Technical Memo

Technical Memo No	TM0003	Date of Issue	14 September 2020
Subject/Title	Future Parking Demands		
Project Name	Projected Future Car Parking Needs	Project Number	3006375
Discipline	Transport Planning		
Document Number	3006375_TM_0003_Future Parking Demand		
Revision Details	FINAL		
Author	Louise ROUND		
Reviewed by	Kathy Ward		
Approved by	James Parrott		
Prepared for	City of Busselton	Attention to	Louise Koroveshi
Attachments	Dunsborough Town Centre Parking Utilisation and Turnover Survey (July 2019) Dunsborough Town Centre Parking Utilisation and Turnover Survey (Feb 2020) Busselton City Centre Parking Utilisation and Turnover Survey (Mar 2020) Base Parking Demand for Future Years (July 2020) Current Proposed Parking Changes		

1 Purpose

The purpose of this Technical Memo is to provide the City of Busselton (the City) with an estimate of future parking demand in the Dunsborough Town Centre and the Busselton City Centre. The estimates will be used as part of the Activity Centre planning being undertaken by the City.

This is intended as an internal document for the City.

2 Introduction

2.1 Background

Parking surveys for peak and non-peak days have been conducted and base levels of parking demand were agreed with the City at a meeting on 23 July. This Technical Memo should be read in conjunction with the previous Technical Memos prepared by SMEC:

- Dunsborough Town Centre Parking Utilisation and Turnover Survey (July 2019)
- Dunsborough Town Centre Parking Utilisation and Turnover Survey (Feb 2020)
- Busselton City Centre Parking Utilisation and Turnover Survey (Mar 2020)
- Base Parking Demand for Future Years (July 2020)

The previous Technical Memos are attached in Appendix A to Appendix D.

2.1.1 Dunsborough Town Centre

A base parking demand of 670 spaces has been agreed for Dunsborough Town Centre.

This demand was exceeded for four hours (12:15 to 16:15) in the peak season survey, and not at all in the non-peak survey.

2.1.2 Busselton City Centre

A base parking demand of 1,880 spaces has been agreed for Busselton City Centre.

This demand was exceeded for four hours (10:45 to 14:45) in the peak season survey, and for three hours (11:30 to 14:30) in the non-peak survey.

2.2 Objectives

The objective of this Technical Memo is to present the methodology that SMEC has used to derive the future parking demands and to compare future parking demand with likely future parking supply.

2.3 Scope

The scope of this memo is as follows:

- Model and analyse the projected future car parking needs for a 20-year timeframe, from 2020 to 2040, for the Busselton City Centre and Dunsborough Town Centre based on
  - Predicted commercial/retail floorspace growth and development within the Busselton City Centre and Dunsborough Town Centre
  - Projected population growth
  - Seasonal holiday-maker visitation periods/trends.
- provide recommended improvements and/or changes required in the provision and management of car parking zones/cells for both the short and longer terms

3 Factors Creating Future Parking

3.1 Population Growth

An increase in the resident population will lead to an increase in demand for parking. This is irrespective of the age groups that are increasing. A positive correlation between population and parking demand exists in the absence of any travel behaviour constraints.

3.2 Driver's Licence Holders

The number of people holding a licence and level of car ownership, and hence car parking demand, are linked. Western Australia (WA) has high levels of licencing and car ownership, or access to a vehicle. Analysis of car ownership in 2016 indicates 96.2% of households in the South West Region had access to a motor vehicle.[1]

[1] https://profile.id.com.au/wapl/car-ownership?WebID=740

There is an increasing number of driver's licence holders in Australia[2]. Whilst younger drivers are delaying obtaining a licence, the number of people over 60 years old with a driver's licence continues to rise. Looking at the next 20 years, there will continue to be an increase in driving licence holders as nearly everyone in the current age group 40 – 60 years old has a driver's licence.

In addition, the generation 40 – 60 years old has grown up with the car dependency culture. This generation will continue to drive as long as infrastructure, such as parking, is provided. This predict and provide approach gives rise to "the continual expansion of transport infrastructure to meet inferred latent demand"[3]. Therefore, this approach perpetuates the car dependency culture.

3.3 Tourism

Both Dunsborough and Busselton attract large numbers of tourists, particularly in the school summer holidays. Busselton is located just over 200km or two and a half hours south of Perth, and Dunsborough is a further half hour west. Most of the tourism is domestic and is set to increase in the next 10 years.

As both Dunsborough and Busselton are a relatively easy drive from Perth, the majority of tourists have a car. The attractions are widespread and there is no public transport, further making a private vehicle advantageous. Therefore, an increase in tourists will inevitably result in an increase in parking demand.

3.4 Technology

Much is made of changes in technology that will bring about autonomous vehicles, which have different parking demands. However, given the large number of barriers still to be overcome with the technology it is unlikely to have an impact on parking demand in the next 20 years.

The deployment of technology for car parking management has become common place, both for enforcement and for wayfinding to available spaces.

3.5 Changes to Land Use

For both Dunsborough and Busselton, peak demand is concentrated to a few locations with particular land uses. The Busselton Foreshore Redevelopment is a good example of this, incorporating future hotel developments and commercial venues.

Changes of land use to complementary activities will assist in smoothing out the demand, through reciprocity and increasing demand in the evening.

3.6 Public Transport

The provision of public transport is a key measure for limiting parking demand in areas of intense activity or where land for car parking is constrained. However, it is not expected that activity will increase in the next 20 years to levels that would require a comprehensive public transport system.

3.7 Dominant Factors

The two dominant factors in predicting future demand will be the future population of people with a driver's licence and future tourism.

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[2] https://chartingtransport.com/2015/03/09/trends-in-drivers-license-ownership-in-australia/

[3] Murray Goulden, Tim Ryley, Robert Dingwall Beyond 'predict and provide': UK transport, the growth paradigm and climate change - https://doi.org/10.1016/j.tranpol.2014.01.006

4 Dunsborough Town Centre

4.1 Population

Figures supplied by the City indicate that the resident population of Dunsborough, including the adjoining localities, is estimated to be 9,820 in 2020 and this will increase to 16,390 by 2040. This is a 67% increase.

Taking the base parking demand of 670 spaces and applying a 67% increase, to reflect population growth, gives a parking demand of 1,118 spaces. It is unknown how much of the parking is tourism related, using population gives a slight overestimate of future demand.

4.2 Tourism

Tourism visitor nights in Dunsborough are increasing at a slower rate than population, approximately 49% from 2020 to 2040 (refer to Dunsborough City Centre Commercial Growth Analysis Pracsys 2018).

Taking the base parking demand of 670 spaces and applying a 49% increase, to reflect tourism growth, gives a parking demand of 996 spaces. It is unknown how much of the parking is by tourists, using tourism gives a slight underestimate of future demand.

4.3 Land Use

The report Dunsborough City Centre Commercial Growth Analysis (Pracsys 2018) indicates an increasing demand for retail/shop, entertainment/recreation/cultural, health/welfare/community services, and office/business. All these land uses will generate demand for private and public parking.

Pracsys 2018 suggests that the growth in demand for the floor spaces noted above increases faster than population increase. However, future demand for other floor space is increasingly likely to be accommodated outside the town centre, examples of such land use are storage/ distribution and utilities / communication, thereby reducing the amount of this floor space in the Town Centre.

Assuming complementary land uses, the increase in floor space will be offset by reciprocity of parking demand and will increase the length of time that people stay in the town centre.

4.4 Future Demand and Supply

A future demand of 1,118 spaces is estimated for the Dunsborough Town Centre. The main increase in demand will come from an increasing population.

For efficient car parking, demand should be 85% of supply. Therefore, 1,316 bays should be provided in the Dunsborough Town Centre by 2040. The existing parking supply across public and private parking is 1,160 formal bays.

It should be noted that public parking in the Dunsborough Town Centre is quite limited, with the private parking in the Dunsborough Centrepoint Shopping Centre being used by 41% of cars parking in the Town Centre.

4.4.1 Proposed Parking Changes

Currently, there are an estimated 160 informal bays in a vacant lot at the corner of Cyrillean Way and Dunn Bay Road. It is assumed that these bays will be unavailable in the future.

Proposed changes to Dunsborough parking are that Naturaliste Terrace (Cyrillean Way to Dunn Bay Road) will have streetscaping, which may reduce parking supply, in conjunction with an increase in supply in the car park off Chieftain Crescent, refer Appendix E.

The City is also looking at the potential for additional parking on the southern side of Caves Road, around the Dunsborough playing fields, which may yield around 60 additional bays. There are ongoing discussions with Main Roads regarding pedestrian movement across Caves Road for access to the Town Centre from the Dunsborough Playing Fields.

The City is in negotiation to acquire an area of land in a vacant block to the north of the Cape Naturaliste Road / Caves Road roundabout for 300 bays of additional parking. Negotiations on this acquisition have stalled so it cannot be assumed that the City will be successful in purchasing this land.

These changes will yield approximately 360 additional bays.

4.4.2 Summary

The current oversupply of parking in the Dunsborough Town Centre may continue into 2040 if the predicted increase in of 360 bays eventuates, refer Table 1.

Table 1 - Dunsborough Town Centre Parking Provision

	2020	Additional Parking Spaces (potential)	Medium Term 2030	Long Term 2040
Demand	670		894	1,118
Required Supply (85% occupancy)	788		1,052	1,316
Supply	1,160	360	1,520	1,520
+Over / -under Supply	+372		+468	+204

4.5 Parking Management

The Dunsborough Town Centre's parking supply is sufficient for the next 20 years, allowing that at peak times the most popular parking areas will be congested and that the Town relies on the continued provision of private parking. To echo the comments in the Dunsborough City Centre Commercial Growth Analysis, the location of the parking is just as important as the quantity.

The 2019 parking survey by SMEC showed that the majority of vehicles are parking within the given time parking restrictions. The exceptions, in public parking areas, were the on-street parking in Naturliste Terrace and Dunsborough Place. Naturaliste Terrace has occupancy greater than 80% in the peak season for most of the day.

The City has noted that Dunsborough has only recently had enforced parking management. However, this was interrupted by the impact of Covid 19, with fewer tourists and more people working from home. Now that intrastate travel is possible there will be a return to enforcement.

5 Busselton City Centre

5.1 Population

Figures supplied by the City indicate that the resident population of Busselton, including the adjoining localities, is estimated to be 29,460 in 2020 and this will increase to 49,169 by 2040. This is a 67% increase.

Taking the base parking demand of 1,880 spaces and applying a 67% increase gives a parking demand of 3,691 spaces.

5.2 Tourism

The Busselton City Centre Retail & Commercial Analysis (Urbis 2020) anticipates a small growth in tourism between 2019 and 2029, and notes that "Busselton City Centre has a significant level of spending generated by tourists."

5.3 Land Use

The Urbis Report 2020 recommends that the retail strategy in the Activity Centre Plan, over the next 15 years, should be focused "on consolidation and enhancement of the mix and overall revitalisation of the precinct, rather than an increase in floorspace." Therefore, it is anticipated that there will not be an increase in demand for parking spaces related to retail but consideration of demand for parking spaces for other land uses is required.

The report further identifies an "undersupply of several non-retail uses in the City Centre, particularly commercial and entertainment/leisure focussed developments." A recommendation of the Urbis Report is to provide more entertainment in and around the City Centre to attract more activity in the evenings and to increase visitors' length of stay, both during the day and into the evening.

5.4 Future Demand and Supply

It is anticipated that from 2020 to 2030 there will be a consolidation of the City Centre in terms of land use, with the provision of complementary land uses. This should see visitors staying longer and higher demand in the evenings, without an increase in the peak demand. This will allow better usage of the existing public car parks.

Existing supply in Busselton is 3,374 formal spaces, which is well in excess of the 2,212 spaces that would cater for the existing demand of 1,880 spaces.

5.4.1 Proposed Parking Changes

At the time of the parking surveys there were an estimated 200 informal spaces in Signal Park and a further estimated 200 informal spaces on vacant land at the south west corner of Brown Street and Harris Road.

Proposed changes to parking in Busselton include the addition of a 600 seat Performing Arts Centre, located at the top end of Queen Street. The Centre will rely on existing public parking as most of the demand for parking will be in the evenings. Similarly, a microbrewery is under construction on the foreshore with an expected opening in spring 2020. The microbrewery has a capacity for 700 patrons and relies on public parking.

There are three hotels proposed for Foreshore Precinct. Other than Site 2 (development of which is imminent), it is not known what car parking supply and demand for those sites will be, but for the purposes of this work, it is reasonable to assume they will require some dedicated car parking (30 bays,

30 bays and 60 bays) and that will result in the loss of some public parking. The City proposes 176 additional public parking close to the tennis courts at the Foreshore. Over time, this additional parking will compensate for the loss of public parking from the hotel developments. Therefore, there is no net gain of parking bays.

5.4.2 Summary

Assuming a 1% per annum increase in parking demand, there will still be an oversupply of parking spaces, refer Table 2.

Should parking supply be increased in line with population growth there may be an undersupply of parking spaces in the City Centre by 2040, refer Table 2. However, this is unlikely due to the changing nature of the land uses within the City Centre.

Table 2 - Busselton City Centre Parking Provision

	2020	Additional Parking Spaces (potential)	Medium Term 2030 (1.0% growth in demand)	Long Term 2040 (1.0% growth in demand)	Long Term 2040 (In line with population)
Demand	1,880		2,077	2,294	3,138
Required Supply (85% occupancy)	2,212		2,443	2,699	3,691
Supply	3,374	120	3,494	3,494	3,494
+Over / -under Supply	+1,162		+1,051	+795	-197

5.5 Parking Management

There is an oversupply of parking in the Busselton City Centre for both the Medium and Long Term.

There is strong parking management for the Busselton City Centre.

6 Recommendations

6.1 Peak Season Parking

The use of additional parking in the peak season should be continued. This allows the City to limit the oversupply of parking outside the summer months.

6.2 Parking Policy

The City does not have direct control over private parking but can set policies that ensure that there is not an oversupply.

It is inevitable that high private vehicle usage will continue across the City of Busselton, particularly for tourists, and therefore policies around travel demand management and public transport will not be appropriate in the next ten years. These types of policies should be revisited in 2030.

6.3 Dunsborough Town Centre Parking Supply

6.3.1 Medium Term 2030

A parking supply of 1,052 spaces, across public and major private car parks, is recommended for Dunsborough Town Centre by 2030.

Currently, public parking in the Dunsborough Town Centre is limited and the City should consider increasing the ratio of public to private parking.

