

**HORNSBY SHIRE COUNCIL**

**CAR PARKING MANAGEMENT STUDY**

**PART D – UTILISATION SURVEYS**

| Precinct   | Current Restrictions | Trip Origin (% outside of LGA) | Occupancy | Average Stay (hours) | Findings  |
|--|----------------------|--------------------------------|-----------|----------------------|---|
| <b>Berowra Town</b>                                |                      |                                |           |                      |   |
| On-street<br>(584 bays, 82 bays time restricted)   | 1P, 2P               | 24.59%                         | 50%       | 2.1                  | Current time restricted bays are not being used by commuters.   |
| Off-street<br>(626 bays, 125 bays time restricted) | 4P                   | 24.59%                         | 96%       | 6.0                  | Commuter parking overspill is occurring at the Community centre and along Pacific Highway.  |
| <b>Brooklyn</b>                                    |                      |                                |           |                      |   |
| On-street<br>(1199 bays, 53 bays time restricted)  | 4P                   | 34.83%                         | 58%       | 2.1                  | Commuter parking overspill is occurring around the activity centres.  |
| Off-street<br>(664 bays, 118 bays time restricted) | 2P, 4P               | 34.83%                         | 38%       | 1.2                  | Operating near capacity on weekends at carparks near certain activity centres.  |
| <b>Berowra Waters</b>                              |                      |                                |           |                      |   |
| On-street<br>(332 bays, 0 bay, time restricted)    | N/A                  | 24.59%                         | 23%       | 1.9                  | Demand during weekends impacts the availability of River Resident Parking.  |
| Off-street<br>(288 bays, 0 bay time restricted)    | N/A                  | 24.59%                         | 59%       | 2.9                  | The rooftop level of the multideck car park is underutilised.   |
| <b>Asquith</b>                                     |                      |                                |           |                      |   |
| On-street<br>(1199 bays, 53 bays time restricted)  | 1/4P, 1/2P, 1P, 2P   | 35.51%                         | 57%       | 3.1                  | Owners and tenants own more than one vehicle and park their second vehicle on-street utilising highly desirable town centre parking bays. |
| Off-street<br>(287 bays, 49 bays time restricted)  | 2P, 3P               | 35.51%                         | 71%       | 3.4                  | Operating at reasonable occupancy with possible improvements to compliance.   |

# 1 STAGE 1 PARKING INVENTORY AND UTILISATION SURVEY RESULTS

## 1.1 SURVEY METHODOLOGY

Council engaged Trans Traffic Surveys (TTS) to undertake the parking supply and demand surveys. The surveys were conducted, on Thursday 2 August 2018, and Saturday 4 August 2018, between 8.00am and 6.00pm at 60 minute time intervals on both days. Automatic licence plate recognition (ANPR) technology was used to survey the study area. This comprised an unobtrusive camera which was attached to a vehicle.

A basic inventory of parking supply was developed using a combination of camera recognition software, site inspection and a review of existing information.

### 1.1.1 PARKING SUPPLY SURVEY

Using information supplied by Council and site visits, a detailed inventory of current parking facilities was prepared. The time restrictions for all parking was recorded in the inventory.

The following was included:

- Public on-street.
- Public off-street.
- Private off-street – where access was available.
- Parking for persons with a disability.
- Taxi ranks.
- Bus parking.
- Loading zones (delivery vehicles).
- Parking for drivers with prams.
- Motorcycle parking.
- No parking zones.
- No stopping zones.

The inventory included both marked and unmarked parking supply.

### 1.1.2 PARKING UTILISATION SURVEY

This survey investigated:

- Car parking demand at various times of the day.
- Average parking demand.
- Peak car parking demand and time period.
- Bay turnover.
- Car parking duration of stay.

### 1.1.3 PARKING OCCUPANCY BENCHMARK

Parking occupancy is one of the central concepts in parking management. Whether in reference to on-street parking or to an off-street car park, parking occupancy describes the percentage of spaces that are occupied at any given time. Parking occupancy rates, also called 'utilisation', reflect the relationship between parking supply and demand. Ideally, the occupancy of parking facilities should be high enough to ensure that they are occupied at a level that justifies that parking as a necessary land use, but not so high that it is unreasonably difficult to find a space.

