning, by encouraging more diverse and dense development near high-quality public transport to help support public transport usage. It helps provide certainty to planners and the community about locations that are, or will be, served by high-quality public transport.

The PPTN is a key component of Plan Melbourne, and is reflected in planning schemes across Victoria. Figure 5-1 shows the subject site lies within 400m of the PPTN.

Figure 5-1 Greensborough Principle Public Transport Network



It is noted that Planning Scheme Amendment VC148 was gazetted on the 31st of July 2018, which introduced an update to Clause 52.06.

A car parking requirement in Table 1 of Banyule Planning Scheme is calculated by multiplying the figure in Column A or Column B (whichever applies) by the measure (for example square metres, number of patrons or number of bedrooms) in Column C.

Column B applies if:

- > Any part of the land is identified as being within the Principal Public Transport Network Area as shown on Figure 5-1 of the Principal Public Transport Network Area Maps provided by the State Government of Victoria in 2018.

In this instance, the subject site is within 400m of the PPTN and as such Column B of Table 1 of the Banyule Planning Scheme is the applied parking rate.

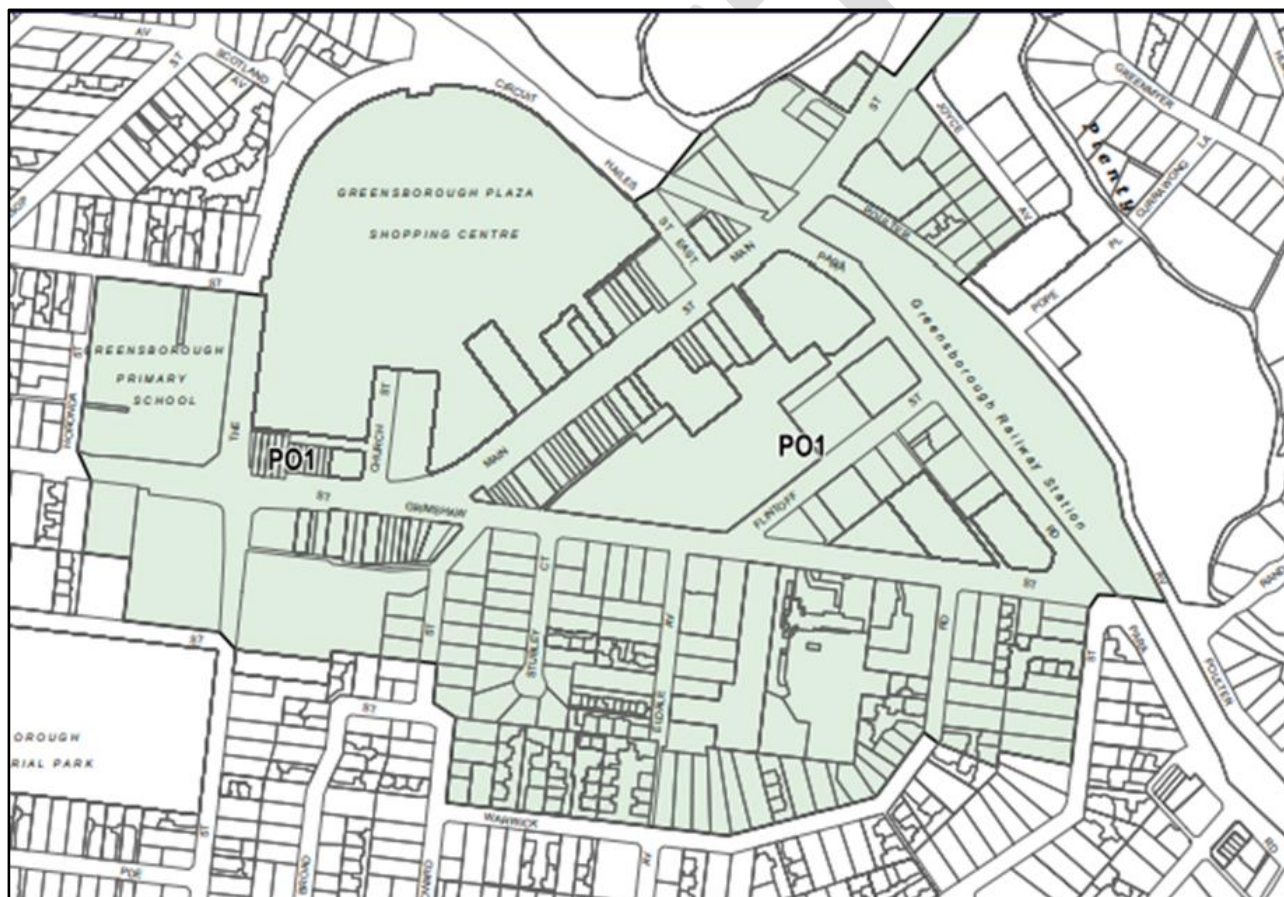
5.2 Car Parking Rates

5.2.1 Current Statutory Requirements

Existing statutory car parking requirements for the GMAC and its immediate surrounds are set out in Clauses 52.06 and 45.09 of the Banyule Planning Scheme.

The GMAC lies within Schedule 1 of Banyule's Parking Overlay as shown in Figure 5-2 below. It is recommended to remove the existing Schedule 1 to the parking overlay. The car parking requirement for new developments within the Greensborough Activity centre will be subject to the requirements of Clause 52.06, with the majority of the activity centre being subject to Column B car parking rates.

Figure 5-2 Banyule Parking Overlay



The intention of the parking provision criteria, as set out in Clause 52.06, is to ensure that there is sufficient parking provided for new uses, change of uses or extended land uses, but that there is not an excessive / oversupply of parking.

The Planning Scheme allows for the reduction of car parking (including a reduction to zero) based on a number of discussion guidelines to the satisfaction of the Responsible Authority.

A summary of the existing car parking rates applicable to overarching land uses situated within the Greensborough Activity Area have been described in Table 5-1.

Table 5-1 Existing Parking Rates – Overarching Land Uses

Land Use	Existing Parking Rate	Car Parking Measure	Rate Reference Document