6.3.2 Long Term 2040

A parking supply of 1,316 spaces, across public and major private car parks, is recommended for Dunsborough Town Centre by 2040.

6.4 Busselton City Centre Parking Supply

6.4.1 Medium Term 2030

A parking supply of 2,443 spaces across public and major private car parks, is recommended for Busselton City Centre by 2030.

6.4.2 Long Term 2040

A parking supply of 2,699 spaces, across public and major private car parks, is recommended for Busselton City Centre by 2040. This assumes that the land use recommendations of the Busselton City Centre Retail & Commercial Analysis (Urbis 2020) are implemented, resulting in visitors staying longer in the City and additional visitors in the evenings.

Appendix A Dunsborough Town Centre Parking Utilisation and Turnover Survey (July 2019)

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Technical Memo

Technical Memo No	0001	**Date of Issue**	30 July 2019
Subject/Title	Dunsborough Town Centre Parking Utilisation and Turnover Survey		
Project Name	Technical Memo	**Project Number**	3006347
Discipline	Transport Planning, Logistics and Analysis		
Document Number	3006347_TM_0001 - Final		
Revision Details	01		
Author	Clara Hechei		
Reviewed by	Louise Round		
Approved by	David Freer		
Prepared for	City of Busselton	**Attention**	Matthew Riordan

1 Introduction

The City of Busselton (the City) commissioned SMEC Australia Pty Ltd (SMEC) to undertake a Parking and Utilisation study for the Dunsborough Town Centre, Figure 1 shows the extent of parking areas considered in this study.

The scope of the project includes;

a) Undertaking a typical day and a holiday season Parking Occupancy and Duration Survey for all parking within the Dunsborough Town Centre to inform the performance of the existing parking management, identify areas of short and over parking supply, and analyse if there is a need for change in the current parking management plan. The Survey will be used as an input to the Activity Centre Plan for Dunsborough.
b) Capacity assessment of Cape Naturaliste Rd/ Dunn Bay Rd roundabout and Naturaliste Terrace/ Dunn Bay Rd roundabout to identify the need and time for Clark Street connection to Cape Naturaliste Rd.

Figure 1: Extent of the study area

1.1 Data Collection

SMEC collected parking survey data from 6:00 am to 10:00 pm and traffic turn counts data from 07:00 am to 07:00 pm on the following days;

- Wednesday the 24 April 2019 (a holiday season), and
- Wednesday 1 May 2019 (a typical day).

Below are the holiday seasons observed during the survey period window;

- Autumn School holidays: 13 April to 28 April
- Easter weekend: 19 April – 22 April
- ANZAC day: 25 April

2 Parking Survey Analysis

The Parking Occupancy and Duration Survey was undertaken between hours of 6:00 am to 10:00 pm using License Plate Recognition (LPR) technology. Appendix A provides Parking zone cells as provided by the City, which represents a total of 1320 parking supply.

2.1 Overall Parking Observation

A total of 3066 individual vehicles were recorded using town centre car parks on a typical day, which is about 11% higher than the traffic observed in the holiday season (2774 cars).

The table below summaries average observed parking data for all town centre parking zones.

Table 1: Observed Data for all parking zones

	Typical Day	Holiday Season	Difference
Parking Turn Over (cars per space)	2.6	2.4	0.2
Average Duration (hrs/car)	2.1	2.0	0.1
Maximum Duration (hrs/car)	2.8	2.5	0.3
Parking Utilization	32%	28%	4%

The survey data has indicated a slight difference in overall parking utilisation and parking turn over per bay during a typical day and the holiday season.

Further analysis of the data has also suggested, there is no significant difference in maximum hourly occupancy rate between a regular day and holiday. A maximum parking occupancy rate of 43% (565 vehicles) was observed during a typical day in contrast to 42% (565 vehicles) on holiday season. A detailed comparison of hourly parking occupancy rate between a typical day and holiday season is provided in section 2.2.

Parking utilisation, total hours occupied, and the maximum duration for parking zone 2 was noted to be substantially higher in all days, in comparison to any other car parks in the town centre. Parking utilisation for this car park was 63% on holiday season and 67% on an average day. Parking zone 2 has no restriction on parking times and was occupied for 10.2 hours during a holiday season and 10.8 hours in a typical day. This finding suggests that the workers in the town centre are likely to be using this parking.

2.2 Hourly Parking Occupancy Rate

Figure 2 below provides a detailed comparison of hourly parking occupancy rate between a typical day and holiday season.

In summary Figure 2 illustrates;

- The highest parking demands during the holiday season appears earlier than that of a typical day and decline quicker than parking demands for a typical day.
- A regular day has a parking occupancy rate of above 20% between hours of 07:45 am to 07:15 pm and the peak parking occupancy rate of 40% and above occurs between 10:15 am and 02:30 pm.
- During the holiday season, parking occupancy rate above 20% occurs between hours of 08:15 am and 06:30 pm and parking occupancy rate above 40% occurs between hours of 09:00 am and 12:30 pm.

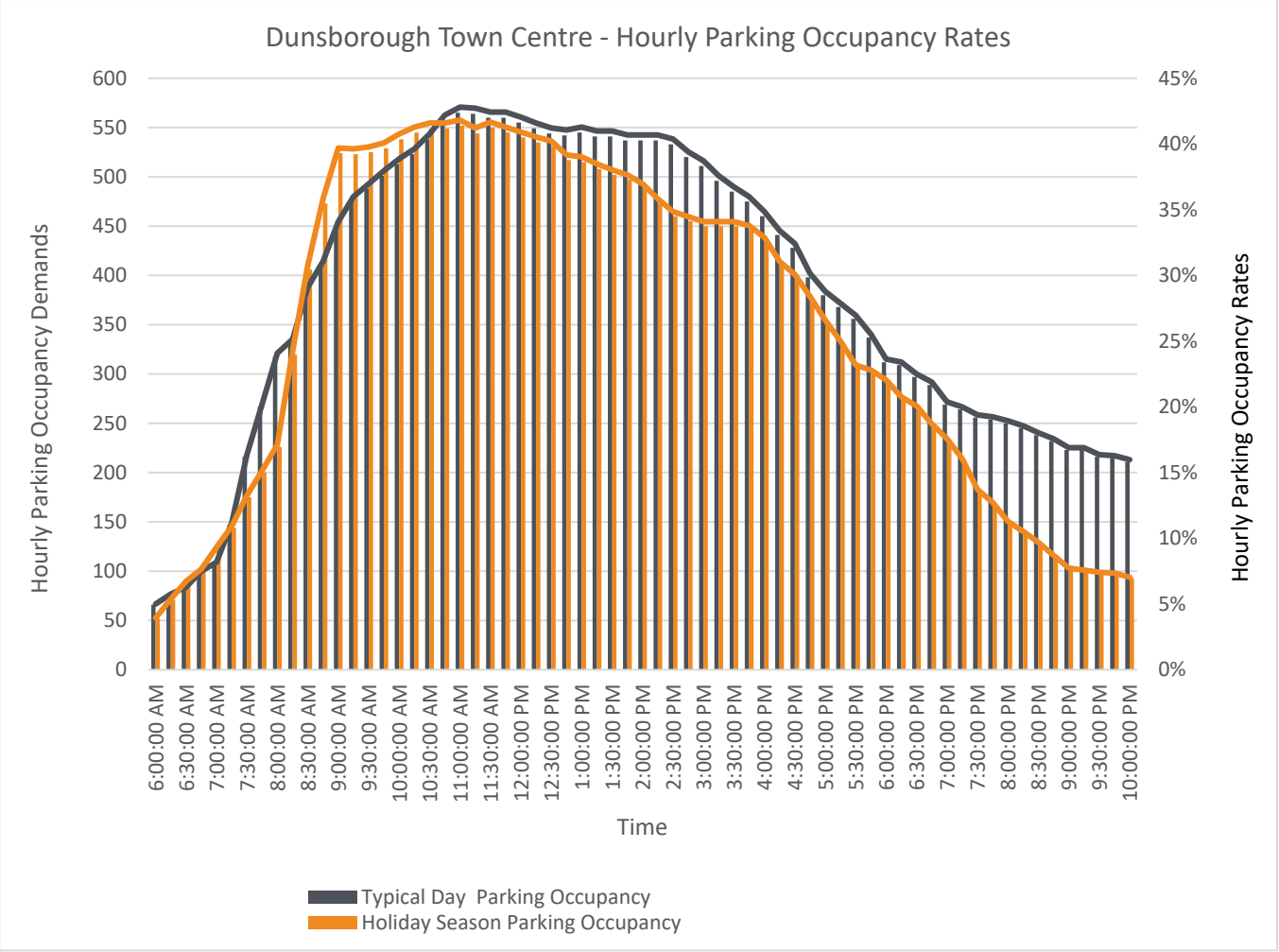


Figure 2: Observed 06:00 am to 10:00 pm hourly parking occupancy rate

2.3 Parking Zones Utilisation

Figure 3 summarises the total number of vehicles observed accessing the car parks during the survey period and their equivalent percentage to the total surveyed vehicles to that day.

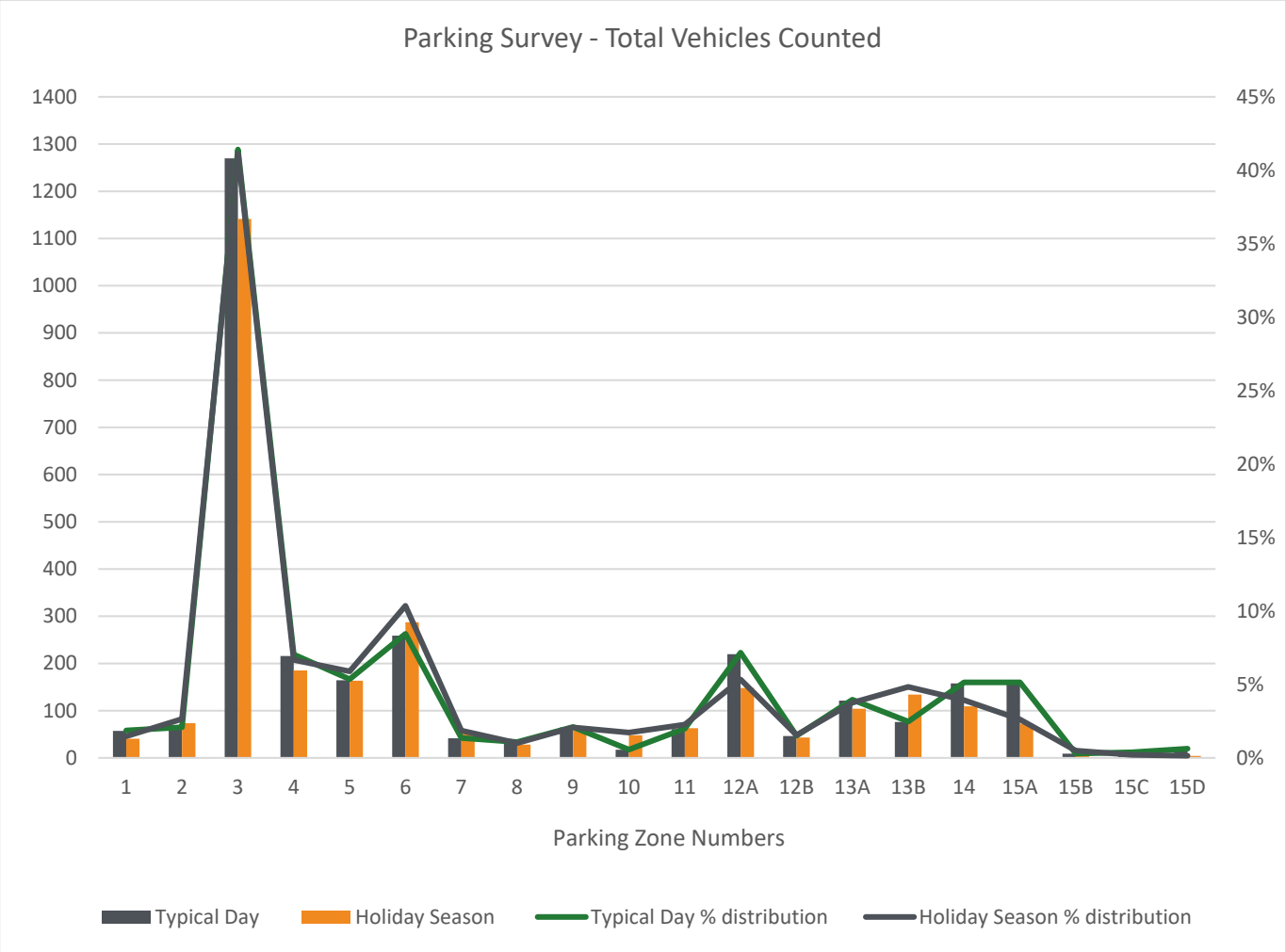


Figure 3: Summary of counted vehicles in each parking zone

Analysis of individual parking zone data indicates;

- 41% of traffic parking in Dunsborough Town Centre are parking in zone 3.
- 8% and 10% of all observed parking traffic on a typical day and holiday season were parked in zone 6.
- 7% of all vehicles parking in the town centre are parking in zone 4.
  During holiday seasons, more vehicles were parked in zones 6, 7,10 and 13B than on a typical day. zone 10 is at walkable distance to Dunsborough Lake Golf Club, Parking zone 7 is the walkable distance to the beach, and 13B is near IGA. Average parking duration of stay for parking zone 7 and 10 are also significantly higher during the holiday season.

2.4 Vehicles Duration of Stay in Parking Zones

The parking duration of stay analysis has also indicated that parking zones located east of Dunsborough Place, and Naturaliste Terrace are more desirable during the holiday seasons and have higher parking duration during this time.

Figure 4 summaries average parking duration of stay for each parking zone within the study area.