Generally, parking is considered 'at capacity' when available spaces are 85% occupied for on-street and 95% occupied for off-street at times of peak demand.<sup>1</sup>

85% occupancy at times of peak demand means that approximately one parking space in every seven should be vacant. When peak parking occupancy (the average of the four highest hours of demand in a day) is regularly above 85%, a change to the parking management approach is necessary. This 85% benchmark is a recognised best practice approach to the management of on-street parking. It means that the parking resource is well used but people can still easily find a space, thus reducing customer frustration and congestion.

#### 1.1.4 DURATION AND TURNOVER

Parking duration, Average Length of Stay (ALS), refers to the length of time a vehicle occupies a space. Turnover per bay describes how frequently a parking space becomes available or 'turns over' during an hour.

A low occupancy rate in an area means that there are many spaces that are empty or unused. While this may be convenient for drivers travelling to that destination, low occupancy rates can also mean that oversupplies of parking or inappropriate parking prices exist in the area. By contrast, an area, or precinct that has a very high level of occupancy could mean that the available parking supply needs additional management to accommodate the appropriate demand.

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<sup>1</sup> Shoup Donald 2005, 'The High Cost of Free Parking. American Planning Association *Part II: Section 12*.

## 2 STAGE 2 PARKING INVENTORY AND UTILISATION SURVEY RESULTS

### 2.1 BROOKLYN

The study area for the Brooklyn Activity Centre is presented in Figure 2.1.

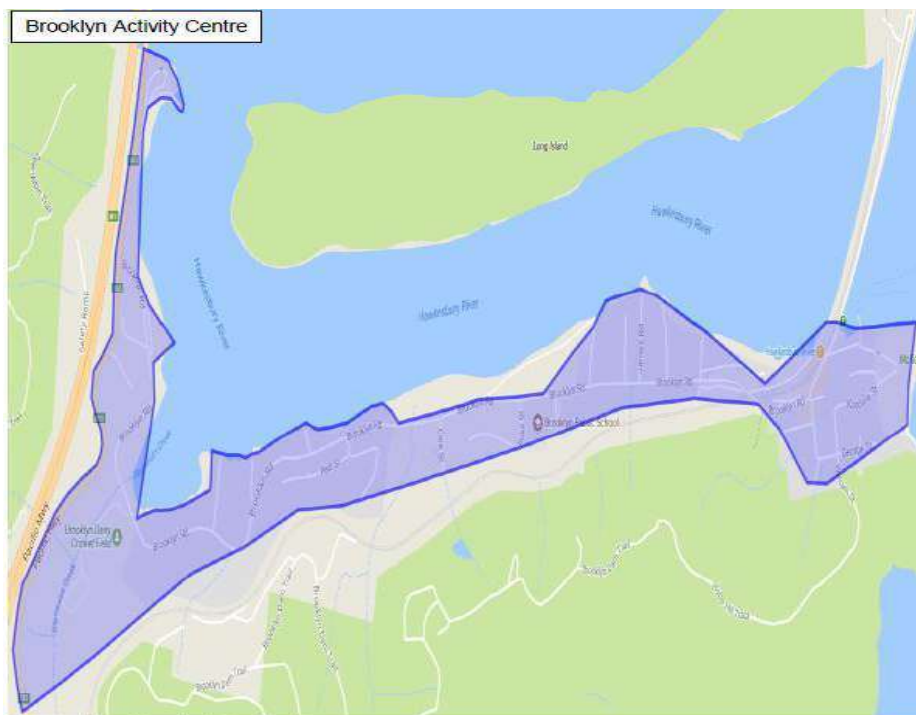


Figure 2.1: Brooklyn Activity Centre survey study area

#### 2.1.1 PARKING SUPPLY

The supply survey identified 1485 parking bays on-street and 909 parking bays off-street within the Brooklyn Activity Centre. A summary of the overall on-street and off-street parking supply in the Brooklyn Activity Centre is presented in Table 2-1 and Table 2-2.

Figure 2.2 and Figure 2.3 present the distribution of on-street and off-street parking types in pie chart format.

