Riseley and Canning Bridge Activity Centres

Parking Management Plan

CEP02379

Prepared for
City of Melville

22 March 2016

Cardno
Shaping the Future

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Document Information

Prepared for	City of Melville
Project Name	Parking Management Plan
File Reference	CEP02379-TR-R001-E-Riseley and Canning Bridge_Activity Centre PMPs-V1SR-JHM.docx
Job Reference	CEP02379
Date	22 March 2016
Version Number	Revision E
Effective Date	22 March 2016
Date Approved:	22 March 2016

Document History

Version	Effective Date	Description of Revision	Prepared by:	Reviewed by:
A	23 June 2015	Parking Management Plan	Sneha Rapur	Ray Cook Jacob Martin
B	6 August 2015	Parking Management Plan: Rev B	Sneha Rapur	Jacob Martin
C	12 August 2015	Parking Management Plan: Rev C	Sneha Rapur	Jacob Martin
D	4 January 2016	Parking Management Plan: Rev D	Sneha Rapur	Jacob Martin
D	22 March 2016	Parking Management Plan: Rev E	Sneha Rapur	Jacob Martin

Executive Summary

Cardno has been commissioned by the City of Melville to prepare Parking Management Plans for the Canning Bridge and Riseley Activity Centres along with the Canning Highway corridor linking these centres. The report focusses on the requirements for car parking quantum and management within the build-out timeframe of the Centres.

This study includes a detailed assessment of existing parking issues within the study area. Parking occupancy surveys and origin-destination (OD) surveys have been conducted to determine the existing behaviour and usage of available parking quantum. The analysis of the data yielded the following results:

Riseley Centre

> There are **1,026** parking spaces with **310** spaces (29%) being managed by the City of Melville (CoM) and **766** spaces (71%) managed privately by landowners or businesses. Most of the parking areas are therefore the responsibility of landowners/businesses, not the City.

> The CoM-managed parking supply is generally well-used, with the maximum utilisation rate of 77% at 11am-12pm Fridays. The target for good parking management is typically 85% utilisation. This suggests that there is not a parking supply issue, but rather a parking management issue.

Occupancy rates by hour for public parking areas managed by City of Melville										
Hour Starting (Friday)	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00
Average Occupancy Rate by Hour	40%	68%	70%	77%	71%	77%	75%	71%	62%	53%

> 82% of surveyed parkers stay for 2 hours or less.

> Although a sizable parking surplus currently exists, the attractiveness of ‘prime’ parking bays creates a local shortage close to the major activity hubs (Riseley Square shopping complex and Kearns Crescent). Parking areas that are located within a comfortable walk away from the centre were observed to be empty throughout the day, indicating a general lack of efficient utilization of parking areas.

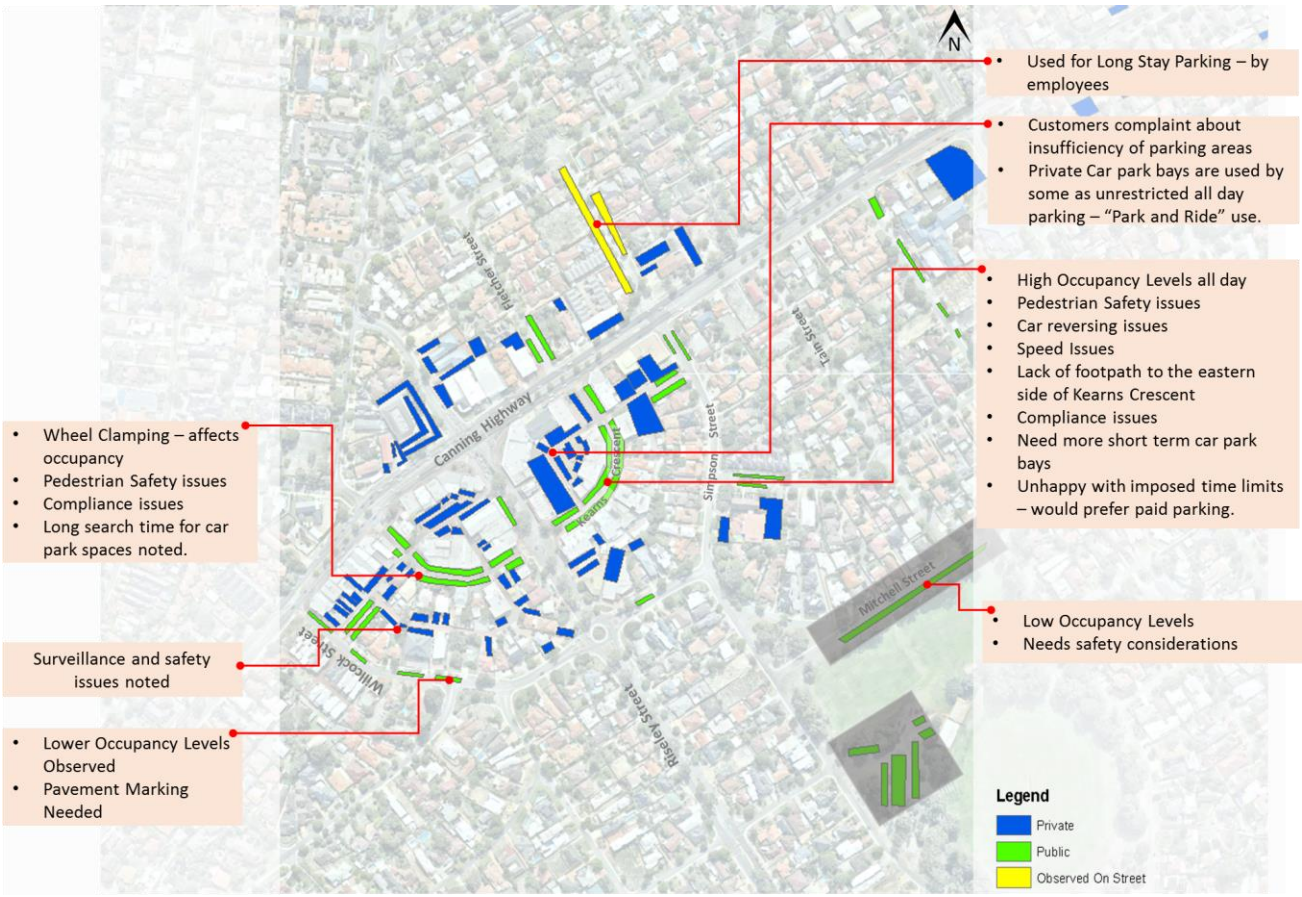
> There are no paid parking areas currently, with parking managed mainly through time restrictions. There are two issues with using time restrictions:

- There are compliance issues if time limits are not back up by consistent enforcement.
- Motorists park for longer than they are allowed to, which means there are less bays available for customers

> There are a range of parking and urban design issues which can be addressed through better parking management.

The figure below summarises some of the key parking issues identified for the Riseley Centre:

Riseley Centre parking management issues



Canning Bridge Centre

> There are 1,233 parking spaces with 503 (41%) being managed by the City and 730 (59%) managed privately by landowners or businesses.

> CoM-managed parking supply is underutilised, with the maximum utilisation rate of 50% at 1-2pm Fridays. The aim for good parking management is typically 85% utilisation. So there is not a parking supply problem, but there is a parking management problem.

Occupancy rates by hour for public parking areas managed by City of Melville										
Hour Starting (Friday)	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00
Average Occupancy Rate by Hour	23%	27%	29%	28%	38%	50%	46%	34%	34%	43%

> 84% of surveyed parkers stay for 2 hours or less

> Although a sizable parking surplus currently exists, the attractiveness of 'prime' parking bays creates a local shortage close to the major activity hubs. Parking areas that are located within a comfortable walk away from the centre were observed to be empty throughout the day, indicating a lack of efficient utilization of existing parking.

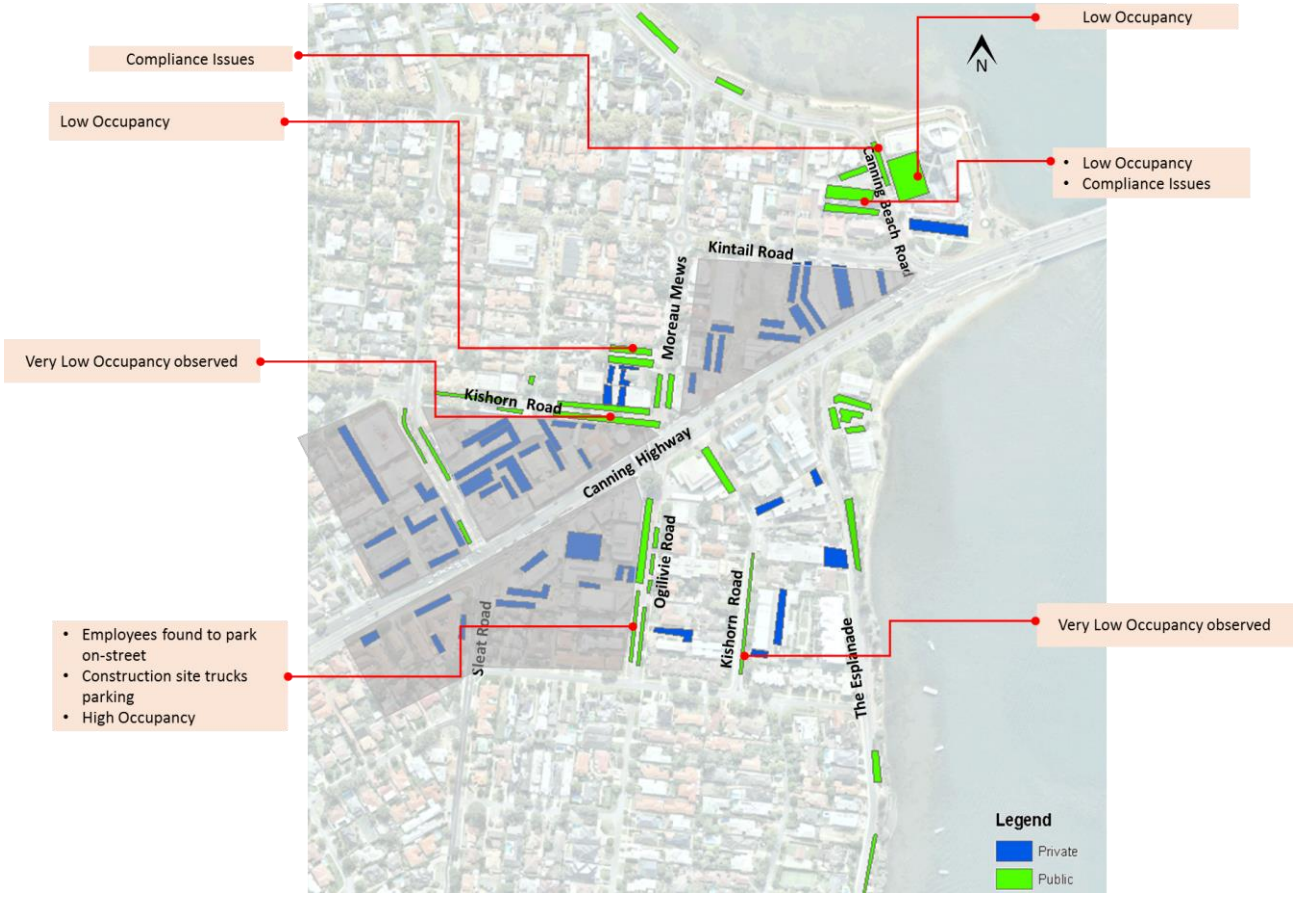
> CoM-managed parking includes both paid and time restricted parking. There may be a need to modify parking fees to encourage a more even distribution of demand.

> The Canning Bridge Centre attracts visitors with a longer duration of stay than the Riseley Centre. This includes a higher proportion of recreation and office patronage.

> The surveys identified a lack of compliance on part of the customers, especially in short stay parking areas. Consistent enforcement including the introduction of additional rangers or subcontracted enforcement staff will help mitigate this issue.

The figure below summarises some of the key parking issues identified for the Canning Bridge Centre:

Canning Bridge Centre parking management issues



The analysis of the current parking situation within the study area revealed several issues regarding its current operation and its future potential. The issues for consideration include:

> Parking supply and occupancy – parking shortages near major activity hubs.

> Parking restrictions – ratio of free parking and paid parking not optimised.

> Enforcement – lack of compliance by users.

> Heterogeneity of the visitors – the activity centres have different user categories.

> Pedestrian safety – poor facilities for pedestrians and cyclists.

Based on the identified issues, detailed Parking Management Plans have been prepared for three scenarios to reflect the staged build-out of the activity centres by transitioning the parking management framework appropriately. The identified strategic action areas are as follows:

> Instituting parking pricing

> Revised time limits

> Keeping parking meter revenue within the centre,

> Better management and enforcement of car parking on public land (City of Melville responsibility) and private land (private landowner responsibility)

> Improving parking bay design/ safety/ infrastructure & information and enhancing walkability and end of trip facilities.

Further, quick wins for parking management have been identified for both Riseley Centre and Canning Bridge Areas along with short, medium, and long term parking management plans.

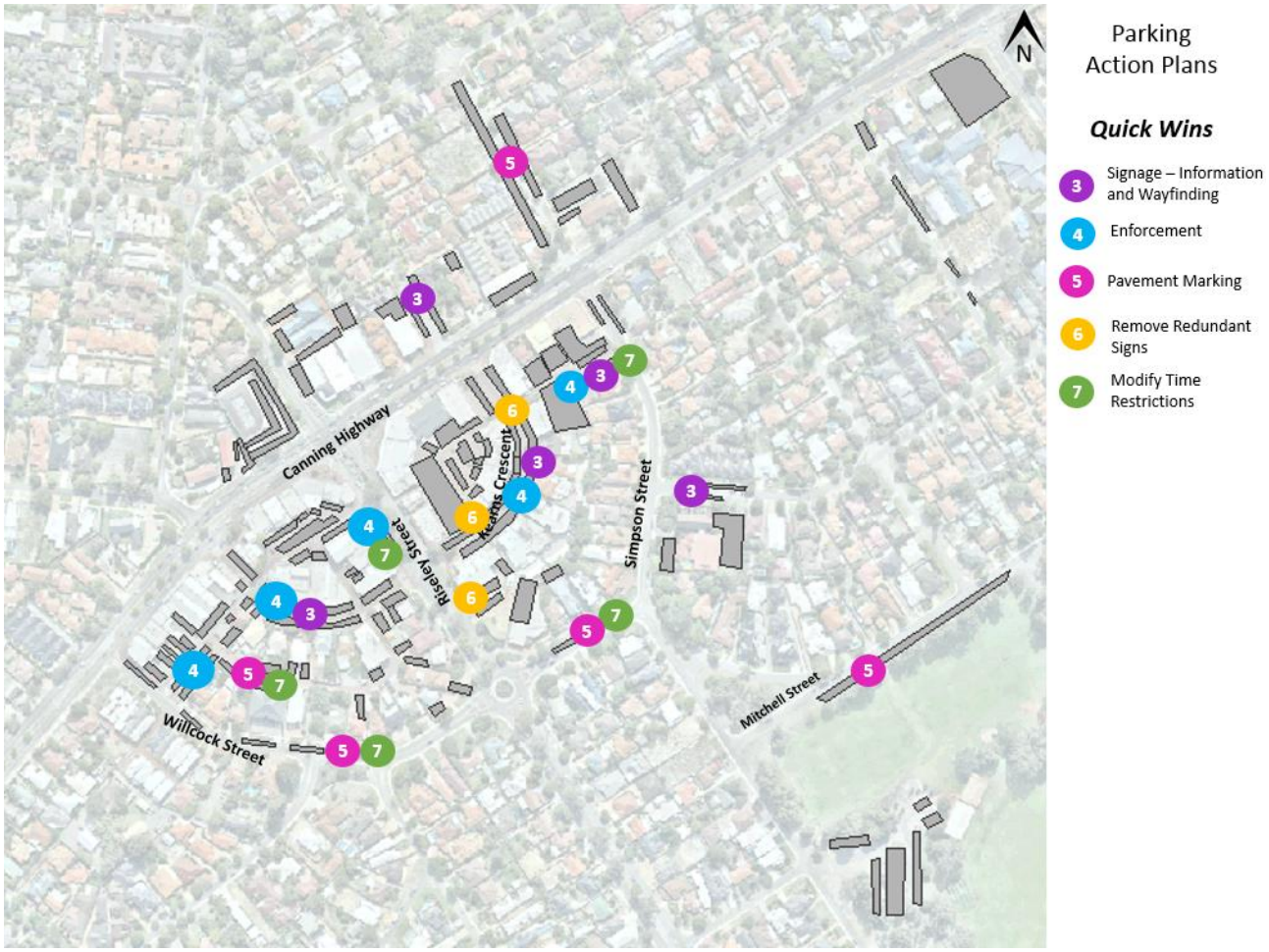
In order to address the existing parking management issues immediately, following steps can be adopted as quick remedial actions for both Riseley and Canning Bridge centres:

No.	Action	Rationale
Both Centres Quick Wins Within Next 12 Months		
1	**Update Intramaps** to include details of all parking areas and associated parking restrictions **Action – Technical Services, Strategic Urban Planning, GIS Officer**	▪ Intramaps does not currently show where parking areas are located and what parking restrictions apply. Updating Intramaps and making this information available to all staff will make it easier to provide accurate advice to the community. It would also provide background data for new wayfinding signage and maps etc
2	**Develop a new webpage** with information and maps on where parking is available, how much it costs, what restrictions apply and potential areas for staff parking. **Action – Marketing & Comms, Neighbourhood Amenity, Strategic Urban Planning**	▪ The City's website currently has basic information on parking, which mainly focuses on regulations ▪ Additional customer-focussed information could be provided including simple maps to help people make decisions on where to park
3	**Develop new Signage and Information** Provide new way-finding signage, brochures and information on staff and long-term parking options **Action - Marketing & Comms, Travelsmart, Sign Shop**	▪ Wayfinding signage, maps and information will help make it easier for staff and long term parkers to know where to park ▪ New signage could also be prepared for high demand parking areas (e.g. Ogilvie Road) to show where alternative parking areas are available (e.g. 29 Moreau Mews)
Riseley Centre Quick Wins Within Next 12 Months		
4	**Improve Enforcement** **Action – Neighbourhood Amenity**	▪ Parking enforcement acts as a firm, but fair, incentive for people to comply with the rules, helps improve the turnover of car bays and make it easier to find parking
5	Provide **new pavement marking** for parking bays on the following street sections: Existing and new car bays on Willcock Street and Simpson Street Simpson Street to the north of Canning Highway Laneway parallel to Kearns Crescent - to the west of Riseley Street Existing bays on Mitchell Street **Action – Technical Service**	▪ New pavement marking will delineate existing bays that are not line-marked and new parking bays. It will help formalise existing and new on-street parking bays ▪ It is a relatively quick and cheap way to create extra car parking where safe to do so
6	**Remove redundant parking signs** in Riseley Centre (Parking Stations No. 19 and 27) **Action – Technical Services**	▪ These signs are redundant as parking on private land is no longer managed by CoM
7	**Modify parking time restrictions** a. Willcock Street west of Riseley Street to be changed to 4hr parking from current 2hr parking (not including ¼ hour parking which is to remain) b. Willcock Street west of Riseley Street to be changed to 4hr parking **Action – Technical Services**	▪ ▪ These bays can provide medium term parking options

No.	Action	Rationale
Canning Bridge Quick Wins Within Next 12 Month		
8	Improve Enforcement Action – Neighbourhood Amenity	▪ Parking enforcement acts as a firm, but fair, incentive for people to comply with the rules, helps improve the turnover of car bays and make it easier to find parking
9	Increase parking fee to $3 per hour on Ogilvie Road Action – Neighbourhood Amenity	▪ Parking on Ogilvie Road is often full and being used by employees. A higher fee will reduce demand and shift parking to other parking areas
10	Remove parking time restrictions and introduce first hour free in targeted locations Action – Neighbourhood Amenity and Technical Services	▪ Remove time restrictions (e.g. 2 hour limit) wherever paid parking is currently in place to provide more flexibility for parkers ▪ Introduce first hour free on-parking in Forbes Road, Sleat Road and Kishorn Road north of Canning Highway and Moreau Mews which are underutilised, and at the 29 Moreau Mews car park to encourage short term parking close to local businesses

The figure below presents the Riseley Centre parking management action plan "Quick Wins":

Riseley Centre Parking Management Action Plan "Quick Wins"



The figure below presents the Canning Bridge Centre parking management action plan “Quick Wins”:

Canning Bridge Centre Parking Management Action Plan “Quick Wins”

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1 Introduction

1.1 Purpose of this Report

Cardno has been commissioned by the City of Melville to prepare Parking Management Plans (PMP) for Riseley and Canning Bridge Activity Centres. **Figure 2-1** shows the identified study area.

There has already been extensive planning in the area, including:

> Riseley Centre Structure Plan (2014)

> Canning Bridge Structure Plan (2015)

This Report focuses on identification of the existing issues with parking within the study area to devise an appropriate Parking Management framework for managing the existing parking supply efficiently through to the long term development of the Activity Centres.

Additionally, a detailed Parking Assessment has been conducted to determine the requirement for car parking quantum taking into account the effects of shared and reciprocal parking interactions within the build-out timeframe of the area, as well as in the context of the Riseley and Canning Bridge Activity Centres.

1.2 Scope

This study includes a detailed assessment of existing parking issues within the study area. Parking Occupancy surveys and Origin-Destination (OD) surveys have been conducted to determine the existing behaviour and usage of available parking quantum. Based on the identified issues, detailed Parking Management Plans have been prepared for three scenarios to reflect the staged build-out of the activity centres by transitioning the parking management framework appropriately.

Short and intermediate term plans discuss actions to be undertaken within 5 years, while long term PMPs describe the additional supply and management framework requirements for a full build-out scenario, which is projected to be well beyond the 5 year time horizon.

This study also includes consideration for theoretical demand and current statutory supply requirements, including the effect of shared and reciprocal parking. The parking quantum determined has been allocated across on-street, off-street exclusive and off-street shared car parking for the constituent land uses.

The proposed parking management system and design guideline options have been offered with the aim to create a sustainable parking supply, minimise capital expenditure on parking and support mode shift while maintaining short- and long-term commercial viability for the study area. Also considered are the various mechanisms for demand and supply management necessary to maintain an effective parking system, including transition of that parking supply over time.

1.3 Reasons for drafting a Parking Management Plan

Car parking is an important land use as most cars are parked for most of the day often at various locations at different times of the day. Parking issues are becoming more evident and are likely to grow in the future unless the City proactively plans for a better Parking Management Plan.

The City would like to better manage parking issues in the Riseley and Canning Bridge Activity Centres and along the Canning Highway corridor between the two centres, which are approximately 1 kilometre apart.

Parking Management Plans are required for the following reasons:

> Parking issues are a concern for landowners, businesses, residents and visitors to the centres;

> A Structure Plan has been approved for the Riseley Centre, which provides more development potential and encourage an intensive mix of land uses;

> A Structure Plan has been approved for Canning Bridge Centre. The structure plan significantly increases development potential and commercial and residential floor space in the centre;

- Local Planning Scheme No. 6 has increased the development potential and residential population along the Canning Highway corridor in line with the Western Australian Planning Commission's Directions 2031 and Beyond strategy;
- Canning Highway is a key public transport route. The Department of Transport and Public Transport Authority are investigating potential bus lanes and further improvements to public transport along the route. This may increase demand for park and ride options.

Given the importance of these centres in achieving local and regional growth management and transportation planning objectives a comprehensive Parking Management Plan is identified to be an important aspect in the structure plans, recently prepared for both the centres. Managing parking is one way to encourage alternative modes of travel into and within centres and therefore becomes a significant land use and transportation strategy. Parking management plans allow communities to control the supply and design of parking.

2 Project Background

2.1 Background

The City of Melville has recently prepared structure plans for both Riseley and Canning Bridge Activity Centres detailing the City's future vision of the Precincts. The plans primarily focus on mixed use and retail development for these centres. As these centres develop, the need to supply and manage parking becomes increasingly important.

It has also been recognised within the structure plans that in order to keep the activity centres vibrant and pedestrian friendly, lesser space should be devoted to car parking. Having an area which is compact, walkable and lively is highly desirable and will be an important part of the City's land-use portfolio. The City therefore intends to work together with business and residential property owners to resolve parking issues in these centres to ensure that each Precinct can function to its capacity.

2.2 Site Location

The Study Area is bounded by the roads labelled on **Figure 2-1,** comprising the Riseley Centre to the west and Canning Bridge Centre to the east. The corridor connecting these two centres has also been identified as an important contributor to the growth of these two strategic centres. PMPs have been prepared separately to address the parking behaviours within Riseley and Canning Bridge Centres. This method reflects the different and independent characteristics of the two Centres; resulting in differing visions for change.

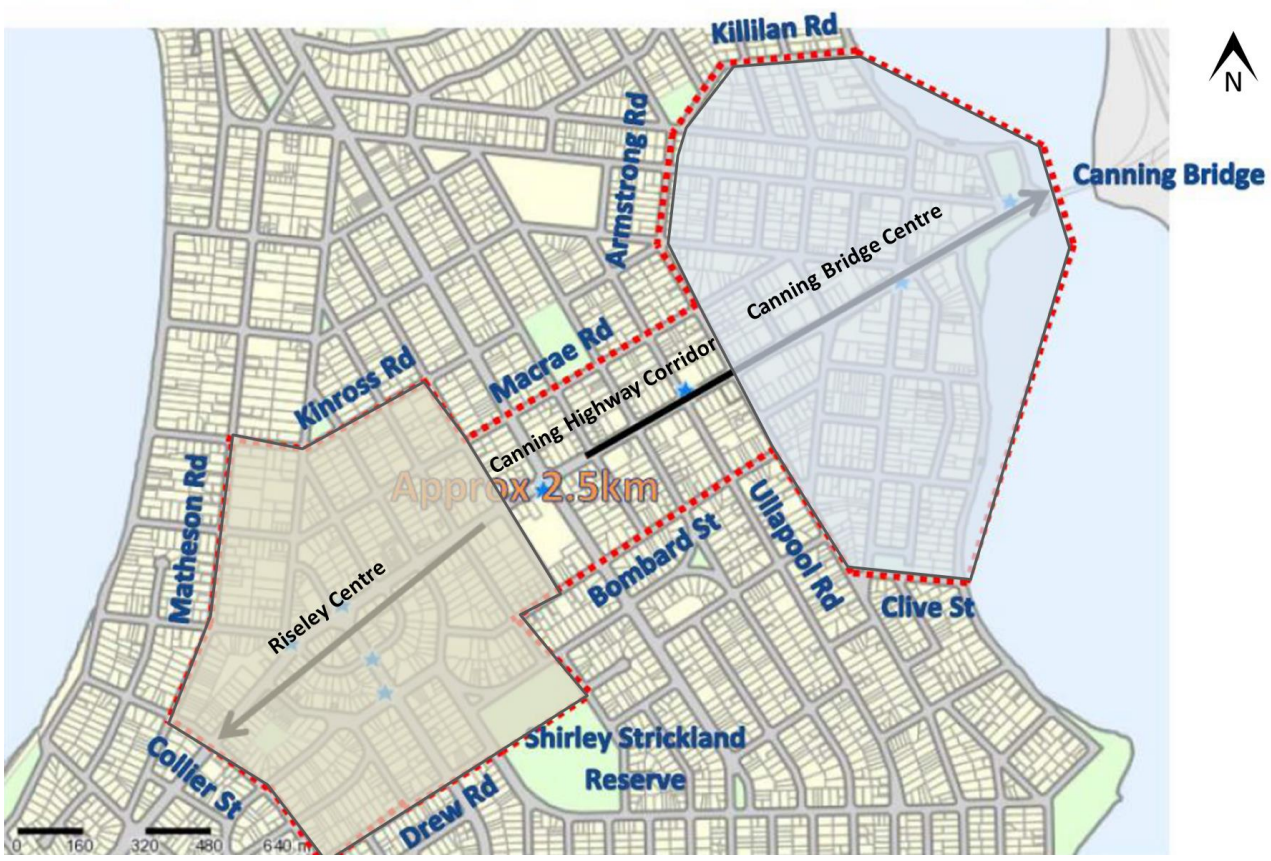


Figure 2-1 Study Area

2.2.2 Current land uses

Figure 2-2 provides a detailed view on the land uses within the Study Area while **Table 2-1** provides the current land use yields.

Riseley and Canning Bridge Centres predominantly operate as mixed use centres attracting intense activity during the day. The Canning Highway corridor is predominantly residential but forms an important connection between the two centres.

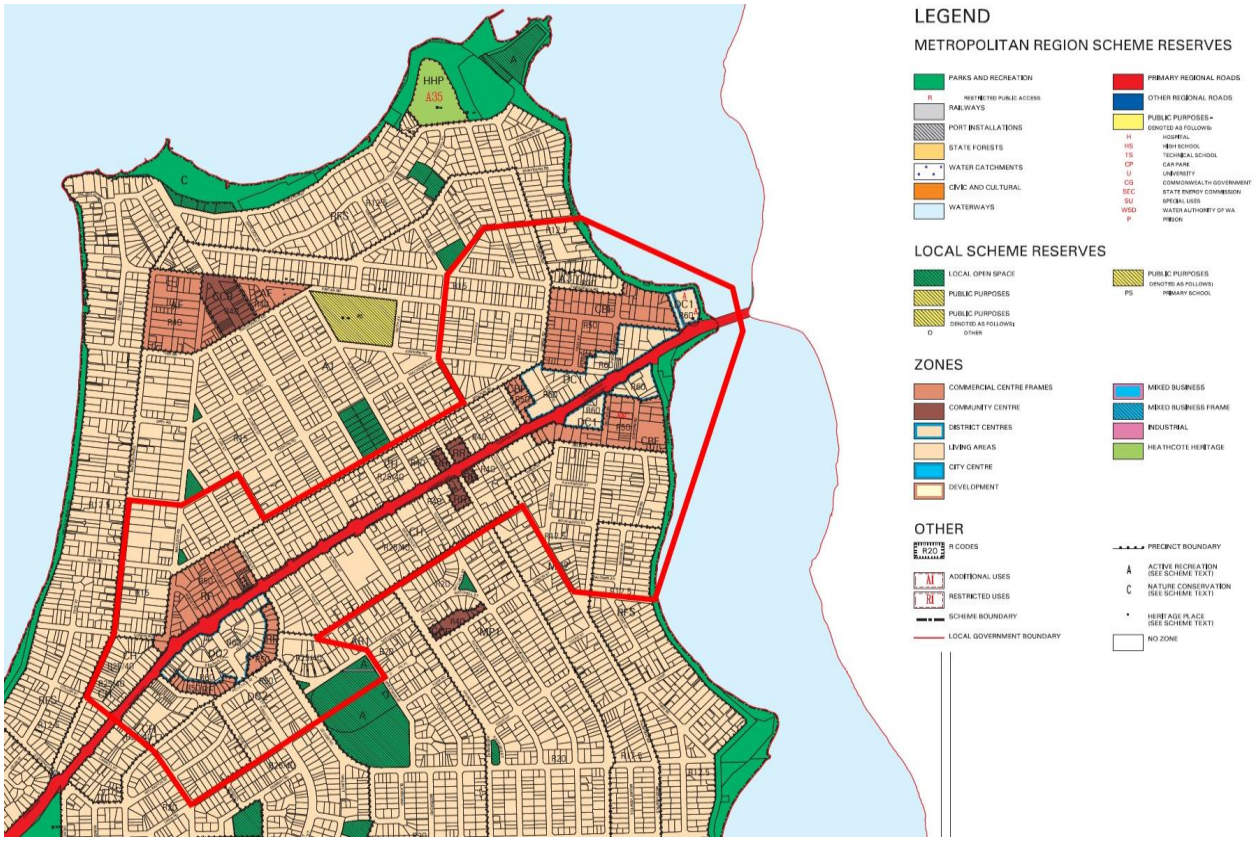


Figure 2-2 Land Zoning Map in Community Planning Scheme 5

Source: Department of Planning

Table 2-1 Current Land Use Yields of the Activity Centres

Land Use	Riseley Centre	Canning Highway Corridor	Canning Bridge Centre
Residential - Single house, grouped dwelling, multiple dwellings	298 dwellings 274,888m^2	550 dwellings 149,190m^2	845 dwellings 353,971m^2
Office	7,547m^2	16,804m^2	25,232m^2
Restaurant / Café / Small Bar / Lunch Bar / Take Away Food Outlet	1,106m^2	0m^2	710m^2
Hotel / Tavern	0m^2	0m^2	2,380m^2
Cinema / Theatre / Public Amusement	573m^2	0m^2	5,041m^2
Shop / Corner Store / Convenience Store / Restricted Premises	7,171m^2	0m^2	4,714m^2
Total	291,285m^2	149,490m^2	392,048m^2

2.3 Future Direction

The future envisaged for the Study Area has been described in two separate Structure Plans; the Riseley Structure Plan and the Canning Bridge Structure Plan. The Canning Highway Corridor is planned to be

developed as a high-density residential precinct, acknowledging its proximity to the high frequency Public Transport Route along Canning Highway.

2.3.1 Riseley Activity Centre Structure Plan

The Riseley Activity Centre Structure Plan was approved in June 2014 and details the City of Melville's vision for the future development of the Activity Centre. The key objectives of the Structure Plan are as follows:

> Create an attractive and sustainable activity centre that is a vibrant, desirable and safe place to live, work and socialise;

> Facilitate viable, enduring and high quality development in the activity centre with an appropriate mix of land uses;

> Enhance the character, streetscapes and public spaces in the activity centre;

> Appropriately manage traffic, parking and accessibility issues;

> Promote a mix of housing choices;

> Encourage local employment and business opportunities; and

> Provide certainty to enable investment decisions to be made with reasonable confidence.

Figure 2-3 presents the Riseley Centre Structure Plan Map showing the maximum building heights. The structure plan identifies 5 major development precincts with distinctive characteristics as described below:

> **Precinct 1: Riseley Core** is a pedestrian-scaled, vibrant, mixed use area with a boulevard character. Commercial, entertainment and retail uses are envisaged on the ground floor to service the local community and visitors. Residential dwellings and commercial uses are envisaged on upper levels of buildings.

> **Precinct 2: Canning Corridor** has a high exposure to passing traffic. Commercial, showroom and retail uses are envisaged on the ground floor, with offices and residential uses on the upper levels of buildings.

> **Precinct 3: The Crescent** is the vibrant heart of the activity centre with a variety of fine-grained shops and entertainment activities on the ground floor. Residential dwellings and commercial uses are envisaged on upper levels of buildings. The Precinct provides the opportunity to live, work and play in an exciting, urban place.

> **Precinct 4: Transitional Frame** provides for the incremental expansion of the activity centre over time. The precinct is anticipated to change from a predominately residential area to also include compatible commercial uses. A key feature of the precinct is adaptability, where buildings can be used for different uses over time.

> **Precinct 5: The Residential Frame** is intended to remain as a predominately residential area and provides for medium to high density residential development. Given its location next to a busy activity centre, the amenity of the precinct will be different to the amenity found in suburban residential areas.

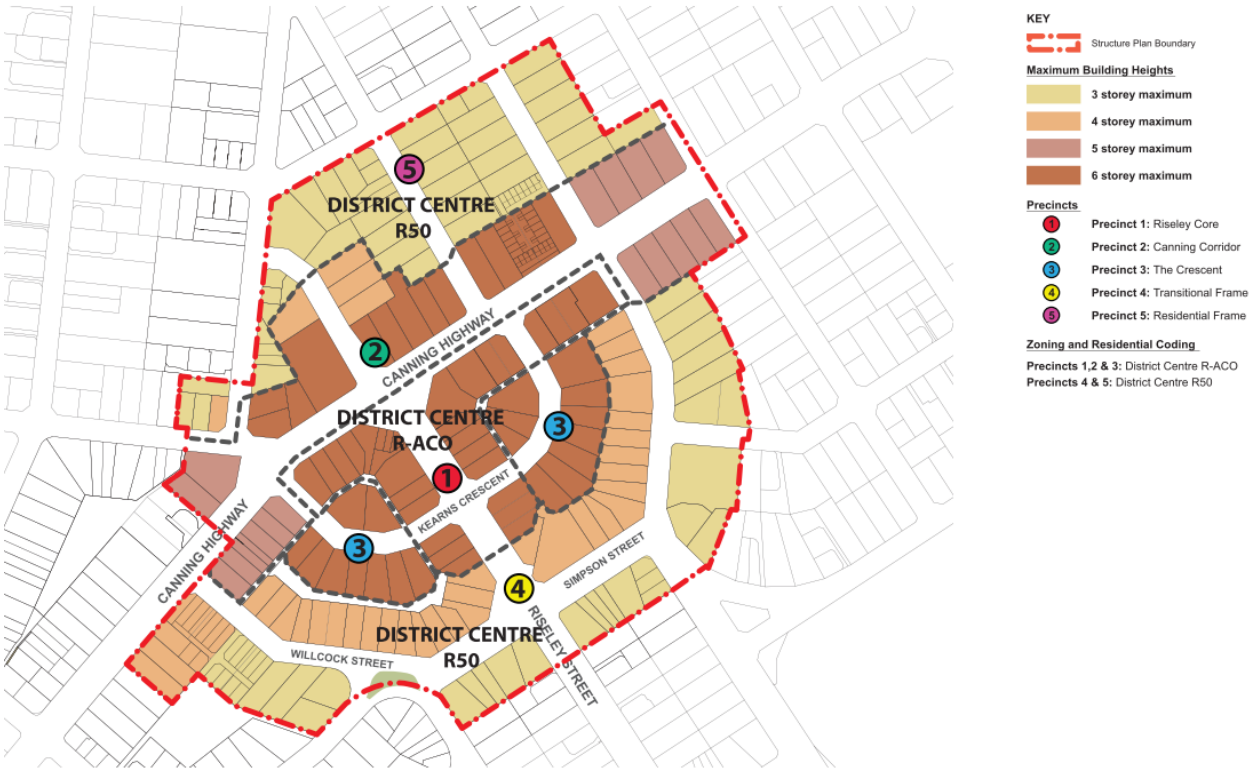


Figure 2-3 Riseley Centre Structure Plan map

Source: Riseley Centre Structure Plan, April 2014

Proposed future land use yields for the full build out of the activity centre is shown in **Figure 2-4**, as a comparison to the existing yields.

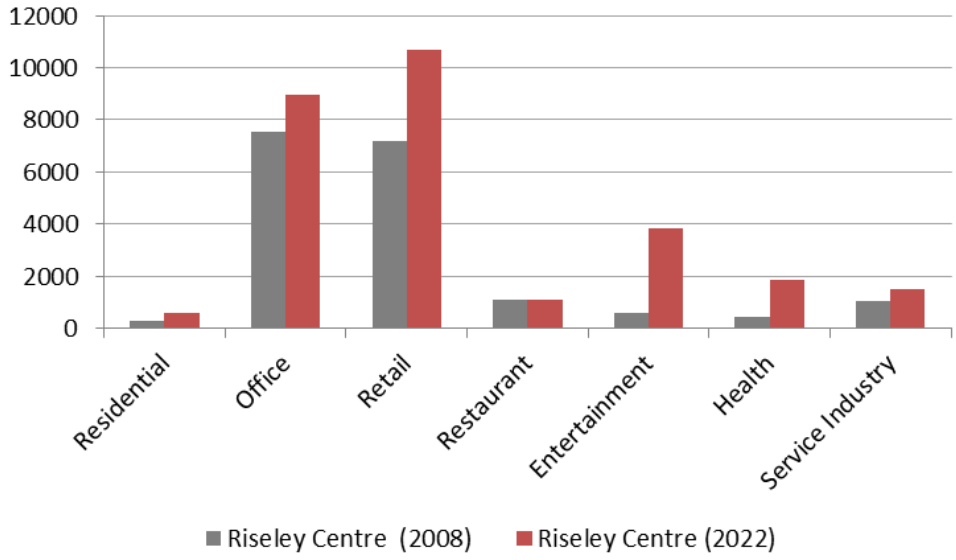


Figure 2-4 Riseley Centre existing and future land use yields (in sq.m NLA)

As shown, there is a proposed increase in office, retail and entertainment facilities in the centre.

2.3.2 Canning Bridge Structure Plan

The Canning Bridge Structure Plan (CBSP) was approved in March 2015. The CBSP establishes a foundation for the future of the area including objectives and goals for its ongoing development, guidelines for the style of built form which is expected, and an implementation framework for orderly improvements to

infrastructure and land over time. **Figure 2-5** presents the CBSP area. The CBSP area is divided into 6 sub-zones. The present parking assessment considers the area covered within Q1 and Q2 sub-zones, referred to as the Canning Bridge Centre from here on. **Figure 2-6** shows the proposed vision for the development of Canning Bridge Centre. The objectives of the structure plan are as follows:

- Meet district levels of community need and enable employment, goods and services to be accessed efficiently and equitably by the community.
- Support the activity centre hierarchy as part of a long-term and integrated approach to the development of economic and social infrastructure.
- Support a wide range of retail and commercial premises and promote a competitive retail and commercial market.
- Increase the range of employment within the CBSP area and contribute to the achievement of sub-regional employment self-sufficiency targets.
- Increase the density and diversity of housing in and around the CBSP to improve land efficiency, housing variety and support the facilities in the area.
- Ensure the CBSP area provides sufficient development intensity and land use mix to support and increase high frequency public transport.
- Maximise access to and through the CBSP area by walking, cycling and public transport while reducing private car trips.
- Plan development in the CBSP area around a legible street network and quality public spaces.
- Concentrate activities, particularly those that generate steady pedestrian activation, within the CBSP area.

