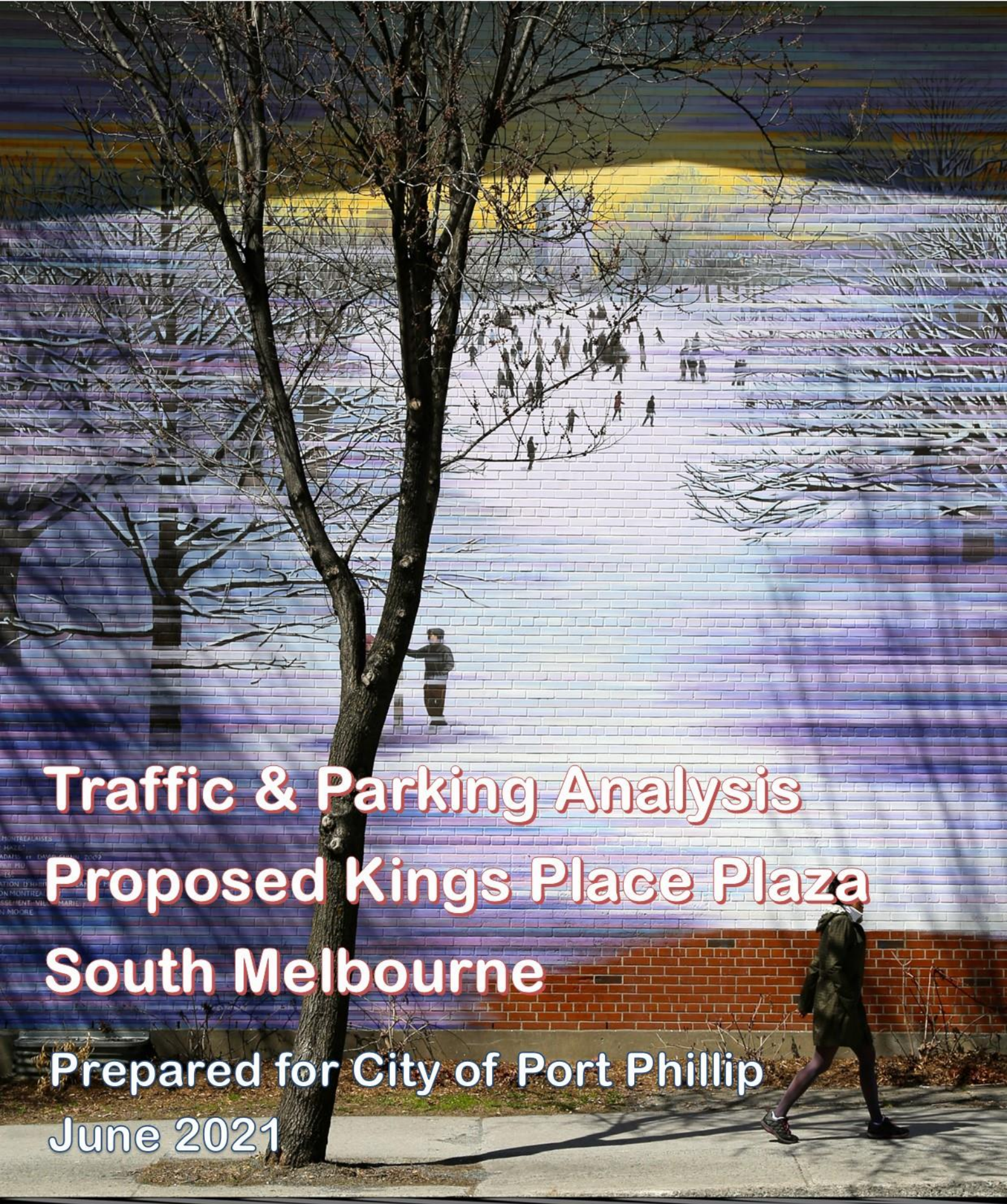

Traffic & Parking Analysis
Proposed Kings Place Plaza
South Melbourne

Prepared for City of Port Phillip
June 2021

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CONTENTS

1 INTRODUCTION

This 'Traffic and Parking Analysis' report has been prepared to inform the City of Port Phillip's design of a proposed pocket park known as 'Kings Place Plaza', in South Melbourne. Kings Place Plaza is intended to use a grouping of streets that includes Kings Place along with feeder streets Millers Lane and Cobden Street, as shown in Figure 1. The Council's general area of interest, from a traffic and parking perspective encompasses:

- Kings Place;
- Millers Lane;
- Cobden Street (between Kings Place and Kings Way);
- Palmerston Crescent (between Park Street and Kings Way);
- Park Street (between Kings Way and St Kilda Road); and
- Kings Way (between Park Street and Palmerston Crescent).

Figure 1: Initial Concept Design for Kings Place Plaza

This report includes a review of exiting and historic traffic and parking data and other relevant background information. The data analysis activities presented in this report include:

- Establishment of existing traffic and parking conditions through new survey work;
- A review of historical aerial images (using NearMap) to estimate representative parking occupancy in the study area pre COVID-19;
- An analysis of crash statistics; and
- Review of Planning Applications in the general area and the forecast future traffic and parking conditions associated with those future developments.

2 SURVEY PROGRAM

2.1 OVERVIEW

The survey activities have been designed to provide a detailed insight of current traffic and parking conditions in the Kings Place Plaza precinct.

The survey work was undertaken between Wednesday 14 and Thursday 29 April 2021; a period when traffic conditions on Melbourne's road network were, partly, atypical (compared to similar periods in previous years). The anomalous conditions prevailed through most of 2020 and the first few months of 2021. In particular, 2020 was a year characterised, at times, by the imposition of significant travel restrictions on Melburnians – as part of the Victorian government's strategy to contain the spread of the Covid-19 global pandemic. The earliest restrictions were introduced across metropolitan Melbourne in March 2020, and they varied throughout the year, as the government adjusted its strategy in response to the spread of Covid-19.

The '14 April to 28 April 2021' survey period occurred some time after the relaxation of the strictest stay-home orders (colloquially known as the 'Melbourne lockdown') which had been initially imposed in early July 2020 after the emergence of a second wave of infections in Melbourne. The 'lockdown' was a key feature of the government's disease-control strategy. Shorter 'circuit-breaker' lockdowns have occurred in 2021. All of these measures had the effect of reducing travel demand and, thus, lower traffic volumes have been experienced throughout Melbourne's road and public transport networks.

2.2 TRAFFIC & ORIGIN-DESTINATION SURVEYS

The traffic data collection was designed to thoroughly capture both existing conditions as well as likely future conditions relevant to the proposed Kings Place Plaza. To this end, the data collection involved two main components:

- Surveys of current traffic conditions (new data collection during April 2021 during peak hours)
- Collection of traffic data pertaining to future buildings (extracted from planning reports to be made available by Council)

Figure 2 shows the 6 intersections at which new weekday traffic turning movements counts were undertaken in both AM and PM peak hours (8-9am and 5-6pm) as well as vehicle number plate matching to allow origin-destination (OD) mapping and identify prevailing traffic circulation patterns. At the Kings Way intersections traffic movements were recorded on the north-east side of those intersections, except Park Street where a full intersection count was undertaken.

For the purposes of the future-conditions SIDRA traffic analysis, the existing traffic volumes have been combined with the future traffic forecasts associated with approved new buildings in the area.

Figure 2: Location of Manual Turning Movement Counts

The OD mapping for this study was designed to identify prevailing traffic patterns in the precinct surrounding Kings Place Plaza. The OD task was undertaken at the same time as the weekday manual turning movement surveys and it utilised number plate matching techniques to establish the 'prevailing' patterns of traffic using the street network bounded by Park Street, Palmerston Crescent and Kings Way. Ultimately, the key objective of the OD survey is to identify where vehicles have 'come from' and are 'heading to' within the Kings Place Plaza precinct and whether vehicle movements can be classified as 'local' traffic movements (if stopping or starting journeys in the precinct) or 'non-local' / 'through' traffic (when simply travelling all the way through from Park Street to Kings Way and vice versa).

2.3 PARKING SURVEYS

The assessment of existing parking conditions in the Kings Place Plaza precinct included the preparation of a full parking inventory, measurements of parking occupancy and the duration-of-stay statistics of all parked vehicles (vehicle number plates were captured to allow identification of parking duration-of-stay). Parking surveys covered all spaces on both sides of:

- Palmerston Crescent, between Park Street and Kings Way;
- Cobden Street, between Kings Place and Kings Way;
- Park Street, between Kings Way and St Kilda Road; and
- Kings Place between Palmerston Crescent and Kings Way.

The streets surveyed are shown in Figure 3.

Figure 3: Parking Survey Areas

Parking occupancy surveys were conducted for each street on two days (a typical weekday and a weekend day) at 2-hourly intervals at the following times: 7.00am, 9.00am, 11.00am, 1.00pm, 3.00pm, 5.00pm and 7.00pm.

The car parking availability captured by the surveys was compared with historic aerial photos to enable the determination of typical:

- Average weekday (pre COVID-19) parking availability
- Average weekend (pre COVID19) parking availability

Ultimately, the objective of the surveys and the associated 'parking assessment' has been to determine how many parking spaces are necessary or desirable (the 'future parking supply'), in the area surrounding Kings Place Plaza, based on an identified 'legitimate' on-street parking demand that Council wishes to satisfy. Thus, the 'parking assessment' uses a combination of:

- Existing Parking Demand Determination – understanding how busy the streets surrounding Kings Place Plaza currently are and have been historically (pre COVID19) – parking occupancy measurements provide a key measure in this respect by revealing how many parking spaces are occupied at different times of the day.
- Parking Utilisation Analysis – measuring how long motorists are currently using parking spaces (duration-of-stay statistics) – this metric reveals whether motorists are using the existing parking spaces in compliance with short-term parking controls or parking for periods longer than the permitted time limits.
- Identification of Desirable Future Parking Requirements – this step involves identifying likely new parking demands associated with Kings Place Plaza as well as any demands arising from the future approved buildings in the area.

3 TRAFFIC ANALYSIS

3.1 OVERALL TRAFFIC VOLUMES IN STUDY AREA

The traffic volume in the study area varies between the high arterial road traffic flows experienced on Kings Way and the more modest sub-arterial function of Park Street to the low traffic flows experienced in the core study area, namely Palmerston Crescent (between Park Street and Kings Way); Cobden Street (between Kings Place and Kings Way); and Kings Place (between Palmerston Crescent and Kings Way).

The traffic flows collected during the survey program for the 'average weekday' are summarised in Table 1 and also shown graphically in Figure 4 and Figure 5 for the AM and PM peak periods respectively.

Table 1: Comparison of Directional Traffic Volumes in the Study Area

Location	Directional Traffic Volume	
	AM Peak (8am-9am)	PM Peak (5pm-6pm)
Kings Way Southbound (between Park St & Alfred Rd)	5,156	6,422
Park Street Eastbound (between St Kilda Rd & Kings Way)	273	520
Park Street Westbound (between St Kilda Rd & Kings Way)	574	736
Palmerston Crescent Northbound (between Park Street & Kings Way)	49	48
Palmerston Crescent Southbound (between Park Street & Kings Way)	133	167
Kings Place Eastbound (between Kings Way & Palmerston Cr)	29	15
Kings Place Westbound (between Kings Way & Palmerston Cr)	4	7

The table and images highlight that the peak hour traffic flow is low on Palmerston Crescent and Kings Place. Traffic is negligible on Cobden Street as it is only used for the small number of vehicles that park in the on-street spaces on that small street section. The combined overall AM and PM peak traffic volumes on these local streets are similar – in the order of 215 to 240 vehicles per hour (or roughly four vehicles per minute).

By comparison, in the AM peak, the combined traffic volume for Palmerston Crescent and Kings Place is only around 25% of the two-way flow on Park Street and around 4.2% of the southbound traffic on Kings Way. This highlights the minor traffic function of those local streets. In the PM peak, the combined traffic volume for Palmerston Crescent and Kings Place is around 19% of the two-way flow on Park Street and around 3.7% of the southbound traffic on Kings Way. Overall, the local streets in the heart of the Kings Place Plaza precinct represent only a very small proportion of the total traffic using the surrounding streets.

Furthermore, as discussed in the next Section 3.2, the OD analysis has revealed that the majority of traffic (over 70%) using the streets between Park Street and Kings Way has a local origin and destination, and the proportion of traffic short-cutting through the area is low (less than 30%).

Figure 4: AM Peak Traffic Flows on Park Street, Kings Way, Palmerston Crescent and Kings Place

Figure 5: PM Peak Traffic Flows on Park Street, Kings Way, Palmerston Crescent and Kings Place

As previously noted in chapter 2, it is probable that the surveys undertaken in April 2021 were not fully representative of the traffic volumes that would have normally been present in the study area (as a result of travel disruptions associated with the Covid pandemic).

Accordingly, in order to establish the extent of any variance, an analysis was undertaken of the difference between pre-Covid and April 2021 traffic volumes. The comparison of traffic volumes is shown in Table 2 (AM peak) and Table 3 (PM peak).

The comparison has been undertaken between April 2019 (sourced from historic Department of Transport data) and the recently surveyed April 2021 traffic volumes on both Kings Way and Park Street. The tables show that traffic conditions are extremely similar for both peak periods on weekdays. In the AM peak, traffic in April 2021 was marginally lower than that recorded in April 2019 – the difference ranges between 3% and 6%. In the PM peak, traffic in April 2021 was marginally lower on Kings Way (2% difference) and slightly higher (4%) on Park Street. The AM and PM peak differences are well within normal daily traffic variations in metropolitan Melbourne, which can fluctuate by as much as 10% between consecutive days. As such, it follows that the April 2021 traffic conditions on Kings Way and Park Street are not only comparable, but also realistically representative of pre-Covid conditions (such as those traffic levels measured in April 2019).

Table 2: AM Peak – Comparison of Weekday Directional Traffic Volumes (April 2021 and April 2019)

Location	Directional Traffic Volume		
	April 2021	April 2019	Difference (%)
Kings Way Southbound (between Park St & Albert Rd)	5,156	5,300	-3%
Park Street Eastbound (between St Kilda Rd & Kings	273	287	-5%
Park Street Westbound (between St Kilda Rd & Kings	574	612	-6%

Table 3: PM Peak – Comparison of Weekday Directional Traffic Volumes (April 2021 and April 2019)

Location	Directional Traffic Volume		
	April 2021	April 2019	Difference (%) relative to 2019
Kings Way Southbound (between Park St & Albert Rd)	6,422	6,548	-2%
Park Street Eastbound (between St Kilda Rd & Kings	520	501	+4%
Park Street Westbound (between St Kilda Rd & Kings	736	708	+4%

3.2 VEHICLE ORIGIN-DESTINATION PATTERNS

3.2.1 OVERVIEW

As highlighted in the previous section, the busiest local street in the heart of the King Place Plaza precinct is Palmerston Crescent. The OD analysis identified that in both the AM and PM peak periods, Palmerston Crescent performs two key functions:

- It is principally used for local access and circulation to/from commercial carparks and the residential properties in the study area.
- It provides a north-south connection for some through traffic wishing to travel between Wells and Park Streets and the Kings Way corridor. This occurs primarily in the southbound direction. There is also a minor pattern that occurs in the northbound direction on Palmerston Crescent – associated with vehicles turning off the southbound carriageway of Kings Way and travelling to South Melbourne via Park Street (circumventing the right turn ban from Kings Way into Park Street).

Each of these functions is discussed in the sections that follow for the AM and PM peak periods.

3.2.2 PATTERNS IN THE AM PEAK PERIOD FOR VEHICLES ENTERING THE STUDY AREA

3.2.2.1 SOUTHBOUND CONNECTION AND LOCAL ACCESS & CIRCULATION

Figure 6 highlights both the southbound connectivity role provided by Palmerston Crescent, as well as its role in support of local access and circulation. The southbound traffic entering Palmerston Crescent from Park and Wells Streets at its northern end is low – 114 vehicles between 8am and 9am, equivalent to less than two cars per minute.