Table 2-1: On-street parking inventory within the Brooklyn Activity Centre

| Parking type                          | Parking bays | % of total |
|---------------------------------------|--------------|------------|
| Time-restricted parking               | 32           | 2%         |
| Unrestricted parking                  | 549          | 37%        |
| Parking for persons with a disability | 0            | 0%         |
| Taxi zone                             | 0            | 0%         |
| Loading zone                          | 1            | 0%         |
| Bus zone                              | 11           | 1%         |
| Others (ambulance, reserved etc.)     | 72           | 5%         |
| <b>Total overall supply</b>           | <b>665</b>   | <b>45%</b> |

Table 2-2: Off-street parking inventory within the Brooklyn Activity Centre

| Parking type                          | Parking bays | % of total  |
|---------------------------------------|--------------|-------------|
| Time-restricted parking               | 37           | 2%          |
| Unrestricted parking                  | 624          | 42%         |
| Parking for persons with a disability | 9            | 1%          |
| Taxi zone                             | 0            | 0%          |
| Loading zone                          | 8            | 1%          |
| Bus zone                              | 3            | 0%          |
| Others (ambulance, reserved etc.)     | 208          | 14%         |
| <b>Total overall supply</b>           | <b>889</b>   | <b>100%</b> |

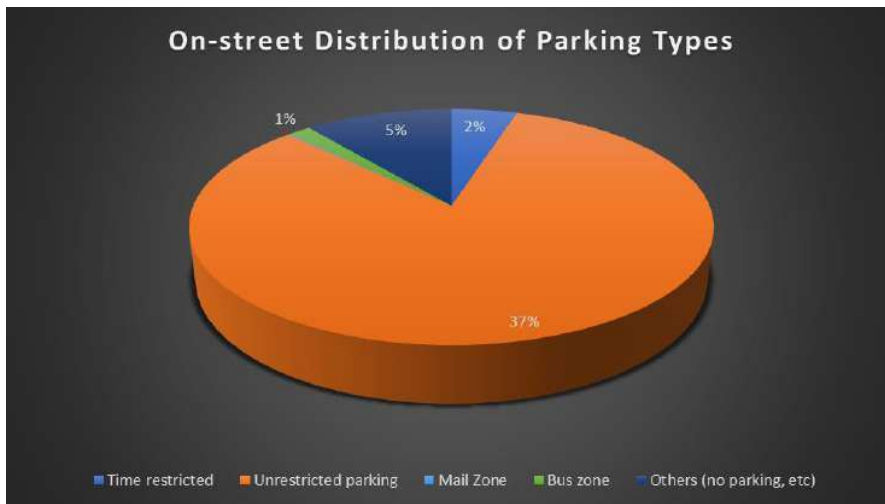


Figure 2.2: Distribution of on-street parking types in the Brooklyn Activity Centre

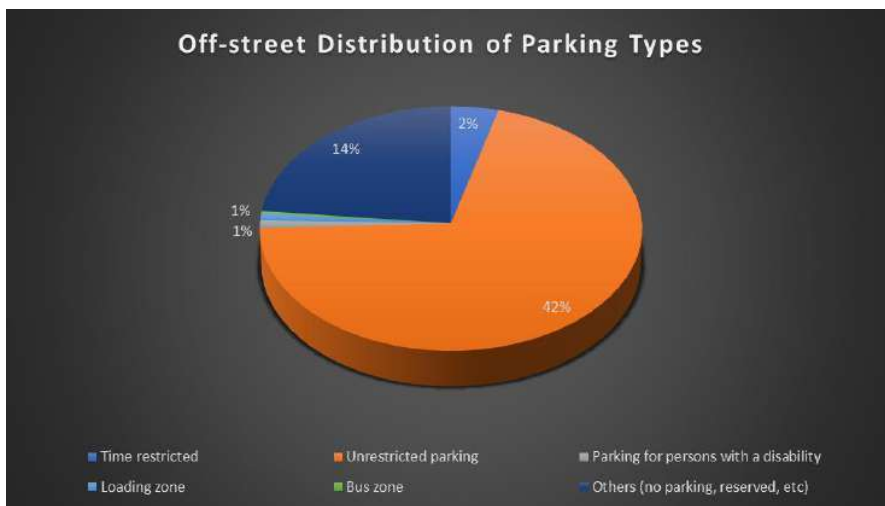


Figure 2.3: Distribution of off-street parking types in the Brooklyn Activity Centre

Table 2-3 presents the breakdown of on-street and off-street parking supply while Figure 2.4 presents the percentage distribution for on-street and off-street parking.