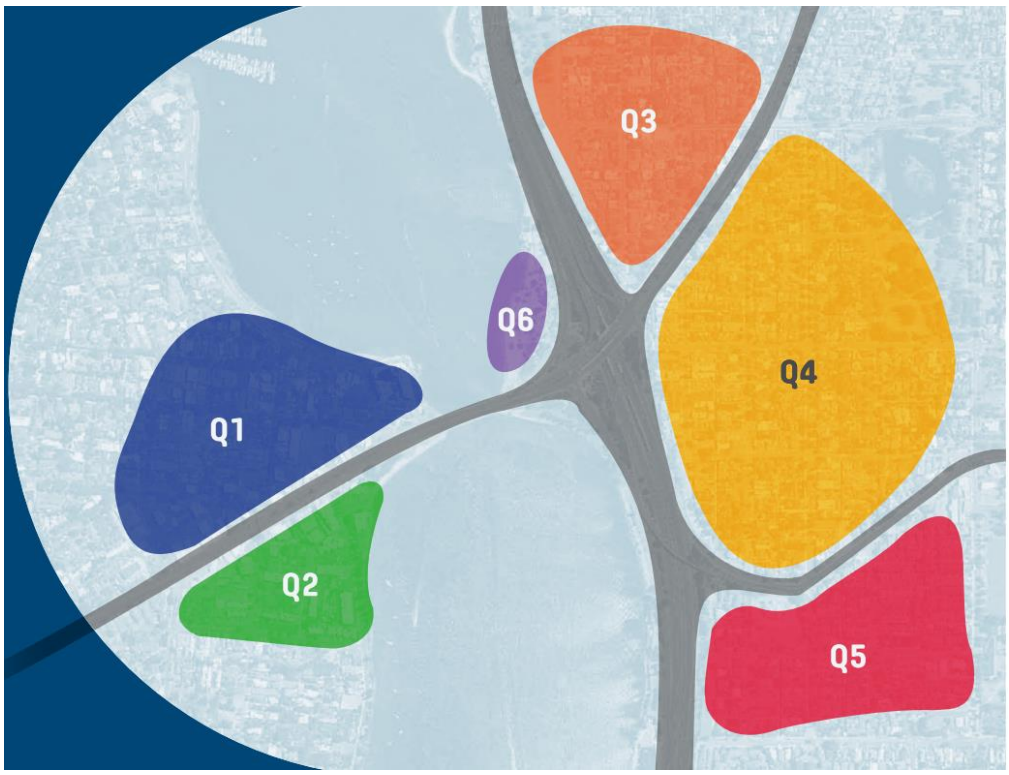


Figure 2-5 CBSP Area and sub-zoning

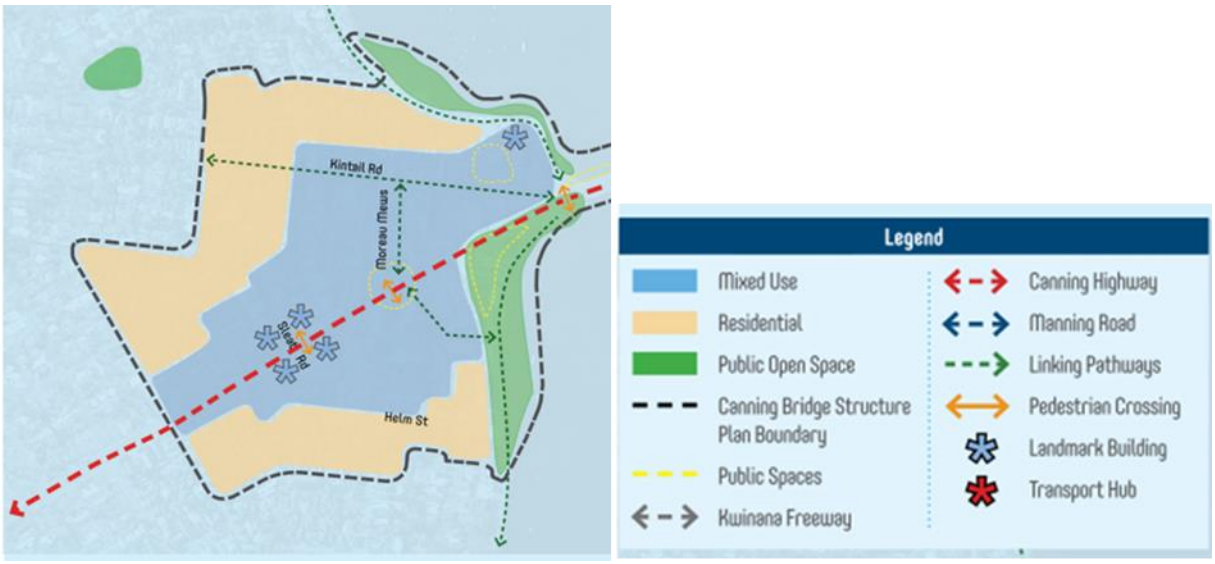


Figure 2-6 CBSP development vision for Canning Bridge Centre

Proposed future land use yields for the full build out of the CBSP is shown in **Figure 2-7**, as a comparison to the existing yields.

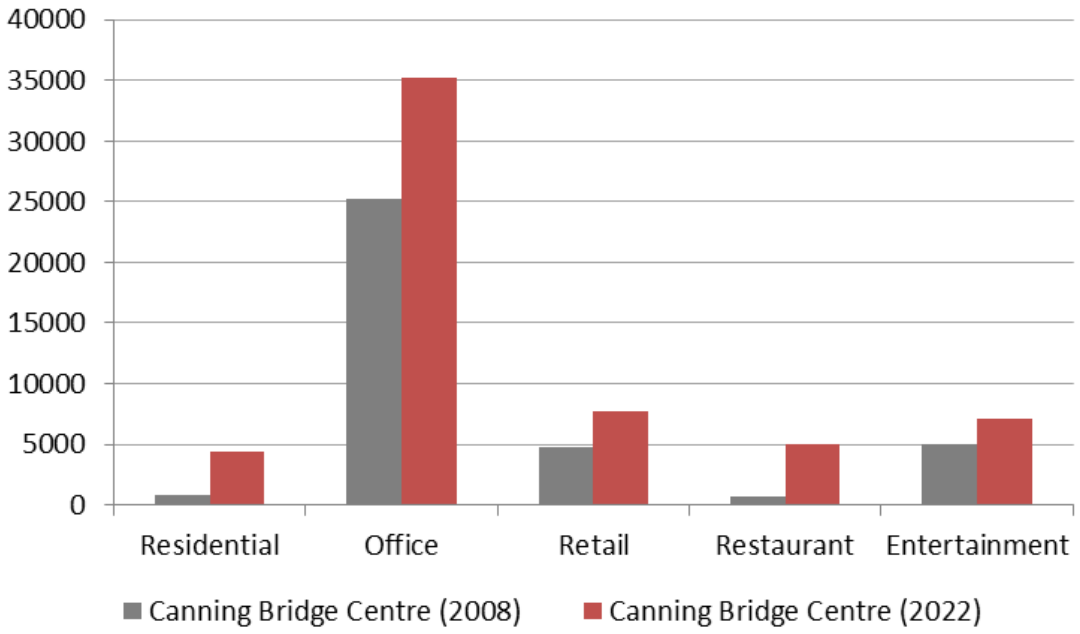


Figure 2-7 Canning Bridge Centre existing and future land use yields (sq.m NLA)

As shown, there is a proposed increase in office, retail, restaurant and entertainment facilities in the centre.

2.3.3 Canning Highway Corridor

The Canning Highway Corridor forms a continuum, linking the two activity centres. It has a potential to be developed as a TOD corridor with easy access to a future high frequency public transport corridor and to accommodate a park and ride facility in the long term.

3 Existing Parking Situation

3.1 Parking Surveys

Site Visits were conducted to develop an understanding of the Study Area and its context as a first step. Two on-site surveys were later undertaken to obtain the required data for analysis:

> **A parking occupancy survey** was conducted to record the total number of parking spaces available in the area as well as the peak occupancy levels of those spaces.

> **An origin–destination intercept survey** was undertaken to determine travel patterns and duration of stay of the car park users.

The survey methodology is discussed in detail in the following sections.

3.1.1 Site Visits

Site visits marked the first stage of data gathering for the study purpose. Site visits and examination of the area gave an insight into the current areas of concern both in terms of parking space utilisation and design. Site visits helped identify the availability of infrastructure and also helped in confirming the information obtained from desktop surveys to the on–ground situation. The collected data was mapped using a Geographic Information System (GIS) platform to represent the parking supply and demand characteristics of each area.

3.1.2 Parking Occupancy Survey

3.1.2.1 Survey Purpose

To develop a parking plan it is vital to thoroughly research the parking patterns in the centres. Occupancy surveys were conducted as were field observations. This data was analyzed by time and by area to understand when and where parking problems existed.

Among other things, the parking occupancy survey provided the peak hour utilisation of parking areas, hourly changes in parking occupancy, underutilised parking areas and an indication of the potential land use impact on parking behaviour. Hence, day-long surveys were undertaken for the study area for both weekday and weekend periods.

3.1.2.2 Survey Methodology

The preliminary discussions with the City, site inspections and desktop analysis helped locate parking areas within the centres which needed to be investigated. Parking occupancy information has been gathered over two surveys undertaken on 20 and 21 March, 2015 for the identified parking areas. These surveys recorded car parking occupancies for each of the car parks identified as well as the on-street car parking. The survey was conducted over the 2 days, as follows:

> Friday (8:00am to 6:00pm);

> Saturday (8:00am to 6:00pm).

Within the survey period, the occupancy of each bay was logged in 1 hour increments, with results collated across the entire study area. The collated survey results have been included in **Appendix C**.

3.1.3 Origin – Destination Survey

3.1.3.1 Survey Purpose

The purpose of the origin – destination (OD) surveys is to gain a better understanding of the travel patterns and tendencies of drivers which would aid in the development of future planning and development within the area. The information obtained can also be used to provide an indication of the existing transport network and any potential issues that may arise in order to determine mitigation solutions.

3.1.3.2 Survey Methodology

The survey was conducted at several parking locations in the Riseley and Canning Bridge Centres. Parking occupancy surveys indicated the peak hours for parking for the centres to be in the afternoon from 1 pm till 4 pm. Hence, OD Surveys were conducted for the Friday peak hours in the study area. The locations chosen for the surveys have been indicated in **Figure 3-1** shown below along with a questionnaire used to interview drivers (**Table 3-1**).

The surveys were conducted on 15 May, 2015 between the hours of 1:00pm to 5:00pm.

For the purpose of this survey, the Canning Highway Corridor was excluded from the origin–destination surveys as most of the parking was found to be privately managed.

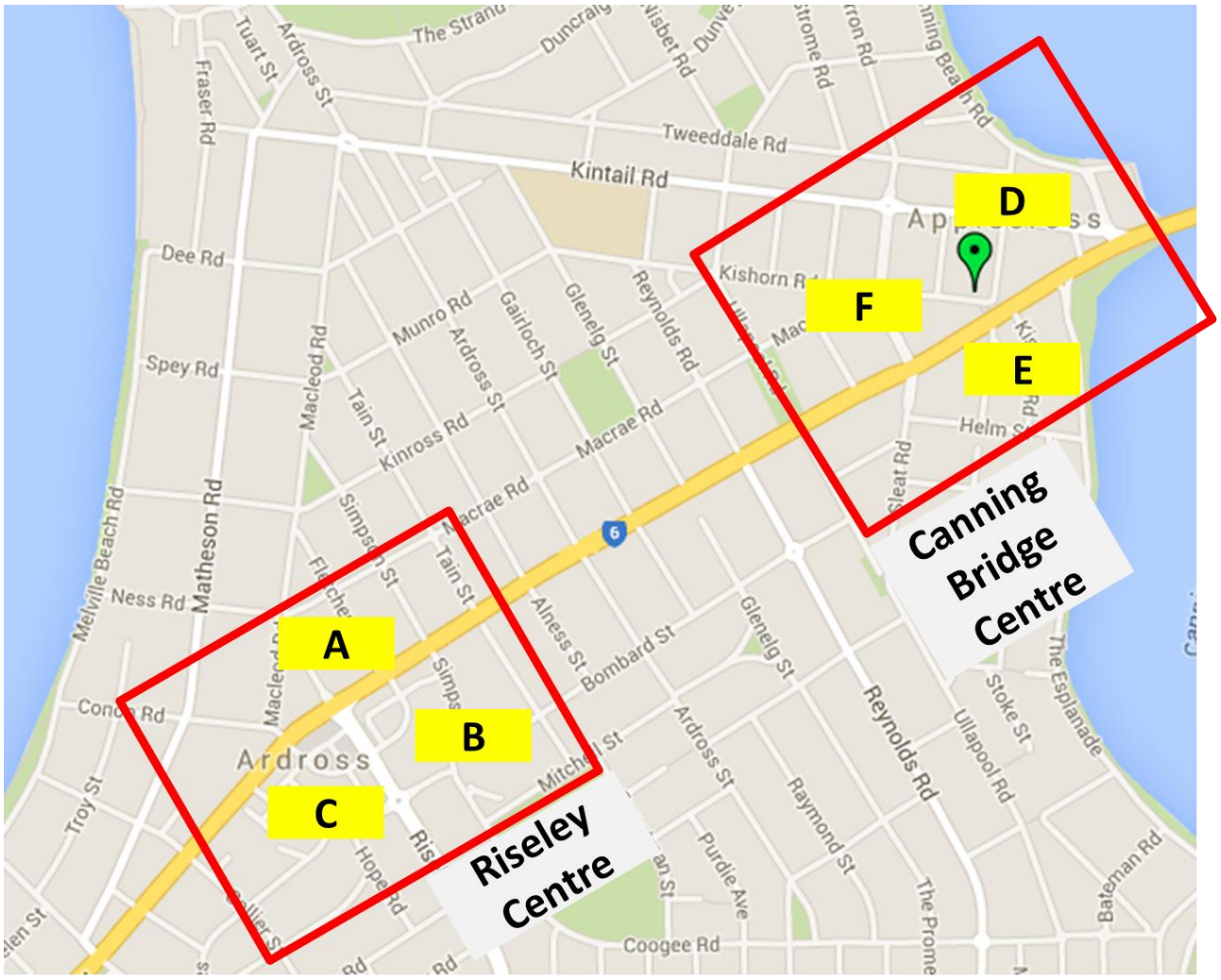


Figure 3-1 Origin-Destination survey locations

Background Image Source: Nearmaps, April 2015

Table 3-1 Origin – Destination questionnaire

Melville Parking Survey – Origin-Destination Survey Questionaire							
1	**Date**						
2	**Time**						
3	**Car Park Location**						
4	**Type of Parking**	On-Street		Off- Street			
5	**Land use & Property Details**						
6	**Trip Origin**						
7	**Trip Destination**						
8	**Final Destination**						
9	**Trip Purpose**	Work	School	Shopping	Recreation	Business	Other
10	**Length of Stay**						
11	**Additional Comments**						

A total of 187 people were surveyed including 96 respondents from Riseley Centre and 91 from Canning Bridge Centre.

3.2 The Current Parking Situation

Observations and findings from the surveys are presented separately for each component of the study area in the following sections.

3.2.1 Riseley Centre:

The Riseley Centre area considered for this parking assessment is presented in **Figure 3-2**, which is generally bounded by Macrae Road, Tain Street, Mitchell Street and Willcock Street.

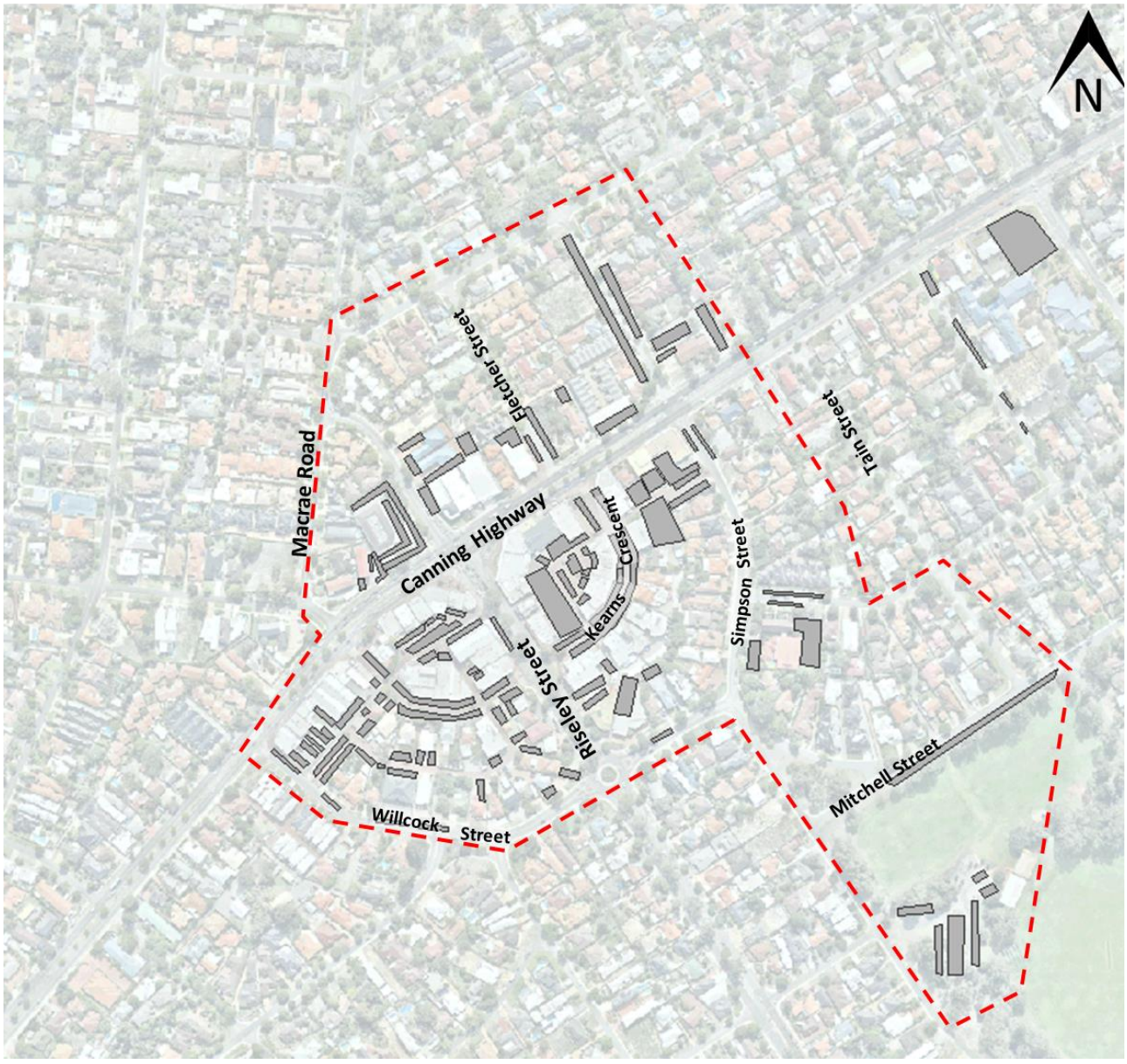


Figure 3-2 Riseley Centre Parking Study Area – showing the location of parking areas

3.2.1.2 Existing Parking Supply and Occupancy

Figure 3-3 presents the public and private parking areas identified within the centre.

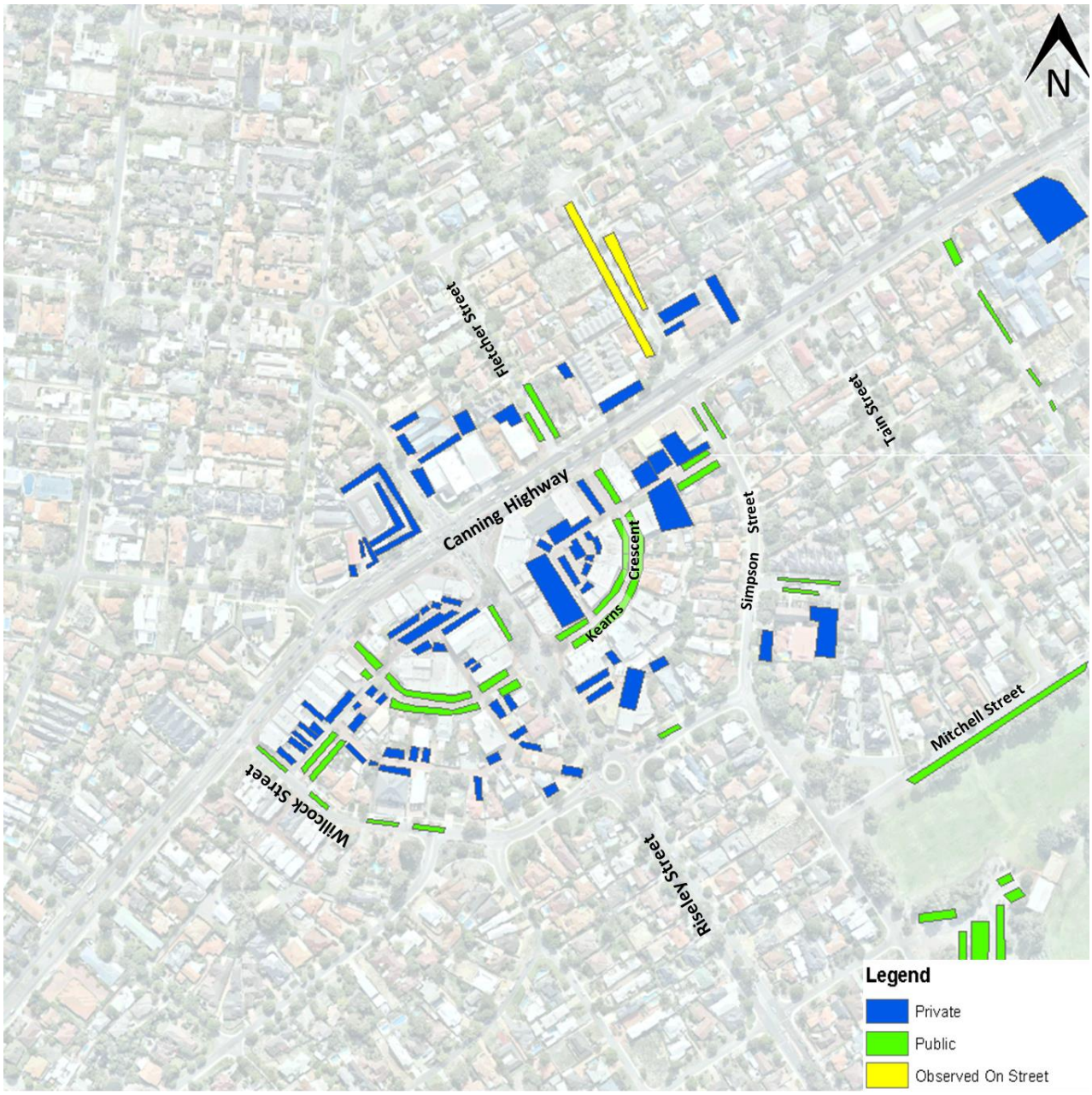


Figure 3-3 Public and private parking spaces in Riseley Centre Parking Study Area

Riseley Centre has a total existing parking supply of **1,026** spaces. **310** (30%) of these are City-managed public parking bays while the remaining are managed privately.

It has been found from the parking occupancy surveys that the current parking supply tends to be underutilised as a whole, and that there is theoretically sufficient parking supply to accommodate the Centre's observed peak parking activity and demand. At peak activity, (1–2pm weekdays), an average occupancy of only 70% was observed (see **Figure 3-4** below).

Hourly variation in parking occupancy for Riseley Centre across the surveyed week day and week-end is shown in **Figure 3-4** below.

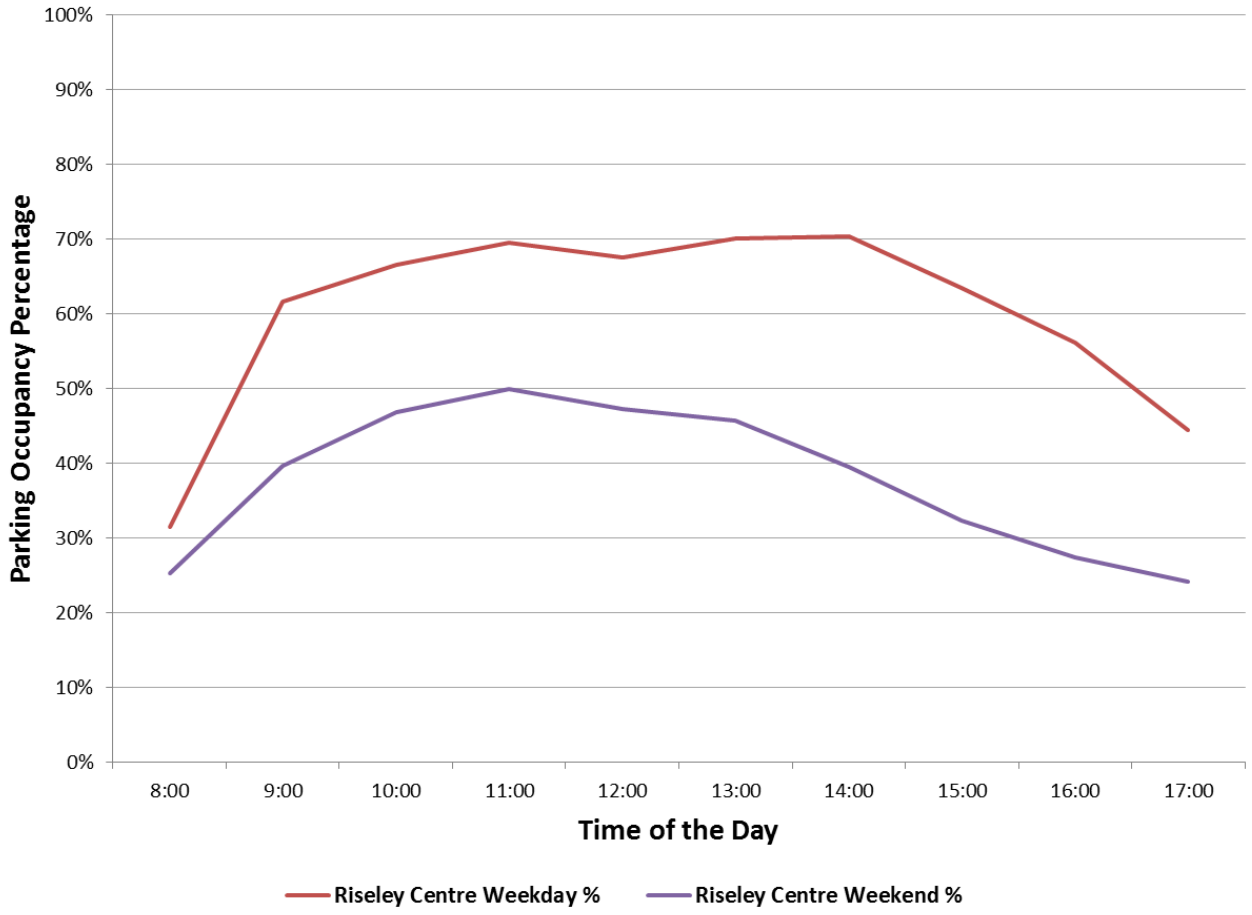


Figure 3-4 Parking hourly occupancy rate across the weekday and weekend in Riseley Centre

Following **Table 3-2** summarises the existing parking supply and observed occupancy rate for both public and private parking spaces.

Table 3-2 Summary of parking supply and observed parking occupancy for Riseley Centre

	Parking Supply			Observed Peak Parking Demand			
	Total Parking Supply	Public Parking Supply	Private Parking Supply	Public		Private	
				Weekday	Weekend	Weekday	Weekend
Riseley Centre	1026	310	766	237	167	490	358
		29%	71%	77%	54%	68%	50%

Source: Parking Occupancy Surveys, March, 2015

Figure 3-5 shows a plot of Peak Friday Parking Occupancy rate to identify the existing parking hotspots and the parking utilisation rate across Riseley Centre.

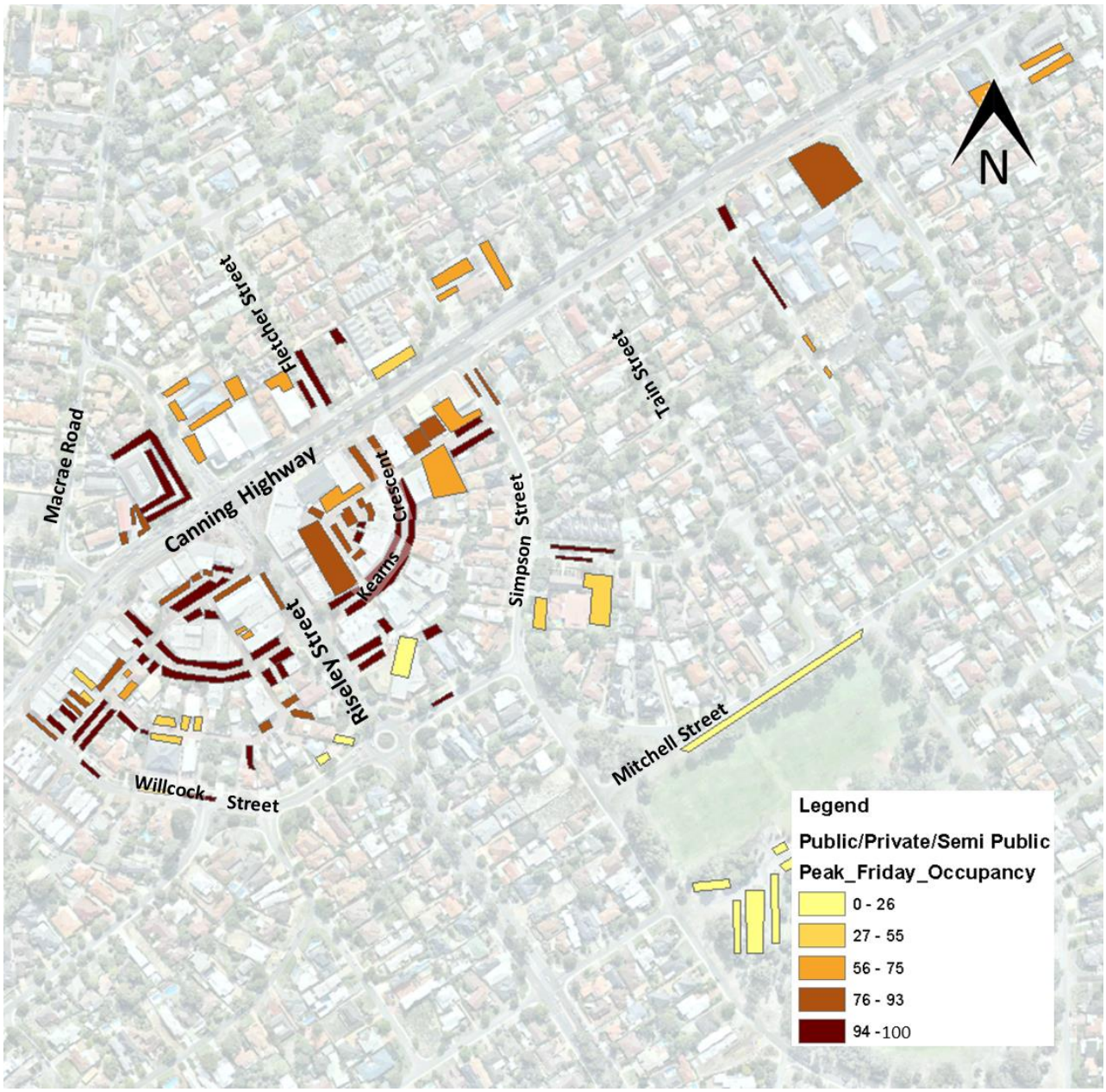


Figure 3-5 Riseley Centre peak parking occupancy plot for Friday

Figure 3-6 shows a plot of Peak Parking Occupancy for Friday and Saturday with respect to the total number of bays available for the Public Parking Areas.

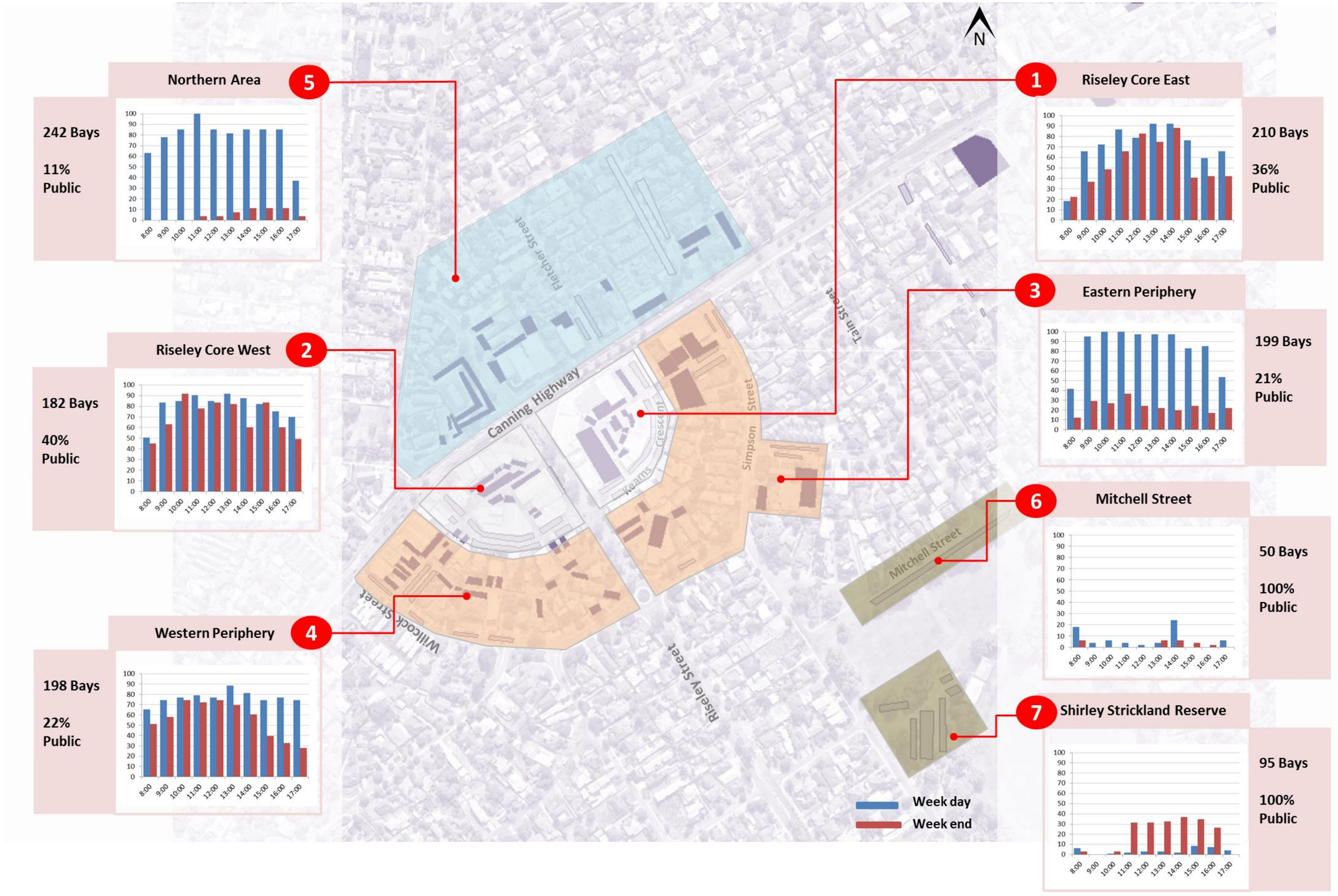


Figure 3-6 Zone wise hourly occupancy rates for public car park areas in Riseley Centre

The following observations have been made based on the Parking Occupancy data presented:

> On-street spaces near the city centre, along Kearns Crescent, Riseley Street are the most occupied locations as these are the most desirable spaces in the centre being the closest to the retail, commercial and entertainment areas of the precinct. These areas experience occupancy at capacity all day long.

> Parking areas beyond 400m (e.g. Mitchell Street) are almost always found unoccupied. This might be due to lack of knowledge on part of the people who frequent the centre or due to parking restrictions in the Centre that do not provide any disincentive to the parkers to park close to their place of employment.

3.2.1.3 Existing Parking Management

Currently in Riseley Centre, time restrictions are used to manage parking. **Figure 3-7** shows a plot of currently operational parking restrictions in the centre.

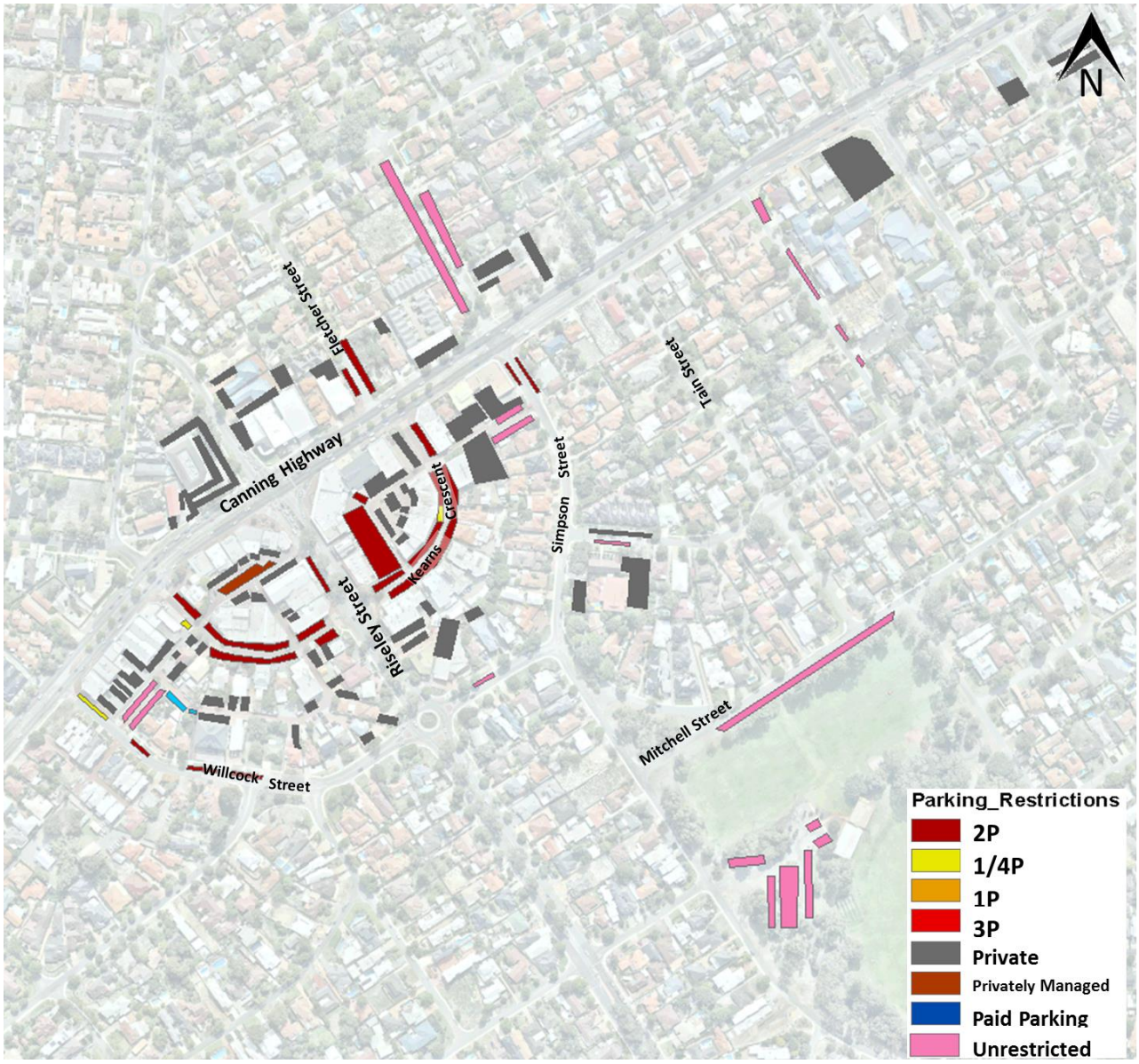


Figure 3-7 Plot of currently operational parking restrictions in Riseley Centre

The parking restrictions within the study area fall under the following categories listed below:

> Unrestricted parking

> 1/4 hour parking

> 2 hour parking

> Private Parking

> Privately managed parking

> Illegal Parking

The City does not currently impose paid parking within the Riseley Centre.

Lack of distinction between short-term parking and long-term parking was observed to lead to poor levels of compliance with existing parking restrictions.

3.2.1.4 Existing Parking utilization pattern

Origin and Destination survey results have been used to determine the existing parking utilisation pattern for the centre. Based on the surveys, the following hierarchy of users were observed to use the centre:

> Short Stay Shopping Customers (10 – 30 minutes): Include mostly the visitors for shops, cafes, takeaway restaurants etc.

> Medium Stay Customers (< 2 hours) – Include Shop, Pharmacy, Restaurant goers

> Long Stay Customers (> 2 hours) – Include Restaurant and Entertainment centre goers

> Employees (4 hours to 8 hours)

Following **Figure 3-8** shows the Trip Purpose vs Duration of Stay for Riseley Centre.

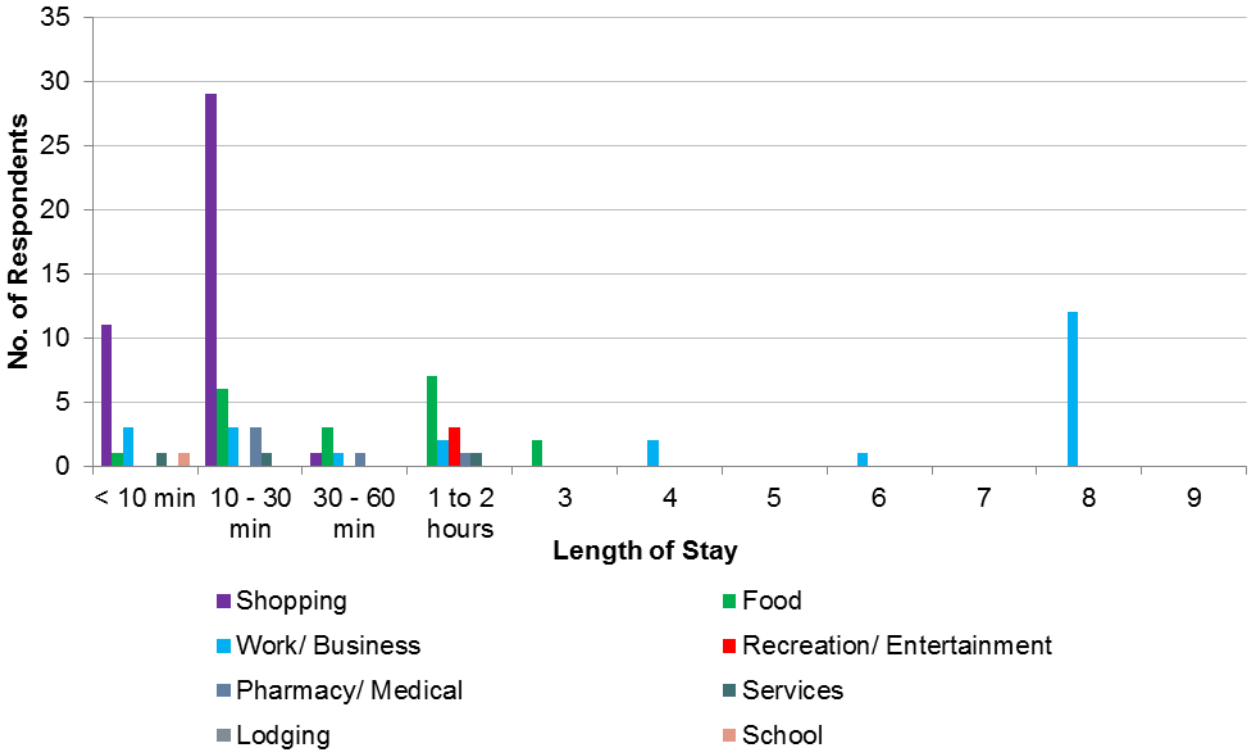


Figure 3-8 Trip purpose vs duration of stay (Riseley Centre)

It has been observed that Shopping and Restaurant constitute the largest purpose for a visit to the Centre, as shown in **Figure 3-9**.

Figure 3-9 Riseley Centre trip purpose

Most of the visitors with a shopping trip purpose said that they came from nearby areas. However, since Riseley Centre houses unique shopping and food/café destinations, many visitors arrive from more than 3km distance from the centre. Detailed OD survey data collected can be found in **Appendix D**.

Employees were found to regularly travel more than 5km, but almost 50% of employees surveyed came from within a 3km radius. **Figure 3-10** below summarises the trip origin distances of the surveyed visitors of the centre while **Figure 3-11** shows a plot of trip distance by purpose for travel to the centre.