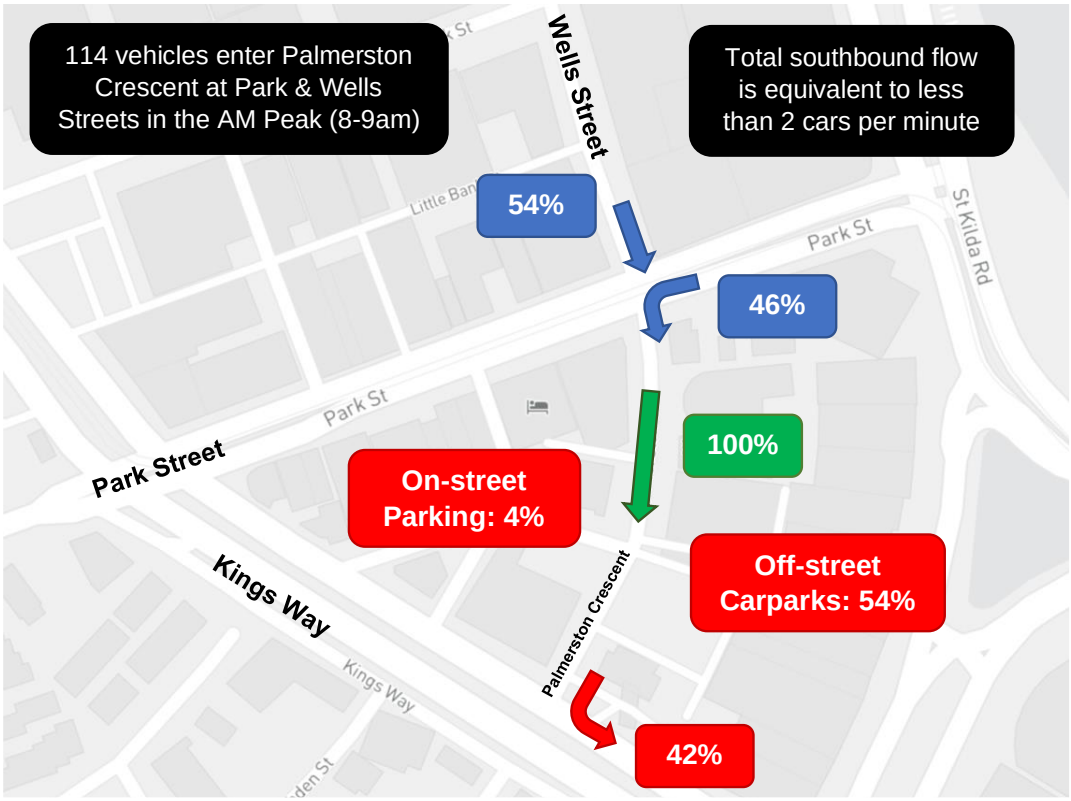

Figure 6: Southbound Passenger Car Movements in Palmerston Crescent (measured at a point south of Park St) Origins and Destinations in the morning peak period between 8am and 9am

When examining the AM peak passenger vehicle flow in the section of Palmerston Crescent just south of Park Street, it was found that 42% of the passenger vehicles travelling southbound on Palmerston Crescent (using as a reference the traffic volume measured at its northern end – just south of Park Street) turn left into Kings Way. This is the 'through traffic' function referenced earlier. The remaining 58% of vehicles entering Palmerston Crescent at its northern end have local destinations and park in the study area – 54% in off-street carparks (both commercial and residential) and only 4% use on-street parking spaces.

The origin of the southbound traffic at the northern end of Palmerston Crescent is roughly evenly split between vehicles travelling south along Wells Street and crossing Park Street into Palmerston Crescent (54%) and vehicles turning left (east to south) from Park Street (46%). Analysis of the destination of vehicles based on their origin (Wells or Park Streets) revealed that a larger proportion of those vehicles coming from Wells Street travel to the Kings Way corridor, whereas a larger proportion of those vehicles coming from Park Street have a local destination. This is logical, as most vehicles coming from Wells Street are likely to have originated from the Southbank areas north of Park Street, while vehicles coming from Park Street will have come from areas to the south and east (and would therefore be effectively turning back to where they came from, if they executed left turns onto Kings Way).

3.2.2.2 NORTHBOUND CONNECTION AND LOCAL ACCESS & CIRCULATION

Figure 7 highlights both the northbound connectivity role provided by both Palmerston Crescent and Kings Place, as well as their role in support of local access and circulation. The northbound traffic entering both streets from Kings Way at its southern end is very low – 60 vehicles between 8am and 9am, equivalent to one car per minute.

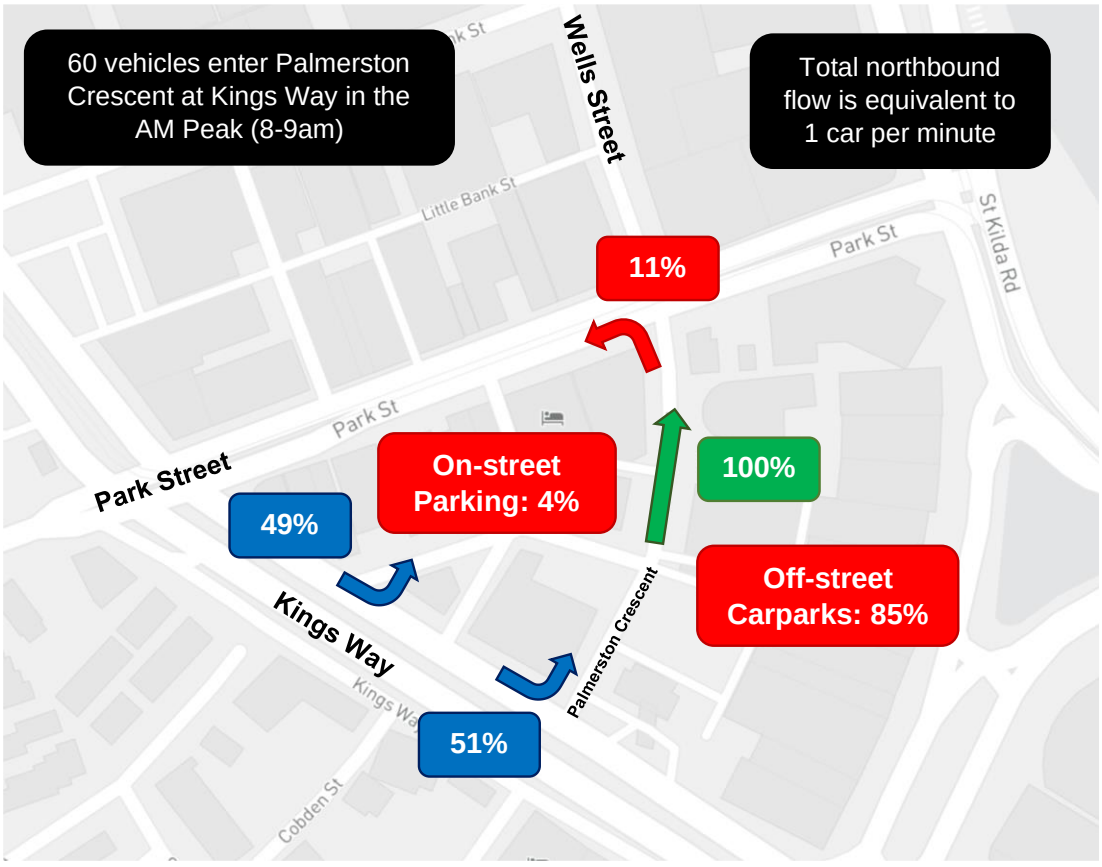

Figure 7: Northbound Passenger Car Movements in Palmerston Crescent & Kings Place (measured at a point north of Kings Way)
Origins and Destinations in the morning peak period between 8am and 9am

When examining the northbound AM peak passenger vehicle flow in Kings Place and the section of Palmerston Crescent just north of Kings Way, it was found that only 11% of the passenger vehicles travelling that enter from Kings Way end up driving through the precinct and turning left into Park Street. This unusual manoeuvre is a result of the right-turn restriction that prevents southbound traffic on Kings Way from turning directly in to Park Street. Thus, vehicles wishing to use Park Street to travel to destinations in South Melbourne (west of Kings Way) bypass the right-turn ban by resorting to the unusual circuitous manoeuvre through the Kings Place Plaza precinct. Notwithstanding the above, the majority of vehicles (89%) entering the precinct from Kings Way in the AM peak end up parking in the study area – 85% in off-street carparks (both commercial and residential) and only 4% on-street.

The origin of the northbound traffic is evenly split between vehicles turning left into Kings Place (49%) and vehicles turning left into Palmerston Crescent (51%). Analysis of the destination of vehicles based on their origin (Kings Place or Palmerston Crescent) revealed a very similar pattern, with most vehicles accessing local parking. A slightly higher proportion of those vehicles turning left into Kings Place travel to the northern end of Palmerston Crescent and turn left into Park Street. This is logical as these vehicles are using Park Street to travel west into South Melbourne and are thus looking for the first alternative to turn off Kings Way and minimise time spent in traffic. The observations revealed relatively higher speeds for those vehicles using Kings Place to travel to Park Street, consistent with their use of the study area as a through route.

3.2.3 PATTERNS IN THE PM PEAK PERIOD FOR VEHICLES ENTERING THE STUDY AREA

3.2.3.1 SOUTHBOUND CONNECTION AND LOCAL ACCESS & CIRCULATION

Figure 8 highlights both the southbound connectivity role provided by Palmerston Crescent, as well as its role in support of local access and circulation. The southbound traffic entering Palmerston Crescent from Park and Wells Streets at its northern end is low – 99 vehicles between 5pm and 6pm, equivalent to less than two cars per minute.

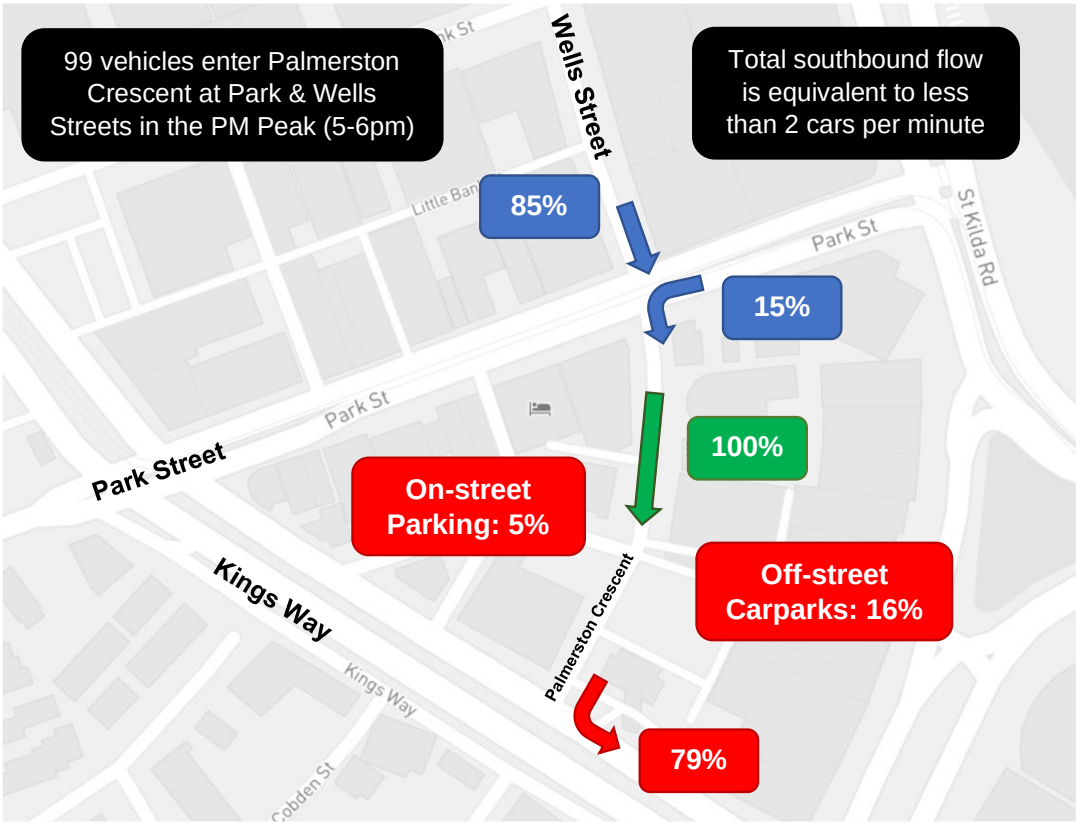

Figure 8: Southbound Passenger Car Movements in Palmerston Crescent (measured at a point south of Park St) Origins and Destinations in the afternoon peak period between 5pm and 6pm

When examining the PM peak passenger vehicle flow in the section of Palmerston Crescent just south of Park Street, it was found that 79% of the passenger vehicles travelling southbound on Palmerston Crescent (using as a reference the traffic volume at its northern end – just south of Park Street) turn left into Kings Way. While this is a dominant proportion, the actual traffic volume associated with this movement is very low – 78 vehicles/hour. The remaining 21% of vehicles entering Palmerston Crescent at its northern end park in the study area – 16% in off-street carparks (both commercial and residential) and only 5% on-street.

The origin of the southbound traffic is primarily from Wells Street (travelling south and crossing Park Street into Palmerston Crescent) – which accounts for 85%. Vehicles turning left (east to south) from Park Street represent only 15% of southbound traffic in Palmerston Crescent. As was the case in the AM peak, analysis of the destination of vehicles based on their origin (Wells or Park Streets) revealed that a much larger proportion of those vehicles coming from Wells Street travel to the Kings Way corridor, whereas a larger proportion of those vehicles coming from Park Street have a local destination.

3.2.3.2 NORTHBOUND CONNECTION AND LOCAL ACCESS & CIRCULATION

Figure 9 highlights both the northbound connectivity role provided by Palmerston Crescent and Kings Place, as well as their role in support of local access and circulation. The northbound traffic entering both streets from Kings Way at its southern end is extremely low – 21 vehicles between 5pm and 6pm, equivalent to one car every three minutes.