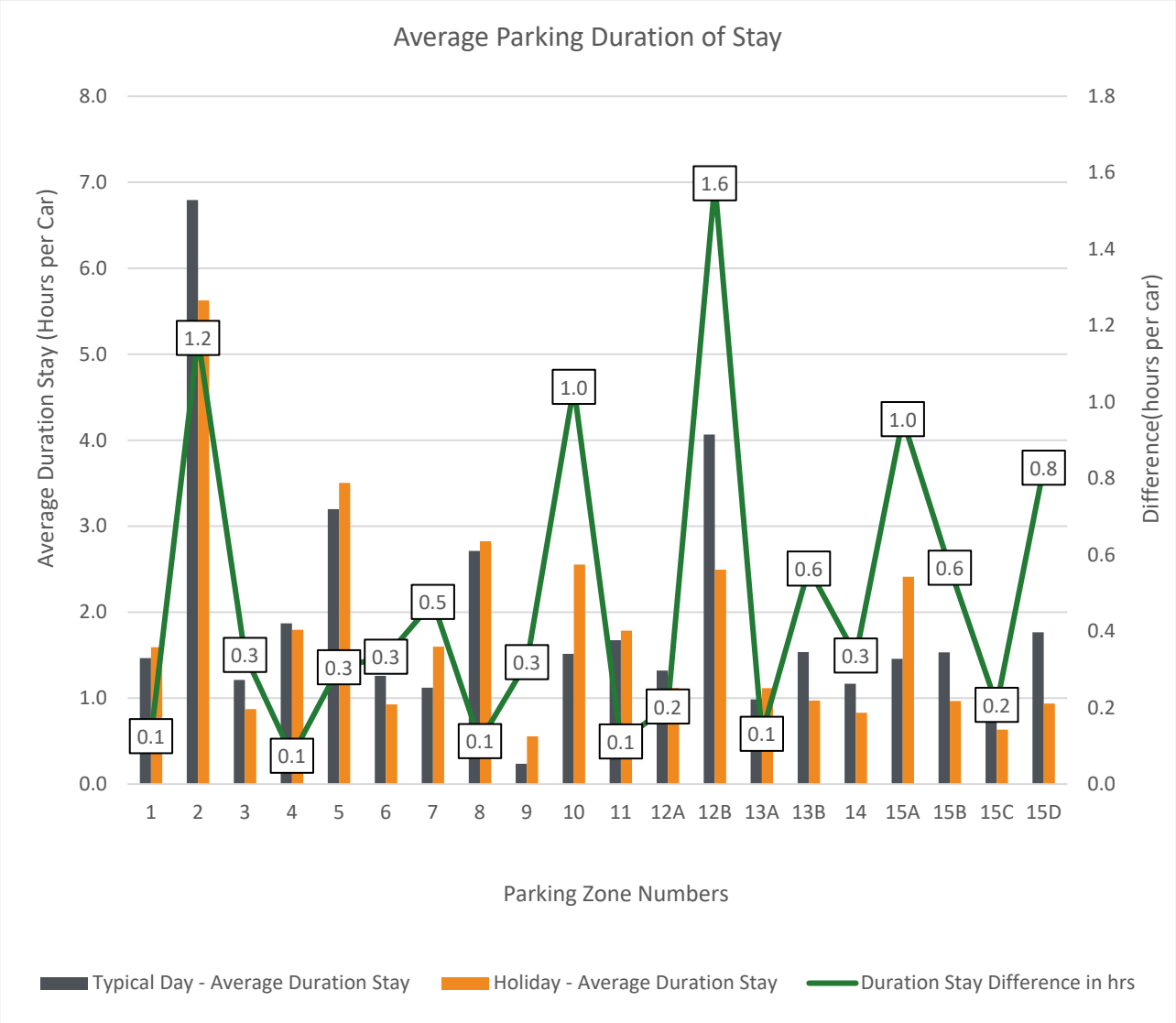


Figure 4: Observed Average Parking Duration of Stays

2.5 Parking Turn Over

70% of car parking zones within the Town Centre has a parking turnover of above one car per parking bay.

Parking turnover for each parking zone is provided in Figure 5, and the following are the critical observations;

- Parking zone 6 has the highest parking turn over, seven cars per space during a holiday peak and 6.3 cars per parking space during a typical day;
- There is no significant turnover difference between typical day and holiday season for parking zone 3. Parking turn over for a typical day is 5.2 cars per space, and during the holiday is 4.7 vehicles per parking bay.
- A holiday and typical day parking turn over difference of above one were observed in parking zones 15A and 14. This difference is due to the low number of parked vehicles during the holiday seasons, as shown and analysed in Figure 3.

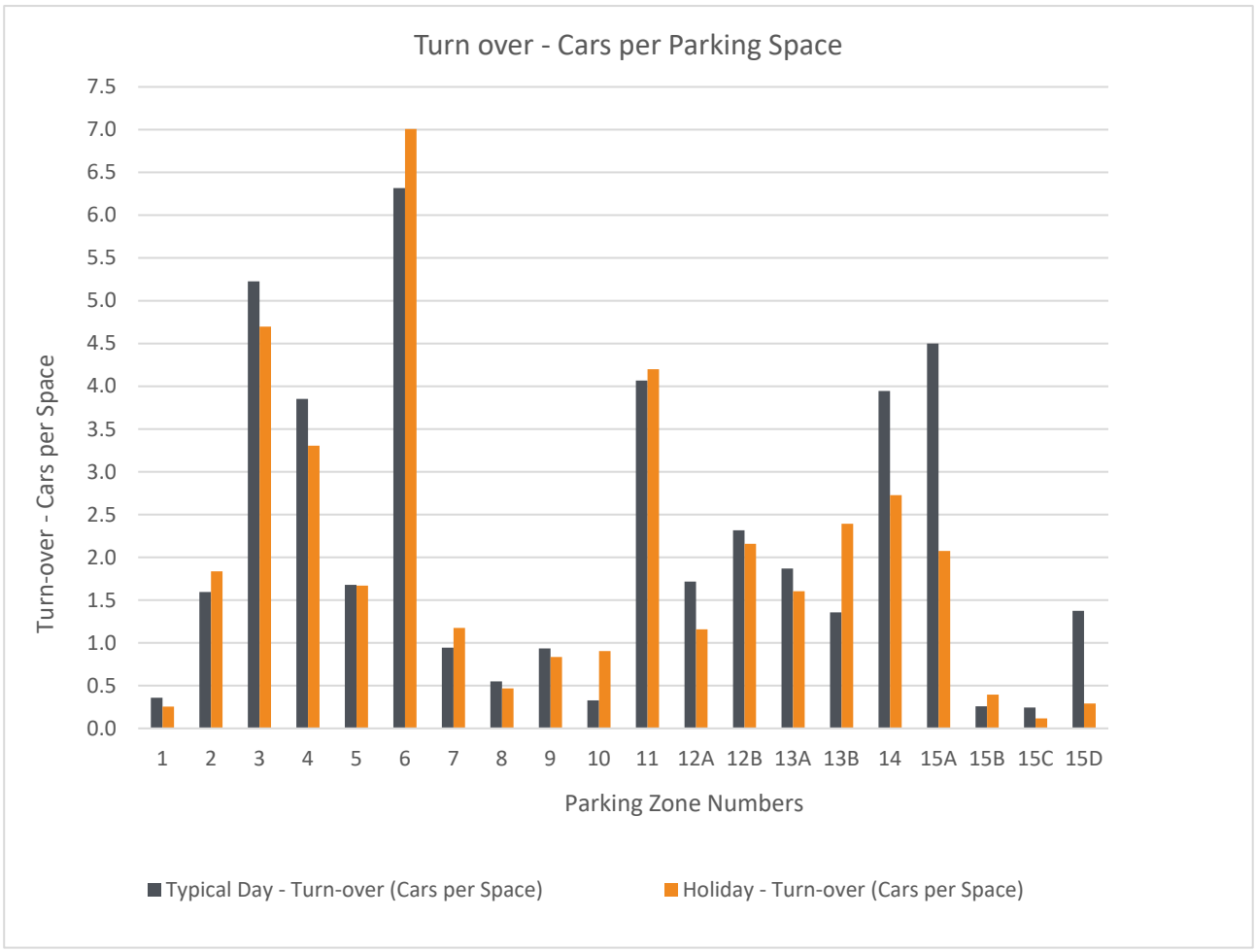


Figure 5: Typical day vs Holiday Season Parking Turn Over Comparison

3 Intersection Capacity Assessment

On the same days as the parking surveys, SMEC collected vehicle turn counts for the following intersections;

- Cape Naturaliste Rd/ Dunn Bay Rd roundabout and
- Naturaliste Terrace/ Dunn Bay Rd roundabout

The period for the turn counts surveys was 07:00 am to 07:00 pm. Table 2 and Table 3 summarise the observed number of vehicles at the Cape Naturaliste Rd/ Dunn Bay Rd roundabout and Naturaliste Terrace/ Dunn Bay Rd roundabout.

Table 2: Observed Vehicles at Cape Naturaliste Rd/ Dunn Bay Rd roundabout

Approach Name	Typical Day	Holiday Season
North Approach Cape Naturaliste Rd	561	730
East Approach Dunn Bay Rd	992	1054
South Approach Petrol Station	281	351
West Approach Caves Rd	1772	1879
Total	**3606**	**4014**

The above data on Table 2 suggests there are about 11% more traffic movements on the Cape Naturaliste Rd/ Dunn Bay Rd roundabout during a holiday season than on a typical day. The increase is due to a significant increase in traffic movements between Caves Rd and Cape Naturaliste Road during the holiday peak.

Table 3: Observed Vehicles at Naturaliste Terrace/ Dunn Bay Rd roundabout

Approach Name	Typical Day	Holiday Season
North Approach Naturaliste Terrace	2497	2338
East Approach Dunn Bay Rd	408	419
South Approach Dunsborough Pl	2223	2299
West Approach Dunn Bay Rd	1078	1096
Total	**6206**	**6152**

The observed turn counts data for Naturaliste Terrace/ Dunn Bay Rd roundabout summarised in Table 3 indicates the typical day has high traffic volumes in comparison to the holiday season. The difference in traffic volumes are notable higher (159 vehicles) on north approach, Naturaliste Terrace, this difference in traffic volumes aligns with the parking data observation summarised in Figure 2 and Figure 3.

3.1 Level of Service

Peak hour turn counts for Cape Naturaliste Rd/ Dunn Bay Rd roundabout are attached in Appendix B, and for Cape Naturaliste Rd/ Dunn Bay Rd roundabout in Appendix C.

Level of Services assessment for both intersections has quantified both intersections perform at Level of Services A. This finding suggests; the roundabouts have no geometric constraints to accommodate the current traffic demands. Therefore, any observed or perceived delays on the two roundabouts would likely to be due to drivers behaviour of vehicles reversing in and out of car parks along Dunn Bay Road and Dunsborough Place.

4 Conclusions

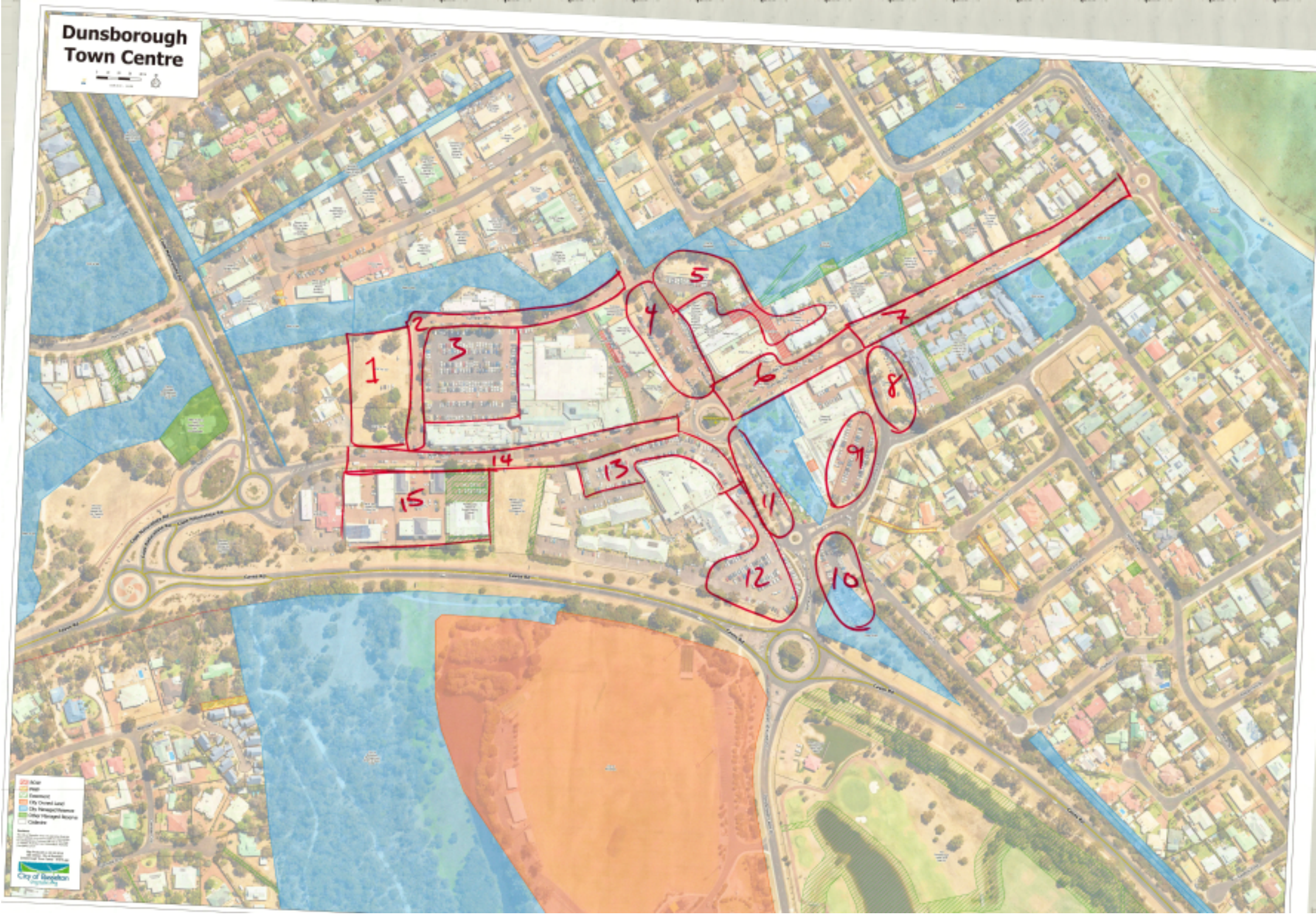
The survey data has indicated that the Dunsborough Town Centre has no shortage of parking supply, and it is likely that the access to town centre car parks is impacted by drivers behaviour of vehicles reversing in and out of car parks along Dunn Bay Road and Dunsborough Place.

The data also suggests that parking demands for the holiday season are lower than that of an average day, and there is no substantial difference in the maximum hourly occupancy rate between a regular day and holiday season. A maximum parking occupancy rate of 43% (565 vehicles) was observed during a typical day in contrast to 42% (565 vehicles) on holiday season.