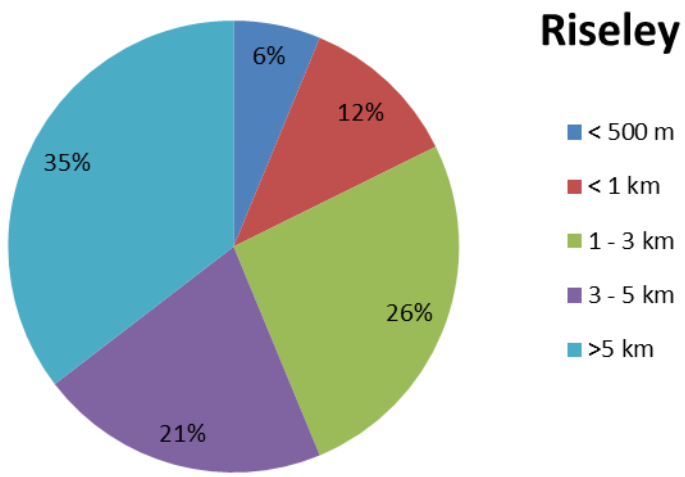


Figure 3-10 Trip distance

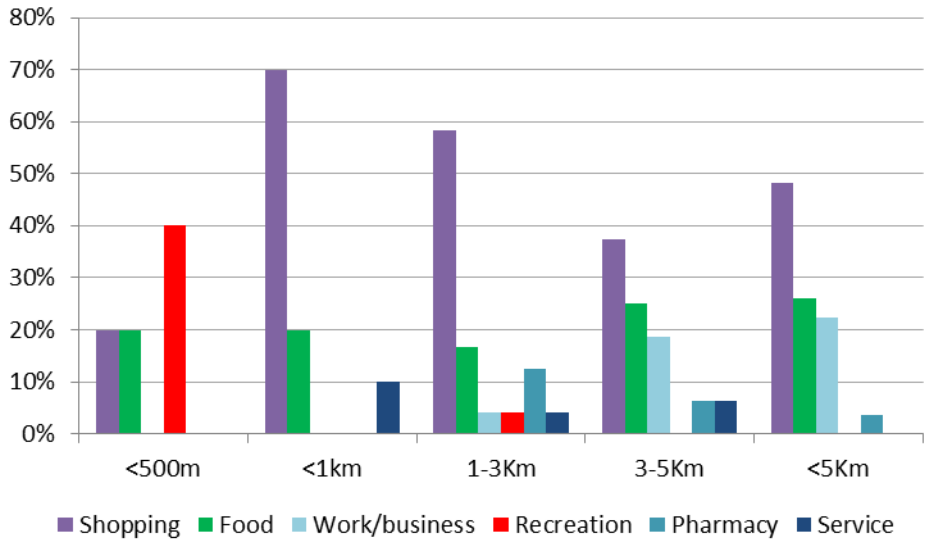


Figure 3-11 Trip Purpose versus Trip Distance

Those who were surveyed were also invited to provide any additional comments regarding any issues they may have experienced or to provide any suggestions that they may have. The following lists some of the issues as noted by the visitors:

> Many businesses complained that the restrictions imposed have not done anything to prevent long term parkers.

> Business owners noted that their customers continually complain about lack of enough parking.

- Businesses that relied on quick turnover (like the Ardross Dry Cleaners) required spaces for their customers to pull up, complete their transaction and leave. This might take a maximum of five minutes. However, the adjacent parking spaces are consumed by long-stay customers and employees; affecting business.
- A few respondents said that the addition of new land uses would create a burden on the existing parking, adversely affecting customers.
- Some employees said that people use the parking bays in front of their shops (in particular, Riseley – Off Street Parking Court) for either other local purposes or to take advantage of free park 'n' ride. Private Bays were also identified as occupied by shoppers.
- Some respondents said that they would stay for more than two hours in a 2P restriction zone. Some restaurant-goers spent more than 3 hours in the area with their cars parked in a 2P restriction zone, indicating a generally poor level of compliance.
- Some respondents complained about the long search time required to find a parking spot.
- One employee working in the Riseley Centre said that they were generally unhappy with the existing parking restrictions due to the imposed time-limits. They noted that they would accept paid parking if it meant that they could park close to the office.
- Design of parking bays was another aspect noted by many respondents to be less than satisfactory. This has also been identified in the structure plan. Respondents said that they find it difficult and unsafe to reverse into traffic and suggested that more speed calming devices be provided to assist safe manoeuvring.
- Site visits and OD surveys identified the need for improvements to footpaths and pedestrian islands within the parking areas to allow for better access and safety.
- It was found from OD surveys that many parkers use Kearns Crescent and the Off-Street Parking Courts within the centre for long-stay parking, despite the timing restrictions in these car parks.
- Many employees were found to use parking spaces within the centre despite existing parking restrictions.

3.2.1.5 Survey Findings Summary

The parking surveys identified many issues relating to parking supply, occupancy and management in the area. The following lists the issues and a recommended direction to address them:

- **Parking Supply and Occupancy:** Although a sizable parking surplus currently exists, the attractiveness of 'prime' parking bays creates a local shortage close to the major activity hubs (Riseley Square shopping complex and Kearns Crescent). Parking areas that are located within a comfortable walk away from the centre were observed to be empty throughout the day, indicating a general lack of efficient utilization of available parking areas. This observation suggests that a Parking Management Plan would be of great benefit to support the existing and planned vibrancy of the Centre. The Parking Management Plan should address the hierarchy of users and provide for parking accordingly.
- **Parking Restrictions:** Currently, time restrictions are used to manage parking within the Centre. However, it was found that there are two issues with the use of time restrictions:
- **Enforcement:** Riseley Centre has a large number of public parking areas with varying parking restrictions and unless time limits are backed up by consistent enforcement, it is difficult to address the issues of non-compliance on the part of visitors and employees. It was found from the surveys that, despite the restrictions, parking duration is consistently longer than the allowable limit, which in turn causes issues of availability for local businesses customers. On the other hand, consistent enforcement means that not only do employees get tickets, but customers tend to get tickets too—often for just being a few minutes late. This potential impact has a cooling effect on the demand for change, as businesses would not want their customers to conclude their experience in the Centre on such a bad note.
- **Use of wheel clamping to manage parking:** Currently, wheel-clamping is used by many private land owners to manage parking. The high opportunity cost associated with parking in the areas where such practices are prevalent is likely to push customers away from the area, resulting in reduced occupancy

levels. Practices such as wheel clamping need to be replaced by other alternatives that do not result in inconvenience to the customers and visitors.

> **Turnover:** It has been found out from the surveys that many long term parkers regularly shift their cars to new bays within the time limit to avoid being fined. This means that short-stay visitors experience an artificial shortage of parking, as a result of employee behaviour.

  - As a solution to this issue, time restrictions can be replaced/ accompanied with paid parking – which is considered more effective. This mechanism allows for a greater level of control, with two primary variables available for the City to adjust (parking duration and price). An incentive can then be given to short-stay parking within the Centre through the use of pricing, which has a greater impact on long-stay parking. Paid parking would therefore tend to relocate long-stay parking to the periphery and retain short-stay within the centre.

> **Heterogeneity of the Visitors:** Riseley Centre, is a unique destination with a mix of retail and entertainment uses, legal services, pharmacies, clinics, retail centres, food outlets, cafes, speciality shops, restaurants, office facilities etc. This heterogeneity and uniqueness of the centre attracts a variety of visitors with differing requirements of stay. Therefore, it may not be justifiable to manage parking through a flat time restriction across the Centre as a whole. Parking management must be careful to provide facilities for all of the desired activities and to not unduly prejudice the types of development through parking restrictions.

> **Hierarchy of Users:** Parking areas closer to the major activity areas within the Centre attract a large number of different types of visitors. It was found that retail and entertainment users stay for more than an hour in the centre, while restaurant patrons stay for around 2 hours or more, and employees tend to stay for between 4 and 8 hours. In a typical Centre hierarchy gives short-stay uses the highest preference, with parking allocation located as close to the centre as possible. Timing and duration restrictions can be imposed independent of parking pricing to discourage long-stay parking by the employees.

> **Parking Bay Design:** Surveys revealed that customers may be uncomfortable using parking bays along Kearns Crescent due to the design and speed environment. This issue can be addressed either through modifications to the parking geometry or by reducing the local road speed through traffic calming.

> **Pedestrian Safety:** Both the surveys and the Structure Plan identify the need for better facilities for pedestrians and cyclists. Pedestrian safety has to be given due consideration in the Parking Management Plan and also generally by City by reducing speeds and improving crossing points

3.2.2 Canning Bridge Centre

Canning Bridge Centre considered for parking study is presented in **Figure 3-12**, which is generally bounded by Canning Bridge Road, Kintail Road, Kishorn Road, Reynolds Road, Sleat Road, Helm Street and the Esplanade.

Figure 3-12 Canning Bridge Centre Parking Study Area

3.2.2.2 Existing Parking Supply and Occupancy

Figure 3-13 presents the public and private parking areas identified within the Centre.

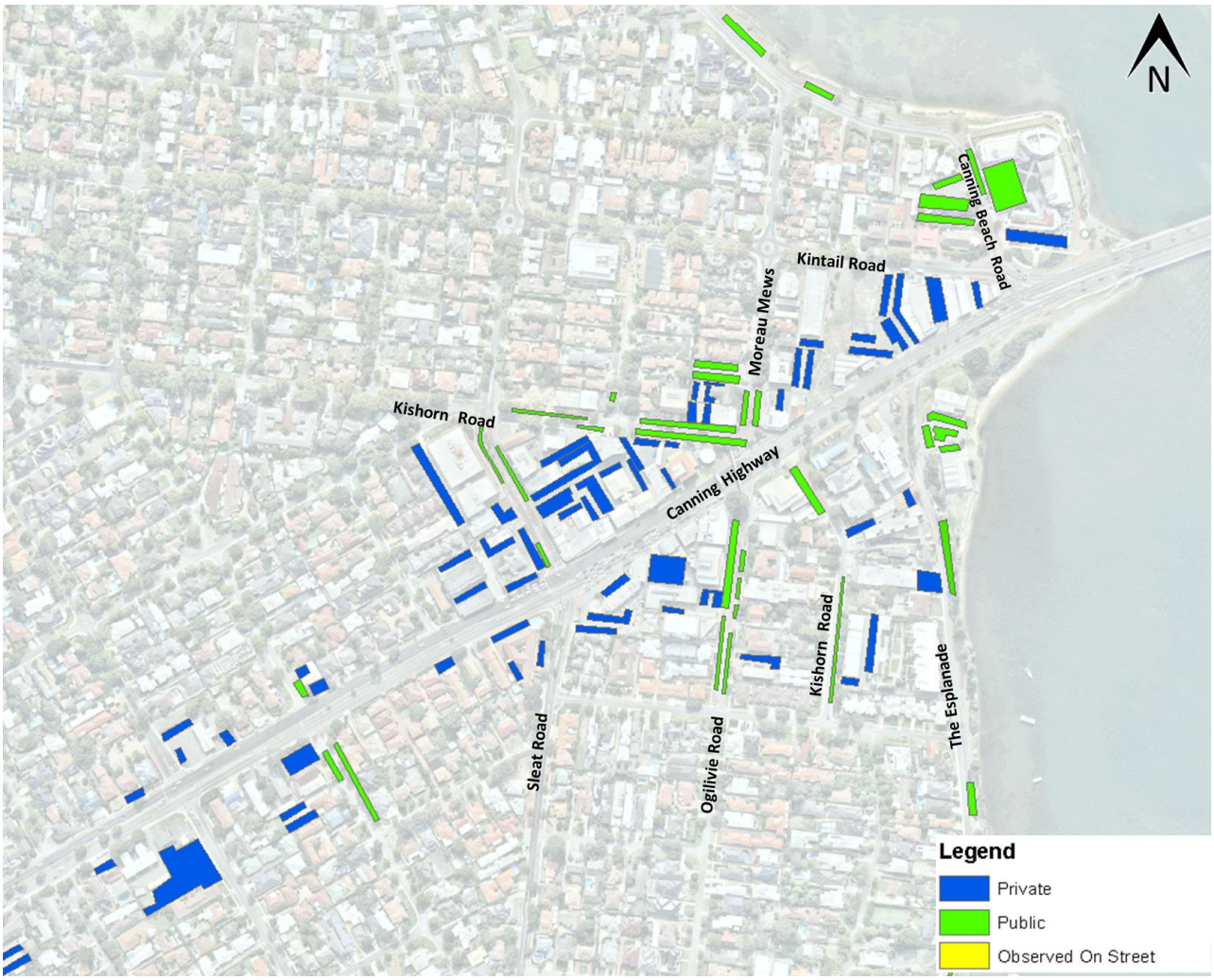


Figure 3-13 Public and Private Parking Spaces in Canning Bridge Parking Study Area

Canning Bridge Centre has a total existing parking supply of **1,233** spaces. **503** (41%) of these are City-managed public parking bays while the remaining are provided in privately managed parking areas.

It has been found from the parking occupancy surveys that the current parking supply tends to be underutilised as a whole, and that there is theoretically sufficient parking supply to accommodate the Centre's observed peak parking activity and demand. At peak of activity, (1–2pm weekdays), an average occupancy of only 60% was observed.

Hourly variation in parking occupancy for Canning Bridge Centre across the surveyed week day and weekend is shown in **Figure 3-14** below.

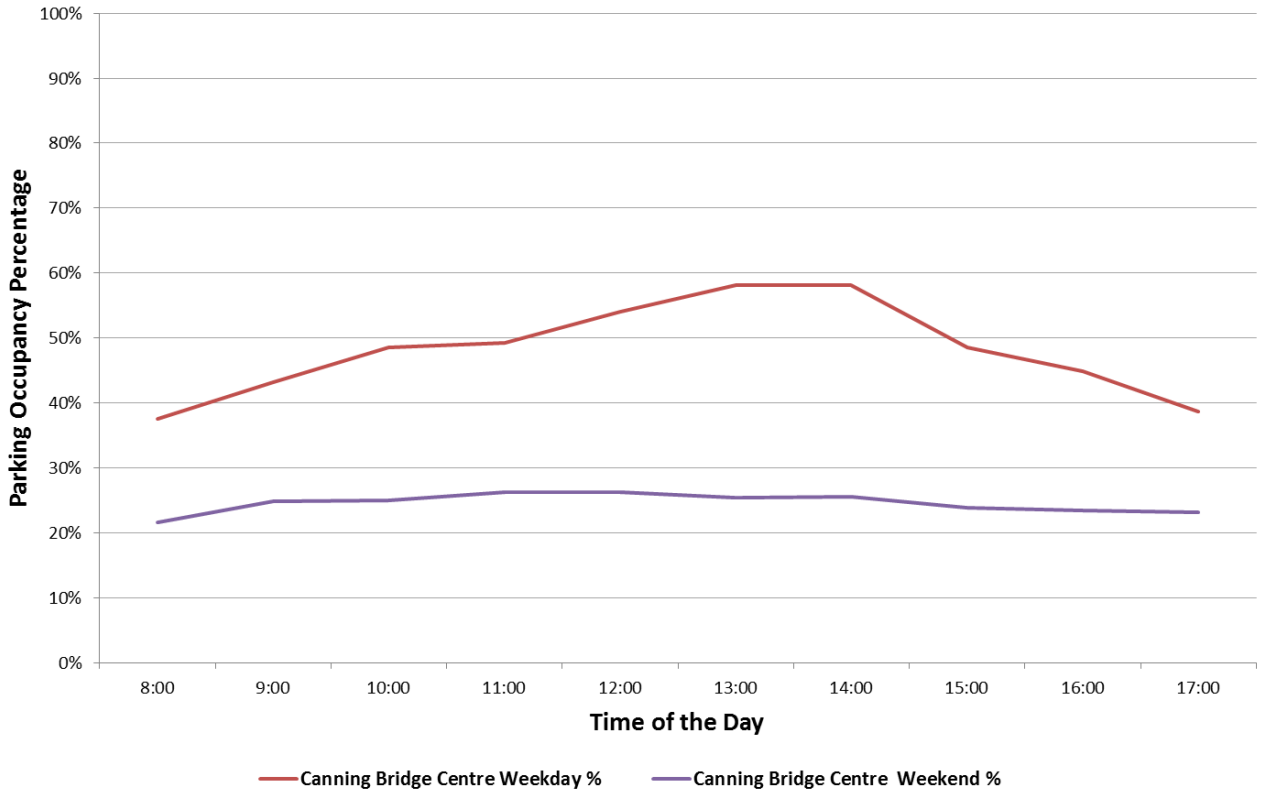


Figure 3-14 Parking Hourly Occupancy Rate across the weekday and weekend in Canning Bridge Centre

Following **Table 3-3** summarises the existing parking supply and observed occupancy rate for both public and private parking spaces.

Table 3-3 Summary of Parking Supply and Observed Parking Occupancy for Canning Bridge Centre

	Parking Supply			Observed Peak Parking Demand			
	Total Parking Supply	Public Parking Supply	Private Parking Supply	Public		Private	
				Weekday	Weekend	Weekday	Weekend
Canning Bridge Centre	1233	503	730	250	166	485	202
		41%	59%	50%	33%	66%	28%

Source: Parking Occupancy Surveys, March, 2015

Figure 3-15 shows a plot of the Peak Friday Parking Occupancy rate to identify the existing parking hotspots and the parking utilisation rate across Canning Bridge Centre.

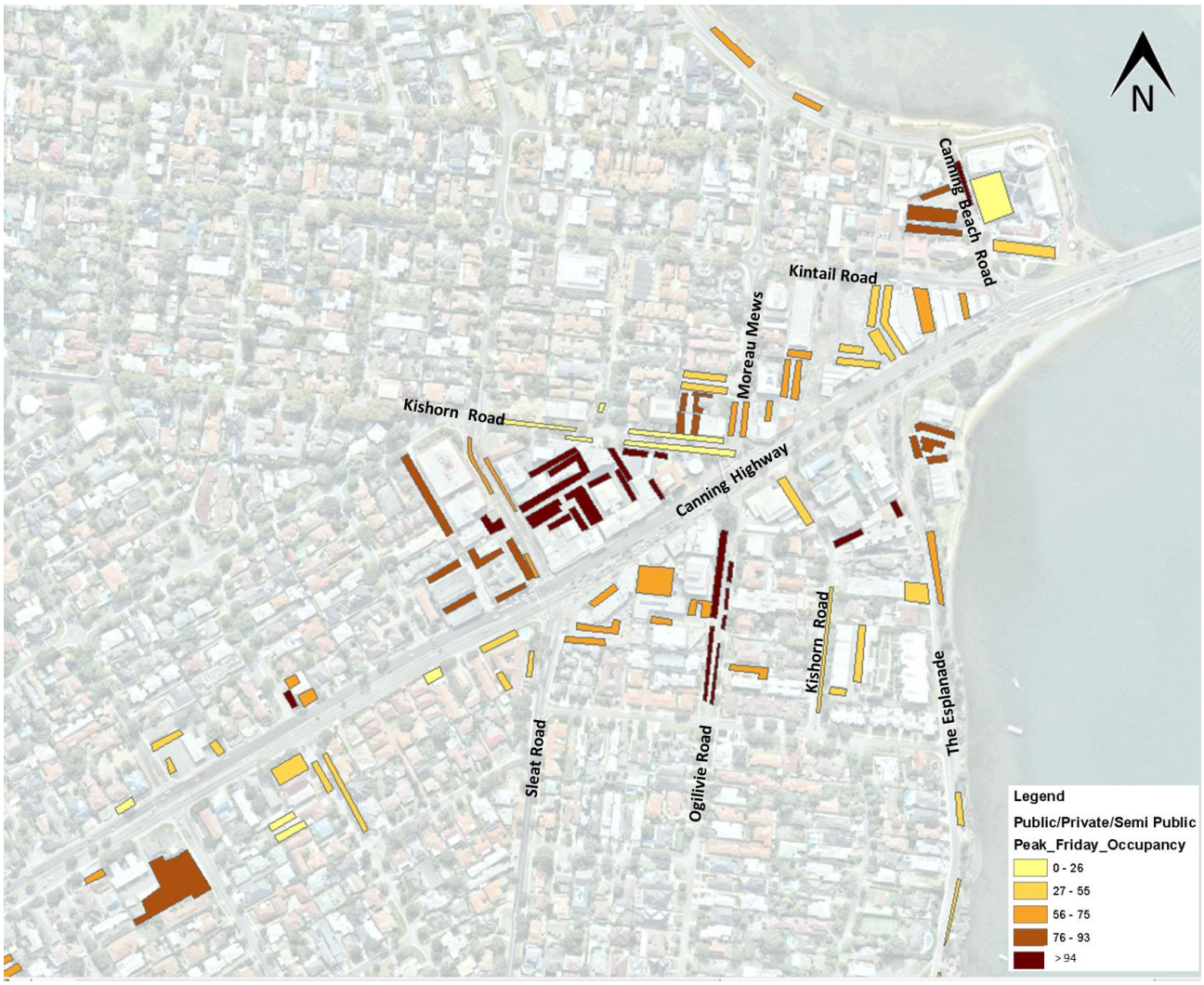


Figure 3-15 Canning Bridge Centre Peak Parking Occupancy Plot for Friday

Figure 3-16 and **Figure 3-17** below show the hourly occupancy variation for both the public and major private car park areas identified within the centre.

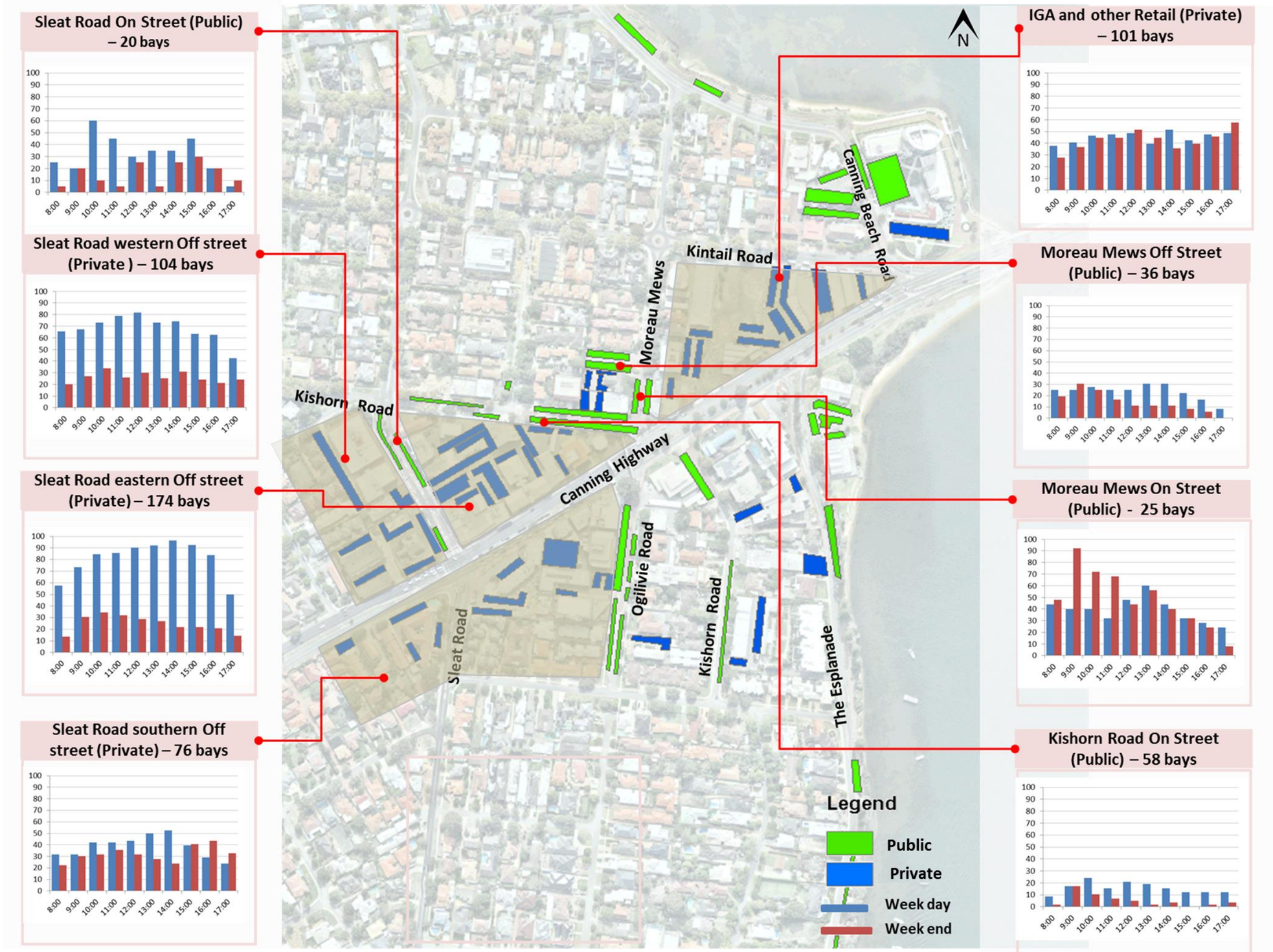


Figure 3-16 Zone wise hourly occupancy rates in Canning Bridge Centre: Part I

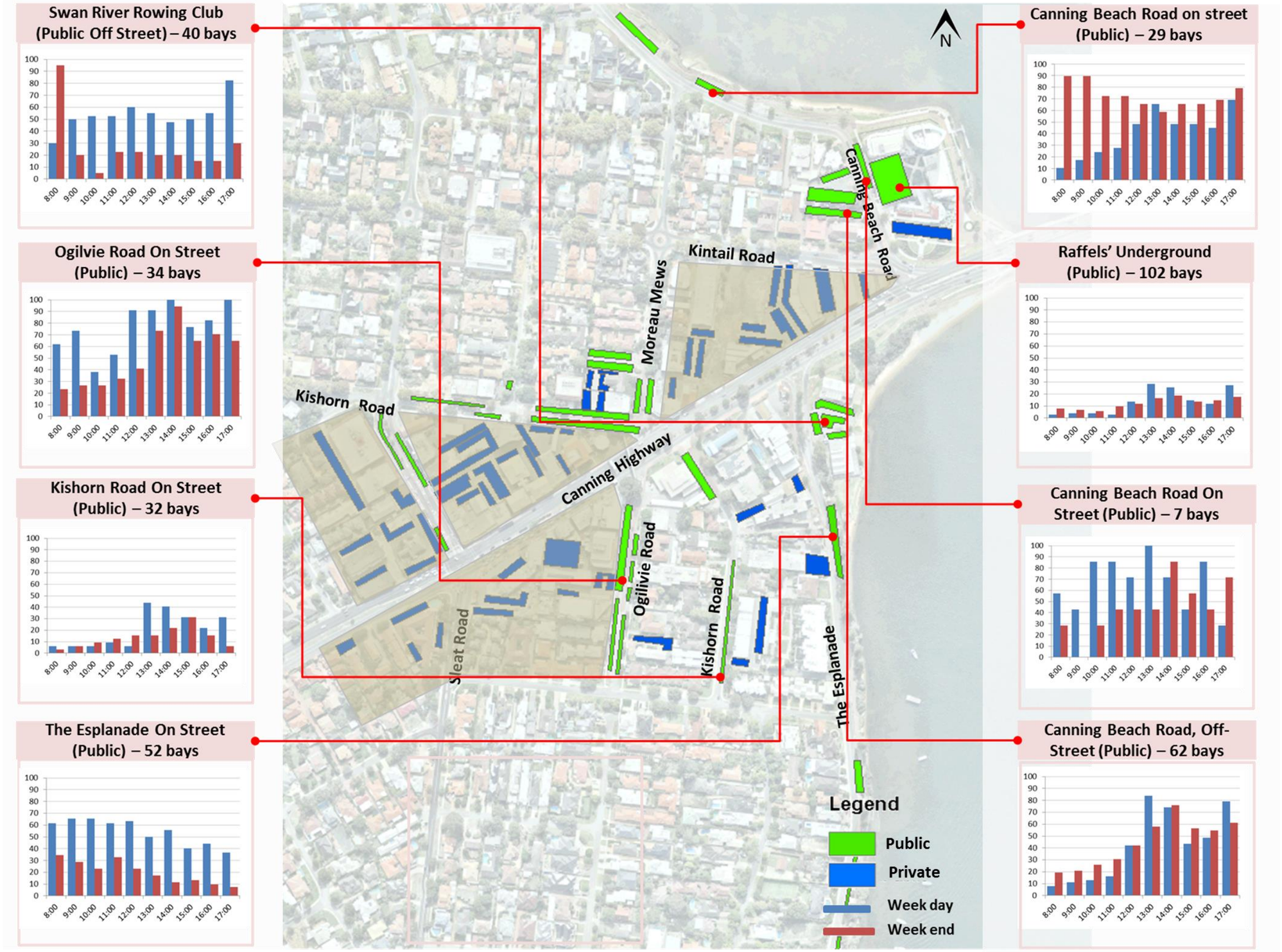


Figure 3-17 Zone wise hourly occupancy rates in Canning Bridge Centre: Part II

Following Observations have been made based on the Parking Occupancy data recorded:

> Unrestricted parking supply provided by the shopping mall on Sleat Road is found to be used at a rate approaching 100% throughout the day.

> On-street parking on Ogilvie Road is found to attract a high demand as a result of the many restaurant and office establishments in the vicinity.

> The retail and restaurant core on either side of Canning Highway between Sleat Road and Ogilvie Road are found to attract higher than average parking demands.

> Parking along Canning Beach Road is found to operate at greater than 85% utilisation during the peak and attracts a high parking demand across the day.

> Public parking on Canning Beach Road is found to be occupied at a rate of 70-75%.

> It is noted that the Raffles Hotel basement parking is occupied at a significantly lower rate. This is presumably a result of a combination of lack of awareness, accessibility issues and the parking price that is levied.

> Along the Esplanade, parking occupancy was observed to be relatively low.

3.2.2.3 Existing Parking Management

Currently in the Canning Bridge Centre, time restrictions and paid parking are used to manage parking. **Figure 3-18** shows a plot of existing parking restrictions in the Centre.

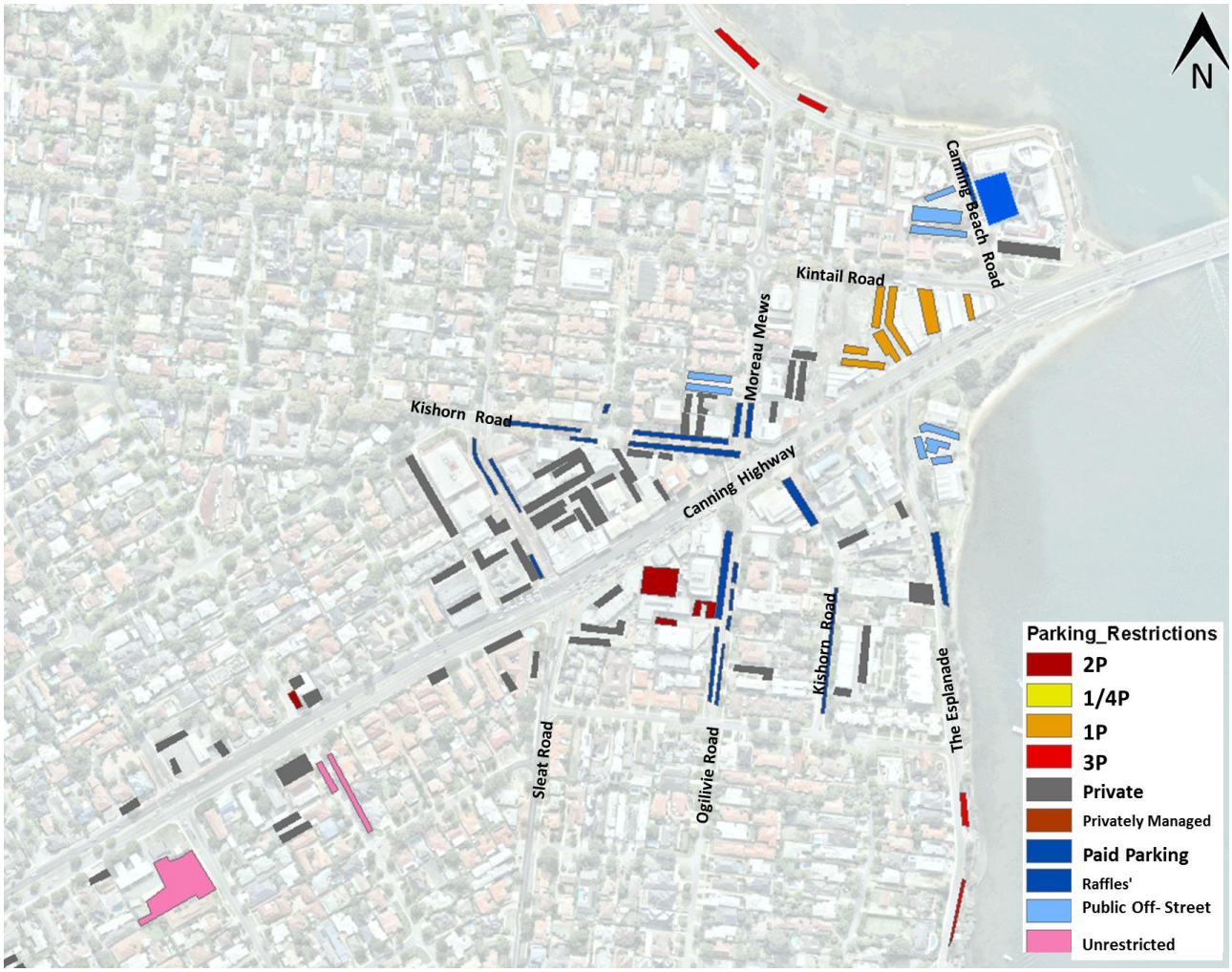


Figure 3-18 Plot of Currently Operational Parking Restrictions in Canning Bridge Centre

The parking restrictions within the Study Area fall under the following categories listed below:

> 1 hour non payable parking

> 2 hour non payable parking

> 3 hour non payable parking

> 2 hour paid parking

> 3 hour paid parking

> Public off-street paid parking

> Raffles' basement paid parking

> Private Parking

The Canning Bridge Centre has a large supply of privately-managed carparks, especially in the major activity areas. Many of these private car parks are specifically reserved for either staff or for the business's own patrons. Observations show that there is a scarcity of short term parking in the major activity centre within the Canning Bridge Centre. This appears to be caused or exacerbated by long-stay parking in short-stay bays, reducing turnover and supply.

Paid on-street and off-street parking areas in general are found to attract lower turnover and occupancy levels across the day, with the exception of Oglivie Road and Canning Bridge Centre on-street parking.

3.2.2.4 Existing Parking utilization pattern

Origin and Destination surveys were used to determine the existing parking utilisation pattern for the centre. Based on the surveys, the following hierarchy of users were observed to use the centre:

> Short Stay Shopping Customers (10 – 30 minutes): Includes mostly the visitors for shops, cafes, takeaway restaurants etc.

> Medium Stay Customers (< 2 hours) – Includes Shop, Pharmacy, Restaurant goers

> Long Stay Customers (> 2 hours) – Includes Restaurant and Entertainment centre goers

> Employees (4 hours to 8 hours)

The following **Figure 3-19** shows respondents' Trip Purpose vs Duration of Stay for the Canning Bridge Centre.

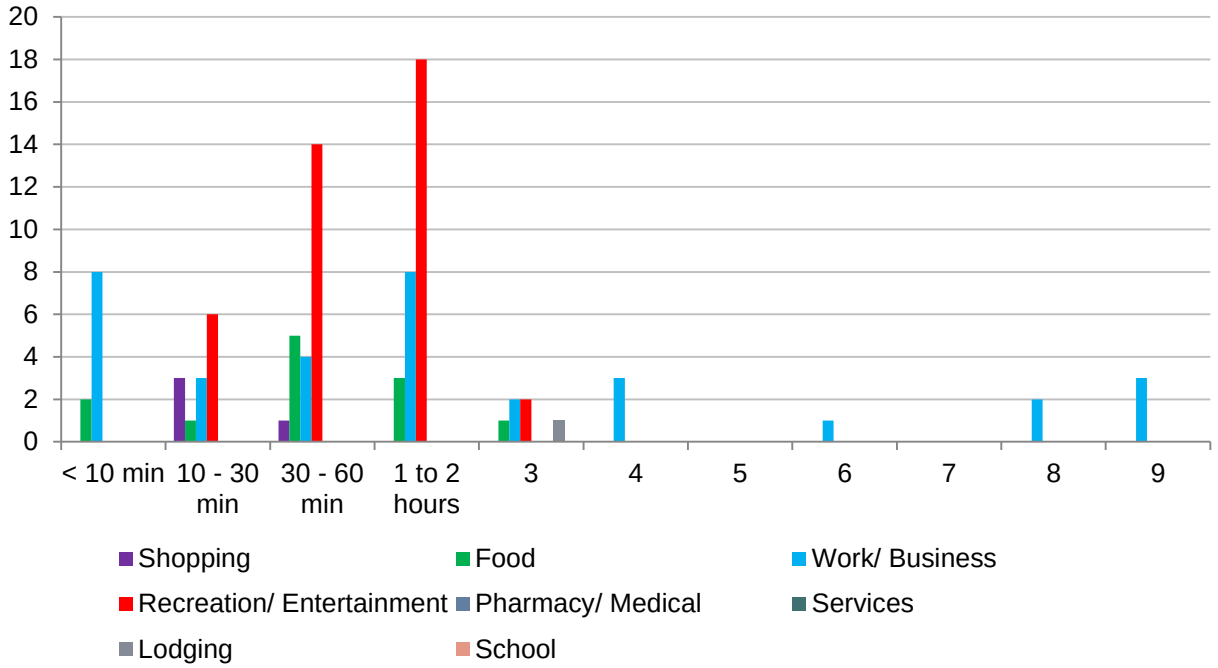


Figure 3-19 Trip purpose vs duration of stay (Canning Bridge Centre)

The Canning Bridge Centre attracts visitors with a longer duration of stay than the Riseley Centre. This includes a higher proportion of recreation and office patronage (**Figure 3-20)**. Canning Bridge centre houses many speciality restaurants and unique places for recreation such as the rowing club, library, community centre and a unique river front environment, which are the major attractors and distinguishing features of Canning Bridge Centre.

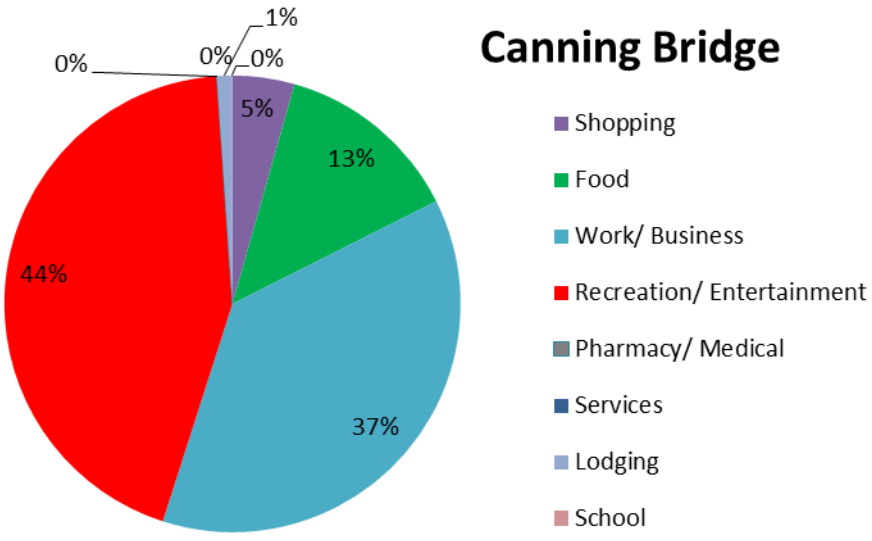


Figure 3-20 Canning Bridge Centre Trip Purpose

Figure 3-21 below summarises the trip origin and destination distances for the surveyed visitors. Approximately 50% of respondents arrive from beyond the 5km catchment.

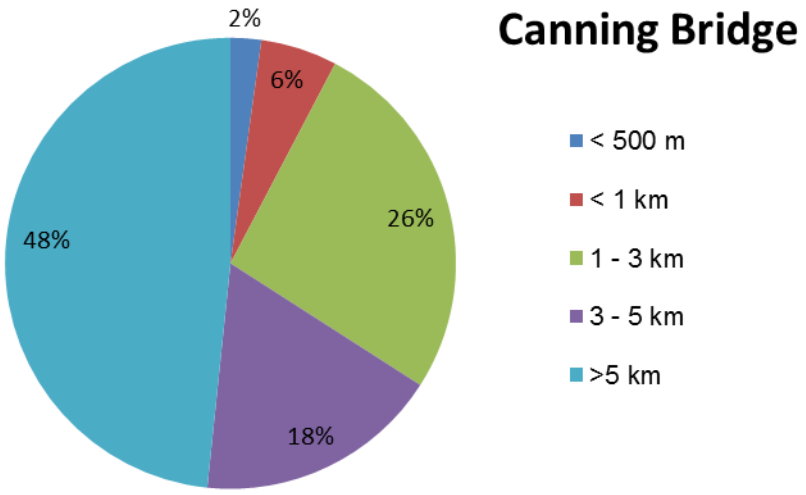


Figure 3-21 Trip Origin distance

Figure 3-22 shows a plot of trip distance range versus the purpose of travel to the centre.

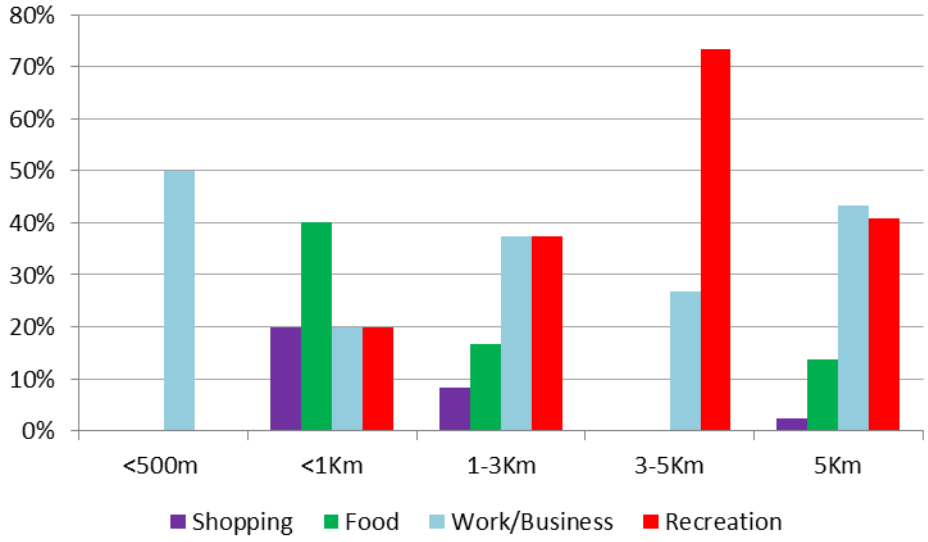


Figure 3-22 Trip Purpose versus Trip Distance

Those who were surveyed were also invited to provide any additional comments regarding any issues they may have experienced or provide any suggestions that they may have. The following lists some of the issues as noted by the visitors:

> Short stay parkers said that they did not want to pay for parking for a short time (e.g. Just to get a beer or collect a take away).

> Some short stay parkers were found to resort to illegal parking to avoid payment, by parking without buying the tickets or parking 'informally' (i.e. outside of designated parking areas).