Table 2-3: On-street and off-street parking supply within the Brooklyn Activity Centre

| Parking type            | Parking bays | % of total  |
|-------------------------|--------------|-------------|
| <b>On-street</b>        |              |             |
| Time restricted parking | 116          | 7%          |
| Unrestricted parking    | 549          | 35%         |
| <b>Off-street</b>       |              |             |
| Time restricted parking | 265          | 17%         |
| Unrestricted parking    | 624          | 40%         |
| <b>Total</b>            | <b>1554</b>  | <b>100%</b> |



Figure 2.4: Distribution of on-street and off-street parking in the Brooklyn Activity Centre

### 2.1.2 DEMAND

Table 2-4 presents the hourly parking occupancy observed at the Brooklyn Activity Centre, while Figure 2.5, Figure 2.6 and Figure 2.7 present the on-street, off-street and overall hourly parking occupancy.

Table 2-4: Brooklyn Activity Centre hourly occupancy

| Time  | Occupied bays |        | % Occupied |          |
|-------|---------------|--------|------------|----------|
|       | Thursday      | Sunday | Thursday   | Saturday |
| 6:00  | 767           | 867    | 49%        | 56%      |
| 7:00  | 831           | 941    | 53%        | 61%      |
| 8:00  | 879           | 986    | 57%        | 63%      |
| 9:00  | 928           | 1015   | 60%        | 65%      |
| 10:00 | 954           | 1060   | 61%        | 68%      |
| 11:00 | 985           | 1061   | 63%        | 68%      |
| 12:00 | 1008          | 1039   | 65%        | 67%      |
| 13:00 | 1000          | 1021   | 64%        | 66%      |
| 14:00 | 1000          | 979    | 64%        | 63%      |
| 15:00 | 978           | 933    | 63%        | 60%      |
| 16:00 | 892           | 889    | 57%        | 57%      |
| 17:00 | 830           | 850    | 53%        | 55%      |

| Time  | Occupied bays |     | % Occupied |     |
|-------|---------------|-----|------------|-----|
| 18:00 | 766           | 800 | 49%        | 51% |
| 19:00 | 723           | 778 | 47%        | 50% |
| 20:00 | 673           | 742 | 43%        | 48% |
| 21:00 | 644           | 713 | 41%        | 46% |
| 22:00 | 616           | 666 | 40%        | 43% |