The analysis has also shown that the majority of vehicles are parking within the given time parking restrictions except for parking zone 4, 11 and 15A (Dunsborough Medical Centre).

Parking utilisation, total hours occupied, and the maximum duration for parking zone 2 is substantially higher in all days, in comparison to other car parks in the town centre, which suggests, the workers use this parking. Parking zone 2 has no restriction on parking times and was occupied for 10.2 hours during a holiday season and 10.8 hours in a typical day. Parking utilisation for this car park was 63% on holiday season and 67% on an average day.

Appendix A: Parking Zone Cells


Dunsborough
Town Centre
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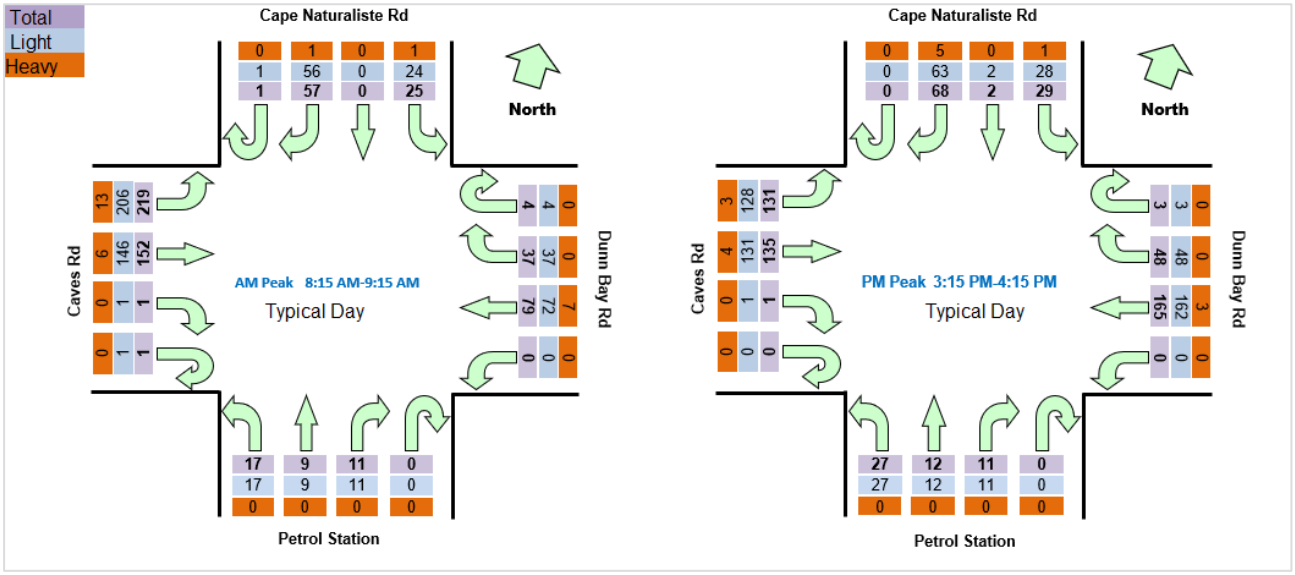
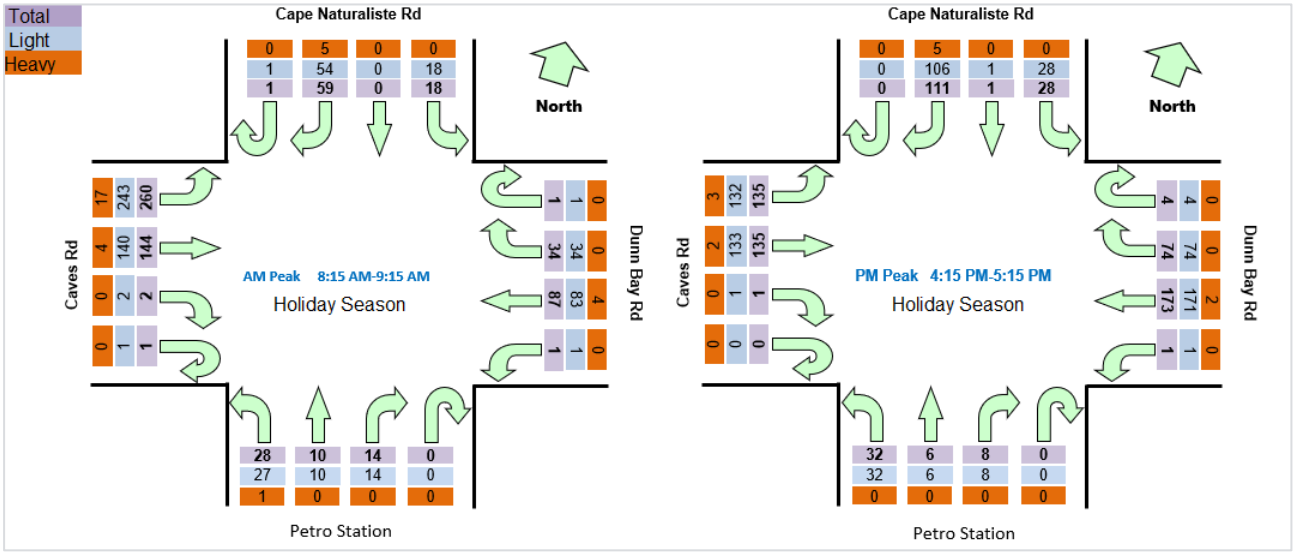
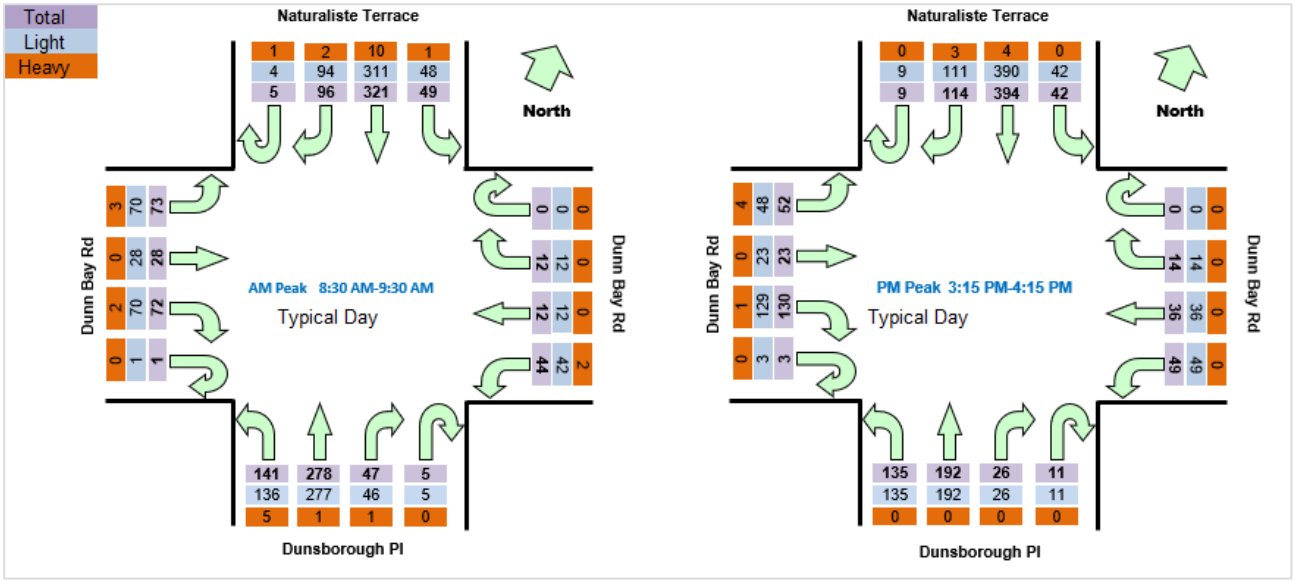
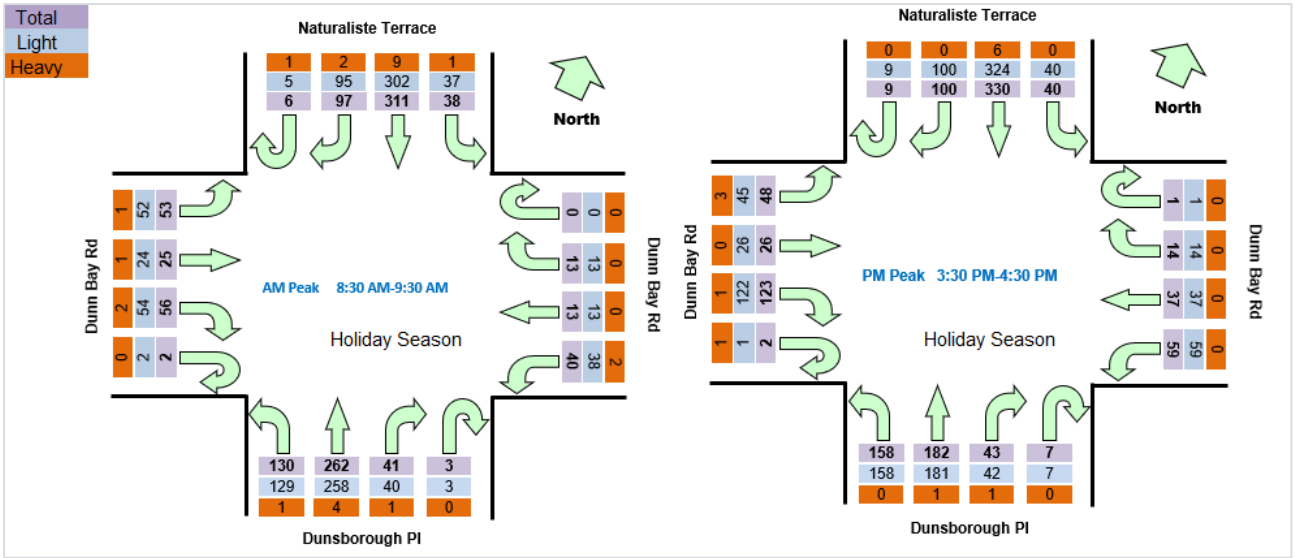
Appendix B: Cape Naturaliste Rd/ Dunn Bay Rd -Turn Counts





Appendix C: Naturaliste Terrace/ Dunn Bay Rd – Turn Counts





Appendix B Dunsborough Town Centre Parking Utilisation and Turnover Survey (Feb 2020)

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Technical Memo

Technical Memo No	0001	**Date of Issue**	06 February 2020
Subject/Title	Dunsborough Town Centre Parking Utilisation and Turnover Survey		
Project Name	Technical Memo	**Project Number**	3006375
Discipline	Transport Planning, Logistics and Analysis		
Document Number	3006375_TM_0001		
Revision Details	02		
Author	Clara Hechei		
Reviewed by	Louise Round		
Approved by	Louise Round		
Prepared for	City of Busselton	**Attention**	Paul Needham & Louise Koroveshi

1.1 Introduction

The City of Busselton (the City) commissioned SMEC Australia Pty Ltd (SMEC) to undertake a supplementary peak parking demand survey for Dunsborough Town Centre. The new survey data will be used to confirm the accuracy of the observed 2019 Easter holiday peak parking demands and to support the development of Dunsborough Town Centre Activity Centre.

The extent of the study area remains the same as the previous survey, and *Figure 1* shows the study area boundaries.

Figure 1: Extent of the study area

This Technical Note documents and compares parking surveys data for two peaks days. To provide completeness of the survey results, the Technical Note for the previous survey results comparisons are attached as Appendix B of this document.

1.2 Data Collection

This Technical Note documents and compares parking demands between Easter holiday peak (Peak Day 1) and end of the year peak (Peak Day 2). On both days, the Parking Occupancy and Duration Survey was undertaken between hours of 6:00 am to 10:00 pm using License Plate Recognition (LPR) technology. Appendix A includes parking zones cells as provided by the City.

A summary of peak survey dates and holidays observed within the survey window time are provided in the below table.

Table 1: Peak Survey Dates and Holidays Observed

PEAK DAY 1	PEAK DAY 2
Wednesday 24 April 2019	Tuesday 7 January 2020
Autumn school holidays: 13 April to 28 April	Summer school holidays: 18 December – 31 January
Easter weekend: 19 April – 22 April	New Year's Day: 1 January
ANZAC Day: 25 April	

A total of 1320 parking supply was counted on Peak Day 1, and a total of 1315 parking supply was observed on the Peak Day 1. A close look at the data has indicated the discrepancy in parking supply is coming from

- Parking Zone 3 (Coles car park) – 1 parking space and
- Parking Zone 9, Dunsborough Park Shopping Centre - Adjacent to Seymour Blvd = 4 Motorbike spaces.

The difference in total parking supply is too insignificant to affect the parking area within Dunsborough Town Centre.

1.3 Overall Parking Observation

A total of 2774 individual vehicles were recorded using town centre car parks on Peak Day 1 survey, which is about 370 fewer vehicles than the parking demands which were counted on Peak Day 2. The 370 vehicles equate to 12% difference in parking demands between the two peaks.

The maximum hourly parking demand for the summer holiday season was 786 vehicles in comparison to 552 vehicles in the Easter holiday period. In the summer holiday season, hourly parking demands above 700 vehicles were observed between 1:15 pm to 3:00 pm. In both surveyed days, parking zone 2 had the maximum utilization rate of 63% on Peak Day 1 and 58% on Peak Day 2.

A Peak Day 1 and Peak Day 2 comparison summary of observed data for all parking zones within the study area are provided in Table 2.

Table 2: Observed Data for all parking zones

	Peak Day 1	Peak Day 2	Difference (Peak Day 2- Peak Day 1)
Parking Turn Over (cars per space)	2.4	2.9	+ 0.5
Average Duration (hrs/car)	2.0	1.7	- 0.3
Maximum Duration (hrs/car)	2.5	2.5	0
Parking Utilization	28%	34%	+ 6%

As shown in Table 2, average parking utilization at the end of the year peak is about 6% higher than that of Easter peak, and parking turn over per bay also increases by 0.5 cars per pay. The parking spaces are occupied longer during the end of the year peak compare to Easter holiday peak.

Hourly occupancy rate comparison between the two surveyed peak days are provided in *Figure 2*. A maximum parking occupancy rate of 60% (786 vehicles) was observed on Peak Day 2 in comparison to 42% (552 vehicles) on Peak Day 1.