> Customers and employees were observed by business owners to park for long periods within private parking areas, resulting in parking scarcity for customers. Businesses complained about this behaviour.

> Parking along Canning Beach Road was observed to be usually occupied by visitors to the library, Raffles Hotel and other entertainment uses in the Canning Bridge Centre. It was observed that some employees park for more than 4 hours within on-street paid parking locations despite the 2P restrictions.

> Some respondents noted that they would stay for more than two hours in a 2P restriction zone. Some restaurant patrons were observed to spend more than 3 hours parked in a 2P restriction zone.

> Some respondents complained about the search time required to locate a parking spot.

> In the car park within the vicinity of Sleat Road, there are a large number of parking bays reserved specifically for each business and its employees and customers. These arrangements were considered to be confusing, with difficulties identifying general public parking.

> It was found that currently, the parking meters accept credit card payment but the minimum charge is $2, which is more than 1 hour rate of $1.70, causing inconvenience to customers and creating an opportunity cost for drivers parking for less than 1 hour.

3.2.2.5 Survey Findings Summary

The parking surveys identified many issues relating to parking supply, occupancy and management in the area. The following lists the issues and a recommended direction to address them:

> **Parking Supply and Occupancy:** Although a sizable parking surplus currently exists, the attractiveness of 'prime' parking bays creates a local shortage close to the major activity hubs. Parking areas that are located within a comfortable walk away from the centre were observed to be empty throughout the day, indicating a general lack of efficient utilization of available parking areas. This observation suggests that a Parking Management Plan would be of great benefit to support the existing and planned vibrancy of the Centre. The Parking Management Plan should address the hierarchy of users and provide for parking accordingly.

> **Parking Restrictions:** Currently, a mix of paid parking and time restrictions are being used to manage parking within the centre. However, it was found that due to the availability of a large amount of un-restricted parking supply offered by retail centres, the on-street and off-street paid parking spaces are not sufficiently occupied. This suggests that the ratio of paid to free parking spaces has not been optimised. To address this issue, either parking prices should be lowered to achieve an 85-90% occupancy rate, or the paid parking extent should be increased to reduce the availability of free, unrestricted bays. Payment options should be convenient for the customers.

> **Enforcement:** OD surveys identified a lack of compliance on the part of customers, especially in short stay parking areas. Hence, provisions should be made in the PMP to encourage compliance. Consistent enforcement including the introduction of more rangers will also help mitigate this issue.

> **Heterogeneity of the Visitors:** Canning Bridge Centre on the whole, unlike Riseley Centre attracts visitors from greater distances and with longer duration of stay. However a relatively high proportion of short term parkers are also found to use the Centre. An appropriate pricing system should be determined to service both of these categories of users.

> **Pedestrian Safety:** Both the surveys and the structure plan identify the need for better facilities for pedestrians and cyclists. Pedestrian safety should be given due consideration in the Parking Management Plan and by the City generally in terms of vehicles speed and crossing facilities.

3.2.3 Canning Highway Corridor

> Mostly privately managed parking.

> Occupancy rate is found to be fairly low.

> Predominantly residential area.

> Proposed to be developed as a high dense residential area.

> Unbundled and regulated off-street parking can be implemented to restrain park and ride.

4 Parking Management Plans

Parking Management refers to how public parking is controlled through prices, time limits, and other regulations. The main reason for managing parking is to create “turnover” of spaces, meaning people leave the spaces after a while so that someone else may use them. If there were always spaces available when and where people needed them, then parking management wouldn’t be necessary. In compact city centres where there is competition for space, management is needed. A secondary reason that parking is managed is to generate revenue to operate parking facilities and to fund other programs.

4.1 Goals

The goals for the proposed Parking Management Plans are listed below:

> Prioritise short-term parking in the central areas of activity centres and shift longer-term parking to the periphery;

> Focus on effective parking management measures as it is more effective, cheaper and easier to manage parking rather than attempting to satisfy parking demand

> Focus on improving people’s access to activity centres by promoting walking, cycling, public transport and parking management

Each component of the PMPs discussed is aimed at fulfilling one or more of these goals in order to be of value in supporting the overall planning vision for the development of both the activity centres.

The following section discusses the actions to be taken to manage parking for the entire Study Area, while the subsequent sections discuss in more detail for each of the parking study area components.

4.2 Parking Management Plan Strategic Actions

After considering all available strategies, current and projected parking patterns and the needs of the community, a Parking Management Plan has been developed for the entire Study Area. In order to meet the new demands that will be placed on the proposed activity centre parking system, the following actions have been proposed to be adopted as part of Riseley and Canning Bridge Activity Centres

Action 1: Institute Parking Pricing System

Of all of the options available, market-rate pricing provides the best outcomes for maintaining the availability of on-street spaces and to ensure convenience and positive experiences for visitors. Market-rate pricing will not discourage people from coming to the Centres. Instead, it provides a pricing signal to reinforce the City’s desired parking behaviour. However, the mix of paid and unpaid car parks is critical to ensure consistent utilisation across the Centre and to maintain an 85-90% occupancy rate.

Initially, prices have to be adopted by the City before tracking the occupancy levels and determine accurately what the true market price is. Market rates need to be determined based on current prices and occupancy levels in the area and proximity to major trip destinations.

The existing on-street parking management structure uses timing restrictions to manage on-street parking for its intended users. The implementation of a paid system in high demand areas can greatly improve the distribution of parking in the City and ensure that there is short-stay parking available in close proximity to high value activity generators.

A well-managed on-street paid parking system has the following benefits:

> Ensure safety and traffic efficiency in the context of travel demand management and the management of traffic on the road system;

> Provide equitable access to car parking for road users where demand for parking exceeds the available supply;

> Ration the use of on- and off-street car parking to allow short-stay parkers access to parking during business hours by removing competition from all-day parking;

> Ensure that the parking demand strategy is consistent with the transport strategy in the area and to complement transport objectives, particularly public transport use; and

> Paid parking is necessary where timing restrictions are not sufficient to manage the demand for on street parking.

Pricing mechanisms should be implemented such that off-street car parking is generally more attractive for long-stay users than on-street facilities. This assists in maintaining the desired vacancy rate in prime locations. Ideally, spaces are always available in every on-street and off-street car park. This ensures that all visitors have adequate opportunities to park.

Action 2: Extend or Remove Paid Parking Time Limits

Parking tickets and forced car shuffling aggravate customers. As was stated earlier, without appropriate prices, the only tactic available to cities to create turnover are strict time limits backed up by consistent enforcement. But stringent enforcement means that not only do employees get tickets, but customers get tickets too - often for just being a few minutes late. This will result in a bad experience for the visitor.

To address this issue, extending or even removing time limits can be extremely beneficial where paid parking is implemented. This gives customers much greater control over their parking choice, while still sending a strong parking signal to limit all-day parking. The elimination of mandated limits can be supplemented through a progressive pricing scheme which imposes a higher per-hour cost for longer-stay parking behaviour.

Parking pricing is an adaptive mechanism that can be used to manage demand within a precinct even in the absence of a timing restriction. It is acknowledged that there may be central locations that require the imposition of both pricing and timing to maintain the desired parking behaviour (e.g. where there is a high density of professional employee and visitor parking demand such that it greatly exceeds supply).

Action 3: Keep parking meter revenue within the centre

Wherever possible, some of the profits from parking permit revenue should be used to manage parking within the Centre or provide additional local amenity. By hypothecating funds to those areas with paid parking, local businesses benefit directly from parking management.

The use of these funds should be at the discretion of the City Council, under the advisement of a Parking Fund Advisory Committee (PFAC) made of up business owners.

Action 4: Parking Bay Design, safety, infrastructure and Information to be improved

Parking bay design should be modified to allow for comfortable manoeuvring and pedestrian safety in all locations.

There are a few options available to add a limited number of inexpensive spaces to our surplus.

> ***Diagonal Parking:*** On-street parking spaces are typically parallel spaces. However, some streets have diagonal spaces which meet the curb at a 45 degree or 60 degree angle. Parallel parking lanes require much less roadway width—7 to 9 feet compared with 15 to 18 feet for diagonal parking lanes. However, diagonal spaces are much more efficient where the roadway width exists. Parallel parking can fit about 4.5 spaces per 100 feet of curb, whereas diagonal parking can squeeze in nearly double that amount, or about 8.3 spaces per 100 feet of curb width. This efficiency is not gained by smaller stall sizes, but rather through a more efficient layout.

> The Riseley Centre Structure Plan recommends parallel parking on Kearns Crescent. Diagonal parking can instead be considered to increase the number of parking bays. Such conversions would likely also provide the opportunity to add prime on-street parking spaces by using diagonal parking to fill the space freed up by the removal of traffic lanes. In addition to creating prime parking for very little cost, these conversions would have the added benefit of slowing traffic, thus increasing safety for motorists and comfort for pedestrians.

> “Nose – in” parking has been cited as another problem that needs addressing while designing parking bays. This issue can be eliminated with the introduction of “rubber-wheel-stop” as shown in **Figure 4-1.**

Figure 4-1 Rubber Wheel Stop

- ***Signage, Lighting and Safety equipment:*** Some people may be willing to park in off-street parking facilities, if only they could find them. Use of appropriate signage to guide people to parking areas will greatly reduce this issue.

  Similarly, lighting and surveillance should also be improved at all parking locations to promote safety as some visitors may be aware of off-street parking areas, but don't want to park there because of a dark and uncomfortable walk during evening hours. Appropriate signage has to be used to guide people to parking areas.

- ***Improve User Information and Marketing:*** Many parking problems result, in part, from inadequate user information and Marketing. Motorists need convenient and accurate information on parking availability and price, including what parking facilities exist near a destination, whether spaces are available in a particular facility at a particular time, the price they will need to pay, and whether there are less expensive alternatives nearby. Produce a Transportation Access Guide that provides concise information on how to access a particular destination by various modes, including parking availability and price. Parking information can include maps, signs, brochures and various types of Electronic Communication systems to provide information to motorists on parking facility location, availability (whether a parking lot is full), service options, and price (FHWA 2007). This can help improve user convenience and security, increase the functional supply of parking, and address many objections to specific parking management strategies. For example, motorists may be less resistant to parking regulation, pricing and reduced supply in a particular location if they can easily obtain information on alternatives parking and travel options that can meet their needs.

Action 5: Enhance Walkability and End of Trip Facilities

The usable parking supply serving a destination can often be increased by improving Walkability . Walkability takes into account footpath, cycle routes and roadway conditions; land use patterns; social acceptance; security and comfort for walking. Improved walking conditions expands the range of Shared Parking, and encourages park once trips, which means that visitors park their vehicles and walk to several destinations, rather than driving to, and parking at, each destination. There are many specific ways to improve walkability.

They include:

- Improving footpaths and cycle routes.
- Creating pedestrian shortcuts, such as mid-block paths and connections between dead-end streets.
- Improving facility designs to accommodate special needs, including people using wheelchairs, walkers, strollers and hand carts.
- Providing covered walkways, loading and waiting areas with shade from hot sun and protection from rain.
- Street furniture (e.g., benches) and design features (e.g., human-scale street lights).

> Implementing traffic calming, speed reductions and vehicle restrictions.

> Addressing pedestrian Security Concerns.

> Creating more attractive, interesting and clean walking areas.

End of trip facilities should be provided to encourage Cyclists and thereby reduce the demand for parking. Based on the site observations, it is noted that currently, end of trip facilities are prevalent in the Centres to a good extent. This issue should be addressed while implementing the PMPs.

4.3 Riseley Centre Parking Management Strategy

The Parking Management strategy for Riseley Centre is described based on the Riseley Centre Structure Plan. The PMP is discussed below both for the short, interim and long term development of the centre.

4.3.1 Structure Plan Recommendations

The Riseley Centre Structure Plan proposal for parking locations for the future and the design changes in the future are shown in **Figure 4-2**.

Figure 4-2 Riseley Centre Structure Plan recommendations

4.3.2 Short Term Parking Management Strategy for Riseley Centre

In the short term, the activity in Riseley centre is expected to remain the same. It has however been identified through the parking studies that, despite the availability of enough parking spaces in the vicinity, parking issues exist. Management is therefore necessary to address these issues.

Following **Figure 4-3** shows the suggested Parking Management Strategy for the short term for Riseley Centre.

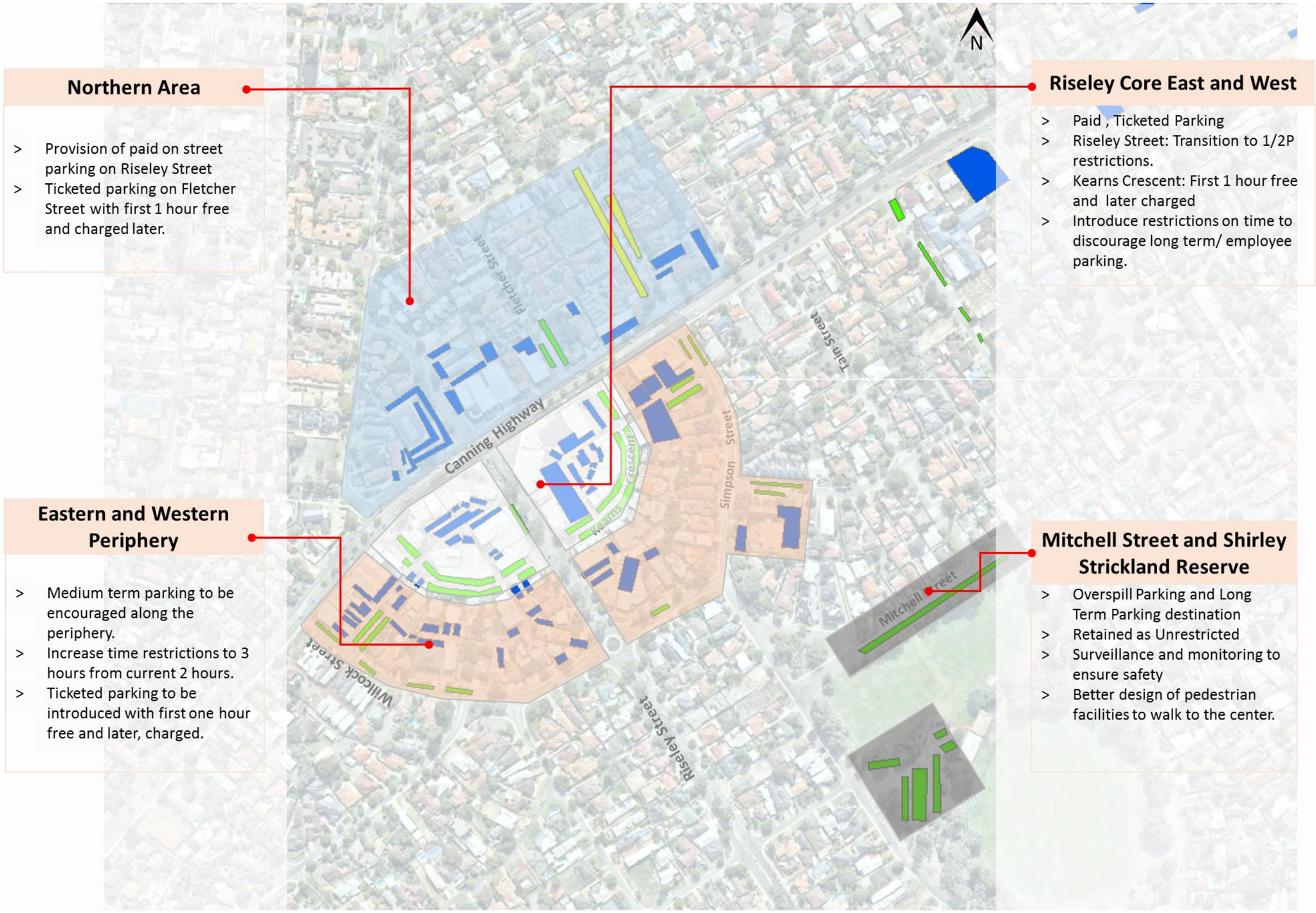


Figure 4-3 Riseley Centre Short Term Parking Management Plan

The Parking Management Plan for the short term focuses on better management of the existing supply, rather than increasing the supply. Four major precincts have been identified for the parking management, with differing characteristics in relation to their location and proximity to the centre.

Riseley Core East and West Precinct consists of the Riseley commercial core area where most of the centre's activity is focussed at. This precinct is found to be in highest demand and hence market based paid parking should be introduced with incentives of free parking for very short stay parkers and charges for longer stay lengths. This will tend to shift long stay parkers further from the Centre. Employees will be discouraged from parking within the Centre through a combination of paid parking and timing restrictions on free parking.

Eastern and Western Periphery Precinct forms the outer periphery of the centre. There is a relatively high parking supply within this precinct which is not shown to be used to a good extent. It is therefore proposed that the existing timing restrictions be increased from 2P to 3P. Following roll-out of paid parking, free parking retained for the first 1 hour to encourage turnover.

Northern Area Precinct is the northern edge of the centre that is on the other side of Canning Highway. Private Parking Regulation is proposed. On-Street parking along Fletcher Street is proposed to be priced based on market rates. Simpson Street that is currently used by employees of the centre does not have any on-street parking facilities. The parking needs to be regulated on this street.

Mitchell Street and Shirley Strickland Reserve Precinct consists of existing parking supply on Mitchell Street and Shirley Strickland Reserve, which is just around 500 m walk away from the Riseley Core Centre. It is recommended that this precinct be provided with good surveillance and retained as unrestricted parking. This can form the destination for long term parkers with good facilities for walking to the core.

As an interim term measure, additional parking supply can be accommodated at the periphery of the Riseley Centre along Simpson Street and Wilcock Street. The structure plan identifies two potential locations within the **Eastern and Western Periphery Precinct** to locate off-street public parking. Future supply can be provided at these locations with uncapped paid hourly pricing.

PMPs through to the 5-year horizon for Riseley Centre have been presented in **Appendix C**.

4.4 Canning Bridge Centre Parking Management Strategy

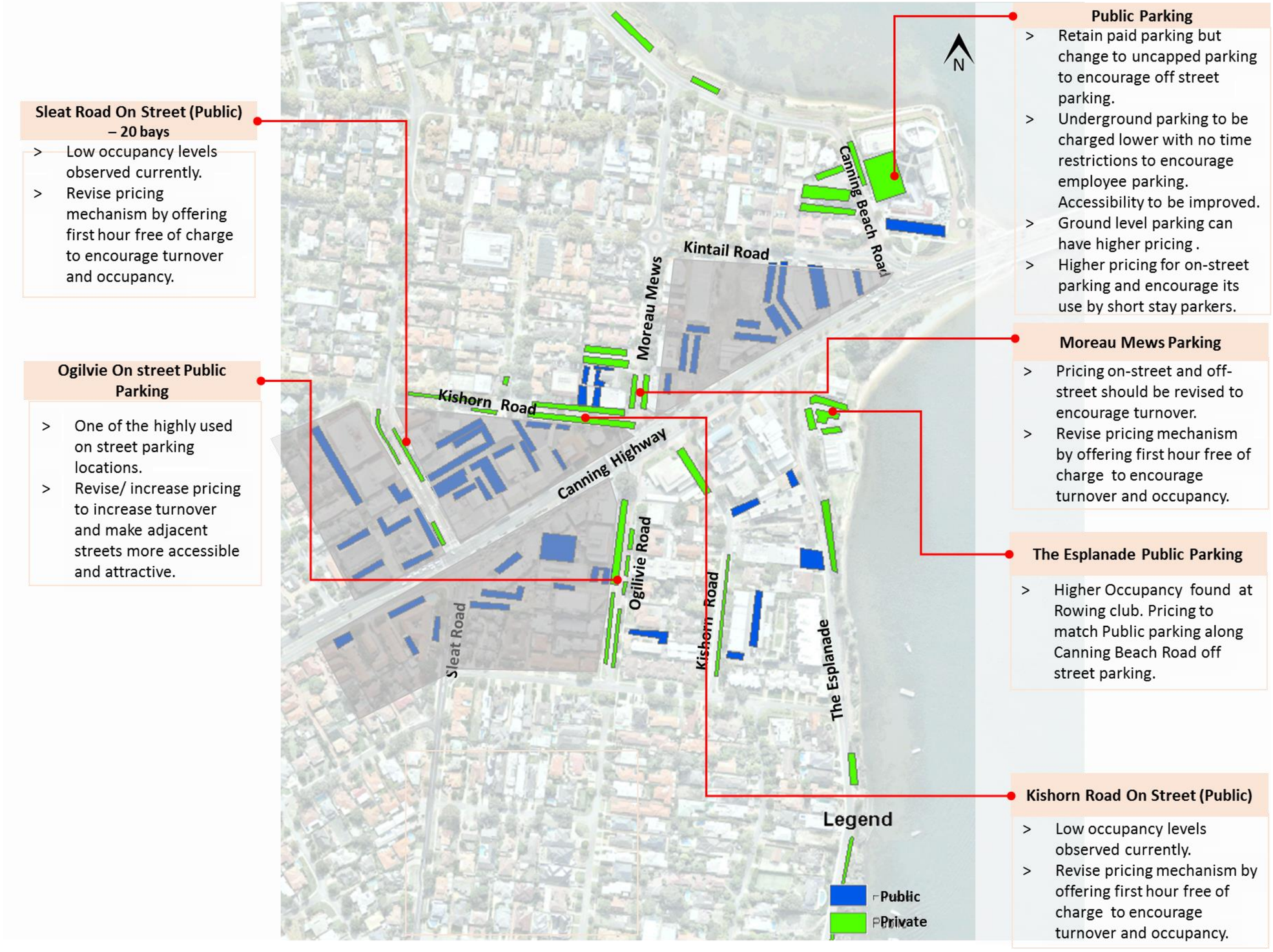
As noted in **Section 3.2.2**, Canning Bridge is different from Riseley Centre in terms of land use mix, activity and the current parking management.

Most of the publicly-available parking spaces are priced in Canning Bridge Centre. However, utilisation of these paid parking spaces is found to be very low. The unrestricted parking supply provided by the adjacent commercial areas attracts most of the long-stay and short-stay parkers.

4.4.1 Short Term Parking Management Strategy for Canning Bridge Centre

In the short term, activity in the Canning Bridge Centre is expected to remain the same. It has however been identified through the parking studies that, despite the availability of enough parking spaces in the vicinity, parking issues exist. Management is therefore necessary to address these issues.

Following **Figure 4-4** shows the suggested parking management strategy for the short term for Canning Bridge Centre.



Sleat Road On Street (Public) – 20 bays

- Low occupancy levels observed currently.
- Revise pricing mechanism by offering first hour free of charge to encourage turnover and occupancy.

Ogilvie On street Public Parking

- One of the highly used on street parking locations.
- Revise/ increase pricing to increase turnover and make adjacent streets more accessible and attractive.

Public Parking

- Retain paid parking but change to uncapped parking to encourage off street parking.
- Underground parking to be charged lower with no time restrictions to encourage employee parking. Accessibility to be improved.
- Ground level parking can have higher pricing .
- Higher pricing for on-street parking and encourage its use by short stay parkers.

Moreau Mews Parking

- Pricing on-street and off-street should be revised to encourage turnover.
- Revise pricing mechanism by offering first hour free of charge to encourage turnover and occupancy.

The Esplanade Public Parking

- Higher Occupancy found at Rowing club. Pricing to match Public parking along Canning Beach Road off street parking.

Kishorn Road On Street (Public)

- Low occupancy levels observed currently.
- Revise pricing mechanism by offering first hour free of charge to encourage turnover and occupancy.

Figure 4-4 Canning bridge Centre Short Term Parking Management Plan

It is recommended that the current paid parking mechanism for the Centre be retained. Short term parkers can be given an incentive to park for free for the first one hour, with fees paid for longer durations.

Two major strategies are proposed for Canning Bridge Centre in terms of pricing:

> Designation of on-street short-stay paid parking in the Centre at strategic key high turnover locations and relevant timing restrictions ranging from 15-60 minutes.

> Conversion of existing public off-street car parks to hourly paid parking in the City Centre uncapped but priced to ensure turnover and to encourage long-stay parkers towards the periphery.

PMPs through to the 5-year horizon for the Canning Bridge Centre have been presented in **Appendix A**.

4.5 Parking Enforcement

Currently, City of Melville manages all public parking enforcement within the centres. However, surveys showed compliance issues across the study area. One of the immediate actions recommended for the City is to increase the level of enforcement within the Riseley and Canning Bridge Centres.

Cardno understands that parking enforcement is rightly focused on unsafe parking practices across the City of Melville, and that the Ranger team is not sufficiently staffed to maintain a consistent presence throughout the Centre precinct.

One potential option to address this issue is to increase the number of rangers. Alternatively, parking enforcement can be outsourced to an independent third party. This has the advantage of reducing some of the management burden in terms of enforcement, responding to complaints, provision of infrastructure, monitoring, etc.

There are a range of parking enforcement contractors that can provide this service, including Wilson Group and Parking Enforcement Services with a variety of business models that could be tailored to the city's requirements.

Two options for third party paid parking enforcement are described below for reference.

4.5.1 Third Party Management Only

For this option, The City would contract an original equipment manufacturer to source (either purchase or rent) the necessary infrastructure (ticket machines, etc) with a third party contractor managing the parking. The degree of management required is dependent on which management system is implemented.

Pay and display requires the most on-site management, as wardens are required to patrol on a regular basis and issue parking infringements.

A summary of the basic business model is as follows;

> Parking wardens to patrol site (Pay and Display, some number plate recognition systems)

> Technical services (on-going maintenance of infrastructure etc.)

> Financial reconciliation

> Customer service (telephone support)

An hourly rate (capped at 'x' number of hours) will be decided by both parties before calculating the cost of parking wardens. The amount of capped hours will depend on the size of the facility, turnover rates, opening hours etc.

The contract between the City and the 3rd party management company would likely include some financial incentives based on the following Key Performance Indicators (KPI's):

> Revenue targets (tickets and infringements)

> Rapid resolution of any on-site problems that may arise

> Infrastructure 'Up-time'

4.5.2 Third Party Infrastructure Provision and Management

For this option, the City contracts a 3rd party to source, install and maintain parking infrastructure and manage parking enforcement on-site.

In this model, the third party contractor sources and pays for all necessary equipment, facilitating the purchase and installation with payment over a fixed time period (i.e a 5-year loan). The City agrees to pay back a portion of the infrastructure costs each year for the duration of contract, plus interest and management costs. This annual fee would be extracted from revenue from fees and fines.

The contractor carries no risk in this transaction, as the City must pay any shortfall between revenue and the agreed annual fee.

The City owns the equipment after the conclusion of the contract, with an expected equipment life of 5-10 years. It should be noted that a third party contractor does not own the equipment and will not lease.

Parking management costs will be decided by both parties according to the agreed attendance rate. The initial management contract should also contain KPI's in order to maximise efficiency.

4.6 Private Car Park Management Advice

There is currently a large supply of privately owned parking within Riseley and Canning Bridge Centres. While the responsibility to manage these car parks lies with the private land owners, the City can have a role in providing advice to efficiently manage parking within the Centres.

It was identified from the study that many private car parks operate inefficiently, either as a result of reserved parking, illegal or illegitimate parking, employee parking or other operational management issues. This has led to inconvenience for both customers/employees in a variety of locations throughout the Centres.

In addition to providing direct parking management advice, the City can assist businesses through discuss TravelSmart measures, to encourage their employees to use public transport options.

5 Ultimate Parking Management Framework

Utilising the comprehensive Parking Assessment undertaken for Riseley and Canning Bridge Centres for the future full build out scenario the impacts of shared and reciprocal parking reductions has been determined; the detailed report is presented in **Appendix B**.

Following **Table 5-1** presents the results of this assessment.

Table 5-1 Shared and Reciprocal Parking Assessment Summary

	Riseley Centre	Canning Bridge Centre
Existing Supply	1,026	1,233
Existing Unrestricted Peak Parking Demand	1,144	2,459
Shared Parking Demand	785	1,426
Reciprocal and Shared Parking Demand	599	1,263
Future* Unrestricted Peak Parking Demand	1,437	5,982
Future* Shared Parking Demand	932	4,327
Future* Reciprocal and Shared Parking Demand	753	3,788

* Future here denotes the ultimate build out scenario of the envisioned activity centre development.

Riseley Centre:

The assessment results conclude that, if shared and reciprocal synergies were introduced for the centre, additional parking provision is not required for the future. This calls for efficient management of existing resources and introduction of policies that encourage these synergies.

Canning Bridge Centre:

The assessment shows that, with the proposed growth in land use yields in the future, an additional 2,500 spaces would be required to service the centre, considering the reciprocal and shared parking synergies.

The additional spaces are mostly from the contribution of high dense residential and office development in the area. Strategies to promote parking Unbundling, Convertible parking, Transferable Parking entitlements need to be discussed with the new developments to manage parking in the future.

Some of the parking directions suggested in the above discussions are briefly explained below. The City can consider these options for the future, beyond the time horizon of the Parking Management Plans.

> **Unbundled Residential Parking:** Unpriced parking is often “bundled” with building costs, which means that a certain number of spaces are automatically included with building purchases or leases. Unbundling Parking means that parking is sold or rented separately. Occupants only pay for the parking spaces that they actually need and this tends to have a suppressive effect on parking supply and housing coasts. For this to function efficiently, building owners must be able to lease or sell excess parking spaces (such as parking brokerage services described below), and the City should regulate nearby on-street parking to avoid spill-over problems that could result if residents use on street parking to avoid paying for parking spaces.*(Source: Online TDM)*

> **Transferable Parking Entitlements:** Maximum limits turn conventional parking requirements upside down by restricting the total number of spaces that can be constructed. Communities can make maximum

parking requirements more flexible by introducing transferable parking entitlements as in Portland, Oregon. The allowed numbers of parking spaces for a particular development are an “entitlement” that can be transferred or sold to another development if they are unused. The policy enables cities to control the parking supply, without restricting developments that would not be feasible without additional parking. Projects that enquire more parking can proceed, while those that need less parking can benefit by selling their rights or negotiating shared parking agreements for their employees and customers. *(Source: Parking Spaces, Community places finding the balance through smart growth solutions, Pg 16)*

6 Conclusion

City of Melville has commissioned Cardno to prepare Parking Management Plans for the Canning Bridge and Riseley Activity Centres along with the Canning Highway corridor linking these centres. In formulating the plan, various aspects that had to be considered include:

> Development potential under Canning Bridge Structure Plan (2015) & Riseley Centre Structure Plan (2014)

> Draft Local Planning Scheme No.6 & Directions 2031 and Beyond Strategy

> Interim and ultimate build-out scenarios for the study area

> Review of Existing Parking Strategy & situation

To address the above-mentioned considerations, Parking Management Plans for the individual centres were formulated. Aspects of the plans include:

> Instituting parking pricing

> Revised time limits

> Keeping parking meter revenue within the centre,

> Improving parking bay design/ safety/ infrastructure & information and enhancing walkability and end of trip facilities.

> Unbundling of Residential Parking

> Transferable Parking Entitlements

There are significant developments envisioned for the Canning Bridge & Riseley Activity Centres. This will certainly add pressure on the existing parking infrastructure located in and around the study area. There are a number of alternative strategies which the city can employ without compromising its vision and its residents' quality of life. Many of these measures require relatively small amounts of investment and can be implemented rather quickly. That said, for these strategies to be implemented effectively and efficiently, there needs to be co-operation amongst the various stakeholders. It may be in the best interest of the City to lead consultation with other stakeholders in the deliberation of pursuing strategies outlined in this plan given the resources and capabilities of the city.

APPENDIX A

PARKING MANAGEMENT PLANS

Cardno
Shaping the Future

Parking Management Plans

1.1 Access and Parking Priorities

Future decisions and actions will sometimes need to balance competing priorities. A clear idea is therefore required of what the City's access and parking priorities should be. The list below summarises the priorities for access to and parking in the Canning Bridge and Riseley Centres.

Priority	Type	Description
1	Sustainable transport options	Bus stops, pedestrian footpaths and crossings, cycling facilities, taxi ranks, 'Kiss and Ride'
2	ACROD (for persons with a disability), motorcycle and scooter parking	Provide safe and accessible ACROD parking, motorcycle and scooter parking, which are generally free of cost
3	Property and business servicing	Crossovers to lots, loading bays
4	Customer and visitor parking	Paid parking with first hour free or time-limited parking generally up to 2 hours
5	Medium term parking	Paid parking with first hour free or time-limited parking generally up to 4 hours
6	Long term parking	Paid parking without time limits or free parking without time limits. Long term parking should generally be on the periphery of the activity centre
7	Residential parking permits	Residential parking permits will not be issued in the Parking Management Study Area as on-site parking should be provided

1.2 Parking Action Plan

In order to address the existing parking management issues immediately, the following table lists actions to be taken within the next 1, 2, 3, and 5 years following for both Riseley and Canning Bridge centres:

Table 1 Parking Management Plan For Riseley and Canning Bridge Centre

No.	Action	Rationale
Both Centres Quick Wins Within Next 12 Months		
1	**Update Intramaps** to include details of all parking areas and associated parking restrictions **Action – Technical Services, Strategic Urban Planning, GIS Officer**	• Intramaps does not currently show where parking areas are located and what parking restrictions apply. Updating Intramaps and making this information available to all staff will make it easier to provide accurate advice to the community. It would also provide background data for new wayfinding signage and maps etc
2	**Develop a new webpage** with information and maps on where parking is available, how much it costs, what restrictions apply and potential areas for staff parking. **Action – Marketing & Comms, Neighbourhood Amenity, Strategic Urban Planning**	• The City's website currently has basic information on parking, which mainly focuses on regulations • Additional customer-focussed information could be provided including simple maps to help people make decisions on where to park
3	**Develop new Signage and Information** Provide new way-finding signage, brochures and information on staff and long-term parking options **Action - Marketing & Comms, Travelsmart, Sign Shop**	• Wayfinding signage, maps and information will help make it easier for staff and long term parkers to know where to park • New signage could also be prepared for high demand parking areas (e.g. Ogilvie Road) to show where alternative parking areas are available (e.g. 29 Moreau Mews)
Riseley Centre Quick Wins Within Next 12 Months		
4	**Improve Enforcement** **Action – Neighbourhood Amenity**	• Parking enforcement acts as a firm, but fair, incentive for people to comply with the rules, helps improve the turnover of car bays and make it easier to find parking
5	Provide **new pavement marking** for parking bays on the following street sections: a. Existing and new car bays on Willcock Street and Simpson Street b. Simpson Street to the north of Canning Highway c. Laneway parallel to Kearns Crescent - to the west of Riseley Street d. Existing bays on Mitchell Street **Action – Technical Service**	• New pavement marking will delineate existing bays that are not line-marked and new parking bays. It will help formalise existing and new on-street parking bays • It is a relatively quick and cheap way to create extra car parking where safe to do so

No.	Action	Rationale
6	**Remove redundant parking signs** in Riseley Centre (Parking Stations No. 19 and 27) **Action – Technical Services**	• These signs are redundant as parking on private land is no longer managed by CoM
7	**Modify parking time restrictions** a. Willcock Street west of Riseley Street to be changed to 4hr parking from current 2hr parking (not including ¼ hour parking which is to remain) b. Willcock Street west of Riseley Street to be changed to 4hr parking **Action – Technical Services**	• These bays can provide medium term parking options
Canning Bridge Quick Wins Within Next 12 Month		
8	**Improve Enforcement** **Action – Neighbourhood Amenity**	• Parking enforcement acts as a firm, but fair, incentive for people to comply with the rules, helps improve the turnover of car bays and make it easier to find parking
9	**Increase parking fee to $3 per hour on Ogilvie Road** **Action – Neighbourhood Amenity**	• Parking on Ogilvie Road is often full and being used by employees. A higher fee will reduce demand and shift parking to other parking areas
10	**Remove parking time restrictions and introduce first hour free in targeted locations** **Action – Neighbourhood Amenity and Technical Services**	• Remove time restrictions (e.g. 2 hour limit) wherever paid parking is currently in place to provide more flexibility for parkers • Introduce first hour free on-parking in Forbes Road, Sleat Road and Kishorn Road north of Canning Highway and Moreau Mews which are underutilised, and at the 29 Moreau Mews car park to encourage short term parking close to local businesses.
Both Centres Short Term Actions within Next 2 Years		
11	**Develop a positive marketing campaign** to provide information to the community on what the funds raised from paid parking are to be used for and the real cost of providing car parking **Action – Strategic Urban Planning, Marketing & Comms, Travelsmart**	• There is a lack of information available for the community on how much parking costs and what paid parking contributions are used for. This would help people understand the issues and provide transparency

No.	Action	Rationale
12	**Travelsmart Initiatives** **Action – Travelsmart**	• Travelsmart can help people change their travel behaviour. This would be particularly relevant and required for staff of local businesses
13	**Provide more bicycle racks** to make bicycle parking safer and more convenient **Action – Travelsmart**	• There are very few bicycle racks provided currently. New bicycle racks would make it easier to cycle to the centre and demonstrate the City's commitment to encouraging cycling
14	**Encourage public access to parking areas on private land (shared parking)** **Action – Urban Planning**	• Sharing parking on private land is more efficient and less expensive than reserved parking on each lot. The City's Parking Policy CP-079 provides a 25% reduction in on-site parking requirements to incentivise shared car parks.
Riseley Centre Short Term Actions within Next 2 Years		
15	**Reduce speed** on Kearns Crescent to 30kmh, Riseley Street to 40kmh and Willcock & Simpson Streets to 40kmh **Action – Technical Services**	• Speed limit reductions were recommended by the Riseley Centre Structure Plan • Reducing speed limits will help make it safer, easier and more pleasant for people to walk and cycle to the centre. It will also make on-street parking safer
16	**Changes to car parking on Riseley Street** south of Canning Highway (subject to designs being approved and funding provided): a. Removing the bays on the west side of Riseley Street to provide for an additional vehicle lane b. Installing off-peak parking on the east side of Riseley Street between Canning Highway and Willcock Street **Action – Technical Services**	• Existing parking bays on Riseley Street are likely to be removed as part of proposed upgrades to the Riseley Street / Canning Highway intersection • Installing off-peak parking on the east side of Riseley Street was identified as an opportunity in the Riseley Centre Structure Plan. Traffic on this section of Riseley Street can be accommodated in one lane in off-peak periods. It would provide more customer parking for the centre
17	a. **Introduce paid parking with first hour free in high demand parking areas** i. Kearns Crescent (all) ii. 90 degree parking bays on Fletcher Street north of Canning Hwy (parallel bays at north end of Fletcher St to remain free with 4hr limit) iii. 41 Simpson Street	• Paid parking becomes necessary where other management techniques are not sufficient to manage parking demand, often in 'prime' parking areas. • The locations identified are 'prime' parking bays, with good access to adjacent businesses. Paid parking will ensure that: ○ Short term parking is prioritised with the first hour free. This promotes a higher turnover of bays. ○ Long term parking, particularly staff parking, is dis-incentivised.

