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CONSULTING

PORTSTORONTO

# Billy Bishop Toronto City Airport

Results of Spring 2018 Traffic and Passenger Surveys



# Table of Contents

|                |  |    |
|----------------|--|----|
| 1.0            | Introduction   | 1  |
| 1.1            | Purpose .....  | 1  |
| 2.0            | Modal Split  | 2  |
| 3.0            | Shuttle Usage  | 5  |
| 4.0            | Taxi Usage   | 7  |
| 4.1            | Taxi Corral Queues .....                                     | 7  |
| 4.2            | Taxi Deadheading .....                                       | 10 |
| 5.0            | Taxi and Auto Occupancy Levels                               | 13 |
| 6.0            | Intersection Traffic Volumes                                 | 15 |
| 6.1            | Scope of Intersection Surveys .....                          | 15 |
| 6.2            | Intersection Traffic Volumes .....                           | 15 |
| 6.3            | Observance of Signed Turn Prohibitions .....                 | 18 |
| 6.4            | Eireann Quay Traffic Volumes .....                           | 20 |
| 7.0            | Queue Surveys  | 23 |
| 7.1            | Northbound Queues on Eireann Quay .....                      | 23 |
| 7.2            | Ferry Queue .....  | 26 |
| 8.0            | Utilization of Pick-Up / Drop-Off Spaces                     | 27 |
| <b>Figures</b> |  |    |
|                | Figure 1: Passenger Movements by Travel Mode .....           | 3  |
|                | Figure 2: Hourly Variation in Modal Split .....              | 3  |
|                | Figure 3: Hourly Airport Shuttle Ridership .....             | 5  |
|                | Figure 4: Shuttle Passengers per Trip .....                  | 6  |
|                | Figure 5: Number of Taxis Queued in Corral (Morning) .....   | 7  |
|                | Figure 6: Number of Taxis Queued in Corral (Afternoon) ..... | 8  |
|                | Figure 7: Taxi Corral Queues Reaching End of Corral .....    | 9  |
|                | Figure 8: Taxi Deadheading Statistics (Morning) .....        | 11 |

|   |    |
|---|----|
| Figure 9: Taxi Deadheading Statistics (Afternoon) .....   | 12 |
| Figure 10: Hourly Variation in Auto / Taxi Occupancy Levels .....                               | 14 |
| Figure 11: Peak Hour Intersection Traffic Volumes .....   | 16 |
| Figure 12: Peak Hour Intersection Traffic Volumes (Taxis Only) .....                            | 16 |
| Figure 13: Estimated Peak Hour Airport Traffic Volumes .....                                    | 17 |
| Figure 14: Estimated Peak Hour Airport Traffic Volumes (Taxis Only) .....                       | 17 |
| Figure 15: Estimated Peak Hour Non-Airport Traffic Volumes.....                                 | 18 |
| Figure 16: Eastbound Right Turns at Lake Shore Boulevard and Stadium Road .....                 | 19 |
| Figure 17: Northbound Left Turns at Lake Shore Boulevard and Stadium Road.....                  | 19 |
| Figure 18: Hourly Traffic Volumes on Eireann Quay.....  | 21 |
| Figure 19: 5-Minute Interval Traffic Volumes on Eireann Quay.....                               | 22 |
| Figure 20: Queue Length on Northbound Eireann Quay (Morning Surveys).....                       | 23 |
| Figure 21: Queue Length on Northbound Eireann Quay (Afternoon Surveys) .....                    | 24 |
| Figure 22: Queue Lengths on Northbound Eireann Quay Extending Beyond Taxi Corral Entrance ..... | 25 |
| Figure 23: Surveyed Ferry Queues (Finger Lot) .....   | 26 |
| Figure 24: Parking Occupancy on Thursday, June 7.....   | 28 |
| Figure 25: Parking Occupancy on Saturday, June 9 .....  | 29 |
| Figure 26: Parking Occupancy on Sunday, June 10.....  | 30 |

### Tables

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|   |    |
|---|----|
| Table 1: Modal Split for Travel to/from BBTCA .....               | 4  |
| Table 2: Average Number of Passengers per Taxi and per Auto ..... | 13 |

# Executive Summary

This report documents the results of the mainland traffic and pedestrian surveys undertaken in June 2018 in the vicinity of Billy Bishop Toronto City Airport (BBTCA). These surveys follow up from similar survey programs undertaken in April and October 2015, and allow for a comparison of how conditions may have changed now that the pedestrian tunnel has been open to airport users for approximately three years.

The survey program yielded the following data:

- Intersection traffic volumes during the AM and PM peak hours;
- Two-way traffic flows along Eireann Quay;
- The level of compliance with signed turn prohibitions in the vicinity of the airport;
- Variation in the length of northbound queues along Eireann Quay at the Queens Quay intersection;
- Variation in the length of the queue of traffic waiting to board the ferry;
- Ridership on the shuttle traveling between Union Station and the airport;
- Variation in the number of taxis queued in the taxi corral;
- The number of deadheading taxis, including “double deadheading” taxis;
- Vehicle occupancy levels in taxis and private vehicles picking up and dropping off passengers; and
- Calculated modal splits indicating the proportion of passengers using different transportation modes to travel to and from the airport.

Below is a summary of the main findings of the June 2018 survey.

## Modal split

(see Section 2.0)

The modal split for trips to and from the airport — the proportion of trips made using the various travel modes — was determined based on observed shuttle usage, auto and taxi pick-ups and drop-offs, pedestrian activity, and parking statistics. In addition, trips made by Uber and Lyft were recorded for the first time.

Overall, approximately 32% of trips to the airport and 41% of trips from the airport were made by non-auto modes (the airport shuttle; TTC streetcar service; and pedestrian access):

- The Union Station shuttle bus carries one out of every four to five airport trips (21% of trips to the airport; 29% of trips from the airport);
- Approximately 11% to 12% of trips are other non-vehicular trips (likely most traveling by TTC streetcar and walking between Queens Quay and the airport, but some potentially making the trip entirely by foot or by bicycle).

Overall, approximately 68% of trips to the airport and 59% of trips from the airport were made by auto modes (taxis; private vehicles):

- Taxis continue to carry a substantial proportion of travelers (27% of trips to the airport; 36% of trips from the airport);
- Pick-up and drop-off trips by private auto also comprise a substantial proportion (31% of trips to the airport and 18% of trips from the airport);
- Uber and Lyft make up a moderate proportion of trips to the airport (8%) but few trips from the airport (3%); and
- Approximately 2% of trips drive to the airport and park in one of the three lots.

The primary change that has occurred since the fall 2015 surveys is a noticeable decrease in the proportion of passengers being picked up and dropped off by taxi, and a corresponding increase in the proportion of passengers being picked up and dropped off by private vehicle. This continues a trend observed in 2015 after the opening of the pedestrian tunnel. When dividing trips into auto-based trips (taxi; Uber/Lyft; private auto) and non-auto-based trips (airport shuttle; TTC; walking/cycling), the proportion of auto-based trips has increased slightly for drop-offs, and decreased slightly for pick-ups. Auto-based trips comprise 68% of all travel to the airport, but only 59% of travel from the airport.

### Peaking of traffic and queues

*(see Sections 6.4; 7.1; 3.0)*

Before the opening of the tunnel, traffic flows were characterized by periods of lower volume related primarily to drop-offs, with regular surges in traffic flow every 15 to 20 minutes following the arrival of a ferry. The surges in activity would be especially pronounced following ferry trips that accommodated passengers from two or more arriving flights. The Queens Quay and Eireann Quay intersection experienced periods of queuing and congestion following the arrival of a ferry, followed by a “recovery” period to allow queues to dissipate before the arrival of the next ferry. Queues on northbound Eireann Quay regularly reached 10 vehicles in length during the morning peak, and 15 to 18 vehicles during the afternoon peak.

With the opening of the tunnel, the flow of passengers arriving on the mainland is better dispersed rather than concentrated into surges. The flow of taxis and other vehicles associated with passenger pick-up has similarly been better dispersed. Although the traffic flows and queues along Eireann Quay still experience some variation associated with the flight schedule, the variation is much more moderate and the northbound queues were observed to be substantially reduced compared to pre-tunnel conditions. This was first observed in the fall 2015 post-tunnel surveys and continues to be the case in the 2018 surveys. Most queues on northbound Eireann Quay were approximately five vehicles or less, with occasional queues of 10 to 12 vehicles in the afternoon.