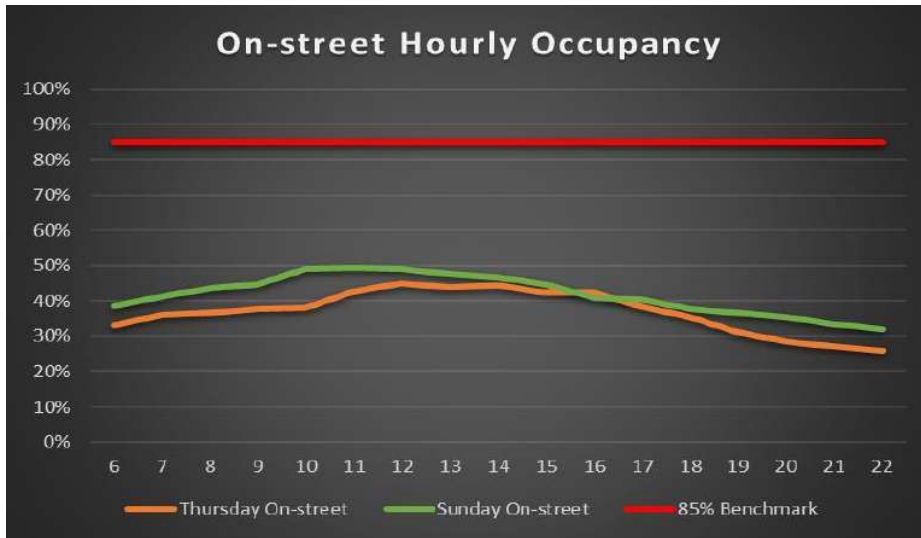


Figure 2.5: On-street hourly occupancy in the Brooklyn Activity Centre

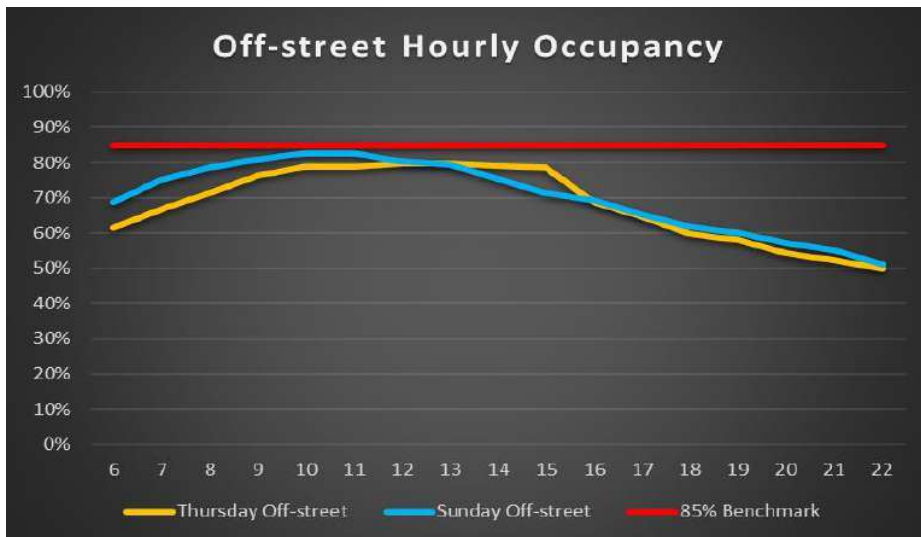


Figure 2.6: Off-street hourly occupancy in the Brooklyn Activity Centre



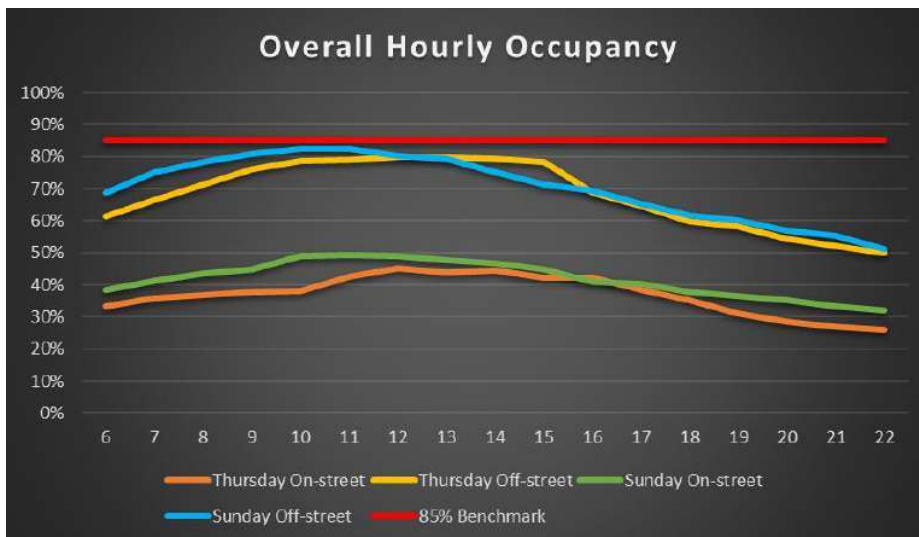


Figure 2.7: Overall Brooklyn Activity Centre parking occupancy

Table 2-5 and Table 2-6 present the on-street and off-street, average and peak occupancy for the Brooklyn Activity Centre.