No.	Action	Rationale
	iv. 1 Willcock Street v. Riseley Street (if/when bays are installed) b. **Remove time limits from the above paid parking areas** **Action – Neighbourhood Amenity and Technical Services**	○ Enforcement is made easier • Remove time restrictions (e.g. 2 hour limit) wherever paid parking is currently in place to provide more flexibility for parkers
18	**Upgrade footpaths and pedestrian crossings** between the Mitchell Street long term car park and Riseley Centre **Action – Technical Services**	• Make it easier and safer to walk between the long-term parking on Mitchell Street and the Riseley Centre
19	**Establish an Access and Parking Account for Riseley Centre** **Action – Finance**	• Establish a new account to receive a percentage of paid parking fees and cash-in-lieu of parking contributions to be used to fund any of the following: public transport, car parking, streetscape upgrades that improve opportunities for walking and cycling, footpaths and other pedestrian-related infrastructure, cycle paths and other cycling-related infrastructure, street trees, plants and landscaping that improves pedestrian amenity and/or Travelsmart programs and initiatives
Canning Bridge Short Term Actions within Next 2 Years		
20	**Review paid parking fees** in high and low parking demand areas as necessary **Action – Neighbourhood Amenity**	• If parking demand issues become evident in particular streets, parking pricing can be reviewed to increase parking fees in high demand areas and potentially reduce parking fees in low demand areas to stimulate demand
21	**Establish an Access and Parking Account for Canning Bridge** **Action – Finance**	• Establish a new account to receive a percentage of paid parking fees and cash-in-lieu of parking contributions to be used to fund any of the following: public transport, car parking, streetscape upgrades that improve opportunities for walking and cycling, footpaths and other pedestrian-related infrastructure, cycle paths and other cycling-related infrastructure, street trees, plants and landscaping that improves pedestrian amenity and/or Travelsmart programs and initiatives.
22	**Install New Loading Bay** **Action – Technical Services**	• Install a new loading bay outside Canning Bridge Post Office to make unloading safer for local businesses

No.	Action	Rationale
23	**Develop a new Kiss and Ride bay in library car park** **Develop new Kiss and Ride at around Swan River Rowing Club building** **Action – Technical Services**	• Kiss and Ride bays provide a formalised, safe place to drop passengers off, which is becoming more common for people wanting to access Canning Bridge Station. The two suggested locations provide access from the north and south sides of the highway. The locations can be further investigated and changed if required.
24	**Investigate vehicle speed and safety issues** in Moreau Mews and western end of Kishorn Road **Action – Technical Services**	• A number of safety issues have been raised by the community including high vehicle speeds on Moreau Mews, the single bay on the south-western end of Moreau Mews (across from Post Office) and hedges reducing sightlines.
All Paid Parking Areas in City of Melville within Next 3 Years		
25	**Investigate the introduction of new technology to improve customer convenience, including paying parking fees via mobile phone** **Action – Neighbourhood Amenity and Finance**	• Provide better customer service and functionality
Both Centres Medium Term Actions within Next 3 Years		
26	**Investigate opportunities for more ACROD parking** **Action – Technical Services**	• Existing areas could be retrofitted or new bays created to further encourage ACROD users to visit the centres
27	**Investigate opportunities for more loading bays and motorcycle and scooter parking** **Action – Technical Services**	• Existing areas could be retrofitted or new bays created to make loading/deliveries safer and further encourage motorcycle and scooter parking
28	**Work with businesses to encourage parking management on private land** **Action – Travelsmart and Strategic Urban Planning**	• Parking issues won't significantly improve until businesses and landowners better manage parking on private land
Riseley Centre Medium Term Actions within Next 3 Years		

No.	Action	Rationale
29	**Upgrade Kearns Crescent Streetscape** **Action – Technical Services**	• Install new footpath on southern / eastern / western side of Kearns Crescent as there is no footpath currently • Upgrade streetscapes, pedestrian crossings, street furniture and street trees, more ACROD parking and consider dedicated taxi bay and loading bays
Both Centres Long Term Actions within Next 5 Years		
30	**Consider market-based pricing of parking fees** to manage demand so that generally no more than 85% of bays are occupied **Action – Neighbourhood Amenity**	• Market based pricing can have different parking fees at different times of the day and/or different fees in different locations to manage parking demand
31	**Improve walking and cycling access to the two centres** **Action – Technical Services**	• Provide more, high quality shared paths, on road bike lanes and a more conducive environment to walk and ride
Riseley Centre Long Term Actions within Next 5 Years		
32	**Upgrade Riseley, Willcock and Simpson Streets** **Action – Technical Services**	• Install footpaths on both sides of streets • Provide on-street parking on both sides of streets wherever possible to do so • Upgrade streetscapes, pedestrian crossings, street furniture and plant more street trees • Provide more ACROD parking

33	**Introduce paid parking with first two hours free on Willcock Street and Simpson Street (south of Canning Hwy) and remove time limits**
	Action – Neighbourhood Amenity
		• Paid parking will ensure that:
		  ○ Short term parking is prioritised with the first two hours free. This promotes a higher turnover of bays.
		  ○ Long term parking, particularly staff parking, is dis-incentivised.
		  ○ Enforcement is made easier
		• The parking fees should be cheaper than Kearns Crescent etc to encourage use

No.	Action	Rationale
34	**Investigate potential for more car parking along Coogee Road or around Shirley Strickland Reserve** **Action – Technical Services**	• Investigate potential for more long term parking along Coogee Road and around Shirley Strickland Reserve
Canning Bridge Long Term Actions within Next 5 Years		
35	**Upgrade Helm Street, Kintail Road and Moreau Mews** **Action – Technical Services**	• Install footpaths on both sides of streets • Provide on-street paid parking on both sides of streets wherever possible to do so • Upgrade streetscapes, pedestrian crossings, street furniture and street trees • Provide more ACROD parking

1.2.1 Riseley Centre Action Plan Maps

Figure 1 Riseley Centre Parking Management Action Plan: Quick Wins

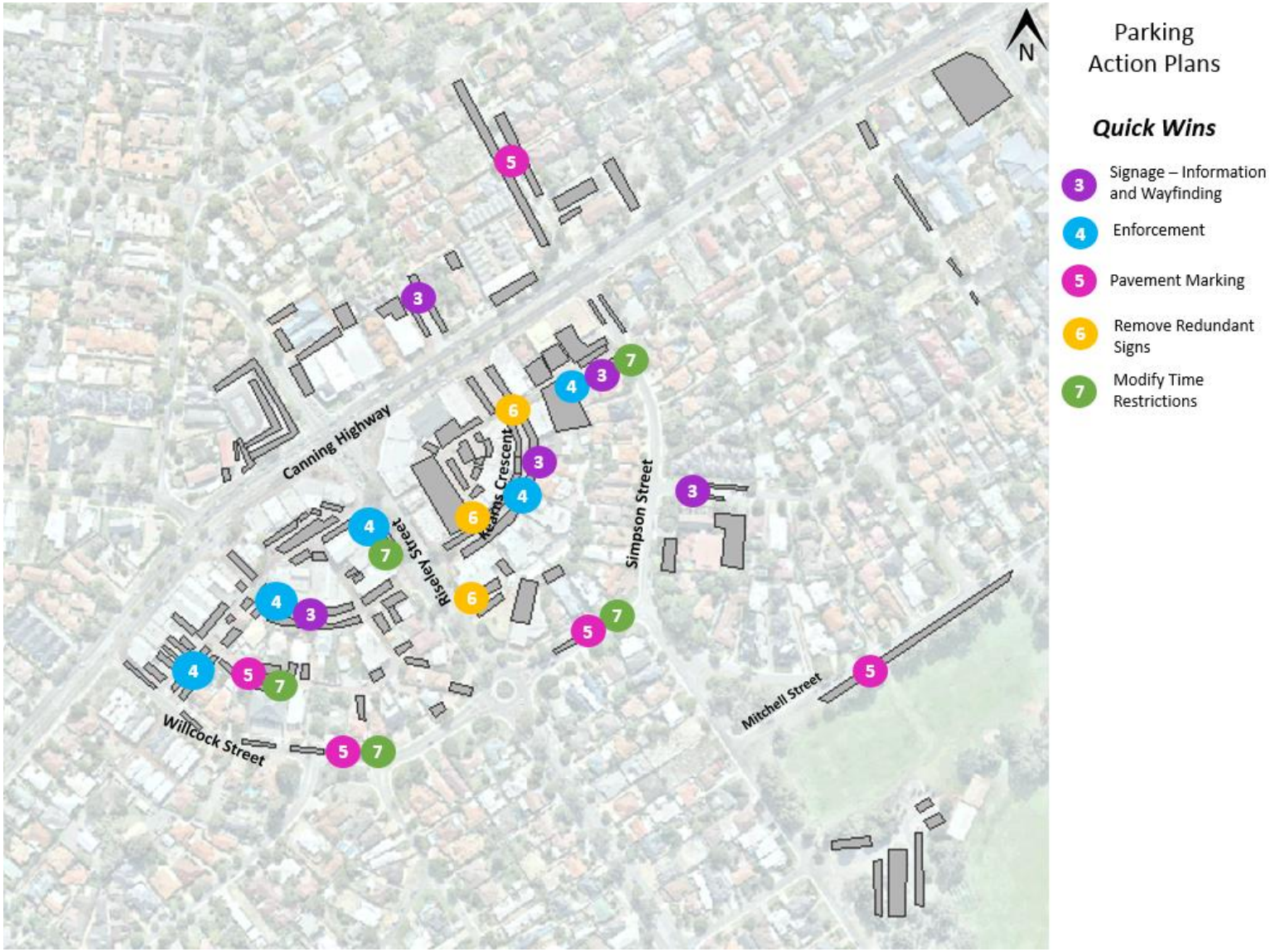


Figure 2 Riseley Centre Short Term Parking Management Action Plan

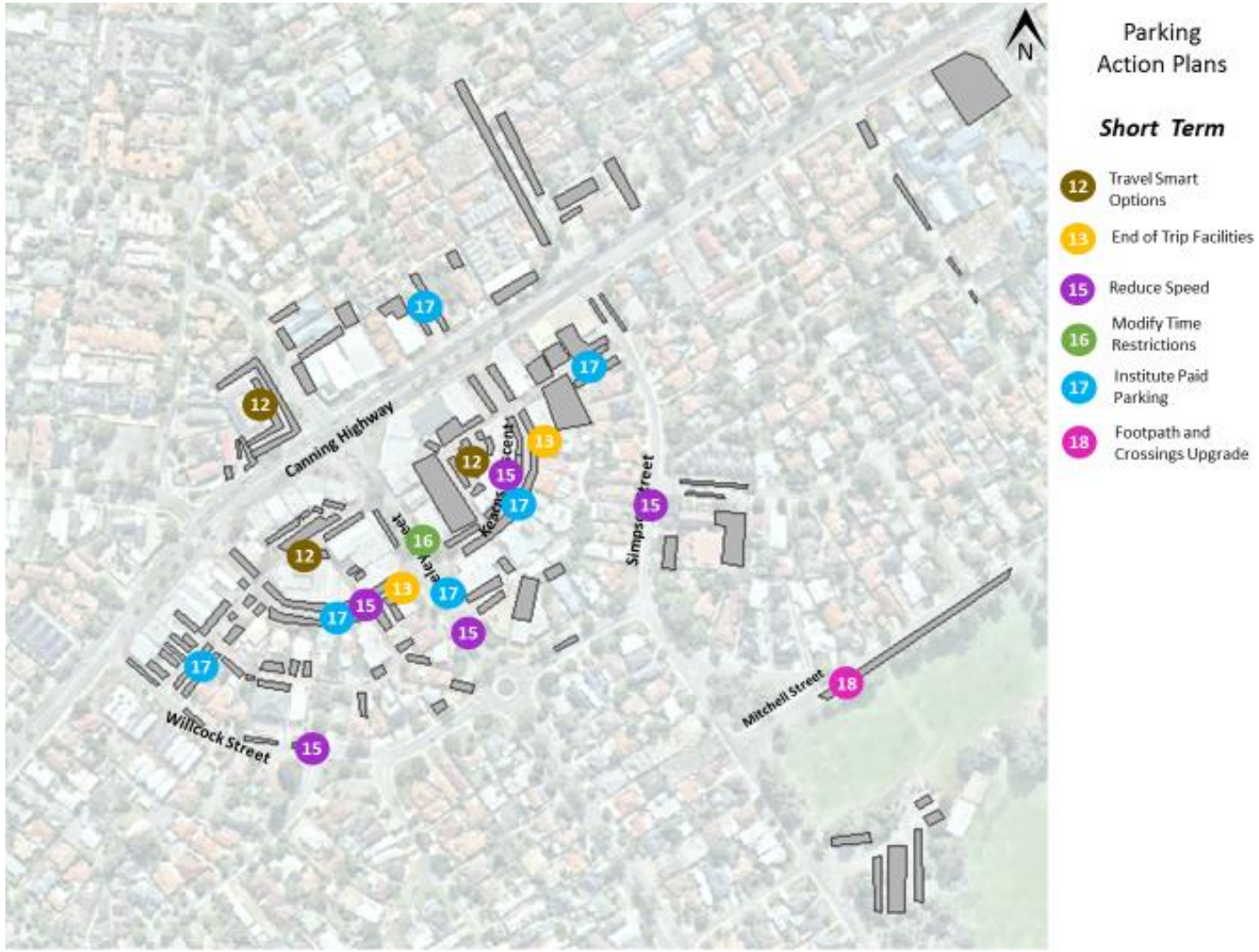


Figure 3 Riseley Centre Medium Term Parking Management Action Plan

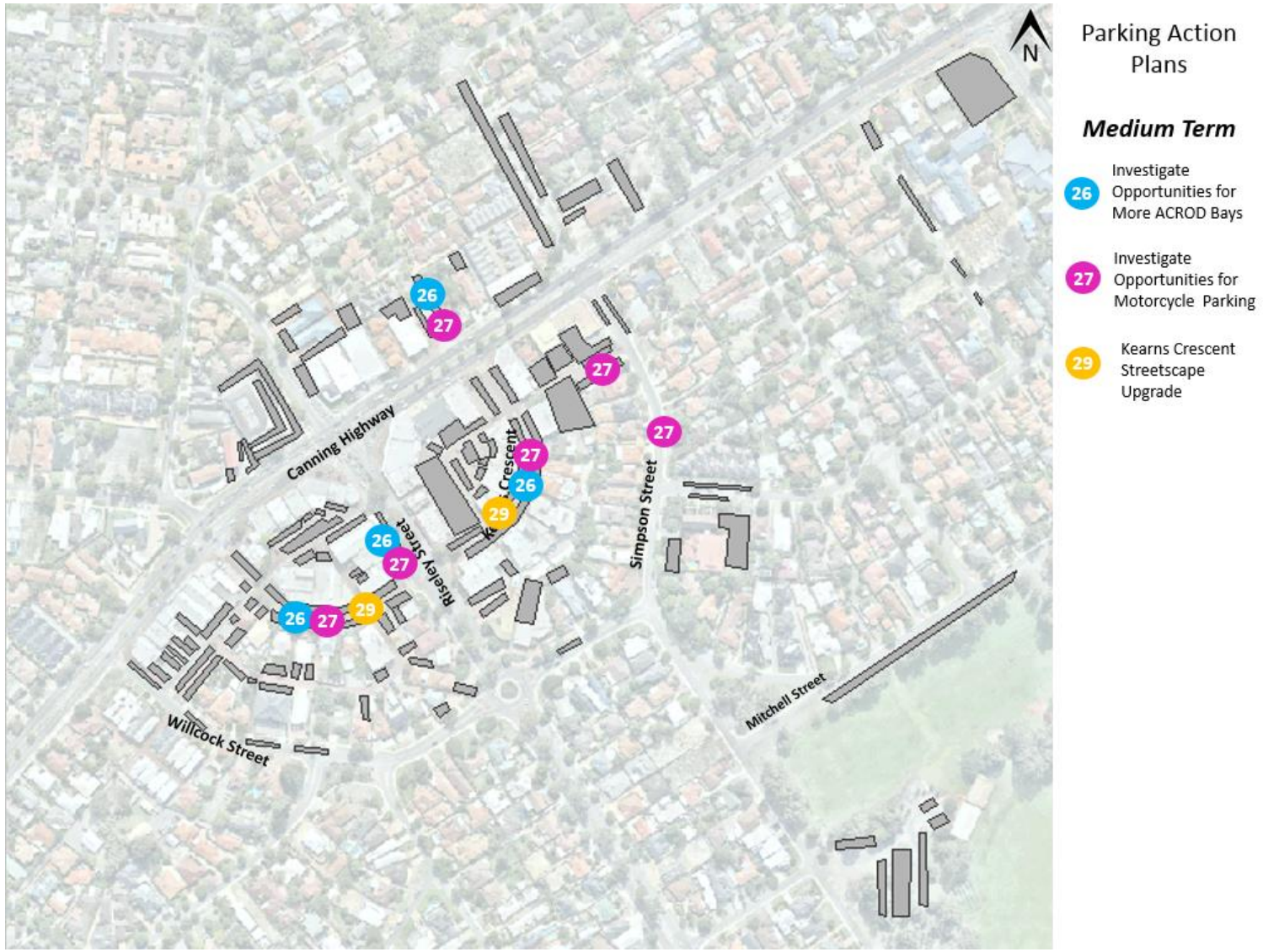
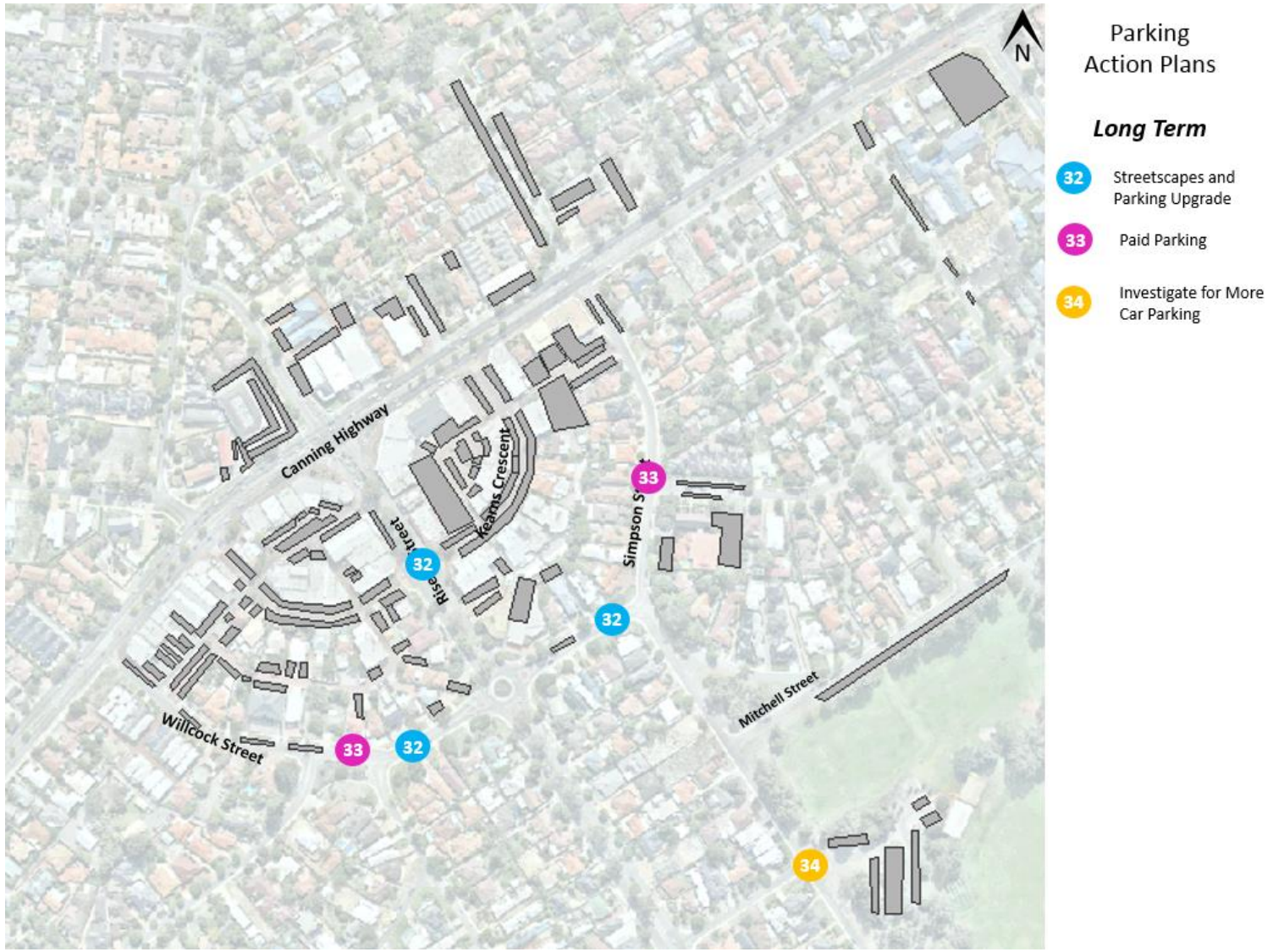


Figure 4 Riseley Centre Long Term Parking Management Action Plan



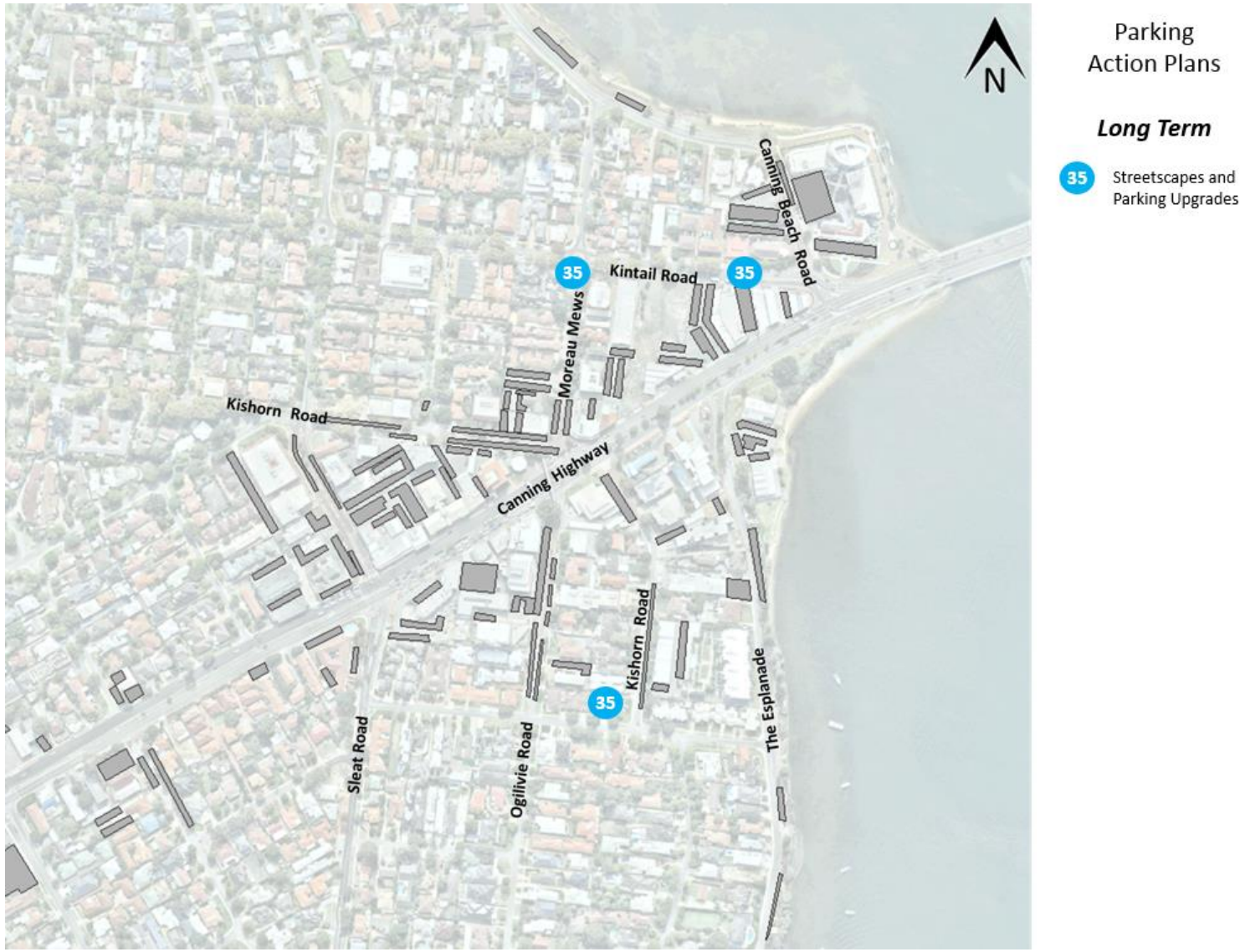
1.2.2 Canning Bridge Centre Action Plans Maps

Figure 5 Canning Bridge Centre Parking Management Action Plan: Quick Wins

Figure 6 Canning Bridge Centre Short Term Parking Management Action Plan

Figure 7 Canning Bridge Centre Medium Term Parking Management Action Plan

Figure 8 Canning Bridge Centre Long Term Parking Management Action Plan



1.3 List of Actions and Suggested Lead Department

Table 2 List of Actions for Multiple Departments

No.	Action	Rationale
Multiple Departments - Quick Wins in the Next 12 Months		
1	**Update Intramaps** to include details of all parking areas and associated parking restrictions **Action – Technical Services, Strategic Urban Planning, GIS Officer**	• Intramaps does not currently show where parking areas are located and what parking restrictions apply. Updating Intramaps and making this information available to all staff will make it easier to provide accurate advice to the community. It would also provide background data for wayfinding signage, brochures and maps
2	**Develop a new webpage** with information and maps on where parking is available, how much it costs, what restrictions apply and potential areas for staff parking. **Action – Marketing & Comms, Neighbourhood Amenity, Strategic Urban Planning**	• The City's website currently has basic information on parking, which mainly focuses on regulations in place • Additional customer-focussed information could be provided including simple maps to help people make decisions on where to park
3	**Develop new Signage and Information** Provide new way-finding signage, brochures and information on staff and long-term parking options **Action - Marketing & Comms, Travelsmart, Sign Shop**	• Wayfinding signage, maps and information will help make it easier for staff and long term parkers to know where to park • New signage could also be prepared for high demand parking areas (e.g. Ogilvie Road) to show where alternative parking areas are available (e.g. 29 Moreau Mews)
Multiple Departments – Short Term Actions within Next 2 Years		
11	**Develop a positive marketing campaign** to provide information to the community on what the funds raised from paid parking are to be used for and the real cost of providing car parking **Action – Strategic Urban Planning, Marketing & Comms, Travelsmart**	• There is a lack of information available for the community on how much parking costs and what paid parking contributions are used for. This would help people understand the issues and provide transparency
Multiple Departments – Long Term Actions within Next 5 Years		
28	**Work with businesses to encourage parking management on**	• Parking issues won't significantly improve until businesses and

No.	Action	Rationale
	private land	landowners better manage parking on private land
	Action – Travelsmart and Strategic Urban Planning	

Table 3 List of Actions for Neighbourhood Amenity Department

No.	Action	Rationale
Neighbourhood Amenity – Quick Wins within Next 12 Months		
4 8	**Improve Enforcement** **Action – Neighbourhood Amenity**	• Parking enforcement acts as a firm, but fair, incentive for people to comply with the rules, helps improve the turnover of car bays and make it easier to find parking
9	**Increase parking fee to $3 per hour on Ogilvie Road with no first hour free** **Action – Neighbourhood Amenity**	• Parking on Ogilvie Road is often full and being used by employees. A higher fee with no first hour free will reduce demand and shift demand to other car parks.
10	**Remove parking time restrictions and introduce first hour free in targeted locations** **Action – Neighbourhood Amenity and Technical Services**	• Remove time restrictions (e.g. 2 hour limit) wherever paid parking is currently in place as it will provide more flexibility for parkers • Introduce first hour free parking in Forbes Road, which is underutilised, and at the 29 Moreau Mews car park to encourage short term parking close to local businesses
Neighbourhood Amenity – Short Term Actions within Next 2 Years		
17	a. **Introduce paid parking with first hour free in high demand parking areas** i. Kearns Crescent (all) ii. 90 degree parking bays on Fletcher Street north of Canning Hwy (parallel bays at north end of Fletcher St to remain free with 4hr limit) iii. 41 Simpson Street iv. 1 Willcock Street v. Riseley Street (if/when bays are installed) b. **Remove time limits from the above paid parking areas** **Action – Neighbourhood Amenity and Technical Services (signage)**	• Paid parking becomes necessary where other management techniques are not sufficient to manage parking demand, often in 'prime' parking areas. • The locations identified are 'prime' parking bays, with good access to adjacent businesses. Paid parking will ensure that: ○ Short term parking is prioritised with the first hour free. This promotes a higher turnover of bays. ○ Long term parking, particularly staff parking, is dis-incentivised. ○ Enforcement is made easier • Remove time restrictions (e.g. 2 hour limit) wherever paid parking is currently in place as it will provide more flexibility for parkers

20	**Review paid parking fees** in high and low parking demand areas as necessary **Action – Neighbourhood Amenity**	• If parking demand issues become evident in particular streets, parking pricing can be reviewed to increase parking fees in high demand areas and potentially reduce parking fees in low demand areas to stimulate demand
Neighbourhood Amenity – Medium Term Actions within Next 3 Years		
25	**Investigate the introduction of new technology to improve customer convenience, including paying parking fees via mobile phone** **Action – Neighbourhood Amenity and Finance**	• Provide better customer service and functionality
Neighbourhood Amenity – Long Term Actions within Next 5 Years		
30	**Consider market-based pricing of parking fees** to manage demand so that generally no more than 85% of bays are occupied **Action – Neighbourhood Amenity**	• Market based pricing can have different parking fees at different times of the day and/or different fees in different locations to either promote more parking or manage parking demand in busy locations
33	**Introduce paid parking with first two hours free on Willcock Street and Simpson Street (south of Canning Hwy) with no time limits** **Action – Neighbourhood Amenity**	• Paid parking will ensure that: ○ Short term parking is prioritised with the first two hours free. This promotes a higher turnover of bays. ○ Long term parking, particularly staff parking, is dis-incentivised. ○ Enforcement is made easier • The parking fees should be cheaper than Kearns Crescent etc to encourage use

Table 4 List of Actions for Technical Services Department

No.	Action	Rationale
Technical Services – Quick Wins within Next 12 Months		
5	Provide **new pavement marking** for parking bays on the following street sections: a. Existing and new car bays on Willcock Street and Simpson Street b. Simpson Street to the north of Canning Highway c. Laneway parallel to Kearns Crescent - to the west of Riseley Street d. Existing bays on Mitchell Street **Action – Technical Services**	• New pavement marking will delineate existing bays that are not line-marked, new parking bays and formalise on-street parking requirements • It is a relatively quick and cheap way to create extra car parking where safe to do so
6	**Signage and Information** Remove redundant parking signs in Riseley Centre (Parking Stations No. 19 and 27) **Action – Technical Services**	• These signs are redundant as parking on private land is no longer managed by CoM
7	**Modify parking time restrictions** a. Willcock Street west of Riseley Street to be changed to 4hr parking from current 2hr parking (not including ¼ hour parking which is to remain) b. Willcock Street west of Riseley Street to be changed to 4hr parking **Action – Technical Services**	• These bays can provide more medium term parking options
Technical Service – Short Term Actions within Next 2 Years		
12	**Travelsmart Initiatives** **Action – Travelsmart**	• Travelsmart can help people change their travel behaviour. This would be particularly relevant and required for staff of local businesses.

No.	Action	Rationale
13	**Provide more bicycle racks** to make bike parking safer and more convenient **Action – Travelsmart**	• There are very few bicycle racks in the two centres currently. New bicycle racks would make it easier to cycle and demonstrate the City's commitment to improving cycling infrastructure
15	**Reduce speed** on Kearns Crescent to 30kmh, Riseley Street to 40kmh and Willcock & Simpson Streets to 40kmh **Action – Technical Services**	• Speed limit reduction were recommended by the Riseley Centre Structure Plan • Reducing speed limits will help make it safer, easier and more pleasant for people to walk and cycle to the centre. It will also make on-street parking safer
16	**Changes to car parking on Riseley Street** south of Canning Highway (subject to designs being approved and funding provided): c. Removing the bays on the west side of Riseley Street to provide for an additional vehicle lane d. Installing off-peak parking on the east side of Riseley Street between Canning Highway and Willcock Street **Action – Technical Services**	• Existing parking bays on Riseley Street are likely to be removed as part of proposed upgrades to the Riseley Street / Canning Highway intersection. • Installing off-peak parking on the east side of Riseley Street was identified as an opportunity in the Riseley Centre Structure Plan. Traffic on this section of Riseley Street can be provided in one lane in off-peak periods. It would provide more customer parking for the centre.
18	**Upgrade footpaths and pedestrian crossings** between the Mitchell Street long term car park and Riseley Centre **Action – Technical Services**	• Make it easier and safer to walk between the long-term parking on Mitchell Street and the Riseley Centre
22	**Install New Loading Bay** **Action – Technical Services**	• Install a new loading bay outside Canning Bridge Post Office to make unloading safer for local businesses
23	**Develop a new Kiss and Ride bay in library car park** **Develop new Kiss and Ride at around Swan River Rowing Club building** **Action – Technical Services**	• Kiss and Ride bays provide a formalised, safe place to drop passengers off, which is becoming more common for people wanting to access Canning Bridge Station. The two suggested locations provide access from the north and south sides of the highway. The locations can be further investigated and changed if required.

No.	Action	Rationale
24	**Investigate vehicle speed and safety issues** in Moreau Mews and western end of Kishorn Road **Action – Technical Services**	• A number of safety issues have been raised by the community including high vehicle speeds on Moreau Mews, the single bay on the south-western end of Moreau Mews (across from Post Office) and hedges reducing sightlines.
Technical Services Medium Term Actions within Next 3 years		
26	**Investigate opportunities for more ACROD parking in the centres** **Action – Technical Services**	• Existing areas could be retrofitted or new bays created to further encourage ACROD users to visit the centre
27	**Investigate opportunities for more loading bays and motorcycle and scooter parking in the centres** **Action – Technical Services**	• Existing areas could be retrofitted or new bays created to make loading/deliveries safer and further encourage motorcycle and scooter parking
29	**Upgrade Kearns Crescent Streetscape** **Action – Technical Services**	• Install new footpath on southern / eastern / western side of Kearns Crescent as there is no footpath currently • Upgrade streetscapes, pedestrian crossings, street furniture and street trees, more ACROD parking and consider dedicated taxi bay and loading bays
Technical Services Long Term Actions within Next 5 Years		
31	**Improve walking and cycling access to the two centres** **Action – Technical Services**	• Provide more, high quality shared paths, on road bike lanes and a more conducive environment to walk and ride
32	**Upgrade Riseley, Willcock and Simpson Streets** **Action – Technical Services**	• Install footpaths on both sides of streets • Provide on-street paid parking on both sides of streets wherever possible to do so • Upgrade streetscapes, pedestrian crossings, street furniture and street trees • Provide more ACROD parking

No.	Action	Rationale
34	**Investigate potential for more parking on Coogee Road or around Shirley Strickland Reserve** **Action – Technical Services**	• May be opportunities for more long term parking on Coogee Road and around Shirley Strickland Reserve
35	**Upgrade Helm Street, Kintail Road and Moreau Mews** **Action – Technical Services**	• Install footpaths on both sides of streets • Provide on-street paid parking on both sides of streets wherever possible to do so • Upgrade streetscapes, pedestrian crossings, street furniture and street trees • Provide more ACROD parking

Table 5 List of Actions for Urban Planning Department

No.	Action	Rationale
Urban Planning - Ongoing		
14	**Encourage public access to parking areas on private land (shared parking)** **Action – Urban Planning**	• Sharing parking on private land is more efficient and less expensive than reserved parking on each lot. The City's Parking Policy CP-079 provides a 25% reduction in on-site parking requirements to incentivise shared car parks.

Parking Management Plan

APPENDIX

B

PARKING ASSESSMENT

Cardno
Shaping the Future

Determining Parking Supply

A comprehensive parking demand model has been developed for the purpose of determining the parking requirements of the Melville study area. As stated previously, the assessment will be conducted separately for each of the three areas.

1 Assessment methodology

Base Parking Analysis

A base parking analysis has been undertaken to estimate the *Gross Theoretical Peak Demand* for the areas in question. For the purpose of this assessment, the demarcated areas have been considered as it is assumed that all trips, internal and external, are performed within this area.

For the purpose of the assessment, the nine constituent land uses as described in the previous section have been re-classified broadly into six land use categories based on their function:

These land-use categories are as follows:

> Residential: Constituting all Residential development

> Office: Constituting both Government and Private office spaces

> Retail: Constituting Shopping centres, Supermarkets and any small retail outlets

> Restaurant: Constituting Restaurants, small bars, cafes and Night clubs

> Hotel: Constituting hotels and serviced apartments

> Entertainment: Constituting both entertainment and recreational avenues

The parking demand rates and the time-of-day utilization rates published in Parking Generation, 3rd Edition by the Institute of Transportation Engineers (ITE) were used to estimate the theoretical parking demand and the hourly parking occupancy for the constituent land uses, as shown in the tables below. The *Gross Theoretical Peak Demand* for each respective land use defines the maximum no. of parking bays required to satisfy the demand, assuming that parking bays are exclusive to each land use.

Shared Parking Analysis

In a more realistic scenario, it is reasonable to assume that parking can be shared between land uses where the peak demands occur at different times of day. As the usage patterns vary between land uses in a mixed use development, allowing shared parking can decrease the overall requirement for parking compared to an exclusive parking regime.

Reciprocal Parking Analysis

Reciprocal parking occurs when a person has more than one purpose within the Precinct area and hence only one trip is required to serve two or more purposes. Being a mixed-use development, it is likely that a high degree of reciprocity exists within the development at all times. The degree of reciprocal parking occurring depends on the type of land use in the vicinity and the time of day.

For the purpose of this assessment, reciprocal trip rates have been obtained from the *National Cooperative Highway Research Program (NCHRP) Report 684* (March 2011). It has been assumed that, for the purpose of determining parking demand, all land uses within a 400m catchment are eligible for reciprocal parking.

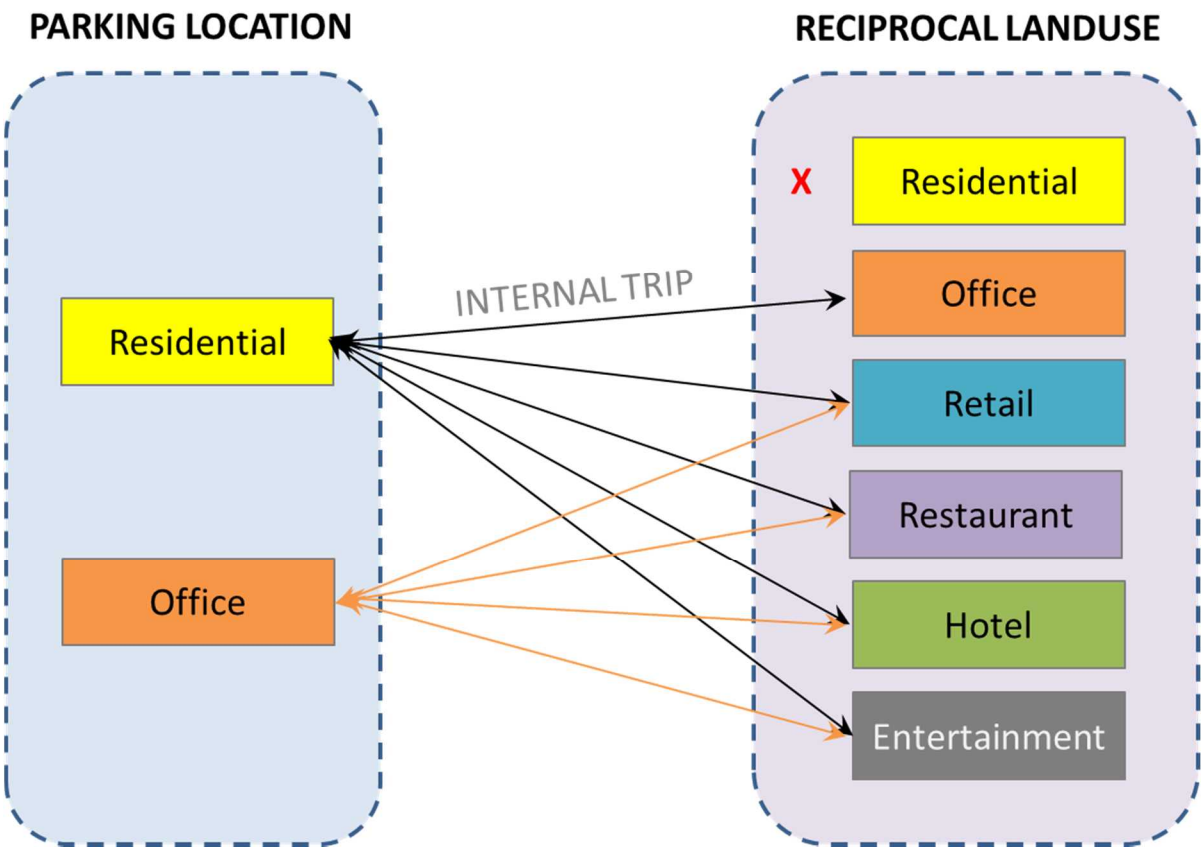
By accommodating reciprocal parking, a lower total parking supply will therefore be required to satisfy demand for the proposed development site.

The sections below show the calculated values from the analysis to produce the *Gross Theoretical Peak Demand* and *Peak Theoretical Parking Demand*.

Within the Melville Study area, the reciprocity has been defined to occur in the manner illustrated in the **Figure 1** below.

Note that all calculation completed in this section for the parking supply is conducted for the peak demand during a **weekday** to determine the minimum number of bays required.

Figure 1 Reciprocity Relation Between Constituent Land Use Pairs



2 Existing Parking Supply

Base Parking Analysis for Riseley Area

Table 1 Riseley Area Hourly Occupancy by Land Use (ITE demand rates)

	Residential	Office	Retail	Restaurant	Hotel	Entertainment	Total
Theoretical Peak Parking Demand	**408**	**231**	**290**	**195**	**0**	**20**	**1,144**
Hour Beginning							
00:00	408	0	0	0	0	0	408
01:00	408	0	0	0	0	0	408
02:00	408	0	0	0	0	0	408
03:00	408	0	0	0	0	0	408
04:00	392	0	0	0	0	0	392
05:00	376	0	0	0	0	0	376
06:00	302	14	0	0	0	0	316
07:00	253	129	78	0	0	0	461
08:00	196	198	160	0	0	0	554
09:00	135	224	221	12	0	1	592
10:00	102	231	223	16	0	2	573
11:00	82	226	267	70	0	7	652

	Residential	Office	Retail	Restaurant	Hotel	Entertainment	Total
12:00	90	201	290	98	0	10	688
13:00	106	173	290	68	0	7	645
14:00	114	194	261	61	0	6	636
15:00	139	201	255	43	0	4	642
16:00	180	173	252	49	0	5	659
17:00	241	99	252	143	0	14	750
18:00	**282**	**42**	**247**	**195**	**0**	**20**	**785**
19:00	269	0	244	195	0	20	728
20:00	306	0	252	156	0	16	731
21:00	314	0	128	113	0	11	567
22:00	376	0	0	39	0	4	419
23:00	384	0	0	0	0	0	384

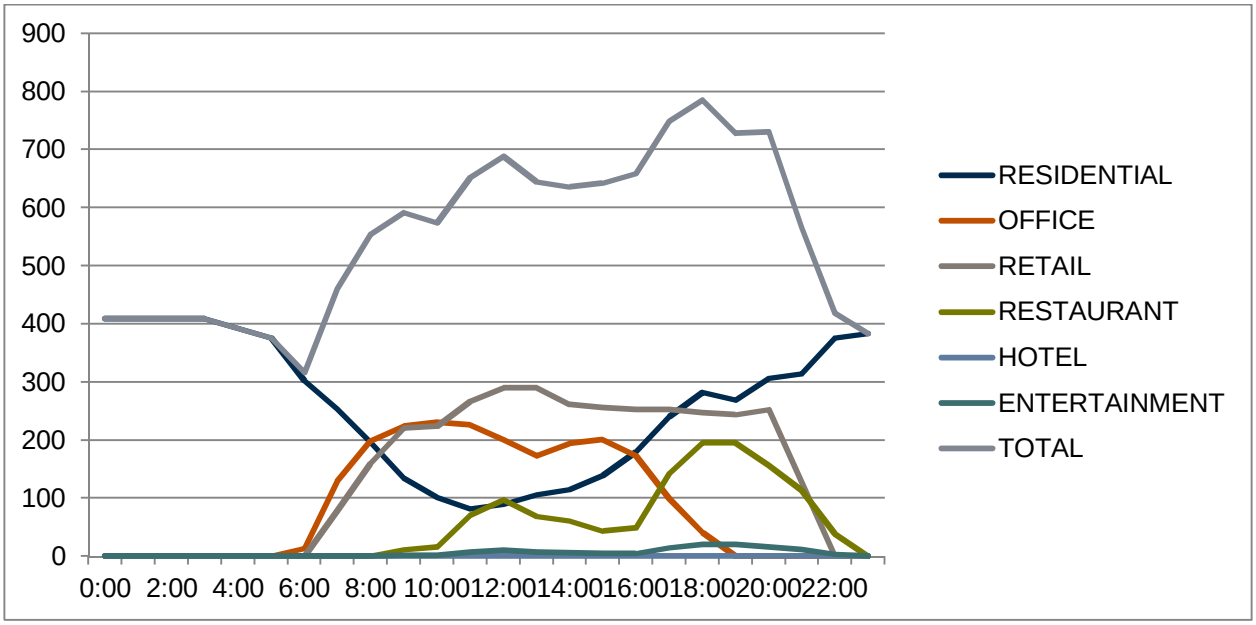
Based on this methodology, the gross peak parking demand for the proposed land uses was determined to be **1,144** bays total, or **736** visitor/employee bays. This assumes exclusive parking for each land use (with no shared or reciprocal parking) and not calibrated to any observed data.

Shared Parking Analysis for Riseley Area

The information contained in **Table 1** above can be represented in a graphical format as shown in **Figure 2** below. As the figure shows, the highest demand for parking occurs between 4 pm and 7 pm, but the total demand for parking bays even during this peak is substantially lower than the 'no shared parking' scenario.

Therefore, if all parking is shared across the site, peak parking demand for the site can be reduced to **785** bays, or **598** visitor/employee bays.

Figure 2 Theoretical Parking Demand Profile for a Typical Weekday (Riseley Area)



1.1 Reciprocal Parking Analysis for Riseley Area

Table 2 Calculated Reciprocal Parking Demand for Land Use Pairs in Riseley Area

	Residential	Office	Retail	Restaurant	Hotel	Entertainment	Total inc. Shared Parking	Non-Residential inc. Shared	Reciprocity	Total inc. Reciprocal	Non-Residential inc. Reciprocal
0:00	408	0	0	0	0	0	408	0	0	408	0
1:00	408	0	0	0	0	0	408	0	0	408	0
2:00	408	0	0	0	0	0	408	0	0	408	0
3:00	408	0	0	0	0	0	408	0	0	408	0
4:00	392	0	0	0	0	0	392	0	0	392	0
5:00	376	0	0	0	0	0	376	0	0	376	0
6:00	302	14	0	0	0	0	316	14	0	316	13
7:00	253	129	78	0	0	0	461	208	42	419	166
8:00	196	198	160	0	0	0	554	358	69	485	289
9:00	135	224	221	12	0	1	592	457	87	504	370
10:00	102	231	223	16	0	2	573	471	91	482	380
11:00	82	226	267	70	0	7	652	570	131	521	439
12:00	90	201	290	98	0	10	688	598	140	548	458
13:00	106	173	290	68	0	7	645	538	141	504	398
14:00	114	194	261	61	0	6	636	522	136	500	385
15:00	139	201	255	43	0	4	642	503	141	501	363
16:00	180	173	252	49	0	5	659	479	145	514	334
17:00	241	99	252	143	0	14	750	509	182	568	327
18:00	**282**	**42**	**247**	**195**	**0**	**20**	**785**	**503**	**186**	**599**	**317**
19:00	269	0	244	195	0	20	728	459	152	576	307
20:00	306	0	252	156	0	16	731	424	142	589	282
21:00	314	0	128	113	0	11	567	252	83	484	169
22:00	376	0	0	39	0	4	419	43	13	406	30
23:00	384	0	0	0	0	0	384	0	0	384	0

Based on this, the parking requirement with the influence of shared and reciprocal parking is calculated at **599** bays or **458** visitor/employee bays.