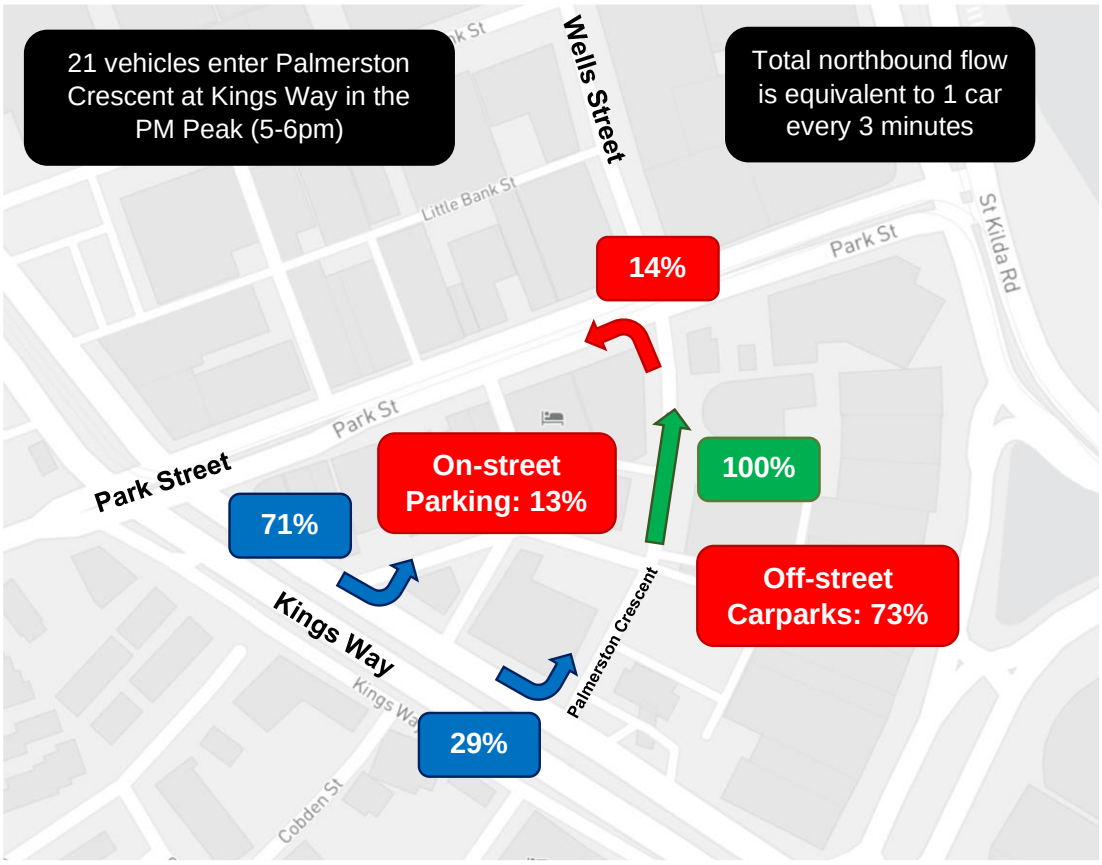

Figure 9: Northbound Passenger Car Movements in Palmerston Crescent & Kings Place (measured at a point north of Kings Way)
Origins and Destinations in the afternoon peak period between 5pm and 6pm

When examining the PM peak passenger vehicle flow in Kings Place and the section of Palmerston Crescent just north of Kings Way, it was found that only 14% of the passenger vehicles travelling northbound turn left into Park Street. These vehicles are circumventing the right-turn ban from Kings Way into Park Street, as previously identified during the AM peak period. The majority of vehicles (86%) entering the study area from Kings Way end up parking in the study area – 73% in off-street carparks (both commercial and residential) and 13% on-street.

The origin of the northbound traffic using Palmerston Crescent is mainly vehicles turning left from Kings Way into Kings Place and subsequently joining Palmerston Crescent (71%), with the remaining 29% turning left directly into Palmerston Crescent from Kings Way. Analysis of the destination of vehicles based on their origin (Kings Place or Palmerston Crescent) revealed a very similar pattern, with most vehicles accessing local parking. A slightly higher proportion of those vehicles turning left into Kings Place travel to the northern end of Palmerston Crescent and turn left into Park Street. This is similar to the AM peak period, as these vehicles are using Park Street to travel west into South Melbourne and are thus looking for the first alternative to turn off Kings Way and minimise time spent in traffic. As in the morning peak, observations revealed relatively higher speeds for those vehicles using Kings Place to travel to Park Street, consistent with their use of the study area as a through route.

3.2.4 PATTERNS FOR LOCALLY GENERATED TRAFFIC

3.2.4.1 AM PEAK

Figure 10 shows the origin and destination of locally generated traffic in the AM peak between 8am and 9am. Only 41 vehicles originate from off-street carparks (both commercial and residential) and on-street parking spaces in the study area between 8am and 9am, equivalent to one car every minute and a half.

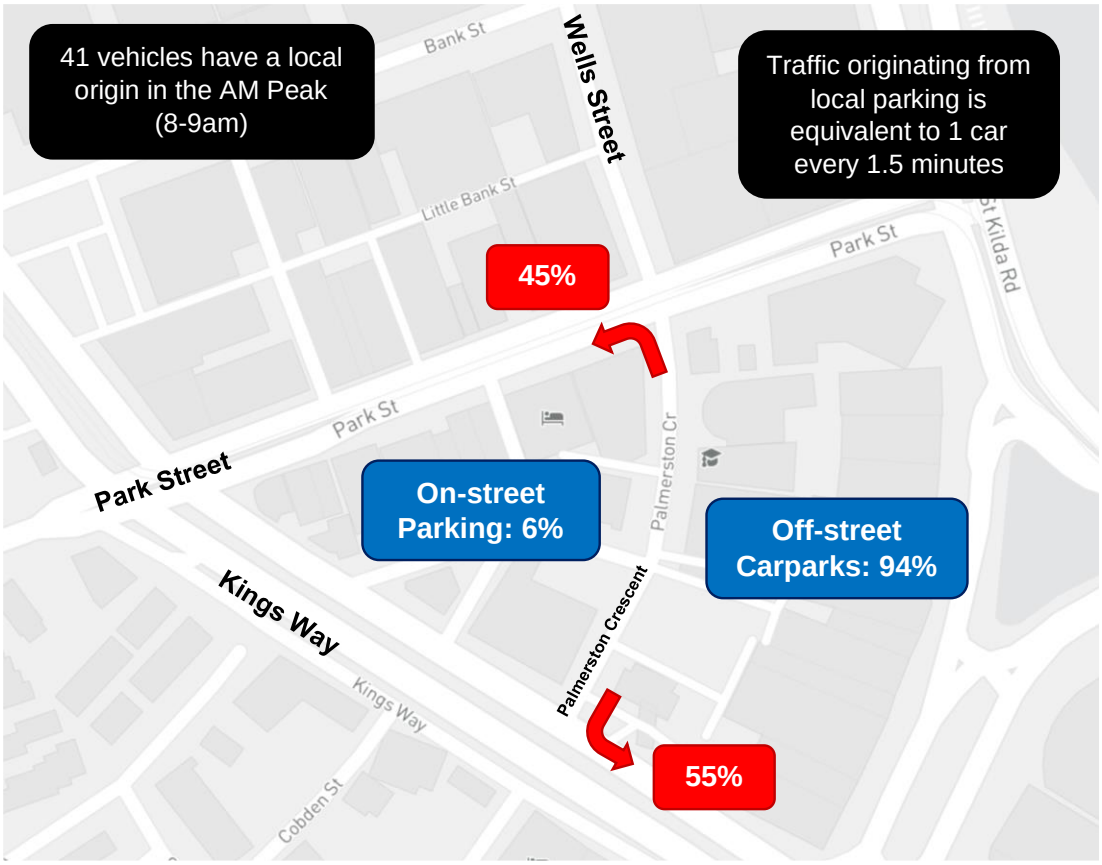

Figure 10: Origins & Destinations of Locally Generated Traffic in the morning peak period between 8am and 9am

When examining the AM peak locally-generated traffic, it was found that 45% of these vehicles travel north on Palmerston Crescent and turn left into Kings Way, while 55% travel south on Palmerston Crescent (or Kings Place) and turn left into Kings Way. The vehicles using Kings Place to access Kings Way were primarily bound for Albert Street – using Kings Place instead of Palmerston Crescent to increase the merging distance across multiple traffic lanes top reach the right-turn lane (north to west) at Albert Road.

The origin of the locally-generated traffic is primarily from off-street carparks – 94%. Only 6% of the locally-generated traffic originates from on-street parking spaces.

3.2.4.2 PM PEAK

Figure 11 shows the origin and destination of locally-generated traffic in the PM peak between 5pm and 6pm. One hundred and seventeen (117) vehicles originate from off-street carparks (both commercial and residential) and on-street parking spaces between 5pm and 6pm, equivalent to less than two cars per minute.

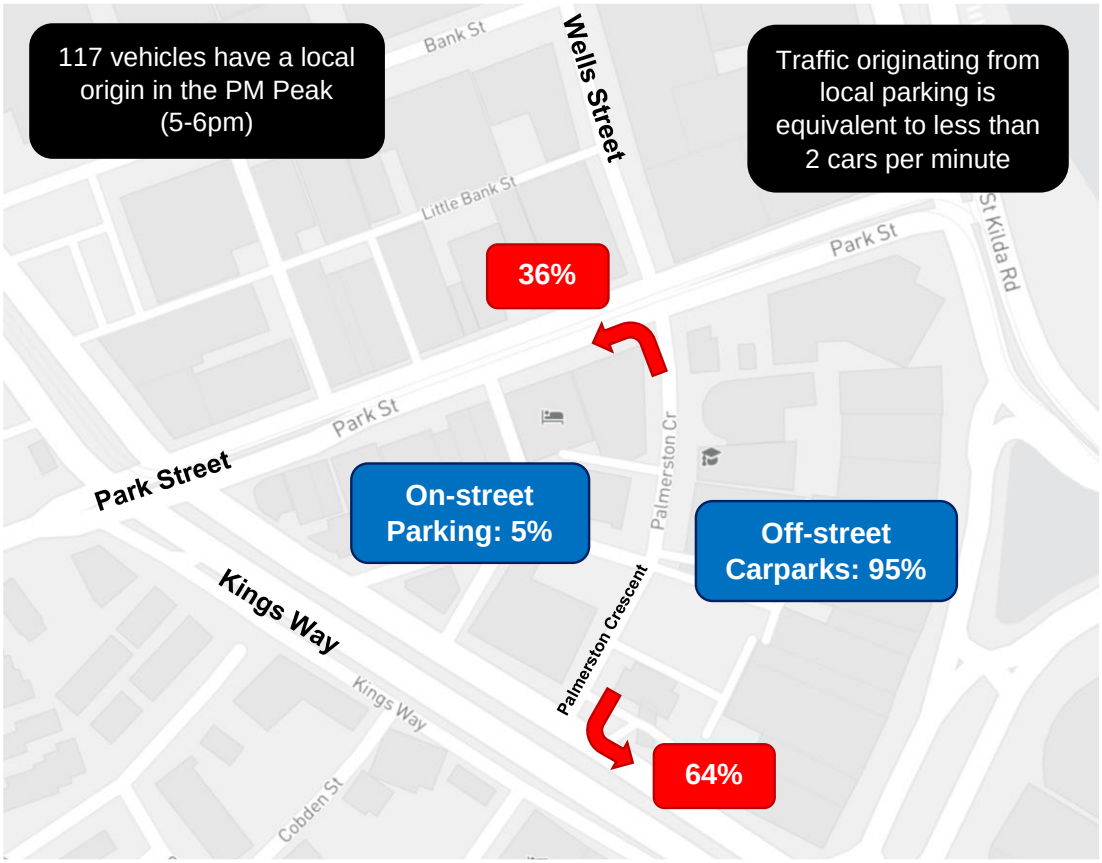

Figure 11: Origins & Destinations of Locally Generated Traffic in the afternoon peak period between 5pm and 6pm

When examining the PM peak locally-generated traffic, it was found that 36% of these vehicles travel north on Palmerston Crescent and turn left into Park Street, while 64% travel south on Palmerston Crescent (or Kings Place) and turn left into Kings Way. As was the case in the morning peak, the vehicles using Kings Place to access Kings Way were primarily bound for Albert Street – using Kings Place instead of Palmerston Crescent to increase the weaving distance to access the right-turn lane at Albert Road more easily.

The origin of the locally-generated traffic is primarily from off-street carparks – 95%. Only 5% of the locally-generated traffic originates from on-street parking spaces.

3.3 TRAFFIC VOLUME & ORIGIN-DESTINATION SUMMARY

The traffic volume and origin-destination analysis described in the previous sections highlights the low levels of traffic travelling in the study area during the AM and PM peak periods. Table 4 shows the southbound, northbound and locally generated traffic volumes in Palmerston Crescent (and Kings Place). Overall, the number of vehicles travelling in the study area is very similar in the morning and afternoon peak periods: 215 vehicles between 8am and 9am, and 237 vehicles between 5pm and 6pm. For both peak periods, that is equivalent to less than four vehicles every minute (less than one vehicle every 15 seconds).

Table 4: Traffic Volumes on Palmerston Crescent / Kings Place in the AM and PM Peaks

Traffic Source	Peak Period	
	AM Peak (8am-9am)	**PM Peak (5pm-6pm)**
Southbound Traffic (entering Palmerston Crescent at Park Street / Wells Street)	114 vehicles per hour	99 vehicles per hour
Northbound Traffic (entering Kings Place and Palmerston Crescent at Kings Way)	60 vehicles per hour	21 vehicles per hour
Locally Generated Traffic (from on-street and off-street carparks)	41 vehicles per hour	117 vehicles per hour
Total	**215 vehicles per hour**	**237 vehicles per hour**

During the combined AM and PM peaks, 452 vehicles travel on Palmerston Crescent, Kings Place and Cobden Street. The majority of these vehicles (70%) have either a local origin or destination. In addition, a significant proportion of those vehicles travelling through the area are likely to be residents or workers of the areas of Southbank to the north of Park Street – these movements are still local in nature as they represent motorists using local streets to connect from their local origin to Kings Way. In summary, only around 30% of all vehicles that use Palmerston Crescent, Kings Place and Cobden Street are using them as a through route to connect to/from Kings Way and Park Street.

3.4 CRASH ANALYSIS

A comprehensive crash analysis was undertaken using the latest pre-Covid data available from the Department of Transport's Crashstats database (July 2014 to June 2019). Only three crashes were recorded during the five-year period at locations intersecting the study precinct. Table 5 summarises the date, location, crash type and severity type for these three crashes. Figure 12 highlights that the location of crashes is on the edge of the study area. No fatalities were recorded in any of the three crashes and a total of nine people were involved in the crashes (three injuries and six not injured).

Table 5: Crashes in the Local Streets in the Study Area (2014-2019)

Date	Intersection	Crash Type	Crash Severity (Number of People)		
			Serious Injuries	Other Injuries	No Injuries
9 Sept 2014	Palmerston Crescent & Kings Way	Rear end (same lane)	0	1	2
6 Mar 2015	Cobden Street & Kings Way	Rear end (same lane)	0	1	2
17 Mar 2015	Palmerston Crescent & Park Street	Right near	1	0	2

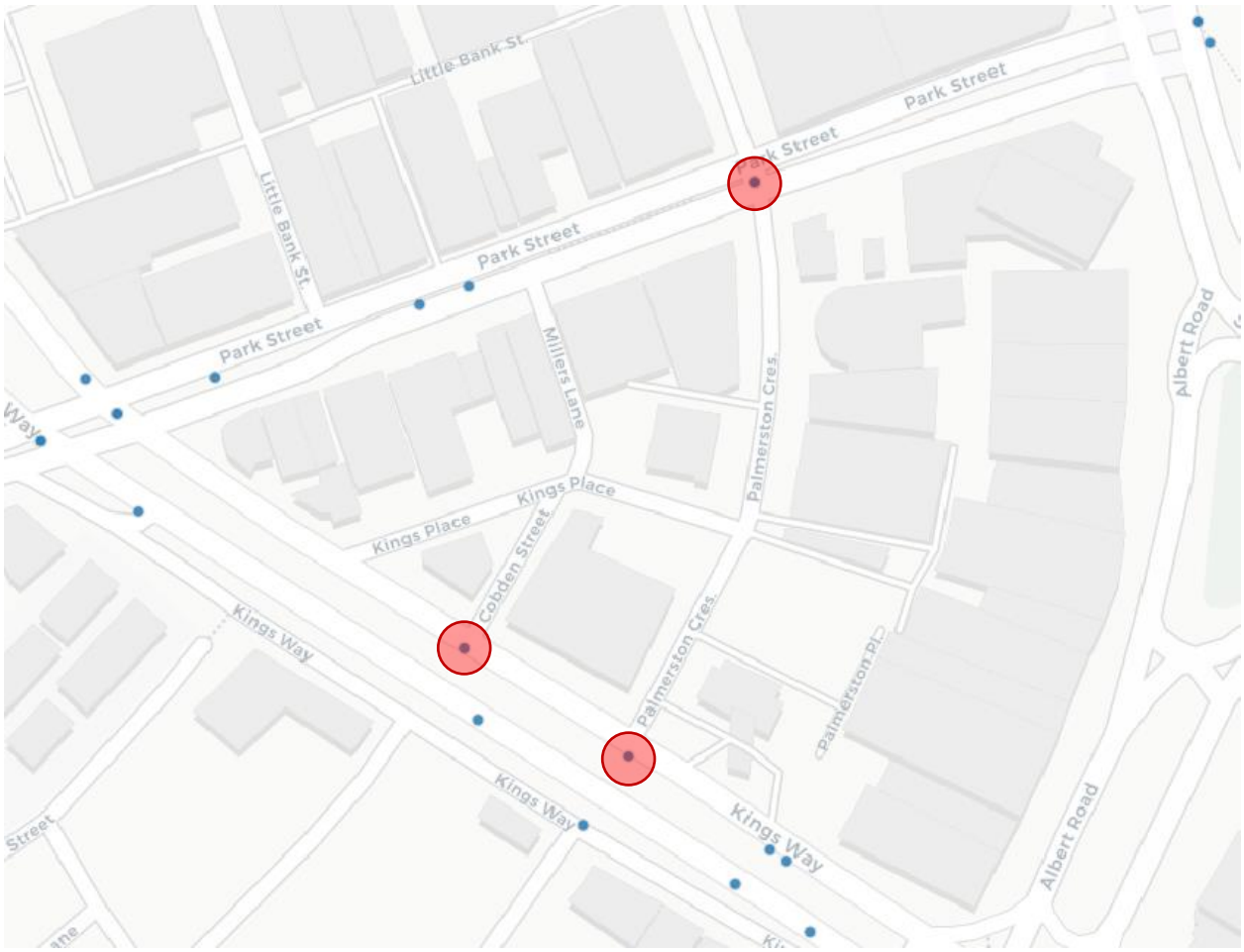

Figure 12: Location of Crashes in the Study Area (2014-2019)

As highlighted in the preceding table and image, there have only been three crashes at locations intersecting the study area in the five-year period examined. Each of three locations are on the precinct's perimeter roads: Park Street and Kings Way. As these locations are all single-crash sites, there is no pattern of concern that has been identified.