Table 2-5: On-street parking capacity and occupancy in the Brooklyn Activity Centre

|                   | Thursday | Saturday |
|-------------------|----------|----------|
| Capacity          | 665      | 665      |
| Average occupancy | 37%      | 42%      |
| Peak occupancy    | 45%      | 49%      |

Table 2-6: Off-street parking capacity and occupancy in the Brooklyn Activity Centre

|                   | Thursday | Saturday |
|-------------------|----------|----------|
| Capacity          | 889      | 889      |
| Average occupancy | 68%      | 70%      |
| Peak occupancy    | 80%      | 83%      |

### 2.1.3 DURATION OF STAY AND TURNOVER

#### On-street Duration of Stay and Turnover

Table 2-7 and Figure 2.8 presents the on-street duration of stay and average turnover observed on Thursday and Saturday.

Table 2-7: On-street duration of stay in the Brooklyn Activity Centre

| Time   | Thursday |     | Saturday |     |
|--------|----------|-----|----------|-----|
|        | Vehicles | %   | Vehicles | %   |
| 0-1hr  | 79       | 9%  | 70       | 8%  |
| 1-2hrs | 110      | 13% | 76       | 9%  |
| 2-3hrs | 106      | 13% | 85       | 10% |
| 3-4hrs | 127      | 15% | 119      | 14% |
| 4-5hrs | 87       | 10% | 121      | 14% |

| Time                     | Thursday   |     | Saturday   |     |
|--------------------------|------------|-----|------------|-----|
|                          | Vehicles   | %   | Vehicles   | %   |
| 5-6hrs                   | 87         | 10% | 101        | 12% |
| 6-7hrs                   | 80         | 10% | 71         | 8%  |
| 7-8hrs                   | 63         | 8%  | 66         | 8%  |
| 8-9hrs                   | 28         | 3%  | 42         | 5%  |
| 9-10hrs                  | 36         | 4%  | 31         | 4%  |
| 10+ hrs                  | 35         | 4%  | 68         | 8%  |
| <b>Total</b>             | <b>838</b> |     | <b>850</b> |     |
| Average turnover per bay | 1.2        |     | 1.3        |     |
| Average duration of stay | 2.3        |     | 3          |     |



Figure 2.8: On-street duration of stay in the Brooklyn Activity Centre

Table 2-8 presents the Thursday and Saturday average turnover per bay, which has been categorised by restricted and unrestricted areas.

Table 2-8: Average on-street turnover in the Brooklyn Activity Centre

| Average turnover per bay |          |          |
|--------------------------|----------|----------|
| Parking restriction      | Thursday | Saturday |
| Time restricted          | 5.1      | 4.6      |
| Unrestricted             | 1.4      | 1.5      |

### Off-Street Duration of Stay and Turn Over

Table 2-9 and Figure 2.9 presents the on-street duration of stay and average turnover observed on Thursday and Saturday.

Table 2-9: Off-street duration of stay in the Brooklyn Activity Centre

| Time   | Thursday |     | Saturday |     |
|--------|----------|-----|----------|-----|
|        | Vehicles | %   | Vehicles | %   |
| 0-1hr  | 314      | 16% | 157      | 9%  |
| 1-2hrs | 195      | 10% | 170      | 9%  |
| 2-3hrs | 217      | 11% | 176      | 10% |
| 3-4hrs | 230      | 12% | 198      | 11% |

| Time                     | Thursday    |     | Saturday    |     |
|--------------------------|-------------|-----|-------------|-----|
|                          | Vehicles    | %   | Vehicles    | %   |
| 4-5hrs                   | 199         | 10% | 193         | 11% |
| 5-6hrs                   | 190         | 10% | 202         | 11% |
| 6-7hrs                   | 159         | 8%  | 183         | 10% |
| 7-8hrs                   | 145         | 7%  | 154         | 9%  |
| 8-9hrs                   | 127         | 6%  | 105         | 6%  |
| 9-10hrs                  | 77          | 4%  | 101         | 6%  |
| 10+ hrs                  | 136         | 7%  | 168         | 9%  |
| <b>Total</b>             | <b>1989</b> |     | <b>1807</b> |     |
| Average turnover per bay | 2           |     | 2           |     |
| Average duration of stay | 3.6         |     | 4.1         |     |



Figure 2.9: Off-street duration of stay in the Brooklyn Activity Centre

Table 2-10 presents the Thursday and Saturday average turnover per bay, which has been categorised by restricted and unrestricted areas.