The northbound queue was also monitored via video footage for a full day on Thursday and Sunday to identify periods when the queue reached the taxi corral entrance. This was observed for a 25-minute period at 7:00 PM on Thursday, but otherwise queues of this length were only observed for limited, occasional instances and dissipated after one to two traffic signal cycles.

Similar observations were made when reviewing ridership on shuttle trips leaving the airport. Both the proportion of overcrowded trips and the proportion of empty trips were observed to be reduced now that passengers are arriving at the shuttle pick-up location in a more dispersed pattern.

### Traffic volumes on Eireann Quay

(see Section 6.4)

Two-way traffic volumes on Eireann Quay were recorded immediately south of Queens Quay.

- During the morning peak period, Eireann Quay carries approximately 700 vehicles per hour between 7:00 and 8:00 AM.
- During the afternoon peak period, Eireann Quay carries approximately 850 vehicles per hour between 4:00 and 5:00 PM. Traffic volumes on Eireann Quay subsequently decrease to approximately 600 vehicles per hour between 5:00 and 6:00 PM, before increasing to approximately 800 vph by the 6:00–7:00 PM interval (corresponding to the time period with the highest total traffic volumes at Lake Shore Boulevard and Bathurst Street).
- The 2018 data were compared against the volumes observed during the Thursday and Friday surveys in fall 2015. The peak 2018 volumes have increased by approximately 50 to 100 vehicles per hour compared to the fall 2015 data.

### Airport traffic as a proportion of total traffic

(see Section 6.2)

The proportion of traffic comprised of vehicles traveling to and from the airport varies by roadway.

- On Lake Shore Boulevard, which serves a commuter function through downtown, airport traffic makes up 3–6% of all traffic.
- On Bathurst Street north of Queens Quay, which is a key airport approach route, 60–65% of traffic in the block between Queens Quay and Lake Shore Boulevard is airport related.
- Within the neighbourhood to the west (Queens Quay to the west; Stadium Road), airport traffic comprises 5% of all traffic in the morning peak and 8% of all traffic in the afternoon peak.
- On other routes in the area (Queens Quay to the east; Dan Leckie Way; Bathurst Street to the north) airport traffic comprises approximately 25–45% of all traffic.

## Turning prohibitions

(see Section 6.3)

Three turn prohibitions were enacted near the airport in 2012. Northbound left turns from Eireann Quay to Queens Quay are prohibited at all times, and time-of-day prohibitions are in effect at Lake Shore Boulevard and Stadium Road during peak periods (no eastbound right turns from 7-9 AM; no northbound left turns from 4-6 PM).

- A high rate of compliance was observed at Queens Quay and Eireann Quay, with an average of two northbound left turns (nearly all by private vehicles) observed during the peak periods.
- On average, 20 vehicles per hour (nearly all private vehicles) were observed making prohibited right turns at Lake Shore Boulevard and Stadium Road during the AM peak period.
- On average, 59 vehicles per hour (nearly all private vehicles) were observed making prohibited left turns at Lake Shore Boulevard and Stadium Road during the PM peak period. Given the minimal number of northbound left turns from Eireann Quay to Queens Quay over the same two-hour period (only one vehicle in total), the left turn activity at Lake Shore Boulevard and Stadium Road is unrelated to the airport.
- Notwithstanding the number of vehicles violating the turn prohibitions at Lake Shore Boulevard and Stadium Road, the volume of traffic on those movements was observed to decrease compared to the volume during the “shoulder” intervals before and following the two-hour peak period.

## Taxi queues and corral usage

(see Section 4.1)

The taxi corral on the Canada Malting lands can accommodate approximately 32 to 38 taxis (depending on the spacing between taxis), in addition to approximately 16 to 18 taxis standing at the loading platform. Ideally, the supply of waiting taxis is balanced such that the corral is never full (there is room to allow additional arriving taxis to enter the corral without being turned away) and is never empty (there are always taxis waiting to serve arriving passengers).

- During the morning surveys, the corral was observed to be near or at practical capacity between approximately 9:15 and 10:00.
- During the afternoon surveys, the corral was observed to be near or at practical capacity for a substantial part of the afternoon, particularly on Friday.
- From a supplementary review of video footage on Thursday and Sunday, other extended periods were observed when the corral was near or at capacity:
  - On Thursday, for much of the period between 12:00–2:00 PM, and between 7:35–8:50 PM;
  - On Sunday, for approximately one hour in the afternoon (2:50–3:50 PM), as well as for an extended period in the evening (6:15–8:00 PM, and 8:20–8:50 PM).



## Taxi deadheading

(see Section 4.2)

Taxi movements on Thursday were observed to determine the number of deadhead trips to and from the airport (i.e., a taxi being driven to or from the airport without any passengers).

- The majority of taxis accessing the airport generated one deadhead trip (either arriving empty before picking up a fare, or dropping off a fare and then leaving empty).
- At most times, there are also some taxis that enter the corral to pick up a fare immediately after dropping off passengers, generating no deadhead trips.
- At some times, however, this is offset by taxis that arrive empty when the taxi corral is full and are turned away, generating two deadhead trips and serving no passengers. On Thursday, this was primarily observed later in the morning, although it would also have been the case at other times when the corral was full (e.g., throughout much of Friday afternoon).

The rate of deadheading varies by time of day.

- For most of the morning, the rate of deadhead trips tends to range from 0.75 to 1.00 deadhead trips per fare (higher than the range of 0.5 to 0.75 deadhead trips per fare observed in the fall 2015 surveys).
- In the latter part of the morning, the corral was full with a lower level of turnover, and a sizeable increase was observed in the number of taxis arriving empty and being turned away. During a 30-minute interval observed in the morning, more than two-thirds of the taxis on Eireann Quay were empty.
- In the afternoon, the deadheading rate was found to be in the order of 0.6 to 0.9 deadhead trips per fare for most of the afternoon. This is generally comparable to the fall 2015 surveys (which observed a rate of approximately 0.7 deadhead trips per fare for most of the afternoon), but with somewhat more variability throughout the afternoon.

## Vehicle occupancy

(see Section 5.0)

During the morning period, overall vehicle occupancy levels are 1.27 drop-offs per vehicle and 1.35 pick-ups per vehicle (not including the driver, and not including “deadhead” trips).

During the afternoon period, overall vehicle occupancy levels are 1.37 drop-offs per vehicle and 1.18 pick-ups per vehicle.

In the fall 2015 surveys, taxi and private vehicle occupancy levels were approximately 1.20 to 1.25 passengers per vehicle. The taxi occupancy levels are generally comparable, while private vehicle occupancy levels were higher in 2018 for morning pick-ups and afternoon drop-offs.

## 1.0 Introduction

### 1.1 Purpose

This memo documents the results of the mainland traffic and pedestrian surveys undertaken in June 2018 in the vicinity of Billy Bishop Toronto City Airport (BBTCA). Similar survey programs were undertaken in April and October 2015. The 2015 surveys were undertaken before and after the opening of the pedestrian tunnel connecting the airport with the mainland. The scope of the updated surveys was the same as the 2015 surveys, allowing for a comparison of how conditions may have changed now that the tunnel has been open to airport users for approximately three years.

The survey included three separate components:

- Passenger counts leading to modal split and auto occupancy calculations;
- Queue length measurements; and
- Traffic counts at key intersections near BBTCA.

Intersection surveys (six locations) were undertaken on Thursday, June 7, 2018. Surveys on Eireann Quay, south of Queens Quay, and at the mainland airport terminal were undertaken on Thursday and Friday, June 7 and 8, 2018. In both cases, the surveys were undertaken for four hours in the morning (6:30 to 10:30 AM) and for four hours in the afternoon (3:00 to 7:00 PM).

The survey data was augmented by parking and shuttle data obtained from Stolport (local parking operators) and from Can-Ar Coach (shuttle bus operators), respectively.

## 2.0 Modal Split

*Figure 1* shows the number of passengers traveling to and from the airport by each mode. *Figure 2* shows the same data, but by the percentage of passengers using each mode (modal split). *Figure 2* also shows the average mode split for the four-hour morning period, the four-hour afternoon period, and the total survey period.

The average modal split for travel to and from the airport is presented in *Table 1*. This table also shows the modal splits that were obtained from the fall 2015 traffic and pedestrian surveys. The same methodology was applied during both surveys, except that the 2015 surveys did not differentiate between Uber/Lyft trips and trips made by private vehicle.