It is relevant to note that in 2018, extensive tram works on Park Street were completed, including the installation of a tram platform stop just west of the intersection of Park Street and Wells Street / Palmerston Crescent. The changes implemented included: (1) reduction of the speed limit to 40 kilometres per hour; (2) installation of traffic signals on the north approach of the intersection to stop southbound vehicles on Wells Street travelling through or turning right into Park Street when trams are approaching; (3) prevention of eastbound and westbound traffic on Park Street from making right turns into Wells Street and Palmerston Crescent across the tram lines; (4) limiting Palmerston Crescent to be left-in and left-out only movements at Park Street; (5) preventing U-Turns; and (6) installation of pedestrian-operated signals at each platform end. These changes have significantly simplified the complexity of movements and reduced potential conflict occurrences at the Palmerston Crescent / Park Street / Wells Street intersection – providing increased safety for all road users.

Between the completion of the tram works in 2018 and June 2019 (the latest date for which crash statistics are available), not a single crash has been reported in the study area (the three crashes shown in Figure 12 occurred prior to the implementation of the Park Street tram works).

4 PARKING ANALYSIS

The parking surveys conducted for this study covered all of the publicly available parking spaces in the Kings Place Plaza precinct, namely both sides of:

- Palmerston Crescent, between Park Street and Kings Way;
- Cobden Street, between Kings Place and Kings Way;
- Park Street, between Kings Way and St Kilda Road; and
- Kings Place between Palmerston Crescent and Kings Way.

The analysis included the preparation of a full parking inventory, measurements of parking occupancy and analysis of the duration-of-stay statistics of all parked vehicles. The parking surveys were undertaken every two hours between 7am and 7pm on Wednesday 14 April 2021 and Sunday 18 April 2021.

The study area has a total of 74 spaces, of which 72 are available to the public during normal weekday daytime business hours. The parking inventory shown in Table 6 summarises parking spaces according to restrictions.

Table 6: Parking Inventory

Parking Restriction (during normal weekday daytime business hours)	Number of Spaces
15 Minute Limit	6
1 Hour Limit	43
2 Hour Limit	23
Loading Zone	2
Total Spaces	**74**
Spaces Available to the Public on Weekdays (excludes Loading Zone spaces)	**72**

The six 15-minute spaces are all located on the north side of Park Street east of Wells Street. These spaces operate between 8am and 4pm Monday to Friday; but are subject to clearway restrictions between 4pm and 6pm on weekdays. As such, these six spaces are unrestricted all day on Sunday and also unrestricted during the 7am and 7pm survey timeslots on the weekday, whilst they are unavailable for parking during the 5pm weekday timeslot. The other time-based restrictions (one-hour and two-hour limit) operate Monday to Friday between 8am and 6pm. As such, these spaces are unrestricted during the 7am and 7pm survey timeslots on the weekday and all day on Sunday.

The two loading zones spaces operate from 8am to 6pm Monday to Saturday. Therefore, these two spaces are only available for public use during the 7am and 7pm survey timeslots on Wednesday 14 April. These two spaces are unrestricted on Sundays and thus were included as 'available spaces' during all survey timeslots on Sunday 18 April.

Table 7 summarises the location of parking spaces by street and restriction. The street sections within the core precinct include Palmerston Crescent, Kings Place and Cobden Street. The core precinct has 48 parking spaces – 32 one-hour spaces, 14 two-hour spaces and two loading zones.

The location of weekday parking restrictions is shown in Figure 13 (with the number of publicly available parking spaces shown in boxes adjacent to each parking zone).

Table 7: Location of Parking Spaces in Study Area by Street and Restriction

Street	Side of the Street	Parking Restriction (during normal weekday daytime business hours)	Number of Spaces
Park Street			
	North side	15 Minute Limit	6
	North side	1 Hour Limit	11
	South side	2 Hour Limit	9
		Sub-Total	**26**
Palmerston Crescent			
	West side	1 Hour Limit	15
	East side	2 Hour Limit	14
	East side	Loading Zone	2
		Sub-Total	**31**
Kings Place			
	North side	1 Hour Limit	5
	South side	1 Hour Limit	6
		Sub-Total	**11**
Cobden Street			
	West side	1 Hour Limit	3
	East side	1 Hour Limit	3
		Sub-Total	**6**
		Overall Total (all Streets Combined)	**74**

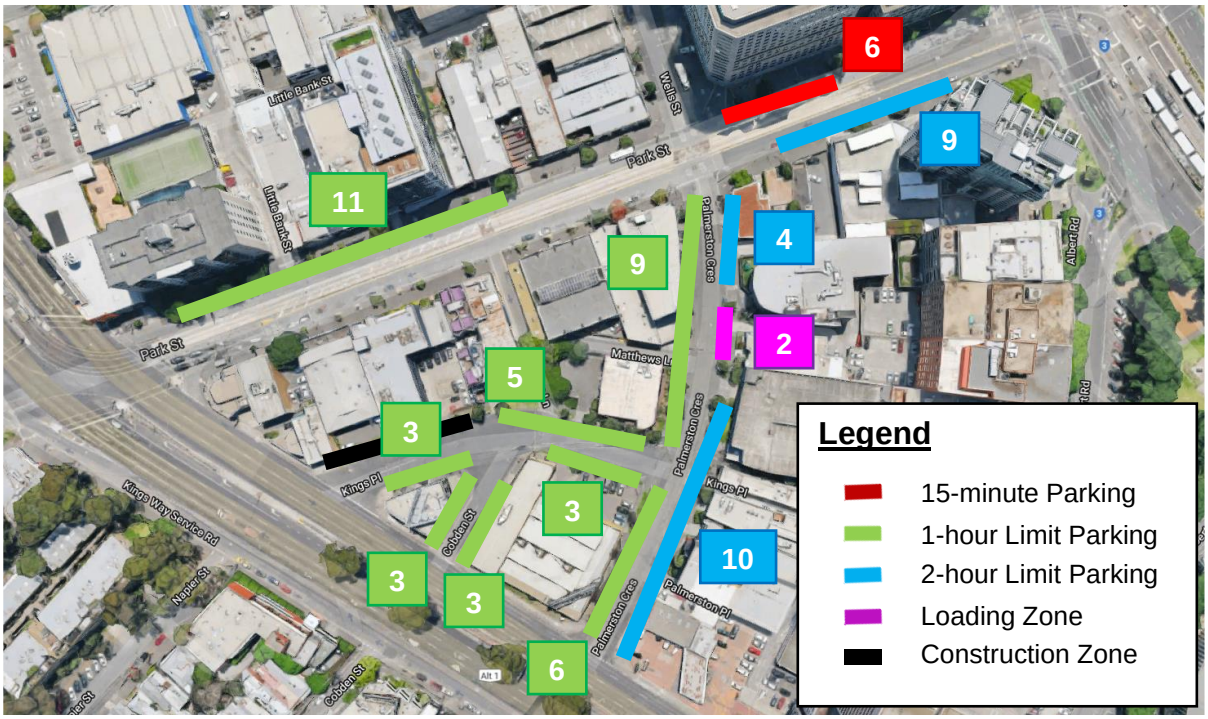

Figure 13: Study Area: Location of Parking Restrictions and Number of Spaces

4.1 PARKING TURNOVER

Parking turnover is a measure of the extent to which motorists comply with the time-limited restrictions. Turnover is effectively a measure of the 'duration-of-stay'.

Figure 14 summarises parking duration for those vehicles that were parked in the study area on Wednesday 14 April 2021 and Sunday 18 April 2021.

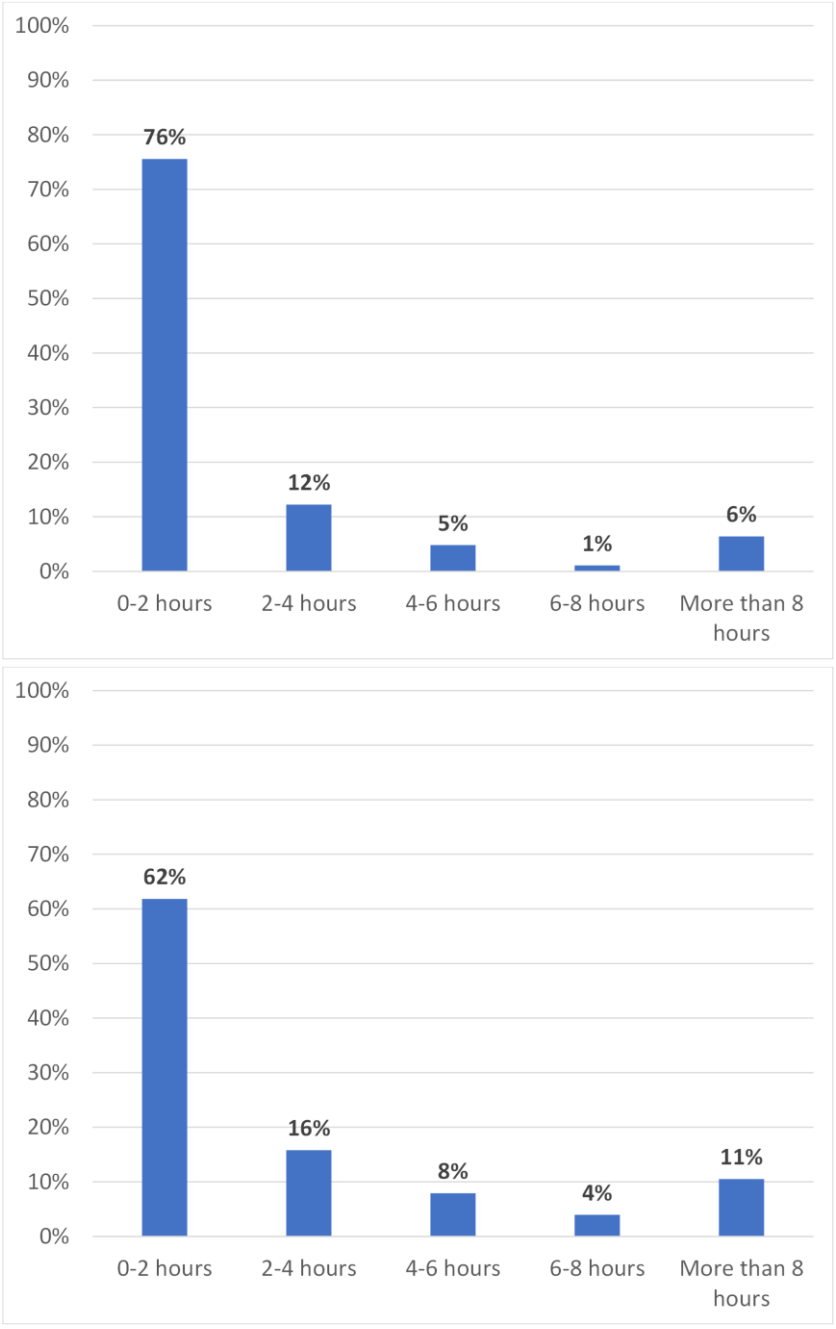

Figure 14: Duration of Stay for the Publicly Available Spaces on Wednesday (top) and Sunday (bottom)

The statistics shown in Figure 14 reveal high levels of compliance on Wednesday for the time-limited parking zones, with over three quarters of all vehicles in the study area parking for less than two hours. No time restrictions apply on Sunday; however, despite the absence of time restrictions, almost 80% of vehicles stayed for less than four hours.

4.2 PARKING OCCUPANCY

Parking utilisation was low to moderate throughout the study area on the Wednesday and Sunday surveyed. The highest occupancy was very similar for both days but manifested at different times of the day. On Wednesday, the highest occupancy was 46% at 11am. On Sunday, the highest occupancy was 45% at 7pm. The overall occupancy over the 12 hours of the survey was almost identical on Wednesday (33.9%) and Sunday (33.6%). The total number of vehicles that parked on both days was 94 on Wednesday and 76 on Sunday. The slightly lower number of vehicles parked on Sunday is explained by the relatively longer duration of stay. The hourly fluctuation in parking occupancy (of the publicly available parking spaces) is shown in Figure 15 (Wednesday) and Figure 16 (Sunday).

Occupancy - All 72 Public Spaces: Wednesday 14 Apr 2021							
Status	7am	9am	11am	1pm	3pm	5pm	7pm
Unoccupied	69%	68%	54%	65%	65%	68%	72%
Occupied	31%	32%	46%	35%	35%	32%	28%

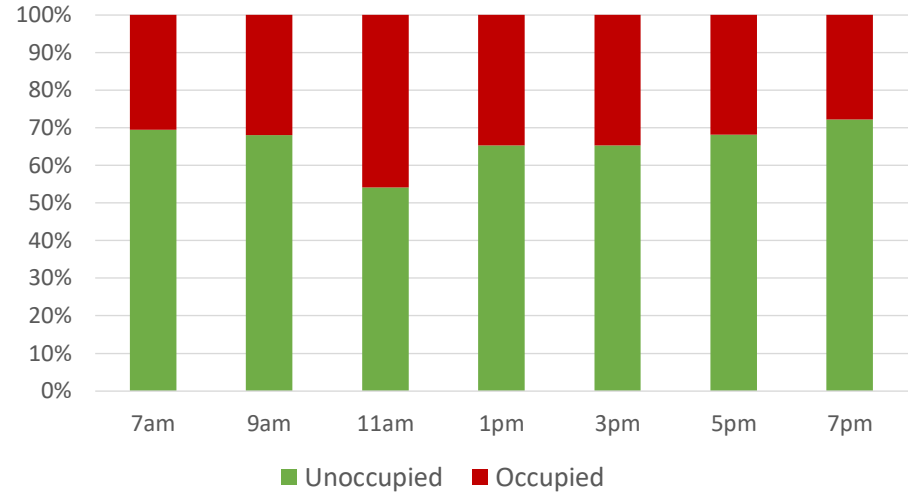

Figure 15: Parking Occupancy (Wednesday 14 April 2021) – Hourly Variation

Note: at 5pm, the 15-minute spaces are not available (clearway zone). 66 spaces are available to the public at that time.