Base Parking Analysis for Canning Highway Corridor

Table 3 Canning Highway Corridor Hourly Occupancy by Land Use (ITE demand rates)

	Residential	Office	Retail	Restaurant	Hotel	Entertainment	Total
Theoretical Peak Parking Demand	**754**	**514**	**0**	**0**	**0**	**0**	**1,267**
Hour Beginning							
00:00	754	0	0	0	0	0	754
01:00	754	0	0	0	0	0	754
02:00	754	0	0	0	0	0	754
03:00	754	0	0	0	0	0	754

	Residential	Office	Retail	Restaurant	Hotel	Entertainment	Total
04:00	723	0	0	0	0	0	723
05:00	693	0	0	0	0	0	693
06:00	558	31	0	0	0	0	588
07:00	467	288	0	0	0	0	755
08:00	**362**	**442**	**0**	**0**	**0**	**0**	**803**
09:00	249	498	0	0	0	0	747
10:00	188	514	0	0	0	0	702
11:00	151	503	0	0	0	0	654
12:00	166	447	0	0	0	0	613
13:00	196	385	0	0	0	0	581
14:00	211	431	0	0	0	0	642
15:00	256	447	0	0	0	0	703
16:00	332	385	0	0	0	0	717
17:00	445	221	0	0	0	0	665
18:00	520	92	0	0	0	0	612
19:00	497	0	0	0	0	0	497
20:00	565	0	0	0	0	0	565
21:00	580	0	0	0	0	0	580
22:00	693	0	0	0	0	0	693
23:00	708	0	0	0	0	0	708

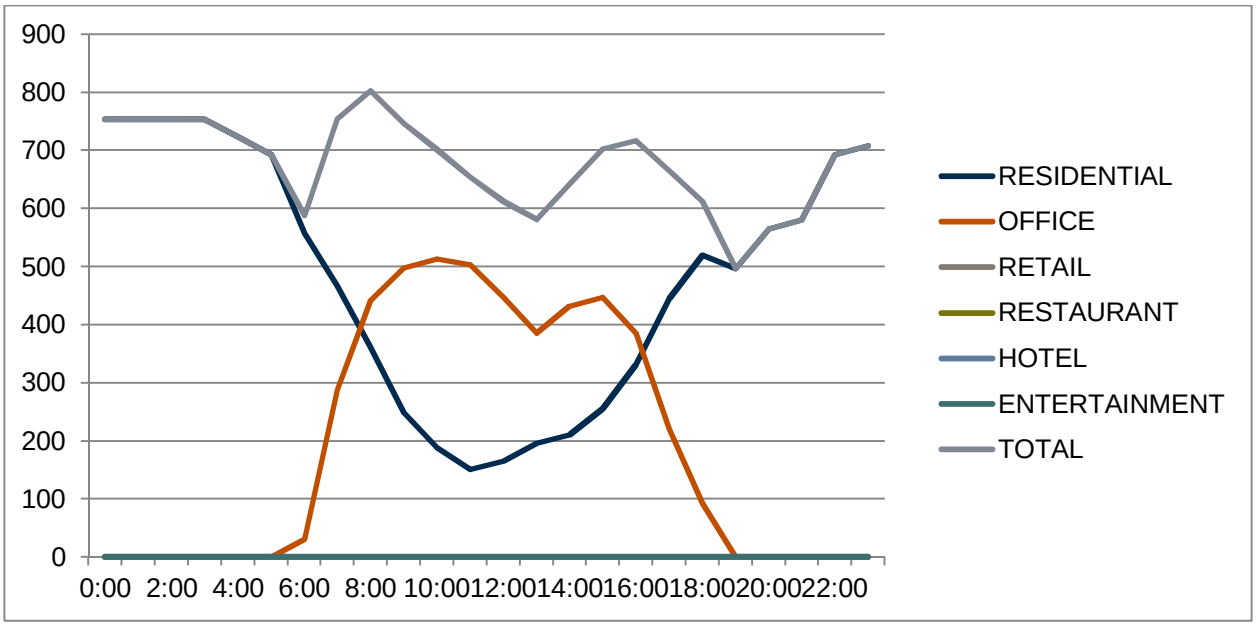
Based on this methodology, the gross peak parking demand for the proposed land uses was determined to be **1,267** bays total, or **514** visitor/employee bays. This assumes exclusive parking for each land use (with no shared or reciprocal parking) and not calibrated to any observed data.

Shared Parking Analysis for Canning Highway Corridor

The information contained in **Table 3** above can be represented in a graphical format as shown in **Figure 3** below. As the figure shows, the highest demand for parking occurs between 12 am and 3 am, but the total demand for parking bays even during this peak is substantially lower than the 'no shared parking' scenario.

Therefore, if all parking is shared across the site, peak parking demand for the site can be reduced to **803** bays or **514** visitor/employee bays.

Figure 3 Theoretical Parking Demand Profile for a Typical Weekday (Canning Highway Corridor)



Reciprocal Parking Analysis for Canning Highway Corridor

Table 4 Calculated Reciprocal Parking Demand for Land Use Pairs in Canning Highway Corridor

	Residential	Office	Retail	Restaurant	Hotel	Entertainment	Total inc. Shared Parking	Non-Residential inc. Shared	Reciprocity	Total inc. Reciprocal	Non-Residential inc. Reciprocal
0:00	754	0	0	0	0	0	754	0	0	754	0
1:00	754	0	0	0	0	0	754	0	0	754	0
2:00	754	0	0	0	0	0	754	0	0	754	0
3:00	754	0	0	0	0	0	754	0	0	754	0
4:00	723	0	0	0	0	0	723	0	0	723	0
5:00	693	0	0	0	0	0	693	0	0	693	0
6:00	558	31	0	0	0	0	588	31	1	587	30
7:00	467	288	0	0	0	0	755	288	9	746	279
8:00	362	442	0	0	0	0	803	442	7	796	435
9:00	249	498	0	0	0	0	747	498	5	742	493
10:00	**188**	**514**	**0**	**0**	**0**	**0**	**702**	**514**	**4**	**698**	**510**
11:00	151	503	0	0	0	0	654	503	3	651	500
12:00	166	447	0	0	0	0	613	447	13	599	434
13:00	196	385	0	0	0	0	581	385	16	566	370
14:00	211	431	0	0	0	0	642	431	17	626	415
15:00	256	447	0	0	0	0	703	447	19	684	428
16:00	332	385	0	0	0	0	717	385	21	696	364

	Residential	Office	Retail	Restaurant	Hotel	Entertainment	Total inc. Shared Parking	Non-Residential inc. Shared	Reciprocity	Total inc. Reciprocal	Non-Residential inc. Reciprocal
17:00	445	221	0	0	0	0	665	221	22	643	199
18:00	520	92	0	0	0	0	612	92	23	590	70
19:00	497	0	0	0	0	0	497	0	0	497	0
20:00	565	0	0	0	0	0	565	0	0	565	0
21:00	580	0	0	0	0	0	580	0	0	580	0
22:00	693	0	0	0	0	0	693	0	0	693	0
23:00	708	0	0	0	0	0	708	0	0	708	0

Based on this, the parking requirement with the influence of shared and reciprocal parking is calculated at **796** bays or **510** visitor/employee bays.

Base Parking Analysis for Canning Bridge Area

Table 5 Canning Bridge Area Hourly Occupancy by Land Use (ITE demand rates)

	Residential	Office	Retail	Restaurant	Hotel	Entertainment	Total
Theoretical Peak Parking Demand	**1,158**	**771**	**191**	**125**	**40**	**174**	**2,459**
Hour Beginning							
00:00	1,158	0	0	0	40	0	1,198
01:00	1,158	0	0	0	40	0	1,198
02:00	1,158	0	0	0	40	0	1,198
03:00	1,158	0	0	0	40	0	1,198
04:00	1,111	0	0	0	38	0	1,150
05:00	1,065	0	0	0	37	0	1,102
06:00	857	46	0	0	30	0	933
07:00	718	432	52	0	25	0	1,226
08:00	556	663	105	0	19	0	1,343
09:00	382	748	145	8	13	10	1,306
10:00	289	771	147	10	10	14	1,242
11:00	232	756	176	45	8	63	1,279
12:00	255	671	191	63	9	87	1,275
13:00	301	578	191	44	10	61	1,185
14:00	324	648	172	39	11	54	1,248
15:00	394	671	168	28	14	38	1,312
16:00	509	578	166	31	18	43	1,346
17:00	683	332	166	91	24	127	1,423
18:00	**799**	**139**	**162**	**125**	**28**	**174**	**1,426**
19:00	764	0	160	125	26	174	1,250
20:00	868	0	166	100	30	139	1,303

	Residential	Office	Retail	Restaurant	Hotel	Entertainment	Total
21:00	891	0	84	73	31	101	1,180
22:00	1,065	0	0	25	37	35	1,162
23:00	1,088	0	0	0	38	0	1,126

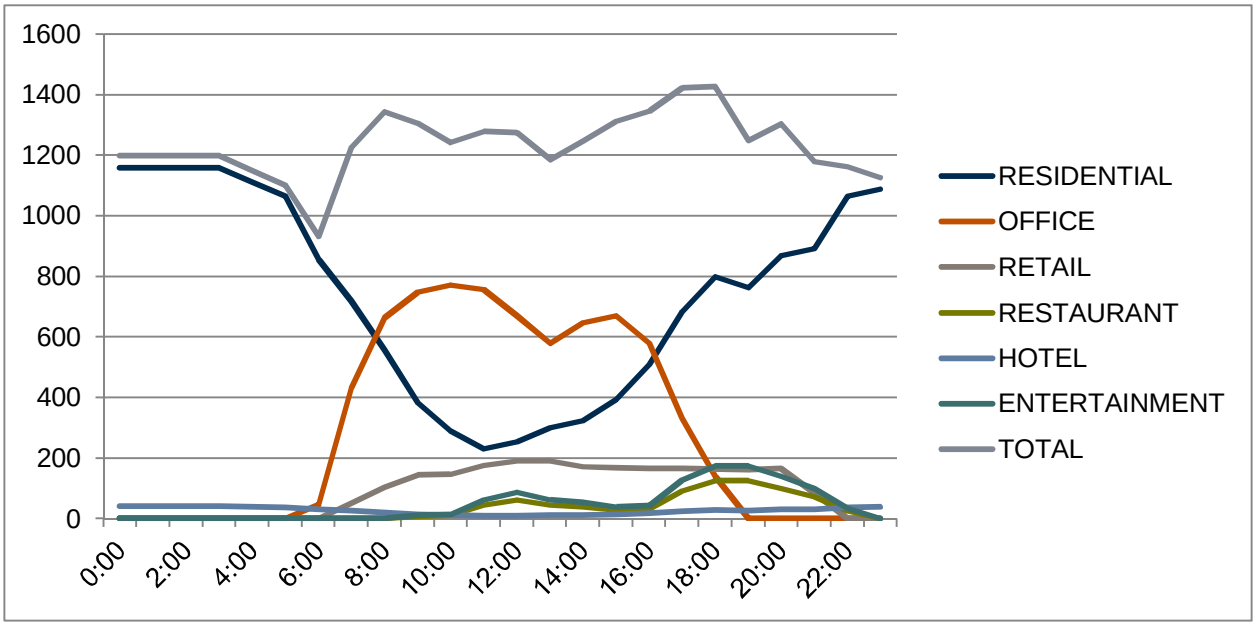
Based on this methodology, the gross peak parking demand for the proposed land uses was determined to be **2,459** bays total, or **1,301** visitor/employee bays. This assumes exclusive parking for each land use (with no shared or reciprocal parking) and not calibrated to any observed data.

Shared Parking Analysis for Canning Bridge Area

The information contained in **Table 5** above can be represented in a graphical format as shown in **Figure 4** below. As the figure shows, the highest demand for parking occurs between 4 pm and 7 pm, but the total demand for parking bays even during this peak is substantially lower than the 'no shared parking' scenario.

Therefore, if all parking is shared across the site, peak parking demand for the site can be reduced to **1,426** bays, or **1,047** visitor/employee bays.

Figure 4 Theoretical Parking Demand Profile for a Typical Weekday (Canning Bridge Area)



2.1 Reciprocal Parking Analysis for Canning Bridge Area

Table 6 Calculated Reciprocal Parking Demand for Land Use Pairs in Canning Bridge Area

	Residential	Office	Retail	Restaurant	Hotel	Entertainment	Total inc. Shared Parking	Non-Residential inc. Shared	Reciprocity	Total inc. Reciprocal	Non-Residential inc. Reciprocal
0:00	1,158	0	0	0	40	0	1,198	40	0	1,198	40
1:00	1,158	0	0	0	40	0	1,198	40	0	1,198	40
2:00	1,158	0	0	0	40	0	1,198	40	0	1,198	40
3:00	1,158	0	0	0	40	0	1,198	40	0	1,198	40
4:00	1,111	0	0	0	38	0	1,150	38	0	1,150	38

	Residential	Office	Retail	Restaurant	Hotel	Entertainment	Total inc. Shared Parking	Non-Residential inc. Shared	Reciprocity	Total inc. Reciprocal	Non-Residential inc. Reciprocal
5:00	1,065	0	0	0	37	0	1,102	37	0	1,102	37
6:00	857	46	0	0	30	0	933	76	3	930	73
7:00	718	432	52	0	25	0	1,226	508	72	1,154	437
8:00	556	663	105	0	19	0	1,343	788	102	1,241	685
9:00	382	748	145	8	13	10	1,306	924	111	1,195	813
10:00	289	771	147	10	10	14	1,242	952	108	1,134	845
11:00	**232**	**756**	**176**	**45**	**8**	**63**	**1,279**	**1,047**	**139**	**1,139**	**908**
12:00	255	671	191	63	9	87	1,275	1,020	141	1,134	879
13:00	301	578	191	44	10	61	1,185	884	135	1,050	749
14:00	324	648	172	39	11	54	1,248	924	126	1,122	798
15:00	394	671	168	28	14	38	1,312	918	122	1,190	796
16:00	509	578	166	31	18	43	1,346	837	126	1,220	710
17:00	683	332	166	91	24	127	1,423	740	160	1,263	580
18:00	799	139	162	125	28	174	1,426	628	176	1,250	451
19:00	764	0	160	125	26	174	1,250	486	115	1,135	371
20:00	868	0	166	100	30	139	1,303	435	107	1,197	329
21:00	891	0	84	73	31	101	1,180	288	65	1,114	223
22:00	1,065	0	0	25	37	35	1,162	97	15	1,146	81
23:00	1,088	0	0	0	38	0	1,126	38	5	1,121	33

Based on this, the parking requirement with the influence of shared and reciprocal parking is calculated at **1,263** bays or **908** visitor/employee bays.

3 Statutory Parking Requirements and Comparison

This analysis has focused on the theoretical estimation of parking demand based on the rates given by the Parking Generation document published by ITE. This provides a theoretical demand as obtained from various land uses surveyed as part of its preparation.

However, the City of Melville has defined statutory parking supply requirements. **Table 7** summarises the statutory parking requirements for the constituent land uses within the Precinct based on City of Melville Car Parking and Access (CP-079).

Table 7 Statutory Land Use Parking Requirements

Land Use	Minimum Parking Provision (Ratio)
Residential - Single house, grouped dwelling, multiple dwellings	Less than R30 – 1 bay per dwelling for residents, 1 bay per 4 dwellings for visitors.*
	Greater than R30 – 0.75 bays per dwelling for small plots (<75m^2), 1 bay per dwelling for medium plots (75-110m^2), 1.25 bays per dwelling for large plots (>110m^2), 0.25 bays per dwelling for visitors.*
Office	1 bay per 50m² NLA.
Restaurant / Café / Small Bar / Lunch Bar / Take Away	1 bay per 10m² PFA, plus 0.5 bay per staff member.

Food Outlet	
Hotel / Tavern	1 bay per 10m² PFA, plus 0.5 bay per staff member, plus 1 bay per bedroom.
Cinema / Theatre / Public Amusement	1 bay per 5 patrons at capacity, plus 0.5 bay per staff member.
Shop / Corner Store / Convenience Store / Restricted Premises	1 bay per 20m² NLA

*within 800m of a train station on a high frequency rail route, measured in a straight line from the pedestrian entry to the train station platform to any part of a lot.

Table 8 Calculated Statutory Parking Requirements

Land Use	Required Parking under CP-079/R-Codes			Assumptions
	Riseley Area	Canning Highway Corridor	Canning Bridge Area	
Residential - Single house, grouped dwelling, multiple dwellings	373	687	1,053	Assume 5% of the maximum capacity are employees
Office	106	235	353	-
Shop / Corner Store / Convenience Store / Restricted Premises	251	0	165	-
Restaurant / Café / Small Bar / Lunch Bar / Take Away Food Outlet	105	0	67	-
Hotel / Tavern	0	0	220	Assume 10% of the maximum capacity are employees
Cinema / Theatre / Public Amusement	50	0	441	Assume 10% of the maximum capacity are employees
Total	**885**	**922**	**2,299**	

If we assume that the parking rates defined above are sufficient to accommodate parking demand for an isolated single-use site, we can perform the same type of assessment as described above to include the effects of shared and reciprocal parking synergies.

The results of this analysis give a requirement of the following, for comparison:

Table 9 Shared and Reciprocal Parking for Statutory Requirements

	Riseley Area	Canning Highway Corridor	Canning Bridge Area
Visitor/employee bays(without shared or reciprocal considerations)	512	235	1,246
Visitor/employee bays(including shared parking only)	421	235	864
Visitor/employee bays(including both shared and reciprocal parking)	324	232	693

4 Calibration of Theoretical Results

From the calculations completed in the previous section, the peak theoretical parking demand was obtained and compared to the existing peak demand obtained from the survey results in order to determine a calibration factor. The calibration factor is used to determine the extent to which demand is likely to increase under the proposed development scenario and is given by the following equation:

$$Calibration\ Factor = \frac{Existing\ Peak\ Parking\ Demand}{Peak\ Theroetical\ Parking\ Demand}$$

The calibration factors for each of the three areas are given in the **Table 10** below.

Table 10 Calibration Factor for All Three Areas

Area	Existing Peak Parking Demand	Peak Theoretical Parking Demand	Calibration Factor
Riseley Area (weekday)	727	458	1.59
Riseley Area (weekend)	515	354	1.45
Canning Highway Corridor (weekday)	139	510	0.27
Canning Highway Corridor (weekend)	52	167	0.31
Canning Bridge Area (weekday)	717	908	0.79
Canning Bridge Area (weekend)	324	437	0.74

5 Future Parking Supply

The future parking supply is determined using the information provided by the structure plans for the Riseley and Canning Bridge Area. The values obtained will then be scaled by the calibration factor obtained in the previous section to obtain a *Calibrated Future Peak Theoretical Parking Demand*. The Canning Highway Corridor has not been considered for the future parking supply as the area contains densified residential dwellings and currently there are no plans in regards to its future land use, therefore it is assumed that it will remain residential and the future parking supply for non-residential parking will remain the same as its current state. The *Ultimate Parking Supply* is then determined through the consideration of various factors relating to the efficiency of parking.

Future Base Parking Analysis for Riseley Area

Table 11 Riseley Area Hourly Occupancy by Land Use (ITE demand rates)

	Residential	Office	Retail	Restaurant	Hotel	Entertainment	Total
Theoretical Peak Parking Demand	**408**	**274**	**428**	**195**	**0**	**132**	**1,437**
Hour Beginning							
00:00	408	0	0	0	0	0	408
01:00	408	0	0	0	0	0	408
02:00	408	0	0	0	0	0	408
03:00	408	0	0	0	0	0	408
04:00	392	0	0	0	0	0	392
05:00	376	0	0	0	0	0	376
06:00	302	16	0	0	0	0	319
07:00	253	153	21	0	0	0	428
08:00	196	235	77	0	0	0	508

	Residential	Office	Retail	Restaurant	Hotel	Entertainment	Total
09:00	135	265	163	12	0	8	582
10:00	102	274	291	16	0	11	693
11:00	82	268	390	70	0	47	857
12:00	90	238	428	98	0	66	919
13:00	106	205	415	68	0	46	841
14:00	114	230	407	61	0	41	852
15:00	139	238	377	43	0	29	826
16:00	180	205	334	49	0	33	801
17:00	241	118	266	143	0	96	863
18:00	**282**	**49**	**274**	**195**	**0**	**132**	**932**
19:00	269	0	330	195	0	132	926
20:00	306	0	300	156	0	105	867
21:00	314	0	180	113	0	76	684
22:00	376	0	0	39	0	26	441
23:00	384	0	0	0	0	0	384

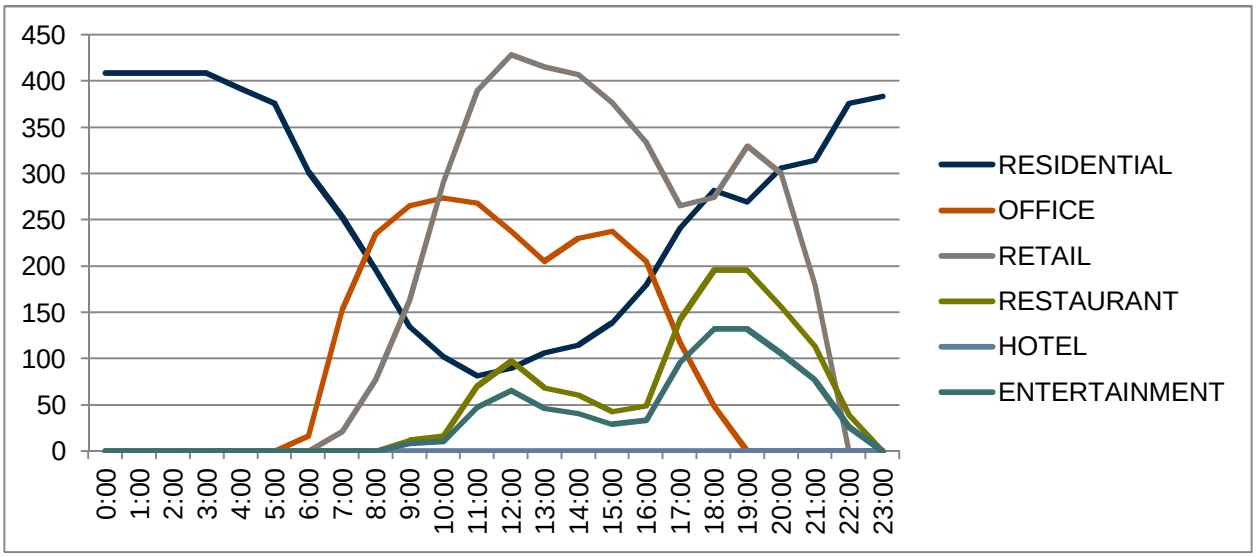
Based on this methodology, the gross peak parking demand for the proposed land uses was determined to be **1,437** bays total, or **1,029** visitor/employee bays. This assumes exclusive parking for each land use (with no shared or reciprocal parking) and not calibrated to any observed data.

Future Shared Parking Analysis for Riseley Area

The information contained in **Table 11** above can be represented in a graphical format as shown in **Figure 5** below. As the figure shows, the highest demand for parking occurs between 5 pm and 7 pm, but the total demand for parking bays even during this peak is substantially lower than the 'no shared parking' scenario.

Therefore, if all parking is shared across the site, peak parking demand for the site can be reduced to **932** bays, or **830** visitor/employee bays.

Figure 5 Future Theoretical Parking Demand Profile for a Typical Weekday (Riseley Area)



Future Reciprocal Parking Analysis for Riseley Area

Table 12 Calculated Reciprocal Parking Demand for Land Use Pairs in Riseley Area

	Residential	Office	Retail	Restaurant	Hotel	Entertainment	Total inc. Shared Parking	Non-Residential inc. Shared	Reciprocity	Total inc. Reciprocal	Non-Residential inc. Reciprocal
0:00	408	0	0	0	0	0	408	0	0	408	0
1:00	408	0	0	0	0	0	408	0	0	408	0
2:00	408	0	0	0	0	0	408	0	0	408	0
3:00	408	0	0	0	0	0	408	0	0	408	0
4:00	392	0	0	0	0	0	392	0	0	392	0
5:00	376	0	0	0	0	0	376	0	0	376	0
6:00	302	16	0	0	0	0	319	16	0	318	16
7:00	253	153	21	0	0	0	428	175	23	405	151
8:00	196	235	77	0	0	0	508	312	44	464	268
9:00	135	265	163	12	0	8	582	448	79	504	369
10:00	102	274	291	16	0	11	693	591	105	588	486
11:00	82	268	390	70	0	47	857	775	145	712	631
12:00	**90**	**238**	**428**	**98**	**0**	**66**	**919**	**830**	**167**	**753**	**663**
13:00	106	205	415	68	0	46	841	735	170	671	565
14:00	114	230	407	61	0	41	852	738	170	683	568
15:00	139	238	377	43	0	29	826	687	168	657	518
16:00	180	205	334	49	0	33	801	621	182	618	439
17:00	241	118	266	143	0	96	863	622	196	666	425
18:00	282	49	274	195	0	132	932	650	210	722	441
19:00	269	0	330	195	0	132	926	657	192	734	465
20:00	306	0	300	156	0	105	867	561	166	701	395
21:00	314	0	180	113	0	76	684	369	107	577	262
22:00	376	0	0	39	0	26	441	65	15	426	51
23:00	384	0	0	0	0	0	384	0	0	384	0

Based on this, the parking requirement with the influence of shared and reciprocal parking is calculated at **753** bays or **663** visitor/employee bays.

The obtained value is now scaled with the calibration factor which was obtained in the previous section to be 1.59. Therefore the calibrated future peak theoretical parking demand is **1,198** bays or **1,054** visitor/employee bays.

Canning Bridge Area

Future Base Parking Analysis for Canning Bridge Area

Table 13 Canning Bridge Area Hourly Occupancy by Land Use (ITE demand rates)

	Residential	Office	Retail	Restaurant	Hotel	Entertainment	Total
Theoretical Peak Parking Demand	**1,158**	**2,889**	**1,043**	**607**	**40**	**246**	**5,982**
Hour Beginning							
00:00	1,158	0	0	0	40	0	1,198
01:00	1,158	0	0	0	40	0	1,198
02:00	1,158	0	0	0	40	0	1,198
03:00	1,158	0	0	0	40	0	1,198
04:00	1,111	0	0	0	38	0	1,150
05:00	1,065	0	0	0	37	0	1,102
06:00	857	173	0	0	30	0	1,060
07:00	718	1,618	52	0	25	0	2,412
08:00	556	2,484	188	0	19	0	3,247
09:00	382	2,802	396	36	13	15	3,645
10:00	289	2,889	709	49	10	20	3,966
11:00	**232**	**2,831**	**949**	**218**	**8**	**89**	**4,327**
12:00	255	2,513	1,043	303	9	123	4,246
13:00	301	2,166	1,012	212	10	86	3,788
14:00	324	2,426	991	188	11	76	4,017
15:00	394	2,513	918	133	14	54	4,026
16:00	509	2,166	814	152	18	62	3,720
17:00	683	1,242	647	443	24	180	3,218
18:00	799	520	668	607	28	246	2,867
19:00	764	0	803	607	26	246	2,446
20:00	868	0	730	485	30	197	2,311
21:00	891	0	438	352	31	143	1,855
22:00	1,065	0	0	121	37	49	1,272
23:00	1,088	0	0	0	38	0	1,126

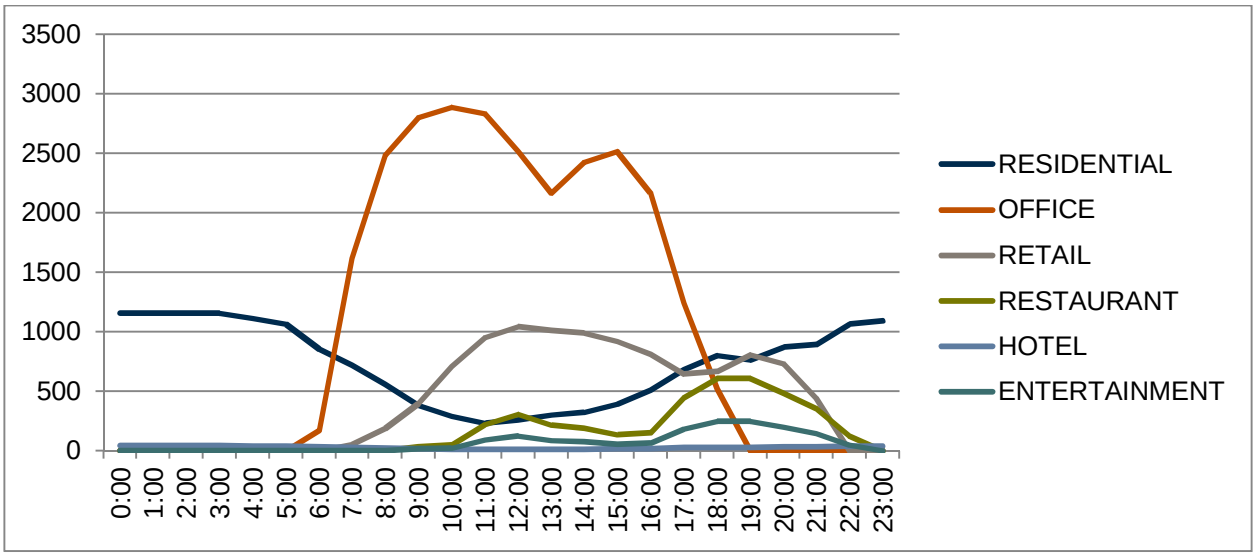
Based on this methodology, the gross peak parking demand for the proposed land uses was determined to be **5,982** bays total, or **4,825** visitor/employee bays. This assumes exclusive parking for each land use (with no shared or reciprocal parking) and not calibrated to any observed data.

Shared Parking Analysis for Canning Bridge Area

The information contained in **Table 13** above can be represented in a graphical format as shown in **Figure 6** below. As the figure shows, the highest demand for parking occurs between 8 am and 12 pm, but the total demand for parking bays even during this peak is substantially lower than the 'no shared parking' scenario.

Therefore, if all parking is shared across the site, peak parking demand for the site can be reduced to **4,327** bays, or **4,095** visitor/employee bays.

Figure 6 Future Theoretical Parking Demand Profile for a Typical Weekday (Canning Bridge Area)



1. Reciprocal Parking Analysis for Canning Bridge Area

Table 14 Calculated Reciprocal Parking Demand for Land Use Pairs in Canning Bridge Area

	Residential	Office	Retail	Restaurant	Hotel	Entertainment	Total inc. Shared Parking	Non-Residential inc. Shared	Reciprocity	Total inc. Reciprocal	Non-Residential inc. Reciprocal
0:00	1,158	0	0	0	40	0	1,198	40	0	1,198	40
1:00	1,158	0	0	0	40	0	1,198	40	0	1,198	40
2:00	1,158	0	0	0	40	0	1,198	40	0	1,198	40
3:00	1,158	0	0	0	40	0	1,198	40	0	1,198	40
4:00	1,111	0	0	0	38	0	1,150	38	0	1,150	38
5:00	1,065	0	0	0	37	0	1,102	37	0	1,102	37
6:00	857	173	0	0	30	0	1,060	203	10	1,049	193
7:00	718	1,618	52	0	25	0	2,412	1,695	79	2,333	1,615
8:00	556	2,484	188	0	19	0	3,247	2,691	157	3,090	2,534
9:00	382	2,802	396	36	13	15	3,645	3,263	296	3,348	2,966
10:00	289	2,889	709	49	10	20	3,966	3,676	402	3,563	3,274
11:00	232	2,831	949	218	8	89	4,327	4,095	605	3,722	3,490
12:00	**255**	**2,513**	**1,043**	**303**	**9**	**123**	**4,246**	**3,991**	**458**	**3,788**	**3,533**
13:00	301	2,166	1,012	212	10	86	3,788	3,487	453	3,335	3,034
14:00	324	2,426	991	188	11	76	4,017	3,693	452	3,565	3,241
15:00	394	2,513	918	133	14	54	4,026	3,632	453	3,573	3,180
16:00	509	2,166	814	152	18	62	3,720	3,211	479	3,241	2,731
17:00	683	1,242	647	443	24	180	3,218	2,535	534	2,684	2,001
18:00	799	520	668	607	28	246	2,867	2,068	602	2,265	1,466

	Residential	Office	Retail	Restaurant	Hotel	Entertainment	Total inc. Shared Parking	Non-Residential inc. Shared	Reciprocity	Total inc. Reciprocal	Non-Residential inc. Reciprocal
19:00	764	0	803	607	26	246	2,446	1,682	506	1,940	1,176
20:00	868	0	730	485	30	197	2,311	1,442	437	1,873	1,005
21:00	891	0	438	352	31	143	1,855	964	285	1,570	678
22:00	1,065	0	0	121	37	49	1,272	207	47	1,225	160
23:00	1,088	0	0	0	38	0	1,126	38	5	1,121	33

Based on this, the parking requirement with the influence of shared and reciprocal parking is calculated at **3,788** bays or **3,533** visitor/employee bays.

The obtained value is now scaled with the calibration factor which was obtained in the previous section to be 1.21. Therefore the calibrated future peak theoretical parking demand is **2,993** bays or **2,792** visitor/employee bays.

6 Parking Assessment Summary

The following tables summarize the results obtained from the Parking Demand Analysis for the proposed Melville Development Sites.

Table 15 Theoretical Peak Weekday Parking Demand Assessment for the Riseley Area

		Total			Visitor/Employee Only		
	Theoretical Parking Demand	**Total**	**Reduction**		**Total**	**Reduction**	
Existing Situation	Un-Restrained Exclusive Parking Demand	**1,144**		%	**736**		%
	Shared Parking Demand	785	359	**31**	598	137	**19**
	Parking Demand: Shared+Reciprocal	599	545	**48**	458	278	**38**
Future Situation	Un-Restrained Exclusive Parking Demand	**1,437**		**%**	**1,029**		**%**
	Shared Parking Demand	932	505	**35**	830	199	**19**
	Parking Demand: Shared+Reciprocal	753	684	**48**	663	366	**36**

Table 16 Theoretical Peak Weekend Parking Demand Assessment for the Riseley Area

		Total			Visitor/Employee Only		
	Theoretical Parking Demand	**Total**	**Reduction**		**Total**	**Reduction**	
Existing Situation	Un-Restrained Exclusive Parking Demand	**1,144**		**%**	**736**		**%**
	Shared Parking Demand	711	433	**38**	465	271	**37**
	Parking Demand: Shared+Reciprocal	555	590	**52**	354	382	**52**
Future Situation	Un-Restrained Exclusive Parking Demand	**1,437**		**%**	**1,029**		**%**
	Shared Parking Demand	921	516	**36**	671	358	**35**
	Parking Demand: Shared+Reciprocal	717	720	**50**	531	497	**48**

Table 17 Theoretical Peak Weekday Parking Demand Assessment for the Canning Highway Corridor

		Total			Visitor/Employee Only		
	Theoretical Parking Demand	**Total**	**Reduction**		**Total**	**Reduction**	
Existing Situation	Un-Restrained Exclusive Parking Demand	**1267**		**%**	**514**		**%**
	Shared Parking Demand	803	464	**37**	514	0	**0**
	Parking Demand: Shared+Reciprocal	796	471	**37**	510	4	**1**
Future Situation	Un-Restrained Exclusive Parking Demand	**1267**		**%**	**514**		**%**
	Shared Parking Demand	803	464	**37**	514	0	**0**
	Parking Demand: Shared+Reciprocal	796	471	**37**	510	4	**1**

Table 18 Theoretical Peak Weekend Parking Demand Assessment for the Canning Highway Corridor

		Total			Visitor/Employee Only		
	Theoretical Parking Demand	**Total**	**Reduction**		**Total**	**Reduction**	
Existing Situation	Un-Restrained Exclusive Parking Demand	**1267**		**%**	**514**		**%**
	Shared Parking Demand	754	514	**41**	171	342	**67**
	Parking Demand: Shared+Reciprocal	754	514	**41**	167	346	**67**
Future Situation	Un-Restrained Exclusive Parking Demand	**1267**		**%**	**514**		**%**
	Shared Parking Demand	754	514	**41**	171	342	**67**
	Parking Demand: Shared+Reciprocal	754	514	**41**	167	346	**67**

Table 19 Theoretical Peak Weekday Parking Demand Assessment for the Canning Bridge Area

		Total			Visitor/Employee Only		
	Theoretical Parking Demand	**Total**	**Reduction**		**Total**	**Reduction**	
Existing Situation	Un-Restrained Exclusive Parking Demand	**2,459**		%	**1,301**		%
	Shared Parking Demand	1,426	1,032	**42**	1,047	254	**20**
	Parking Demand: Shared+Reciprocal	1,263	1,196	**49**	908	393	**30**
Future Situation	Un-Restrained Exclusive Parking Demand	**5,982**		**%**	**4,825**		**%**
	Shared Parking Demand	4,327	1,656	**28**	4,095	729	**15**
	Parking Demand: Shared+Reciprocal	3,788	2,194	**37**	3,533	1,291	**27**

Table 20 Theoretical Peak Weekend Parking Demand Assessment for the Canning Bridge Area

		Total			Visitor/Employee Only		
	Theoretical Parking Demand	**Total**	**Reduction**		**Total**	**Reduction**	
Existing Situation	Un-Restrained Exclusive Parking Demand	**2,459**		**%**	**1,301**		**%**
	Shared Parking Demand	1,303	1,155	**47**	573	728	**56**
	Parking Demand: Shared+Reciprocal	1,198	1,261	**51**	437	864	**66**
Future Situation	Un-Restrained Exclusive Parking	**5,982**		**%**	**4,825**		**%**

		Total			Visitor/Employee Only		
	Demand						
	Shared Parking Demand	2,588	3,394	**57**	2,316	2,509	**52**
	Parking Demand: Shared+Reciprocal	2,113	3,869	**65**	1,858	2,966	**61**

Table 21 Theoretical Peak Parking Demand Assessment for the Riseley Area Statutory Requirements

		Total			Visitor/Employee Only		
	Theoretical Parking Demand	**Total**	**Reduction**		**Total**	**Reduction**	
Existing weekday	Un-Restrained Exclusive Parking Demand	**885**		**%**	**512**		**%**
	Shared Parking Demand	645	240	**27**	421	91	**18**
	Parking Demand: Shared+Reciprocal	513	372	**42**	324	188	**37**
Existing weekend	Un-Restrained Exclusive Parking Demand	**885**		**%**	**512**		**%**
	Shared Parking Demand	592	293	**33**	359	153	**30**
	Parking Demand: Shared+Reciprocal	482	403	**45**	289	223	**43**

Table 22 Theoretical Peak Parking Demand Assessment for the Canning Highway Corridor Statutory Requirements

		Total			Visitor/Employee Only		
	Theoretical Parking Demand	**Total**	**Reduction**		**Total**	**Reduction**	
Existing weekday	Un-Restrained Exclusive Parking Demand	**922**		**%**	**235**		**%**
	Shared Parking Demand	687	235	**25**	235	0	**0**
	Parking Demand: Shared+Reciprocal	687	235	**25**	232	3	**1**
Existing weekend	Un-Restrained Exclusive Parking Demand	**922**		**%**	**235**		**%**
	Shared Parking Demand	687	235	**25**	78	157	**67**
	Parking Demand: Shared+Reciprocal	687	235	**25**	76	159	**68**

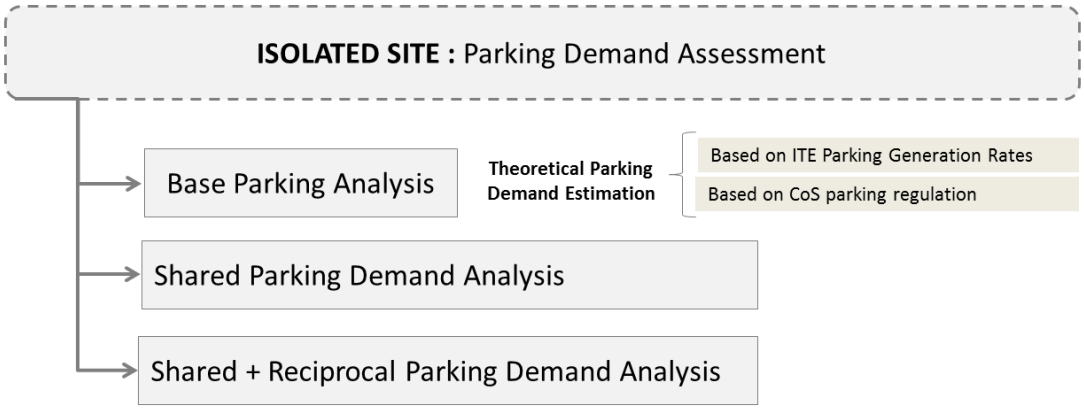
Table 23 Theoretical Peak Parking Demand Assessment for the Canning Bridge Area Statutory Requirements

		Total			Visitor/Employee Only		
	Theoretical Parking Demand	**Total**	**Reduction**		**Total**	**Reduction**	
Existing weekday	Un-Restrained Exclusive Parking Demand	**2,299**		**%**	**1,246**		**%**
	Shared Parking Demand	1,590	709	**31**	864	382	**31**
	Parking Demand: Shared+Reciprocal	1,419	880	**38**	693	553	**44**
Existing weekend	Un-Restrained Exclusive Parking Demand	**2,299**		**%**	**1,246**		**%**
	Shared Parking Demand	1,521	778	**34**	795	451	**36**
	Parking Demand: Shared+Reciprocal	1,389	910	**40**	662	584	**47**

7 Conclusion

Figure 7 summarizes the various stages of the Parking Demand assessment:

Figure 7 Methodology for Parking Demand Assessment



The results of this assessment have been summarized in **Table 15** through **Table 22**. From this assessment it can be inferred that once the effects of shared parking and reciprocity are accounted for within the development, a reduction of approximately 50% in the parking supply can be justified.

Comparison of Calculated and Statutory Supply Rates

It is useful to compare the results of detailed parking supply calculations with the quantum defined in other statutory documents. The results of this comparison for employee/visitor bays are as follows:

Table 24 Comparison of Statutory Requirements and Existing Supply

	Riseley Area	Canning Highway Corridor	Canning Bridge Area
City of Melville Parking and Access (CP-079) excluding residential	512	235	1,246
Observed quantum (free and unrestrained)	1,178	262	1,365
Net shortage/surplus	+666	+27	+119

Comparing the results, it would appear that the total quantum of parking in all three areas either meet or exceed the statutory requirements provided by the City of Melville. The Riseley area contains a large oversupply of parking bays when compared to the City of Melville's parking requirements, though the site visit suggest that the statutory requirements clearly under-estimates the demand for parking in this area.