Shop*	4.6	to each 100 sq m of leasable floor area	Schedule 1 to the Parking Overlay – Banyule Planning Scheme
Food & Drink	3.5	to each 100 sq m of leasable floor area	Column B rate within Table 1 of Clause 52.06-5 – Banyule Planning Scheme
Restaurant	0.4	to each seat	Schedule 1 to the Parking Overlay – Banyule Planning Scheme
Office	3	to each 100 sq m of net floor area	Column B rate within Table 1 of Clause 52.06-5 – Banyule Planning Scheme
Medical Centre	3.5	to each 100 sq m of leasable floor area	Column B rate within Table 1 of Clause 52.06-5 – Banyule Planning Scheme
Dwelling	1 2 0.2	to each one and two bedroom dwelling, plus to each three or more bedroom dwelling, plus visitor spaces to each dwelling	Schedule 1 to the Parking Overlay – Banyule Planning Scheme
Restricted Retail	2.5	to each 100 sq m of leasable floor area	Schedule 1 to the Parking Overlay – Banyule Planning Scheme

* Other than restricted retail premises

5.2.2 Proposed Car Parking Rates

As summarised in Section 6.2 of '*Part 1: Background Report*', this study proposes that future developments situated within the identified Study Area would be required to provide car parking at the following rates set out in Table 5-2.

It should be noted that the recommended peak parking rates for many of the land uses classified as 'overarching' remain the same as the current Column B rate within Table 1 of Clause 52.06 within the Banyule Planning Scheme.

The following sections provide explanations as to the recommended parking rates for each overarching land use based on the available information and offer a *simplified* breakdown of the methodology adopted in determining these rates. Reference is made to Section 6.2.2 of '*Part 1: Background Report*' which offers a more detailed breakdown of the adopted methodology.

Table 5-2 Recommended Parking Rates – Overarching Land Uses

Land Use	Recommended Parking Rate	Car Parking Measure	Planning Scheme Reference
Shop*	3.5	to each 100 sq m of leasable floor area	Column B rate within Table 1 of Clause 52.06-5 – Banyule Planning Scheme
Food & Drink	3.5	to each 100 sq m of leasable floor area	
Restaurant	3.5	to each 100 sq m of leasable floor area	
Office	3	to each 100 sq m of net floor area	
Medical Centre	3.5	to each 100 sq m of leasable floor area	
Dwelling	1	to each one and two-bedroom dwelling, plus	N/A
	2	to each three or more-bedroom dwelling, plus	Column B rate within Table 1 of Clause 52.06-5 – Banyule Planning Scheme
	0^	no visitor car parking requirement	N/A
Restricted Retail^	2.5	to each 100 sq m of leasable floor area	Car parking rates to be applied within the Structure Plan area of Greensborough