The primary change that has occurred since the fall 2015 surveys is a noticeable decrease in the proportion of passengers being picked up and dropped off by taxi, and a corresponding increase in the proportion of passengers being picked up and dropped off by private vehicle. This continues a trend observed in 2015 after the opening of the pedestrian tunnel. When dividing trips into auto-based trips (taxi; Uber/Lyft; private auto) and non-auto-based trips (airport shuttle; TTC; walking/cycling), the proportion of auto-based trips has increased slightly for drop-offs, and decreased slightly for pick-ups. Auto-based trips comprise 68% of all travel to the airport, but only 59% of travel from the airport.

Trips made by app-based services (Uber, Lyft) were recorded separately for the first time in 2018 (they were previously recorded as private vehicles). Those trips made up 8% of trips to the airport, but only 3% of trips from the airport.

Figure 1: Passenger Movements by Travel Mode

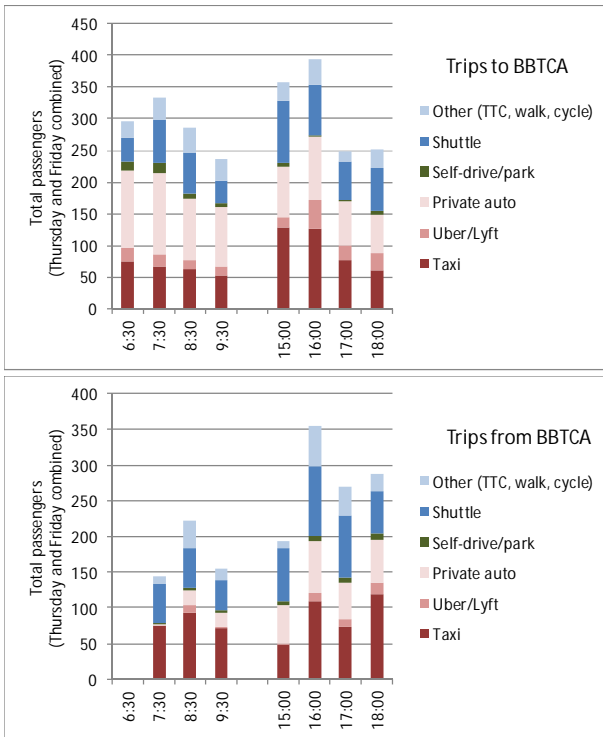


Figure 2: Hourly Variation in Modal Split

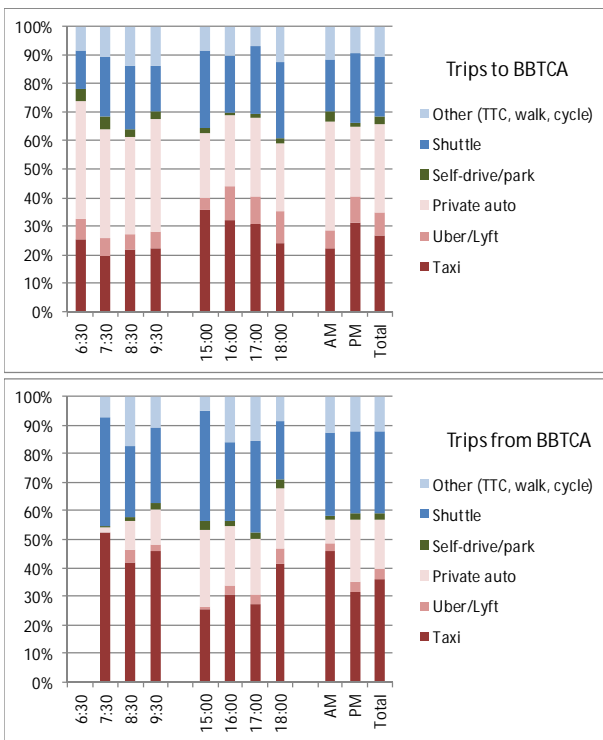


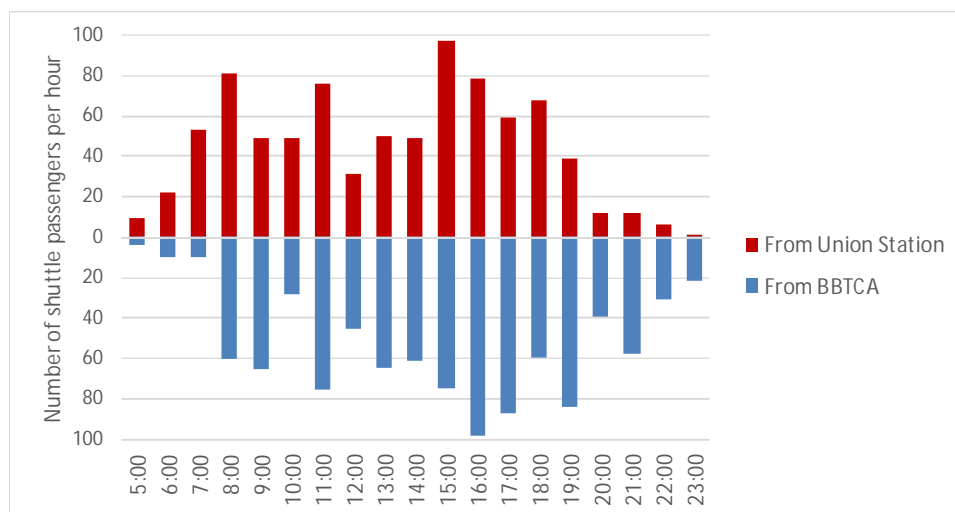
Table 1: Modal Split for Travel to/from BBTCA

| Travel mode to/from BBTCA        | 2018 |     |      | Fall 2015 |     |      |
|----------------------------------|------|-----|------|-----------|-----|------|
|                                  | AM   | PM  | Avg. | AM        | PM  | Avg. |
| Trips to BBTCA (drop-offs):      |      |     |      |           |     |      |
| Taxi drop-off                    | 22%  | 31% | 27%  | 33%       | 39% | 36%  |
| Uber/Lyft drop-off               | 6%   | 9%  | 8%   | —         | —   | —    |
| Private auto drop-off            | 38%  | 25% | 31%  | 21%       | 23% | 22%  |
| Self-drive / park                | 4%   | 1%  | 2%   | 8%        | 4%  | 6%   |
| Airport shuttle bus              | 18%  | 24% | 21%  | 19%       | 21% | 20%  |
| Other (TTC, walking, bicycle)    | 12%  | 9%  | 11%  | 18%       | 13% | 15%  |
| Total taxi / auto                | 70%  | 66% | 68%  | 62%       | 66% | 64%  |
| Total shuttle / transit / active | 30%  | 34% | 32%  | 37%       | 34% | 35%  |
| Trips from BBTCA (pick-ups):     |      |     |      |           |     |      |
| Taxi pick-up                     | 46%  | 32% | 36%  | 55%       | 47% | 49%  |
| Uber/Lyft pick-up                | 3%   | 3%  | 3%   | —         | —   | —    |
| Private auto pick-up             | 9%   | 22% | 18%  | 2%        | 7%  | 5%   |
| Self-drive / park                | 1%   | 2%  | 2%   | 6%        | 5%  | 6%   |
| Airport shuttle bus              | 29%  | 29% | 29%  | 25%       | 28% | 27%  |
| Other (TTC, walking, bicycle)    | 13%  | 12% | 12%  | 11%       | 14% | 13%  |
| Total taxi / auto                | 58%  | 59% | 59%  | 63%       | 59% | 60%  |
| Total shuttle / transit / active | 42%  | 41% | 41%  | 36%       | 42% | 40%  |

## 3.0 Shuttle Usage

Shuttle passenger data was provided by the operator, Can-Ar Coach, who was under contract to Nieuport Aviation, the terminal operator. *Figure 3* illustrates the number of passengers per hour (and shows the average of the Thursday and Friday data).

Figure 3: Hourly Airport Shuttle Ridership



The passenger levels shown in *Figure 3* represent the average of the Thursday and Friday data. Variation in the number of shuttle passengers from one trip to the next is shown in *Figure 4*.