Occupancy - All 74 Public Spaces: Sunday 18 April 2021							
Status	7am	9am	11am	1pm	3pm	5pm	7pm
Unoccupied	72%	72%	70%	68%	68%	61%	55%
Occupied	28%	28%	30%	32%	32%	39%	45%

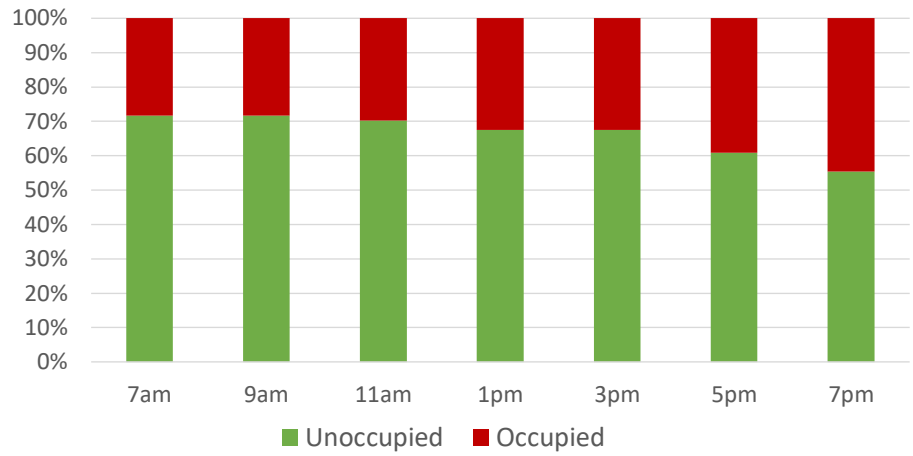

Figure 16: Parking Occupancy (Sunday 18 April 2021) – Hourly Variation

A comparison of all the key parking utilisation statistics for the study area on the Wednesday and the Sunday is provided in Table 8.

Table 8: Comparison of Weekday & Weekend Parking Statistics on Victoria Street

Statistics	Wednesday 14 April 2021	Sunday 18 April 2021
Total Cars Parked (between 7am-7pm)	94	76
Peak Occupancy Time	11am with 46% occupancy	7pm with 45% occupancy
Overall Occupancy (between 7am-7pm)	34%	34%

In summary, the key findings with respect to parking utilisation, include:

- The overall occupancy over the 12 hours of the survey was 34% on both days
- The maximum number of parking spaces occupied at any given hour was found to be 33 out of 72 spaces on Wednesday at 11am (this is equivalent to 46% of the publicly available spaces being occupied) and 33 out of 74 spaces on Sunday at 7pm (this is equivalent to 45% of the publicly available spaces being occupied).
- Thus, even at the busiest times, there is reasonable spare parking capacity – with at least 39 unoccupied spaces out of the publicly available spaces on Wednesday and at least 41 unoccupied spaces out of the publicly available spaces on Sunday. This represents spare parking capacity of 54% of the total supply on Wednesday and 55% of the total supply on Sunday.

The occupancy is even lower when examining parking conditions in the core area of the precinct, namely the 48 parking spaces on Palmerston Crescent, Kings Place and Cobden Street (thus excluding from consideration the parking spaces on Park Street). The maximum occupancy in the core area was 40% at 11am on Wednesday and 29% on Sunday. Even at the busiest times, there were 28 unoccupied spaces on Wednesday (out of 46 spaces available to the public) and 34 unoccupied spaces on Sunday (out of 48 parking spaces available to the public).

On the basis of these findings, it would be reasonable to support a targeted parking rationalisation / reduction strategy for the purposes of the creation of the proposed Kings Place Plaza pocket park in South Melbourne.

The fluctuating parking occupancies recorded in the time-limited parking spaces on Wednesday are shown in the following figures:

- Figure 19 (15-minute time limit) – these spaces operate between 8am and 4pm on weekdays. Before 8am and after 6pm, these spaces are unrestricted. Between 4pm and 6pm these spaces are part of a clearway zone and cannot be used for parking.
- Figure 20 (one-hour time limit)
- Figure 21 (two-hour time limit)

No breakdown has been provided for the occupancy on Sunday as all of the 74 spaces in the study area are unrestricted. Thus, the fluctuating parking occupancy previously shown at Figure 16 provides an accurate representation of how Sunday parking is utilised.

Occupancy - 48 Public Spaces in Core Study Area: Wednesday 14 Apr 2021							
Status	7am	9am	11am	1pm	3pm	5pm	7pm
Unoccupied	81%	83%	60%	71%	75%	79%	81%
Occupied	19%	17%	40%	29%	25%	21%	19%

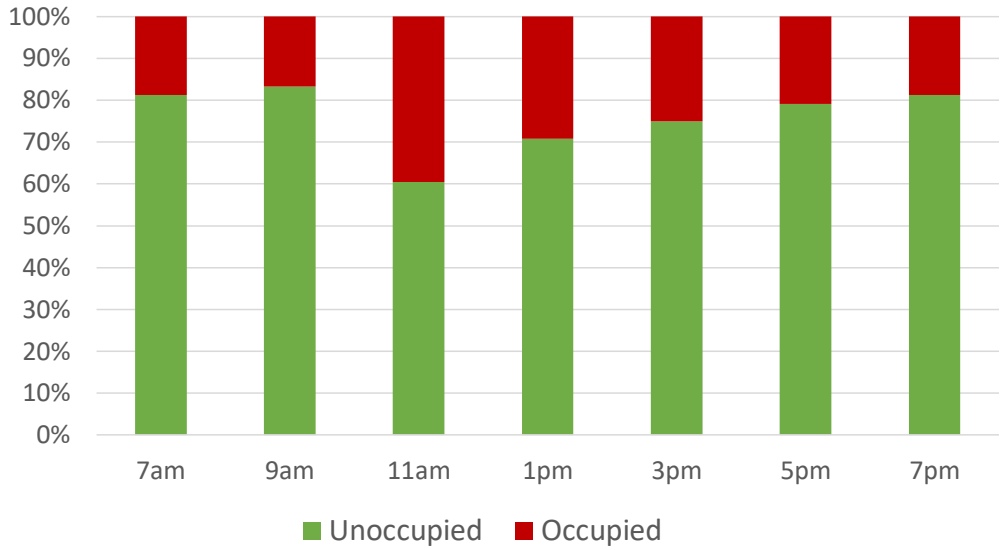

Figure 17: Parking Occupancy (Wednesday 14 April 2021) – Hourly Variation

Occupancy - 48 Public Spaces in Core Study Area: Sunday 18 April 2021							
Status	7am	9am	11am	1pm	3pm	5pm	7pm
Unoccupied	75%	75%	85%	77%	75%	73%	71%
Occupied	25%	25%	15%	23%	25%	27%	29%

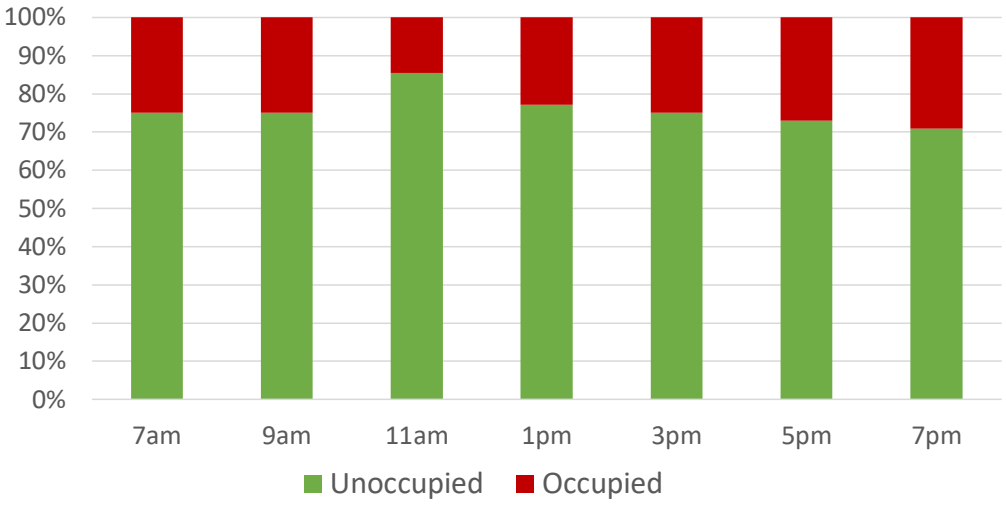

Figure 18: Parking Occupancy (Sunday 18 April 2021) – Hourly Variation

Occupancy - 1/4P Spaces (6 Spaces): Wednesday 14 Apr 2021							
Status	7am	9am	11am	1pm	3pm	5pm	7pm
Unoccupied	N/A	83%	100%	100%	100%	N/A	N/A
Occupied	N/A	17%	0%	0%	0%	N/A	N/A

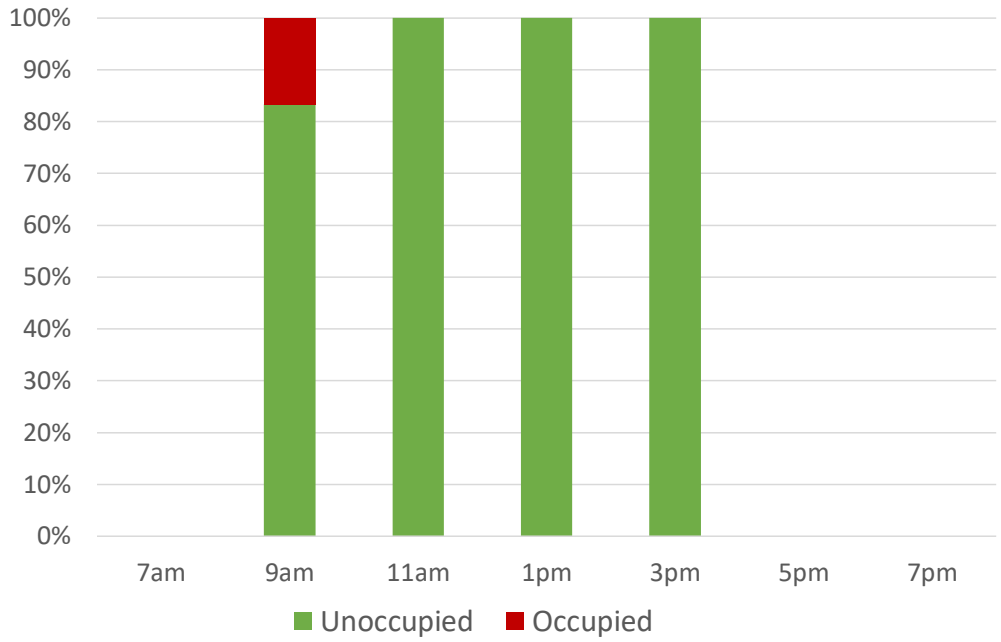

Figure 19: Parking Occupancy in 15-minute time limit spaces (Wednesday)

Occupancy - 1P Spaces (43 Spaces): Wednesday 14 Apr 2021							
Status	7am	9am	11am	1pm	3pm	5pm	7pm
Unoccupied	N/A	74%	56%	67%	70%	70%	N/A
Occupied	N/A	26%	44%	33%	30%	30%	N/A

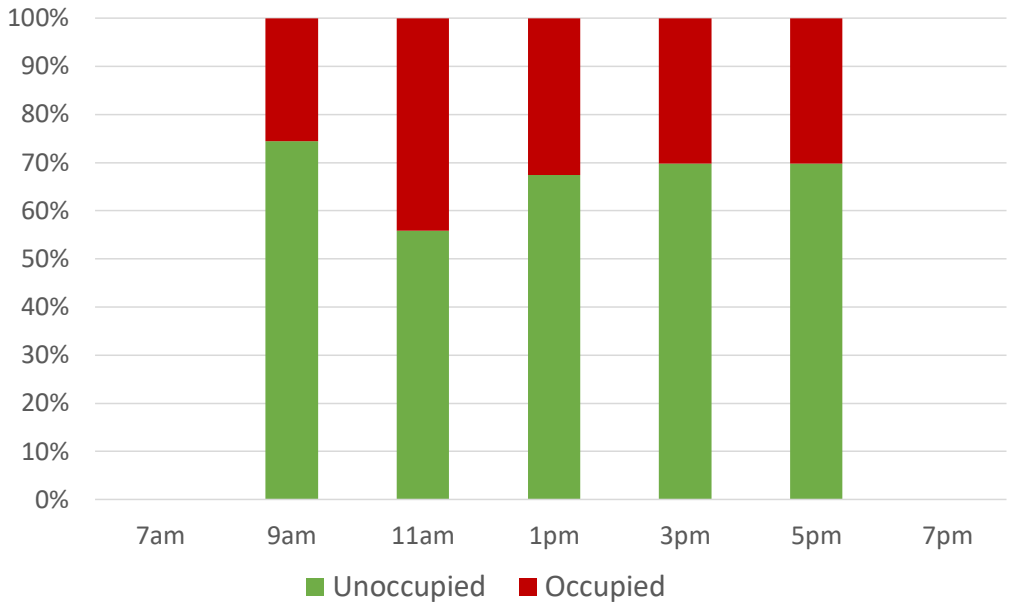

Figure 20: Parking Occupancy in one-hour time limit spaces (Wednesday)

Occupancy - 2P Spaces (23 Spaces): Wednesday 14 Apr 2021							
Status	7am	9am	11am	1pm	3pm	5pm	7pm
Unoccupied	N/A	52%	39%	52%	57%	70%	N/A
Occupied	N/A	48%	61%	48%	43%	30%	N/A

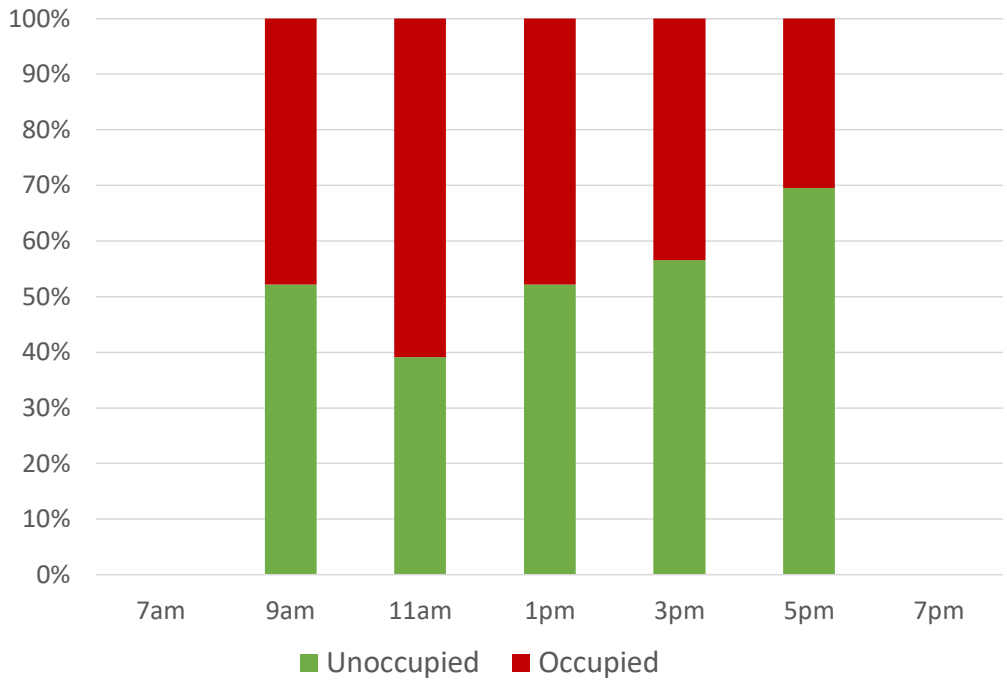

Figure 21: Parking Occupancy in 30-minute time limit spaces (Wednesday)

4.2.1 PARKING OCCUPANCY IMAGES – WEDNESDAY 14 APRIL 2021

Parking conditions within the study area at various times on Wednesday 14 April 2021 are shown in Figure 22 to Figure 29. Conditions at the start of the survey (7.00am) are captured in Figures 22 to 24, which highlight the low 'overnight' parking demand in Palmerston Crescent, Kings Place and Cobden Street. Parking demand is also low on the section of Park Street east of Palmerston Crescent. The north side of Park Street, immediately east of Kings Way is the only section in the study area with relatively high parking demand, as shown in Figure 25. The parking surveys have revealed that only 31% of parking spaces were occupied at 7.00am in the study area (the occupancy in the core area was even lower – 25%).