The calculations completed through this assessment assume that the fundamental demand for parking remains similar to that observed today. It therefore does not account for the increasing cost of private vehicle transport as a result of peak oil or other effects, the impacts of increased congestion and improved public transport on mode choice or the continual increases in house prices which diminish the capacity and demand for small family units to maintain private vehicles. Friday parking occupancy percentage (Canning Bridge)

Parking Management Plan

APPENDIX C

PARKING OCCUPANCY SURVEY DATA

Cardno
Shaping the Future

Parking Occupancy Survey Data

1 Riseley Centre

Map Reference

Figure 1 Riseley Centre Parking Occupancy Survey Reference Map 1

Figure 2 Riseley Centre Parking Occupancy Survey Reference Map 2

Figure 3 Riseley Centre Parking Occupancy Survey Reference Map 3

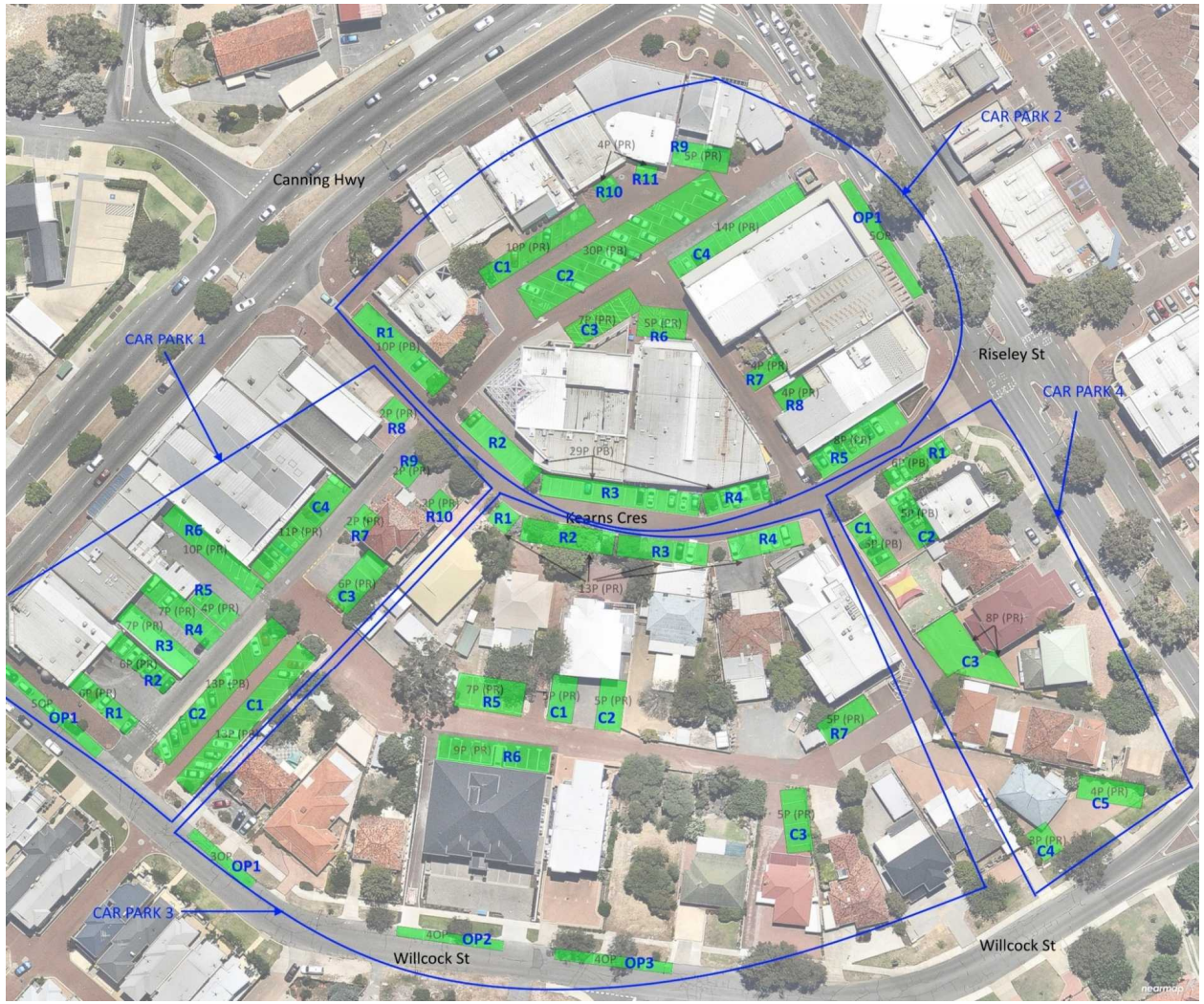


Figure 4 Riseley Centre Parking Occupancy Survey Reference Map 4

Occupancy Survey Data

				Friday										Saturday									
Block 2	**Section**	**Restrictions**	**Onsite Supply**	**08:00 - 9:00**	**09:00 - 10:00**	**10:00 - 11:00**	**11:00 - 12:00**	**12:00 - 13:00**	**13:00 - 14:00**	**14:00 - 15:00**	**15:00 - 16:00**	**16:00-17:00**	**17:00-18:00**	**08:00 - 9:00**	**09:00 - 10:00**	**10:00 - 11:00**	**11:00 - 12:00**	**12:00 - 13:00**	**13:00 - 14:00**	**14:00 - 15:00**	**15:00 - 16:00**	**16:00-17:00**	**17:00-18:00**
Carpark 5	C1, C2, C3	2P 8am-6pm Mon-Sat	54	10	35	46	45	39	50	48	41	41	37	26	34	39	43	43	53	45	23	27	27
Carpark 5	C3	2P 8am-6pm Mon-Sat (Disabled)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Carpark 5	C4	Private Parking	11	0	5	8	8	8	8	8	9	7	3	3	5	4	7	5	6	3	7	6	3
Carpark 5	C5	Private Parking	11	0	3	8	10	10	0	7	8	6	5	1	5	5	9	5	7	6	4	5	4
Carpark 5	C8	Private Parking	9	2	4	4	4	3	3	3	2	2	8	1	1	2	2	1	1	1	1	2	1
Carpark 5	C11	Private Parking	3	1	3	2	2	3	3	2	3	3	3	0	1	1	1	1	1	1	1	1	2
Carpark 5	R8	Private Parking	4	2	2	3	3	2	4	4	2	2	1	0	4	1	4	3	2	0	0	0	0
Carpark 5	R3	Private Parking	5	1	2	3	3	3	3	4	4	3	1	3	1	3	0	0	1	1	0	1	0
Carpark 5	C5	Loading Bay	1	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0
Carpark 5	C10	2P 8am-6pm Mon-Sat	5	2	1	2	3	3	3	3	4	4	2	3	2	2	4	4	4	0	2	3	1
Carpark 5	C6, C7, R9	Private Parking	16	1	7	14	14	15	14	13	12	10	8	3	5	7	9	11	11	11	8	6	4

				Friday										Saturday									
Carpark 5	R9	Private Parking (Disabled)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Carpark 5	C9	Public Parking (Unrestricted)	13	0	6	7	10	11	11	10	6	3	1	1	3	3	12	13	13	13	8	4	1
Carpark 5	R1, R2	2P 8am-6pm Mon-Sat	6	4	5	4	5	6	5	6	5	4	6	3	5	5	5	6	6	6	3	5	6
Carpark 5	R4, R5, R6, R7	2P 8am-6pm Mon-Sat	29	4	21	20	22	19	29	27	17	15	15	4	15	19	15	24	23	27	7	8	6
Carpark 6	C1	2P 8am-6pm Mon-Sat	11	0	2	3	8	8	9	9	8	5	7	0	0	1	8	11	8	9	6	5	4
Carpark 6	C2, C3	Absolute Patient Parking Only (Private)	11	0	5	6	7	6	8	9	9	8	8	2	3	3	2	1	1	1	1	1	0
Carpark 6	C4, C5	Renouf Parking Only (Private)	14	9	13	13	12	10	3	3	2	2	4	2	4	5	3	0	0	0	2	1	2
Carpark 6	C6, C7, R1	Public Parking (Unrestricted)	23	0	14	16	15	14	16	13	8	7	9	8	12	12	9	9	12	12	7	6	5
Carpark 6	R2, R3	Public Parking (Unrestricted)	27	10	27	27	27	28	27	27	25	26	14	3	10	9	10	7	6	5	7	5	5

				Friday										Saturday									
Carpark 6	C8	Private Parking	34	8	18	18	18	24	19	20	21	22	16	0	4	5	8	8	7	8	2	2	1
Carpark 6	R4, R5, R6, R7, R8, R9, R10	2P 8am-6pm Mon-Sat	30	6	22	28	31	27	27	28	28	21	22	10	8	12	22	22	20	25	15	14	16
Carpark 6	R11, R12, R13	Private & Customer Parking Only	21	15	23	22	23	14	20	18	14	13	8	12	10	8	7	13	6	5	6	5	5
Carpark 6	C9	Church Parking Only	14	Na	Na	Na	Na	Na	Na	Na	Na	Na	Na	0	0	0	0	0	0	0	0	0	0
Carpark 6	R14	Tenant Parking Only (Private)	6	3	3	5	6	7	8	5	6	6	7	0	0	0	0	0	0	0	1	1	1
Carpark 6	OP1	Public On-street Parking (Unrestricted)	4	2	3	4	4	3	3	3	3	2	2	0	1	1	3	1	1	1	2	1	1
Block 3																							
Carpark 7	R1	Private Parking	5	5	4	6	5	3	5	5	4	5	4	1	1	1	2	2	2	2	1	1	2
Carpark 7	R2	Public On-street Parking (Unrestricted)	5	0	5	5	6	6	5	5	2	2	2	1	0	0	0	0	0	0	0	0	1
Carpark 7	R3, R4, R5, C2, C1	Church Parking Only	35	7	1	6	9	9	9	11	5	4	5	6	8	10	8	0	0	0	0	0	1

				Friday										Saturday									
Carpark 7	R6	Public On-street Parking for PARK (Unrestricted)	50	10	9	2	3	2	1	2	12	0	0	3	3	0	0	0	0	3	3	2	1
Carpark 7	R7, R8, R9, C3, C4,C5, C6	Public Parking (Unrestricted)	95	7	6	0	1	2	3	3	2	8	7	4	3	0	3	30	30	31	35	33	25
CarPark 1	OP1	1/4P Parking at all times	5	0	0	1	1	3	4	2	3	3	3	0	1	1	1	2	1	2	2	1	1
Carpark 1	R1 & R2	AppleCross Chinese Restaurant Parking Only (Private)	12	1	1	3	6	9	12	10	1	1	4	0	0	0	8	11	12	5	5	3	4
Carpark 1	R3 & R4	PPS Parking Only (Private)	14	2	9	9	10	10	11	8	8	7	6	2	2	7	7	7	6	6	4	2	4
Carpark 1	R5 & R6	Hardware Parking Only (Private)	14	1	3	3	4	5	6	2	2	2	1	1	3	3	2	3	3	3	2	2	3
Carpark 1	R7 & C3	Prana Active Client and Staff Parking Only (Private)	8	1	4	4	4	3	2	4	2	2	1	0	2	3	4	3	4	3	3	3	2

				Friday										Saturday									
Carpark 1	R8	1/4P 8am-6pm Mon-Sat	2	0	2	2	2	0	0	0	2	2	2	1	0	2	2	0	2	1	1	0	0
Carpark 1	R9 & R10	Image Dentist Parking Only (Private)	4	2	4	3	3	2	0	2	3	3	0	0	0	2	0	0	0	0	0	0	0
Carpark 1	C4	Monro & Anytime Fitness Parking Only (Private & Customer)	11	7	10	8	3	4	7	7	6	7	8	6	10	11	9	8	3	7	6	7	8
Carpark 1	C1 & C2	Public Parking (Unrestricted, 45' Parking)	26	26	23	25	26	25	26	26	25	26	26	17	19	26	25	25	26	20	11	12	11
***Extra Car Bay**	C3	Previously Unknown in Private Parking (1x)	*1*	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	0
***Unmarked Bay**	C3	1 Car in Private Parking	*1*	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	0
***Unmarked Bay**	Side of C3	3 Cars on Public Road	*3*	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	0
Carpark 2	R1	2P 8am-6pm Mon-Sat	10	8	9	9	9	9	10	10	9	10	7	10	10	9	10	5	4	6	5	4	3

				Friday										Saturday									
Carpark 2	R2, R3, R4	2P 8am-6pm Mon-Sat	29	11	29	29	29	22	29	27	27	20	25	6	18	27	23	27	26	16	27	19	15
Carpark 2	R5	2P 8am-6pm Mon-Fri; 8am - 12noon Sat with Motorcycle Parking	7	7	7	7	7	7	6	7	6	5	7	6	7	6	5	7	7	6	7	4	7
Carpark 2	R5	2P 8am-6pm Mon-Sat (Disabled)	1	1	1	0	0	1	1	1	0	1	0	1	0	1	1	1	0	1	1	1	0
Carpark 2	R6	Arcade Parking Only (Private)	5	1	3	4	5	4	3	2	1	1	1	1	2	3	4	4	4	2	0	0	1
Carpark 2	R7 & R8	RealMark Parking Only (Private)	8	3	3	3	3	3	4	5	5	4	4	2	2	2	3	2	3	2	2	2	4
Carpark 2	R9	Flowers & Marie Claire Parking Only (Private)	5	3	3	2	2	4	5	4	2	2	2	0	1	2	3	2	2	2	2	3	2
Carpark 2	R10 & R11	Post Office & other Parking Only (Private)	5	2	3	4	4	4	4	3	2	1	3	1	2	3	3	2	4	2	3	4	2
Carpark 2	C2	~~Public Parking (Unrestrict~~	28	25	27	28	28	28	28	28	28	27	28	15	28	27	27	26	25	27	26	22	25

				Friday										Saturday									
		~~ed, 45' Parking)~~ Shoppers Car Park 2hr Limit Only Mon-Fri																					
Carpark 2	C2	Shoppers Car Park 2hr Limit Only Mon-Fri (Disabled)	2	1	1	2	0	2	1	0	0	0	0	0	0	0	1	0	1	1	0	0	0
Carpark 2	C3	Staff Parking Only At All Times	7	4	4	7	5	6	6	5	5	4	1	0	2	2	2	2	2	2	2	1	0
Carpark 2	C1	Wardrobe Parking Only (Private, 45' Parking)	10	3	6	7	7	7	5	8	7	7	5	0	0	4	5	3	5	7	5	5	5
Carpark 2	C4	Private	14	3	6	7	12	7	8	10	5	8	3	2	7	7	7	3	4	5	9	3	3
Carpark 2	OP1	2P 8am-6pm Mon-Fri, 8am-12noon Sat	5	1	3	4	3	4	3	3	3	4	1	0	1	5	1	3	3	0	3	2	1
***Extra Car Bay**	Near R1	Previously Unknown in Private Parking (5x)	*5*	3	5	5	5	5	5	5	5	5	3	5	5	5	5	5	5	5	5	5	3

				Friday										Saturday									
***Extra Car Bay**	Near R1	Previously Unknown in Private Parking (8x)	*8*	3	5	8	8	8	8	8	8	8	5	2	5	8	8	8	8	8	8	5	5
***Extra Car Bay**	R7 & R8	Previously Unknown in Private Parking (2x)	*2*	0	2	2	2	0	0	0	2	2	2	1	0	2	2	0	2	1	1	0	0
***Unmarked Bay**	R6	1 car parking in an unmarked area	*1*	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0
***Unmarked Bay**	C3	2 cars parking in an unmarked area	*2*	0	2	2	2	0	0	0	2	2	2	1	0	2	2	0	2	1	1	0	0
***Unmarked Bay**	R10 & R11	1 car parking in an unmarked area	*1*	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0
***Unmarked Bay**	R9	2 cars parking in an unmarked area	*2*	0	2	2	2	0	0	0	2	2	2	1	0	2	2	0	2	1	1	0	0
Carpark 3	OP1	2P 8am-6pm Mon-Fri; 8am-12noon Sat	2	0	1	0	0	1	2	2	1	1	0	2	1	2	2	2	0	1	1	0	0

				Friday										Saturday									
Carpark 3	OP2	2P 8am-6pm Mon-Fri	4	0	2	2	2	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Carpark 3	OP3	2P 8am-6pm Mon-Fri	3	0	3	2	2	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Carpark 3	R1, R2, R3, R4	~~2P 8am-6pm Mon-Sat~~ 2HR Parking 8am-6pm (Mon-Fri) 8am-12noon (Sat)	14	4	5	7	12	14	13	11	8	8	6	4	7	12	10	13	13	9	12	9	5
Carpark 3	R5	Private Parking	6	2	2	1	2	2	2	3	2	2	2	0	1	2	0	0	0	0	0	0	0
Carpark 3	R6	Private Parking	9	1	1	2	1	2	2	3	1	1	2	0	0	0	0	0	0	0	0	0	0
Carpark 3	R7	Private Parking	5	3	4	3	4	3	3	4	4	1	0	0	0	0	0	0	0	0	0	0	0
Carpark 3	C1 & C2	Private Parking	10	2	3	3	3	3	4	4	4	4	2	0	0	0	0	0	0	0	0	0	0
Carpark 3	C3	Private Parking	5	2	2	3	4	2	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Carpark 3	C3 (NEW)	Private Parking	5	25	26	26	29	27	28	28	25	22	20	22	22	25	25	25	25	2	2	2	2
***Unmarked Bay**	In front of Central Podiatry	2 cars parking in an unmarked area with signs	*2*	2	1	2	1	2	2	2	1	0	0	0	1	0	0	0	0	0	1	0	0

				Friday										Saturday									
***Unmarked Bay**	Inner lane	25 cars parking in an unmarked area	*25*	23	24	23	25	25	25	25	25	22	20	22	22	25	25	25	25	2	2	2	2
Carpark 4	R1	2P 8am-6pm Mon-Fri, 8am-12noon Sat	5	5	5	4	4	5	5	5	5	5	3	5	3	5	5	5	5	5	5	5	5
Carpark 4	C1 & C2	Public Parking (Unrestricted)	10	7	9	8	8	8	10	11	9	8	8	6	7	8	8	10	8	9	7	6	8
Carpark 4	C3	Private Parking	9	6	7	7	7	8	7	7	8	8	6	0	0	0	0	0	0	0	0	0	1
Carpark 4	C4 & C5	Private Parking	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
***Unmarked Bay**	In front of C1	1 car parking under a tree	*1*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
Original Carpark 8	R1, R2, R3, C1, C2	Customer & Staff Parking Only	70	6	69	54	56	36	39	51	50	34	12	18	30	30	27	15	11	5	0	0	0
Original Carpark 8	C3, C4, C5	Tenant Parking Only (Private) ??	10	2	3	6	5	5	5	6	4	8	6	7	8	8	8	6	5	6	5	4	4
Carpark 8	R4, R5, R6	Private Parking Only	24	9	16	17	16	14	11	10	11	11	2	8	6	8	6	9	2	3	2	0	0

				Friday										Saturday									
Carpark 8	C6	CA Parking Only (Private)	20	4	8	8	10	14	11	10	11	9	7	0	0	0	1	0	0	0	0	0	0
Carpark 8	R7	ANL Parking Only (Private)	12	2	7	9	6	7	9	8	8	6	4	2	2	2	2	1	1	1	0	0	0
Carpark 8	R8, C7	Physio Parking Only (Private)	13	4	8	8	7	9	7	8	8	8	5	0	0	0	1	1	1	1	1	1	1
Carpark 8	C8, C9	2P 8am-6pm Mon-Sat	27	17	21	23	27	23	22	23	23	23	10	0	0	0	1	1	2	3	3	3	1
Carpark 8	C10	Private Parking Only	5	0	2	2	3	3	2	3	5	4	4	0	0	0	0	1	1	1	1	0	0
Carpark 8	R9, R10, R11, C11	Melville Bridge Club Parking Only (Private)	41	1	1	0	0	28	30	30	30	11	1	3	40	40	42	37	30	28	28	28	12
Carpark 8		Applecross Centro	20	4	9	10	8	6	6	5	5	5	1	0	1	0	0	0	0	0	0	0	0
		TOTAL SUPPLY	1076	332	641	684	716	694	719	724	663	576	456	262	410	480	512	484	468	408	334	283	248

2 Canning Bridge Centre

Map Reference

Figure 5 Canning Bridge Centre Parking Occupancy Survey Reference Map 1

Figure 6 Canning Bridge Centre Parking Occupancy Survey Reference Map 2

Occupancy Survey Data

				Friday										Saturday									
Block 1	**Section**	**Restrictions**	**Onsite Supply**	**08:00 - 9:00**	**09:00 - 10:00**	**10:00 - 11:00**	**11:00 - 12:00**	**12:00 - 13:00**	**13:00 - 14:00**	**14:00 - 15:00**	**15:00 - 16:00**	**16:00-17:00**	**17:00-18:00**	**08:00 - 9:00**	**09:00 - 10:00**	**10:00 - 11:00**	**11:00 - 12:00**	**12:00 - 13:00**	**13:00 - 14:00**	**14:00 - 15:00**	**15:00 - 16:00**	**16:00-17:00**	**17:00-18:00**
Carpark 1	24,28	2P 8am-6pm Mon-Sat (On Street Parking)	58	5	10	14	9	12	11	9	7	7	7	1	10	6	4	3	1	2	0	1	2
Carpark 1	30	Private Parking	14	10	12	11	12	9	10	11	10	8	2	0	1	1	1	1	0	0	0	0	0
Carpark 1	31	8am- 6pm Mon- Fri Public Fee Paid Parking (Ticket)	36	9	9	10	9	9	11	11	8	6	3	7	11	9	6	4	4	4	3	2	0
Carpark 1	32	2P 8am-6pm Mon-Sat (Ticket On Street Parking)	25	11	10	10	8	12	15	11	8	7	6	12	23	18	17	11	14	10	8	6	2
Carpark 1	33,34	Private Parking (Staff & Client)	42	19	21	22	23	20	26	25	18	14	9	1	3	5	9	8	5	4	3	3	2
Carpark 1	35	Private Parking (Staff & Client) 24Hrs & 2floors	74	35	42	49	50	52	48	45	38	25	18	1	2	2	3	1	1	1	1	1	1
Carpark 1	37	Public Parking (Only 1Hr)	78	32	34	41	43	38	30	39	36	40	41	23	32	34	31	41	32	28	27	37	48
Carpark 1	38,39	Public Parking (Only 1Hr)	23	6	7	6	5	11	10	13	7	8	8	5	5	11	14	11	13	8	13	9	10
Carpark 1	40	8am - 6pm Mon - Sat City of Perth Parking (Public Ticket)	62	5	7	8	10	26	52	46	27	30	49	12	13	16	19	26	36	47	35	34	38
Carpark 1	41,42	3P Mon-Fri (On-street Parking)	29	3	5	7	8	14	19	14	14	13	20	26	26	21	21	19	17	19	19	20	23
Carpark 1	47	Private Parking (Bar & Café)	8	2	3	3	2	2	4	3	1	3	2	0	1	1	2	0	0	1	0	2	4

				Friday										Saturday									
Carpark 1	48	2P 8am-6pm Mon-Sat (On Street Parking)	7	4	3	6	6	5	7	5	3	6	2	2	0	2	3	3	3	6	4	3	5
Carpark 1	49	Public Underground Parking - Public $2/Hr	102	3	4	4	3	14	29	26	15	12	28	8	7	6	10	12	17	19	14	15	18
		Public Underground Parking - VIP (Reserved Bay)	23	4	3	2	2	2	2	3	2	2	2	4	4	4	5	4	6	4	5	7	3
Carpark 1	43	Ticketed Public Parking (Unrestricted)	40	12	20	21	21	24	22	19	20	22	33	38	8	2	9	9	8	8	6	6	12
Carpark 1	44	Ticketed Public Parking (Unrestricted)	19	2	2	2	3	2	9	10	10	7	10	1	2	3	4	3	2	4	8	5	2
Carpark 1	45	Private Parking	6	0	2	3	3	6	1	2	3	1	2	2	1	2	4	3	1	1	1	0	0
Carpark 1	46	Private Parking	7	7	10	10	10	9	10	9	10	10	5	0	0	0	0	0	0	0	0	0	0
Carpark 2	1,2	Private Parking	25	7	7	8	10	8	7	6	6	4	7	9	8	6	8	8	6	3	6	8	8
Carpark 2	3,4	Private Parking	45	13	13	20	19	22	27	30	21	16	11	7	10	13	14	12	12	15	23	22	17
Carpark 2	5,6	Public Parking	6	4	4	4	3	3	4	4	3	2	0	1	5	5	5	4	3	0	2	3	0
			32	13	13	19	18	21	20	19	16	15	10	5	5	5	8	10	7	6	7	6	2
Carpark 2	7	2P 8am-6pm Mon-Sat (On Street Parking)	34	21	25	13	18	31	31	38	26	28	36	8	9	9	11	14	25	32	22	24	22
Carpark 2	8	Tenant Parking Only (Private)	10	6	5	6	6	4	5	4	3	2	5	8	7	6	7	5	5	4	4	4	6
Carpark 2	9	2P 8am-6pm Mon-Sat (On Street Parking)	13	0	0	0	0	0	5	3	0	0	0	0	0	0	0	2	3	3	2	0	0

				Friday										Saturday									
Carpark 2	10	Canning Bridge Senior Citizens Parking	20	4	8	9	10	9	11	10	9	8	5	17	4	1	0	0	0	0	0	0	0
Carpark 2	11	Private Parking (Tenant Parking)	28	11	10	12	15	13	12	10	9	11	5	4	3	4	4	5	4	4	4	3	3
Carpark 2	12	3P 8am-6pm Mon-Sat (On-street Parking)	52	32	34	34	32	33	26	29	21	23	19	18	15	12	17	12	9	6	7	5	4
CarPark 1	1	2P 8am-6pm Mon-Fri	6	4	4	5	5	3	6	4	3	4	0	1	1	2	0	2	2	1	1	1	1
Carpark 1	2,3	Private Parking	11	6	4	4	4	5	4	7	8	5	0	0	6	5	4	5	3	0	0	0	0
Carpark 1	4,5	Public Parking (Unrestricted)	21	7	11	12	15	18	16	17	13	17	14	10	13	14	14	15	12	18	18	14	18
Carpark 1	6	Tenant Parking Only (Private)	43	37	33	35	35	34	34	35	32	23	10	2	2	2	2	2	1	1	1	1	1
Carpark 1	7,8,9	Public Parking (Unrestricted)	31	19	17	21	24	24	20	21	17	20	16	8	10	14	9	9	8	11	6	7	6
Carpark 1	11	Public Parking	9	5	9	8	8	9	6	4	4	5	4	1	3	5	2	5	5	2	0	0	0
Carpark 1	10,12	2P 8am-6pm Mon-Sat (On Street Parking)	20	5	4	12	9	6	7	7	9	4	1	1	4	2	1	5	1	5	6	4	2
Carpark 1	13,14,15,16,22,23,25	Public Parking	85	56	71	81	80	75	84	82	78	68	41	19	36	40	38	36	37	30	29	27	21
Carpark 1	26,27	Public Parking	24	13	14	21	23	24	21	23	22	20	13	2	4	7	7	8	6	4	3	3	0
Carpark 1	17,18,19,20,21	Public Parking	65	31	43	45	46	58	55	63	61	58	33	3	13	13	11	6	4	4	6	6	4
			1233	463	533	598	607	667	717	717	598	554	477	267	307	308	324	324	313	315	294	289	285

3 Canning Highway Corridor

Map Reference

Figure 7 Canning Highway Corridor Parking Occupancy Survey Reference Map

Occupancy Survey Data

				Friday										Saturday									
Block 4	**Section**	**Restrictions**	**Onsite Supply**	**08:00 - 9:00**	**09:00 - 10:00**	**10:00 - 11:00**	**11:00 - 12:00**	**12:00 - 13:00**	**13:00 - 14:00**	**14:00 - 15:00**	**15:00 - 16:00**	**16:00-17:00**	**17:00-18:00**	**08:00 - 9:00**	**09:00 - 10:00**	**10:00 - 11:00**	**11:00 - 12:00**	**12:00 - 13:00**	**13:00 - 14:00**	**14:00 - 15:00**	**15:00 - 16:00**	**16:00-17:00**	**17:00-18:00**
CarPark 1	OP1	Public On-street Parking (Unrestricted)	3	3	2	2	2	1	1	2	3	2	1	0	0	0	0	0	0	0	1	1	0
Carpark 1	R1, R2, R3, R4, R5, C1	Church and School Parking Only	53	44	41	30	30	28	25	23	33	7	4	4	2	0	0	0	10	1	0	0	0
Carpark 1		1/2P parking near R1, R2, R3, R4, R5, C1	5	3	1	1	2	1	1	1	4	0	1	2	0	0	1	0	1	0	1	0	0
Carpark 1	R6, R7	Private Parking Only	11	5	5	6	8	8	7	7	6	7	2	0	0	0	1	0	0	0	0	0	0
Carpark 1	R8, R9	Tenant Parking Only (Private)	22	11	10	10	9	11	11	8	9	11	13	18	18	16	16	12	16	16	12	10	13
Carpark 1	R10	Western Cardiology Parking Only (Private)	6	4	4	1	1	1	1	1	1	1	1	0	0	0	0	1	0	0	0	0	0
Carpark 1	C2, C3, C4, C5, C6, R11, R12	Public Parking (Unrestricted)	65	40	43	49	55	45	44	41	48	29	25	16	18	20	18	11	13	9	11	8	3

				Friday										Saturday									
Carpark 1	R13	Midway Parking Only (Private)	*5*	0	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1
Carpark 1	R14	Private Parking Only	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alness St	OP1 WEST	Public On-street Parking (Unrestricted)	7	7	5	5	5	4	3	3	6	4	3	2	2	2	3	2	2	2	2	1	2
Alness St	OP2 WEST	Public On-street Parking (Unrestricted)	4	3	3	1	1	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0
Carpark 2	R1, R2, C1	BP Parking Only	11	2	4	3	0	0	0	1	1	0	0	1	0	2	0	1	1	0	1	1	1
Carpark 2	R3, R4	Church Parking Only	28	12	15	15	13	15	11	11	12	13	4	1	2	5	5	1	1	0	1	1	2
Carpark 2	R5, R6	Church Parking Only	21																				
Carpark 2	OP1	Public Parking (Unrestricted)	20	7	7	9	9	9	6	6	5	6	5	3	3	6	5	5	5	7	5	5	5
Carpark 2	C3, C4	Private Parking	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Carpark 2	New	Private Parking	4	0	1	2	1	3	2	0	0	0	0	0	1	2	1	3	2	0	0	0	0
			273	141	142	135	136	127	113	105	131	82	59	49	47	54	51	37	52	36	35	28	27

Parking Management Plan

APPENDIX D

PARKING OD SURVEY DATA

Cardno
Shaping the Future

Parking Origin-Destination Survey Data

Survey No.	Car Park Location	Street Name/ Address/ Landmark	Type of Parking	Land Use	Trip Origin	Trip Destination	Trip Purpose	Length of Stay
1	Riseley	No. 16 to 787 , Kearns Crescent (East of Riseley Street)	On Street	Office	Unspecified	Unspecified	Work/ Business	4 hours
2	Riseley	Riseley Shopping Centre Shared Parking (East of Riseley Street)	Off Street	Retail	Ardross	Ardross	Shopping	10 - 30 min
3	Riseley	Ohnamiya Restaurant on Kearns Crescent	On Street	Restaurant	Applecross	Applecross	Food	< 10 min
4	Riseley	No. 16 to 787 , Kearns Crescent (East of Riseley Street)	On Street	Retail	Fremantle	Fremantle	Shopping	10 - 30 min
5	Riseley	Opposite 18-22 Kearns Crescent	On Street	Restaurant	Applecross	Applecross	Food	< 2 hours
6	Riseley	No. 16 to 787 , Kearns Crescent (East of Riseley Street)	On Street	Retail	Bicton	Bicton	Shopping	10 - 30 min
7	Riseley	No. 16 to 787 , Kearns Crescent (East of Riseley Street)	On Street	Retail	Alfred Cove	Alfred Cove	Pharmacy/ Medical	10 - 30 min
8	Riseley	Riseley Shopping Centre Shared Parking (East of Riseley Street)	On Street	Restaurant	Scarborough	Scarborough	Food	3 hours
9	Riseley	Riseley Shopping Centre Shared Parking (East of Riseley Street)	Off Street	Retail	Attadale	Attadale	Pharmacy/ Medical	< 2 hours

Survey No.	Car Park Location	Street Name/ Address/ Landmark	Type of Parking	Land Use	Trip Origin	Trip Destination	Trip Purpose	Length of Stay
10	Riseley	Riseley Shopping Centre Shared Parking (East of Riseley Street)	Off Street	Restaurant	South Perth	South Perth	Food	3 hours
11	Riseley	Riseley Shopping Centre Shared Parking (East of Riseley Street)	Off Street	Retail	Ardross	Ardross	Food	10 - 30 min
12	Riseley	Riseley Shopping Centre Shared Parking (East of Riseley Street)	Off Street	Recreation/Entertainment	Attadale	Attadale	Recreation/ Entertainment	< 2 hours
13	Riseley	Riseley Shopping Centre Shared Parking (East of Riseley Street)	Off Street	Retail	Booragon	Booragon	Shopping	10 - 30 min
14	Riseley	Riseley Shopping Centre Shared Parking (East of Riseley Street)	Off Street	Retail	Riseley Street	Riseley Street	Shopping	< 10 min
15	Riseley	Riseley Shopping Centre Shared Parking (East of Riseley Street)	Off Street	Retail	Mt Pleasant	Mt Pleasant	Shopping	10 - 30 min
16	Riseley	Riseley Shopping Centre Shared Parking (East of Riseley Street)	Off Street	Retail	Applecross	Applecross	Shopping	< 10 min
17	Riseley	Riseley Shopping Centre Shared Parking (East of Riseley Street)	Off Street	Retail	Grimsay Rd	Ardross	Shopping	10 - 30 min
18	Riseley	Riseley Shopping Centre Shared Parking (East of Riseley Street)	Off Street	Retail	Applecross	Applecross	Shopping	< 10 min
19	Riseley	Riseley Shopping Centre Shared Parking (East of Riseley Street)	Off Street	Retail	Mt Pleasant	Applecross	Shopping	< 10 min

Survey No.	Car Park Location	Street Name/ Address/ Landmark	Type of Parking	Land Use	Trip Origin	Trip Destination	Trip Purpose	Length of Stay
20	Riseley	Riseley Shopping Centre Shared Parking (East of Riseley Street)	Off Street	Office	Bombard Street	Bombard Street	Work/ Business	< 10 min
21	Riseley	Riseley Shopping Centre Shared Parking (East of Riseley Street)	Off Street	Retail	Perth City	Perth City	Shopping	10 - 30 min
22	Riseley	Simpson Street	On Street	Office	Thornlie	Thornlie	Work/ Business	8 hours
23	Riseley	Simpson Street	On Street	Office	East Cannington	East Cannington	Work/ Business	8 hours
24	Riseley	Riseley Shopping Centre Shared Parking (East of Riseley Street)	Off Street	Office	Yangebup	Yangebup	Work/ Business	8 hours
25	Riseley	Church	Off Street	Office	Como	Como	Work/ Business	8 hours
26	Riseley	Riseley Shopping Centre Shared Parking (East of Riseley Street)	Off Street	Retail	Applecross	Applecross	Shopping	10 - 30 min
27	Riseley	Riseley Shopping Centre Shared Parking (East of Riseley Street)	Off Street	Retail	Applecross	Applecross	Shopping	< 10 min
28	Riseley	Riseley Shopping Centre Shared Parking (East of Riseley Street)	Off Street	Office	Wembly	Wembly	Work/ Business	8 hours
29	Riseley	No. 16 to 787 , Kearns Crescent (East of Riseley Street)	On Street	Retail	Applecross	Applecross	Services	< 10 min
30	Riseley	No. 16 to 787 , Kearns Crescent (East of Riseley Street)	On Street	Restaurant	Myaree	Myaree	Food	< 2 hours

Survey No.	Car Park Location	Street Name/ Address/ Landmark	Type of Parking	Land Use	Trip Origin	Trip Destination	Trip Purpose	Length of Stay
31	Riseley	No. 16 to 787 , Kearns Crescent (East of Riseley Street)	On Street	Restaurant	Manning	Manning	Food	< 2 hours
32	Riseley	No. 16 to 787 , Kearns Crescent (East of Riseley Street)	On Street	Retail	Applecross	Applecross	Shopping	10 - 30 min
33	Riseley	No. 16 to 787 , Kearns Crescent (East of Riseley Street)	On Street	Restaurant	Willagee	Willagee	Food	30 - 60 min
34	Riseley	No. 16 to 787 , Kearns Crescent (East of Riseley Street)	On Street	Restaurant	Mt Pleasant	Mt Pleasant	Food	30 - 60 min
35	Riseley	No. 16 to 787 , Kearns Crescent (East of Riseley Street)	On Street	Restaurant	Wilson	Wilson	Food	30 - 60 min
36	Riseley	Inside of AppleCross	Off Street	Retail	Stinton	CanningBridge	Shopping	10 - 30 min
37	Riseley	Inside of AppleCross	Off Street	Retail	Fremental	Fremental	Work/ Business	< 10 min
38	Riseley	Inside of AppleCross	Off Street	Retail	Attadale	Attadale	Shopping	30 - 60 min
39	Riseley	Inside of AppleCross	Off Street	Retail	Osborne Park	Osborne Park	Work/ Business	10 - 30 min
40	Riseley	Inside of AppleCross	Off Street	Retail	Sadlier Park	AppleCross	Shopping	< 10 min
41	Riseley	Inside of AppleCross	Off Street	Retail	AppleCross	Mount Pleasant	Work/ Business	30 - 60

Survey No.	Car Park Location	Street Name/ Address/ Landmark	Type of Parking	Land Use	Trip Origin	Trip Destination	Trip Purpose	Length of Stay
								min
42	Riseley	Inside of AppleCross	Off Street	Retail	Mount Pleasant	Mount Pleasant	Shopping	10 - 30 min
43	Riseley	Inside of AppleCross	Off Street	Retail	Osborne Park	Osborne Park	Work/ Business	10 - 30 min
44	Riseley	Inside of AppleCross	Off Street	Retail	Shelley	Shelley	Work/ Business	< 2 hours
45	Riseley	Inside of AppleCross	Off Street	Retail	Ardross St.	Ardross	Shopping	10 - 30 min
46	Riseley	Inside of AppleCross	Off Street	Retail	AppleCross	AppleCross	Work/ Business	4 hours
47	Riseley	Inside of AppleCross	Off Street	Retail	Aofred Cove	Aofred Cove	Shopping	10 - 30 min
48	Riseley	Inside of AppleCross	Off Street	Retail	Nollamara	South Lake	Work/ Business	< 10 min
49	Riseley	Inside of AppleCross	Off Street	Retail	Booragoon	Booragoon	Shopping	10 - 30 min
50	Riseley	Inside of AppleCross	Off Street	Retail	Ullapool RD	Ullapool RD	Shopping	10 - 30 min
51	Riseley	Inside of AppleCross	Off Street	Retail	Melville	Ardross St.	Shopping	10 - 30 min
52	Riseley	Inside of AppleCross	Off Street	Retail	Piara Water	Piara Water	Shopping	< 10 min

Survey No.	Car Park Location	Street Name/ Address/ Landmark	Type of Parking	Land Use	Trip Origin	Trip Destination	Trip Purpose	Length of Stay
53	Riseley	Inside of AppleCross	Off Street	Retail	Fremental	Fremental	Pharmacy/ Medical	30 - 60 min
54	Riseley	Inside of AppleCross	Off Street	Retail	Bicton	Bicton	Shopping	10 - 30 min
55	Riseley	Inside of AppleCross	Off Street	Retail	Tain St. Apple cross	Tain St. AppleCross	Shopping	< 10 min
56	Riseley	Inside of AppleCross	Off Street	Retail	Mt Pleasant	Garden City	Shopping	10 - 30 min
57	Riseley	Inside of AppleCross	Off Street	Retail	Melville	Melville	Pharmacy/ Medical	10 - 30 min
58	Riseley	Inside of AppleCross	Off Street	Retail	AppleCross	AppleCross	Work/ Business	8 hours
59	Riseley	Inside of AppleCross	Off Street	Retail	Ardross St.	Ardross St.	Shopping	10 - 30 min
60	Riseley	Inside of AppleCross	Off Street	Retail	Booragoon	Salter Point	School	< 10 min
61	Riseley	Inside of AppleCross	Off Street	Retail	West Perth	West Perth	Shopping	10 - 30 min
62	Riseley	Inside of AppleCross	Off Street	Retail	Wellington	Wellington	Shopping	10 - 30 min
63	Riseley	Inside of AppleCross	Off Street	Retail	Melville	Melville	Shopping	< 10 min

Survey No.	Car Park Location	Street Name/ Address/ Landmark	Type of Parking	Land Use	Trip Origin	Trip Destination	Trip Purpose	Length of Stay
64	Riseley	Inside of AppleCross	Off Street	Retail	Ardross St.	Ardross St.	Shopping	< 10 min
65	Riseley	Inside of AppleCross	Off Street	Retail	Mount Pleasant	Mount Pleasant	Shopping	< 10 min
66	Riseley	C4 - car park 2	Off Street	Retail	belmont	Claremont	Shopping	10 - 30 min
67	Riseley	R2 - car park 2	Off Street	Restaurant	Gosnell	Gosnell	Food	< 2 hours
68	Riseley	C2 - car park 2	Off Street	Restaurant	Claremont	Booragoon	Food	< 2 hours
69	Riseley	C2 - car park 2	Off Street	Restaurant	Mandurah	Mandurah	Food	< 2 hours
70	Riseley	C4 - car park 1	Off Street	Recreation/Entertainment	Applecross	Como	Recreation/ Entertainment	< 2 hours
71	Riseley	R1 - car park 1	Off Street	Retail	Bentley	Bentley	Work/ Business	8 hours
72	Riseley	C2 - car park 1	Off Street	Retail	Cannington	Cannington	Work/ Business	8 hours
73	Riseley	C3 - car park 3	Off Street	Office	Como	Como	Pharmacy/ Medical	10 - 30 min
74	Riseley	underground parking at atrium house - Car park 3	Off Street	Office	Kelmscott	Kelmscott	Work/ Business	8 hours
75	Riseley	C1 - car park 4	Off Street	Restaurant	Cannington	Cannington	Work/ Business	6 hours