* Other than restricted retail premises

^ To be applied within the Structure Plan area of Greensborough

5.2.2.2 Shop (other than restricted retail premises)

The proposed shop car parking rate of **3.5 spaces** per 100 square metres of leasable floor area is noted as being within the range of recommended rates for this land use category adopted across Melbourne metropolitan municipalities (typically observed as 3.5 – 4.0), with Glen Eira adopting a Parking Overlay shop rate of 2.18 spaces per 100 sqm of leasable floor area in the Caulfield Mixed Use Area.

Furthermore, a review of numerous Parking Overlays revealed that the current shop rate contained within Schedule 1 to the Parking Overlay for the Greensborough Activity Centre typically adopts a rate of above 4.0 (currently 4.6). It is therefore considered that the suggested shop parking rate of 3.5 spaces is appropriate, albeit at the lower end of the adopted range across many Melbourne metropolitan municipalities.

5.2.2.3 Food & Drink

It is recommended to maintain the existing car parking rate of **3.5 spaces** per 100 sq m for Food & Drink (Café) uses across the Study Area, in line with the Column B rate for this land use type within Clause 52.06-5 of the Banyule Planning Scheme.

5.2.2.4 Restaurant

The current Schedule 1 to the Parking Overlay rate for restaurant is 0.4 car parking spaces to each seat (*Clause 52.06 refers to each patron permitted*), within the Greensborough Activity Area. It is noted that the same rate was derived as part of the 2006 Greensborough Parking Plan prepared by Cardno. Despite this existing car parking rate being commensurate with Parking Overlay rates observed for restaurant uses across many Melbourne metropolitan municipalities, a review of parking demands vs theoretical and actual supplies within Precinct C revealed this rate to be too high.

It is recommended that a restaurant rate of **3.5 spaces** per 100 square metres of leasable floor area is provided for future uses of this nature, supported by the car parking model and commensurate with the current Column B rate for this land use within Clause 52.06-5 of the Banyule Planning Scheme.

5.2.2.5 Office

It is recommended to maintain the existing car parking rate of **3 spaces** per 100 square metres of leasable floor area as per the existing Column B rate for this land use within Clause 52.06-5 of the Banyule Planning

Scheme. It is noted that this rate represents the office parking rate range of recommended rates for this land use category within Parking Overlays adopted across Melbourne metropolitan municipalities (typically observed as between 3.0 – 3.5 spaces per 100 sq m of net floor area), with Glen Eira and Whitehorse adopting Parking Overlay office rates as low as 2.0 spaces per 100 sq m of leasable floor area.

5.2.2.6 Medical Centre

It is recommended to maintain the existing car parking rate of **3.5 spaces** per 100 sqm for medical centre uses across the Study Area for future developments as per the Column B rate for this land use type within Clause 52.06-5 of the Banyule Planning Scheme and is consistent with the rate recommended in the 2006 Greensborough Car Parking Plan prepared by Cardno.

It is anticipated that this parking rate will continue to support demands associated with this use, with Greensborough continuing to be recognised as one of outer Metropolitan Melbourne's major medical hubs.

5.2.2.7 Residents

In order to estimate the likely parking requirements for residential dwellings, private vehicle ownership rates from ABS Census data have been sourced and data collected relating to current on-street car parking conditions has been analysed.

As noted in Section **Error! Reference source not found.**, a review of the 2016 Census ABS data for 10 Statistical Area Level 1 (SA1) indicates that the study area has a relatively moderate-to-high car ownership level, with average car ownership rates of 1.35 vehicles per dwelling. Notwithstanding, with one and two bedroom dwellings recording average car parking ownership rates of 0.38 and 1.00 spaces per dwelling respectively (and noting only 25% of one bedroom dwellings do not own a vehicle space) scope exists to review car parking rates associated with these dwelling types.

A total of 1,593 residential dwellings have been identified as being located within statistical areas situated inside the identified study area, sharing approximately 2,473 on-street parking spaces with residential frontages. This correlates to a rate of 1.55 on-street parking spaces for every residential dwelling in the study area.