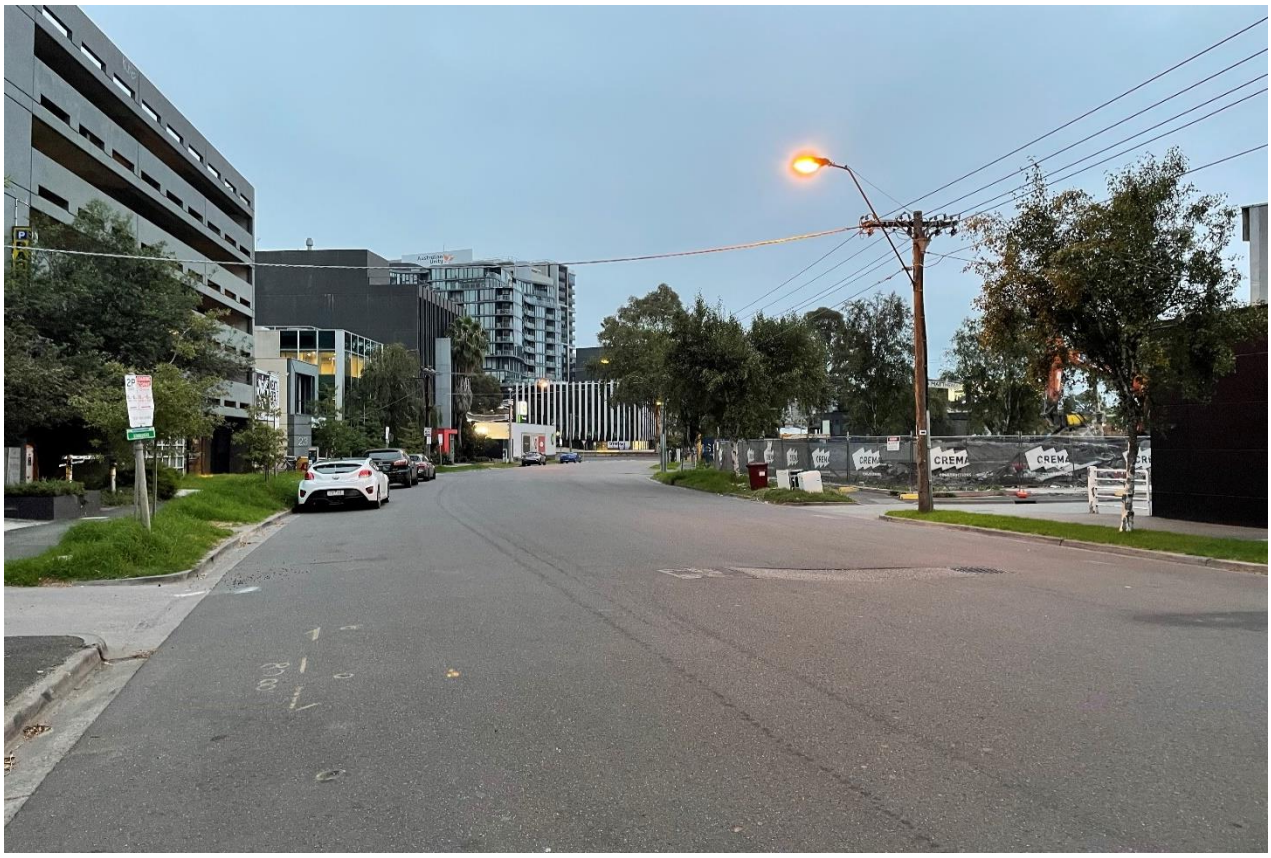

Figure 22: Palmerston Crescent at 7.00am on Wednesday 14 April – looking south from Park Street

Figure 23: Palmerston Crescent at 7.00am on Wednesday 14 April – north west from Kings Place

Figure 24: Cobden Street at 7.00am on Wednesday 14 April – looking south from Kings Place

Figure 25: Park Street at 7.00am on Wednesday 14 April – north side looking west

Figure 26: Kings Place at 9.00am on Wednesday 14 April – looking east from Cobden Street

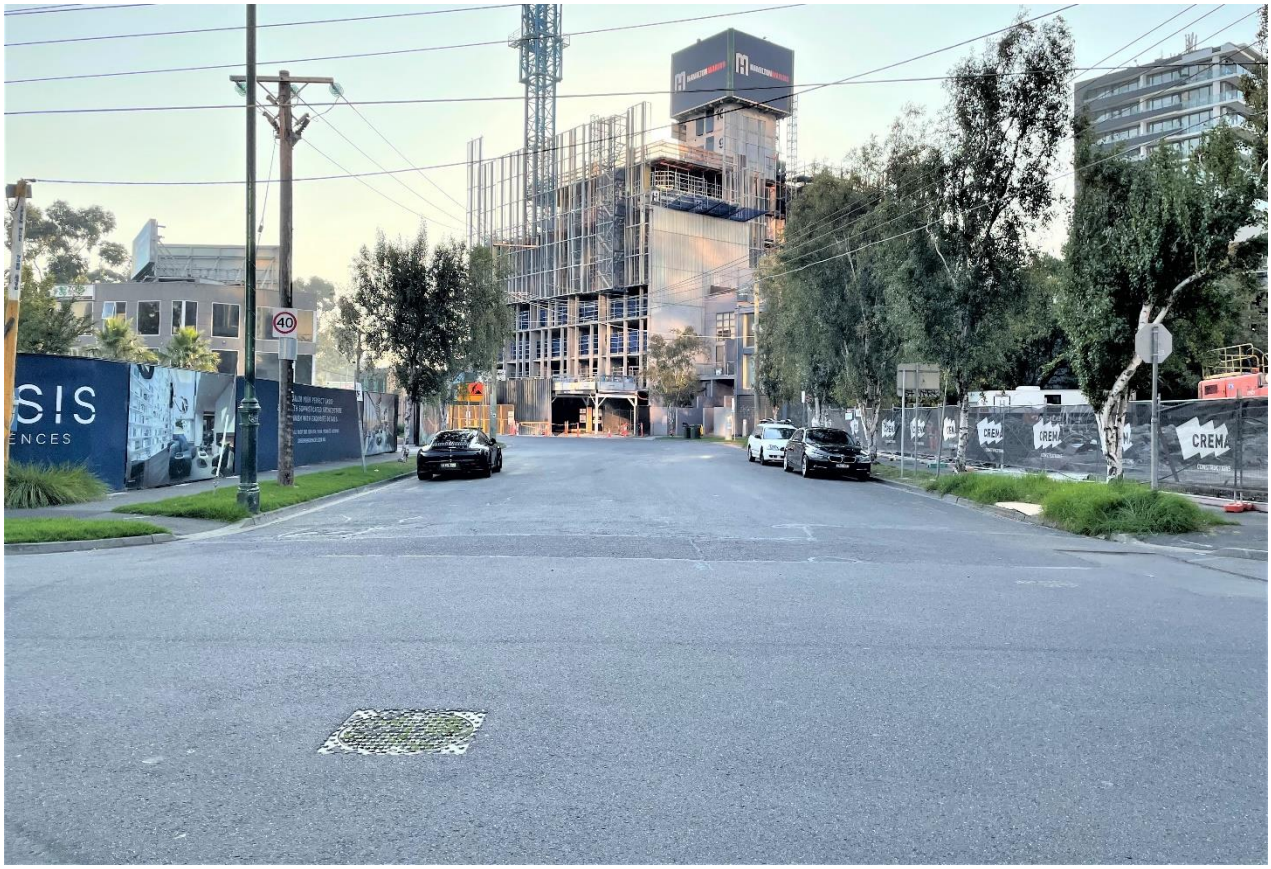

Figure 27: Kings Place Street at 1.00pm on Wednesday 14 April – looking west from Palmerston Crescent

Figure 28: Park Street at 3.00pm on Wednesday 14 April – south side looking east from Palmerston Crescent

Figure 29: Palmerston Crescent at 5.00pm on Wednesday 14 April – looking north from Kings Place

4.2.2 PARKING OCCUPANCY IMAGES – SUNDAY 18 APRIL 2021

Parking conditions within the study area at various times on Sunday 18 April are shown in Figure 30 to Figure 33. Parking demand throughout Sunday was lower across most of the day when compared to Wednesday, with the exception of the late afternoon and evening when occupancy is higher on Sunday (likely related to people visiting the restaurants on Park Street and Wells Streets).

Figure 30: Park Street at 7.00am on Sunday 18 April – south side looking west from St Kilda Road

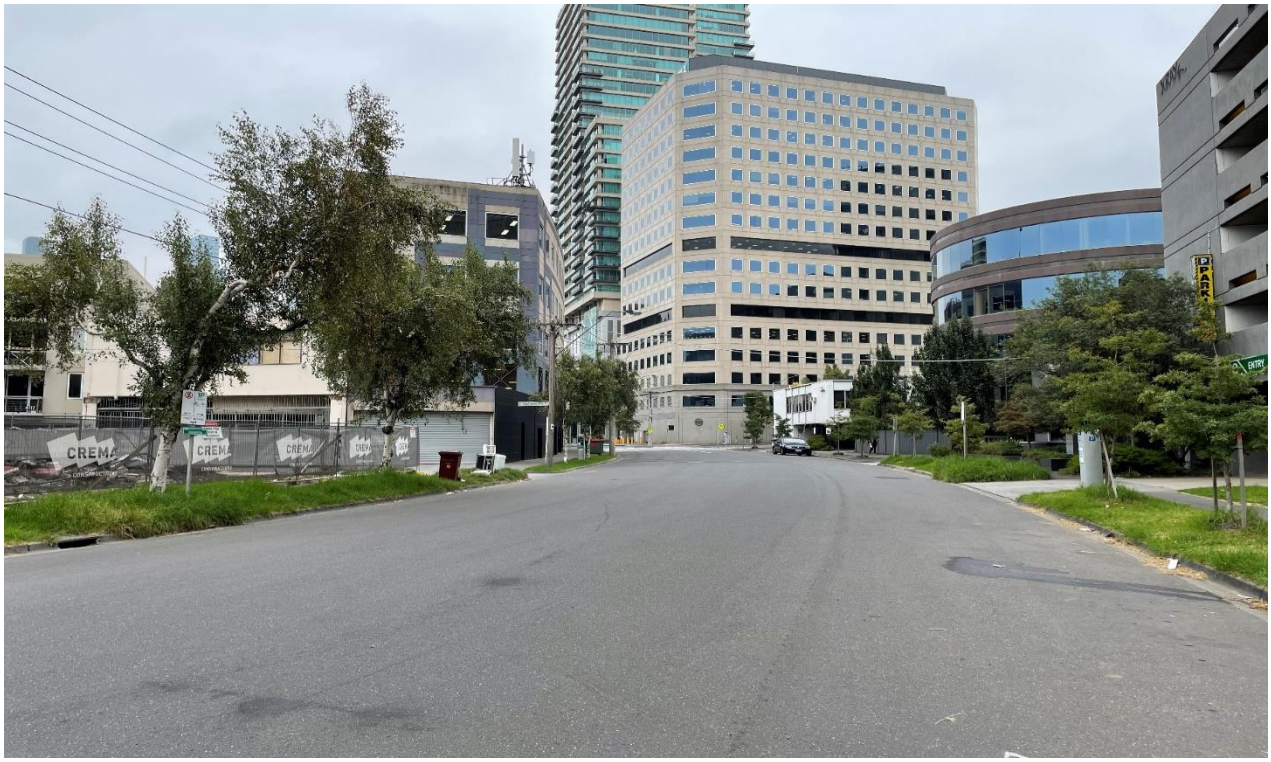

Figure 31: Palmerston Crescent at 9.00am on Sunday 18 April – looking north from Kings Place

Figure 32: Park Street at 1.00pm on Sunday 18 April – north side looking east from Kings Way

Figure 33: Palmerston Crescent at 5.00pm on Sunday 18 April – looking south at Kings Place

4.3 COMPARISON WITH HISTORICAL PARKING OCCUPANCY

The car parking occupancy captured by the April 2021 surveys and presented in the previous section has been compared with historic parking occupancy sourced from aerial photos to enable the determination of typical:

- Average weekday (pre COVID-19) parking availability
- Average weekend (pre COVID19) parking availability

Aerial photographs of the study area between April 2018 and February 2020 were reviewed.

Tables 9-12 summarise the comparison of surveyed parking occupancies with the parking occupancy obtained from historical aerial photographs for both the full study area and core area.

Table 9: Weekday Parking Occupancy Comparison – Full Study Area

Occupancy on Wednesday 14 April 2021	Occupancy for Comparison Period	Time of the Day	Date of Photograph
46%	52%	11am	Tuesday 17 September 2019
35%	36%	1pm	Tuesday 2 April 2019
46%	53%	11am	Thursday 11 October 2018
32%	39%	5pm	Monday 24 September 2018
35%	38%	3pm	Wednesday 18 April 2018

Table 9 highlights that the weekday April 2021 parking occupancies were marginally lower than the pre-Covid parking occupancies.

Table 10: Weekend Parking Occupancy Comparison – Full Study Area

Occupancy on Sunday 18 April 2021	Occupancy for Comparison Period	Time of the Day	Date of Photograph
28%	34%	7am	Sunday 23 February 2020
30%	32%	11am	Sunday 15 December 2019
28%	36%	9am	Saturday 26 May 2018

Table 10 highlights that the weekend April 2021 parking occupancies were also marginally lower than the pre-Covid parking occupancies.

Table 11: Weekday Parking Occupancy Comparison – Core Area

Occupancy on Wednesday 14 April 2021	Occupancy for Comparison Period	Time of the Day	Date of Photograph
40%	44%	11am	Tuesday 17 September 2019
29%	26%	1pm	Tuesday 2 April 2019
40%	45%	11am	Thursday 11 October 2018
21%	28%	5pm	Monday 24 September 2018
25%	30%	3pm	Wednesday 18 April 2018

Table 11 highlights that in the core study area the weekday April 2021 parking occupancies followed the pattern of the full study area and were marginally lower than the pre-Covid parking occupancies.

Table 12: Weekend Parking Occupancy Comparison – Core Area

Occupancy on Sunday 18 April 2021	Occupancy for Comparison Period	Time of the Day	Date of Photograph
25%	31%	7am	Sunday 23 February 2020
15%	21%	11am	Sunday 15 December 2019
25%	32%	9am	Saturday 26 May 2018

In common with the weekday comparison for the core study area, Table 12 highlights that the weekend April 2021 parking occupancies in the core area were also marginally lower than the pre-Covid parking occupancies.

In summary, the evaluation of pre Covid parking occupancies has revealed that parking demand was generally a little higher in the period 2018-2020 compared with the April 2021 parking demands (for both Wednesday and Sunday and across the entire study area as well as the core area). However, the differences were not significant and parking occupancies could typically be described as low to moderate across all the days for which aerial photographs were analysed. The maximum estimated parking occupancy was 53% at 11am on a Thursday in October 2018 compared to the maximum of 46% in April 2021.

It is relevant to note that parking occupancies measured pre-Covid would also have reflected the demand associated with long-standing commercial land uses in the precinct (which were poorly serviced by inadequate on-site parking), many of which have recently been replaced (or are in the process of being replaced) by new residential developments (which are self-sufficient in terms of the adequacy of on-site parking). This transition in the precinct's land use composition from commercial to high density residential, is expected to result in lower on-street parking demand. Within this context and given the relatively small differences in parking occupancy measured between the April 2021 and pre COVID-19 data, it is considered that the recent surveys are realistically representative of the current parking conditions of the precinct in transition.