The average daily shuttle ridership was 7% higher in 2018 than in the fall 2015 surveys (approximately 1,695 passengers per day in 2015; 1,815 passengers per day in 2018)

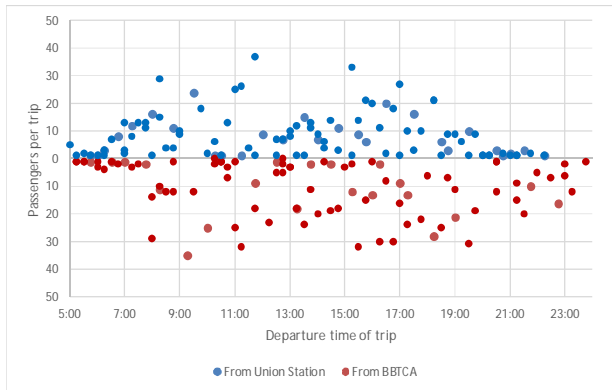
The busiest trips generally carry approximately 30 passengers, with occasional trips carrying nearly 40 passengers.

Shuttle trips were divided into low ridership (<10 passengers), high ridership (>20 passengers), and a middle range (10 to 20 passengers). Of trips to and from the airport, approximately 55% carried fewer than 10 passengers. Trips from the airport were more likely to experience heavier loads (18% of shuttle trips) than trips from downtown (only 10%). Trips leaving the airport are more likely to serve groups of passengers that have just arrived from a recent flight, whereas trips to the airport are more dispersed since passengers have different thresholds of comfort in terms of how early they wish to check in for their flight.

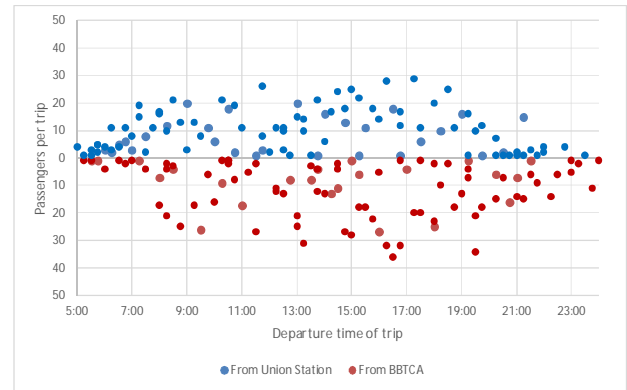
The shuttle buses have seating capacity for 27 passengers. There were 14 trips (out of 187 total recorded trips) with passenger levels exceeding seating capacity, divided nearly evenly between airport-bound and downtown-bound trips. Most of these trips occurred between 3:00 and 5:00 PM.

Figure 4: Shuttle Passengers per Trip

Thursday, July 7, 2018



Friday, July 8, 2018



## 4.0 Taxi Usage

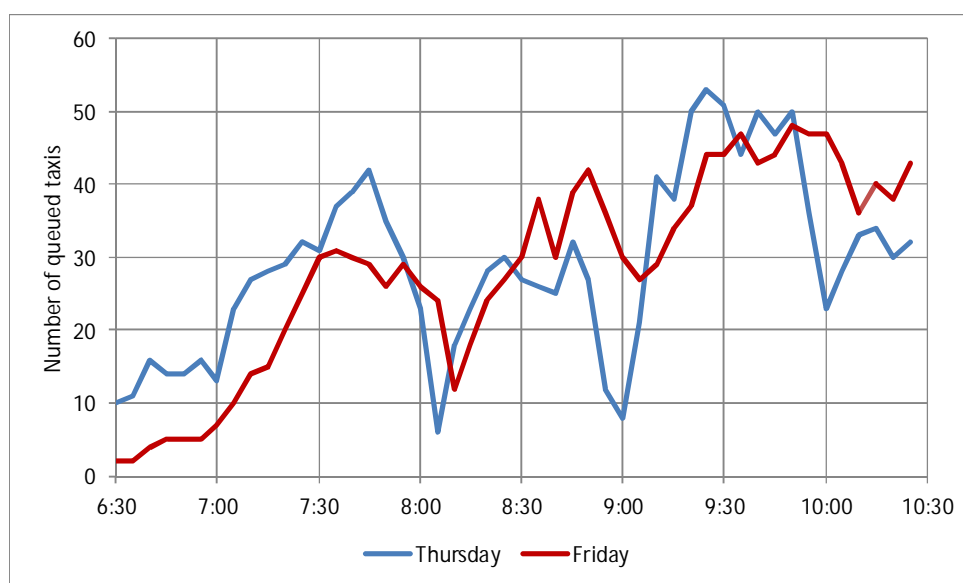
### 4.1 Taxi Corral Queues

Surveyors recorded the number of taxis queued in the corral at five-minute intervals. The survey includes taxis queued in the corral and at the loading area.

The capacity of the corral itself is in the order of 32 to 38 taxis, depending on how tightly spaced the queued taxis are in each lane. In addition, approximately 16 to 18 taxis may be stored in the loading area beyond the corral stop bar.

Figure 5 and Figure 6 show the length of the taxi queue through the morning period and afternoon period, respectively. The figures show the surveyed Thursday and Friday data, as well as the Friday pre-tunnel data for comparison purposes.

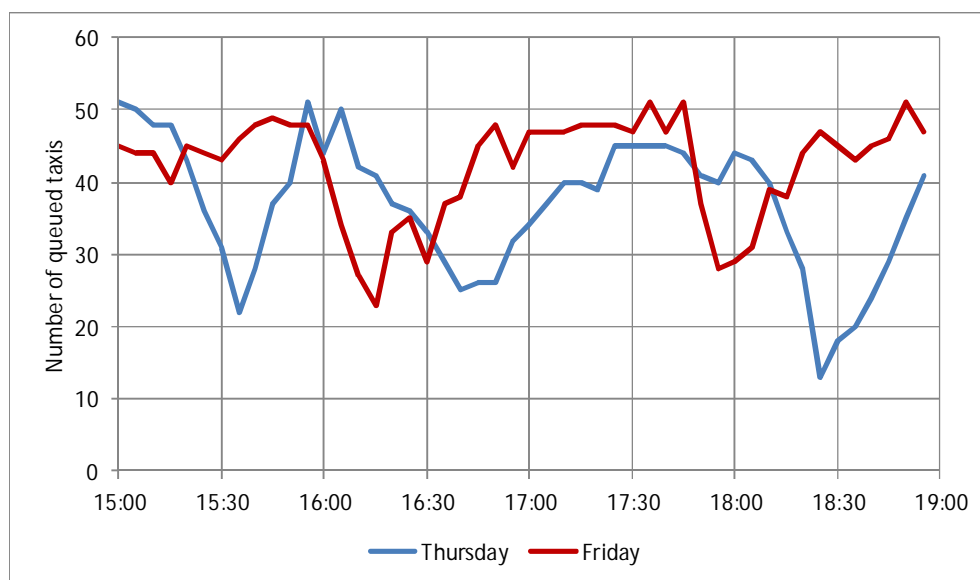
Figure 5: Number of Taxis Queued in Corral (Morning)



For most of the morning, the queue varies between 30 to 40 taxis. On both days, the taxi corral was filled or nearly filled for a period of approximately half an hour starting at approximately 9:20 to 9:30. These conditions are broadly similar to the fall 2015 surveys, when the corral was also observed to fill at approximately 9:15 AM.