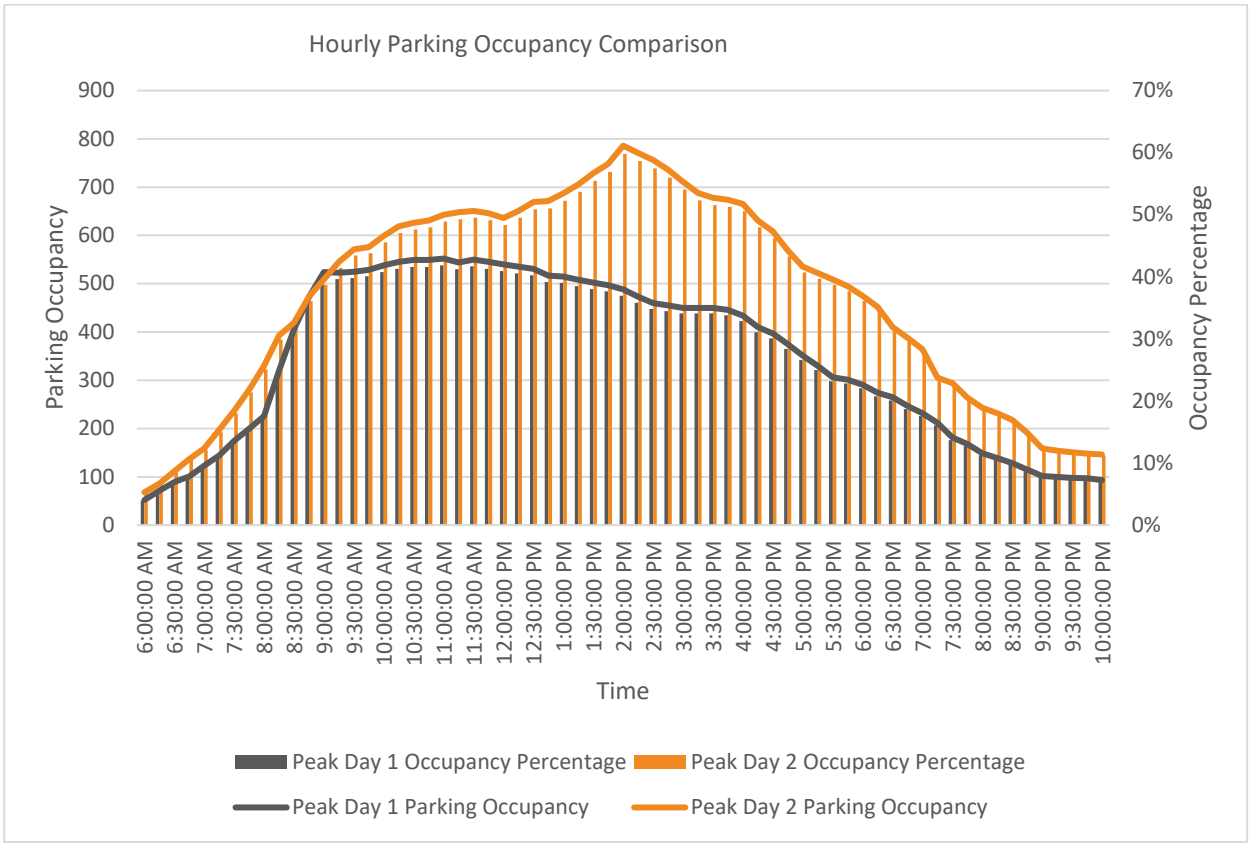


Figure 2: Peak Day 1 vs Peak Day 2 Hourly Parking Occupancy Rates

Analysis of individual zones parking utilization and hours occupied suggests zone 4, 6, 7, 11 and 14 are more utilized and occupied during the end of the year peak in comparison to Easter peak. The absolute parking utilization percentage difference between Peak Day 2 and Peak Day 1 were 18%, 26%, 21%, 26% and 17% for parking zone 4, 6, 7, 11 and 14 respectively.

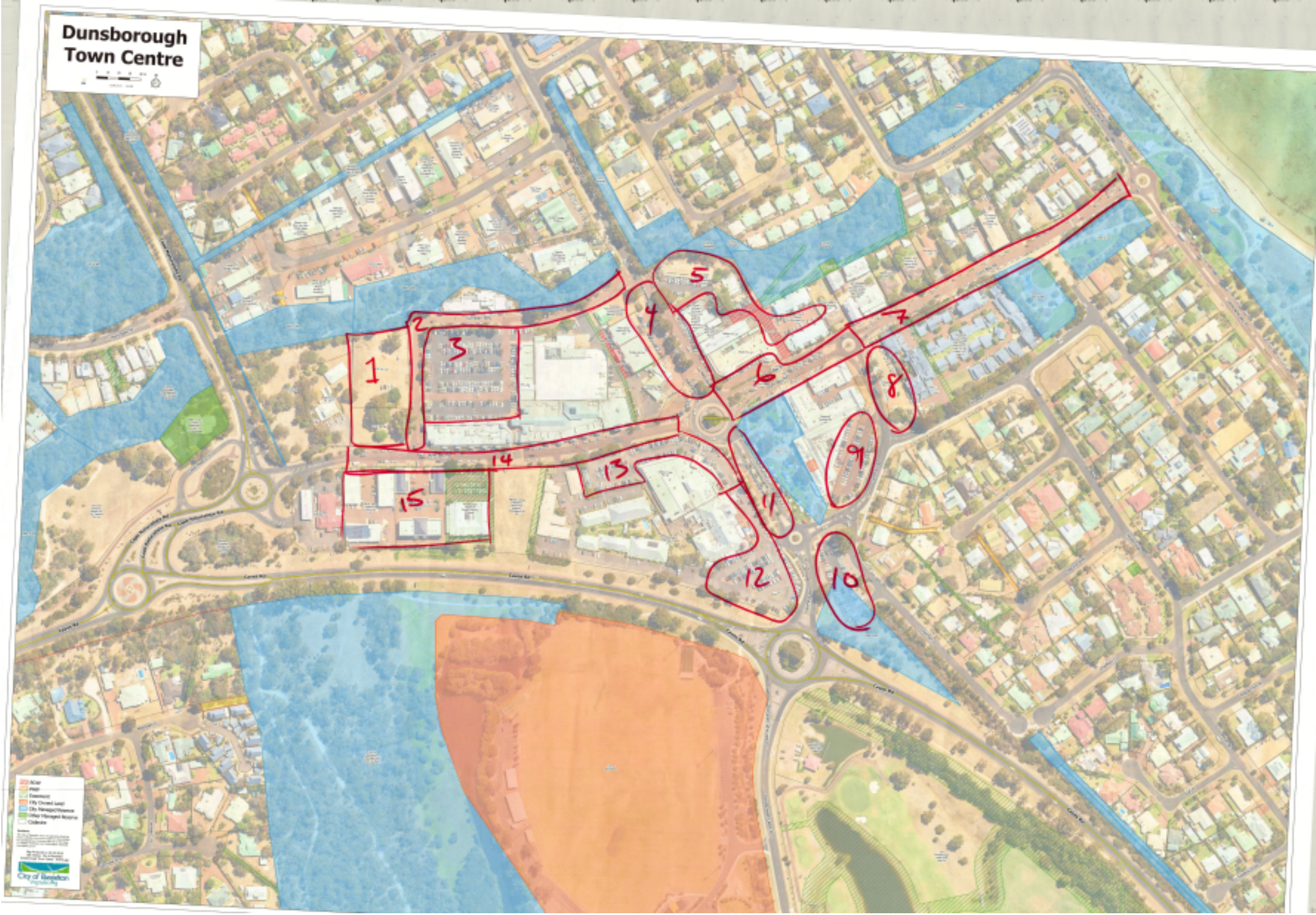
1.4 Conclusions

Dunsborough Town Centre additional peak day survey data has shown higher parking demand at the summer holiday season compared to the Easter holiday period. However, the average parking demand is still only 60% of the supply.

The maximum hourly parking demand for the summer holiday season was 786 vehicles in comparison to 552 vehicles in the Easter holiday period. In the summer holiday season, hourly parking demands above 700 vehicles were observed between 1:15 pm to 3:00 pm.

Assessment of individual parking zone utilisation indicates parking demands for zone 4, 6, 7, 11 and 14 also increase significantly during the end of the year holidays. All these zones are located near the land-use that would likely to attract social and commercial activities during holiday peaks.

Appendix A：Parking Zone Cells


Dunsborough
Town Centre
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Appendix B : Technical Note

Member of the Surbana Jurong Group

local people
global experience

Technical Memo

Technical Memo No	0001	**Date of Issue**	30 July 2019
Subject/Title	Dunsborough Town Centre Parking Utilisation and Turnover Survey		
Project Name	Technical Memo	**Project Number**	3006347
Discipline	Transport Planning, Logistics and Analysis		
Document Number	3006347_TM_0001 - Final		
Revision Details	01		
Author	Clara Hechei		
Reviewed by	Louise Round		
Approved by	David Freer		
Prepared for	City of Busselton	**Attention**	Matthew Riordan

1 Introduction

The City of Busselton (the City) commissioned SMEC Australia Pty Ltd (SMEC) to undertake a Parking and Utilisation study for the Dunsborough Town Centre, Figure 1 shows the extent of parking areas considered in this study.

The scope of the project includes;

a) Undertaking a typical day and a holiday season Parking Occupancy and Duration Survey for all parking within the Dunsborough Town Centre to inform the performance of the existing parking management, identify areas of short and over parking supply, and analyse if there is a need for change in the current parking management plan. The Survey will be used as an input to the Activity Centre Plan for Dunsborough.
b) Capacity assessment of Cape Naturaliste Rd/ Dunn Bay Rd roundabout and Naturaliste Terrace/ Dunn Bay Rd roundabout to identify the need and time for Clark Street connection to Cape Naturaliste Rd.

Figure 1: Extent of the study area

1.1 Data Collection

SMEC collected parking survey data from 6:00 am to 10:00 pm and traffic turn counts data from 07:00 am to 07:00 pm on the following days;

- Wednesday the 24 April 2019 (a holiday season), and
- Wednesday 1 May 2019 (a typical day).

Below are the holiday seasons observed during the survey period window;

- Autumn School holidays: 13 April to 28 April
- Easter weekend: 19 April – 22 April
- ANZAC day: 25 April

2 Parking Survey Analysis

The Parking Occupancy and Duration Survey was undertaken between hours of 6:00 am to 10:00 pm using License Plate Recognition (LPR) technology. Appendix A provides Parking zone cells as provided by the City, which represents a total of 1320 parking supply.

2.1 Overall Parking Observation

A total of 3066 individual vehicles were recorded using town centre car parks on a typical day, which is about 11% higher than the traffic observed in the holiday season (2774 cars).

The table below summaries average observed parking data for all town centre parking zones.

Table 1: Observed Data for all parking zones

	Typical Day	Holiday Season	Difference
Parking Turn Over (cars per space)	2.6	2.4	0.2
Average Duration (hrs/car)	2.1	2.0	0.1
Maximum Duration (hrs/car)	2.8	2.5	0.3
Parking Utilization	32%	28%	4%

The survey data has indicated a slight difference in overall parking utilisation and parking turn over per bay during a typical day and the holiday season.

Further analysis of the data has also suggested, there is no significant difference in maximum hourly occupancy rate between a regular day and holiday. A maximum parking occupancy rate of 43% (565 vehicles) was observed during a typical day in contrast to 42% (565 vehicles) on holiday season. A detailed comparison of hourly parking occupancy rate between a typical day and holiday season is provided in section 2.2.

Parking utilisation, total hours occupied, and the maximum duration for parking zone 2 was noted to be substantially higher in all days, in comparison to any other car parks in the town centre. Parking utilisation for this car park was 63% on holiday season and 67% on an average day. Parking zone 2 has no restriction on parking times and was occupied for 10.2 hours during a holiday season and 10.8 hours in a typical day. This finding suggests that the workers in the town centre are likely to be using this parking.

2.2 Hourly Parking Occupancy Rate

Figure 2 below provides a detailed comparison of hourly parking occupancy rate between a typical day and holiday season.

In summary Figure 2 illustrates;

- The highest parking demands during the holiday season appears earlier than that of a typical day and decline quicker than parking demands for a typical day.
- A regular day has a parking occupancy rate of above 20% between hours of 07:45 am to 07:15 pm and the peak parking occupancy rate of 40% and above occurs between 10:15 am and 02:30 pm.
- During the holiday season, parking occupancy rate above 20% occurs between hours of 08:15 am and 06:30 pm and parking occupancy rate above 40% occurs between hours of 09:00 am and 12:30 pm.