5 FUTURE TRAFFIC & PARKING CONDITIONS

5.1 APPROVED DEVELOPMENTS

Seventeen (17) developments have been approved in and around the study area. Of these, seven are either within the study area or accessed via Palmerston Crescent, Kings Place, Cobden Street or Miller Lane. The other ten developments are located nearby. The forecast traffic and parking impacts associated with these developments are discussed in the sections that follow. The location of the 17 developments is presented in Figure 34.

Figure 34: Location of Approved Developments in and around the Study Area

Table 13 summarises the main characteristics of the 17 approved developments, including location, proposed land uses, number of parking spaces and the likelihood of traffic generated by those developments using the local streets within the Kings Place precinct.

Table 13: Characteristics of Approved Developments

Address	Primary Proposed Land Use	Parking Spaces	Likelihood of Traffic Using Local Streets within Study Area
11-17 Dorcas Street South Melbourne	58 dwellings	89	**Low** Traffic is unlikely to use the Kings Place precinct as Dorcas Street provides direct access to/from both St Kilda Road & Kings Way.
376-384 St Kilda Rd Melbourne	N/A	N/A	**No impact** Redevelopment of ground floor to provide commercial and office space. Traffic is highly unlikely to use the Kings Place precinct as it is on St Kilda Rd. Albert Rd provides direct access to/from Kings Way.
41-49 Bank Street South Melbourne	170 dwellings	No information available	Low Traffic is unlikely to use the Kings Place precinct as Bank Street provides direct access to/from Kings Way; additionally, Park and Dorcas Streets provide direct access to/from St Kilda Rd.
52-58 Park Street South Melbourne	N/A	N/A	**No impact** Redevelopment of ground floor to provide commercial and office space. As the development is on the north side of Park Street (west of Palmerston Crescent), the local streets in the precinct do not provide an access route (given the right turn bans at the intersection of Park Street and Palmerston Crescent/Wells Street).
50 Park Street South Melbourne	11 dwellings	No information available	**No impact** As the development is on the north side of Park Street (west of Palmerston Crescent), the local streets in the precinct do not provide an access route (given the right turn bans at the intersection of Park Street and Palmerston Crescent/Wells Street).
200-204 Wells Street South Melbourne	84 dwellings	119	**Medium** Some of the traffic generated by the development is likely to travel south on Wells Street, cross Park Street and use Palmerston Crescent to access Kings Way. The local streets in the precinct cannot provide access to the development, given the through movement ban (south to north) across Park Street from Palmerston Crescent into Wells Street.

Address	Primary Proposed Land Use	Parking Spaces	Likelihood of Traffic Using Local Streets within Study Area
9-13 Park Street South Melbourne	45 dwellings	46	**High** Access to the site is via Palmerston Crescent. Therefore, all vehicles to/from the site will use Palmerston Crescent to access Park Street to the north and Kings Way to the south. Depending on their destination, vehicles may use Kings Place to access Albert Road (via Kings Way) more easily. When Kings Way southbound is congested, motorists may elect to use Kings Place to access the site and avoid travelling to Palmerston Crescent.
31-33 Park Street South Melbourne	38 dwellings	35	**High** Access to the site is via Millers Lane. Therefore, all vehicle trips generated by the site will use Kings Place/Cobden Street to access Kings Way or Kings Place/Palmerston Crescent to access Park Street. Vehicles traveling to the site will either use Park Street or Palmerston Crescent to access Park Street and travel to Millers Lane.
37-43 Park Street South Melbourne	131 dwellings & 75 hotel rooms	132	**High** Access to the site is via Kings Place. Therefore, all vehicle trips generated by the site will use the precinct's local streets to travel to/from Kings Way and Park Street.
9-11 Palmerston Crescent South Melbourne	4,670 m^2 office space	18	**High** Access to the site is via Palmerston Crescent. Therefore, all vehicle trips generated by the site will use the precinct's local streets to travel to/from Kings Way and Park Street.
13-21 Palmerston Crescent South Melbourne	196 dwellings	No information available	**High** Access to the site is via Palmerston Crescent. Therefore, all vehicle trips generated by the site will use the precinct's local streets to travel to/from Kings Way and Park Street.
28-32 Albert Road South Melbourne	55	148	**No impact** Traffic is highly unlikely to use the Kings Place precinct as it is on Albert Rd, which provides direct access to/from Kings Way & St Kilda Road.

Address	Primary Proposed Land Use	Parking Spaces	Likelihood of Traffic Using Local Streets within Study Area
8 Palmerston Crescent South Melbourne	36 dwellings & 3,087 m^2 office space	101	**High** Access to the site is via Palmerston Crescent. Therefore, all vehicle trips generated by the site will use the precinct's local streets to travel to/from Kings Way and Park Street.
1-13 Cobden Street South Melbourne	158 dwellings & 97 serviced units	214	**High** Access to the site is via Cobden Street. Therefore, all vehicle trips generated by the site will use the precinct's local streets to travel to/from Kings Way and Park Street.
2 Bowen Crescent South Melbourne	194	226	**No impact** Traffic is highly unlikely to use the Kings Place precinct as it is on Bowen Crescent, which provides direct access to/from Kings Way and St Kilda Road.
7-8 Bowen Crescent South Melbourne	121	No information available	**No impact** Traffic is highly unlikely to use the Kings Place precinct as it is on Bowen Crescent, which provides direct access to/from Kings Way and St Kilda Road.
412 St Kilda Road Melbourne	130	210	**No impact** Traffic is highly unlikely to use the Kings Place precinct as it is on St Kilda Rd. Albert Rd provides direct access to/from Kings Way.

5.1.1 SUMMARY OF APPROVED DEVELOPMENTS

As noted earlier, 17 developments have been approved in and around the study area, of which seven are either within the study area or accessed via Palmerston Crescent, Kings Place, Cobden Street or Miller Lane.

The information presented in Table 13 reveals that only eight of the 17 developments have the most likely potential to cause traffic increases in the study area – the seven that are either within the study area or accessed via the precinct's local streets and the development just north of the study area, located at 200 Wells Street.

Table 14 summarises the development characteristics for those eight developments. Collectively, the developments will provide over 700 off-street parking spaces and will be self-sufficient (not rely on on-street parking to meet the needs of residents, workers and visitors).

Table 14: Summary of Development Characteristics for the Eight Relevant Developments

Address	Dwellings	Office Space (m^2)	Hotel Rooms	Serviced Units
200-204 Wells Street South Melbourne	84			
9-13 Park Street South Melbourne	45			
31-33 Park Street South Melbourne	38			
37-43 Park Street South Melbourne	131		75	
9-11 Palmerston Crescent South Melbourne	18	4,670 m^2		
13-21 Palmerston Crescent South Melbourne	196			
8 Palmerston Crescent South Melbourne	36	3,087 m^2		
1-13 Cobden Street South Melbourne	158			97
TOTAL	**706**	**7,757 m^2**	**75**	**97**

5.2 COMBINED IMPACT OF THE EIGHT RELEVANT DEVELOPMENTS

The potential traffic generation associated with the eight relevant developments shown in Table 14 was undertaken using the assumptions and figures provided in the respective Traffic Impact Assessments (TIAs) prepared in support of the respective planning applications. This section presents the estimates of traffic generation in the AM and PM peaks associated with the eight relevant developments.

5.2.1 RESIDENTIAL TRAFFIC GENERATION

The TIAs for the residential developments applied a traffic generation rate of 0.2 traffic movements per dwelling in each of the peak periods. The TIAs also estimated the following residential traffic directional distribution split:

- AM peak – 20% arrivals and 80% departures
- PM peak – 60% arrivals and 40% departures

The 'directional split' describes how a two-way hourly traffic volume is split in the two travel directions (to and from the traffic generator – effectively the arrivals and departures).

Applying the traffic generation and directional split patterns adopted in the TIAs results in 141 car trips generated in the AM and PM peaks by the 706 dwellings proposed as part of the eight relevant developments. The directional split of these trips is shown in Table 15.

Table 15: Residential Traffic Directional Split

Peak Period	Arrivals (vehicles per hour)	Departures (vehicles per hour)	Total Residential Traffic (vehicles per hour)
AM Peak (8-9am)	28	113	141
PM Peak (5-6pm)	85	56	141

5.2.2 OFFICE TRAFFIC GENERATION

The TIA for the development at 9-11 Palmerston Crescent (which includes an office component) estimates that there will be a total of 8 car trip arrivals in the AM peak and 10 departures in the PM peak. The other development that includes an office component is located at 8 Palmerston Crescent. No traffic generation is estimated in this TIA. However, given the proximity of these two developments (across the street from each other), it is reasonable to apply the same traffic generation rates. Under this scenario, 8 Palmerston Crescent will generate 5 car trip arrivals in the AM peak and 7 departures in the PM peak. Overall, the combined office developments are expected to generate 13 car trip arrivals in the AM peak and 17 departures in the PM peak, as shown in Table 16.

Table 16: Office Traffic Directional Split

Peak Period	Arrivals (vehicles per hour)	Departures (vehicles per hour)	Total Office Traffic (vehicles per hour)
AM Peak (8-9am)	13	0	13
PM Peak (5-6pm)	0	17	17

5.2.3 HOTEL TRAFFIC GENERATION

The TIA for the development at 37-43 Park Street applied a traffic generation rate of 0.3 vehicles per room in the AM peak and 0.17 vehicles per room in the PM peak (including taxis and other ride share services). The TIA also estimated the following traffic directional split:

- AM peak – 30% arrivals and 70% departures
- PM peak – 70% arrivals and 30% departures

Applying the traffic generation and directional split patterns adopted in the TIA results in 11 car trips generated in the AM peak and 7 car trips generated in the PM peak by the 75 hotel rooms. The directional split of these trips is shown in Table 17.

Table 17: Hotel Traffic Directional Split

Peak Period	Arrivals (vehicles per hour)	Departures (vehicles per hour)	Total Hotel Traffic (vehicles per hour)
AM Peak (8-9am)	7	16	23
PM Peak (5-6pm)	9	4	13

5.2.4 SERVICED APARTMENTS TRAFFIC GENERATION

The TIAs for the development at 1-13 Cobden Street that includes a serviced apartments component estimates that there will be a total of 5 car trip departures in the AM peak and 5 arrivals in the PM peak, as summarised in Table 18.

Table 18: Serviced Apartments Traffic Directional Split

Peak Period	Arrivals (vehicles per hour)	Departures (vehicles per hour)	Total Serviced Apartments Traffic (vehicles per hour)
AM Peak (8-9am)	0	5	5
PM Peak (5-6pm)	5	0	5

5.2.5 OVERALL TRAFFIC GENERATION

Table 19 combines the traffic generation estimates for the residential, office, hotel and serviced apartment components of the eight relevant developments.

Table 19: Overall Traffic Generation & Directional Split

Peak Period	Arrivals (vehicles per hour)	Departures (vehicles per hour)	Total Traffic (vehicles per hour)
AM Peak (8-9am)	48	134	182
PM Peak (5-6pm)	99	77	176

The distribution on the road network of the trips generated by the eight relevant developments (182 in the AM peak and 176 in the PM peak) was estimated using the existing origin-destination patterns (previously described in Section 3.2), namely:

- AM peak arrivals – 55% from the north (via Park and Wells Streets) and 45% from the south (via Kings Way)
- AM peak departures – 45% to Park Street in the north and 55% to Kings Way in the south
- PM peak arrivals – 47% from the north (via Park and Wells Street) and 53% from the south (via Kings Way)
- PM peak departures – 36% to Park Street in the north and 64% to Kings Way in the south

The additional traffic arriving and departing in/from the precinct and manifested on the streets within the precinct and on the surrounding roads during the AM and PM peak periods is summarised in Table 20 and Table 21. The traffic growth on streets within the Kings Place Plaza precinct is highlighted by the blue coloured cells in the tables. Figure 35 and Figure 36 illustrate the current and forecast traffic flows in and around the Kings Place Plaza precinct.

Table 20: AM Peak – Forecast Changes in Traffic on Kings Place Plaza Precinct Streets and Surrounding Roads

Location	Existing Traffic (April 2021)	Additional Traffic (Approved Developments)	Forecast Traffic
Kings Way Southbound (between Park St & Alfred Rd)	5,156	89	5,245
Park Street Eastbound (between St Kilda Rd & Kings Way)	273	0	273
Park Street Westbound (between St Kilda Rd & Kings Way)	574	12	586
Palmerston Crescent Northbound (between Park Street & Kings Way)	49	71	120
Palmerston Crescent Southbound (between Park Street & Kings Way)	133	97	230
Kings Place Eastbound (between Kings Way & Palmerston Cr)	29	10	39
Kings Place Westbound (between Kings Way & Palmerston Cr)	4	4	8
Total Additional Traffic in the Kings Place Plaza Precinct		182	

Table 21: PM Peak – Forecast Changes in Traffic on Kings Place Plaza Precinct Streets and Surrounding Roads

Location	Traffic Today (April 2021)	Additional Traffic (Approved Developments)	Forecast Traffic
Kings Way Southbound (between Park St & Alfred Rd)	6,422	75	6,497
Park Street Eastbound (between St Kilda Rd & Kings Way)	520	0	520
Park Street Westbound (between St Kilda Rd & Kings Way)	736	21	757
Palmerston Crescent Northbound (between Park Street & Kings Way)	48	43	91
Palmerston Crescent Southbound (between Park Street & Kings Way)	167	92	259
Kings Place Eastbound (between Kings Way & Palmerston Cr)	15	37	52
Kings Place Westbound (between Kings Way & Palmerston Cr)	7	4	11
Total Additional Traffic in the Kings Place Plaza Precinct		176	

Figure 35: Forecast AM Peak Traffic Flows on Park Street, Kings Way, Palmerston Crescent and Kings Place

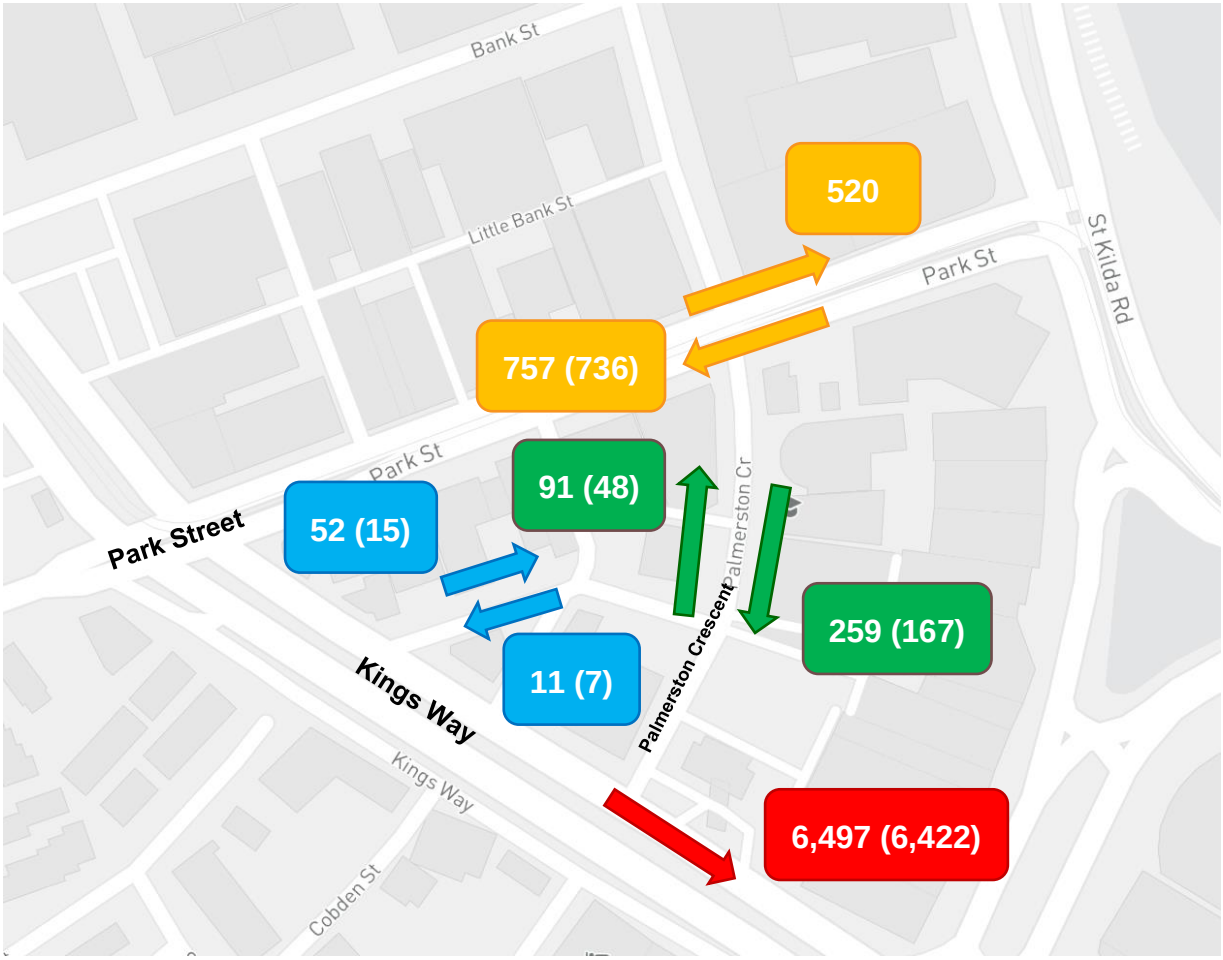

Figure 36: Forecast PM Peak Traffic Flows on Park Street, Kings Way, Palmerston Crescent and Kings Place

The additional traffic forecast for the precinct (182 vehicles in the AM peak and 176 in the PM peak) is comparatively low – equivalent to around three extra vehicles per minute. In addition, as illustrated in the preceding tables and figures, the increases (relative to current traffic conditions) are moderate in the local streets and negligible in the surrounding road network (Kings Way and Park Street).