Survey No.	Car Park Location	Street Name/ Address/ Landmark	Type of Parking	Land Use	Trip Origin	Trip Destination	Trip Purpose	Length of Stay
76	Riseley	C2 - car park 2	Off Street	Retail	Jandakot	Willetton	Shopping	10 - 30 min
77	Riseley	C1 - car park 2	Off Street	Retail	Booragoon	Melville	Shopping	10 - 30 min
78	Riseley	C2 - car park 2	Off Street	Retail	Bibra Lake	Batemen	Shopping	10 - 30 min
79	Riseley	R2 - car park 2	Off Street	Restaurant	Fremantle	Fremantle	Work/ Business	< 2 hours
80	Riseley	C3 - car park 2	Off Street	Restaurant	Booragoon	Willetton	Food	10 - 30 min
81	Riseley	C2 - car park 2	Off Street	Retail	Coogee	Booragoon	Shopping	10 - 30 min
82	Riseley	C2 - car park 4	Off Street	Restaurant	Rossmoyne	Rossmoyne	Work/ Business	10 - 30 min
83	Riseley	C1 - car park 2	Off Street	Retail	Booragoon	Booragoon	Services	10 - 30 min
84	Riseley	C2 - car park 2	Off Street	Retail	South perth	South Perth	Shopping	10 - 30 min
85	Riseley	R1 - car park 1	On Street	Restaurant	Perth	Perth	Food	10 - 30 min

Survey No.	Car Park Location	Street Name/ Address/ Landmark	Type of Parking	Land Use	Trip Origin	Trip Destination	Trip Purpose	Length of Stay
86	Riseley	R4 - car park 3	On Street	Restaurant	Leeming	Rossmoyne	Food	10 - 30 min
87	Riseley	R5 - car park 2	On Street	Retail	Coogee	Fremantle	Shopping	10 - 30 min
88	Riseley	R4 - car park 2	On Street	Restaurant	Applecross	Applecross	Food	10 - 30 min
89	Riseley	car park 3 near R6	Off Street	Recreation/Entertainment	Applecross	Crawley	Recreation/ Entertainment	< 2 hours
90	Riseley	R3 - car park 3	On Street	Restaurant	Booragoon	Booragoon	Food	10 - 30 min
91	Riseley	R10 - car park 3	Off Street	Office	South perth	South Perth	Services	< 2 hours
92	Riseley	C2 - car park 1	Off Street	Restaurant	Waterford	Waterford	Food	< 2 hours
93	Riseley	C1 - car park 1	Off Street	Office	Bentley	Bentley	Work/ Business	8 hours
94	Riseley	R3 - car park 2	Off Street	Retail	Como	Como	Shopping	10 - 30 min
95	Riseley	C2 - car park 1	Off Street	Office	Shelley	Shellye	Work/ Business	8 hours
96	Riseley	Kearns Cres	Off Street	Retail	Wembley	Wembley	Work/ Business	8 hours
97	Canning	kishorn Rd	On Street	Restaurant	Fremantle	Como	Work/ Business	< 10 min

Survey No.	Car Park Location	Street Name/ Address/ Landmark	Type of Parking	Land Use	Trip Origin	Trip Destination	Trip Purpose	Length of Stay
	Bridge							
98	Canning Bridge	kishorn Rd	On Street	Office	Applecross	Applecross	Work/ Business	< 10 min
99	Canning Bridge	kishorn Rd	Off Street	Retail	Armadale	Armadale	Work/ Business	8 hours
100	Canning Bridge	kishorn Rd	Off Street	Office	winthrop	Winthrop	Work/ Business	6 hours
101	Canning Bridge	kishorn Rd	On Street	Office	Applecross	Applecross	Work/ Business	< 10 min
102	Canning Bridge	Moreau Mews	On Street	Office	Applecross	Applecross	Work/ Business	30 - 60 min
103	Canning Bridge	Moreau Mews	On Street	Office	Mt pleasant	Booragoon	Work/ Business	< 10 min
104	Canning Bridge	Moreau Mews	On Street	Restaurant	Applecross	Ardross	Food	30 - 60 min
105	Canning Bridge	Moreau Mews	On Street	Restaurant	Applecross	Mt Pleasant	Food	30 - 60 min
106	Canning Bridge	Sleat Rd	On Street	Office	Perth	Perth	Work/ Business	< 10 min
107	Canning	Sleat Rd	On Street	Office	Applecross	Applecross	Work/ Business	30 - 60

Survey No.	Car Park Location	Street Name/ Address/ Landmark	Type of Parking	Land Use	Trip Origin	Trip Destination	Trip Purpose	Length of Stay
	Bridge							min
108	Canning Bridge	kishorn Rd	Off Street	Office	Hillarys	Hillarys	Work/ Business	9 hours
109	Canning Bridge	kishorn Rd	Off Street	Office	Osborne Park	Osborne Park	Work/ Business	9 hours
110	Canning Bridge	kishorn Rd	On Street	Retail	Como	Como	Work/ Business	< 10 min
111	Canning Bridge	kishorn Rd	On Street	Recreation/Entertainment	Subiaco	Waterford	Recreation/ Entertainment	< 2 hours
112	Canning Bridge	kishorn Rd	On Street	Recreation/Entertainment	Watermans bay	St James	Work/ Business	30 - 60 min
113	Canning Bridge	Sleat Rd	On Street	Office	Bibra Lake	Sejille Grove	Work/ Business	30 - 60 min
114	Canning Bridge	Sleat Rd	Off Street	Retail	Willetton	Perth	Shopping	10 - 30 min
115	Canning Bridge	Sleat Rd	Off Street	Restaurant	Ardross	Ardross	Food	10 - 30 min
116	Canning Bridge	Sleat Rd	On Street	Office	Perth	Belmont	Work/ Business	< 10 min
117	Canning	Sleat Rd	Off Street	Retail	Como	Como	Shopping	30 - 60

Survey No.	Car Park Location	Street Name/ Address/ Landmark	Type of Parking	Land Use	Trip Origin	Trip Destination	Trip Purpose	Length of Stay
	Bridge							min
118	Canning Bridge	Macrae Rd	On Street	Office	winthrop	Winthrop	Work/ Business	< 2 hours
119	Canning Bridge	Macrae Rd	On Street	Residential	Applecross	Applecross	Recreation/ Entertainment	30 - 60 min
120	Canning Bridge	kishorn Rd	Off Street	Office	Mt pleasant	Mt Pleasant	Work/ Business	4 hours
121	Canning Bridge	kishorn Rd	On Street	Retail	Applecross	Applecross	Shopping	10 - 30 min
122	Canning Bridge	Canning Beach Rd	On Street	Restaurant	West Leederville	Perth CBD	Food	< 2 hours
123	Canning Bridge	Canning Beach Rd	Off Street	Restaurant	Ardross	Ardross	Food	30 - 60 min
124	Canning Bridge	Canning Beach Rd	Off Street	Restaurant	Murdoch (St John of God Hopital)	Mandurah	Food	30 - 60 min
125	Canning Bridge	Canning Beach Rd	On Street	Restaurant	Perth CBD	Welshpool	Food	30 - 60 min
126	Canning Bridge	Canning Beach Rd	Off Street	Restaurant	Applecross	Applecross	Recreation/ Entertainment	30 - 60 min
127	Canning	Canning Beach Rd	Off Street	Restaurant	Perth CBD	Bicton	Recreation/	30 - 60

Survey No.	Car Park Location	Street Name/ Address/ Landmark	Type of Parking	Land Use	Trip Origin	Trip Destination	Trip Purpose	Length of Stay
	Bridge						Entertainment	min
128	Canning Bridge	Canning Beach Rd	Off Street	Restaurant	Melville	Melville	Recreation/ Entertainment	< 2 hours
129	Canning Bridge	Canning Beach Rd	Off Street	Restaurant	South Perth	South Perth	Recreation/ Entertainment	10 - 30 min
130	Canning Bridge	Canning Beach Rd	Off Street	Restaurant	Booragoon	Booragoon	Recreation/ Entertainment	10 - 30 min
131	Canning Bridge	Canning Beach Rd	On Street	Restaurant	Murdoch (Fiona Stanley Hospital	Murdoch	Work/ Business	8 hours
132	Canning Bridge	Canning Beach Rd	Off Street	Restaurant	Rossmoyne	Rossmoyne	Recreation/ Entertainment	30 - 60 min
133	Canning Bridge	Canning Beach Rd	Off Street	Restaurant	Applecross Primary School	Applecross	Recreation/ Entertainment	30 - 60 min
134	Canning Bridge	Canning Beach Rd	Off Street	Restaurant	Applecross	Applecross	Recreation/ Entertainment	30 - 60 min
135	Canning Bridge	Canning Beach Rd	Off Street	Restaurant	West Perth	West Perth	Recreation/ Entertainment	30 - 60 min
136	Canning Bridge	Canning Beach Rd	Off Street	Restaurant	Applecross	Applecross	Recreation/ Entertainment	30 - 60 min
137	Canning	Canning Beach Rd	Off Street	Restaurant	Applecross	Applecross	Recreation/	< 2 hours

Survey No.	Car Park Location	Street Name/ Address/ Landmark	Type of Parking	Land Use	Trip Origin	Trip Destination	Trip Purpose	Length of Stay
	Bridge						Entertainment	
138	Canning Bridge	Canning Beach Rd	Off Street	Restaurant	Applecross	Applecross	Recreation/ Entertainment	< 2 hours
139	Canning Bridge	Canning Beach Rd	On Street	Restaurant	Myaree	Myaree	Work/ Business	9 hours
140	Canning Bridge	Canning Beach Rd	Off Street	Restaurant	South Perth	Melville	Recreation/ Entertainment	30 - 60 min
141	Canning Bridge	Canning Beach Rd	Off Street	Restaurant	South Perth	South Perth	Recreation/ Entertainment	< 2 hours
142	Canning Bridge	Canning Beach Rd	Off Street	Restaurant	Bibra Lake	Bibra Lake	Recreation/ Entertainment	30 - 60 min
143	Canning Bridge	Canning Beach Rd	Off Street	Restaurant	South Perth	South Perth	Recreation/ Entertainment	< 2 hours
144	Canning Bridge	Canning Beach Rd	On Street	Restaurant	Leeming	Leeming	Work/ Business	3 hours
145	Canning Bridge	Canning Beach Rd	Off Street	Restaurant	Perth CBD	Como	Recreation/ Entertainment	30 - 60 min
146	Canning Bridge	Canning Beach Rd	Off Street	Restaurant	Morley	Subiaco	Work/ Business	10 - 30 min
147	Canning	Canning Beach Rd	Off Street	Restaurant	Applecross	Applecross	Work/ Business	10 - 30

Survey No.	Car Park Location	Street Name/ Address/ Landmark	Type of Parking	Land Use	Trip Origin	Trip Destination	Trip Purpose	Length of Stay
	Bridge				(Applecross Village)	(Applecross Village)		min
148	Canning Bridge	Canning Beach Rd	On Street	Restaurant	South Perth (Perth Zoo)	Winthrop	Recreation/ Entertainment	< 2 hours
149	Canning Bridge	Canning Beach Rd	Off Street	Restaurant	Perth Airport (international)	South Perth	Recreation/ Entertainment	30 - 60 min
150	Canning Bridge	Canning Beach Rd (underground)	Off Street	Restaurant	Myaree	Myaree	Recreation/ Entertainment	< 2 hours
151	Canning Bridge	Canning Beach Rd (underground)	Off Street	Restaurant	Myaree	Myaree	Recreation/ Entertainment	< 2 hours
152	Canning Bridge	Canning Beach Rd (underground)	Off Street	Restaurant	South Perth	South Perth	Recreation/ Entertainment	30 - 60 min
153	Canning Bridge	Ogilvie Road	On Street	Office	Perth CBD	Asta	Work/ Business	< 2 hours
154	Canning Bridge	Ogilvie Road	On Street	Restaurant	Belmont	Perth	Work/ Business	< 2 hours
155	Canning Bridge	Ogilvie Road	On Street	Restaurant	Winthrop	Restaurant	Work/ Business	3 hours
156	Canning Bridge	Ogilvie Road	On Street	Office	Booragon	Office	Work/ Business	< 2 hours
157	Canning	Apex Park	Off Street	Recreation/Ente	Shelly	Shelly	Recreation/	< 2 hours

Survey No.	Car Park Location	Street Name/ Address/ Landmark	Type of Parking	Land Use	Trip Origin	Trip Destination	Trip Purpose	Length of Stay
	Bridge			rtainment			Entertainment	
158	Canning Bridge	Senior Citizens centre	Off Street	Recreation/Entertainment	Canning	Canning	Recreation/ Entertainment	< 2 hours
159	Canning Bridge	Along Esplanade	On Street	Recreation/Entertainment	Ascot	Canning	Recreation/ Entertainment	< 2 hours
160	Canning Bridge	Shopping centre	Off Street	Retail	Maylands	Maylands	Food	3 hours
161	Canning Bridge	Shopping centre	Off Street	Retail	Applecross	Greenwood	Shopping	10 - 30 min
162	Canning Bridge	Ogilvie Road	On Street	Office	Applecross	Melville	Work/ Business	< 2 hours
163	Canning Bridge	Ogilvie Road	On Street	Office	Applecross	Applecross	Work/ Business	< 2 hours
164	Canning Bridge	Kishorn Road	On Street	Office	Perth CBD	Perth	Work/ Business	< 2 hours
165	Canning Bridge	Private buisness on esplanade	Off Street	Office	Vic Park	Vic Park	Work/ Business	< 10 min
166	Canning Bridge	Apex Park	Off Street	Recreation/Entertainment	Roleystone	Bentley	Recreation/ Entertainment	10 - 30 min
167	Canning	Shopping centre	Off Street	Retail	Palmyra	Palmyra	Food	< 10 min

Survey No.	Car Park Location	Street Name/ Address/ Landmark	Type of Parking	Land Use	Trip Origin	Trip Destination	Trip Purpose	Length of Stay
	Bridge							
168	Canning Bridge	Apex Park	Off Street	Recreation/Entertainment	Burswood	Burswood	Recreation/ Entertainment	3 hours
169	Canning Bridge	Private buisness on esplanade	Off Street	Office	Welshpool	Welshpool	Work/ Business	10 - 30 min
170	Canning Bridge	Ogilvie Road	On Street	Restaurant	Melville	Melville	Recreation/ Entertainment	< 2 hours
171	Canning Bridge	Lodge	Off Street	Residential	Lodge	Lodge	Lodging	3 hours
172	Canning Bridge	Along Esplanade	On Street	Recreation/Entertainment	Cannington	Melville	Recreation/ Entertainment	10 - 30 min
173	Canning Bridge	Apex Park	Off Street	Recreation/Entertainment	Melville	Melville	Recreation/ Entertainment	< 2 hours
174	Canning Bridge	Apex Park	Off Street	Recreation/Entertainment	Lesmurdie	Lesmurdie	Recreation/ Entertainment	< 2 hours
175	Canning Bridge	Ogilvie Road	On Street	Office	Murdoch	South Fremantle	Work/ Business	< 2 hours
176	Canning Bridge	Ogilvie Road	On Street	Restaurant	Mt. Pleasant	Mt. Pleasant	Recreation/ Entertainment	10 - 30 min
177	Canning	Ogilvie Road	On Street	Restaurant	Canning	Perth	Food	< 2 hours

Survey No.	Car Park Location	Street Name/ Address/ Landmark	Type of Parking	Land Use	Trip Origin	Trip Destination	Trip Purpose	Length of Stay
	Bridge							
178	Canning Bridge	Ogilvie Road	On Street	Office	Belmont	Belmont	Work/ Business	4 hours
179	Canning Bridge	Apex Park	Off Street	Recreation/Entertainment	Booragon	Booragon	Recreation/ Entertainment	< 2 hours
180	Canning Bridge	Shopping centre	Off Street	Retail	Applecross	Applecross	Food	< 10 min
181	Canning Bridge	Ogilvie Road	On Street	Restaurant	Canning	Canning	Work/ Business	4 hours
182	Canning Bridge	Shopping centre	Off Street	Restaurant	Applecross	Applecross	Recreation/ Entertainment	< 2 hours
183	Canning Bridge	Ogilvie Road	On Street	Restaurant	Welshpool	Applecross	Food	< 2 hours
184	Canning Bridge	Along Esplanade	On Street	Recreation/Entertainment	Fremantle	Fremantle	Recreation/ Entertainment	3 hours
185	Canning Bridge	Apex Park	Off Street	Recreation/Entertainment	East Perth	East Perth	Recreation/ Entertainment	< 2 hours
186	Canning Bridge	Along Esplanade	On Street	Recreation/Entertainment	Applecross	Applecross	Recreation/ Entertainment	30 - 60 min
187	Canning	Along Esplanade	On Street	Recreation/Ente	Roleystone	Roleystone	Recreation/	10 - 30

Survey No.	Car Park Location	Street Name/ Address/ Landmark	Type of Parking	Land Use	Trip Origin	Trip Destination	Trip Purpose	Length of Stay
	Bridge			rtainment			Entertainment	min

Parking Management Plan

APPENDIX

E

PARKING MANAGEMENT PRINCIPLES

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Shaping the Future

Parking Management Principles

In proposing the Parking Management Plans for the study area, literature review on Parking Management Principles had to be performed. This section of the report outlines some of the research on which the proposed Parking Management Plan was based.

1 Existing Parking Strategy

City of Melville Car Parking Strategy

The objectives of the Car Parking Strategy are to:

> Recognise that car parking is an integral part of the transportation system rather than a separate issue;

> Focus on people access not private vehicle access;

> Understand that it is more effective, easier and cheaper to better manage car parking rather than attempting to satisfy parking demand;

> Promote shared or publicly available parking in preference to single user parking;

> Acknowledge that car parking is never “free” and is actually very expensive to provide;

> Update car parking standards to align with town planning and transport strategies and objectives;

> Determine an appropriate cash in lieu of car parking contribution and allow flexibility in how the resulting funds are best spent

> Improve walking, cycling and public transport access to high activity centres and areas

The strategy includes a number of recommended actions to better manage car parking in the City of Melville ranging from short term fixes to major long term changes. Within these actions, it recommends that all major activity centres develop detailed parking management plans. Recently a Parking and Access Strategy Report has been completed for the Riseley Activity Centre as part of their Structure Plan. As for the Canning Bridge area the Structure Plan does not include a Parking Management Plan but notes that it as a critical transport deliverable within the short term (0-10 years).

City of Melville Car Parking and Access (CP-079)

The Car Parking and Access Policy provide the framework for car parking requirements for both residential and non-residential development proposals. The document contains various standards and requirements for parking provision in the City of Melville. The objectives of this policy are as follows:

> To facilitate the development of adequate, safe and convenient parking facilities that meets the needs of users.

> To ensure that development proposals incorporate an appropriate level of parking.

> To ensure safe, convenient, and efficient access for pedestrians, cyclists and motorists.

> To promote alternative transport modes by incorporating flexibility to reduce parking requirements where alternative transport options exist.

> To enable the payment of a financial contribution in lieu of actual parking provision for non-residential developments and to provide guidelines to ensure that the calculation of cash-in lieu is applied in a consistent and transparent manner.

> To promote ‘shared’ or publicly available parking in preference to exclusive, single user parking for non-residential developments.

The Case against Minimum Parking Requirements

Parking requirements often lag behind a community’s strategic vision or plan. The following section reviews the objectives of the City of Melville Car Parking and Access (CP-079) against the parking requirements. It is

not intended as a critique but as an analysis of how the plan's intentions are hampered by potential decisions made regarding minimum parking requirements. The City of Melville's Strategic Community Plan outlines the long term strategic priorities for the City and is based on key themes which emerged during its development, including building on the place-based service system, providing inclusive and accessible services and assets, and ensuring sustainable growth and employment access.

2 Limited Parking Supply

Office Parking

Parking Requirements for offices differs depending on the location of the office and employee density. Office parking tends to have predictable parking utilisation patterns, mainly on weekdays during business hours. The quantity of office parking often exceeds the usage and office parking often does not allow for shared parking arrangements. Office parking utilisation is lower on weekday evenings and weekends where other land uses experience their peak parking utilisation levels.

The proposed Melville Precinct in its current form is relatively sub-urban. However the future vision of the Precinct is the creation of a dynamic and vibrant hub with various land uses and higher density housing. Generally, there is pressure to reduce the amount of parking in CBD areas and taking into account the costs of maintaining a high parking supply, environmental concerns and finding methods to mitigate traffic congestion.

With the high frequency Public Transport (PT) corridor along Canning Highway, linking the precinct with Canning Bridge train station, this will provide greater public transport accessibility for the Melville precinct.

As the City of Melville implements paid parking over the local government area, office parking utilisation rates will drop. Commuters are highly sensitive to cost, so as the cost of parking transitions from free to paid, the demand will drop. Areas with high public transport availability combined with charging for parking tend to have lower parking utilisation.

Other factors that affect office parking utilisation

> Type of work (number of cubicles increasing)

> High tech companies (many workers may work from home or telecommute)

> Work shifts and schedules that are conducive to public transport schedules and carpooling arrangements

> Good quality alternative transport

Some factors which increase office parking utilisation

> If the job often requires employees to conduct site inspections, then a vehicle is required (e.g. surveying)

> Need to carry equipment to work

> If work shifts are irregular making public transport inconvenient

> If travel patterns are complex and trip chaining is frequent i.e. requiring taking part in an activity before or after work (e.g. dropping children off at school, shopping etc).

Shared Parking

The costs of parking are tangible and include constructing and maintaining the bays, not to mention the costs of road improvements necessitated by the additional traffic generated by abundant, unconstrained parking.

The density of future development suggests that on-site parking will generally be provided in underground or basement car parking, with limited at-grade parking. Basement parking has the highest associated cost per bay, as highlighted in **0** below.

Table 1 Cost benchmarks for parking bay construction (per parking bay)

Type	Life Costs (inc. operation)[1]
Surface	$10,000 – 20,000
Above-Grade	$20,000 – 40,000
Underground	$60,000 – 90,000

Source: *A Plan to Efficiently and Conveniently Unbundle Car Parking Costs* (Bullock, 2010)

Due to the substantial costs associated with the provision of on-site parking, alternative measures have been explored to limit this supply. This has the benefit of making development more commercially viable as the costs of development are greatly reduced, allowing sales or rentals to be priced more attractively. Shared parking encourages the use of large centralised parking facilities and discourages the development of small facilities.

Shared parking works for land uses where there is a clear difference in the parking peaks (such as for office and residential) and potential for the same type of land use where clear over-provisions of parking are either in evidence or are likely to happen in future.

Advantages:

> Reduces parking costs for those choosing this approach
> Reduces parking provision for certain parts of the development,
> Provides mechanism for future overall parking rate reductions
> Flexible as each lot can provide allocated parking if they so choose
> Access to conveniently located parking is increased compared to a site-wide policy
> Shifts majority of responsibility onto developers as all the parking is provided on their land

Disadvantages:

> Requires legally binding agreements between lot owners for access to parking
> Can limit flexibility if lot is resold as the future owners will have to be honour the agreement
> Requires City to enforce compliance
> Possibly unattractive to some developers, although they would be under no obligation adopt this approach
> Still requires a level of parking management, although this will be less stringent than some of the alternatives
> Is effectively unconstrained parking as it relies on varying demand, therefore;
  - Less reduction in traffic impact compared to fully allocated parking;
  - Requires a range of parking uses to work eg. Restaurant and Office.

Reciprocal Parking

Reciprocal parking occurs when a visitor has more than one purpose within an area and hence only one trip is required to serve two or more purposes. Within the Study zones there is a mix of retail and office uses with residential surrounding the Precinct. As a result, there is likely to be a high degree of reciprocity during daytime peak times.

The degree of reciprocal parking occurring depends on the type of land use in the vicinity and the time of day. For the purpose of this assessment, reciprocal parking rates have been taken from the National Cooperative Highway Research Program (NCHRP) Report 684 (March 2011).

A significant consideration in determining the applicability of reciprocal parking is the proximity of land use pairs. As all developments within the Precinct are generally located within acceptable walking distances, and all parking within the precinct will be managed through paid parking or supply management, the reciprocal parking rates given in the NCHRP Report can therefore be considered to be reasonable estimates. By accommodating reciprocal parking a lower total parking supply will therefore likely be required to satisfy demand.

[1] US Dollars

3 Controlling Parking Demand

1.1.1 Employer Incentives

Employers often provide employees with free on-site parking at no direct cost to the employee. Many employers are now establishing and implementing cash-out programs to provide employees with a choice of receiving free parking or foregoing free parking for a cash payment to use transit or other transport alternatives. As this practice increases, employers will require fewer parking bays. A Canadian study by the Victoria Transport Policy Institute found that cash out reduces parking demand by 15-25%. Another study by Donald Shoup at the University of California – Los Angeles found that cash out is two thirds as effective as charging employees for parking.

The option of providing cash out program is suitable for the Melville Activity Centre as it transitions into a vibrant hub. The Precinct is located next to the high frequency public transport route on Canning Highway as well as other high frequency bus services but will only prove to be effective if parking surrounding the precinct is priced accordingly. If parking continues to remain unregulated and free of charge, employees could still park and pocket the cash out rather than taking alternatives to travelling as a single occupancy vehicle.

1.1.2 Preferential Parking for Carpools

A 'carpool' is any process that facilitates a car driver giving a lift to other person formal schemes, which rely on arrangements being made between broader groups of people who may not necessarily know each other.

Need and justification:

1. Number of single driver cars commuting to the destination.
2. High single driver car mode share to the destination travelling at similar times.

Benefits for organisations that support a carpool program can include lower traffic and reduced congestion. Widespread uptake of carpooling in a location will reduce demand on the traffic network. This will improve the attractiveness of the business location for potential employees, access for clients and suppliers, improving efficiency of operations. The number of car parking spaces required would also be reduced.

The University of Western Sydney currently participates in a carpool service run by Western Sydney Carpools and reserved car parking spaces for Western Sydney Carpoolers are available at UWS. Western Sydney Carpool provided the template for the car park and individual stickers for users to attach to their car. **Figure 1-1** illustrates the implementation of this scheme.

Figure 1-1 Reserved carpooling bays

A carpooling program could be implemented by employers in the Study Area. To participate in a carpooling program usually a one off joining fee and annual subscription is charged.

4 Paid Parking

There is No Such Thing as "Free" Parking

It is important to recognise that the provision of car parking provision has both a direct and indirect cost.

The typical approach in Western Australia has been in the past for the user to have access to parking close to their destination at little or no cost, with sometimes irregular application of compliance and enforcement regulation. The cost of this "free" parking has generally been either borne by the provider or recouped in some way though the cost of goods or services at the destination.

When the supply of any commodity is limited and demand for it is near or above that limited supply, the price goes up. If the commodity is free, then it will be quickly used up and exhausted by the first people who get to it, and there can be no rational distribution to those who might need it or want it more.

Therefore, the main reason to charge for parking is to ration a limited supply of a coveted product. By charging for parking, people will be encouraged to move from spaces as quickly as possible in order to pay as little as possible, and spaces are made available to others. Thus, charging for parking makes fewer spaces feel like more.

Without parking management in general, and fees in particular, employees and merchants tend to park in the best spaces all day, depriving paying customers of the most convenient spots. Obviously, merchants and employees “shouldn’t” park in prime spaces, but they do.

The secondary reason to charge for parking is that it generates revenue. This shouldn’t be the main reason to do it, although for some cities it is. The revenue generated is necessary to operate the parking system and to pay for new parking facilities. The “rationing” powers of pricing are a far more powerful incentive to charge for parking in lively downtowns.

The real "cost" of parking (both direct and indirect) and ‘who pays’ are issues which need to be addressed and clarified to users, providers and regulators so that a planning, decision-making and planning framework can be adopted and applied.

What motivates parkers?

In order to effectively use market-rate prices to create available spaces when and where they are needed, we must first understand what motivates parkers. Some feel that people will park where they “should.” Merchants “should” park on side streets. Employees “should” park in the garage outside of the shopping area. Commuters “should” park at the park and ride.

Indeed, they should. Unfortunately, people don’t always do what they should. People tend to act in their individual self-interest when making decisions, and this includes when they are making decisions as to where to park. According to a U.S. parking expert Donald Shoup, “most models of parking choice assume drivers act in their rational self- interest, rather than for moral reason, in deciding whether to obey the law. The essence of parking enforcement is thus economic, and it is futile to rely on rules absent economic incentives.” Australian parking researchers Russell Thompson and Anthony Richardson advise us to “assume that parkers are rational and will behave dishonestly if the effect (on the parker) is positive.”

Basically, carrots (rewards) and sticks (punishments) can influence people’s decision on where to park, but appeals to moral virtue or concern for the common good will not.

Market-rate pricing takes parkers’ needs into account and appeals to those needs, enticing them to park where the downtown needs them to park.

Paid versus Time Restrictions

A tactic that cities use to create turnover of prime parking spaces is to limit the time that one may park in a given space. Violators of the time limit are issued a fine.

It seems like this would be a simple and effective system, but it often is not. For one thing, it is very difficult to set the time limits as different land uses in a precinct would demand different times of stay that occur at different times of the day. It is not possible to set a “theoretical” time limit to allow everyone’s customers to stay for the time that they need. Such time restrictions would be very likely to attract employees, who would only need to rotate their cars four times during the day to avoid a ticket.

Another approach might be to mix it up—perhaps three spaces at 15 minutes, three spaces at one hour, and three spaces at two hours. Unfortunately this is not effective either. We must remember two things: Firstly, Activity Centres are a host to a widely diverse range of businesses, each with their own peculiar fluctuations in activity (think back to the "shared parking" discussion). Second, kerb side parking spaces are highly convenient and desirable and are impossible to add once maximised. Therefore we need to use these resources as efficiently as possible. Together, these two realities mean that one parking bay must fulfil several needs throughout the day.

Another issue with time limits is that enforcement of them is very labour intensive. Commonly, a tire on each car must be marked with chalk. Then, that block must be revisited after the time limit has passed… two hours later, one hour later, maybe only 15 minutes later. Any car which still has a chalk mark is issued a fine. If time limits are very short, then the officer must return very frequently. If multiple time limits are involved, then it is even more complex.

This manual system can be effective and result in high turnover. However, employees often figure out systems for avoiding a ticket by moving their car to another space before the time limit is up, by erasing the chalk before the enforcement officer returns, or by swapping spaces with a co-worker several times during the workday. To thwart such behaviour, some cities divide their city into zones, and one must leave that entire zone before the end of the time limit or face a ticket. This is only slightly more effective at removing employees but us much more inconvenient for customers.

No matter how strict the time limits are, if prices are free or backwards, then employees will probably still park in prime spaces.

Effective parking management compels some people to distribute themselves away from prime parking areas. Time limits do this theoretically by capping the visit time at an hour or two, after which time one must leave, freeing the space for someone else (this is referred to as "turnover"). Pricing does this by making people pay more for prime parking (which deters employees from sitting there all day) and by luring bargain hunters away from the core with better deals in garages and peripheral areas. Without these mechanisms in place, parking congestion will (and does) occur, no matter how many parking spaces there are.

Pricing On-Street and Off-Street Parking Facilities

If a city's core is lively and vibrant and there is a lot of competition for parking, it makes no sense to make all parking free. Yet that is just what many cities insist on doing. Naturally, the on-street parking in front of the shops and restaurants gets completely congested, because it is both a bargain and convenient. Both groups are competing for these same spots. To compensate, rigid time limits are consistently enforced in an attempt to de-congest the prime spaces and to remove employees from them, but this often results in customers getting inconvenienced by having to move their car every so often or, worse yet, burdened with an expensive ticket for being just a few minutes late. Ironically, employees (the main focus of the time limits and ticket-writing) often develop very sophisticated systems to rotate cars and avoid tickets while still congesting the prime customer parking spaces.
Pricing on-street parking at approximately 120% of the equivalent adjacent off-street supply promotes a shift towards managed public and private parking and encourages the availability of on street bays for the use of short-stay, high-value parking activities. On-street parking also allows additional flexibility for reallocation of individual bays to suit changing demands or mode preferences.

Also of consideration is the impact of potential on-street paid parking on the demand for parking bays and length of stay. The instigation of paid parking for on-street bays provides an additional and effective motivator towards more efficient use of the existing on-street supply as well as encouraging visitors to park in public and private off-street car parks.

Literature Review

Numerous studies have been conducted into the introduction of paid parking. To better understand the consumer response to the consumer introduction of paid parking, a "before and after" study was conducted in the city of Eindhoven in the Netherlands. Paid parking was introduced after a considerable extension and renovation of the shopping centre. The involved parties showed their concern about the introduction of paid parking. The parking charge was set to 0.50 euros (1 =$1.40 in 2007) for the first hour and 1.00 euro for every next hour, with a maximum of 3.00 euros per day.

In the short run (approximately 3 months after the introduction of paid parking), the frequency and duration of visiting the Woensel Shopping Centre decreased substantially. Also, expenditures decreased, both for weekly and non-weekly purchases. However, since the introduction of paid parking coincided with a renovated shopping centre with more stores, consumers felt that they gained something, for example better access to the shopping centre and a higher chance of a parking space. As development takes place, the amenity of the area will increase and although consumers dislike paid parking, the new services and vibrancy of the area can offset this.

An increase in parking prices can reduce use of parking facilities at a particular location, but this may simply shift vehicle travel to other locations. Areas could experience spillover parking problems as motorists refuse to pay for parking and try to find free parking. The Victoria Transport Policy Institute in Canada has found that this effect can be countered by increasing parking prices throughout the area, effective enforcement of parking regulations and good transport alternatives. If all these factors are present, an increase in parking prices can reduce total vehicle travel.

Using Parking to Increase Vibrancy

Parking pricing can be used as a sensitive tool to prioritise some types of trip over others, according to their purpose and duration. Short term parking for shopping trips and higher rates for all day parking can discourage commuter all day parking which can free up spaces for customers. By pricing parking according to the type of users you want to attract, the City can cater for desirable trips, such as short-term shoppers, while discouraging undesirable commuter trips. Commuters add to peak-hour congestion and occupy a parking space for an entire day. These pricing strategies reduce the supply of parking needed but ensure that parking is available for important users. They can also alleviate pressure to provide more parking from retailers and businesses, which may be concerned by their perception that poor parking availability discourages shoppers.

An outline for the gradual transition to paid parking over through to 2015 should be prepared (or has been prepared/ will be prepared). This involves reduction of free parking duration outside the City Centre and gradual introduction of pay and display meters in the City Centre.

The introduction of paid parking allows for fine-grained control of parking demand on a precinct or road-specific basis. Ideally, parking rates would vary as required and set to a level which generates a vacancy on each block.

In the short run, *cost-recovery parking pricing* (fees set to recover full parking facility costs) typically reduces the number of spaces needed to serve a destination by between 10-30%. For example, if parking is unpriced, 100 employees typically demand about 90 parking spaces, but cost recovery pricing can reduce this to 70 spaces.

Pay by space parking meter technology

As an action for the future, City can consider the option of introducing “Pay by Space” Parking meters.
While market-rate prices make sense in theory and have worked well in reality, they create a few challenges for the cities that implement them. First, the market-rate price isn’t likely to be excessive, but it isn’t going to be dirt cheap, either. People will find it difficult to always carry enough change.
Another issue deals with the nature of the desirability of parking spaces. The desirability, and therefore the market-price, will vary from block to block depending on the proximity to popular destinations. In order to get the prices right, we will have to make our best educated guess and set initial prices, and then monitor the use to see if we got it right. If the use is too low, we will need to lower the price, and if it the use is too high, we will need to raise the price. This is tough with conventional parking meters. Finally, depending on the activity levels throughout the day, the market price for the evenings may be too expensive for lunchtime, or vice versa. If we overcharge or overcharge during parts of the day, we will not have an optimal system. Unfortunately, conventional meters are not capable of variable prices.
Several companies now sell computerized multi- space parking meters. These meters can replace several conventional meters and are usually paced in the centre of the block. They can accept coins, bills, and credit cards for payment. Since they are connected to a central computer via a cellular internet technology, prices can be changed instantly from a single computer, rather than by having to mechanically adjust every single individual meter. Computerised multi-space meters are also capable of variable price structures.

There are several other benefits to computerized multi-space meters. They include:

- Better urban design: With one or two meters per block instead of ten or twenty, the appearance of sidewalks can be greatly improved.
- Quicker repairs: In the event of mechanical failures an alert is sent to the Parking Department to ensure a speedy response.
- Solar power: No electrical power cables need to be run to the meters. Many run on solar power.
- Better information: Multi-space meters can display information on a large, clear, interactive screen, which means that they can convey much more information much more effectively than a conventional meter.
- Revenue control. Because each transaction is recorded on the central computer, missing revenue can be immediately identified by auditors.
- Better data collection: Because the meters collect detailed records of their use, it is very easy for the parking manager to analyse the parking patterns of city centre parking and to know exactly where there are problems, exactly what the occupancy rate is throughout the day. This information is critical in setting proper prices. With the automatic collection of this data by the meters, parking consultants are not needed to conduct occupancy surveys.

There are two types of multi-space meters: Pay-and-display and pay-by-space. Pay-and-display meters work this way: after parking, the parker walks to the meter and pays for the desired amount of time. A receipt is the printed which displays the time at which the parking will expire, and the parker displays this ticket on their windshield.

Pay-by-space meters work a little differently. Each parking space has a number, which is stencilled on the kerb. The parker then enters the number of their parking space, pays for the desired amount of time, and is on their way.

Some of the advantages of this system include the following:

- Convenience. Upon paying, visitors do not need to return to their car to display their receipt. They can simply pay and go. If they want to purchase more time, they don't need to return to their car, they can pay at the nearest meter, because all of the meters will be networked, allowing parkers to pay for any space from any machine.
- No ticket anxiety. Customers can add time from any machine or via cell phone, making compliance with the parking rules a breeze.
- Easier enforcement. Enforcement officers do not need to look at the dashboard of each car to see who hasn't paid. They can easily find out who is in violation at the meter itself or from hand-held devices.
- Friendliness. A grace time can be programmed into these machines that will give customers a few extra minutes to return before a violation is displayed.

Many cities, such as San Francisco, Berkeley, Boston, West Hollywood, and Aspen have installed pay-by-space meters and have had success with them. Staff feels that they are ideal for the core area, identified in

5 Parking Impacts on Green Modes

Short local journeys by means other than the private motor vehicle are often overlooked given the focus on car-based trips. At the present time, approximately 14 percent of all trips within the Perth region are undertaken via walking (12 percent) or via cycling (2 percent). Typically these journeys are short (less than 1 kilometre) but still play a significant role in a sustainable and balanced transport system. Many of these trips are part of a longer journey with one part of the trip made by walking or, in some cases, by bicycle, yet this intermodal travel is often overlooked.

Comprehensive policies, strategies and detailed design which favours the car plays major role in limiting these other less non-motorised modes, with an often less than desirable street environment, especially in our newer suburbs built over the last 30 years, combined with the restricted safe access to many of our local and district centres discourages walking and cycling for short trips.

It is now emerging that better bicycle parking for commuters and shoppers could potentially result in a substantial increase in cycling mode share. Surveys of bicycle users have indicated that the chief constraint on increasing cycling within the Perth Metropolitan region has been the lack of adequate bicycle parking and associated end-of-trip facilities.

6 Parking Financing

Cash-in-lieu arrangements

Cash-in-lieu of parking is a mechanism by which developers contribute towards public parking and/or sustainable transport initiatives. This mechanism would allow public infrastructure to be funded by development, without the requirements for a Development Contributions Scheme.

A model cash-in-lieu scheme has been recommended for consideration as part of the Melville Activity Centre Transport Assessment which combines parking maximums with mandatory cash-in-lieu to ensure that sufficient public parking can be supplied, while maintaining a limit on parking to prevent adverse impacts to the road network.

Mandatory cash-in-lieu would require developers to fund a proportion of their maximum parking requirement in off-site parking to be constructed by the City, and to fund additional sustainable transport initiatives such as cycling infrastructure and public transport improvements. Additional parking could be funded cash-in-lieu to reduce the development's on-site requirements. Demonstrated synergies within a development which would reduce their parking demand could also be supported to reduce on-site supplies.

By this mechanism, public parking rates need only fund maintenance of infrastructure, rather than recover the costs of capital works.

The City currently accepts cash-in-lieu payments for car parking as part of the land development process. This mechanism encourages a higher density compact development and promotes the aims of both the City's Strategic Plan. This policy can facilitate developments which, due to a number of financial, physical and urban design constraints, cannot provide sufficient self-contained parking at a reasonable cost or at all. The cash-in-lieu mechanism can also discourage the proliferation of smaller and inefficient parking facilities which would ordinarily be necessitated by compliance with minimum parking standards.

Record-Keeping

To maximise developer buy-in and ensure a streamlined process, it is important to ensure that there is an effective record-keeping process to manage cash-in-lieu contributions. This system would track payments by developers, current land and construction costs, infrastructure works and planning. Maintaining a transparent process of cash-in-lieu through which developers can see direct value will assist in achieving both mandatory and voluntary contributions.

Parking Priorities

Parking users should be categorised on the basis of the time spent in the precinct. In order to promote vitality in the Precinct, short term and casual users should have priority access over long term and regular users including commuters.

Use of On-Street parking

On-street parking should be prioritised for short stay users rather than commuters. It provides the most convenient access and is the best option for visitors to the precinct. Through the provision of on-street parking, this can reduce the need for surface parking lots and structures.

Residential Parking

On-street parking for residential uses is not supported except for visitor parking. It is expected that residential development will provide sufficient parking on-site, within the parking rates recommended. This will minimise conflicts over on-street supply and retain it for valuable short-stay parking.

Visitor / Retail Parking

The primary use of on-street parking will be for short-stay visitor parking, particularly in and around activated streets. This parking should be time-restricted to avoid illegitimate commuter parking or priced on a demand-sensitive basis to promote vacancies.

Loading Zones and Service/Delivery Docks

Deliveries will be enabled through an increase in on-road loading zone areas, particularly in 'main street' precincts and where smaller office/retail development is located. Larger office/commercial buildings will be serviced via on-site docks connected to basement or undercroft parking structures. Access to dock areas through a laneway network is supported to minimise the impact of service/delivery vehicles on pedestrian, cycling and bus modes.

ACROD Parking

In the *Car Parking Action Plan Update* (Cardno, 2011), it is recommended in the short term to continue to promote ACROD parking rates above the stipulated rate given in the Building Code Australia (BCA). This reflects the growing mobility of people with disabilities and is consistent with the increasing uptake in ACROD permits in the Perth metropolitan region. Notwithstanding any provision in the BCA or AS2890, it is recommended that parking spaces for people with disabilities are to comprise 2-3% of the total number of parking spaces in non-residential development, with a higher provision rate required for car parks serving health facilities or which provide specific services for aged persons and people with disabilities.

Bicycle Parking (End of Trip Facilities)

In activated streets, or any streets with on-road cycling facilities, cycle parking would ideally be located in on-street corrals. This has the advantage of keeping cyclists away from pedestrian conflict and is a very effective way of creating cycle parking.

Other Critical Short-Stay Parking

Consideration for other specialty uses should be undertaken, depending on the requirements of adjacent land uses. As on-street parking is expected to be in high demand, dedicated parking for emergency and postal vehicles may be necessary. Dedicated taxi stands will also be desirable in entertainment precincts and other high-demand areas. Specific land uses such as banks may require very short-stay parking (15 minutes) to facilitate customer needs.

Motor Cycle Parking

Motorcycles constitute an increasing share of the travel modes accessing centres. This group can be difficult to accommodate both on- and off-street, particularly in pay parking areas, due to the manoeuvrability of motorcycles and their ability to park essentially anywhere. However, sufficient provision of motorcycle parking in high demand on-street locations and in all substantial off-street car parks tends to improve the efficiency of the overall car parking supply. The ability to locate motorcycle bays where a full-sized car bay would be impractical can also increase the overall parking quantum without detrimental impact on the parking supply for cars. Using the City of Perth as a benchmark, a practical ratio for on-street motorcycle bays would be in the order of 1 for every 20 regular car bays.

About Cardno

Cardno is an ASX200 professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD].

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