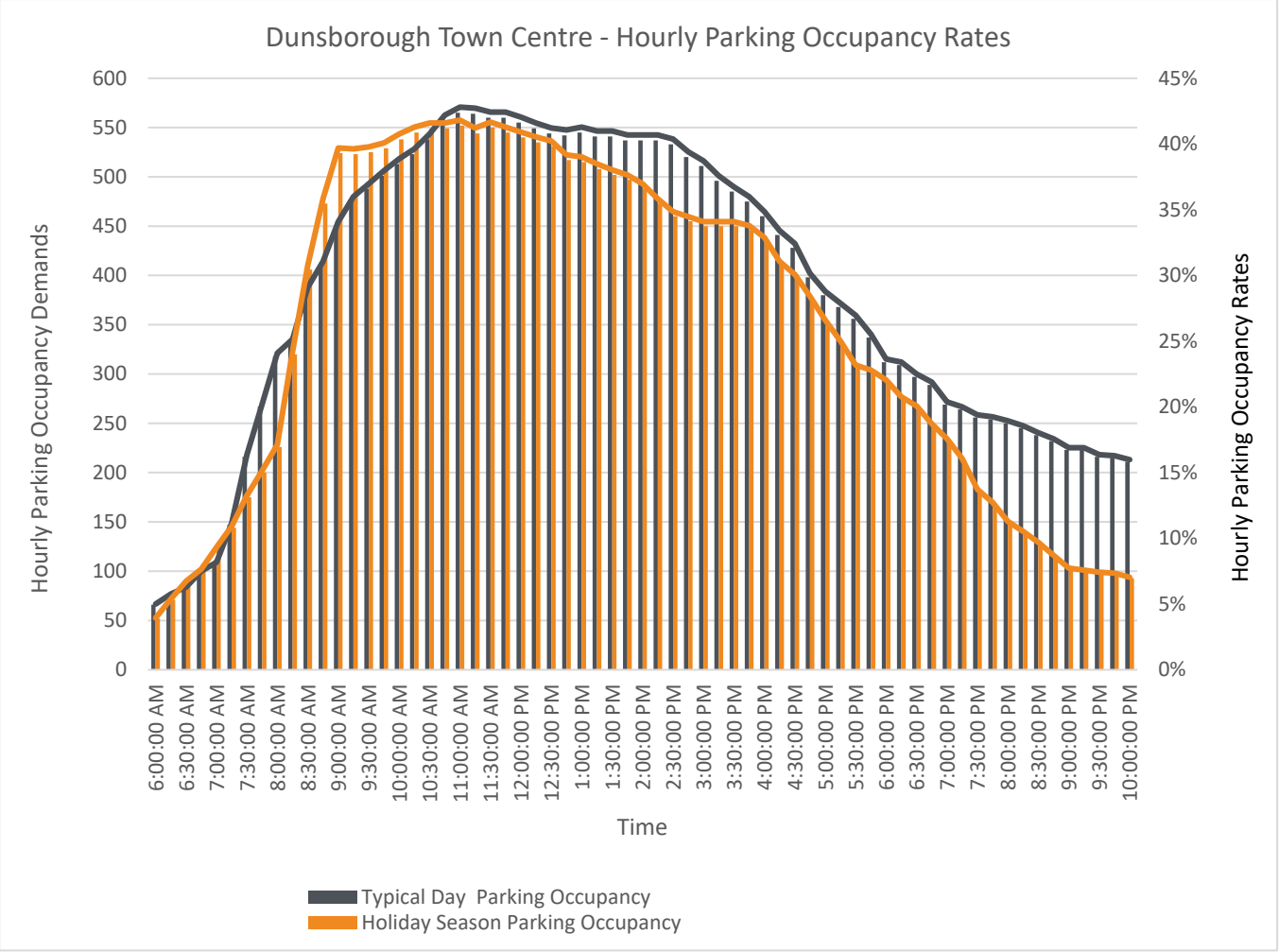


Figure 2: Observed 06:00 am to 10:00 pm hourly parking occupancy rate

2.3 Parking Zones Utilisation

Figure 3 summarises the total number of vehicles observed accessing the car parks during the survey period and their equivalent percentage to the total surveyed vehicles to that day.

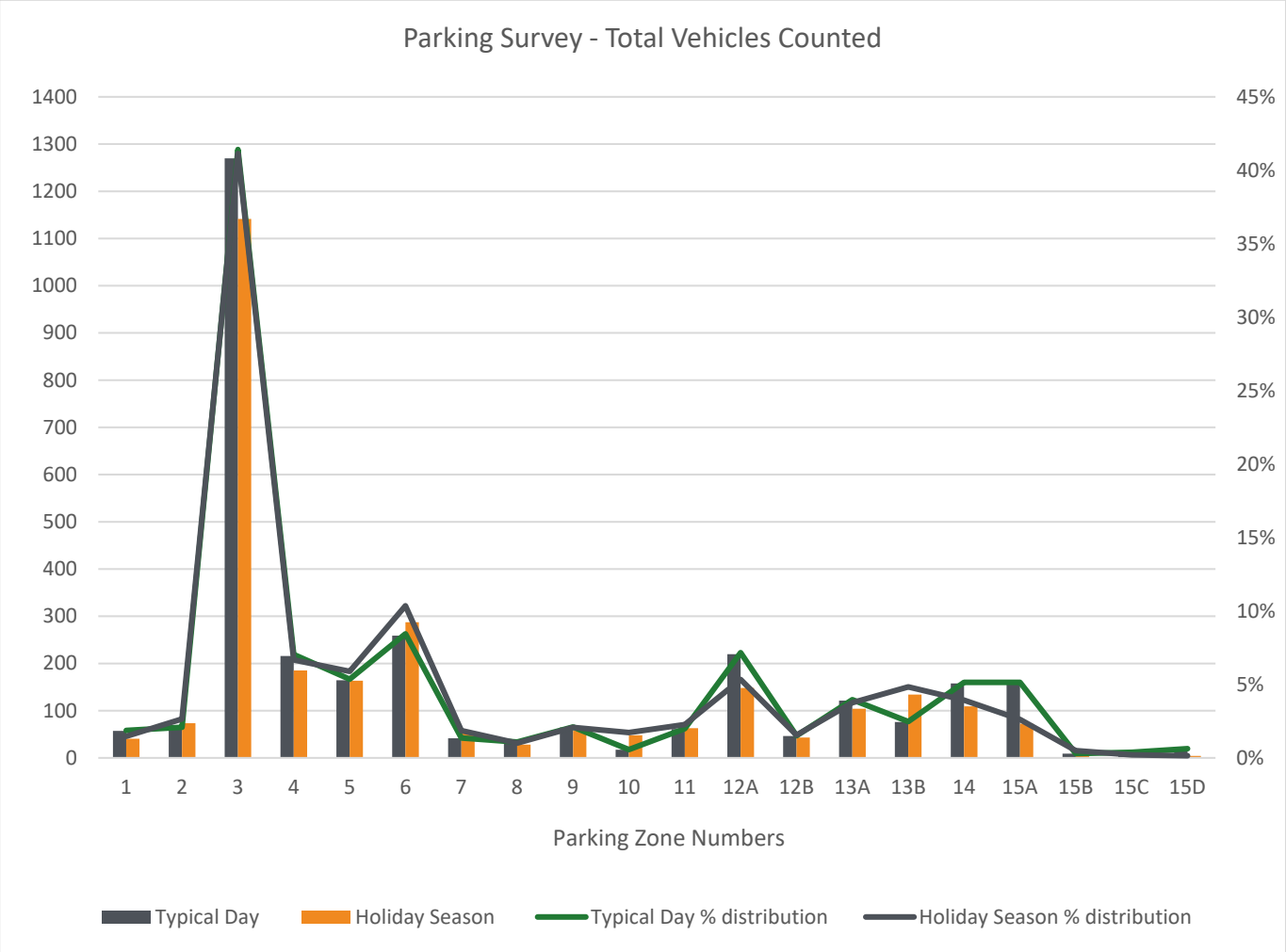


Figure 3: Summary of counted vehicles in each parking zone

Analysis of individual parking zone data indicates;

- 41% of traffic parking in Dunsborough Town Centre are parking in zone 3.
- 8% and 10% of all observed parking traffic on a typical day and holiday season were parked in zone 6.
- 7% of all vehicles parking in the town centre are parking in zone 4.
  During holiday seasons, more vehicles were parked in zones 6, 7,10 and 13B than on a typical day. zone 10 is at walkable distance to Dunsborough Lake Golf Club, Parking zone 7 is the walkable distance to the beach, and 13B is near IGA. Average parking duration of stay for parking zone 7 and 10 are also significantly higher during the holiday season.

2.4 Vehicles Duration of Stay in Parking Zones

The parking duration of stay analysis has also indicated that parking zones located east of Dunsborough Place, and Naturaliste Terrace are more desirable during the holiday seasons and have higher parking duration during this time.

Figure 4 summaries average parking duration of stay for each parking zone within the study area.

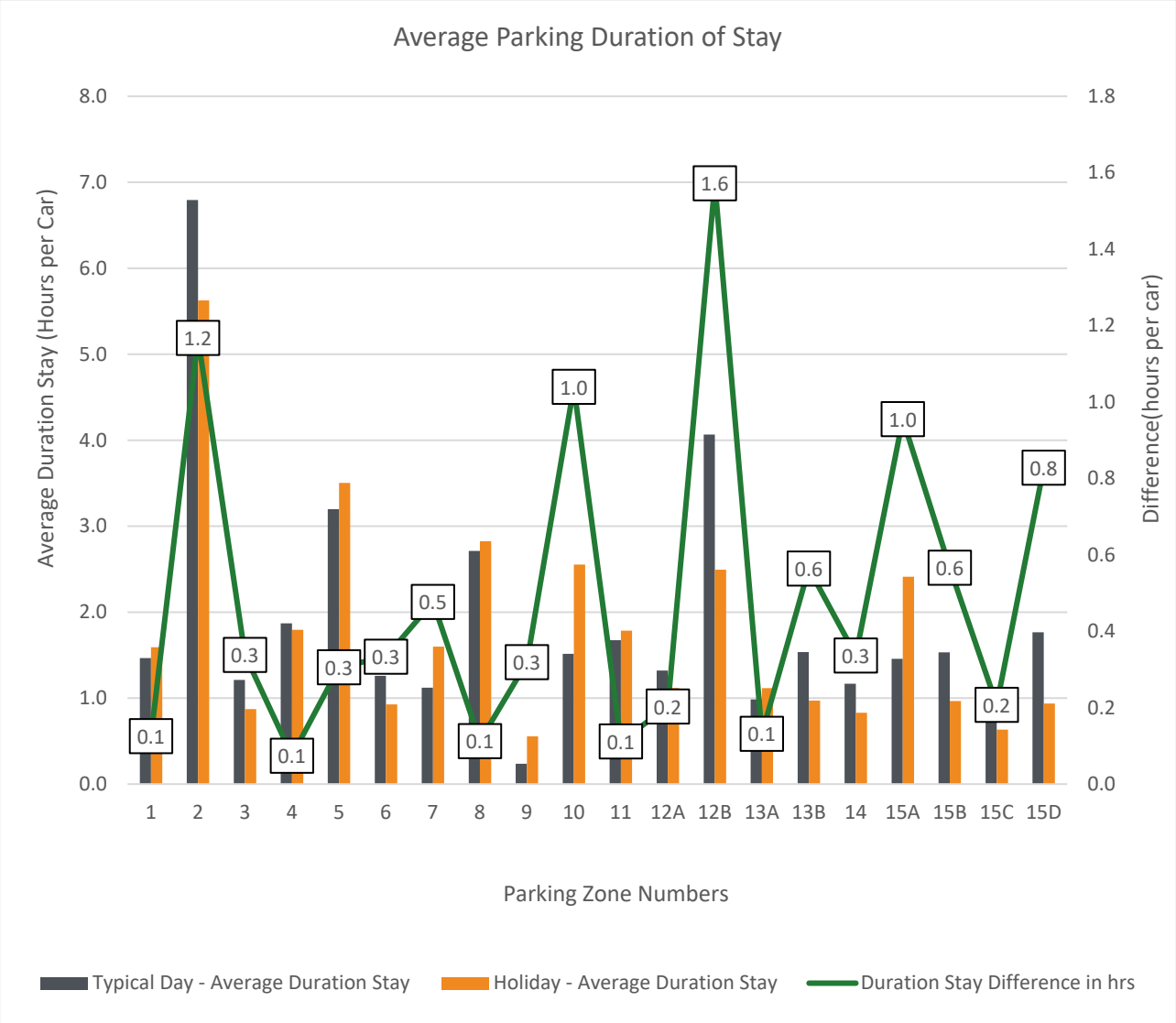


Figure 4: Observed Average Parking Duration of Stays

2.5 Parking Turn Over

70% of car parking zones within the Town Centre has a parking turnover of above one car per parking bay.

Parking turnover for each parking zone is provided in Figure 5, and the following are the critical observations;

- Parking zone 6 has the highest parking turn over, seven cars per space during a holiday peak and 6.3 cars per parking space during a typical day;
- There is no significant turnover difference between typical day and holiday season for parking zone 3. Parking turn over for a typical day is 5.2 cars per space, and during the holiday is 4.7 vehicles per parking bay.
- A holiday and typical day parking turn over difference of above one were observed in parking zones 15A and 14. This difference is due to the low number of parked vehicles during the holiday seasons, as shown and analysed in Figure 3.

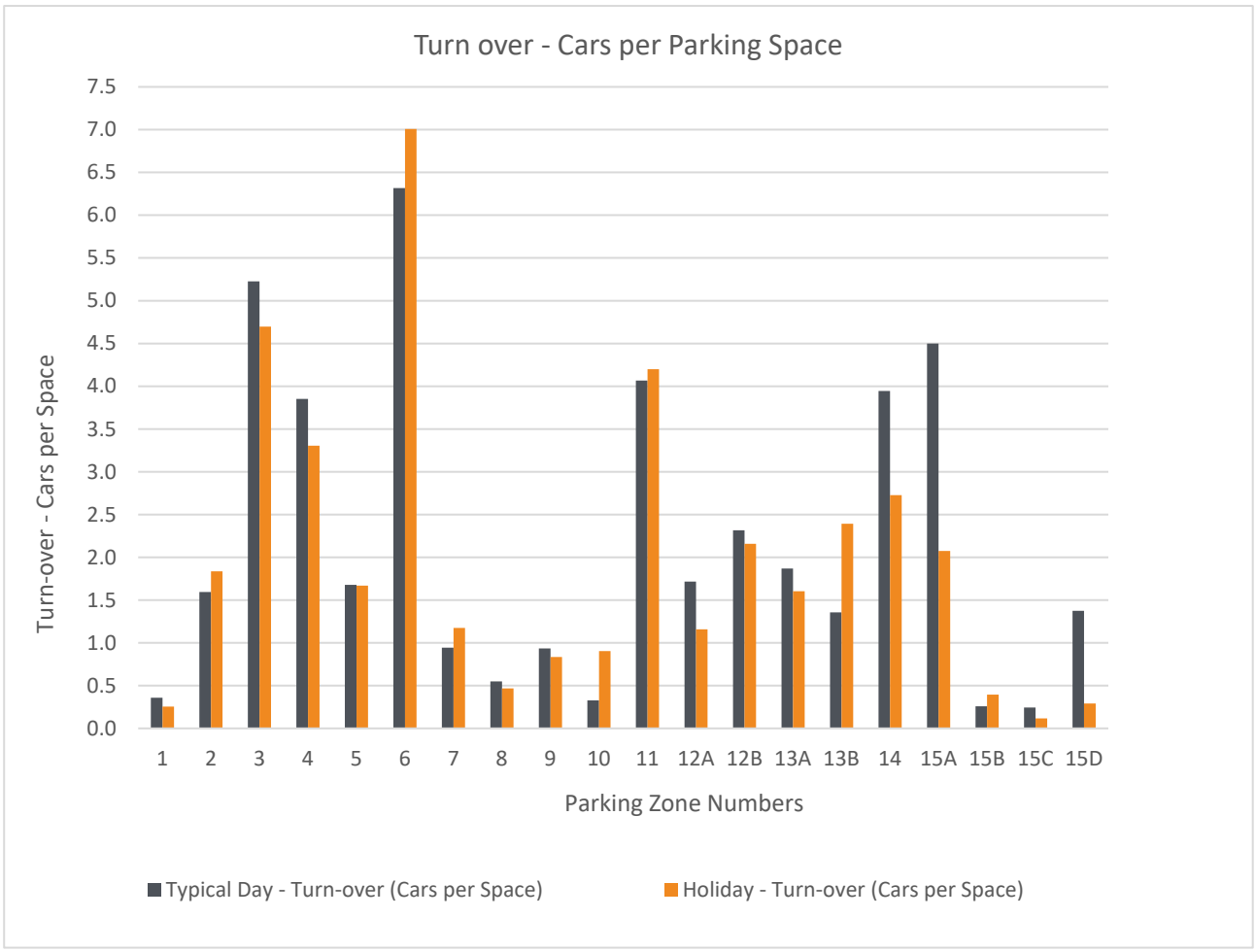


Figure 5: Typical day vs Holiday Season Parking Turn Over Comparison

3 Intersection Capacity Assessment

On the same days as the parking surveys, SMEC collected vehicle turn counts for the following intersections;

- Cape Naturaliste Rd/ Dunn Bay Rd roundabout and
- Naturaliste Terrace/ Dunn Bay Rd roundabout

The period for the turn counts surveys was 07:00 am to 07:00 pm. Table 2 and Table 3 summarise the observed number of vehicles at the Cape Naturaliste Rd/ Dunn Bay Rd roundabout and Naturaliste Terrace/ Dunn Bay Rd roundabout.