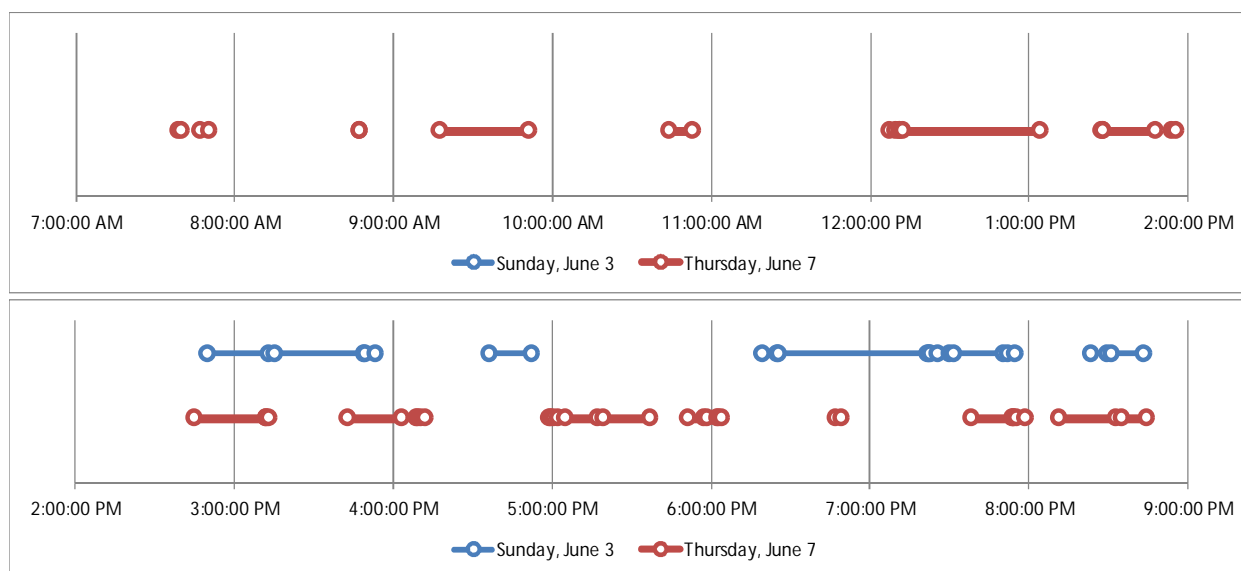
Figure 6: Number of Taxis Queued in Corral (Afternoon)



During the afternoon surveys, the corral was observed to be near or at practical capacity on several occasions. In particular, the corral had more than 40 taxis queued for most of Friday afternoon, save for two 45-minute periods starting at 4:00 PM and 5:45 PM. There was more variability in queue length observed on Thursday, but there were still periods when the corral was full or nearly full at 3:00, 4:00, and between 5:30 and 6:00. Again, the 2015 surveys similarly observed extended periods when the corral was filled to capacity in the afternoon.

The queue length surveys were supplemented by a review of video footage taken on Sunday, June 3 and Thursday, June 7 between 5:00 AM and 11:00 PM. The video footage was used for a high-level review of times when the taxi corral was observed to be full or nearly full, and allowed a review of other times and days not covered by the manual surveyors. These times are illustrated in *Figure 7*.

Figure 7: Taxi Corral Queues Reaching End of Corral



On Thursday, in addition to the queuing observed in the field, the corral was full for most of the early afternoon period (12:00–2:00 PM), as well as for approximately an hour in the evening (7:35–8:50 PM).

On Sunday, the corral was observed to be filled for approximately one hour in the afternoon (2:50–3:50 PM), as well as for an extended period in the evening (6:15–8:00 PM, and 8:20–8:50 PM).

## 4.2 Taxi Deadheading

One way to mitigate traffic levels is to decrease the number of “deadhead” taxi trips (i.e., taxis leaving empty after dropping off a passenger, or taxis arriving empty to enter the corral).

Surveyors tracked every taxi movement and categorized each taxi according to whether they picked up or dropped off passengers and if they:

- Arrived with passenger and entered corral (no deadhead trips);
- Arrived empty and entered corral (one deadhead trip);
- Arrived with passenger and left empty (one deadhead trip); and
- Arrived empty and left without entering corral (e.g., because the corral was full — two deadhead trips).

These surveys were undertaken for the Thursday morning and afternoon four-hour periods only and were undertaken using footage from video cameras at the pick-up / drop-off loop and on Eireann Quay.

*Figure 8* and *Figure 9* show the number of taxi trips made during the morning and afternoon survey periods, respectively, according to the above four categories.

For the taxis that dropped off passengers and left empty, it was not recorded whether the driver preferred to seek the next fare off-site or if the driver had intended to rejoin the corral but was turned away. This should be considered when reviewing the results for times when the corral was frequently at capacity (late morning; much of the afternoon).

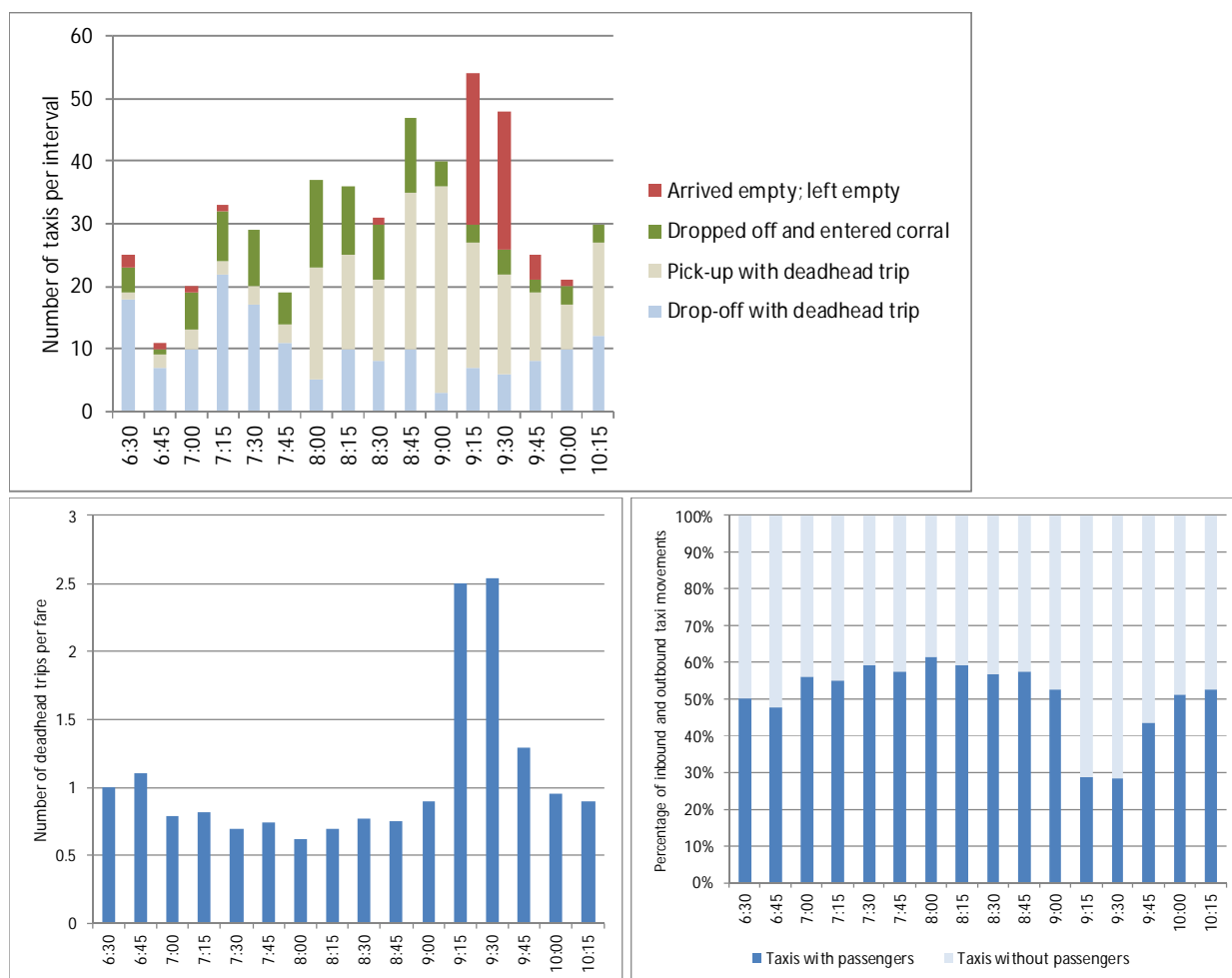
*Figure 8* and *Figure 9* also show the average number of deadhead trips per fare during the morning and afternoon survey periods, respectively. Previous traffic analyses for BBTCA have been based on a value of one deadhead trip per fare (i.e., every taxi arrives empty before picking up a passenger; every taxi dropping off a passenger leaves empty). A lower value is positive (i.e., preferred) and indicates that taxi drivers are entering the corral after dropping off a fare. A higher value is negative and indicates that taxi drivers are being turned away from entering the corral, whether they arrived with a fare or not.

The proportion of deadhead trips fluctuates throughout the day depending on two factors:

- The balance between arriving and departing flights (generally more departing flights earlier in the morning and afternoon, and more arriving flights later in the morning and afternoon); and
- The occupancy level of the corral (both because taxis cannot enter the corral when it is full, but also potentially because there is a shorter wait time to get a second outbound fare if the corral queues are short).