Table 2-10: Average off-street turnover in the Brooklyn Activity Centre

| Parking restriction | Average turnover per bay |          |
|---------------------|--------------------------|----------|
|                     | Thursday                 | Saturday |
| Time restricted     | 5.8                      | 4        |
| Unrestricted        | 1.9                      | 2.1      |

### 2.1.4 FINDINGS

The survey results for the Brooklyn Activity Centre revealed the following:

- **There are 381 time-restricted and 1173 unrestricted parking bays located within the study area. Of these, 9% are time restricted and 91% unrestricted.**
- **43% of parking supply is on-street, while 57% is off-street.**
- **Peak occupancy on-street is 45% on a Thursday from 12 pm to 1 pm, and, 49% on a Sunday with peak demand occurring from 11 am to 12 pm.**
- **Peak occupancy off-street is 80% on a Thursday from 12 pm to 2 pm and 83% on a Sunday with peak demand occurring from 10 am to 11 am.**
- **The time-restricted areas of on-street parking generate an average turnover of 5.1 cars during the survey on Thursday.**
- **The unrestricted areas of on-street parking generate an average turnover of 1.4 cars during the survey on Thursday.**
- **The average length of stay on-street on a Sunday is 3 hours for on-street parking.**

### 2.1.5 TRIP ORIGIN

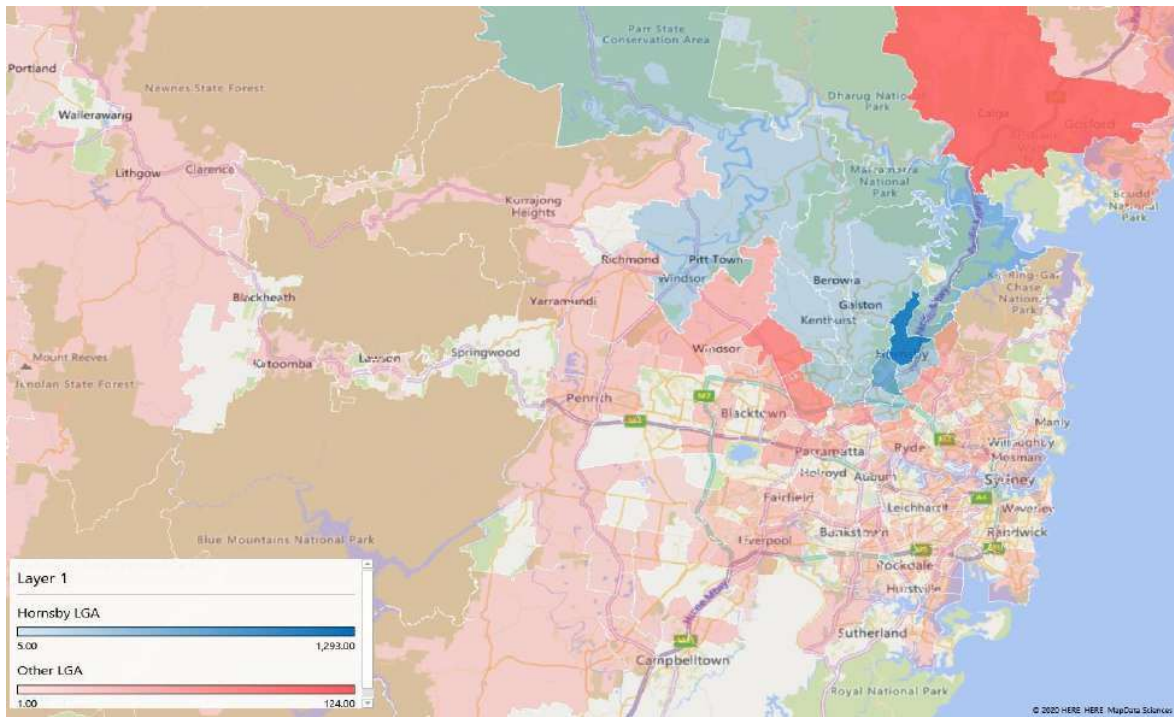


Figure 2.10: Trip origin survey results heat map

The survey results revealed 65.17% of parkers' trip origins in Brooklyn were located within the Hornsby LGA with 34.83% in other surrounding LGA's'.