Table 2: Observed Vehicles at Cape Naturaliste Rd/ Dunn Bay Rd roundabout

Approach Name	Typical Day	Holiday Season
North Approach Cape Naturaliste Rd	561	730
East Approach Dunn Bay Rd	992	1054
South Approach Petrol Station	281	351
West Approach Caves Rd	1772	1879
Total	**3606**	**4014**

The above data on Table 2 suggests there are about 11% more traffic movements on the Cape Naturaliste Rd/ Dunn Bay Rd roundabout during a holiday season than on a typical day. The increase is due to a significant increase in traffic movements between Caves Rd and Cape Naturaliste Road during the holiday peak.

Table 3: Observed Vehicles at Naturaliste Terrace/ Dunn Bay Rd roundabout

Approach Name	Typical Day	Holiday Season
North Approach Naturaliste Terrace	2497	2338
East Approach Dunn Bay Rd	408	419
South Approach Dunsborough Pl	2223	2299
West Approach Dunn Bay Rd	1078	1096
Total	**6206**	**6152**

The observed turn counts data for Naturaliste Terrace/ Dunn Bay Rd roundabout summarised in Table 3 indicates the typical day has high traffic volumes in comparison to the holiday season. The difference in traffic volumes are notable higher (159 vehicles) on north approach, Naturaliste Terrace, this difference in traffic volumes aligns with the parking data observation summarised in Figure 2 and Figure 3.

3.1 Level of Service

Peak hour turn counts for Cape Naturaliste Rd/ Dunn Bay Rd roundabout are attached in Appendix B, and for Cape Naturaliste Rd/ Dunn Bay Rd roundabout in Appendix C.

Level of Services assessment for both intersections has quantified both intersections perform at Level of Services A. This finding suggests; the roundabouts have no geometric constraints to accommodate the current traffic demands. Therefore, any observed or perceived delays on the two roundabouts would likely to be due to drivers behaviour of vehicles reversing in and out of car parks along Dunn Bay Road and Dunsborough Place.

4 Conclusions

The survey data has indicated that the Dunsborough Town Centre has no shortage of parking supply, and it is likely that the access to town centre car parks is impacted by drivers behaviour of vehicles reversing in and out of car parks along Dunn Bay Road and Dunsborough Place.

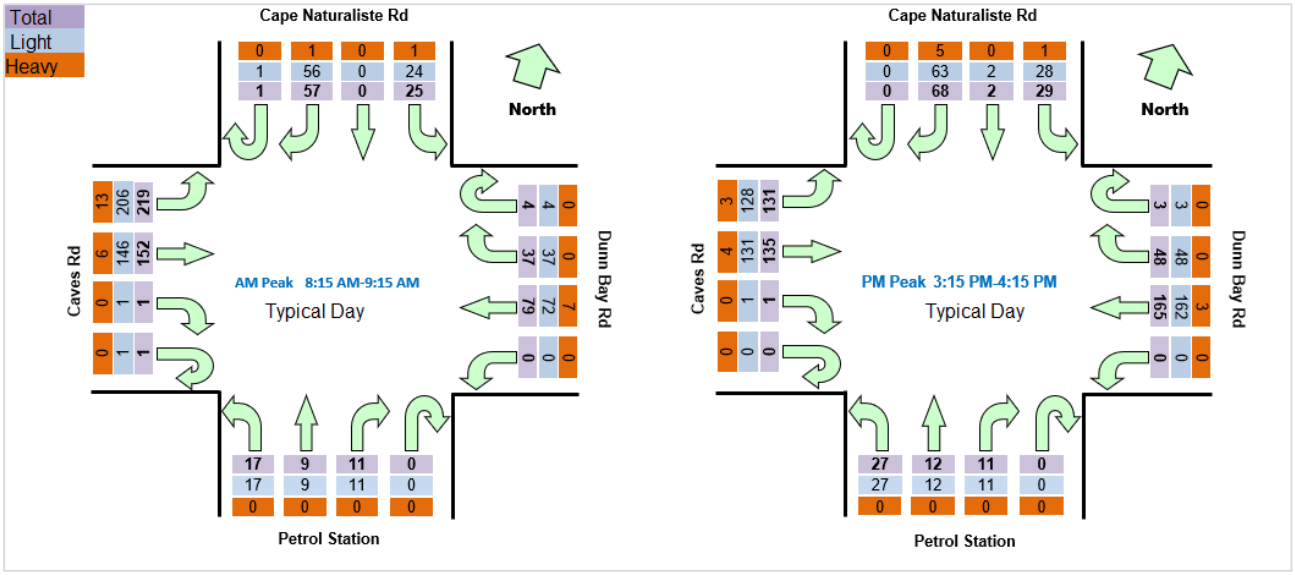
The data also suggests that parking demands for the holiday season are lower than that of an average day, and there is no substantial difference in the maximum hourly occupancy rate between a regular day and holiday season. A maximum parking occupancy rate of 43% (565 vehicles) was observed during a typical day in contrast to 42% (565 vehicles) on holiday season.

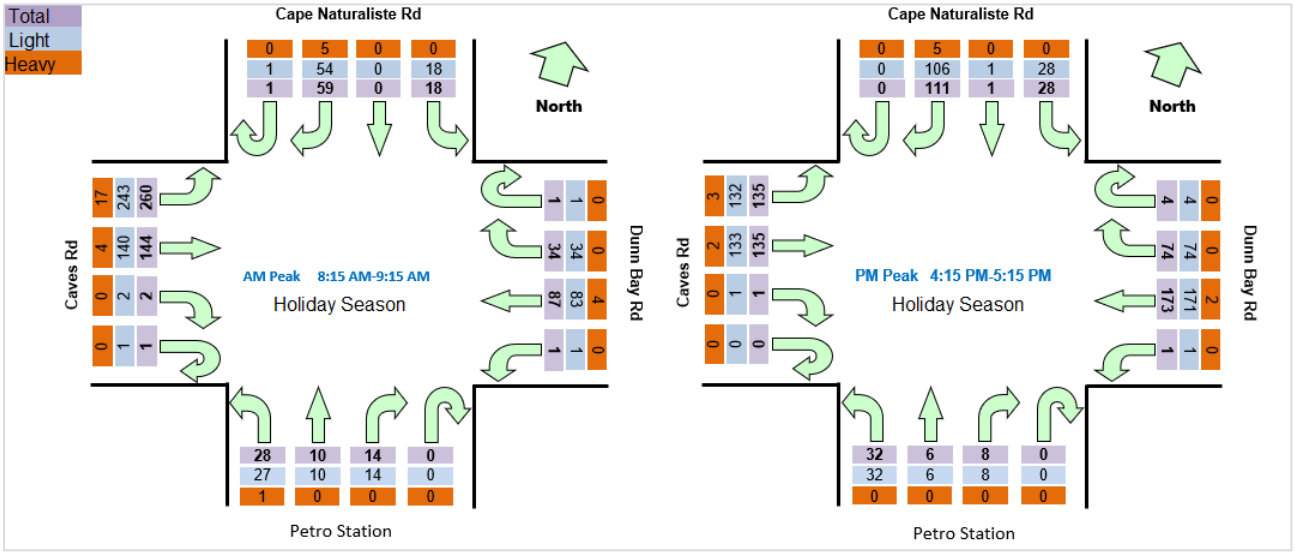
The analysis has also shown that the majority of vehicles are parking within the given time parking restrictions except for parking zone 4, 11 and 15A (Dunsborough Medical Centre).

Parking utilisation, total hours occupied, and the maximum duration for parking zone 2 is substantially higher in all days, in comparison to other car parks in the town centre, which suggests, the workers use this parking. Parking zone 2 has no restriction on parking times and was occupied for 10.2 hours during a holiday season and 10.8 hours in a typical day. Parking utilisation for this car park was 63% on holiday season and 67% on an average day.

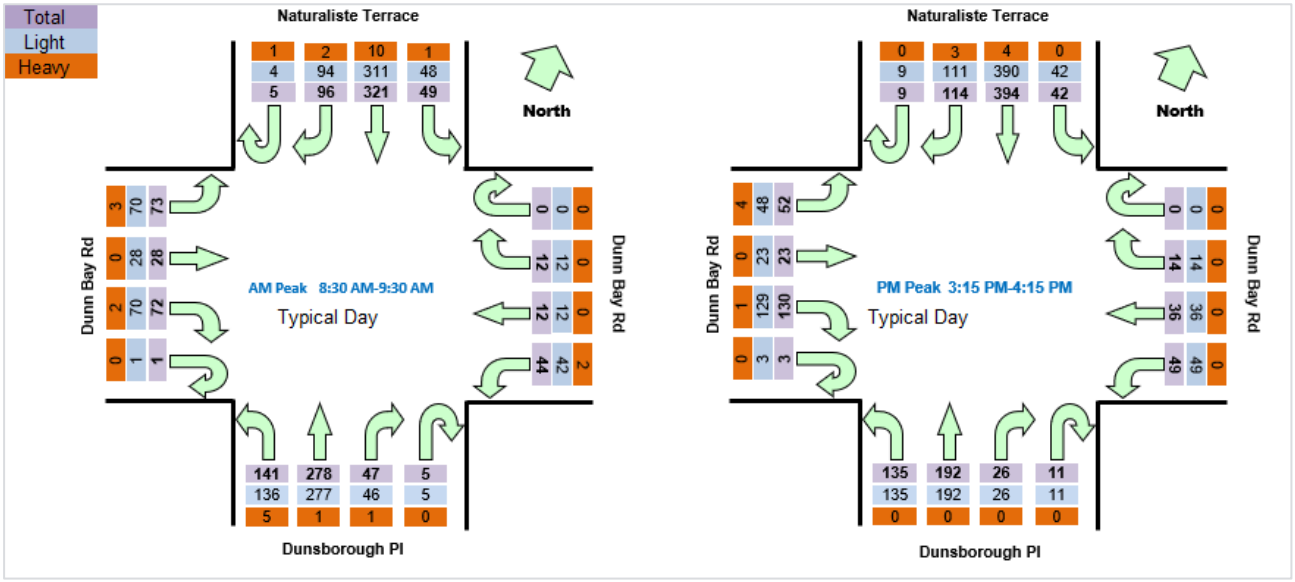
Appendix A: Parking Zone Cells

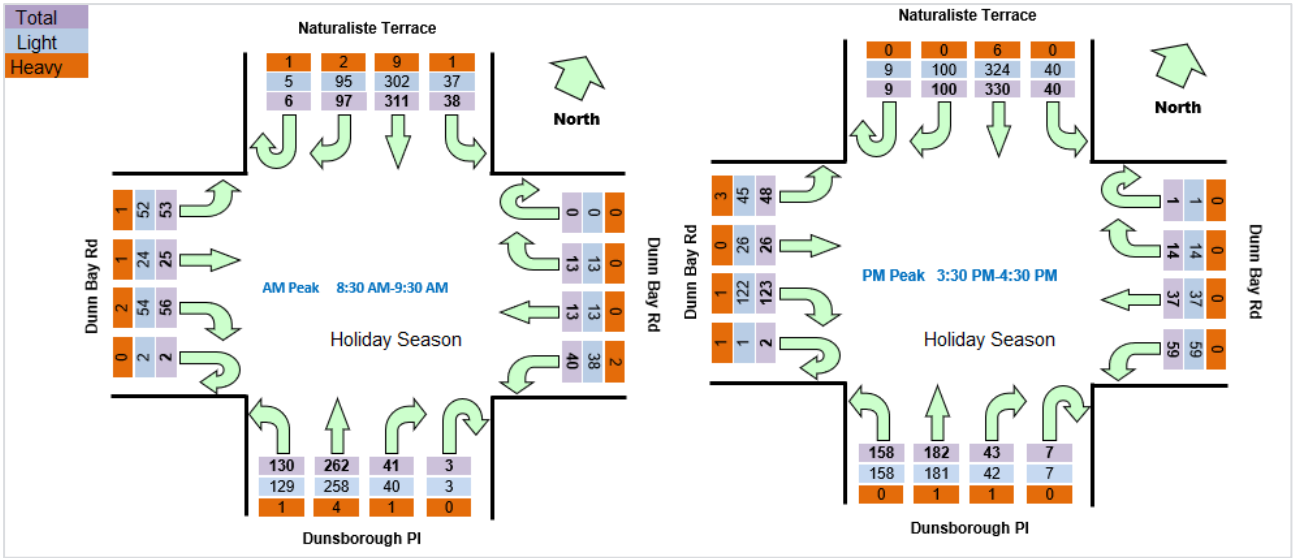
Appendix B: Cape Naturaliste Rd/ Dunn Bay Rd -Turn Counts





Appendix C: Naturaliste Terrace/ Dunn Bay Rd – Turn Counts





Appendix D Base Parking Demand for Future Years (July 2020)

Technical Memo

Technical Memo No	TM0002	Date of Issue	27 July 2020
Subject/Title	Base Parking Demand for Future Years		
Project Name	Projected Future Car Parking Needs	Project Number	3006375
Discipline	Transport Planning		
Document Number	3006375_TM_0002		
Revision Details	FINAL		
Author	Louise ROUND		
Reviewed by	Clara Hechei		
Approved by	James Parrott		
Prepared for	City of Busselton	Attention to	Louise Koroveshi
Attachments			

1 Purpose

The purpose of this Technical Memo is to work with the City to develop specific base year parking demand conditions for the Busselton City Centre and Dunsborough Town Centre. The base conditions are highly dependent on the variation between the 'peak' and 'non-peak' parking demands, which have been determined by survey data.