Finally, *Figure 8* and *Figure 9* also show the percentage of taxis traveling along Eireann Quay (both directions combined) that are carrying one or more passengers, compared to those that are carrying the driver only.

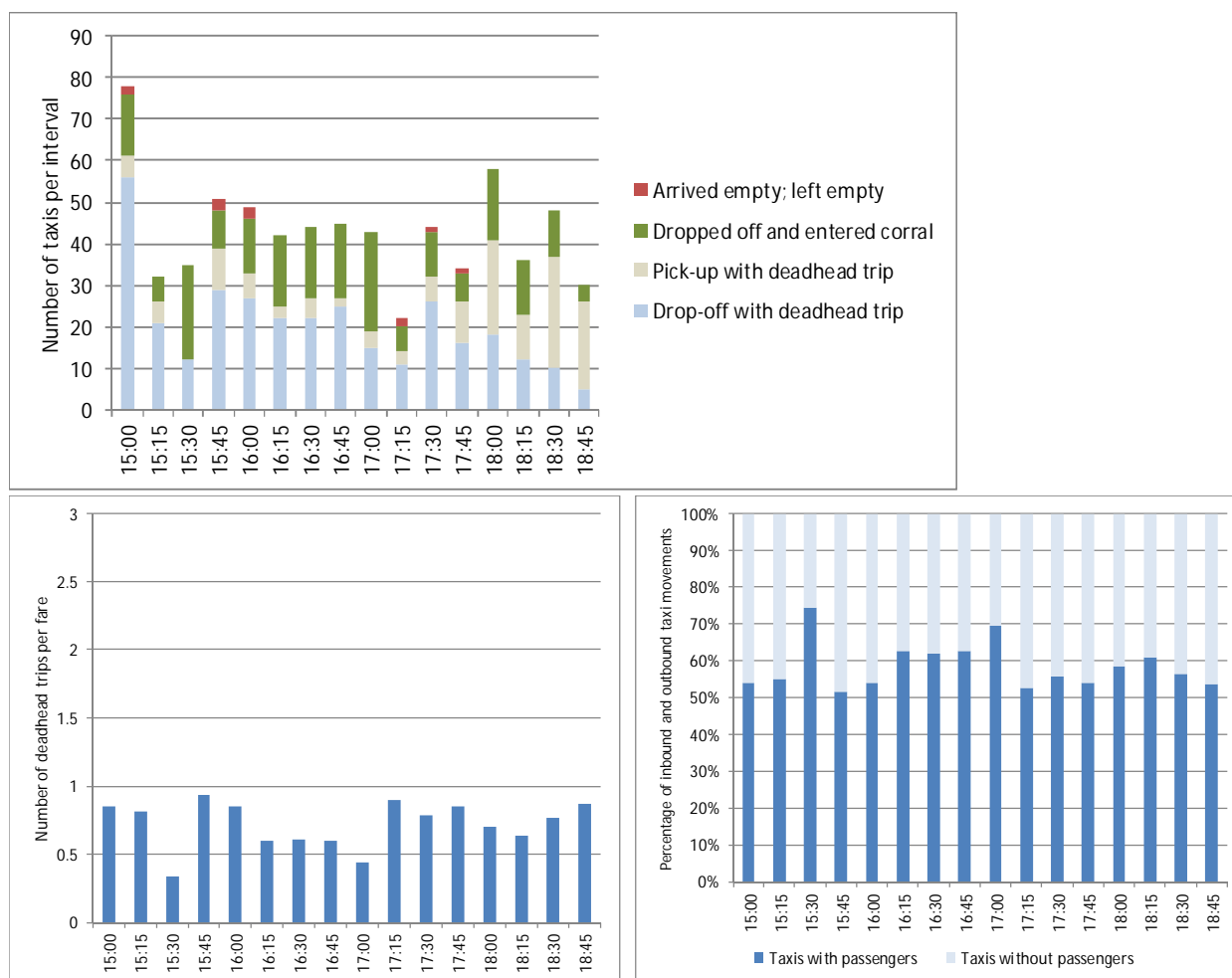
Figure 8: Taxi Deadheading Statistics (Morning)



In the morning, some taxis were observed dropping off a passenger and entering the corral. This reflects a heavier proportion of drop-off demand earlier in the morning and plenty of space available in the corral, and also shows that taxi drivers tend to anticipate the late-morning peak for visitors arriving from out of town. For most of the morning, the rate of deadhead trips tends to range from 0.75 to 1.0 deadhead trips per fare (higher than the range of 0.5 to 0.75 deadhead trips per fare observed in the fall 2015 surveys).

By approximately 9:15 AM, a sizeable increase was observed in the number of taxis arriving empty and being turned away. The rate of deadhead trips increased substantially over a half-hour period, to the point where more than two-thirds of the taxis on Eireann Quay were empty between 9:15 and 9:45 AM. This corresponds to the portion of the morning period where the corral was full with a lower level of turnover. A similar pattern was observed in the fall 2015 surveys, although occurring later in the morning.

Figure 9: Taxi Deadheading Statistics (Afternoon)



For most of the afternoon, the rate of deadhead trips tends to range from 0.6 to 0.9 deadhead trips per fare. This is generally comparable to the fall 2015 surveys (which observed a rate of approximately 0.7 deadhead trips per fare for most of the afternoon), but with somewhat more variability throughout the afternoon. There was relatively little “double deadheading” observed during the PM surveys. The lower rate of double deadheading compared to the morning is related to shorter queues in the taxi corral during the afternoon on Thursday. It is possible that a higher rate of double deadheading would have been observed on Friday afternoon when the corral was at or near capacity for longer periods of time.

## 5.0 Taxi and Auto Occupancy Levels

One way to mitigate traffic levels is to increase the number of passengers sharing a ride to or from the airport, either in a taxi or in a private vehicle.

Surveyors recorded the number of passengers picked up or dropped off by each taxi, each Uber/Lyft vehicle and each private vehicle at the pick-up / drop-off loop and at the taxi corral loading area.

Table 2 shows the average number of passengers per vehicle during the peak periods. Figure 10 shows the hourly fluctuation of occupancy by mode (private auto vs. taxi) and passenger type (arriving vs. departing).

Table 2: Average Number of Passengers per Taxi and per Auto

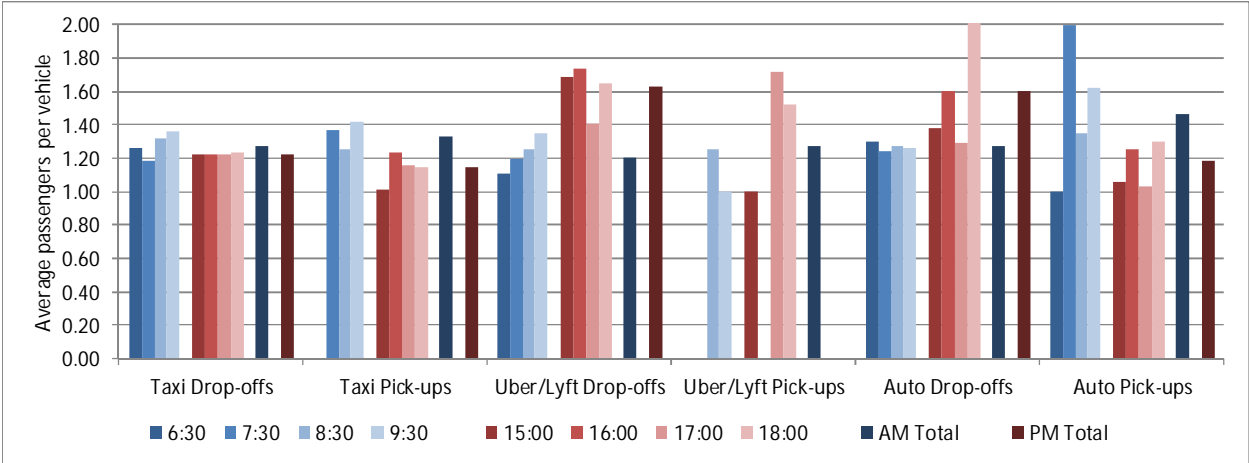
|              | Drop-offs               |                          | Pick-ups                |                          |
|--------------|-------------------------|--------------------------|-------------------------|--------------------------|
|              | Morning<br>(6:30–10:30) | Afternoon<br>(3:00–7:00) | Morning<br>(6:30–10:30) | Afternoon<br>(3:00–7:00) |
| Taxi         | 1.27                    | 1.23                     | 1.34                    | 1.15                     |
| Uber/Lyft    | 1.21                    | 1.63                     | 1.27                    | 1.54                     |
| Private auto | 1.27                    | 1.60                     | 1.47                    | 1.19                     |
| Overall      | 1.27                    | 1.37                     | 1.35                    | 1.18                     |

During the morning period, overall vehicle occupancy levels are 1.27 drop-offs per vehicle and 1.35 pick-ups per vehicle. There is some variation between mode (e.g., lower occupancy for Uber/Lyft), in particular for pick-ups, although this may be a reflection of lower sample sizes.