Clause 56 of ResCode recommends the provision of one (1) on-street parking space for every two (2) dwellings. While it appears that there is a considerably higher rate of supply of on-street parking in the study area compared to the ResCode requirements, on-street parking surveys within these residential precincts recorded a demand for 549 spaces at the identified survey period, equating to an on-street residential demand for 0.34 spaces per dwelling.

Car use in general within the GMAC and overall study area should be discouraged if possible, on the basis of good access to public transport and close proximity to places of employment. To this effect, it is recommended that **parking rates of 1 space for one and two-bedroom dwellings**. This rate is generally in line with the average car ownership range for one and two bedroom dwellings located within the study area.

It is recommended that the rate specified Column B rate for this land use within Clause 52.06-5 of the Banyule Planning Scheme for three or more bedroom dwellings be retained, being **2 resident spaces for each 3 or more-bedroom dwelling**.

The car parking rates for residential dwellings situated within the study area listed above are in line with those previously introduced within other Activity Centres located within the municipality of Banyule.

5.2.2.8 Residential Visitors

The study area contains a total of 12 precincts considered primarily as residential in nature. Of these precincts, Precinct Z is considered (for the most part) as a purely residential precinct situated a considerable distance from GMAC. Any non-residential uses within Precinct Z are understood to typically supply sufficient off-street parking to cater for anticipated use-specific car parking demands, leaving on-street parking to accommodate resident and residential visitor parking demands.

A review of the parking inventory data indicates that a supply of 510 spaces are provided in Precinct Z, with the total number of dwellings currently at 291. This indicates that a total of 1.75 spaces per dwelling are provided to cater for residential visitors and potential resident overspill on-street.

Saturday parking survey data indicates a peak on-street demand for 120 spaces, which occurred at 3:00pm and represented an occupancy level of 24%. It has been conservatively assumed that 25% of these demands were attributed to residential visitors, based on information derived from duration of stay data. In this regard, a resultant peak visitor parking demand for 0.06 spaces per dwelling has been derived.

Furthermore, application of the above methodology to Precinct N also derived an anticipated visitor car parking demand of approximately 0.06 spaces per dwelling.

The above suggests that there is merit in considering the reduction of the statutory visitor car parking requirement (currently 0.2 spaces per dwelling) currently applicable to residential developments situated within the study area. It is noted that the current residential visitor parking rate within Schedule 1 to the Parking Overlay does not trigger the need in visitor parking provision, as it states that the rate be applied to each dwelling. It would appear this is perhaps an oversight, with the current rate applicable to the study area likely to relate to dwellings for developments of *5 or more dwellings*.

Due to the accessibility of the area by public transport and existing availability of on-street parking supply used to derive the anticipated existing visitor parking demand it is recommended the Column B rate for this land use within Clause 52.06-5 of the Banyule Planning Scheme be adopted. **Therefore there is no requirement for visitor car spaces.**

Strategy Recommendations & Action Plan

Within '*Part 2: Options & Strategy Analysis Report*', through consultation with Council, Cardno developed a series of recommendations referenced as 'Strategy Items' in order to suitably manage existing and future car parking provisions and demands. These strategic recommendations aim to provide a balanced solution to the issues identified whilst considering the needs of all stakeholders.

To enable Banyule City Council to implement the recommendations set out in the '*Part 2: Options & Strategy Analysis Report*', an Action Plan has been proposed and categorised into the following priority levels:

- > Immediate (2018 - 2019)
- > Short-term (2019 - 2020)
- > Medium-term (2020 - 2021)
- > Long-term (2021 - onwards)
- > Ongoing

It is important that any actions outlined in the '*Part 2: Options & Strategy Analysis Report*', or any other future traffic and parking items, are designed, implemented and maintained in accordance with the relevant guidelines and standards. These are likely to include:

- > VicRoads Traffic Engineering Manual Volume 1 and 2;
- > VicRoads Supplements to Austroads Guides;
- > Austroads Guides;
- > Australian Standards; and / or
- > Banyule Planning Scheme requirements.