5.2.6 DEVELOPMENT IMPACTS

The preceding analysis drawn from the TIAs for approved developments in and around the Kings Place Plaza precinct has shown that the significant (primarily residential) development that is currently under construction or proposed in and around the Kings Place Plaza precinct is highly unlikely to generate large increases in peak period traffic flows. Furthermore, the most recent Census data reveals that residents in the precinct exhibit very low car ownership rates and equally low car utilisation for the journey-to-work. In fact, residents in the Kings Place Plaza precinct are already exhibiting sustainable travel patterns almost equivalent to those in Southbank – one of the least car dependent suburbs in metropolitan Melbourne.

Figure 37 shows the latest travel-to-work and car ownership statistics for residents in the Kings Place Plaza precinct and in Southbank, and it reveals exceptionally low car utilisation for the trip to work. In the Kings Place Plaza precinct, only 29% of workers use a car to get to work – almost as low as Southbank (25%). This is significantly lower than the car use for greater Metropolitan Melbourne, where around 65% of people use a car for the journey to work. Furthermore, the Kings Place Plaza precinct also exhibits low levels of car ownership (nearly 85% of households own either no cars or a single car, which is almost as high as for nearby Southbank).

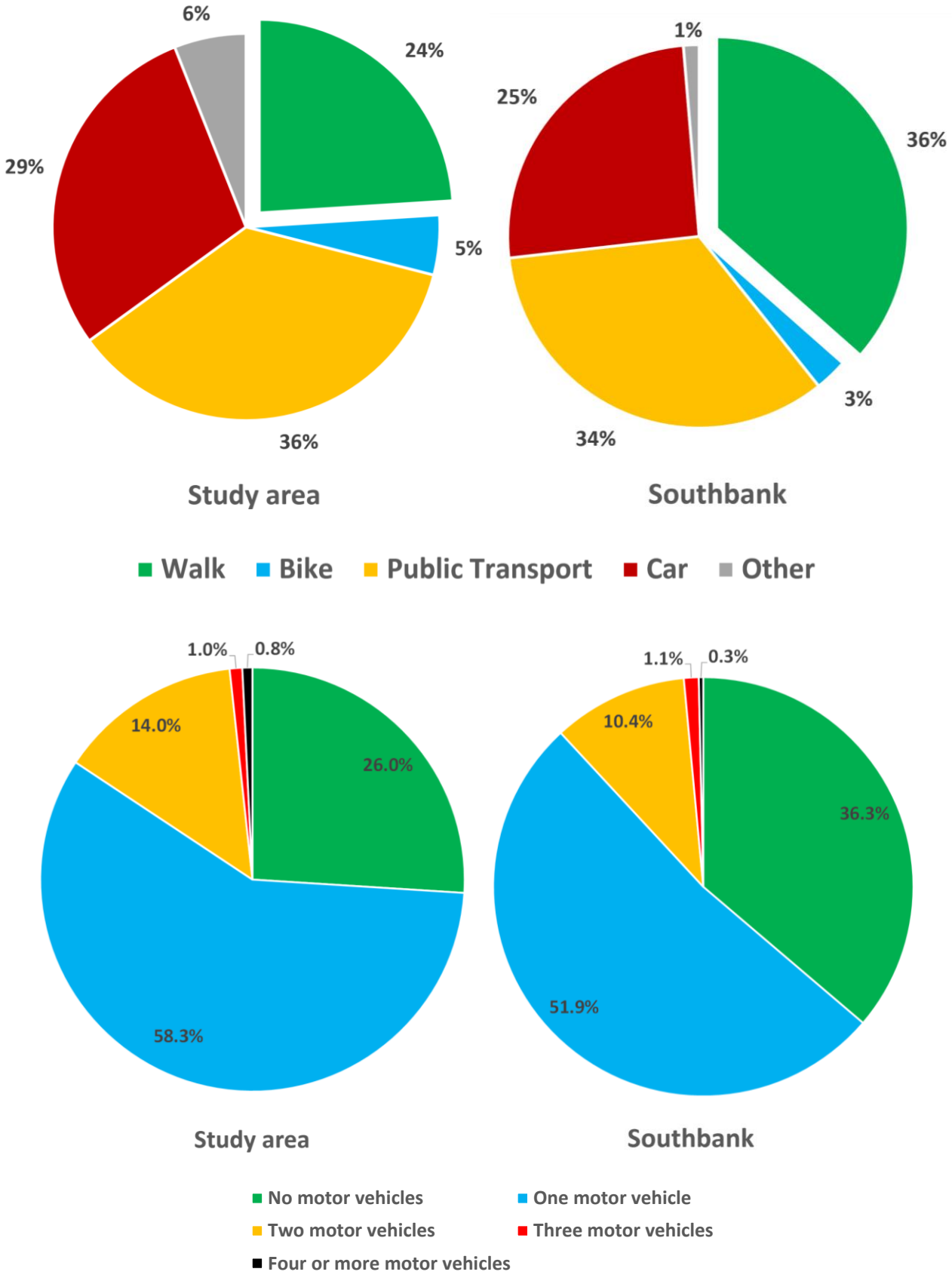

Figure 37: Journey to Work Travel Mode and Car Ownership Statistics for the Study Area and Southbank

The combined travel-to-work and car ownership data suggests that the new developments in and around the Kings Place Plaza precinct are likely to exhibit both low car ownership and utilisation levels – and thus have a very low traffic impact on the precinct's local streets and the surrounding road network.

It is evident that the exceptionally low car ownership and car usage rates (revealed by the Census data) generally reflect the ability of residents to have low levels of car dependency through:

- Excellent public transport availability
- A land use mix that enables residents to access most of their daily needs on foot or by riding bikes
- Generous availability of car share services – for unusual trips that cannot be accommodated by public transport, walking and cycling

Based on the review of Census data for the Kings Place Plaza precinct and Southbank, it is likely that the traffic generation rates used in the previous sections are conservative and overestimate the actual traffic impacts of the approved developments in and around the study area. As such, the overall impacts are likely to be even lower than those presented in the preceding sections.

5.3 DESIRABLE FUTURE PARKING REQUIREMENTS

It is evident from the preceding analysis that the various approved developments within and in the immediate environs of the Kings Place Plaza precinct will be self-sufficient in terms of parking with adequate supply of on-site parking to cater for residents' needs. A number of the developments have also made allowance for visitor drop to occur in porte-cochere arrangements, thus minimising any demand for the use of on-street parking.

Within this context, it has also been established that the use of on-street parking in the area is modest. In April 2021, the overall occupancy over the 12-hour survey periods from 7am to 7pm was 34% on both the weekday and the weekend days surveyed. Importantly, the occupancy levels measured in the parking surveys were found to be consistent with historic pre-Covid parking occupancies in the area.

More specifically, the recent surveys have identified that the generous spare parking capacity in the study precinct (at the busiest times) is significant and equivalent to at least 39 parking spaces being unoccupied and available on Wednesday and at least 41 spaces being unoccupied on Sunday.

In view of the above considerations, any new parking demands associated with the establishment of Kings Place Plaza can be readily accommodated through rationalisation of existing parking restrictions to provide facilities best suited to the daily operation of Kings Place Plaza. The parking facilities typically associated with open-space areas such as Kings Place Plaza include:

- Disabled parking spaces (suggested 2 spaces on Kings Place)
- Drop-off zone (suggested 2 spaces on Kings Place)

In addition, it is also considered desirable to facilitate car share use in the precinct, particularly in view of the significant number of new dwellings proposed in the core precinct surrounding Kings Place Plaza. The most effective means to support car share services is to provide dedicated on-street spaces for car share vehicles in proximity to the areas of potential high demand (in this instance – the approved developments in the Kings Place Plaza precinct).

Several of the TIAs for those developments discuss the desirability and need for additional car share vehicles in the precinct. One of the mixed-use developments (residential and commercial) proposes to have one dedicated parking space for a car share vehicle.

6 KEY FINDINGS

The current concept for Kings Place Plaza involves the part closure of Kings Place and Cobden Street. Accordingly. It is necessary to understand existing and future traffic and parking patterns in order to assess the implications of the proposed traffic arrangements for this precinct. The findings presented in this report are based on a comprehensive review and analysis of traffic and parking data (including available historic data and recently collected survey data from April 2021). On the basis of the analysis undertaken, it has been concluded that the development of Kings Place Plaza is unlikely to cause any adverse traffic or parking impacts within the precinct bounded by Park Street, Palmerston Crescent and Kings Way. This conclusion incorporates the likely traffic generation and parking impacts associated with approved developments in this precinct, which are yet to be completed. Key aspects of the analysis are summarised in the sections that follow.

6.1 PARKING

The parking surveys have revealed that the current occupancy of spaces is modest. Furthermore, a comparison with historic parking occupancy data (obtained from aerial imagery) indicates that the existing parking utilisation is consistent with the period immediately pre-Covid (before March 2020) and following the extensive tram works on Park Street completed in 2018. This suggests that parking dynamics in this precinct (measured in mid-April 2021) had largely recovered to their pre-Covid levels and could be reliably used as a measure of parking demand for both weekdays and weekends.

The key findings with respect to parking utilisation, include:

- The overall occupancy over the 12-hour survey periods was 34% on both the weekday and the weekend.
- The maximum number of parking spaces occupied at any given hour was found to be 33 out of 72 spaces on Wednesday at 11am (this is equivalent to 46% of the publicly available spaces being occupied) and 33 out of 74 spaces on Sunday at 7pm (this is equivalent to 45% of the publicly available spaces being occupied).
- Thus, even at the busiest times, there is reasonable spare parking capacity – with at least 39 unoccupied spaces out of the publicly available spaces on Wednesday and at least 41 unoccupied spaces out of the publicly available spaces on Sunday. This represents spare parking capacity of 54% of the total supply on Wednesday and 55% of the total supply on Sunday.

On the basis of these findings, it would be reasonable to support a targeted parking rationalisation / reduction strategy for the purposes of open space enhancement within the precinct and in targeted support for existing and proposed developments (such as the provision of car share and drop off spaces).

In this regard, it is noted that the parking demand associated with the future approved developments in the Kings Place Plaza precinct will be met entirely off-street, as demonstrated in the respective TIAs for each development. There are over 700 off-street parking spaces proposed for the relevant developments, which include 706 dwellings, close to 8,000m^2 of office space, 75 hotel rooms, 97 serviced apartments and a range of complementary land uses (small retail and food components). It is noted that several of the TIAs prepared for the approved developments envisage the provision of pick-up/drop-off zones. In addition, several TIAs highlight the need for additional car-share vehicles in the precinct. One of the TIAs proposes a dedicated off-street car-share space within its carpark.

Accordingly, the future allocation of on-street parking spaces in the Kings Place Plaza precinct should include:

- Disabled parking near the open space (possibly two spaces)
- A drop-off zone to service Kings Place Plaza (possibly two spaces)
- Car-share spaces to service the precinct – the demand for such spaces is highlighted in the TIAs prepared for the approved developments

6.2 TRAFFIC

This study has revealed that the traffic volume using the Kings Place Plaza precinct is exceptionally low in peak periods. The current low traffic levels largely reflect the constrained connectivity/permeability which is inherent to the precinct's street-structure / orientation and the limited access options that exist for vehicles to move into and out of the area. In essence, with few exceptions, there is effectively little advantage and no clear purpose for non-local traffic to enter / short-cut through the precinct. The unattractiveness of the precinct for non-local traffic is therefore reflected in the low traffic volumes recorded. The only 'short-cut' pattern of note (in both the AM and PM peak periods) takes place in the southbound direction along Palmerston Street with traffic travelling between the Wells Street / Park Street intersection bound for the southbound direction on Kings Way. Other minor short-cuts across the precinct, in the northbound direction using Kings Place and Palmerston Crescent, are only performed by a handful of vehicles per hour and are thus negligible.

Within this context, the busiest street within the precinct is Palmerston Crescent (between Park Street & Kings Way). The April 2021 surveys identified that the peak hour volumes were exceptionally modest in both directions:

- Northbound: 49 vehicles/hour in the AM peak and 48 vehicles/hour in the PM peak
- Southbound: 133 vehicles/hour in the AM peak and 167 vehicles/hour in the PM peak

The predominant function of Palmerston Crescent (when considering both directions of traffic flow and both peak periods) is to service local access and circulation to/from commercial carparks and the residential properties in the study area.

Importantly, the monitoring undertaken in peak periods on weekdays and throughout the weekend revealed that there are no significant existing issues with respect to traffic congestion / queueing in the precinct. Furthermore, the combined forecast traffic impact of the various development proposals that have been approved in the precinct is likely to the modest. The collective increase in traffic volumes is likely to be less than 200 movements in each direction during peak hours. Such an increase is not expected to cause any material deterioration in the operational performance of streets in the precinct.

The key findings with respect to traffic include:

- The current concept design for Kings Place Plaza involves the part closure of Kings Place and Cobden Street. Both of these streets carry very low traffic volumes and are not part of any critical traffic route, as they service only a small amount of local traffic movements.
- In the broader local precinct, the existing traffic volumes are equally low, and the forecast growth (associated with new developments) is modest.
- More specifically the forecast traffic growth associated with new developments indicates that during weekday peak hours it is anticipated that traffic growth will be:
    - 168 vehicles/hour on Palmerston Crescent in the AM peak and 135 in the PM peak
    - 14 vehicles/hour on Kings Place in the AM peak and 41 in the PM peak
    - Negligible on Cobden Street in both peak periods
- Accordingly, the impact associated with implementation of Kings Place Plaza is expected to be inconsequential, as no significant traffic volumes are likely to be generated in the study precinct.
- There is no crash history / pattern of concern in the study precinct and at its intersections with the adjoining arterial / sub-arterial network (Kings Way and Park Street)