2 Introduction

2.1 Background

An important part of parking supply is the difference between the 'peak' and 'non-peak'. Providing for the 'peak' can leave large areas of land unused during the majority of the year. This is balanced by the local businesses' assertion that they lose business in the 'peak' due to a lack of parking. Striking the right balance is a key part of the Activity Centre planning process.

This Technical Memo should be read in conjunction with the previous Technical Memos: Dunsborough Town Centre Parking Utilisation and Turnover Survey (Feb 2020) and Busselton City Centre Parking Utilisation and Turnover Survey (Mar 2020).

2.2 Objectives

The objective of this Technical Memo is to present the methodology that SMEC has used to derive the base demands and consequently obtain agreement from the City for the proposed demands.

The base demands are important as they will form a basis for future demands used in other projects encompassing these areas. As such, SMEC has allowed two weeks in the project timeline as hold point to allow the City to review and agree the base demands.

2.3 Scope

The scope of this memo is as follows:

- Summarise existing parking
- Discussion on industry standards for parking capacity
- Proposed Base Demand

3 Dunsborough Existing Parking

Demand and supply for parking in Dunsborough Town Centre is given in Table 1, showing maximum hourly demand. The peak season survey was conducted on 7 January 2020, and the non-peak survey was conducted on 1 May 2019.

Table 1 - Dunsborough Parking Occupancy

	Peak Season	Non-peak Season
Maximum hourly demand	786	565
Supply	1315	1320
Occupancy	60%	43%

During the hour of maximum demand (14:00) in the peak season there is an ample supply of parking.

3.1 High Demand Areas

During the peak season, in Dunsborough there are three parking areas that have a maximum hourly demand in excess of 85% of supply, refer Table 2.

Table 2 - Dunsborough High Demand Areas

Peak Season	Area 3 – Coles Car Park – Adjacent to Cyrillean Way	Area 4 – Naturaliste Terrace - Adjacent to Cyrillean Way	Area 6 – Dunn Bay Road – Dunsborough Place to Seymour Boulevard
Maximum hourly demand (13:30 – 14:30)	206	54	40
Supply	242	56	41
Occupancy	86%	96%	98%

All these zones are located near the land-use that would likely to attract social and commercial activities during holiday peaks, refer Figure 1. Closer analysis shows that only Area 4 – Naturaliste Terrace and Area 6 – Dunn Bay Road have prolonged demand above 85% occupancy.

Figure 1 - Dunsborough Central Parking Areas

Area 4 has high demand between 09:15 and 14:45. Area 6 has high demand between 12:45 and 15:15.

3.2 Comparison of Peak and Non-peak Demand

In the Dunsborough Town Centre the parking demand is over 500 spaces across the morning and into the afternoon in both the peak and non-peak (09:45 to 15:00). During the peak day, demand is over 600 spaces for most of the working day (10:00 to 16:30). However, demand in the non-peak does not reach 600 spaces, refer Figure 2.

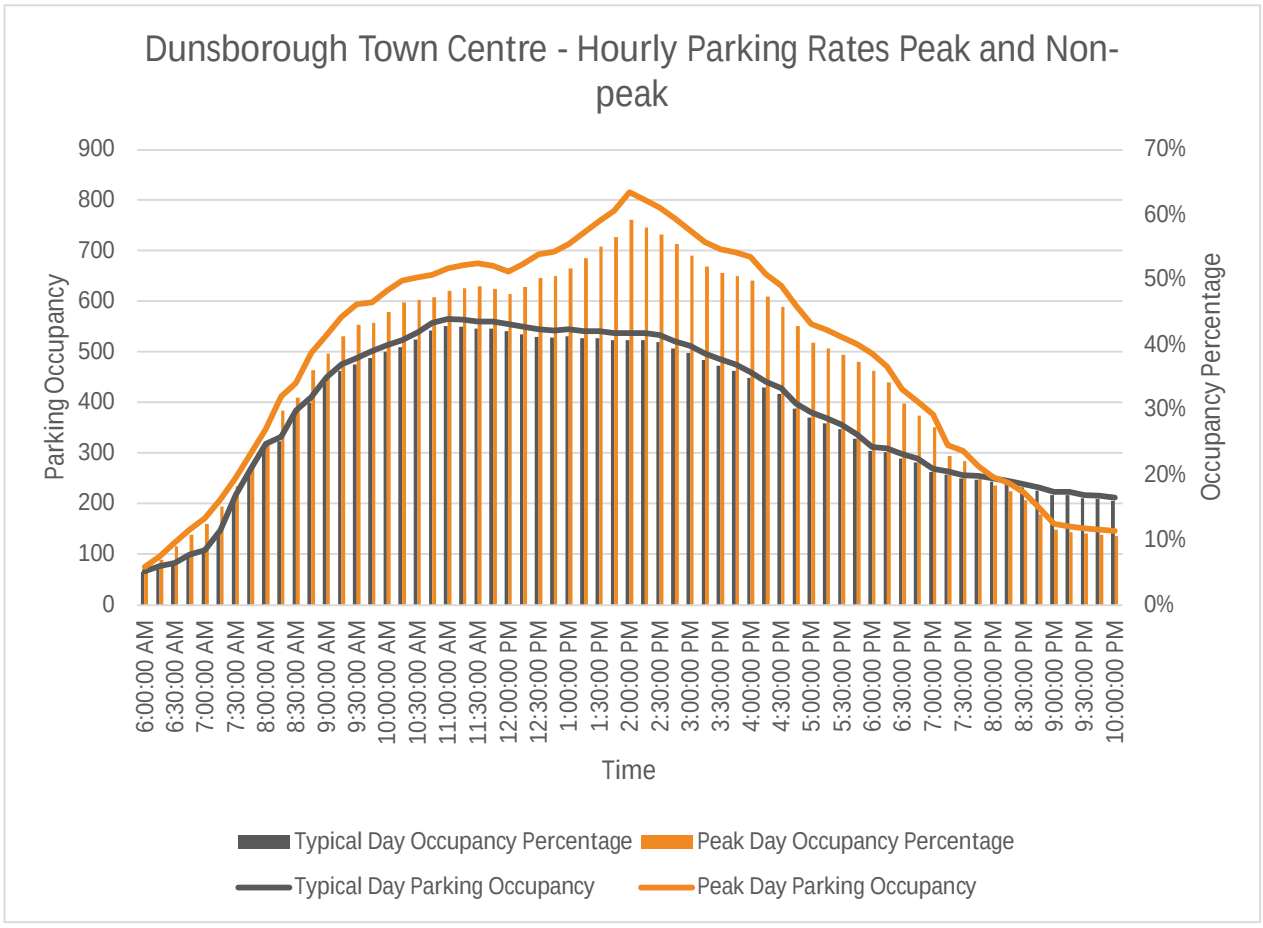


Figure 2 - Dunsborough Comparison of Demands

In the peak, parking demand is over 700 spaces in the early afternoon (13:00 and 15:30). Figure 2 shows this as a clear peak in demand, in comparison to non-peak which has a steady demand.

4 Busselton Existing Parking

Demand and supply for parking in Busselton is given in Table 3, showing maximum hourly demand. The peak season survey was conducted on 7 January 2020, and the non-peak survey was conducted on 4 December 2019.

Table 3 - Busselton Parking Occupancy

	Peak Season	Non-peak Season
Maximum hourly demand	2126	1960
Supply	3774	3774
Occupancy	56%	52%

During the hour of maximum demand (12:00) in the peak season there is ample supply of parking.

4.1 High Demand Areas – Peak Season

Within Busselton there are several areas that are fully occupied for much of the day in the peak season, refer to Table 4. This high demand is centred on the Busselton Jetty and Queens Street. During the non-peak these areas also have high demand, with many of these areas being over 85% occupied.

Table 4 – Busselton High Demand Areas

Peak Season	Area 1 – Busselton Jetty Car Park	Area 2 – Foreshore Parade (west) and Queens Street (north)	Area 3 – Busselton Tennis Courts	Area 4 – Car Park between Marine Tce – Foreshore Parade	Area 36 – Coles Car Park
Maximum hourly demand (14:00-15:00)	216	24	95	310	112 (12:00-13:00)
Supply	249	24	104	324	117
Occupancy	87%	100%	91%	96%	96%

The high demand is centred around Busselton Jetty, as would be expected in the peak season, refer to Figure 3 for parking locations. Coles car park, in the town centre, is the other high demand area.

Figure 3 - Busselton Jetty High Demand Areas

The only car park that has extended high demand is Area 2. From 10:15 to 18:15 the car park has over 85% occupancy.

4.2 High Demand Areas – Non-peak Season

In Busselton in the Non-peak Season, only the Coles car park reaches over 85% occupancy for more than an hour. This is from 11:30 to 12:45.

4.3 Comparison of Peak and Non-Peak Demand

Parking demand in the Busselton City Centre is reasonably consistent across the working day. There is demand for over 1,900 spaces in the middle of the day in both the peak and non-peak (11:45 to 14:00). During the peak day, demand is over 2,000 spaces during this time for the peak.

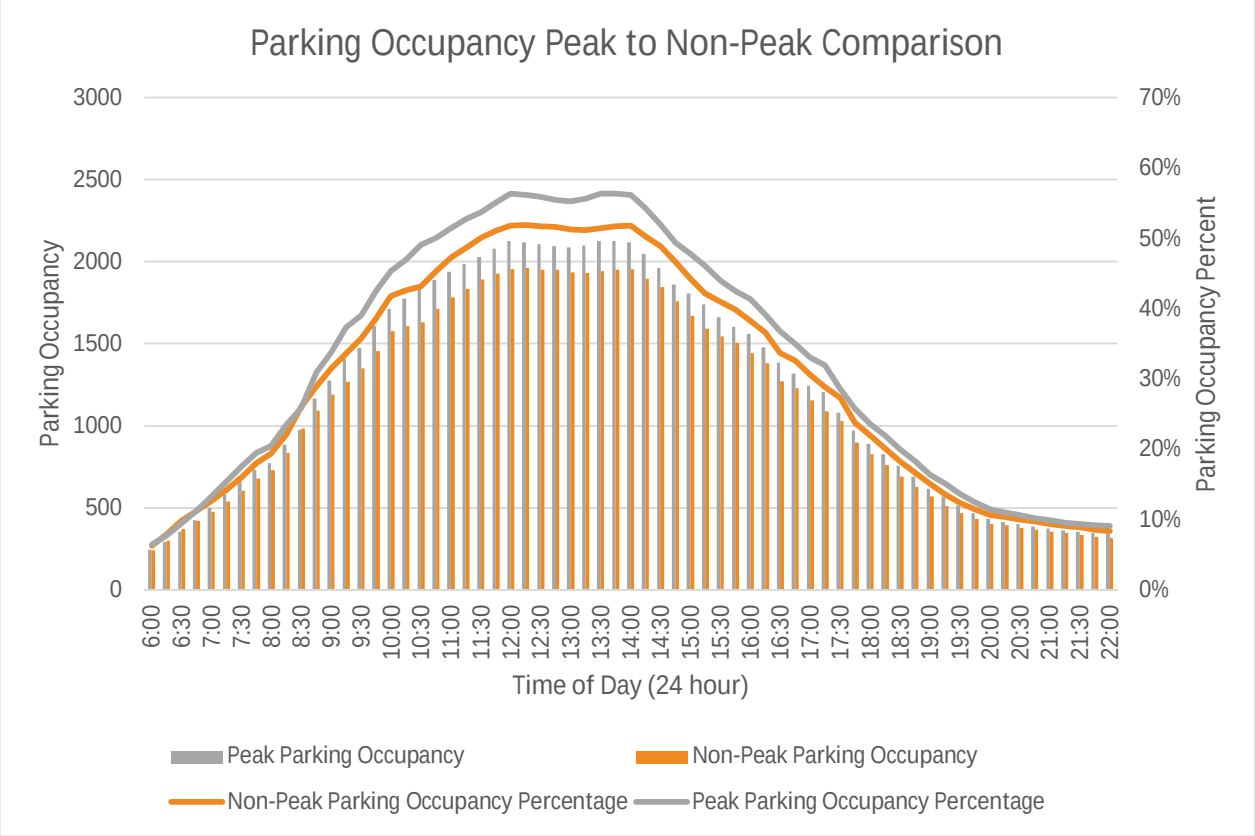


Figure 4 - Busselton Comparison of Demands

5 Industry Standards

An occupancy rate of 85% is taken as the industry standard for an efficient use of a car park. At higher occupancy rates people perceive it as difficult to find a space, leading to frustration. When the occupancy rate is above 85% for an extended period, generally four hours or more, the perception is that there is a lack of parking.

High occupancy rates imply that there is unmet demand and supply should be increased. High occupancy rates also lead to traffic circulating to find a space, which can cause congestion.

5.1 Application of Industry Standards in Dunsborough

Dunsborough has a notable difference in parking demand between Peak Season and Non-peak Season.

As the overall parking demand does not reach over 60% there is no unmet demand.

5.2 Application of Industry Standards in Busselton

Busselton has no notable difference in parking demand between Peak Season and Non-peak Season.

There is unmet parking demand in the vicinity of Busselton Jetty, however, the informal parking that the City provides in Signal Park provides an adequate overflow.

6 Proposed Base Demand

6.1 Demand Levels

The demand levels set will be scaled into future demand. For this reason, a base demand should be set rather than taking the highest demand. Once the demand has been set and scaled then SMEC will look at recommendations for the future supply.

6.2 Dunsborough Town Centre

A parking demand of 670 spaces is recommended for Dunsborough Town Centre.

This demand is exceeded for four hours (12:15 to 16:15) in the peak season, and not at all in the non-peak.

6.3 Busselton City Centre

A parking demand of 1880 spaces is recommended for Busselton City Centre.

This demand is exceeded for four hours (10:45 to 14:45) in the peak season, and for three hours in the non-peak (11:30 to 14:30).

Appendix E Current Proposed Parking Changes

Dunsborough

Busselton