Table 5-3 Action Plan

Action No.	Location	Action	Priority Rating
1	Precinct C	Undertake a review of existing parking restriction signage provision within the Henry Street car park and consider additional signage throughout.	Short-term
2	Precinct D	Discuss the possibility of increasing car parking enforcement throughout the 90-minute car parking area within Greensborough Plaza with Centre Management. Requirement for increased monitoring to be reviewed on a regular basis (to be assessed against quantity of overstay vehicles recorded).	Ongoing
3	Precinct E	Investigate the installation of electronic (variable) signage at the Carter Reserve multi-deck car park for better management of available spaces given consistently high to very high occupancy levels recorded.	Immediate
4		Increase car parking enforcement throughout the Carter Reserve multi-deck car park.	Ongoing
5	Precinct F & G	Discuss the possibility of promoting the 'Living Faith Church' public car park with the relevant stakeholders via the installation of way finding signage, including proposed charges and operating hours.	Immediate
6		Discuss the possibility of promoting the 'Diamond Valley Specialist Centre and Dental Group' off-street car park with the relevant stakeholders via the installation of way finding signage, including proposed charges and operating hours.	Immediate
7	Precinct J	Advocate to State Government authorities for the provision of pedestrian access facilities at Greensborough Station, particularly from Main Street along the southern side of Poulter Avenue.	Short-term
8	Precinct L1	Increase car parking enforcement throughout the off-street car park. Requirement for increased monitoring to be reviewed on a regular basis (to be assessed against quantity of overstay vehicles recorded).	Ongoing
9	Precinct S	Increase car parking enforcement throughout the Precinct, with particular emphasis on on-street and off-street parking spaces in the vicinity of Van Dyk's Swimming Academy. Requirement for increased monitoring to be reviewed on a regular basis (to be assessed against quantity of overstay vehicles recorded).	Ongoing
10	Study Area	Car parking rates to be applied within the Structure Plan area of Greensborough to future major land uses as follows: <ul style="list-style-type: none"> – Shop 3.5 to each 100 sq m of leasable floor area – Food & Drink 3.5 to each 100 sq m of leasable floor area – Restaurant 3.5 to each 100 sq m of leasable floor area – Office 3.0 to each 100 sq m of net floor area – Medical Centre 3.5 to each 100 sq m of leasable floor area – Restricted Retail 2.5 to each 100 sq m of leasable floor area – All other Refer to Column B of Table 1 to Clause 52.06-5 (where specified) 	Immediate
11	Study Area	Car parking rates to be applied within the Structure Plan area of Greensborough for new residential developments as follows: <ul style="list-style-type: none"> – 1 resident spaces for each one and two-bedroom dwelling – 2 resident spaces for each three or more-bedroom dwelling 	Immediate
12	Study Area	Active and public transport improvement projects be completed to support the lower car parking rates identified within this report as identified within the Greensborough Transport Masterplan.	Ongoing
13	Study Area	Where a reduction to statutory car parking requirement for a residential development is approved in accordance with clause 52.06-7 of the planning scheme, bicycle parking is to be provided at a rate of 1 bicycle space to each car space waived, regardless	Immediate

Action No.	Location	Action	Priority Rating
		of scale or height of the development. In addition, bicycle parking is to be provided within the development for waived residential car spaces, or on the developments frontage/footpath if a visitor car space is waived.	
14	Study Area	Encourage the provision of 1 motorcycle or scooter parking space for every 50 car parking spaces constructed within any car park within the Study Area, designed in accordance with the requirements of the relevant Australian Standard for Off-street Parking Facilities.	Immediate
15	Study Area	Council to commission car parking surveys of the Study Area regularly to ensure that the level of car parking demand is increasing in line with anticipated land use growth and being managed in accordance with the objectives of this strategy.	Medium-term
16	Study Area	The car parking strategy be reviewed and updated regularly to reassess car parking demand levels and ensure it reflects local conditions and relevant policies.	Medium-term
17	Study Area	Remove the existing Schedule 1 to the parking overlay. The car parking requirement for new developments within the Greensborough Activity centre will be subject to the requirements of Clause 52.06, with the majority of the activity centre being subject to Column B car parking rates as detailed above.	Immediate
18	Study Area	Wayfinding maps be introduced at offices / facilities within the area to direct staff / customers to parking areas	Immediate
19	Study Area	Ensure appropriate parking restrictions are implemented and enforced to maintain access to driveways and off-street car parking facilities	Ongoing
20	Study Area	Ensure adequate parking is provided for people with disabilities adjacent to the appropriate land uses	Medium-term
21	Study Area	Provide adequate lighting and pedestrian footpaths to ensure accessibility to / from parking areas	Medium-term