During the afternoon period, overall vehicle occupancy levels are 1.37 drop-offs per vehicle and 1.18 pick-ups per vehicle. Uber/Lyft occupancy is substantially higher, although that category makes up a smaller proportion compared to taxi usage, particularly for pick-ups.

In the fall 2015 surveys, taxi and private vehicle occupancy levels were approximately 1.20 to 1.25 passengers per vehicle. The taxi occupancy levels are generally comparable, while private vehicle occupancy levels were higher in 2018 for morning pick-ups and afternoon drop-offs.

Figure 10: Hourly Variation in Auto / Taxi Occupancy Levels



## 6.0 Intersection Traffic Volumes

### 6.1 Scope of Intersection Surveys

Intersection traffic counts were undertaken at six locations:

- Lake Shore Boulevard at Stadium Road
- Lake Shore Boulevard / Fleet Street at Bathurst Street
- Lake Shore Boulevard at Dan Leckie Way
- Queens Quay at Stadium Road
- Queens Quay at Bathurst Street / Eireann Quay
- Queens Quay at Dan Leckie Way

### 6.2 Intersection Traffic Volumes

*Figure 11* and *Figure 12* illustrate the AM and PM peak hour intersection traffic volumes (all vehicles; taxis only).

From the existing volumes, the amount of airport traffic at each intersection was estimated (all vehicles; taxis only). These estimated volumes are illustrated in *Figure 13* and *Figure 14*.

The volume of non-airport related traffic was estimated by subtracting airport-related traffic from the total traffic volumes. The estimated non-airport traffic (or background traffic) volumes are illustrated in *Figure 15*.



Figure 11: Peak Hour Intersection Traffic Volumes

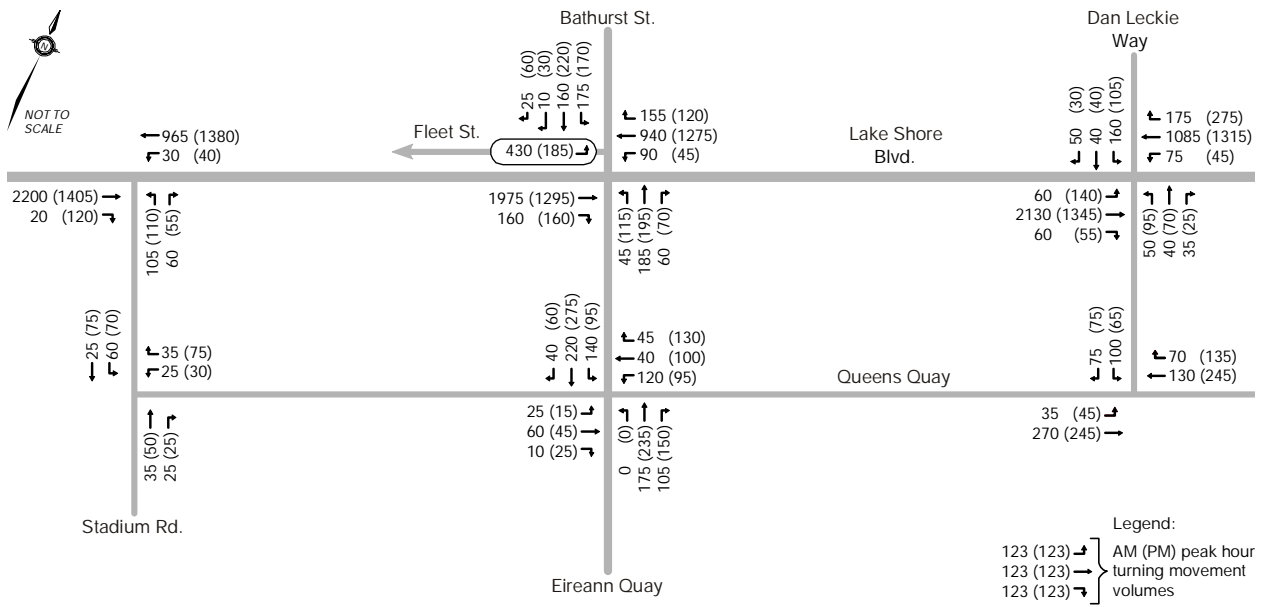


Figure 12: Peak Hour Intersection Traffic Volumes (Taxis Only)

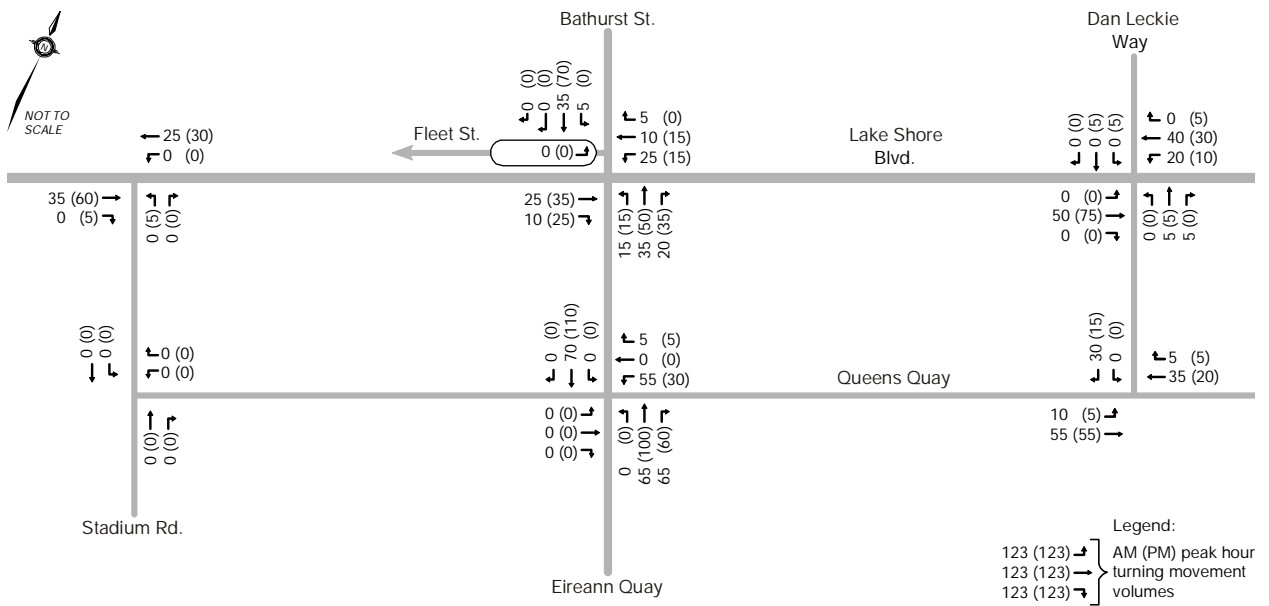


Figure 13: Estimated Peak Hour Airport Traffic Volumes

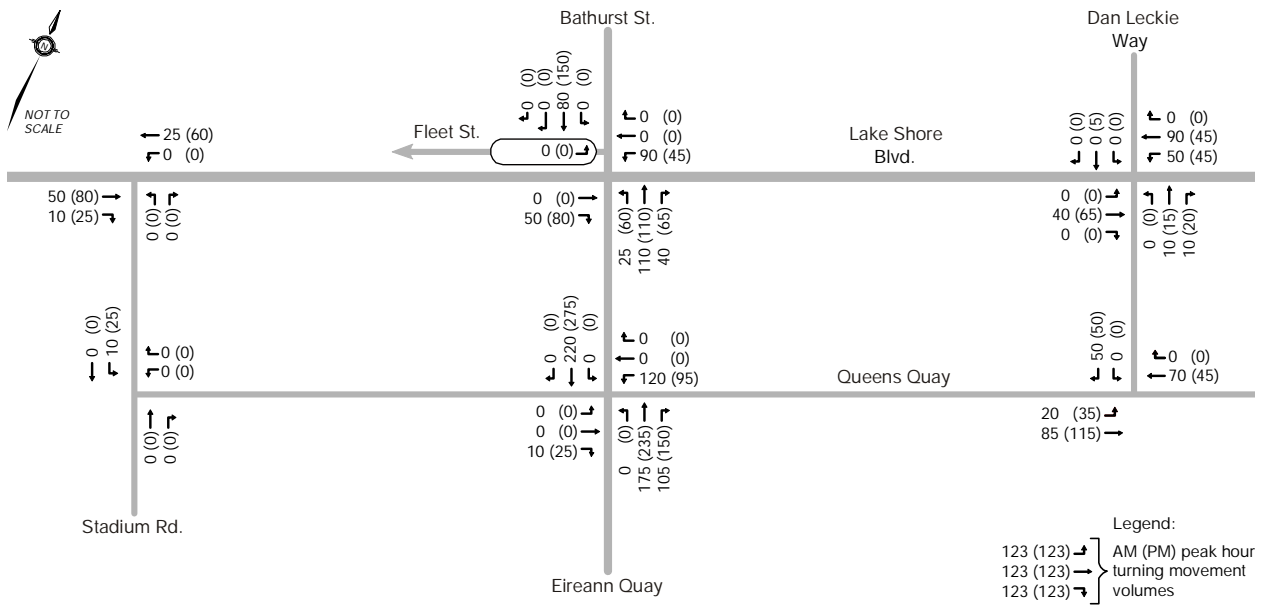


Figure 14: Estimated Peak Hour Airport Traffic Volumes (Taxis Only)

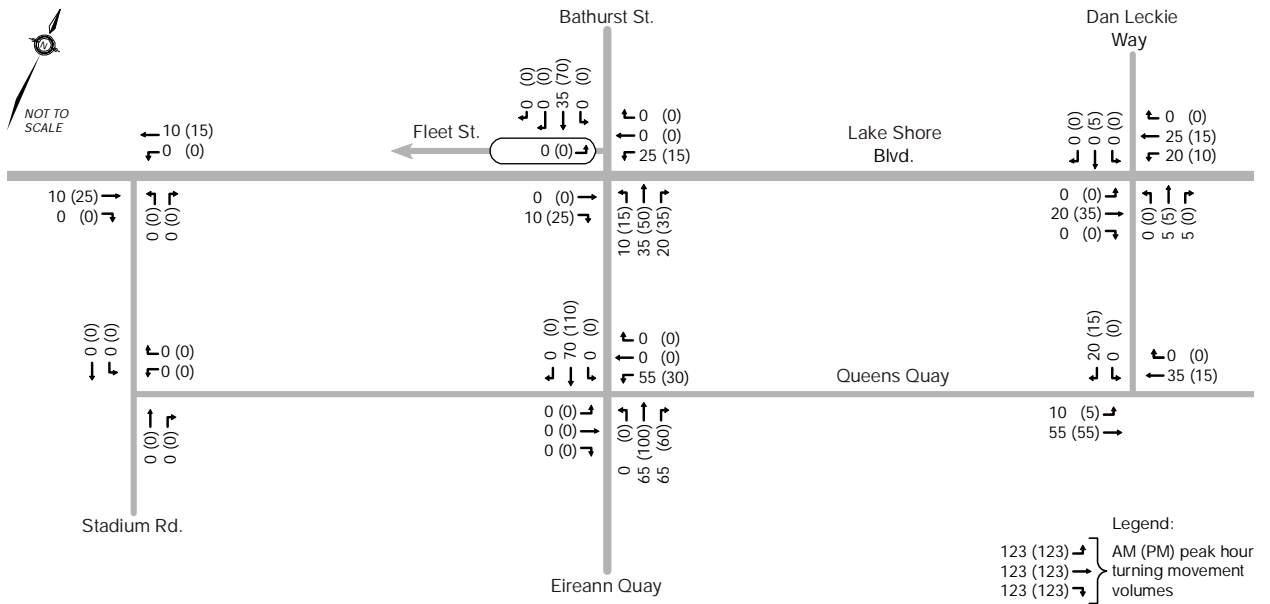
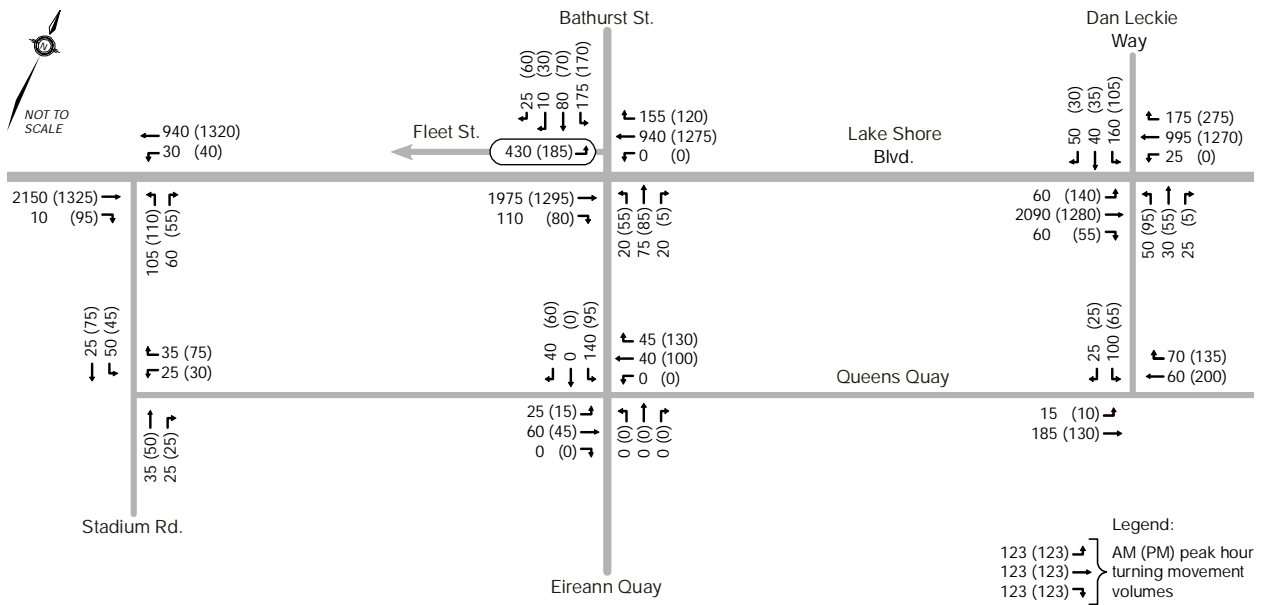


Figure 15: Estimated Peak Hour Non-Airport Traffic Volumes



### 6.3 Observance of Signed Turn Prohibitions

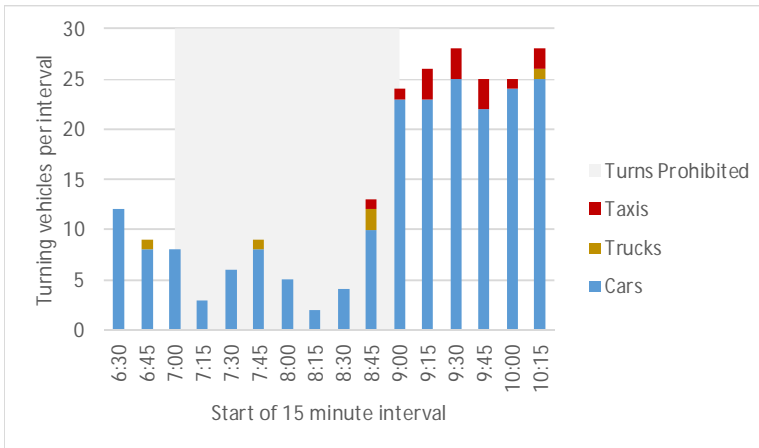
Turn prohibitions were implemented near the airport in 2012; specifically:

- No left turn northbound from Eireann Quay to Queens Quay at any time;
- No right turn eastbound from Lake Shore Boulevard to Stadium Road during the morning peak period; and
- No left turn northbound from Stadium Road to Lake Shore Boulevard during the afternoon peak period.

A small number of vehicles were observed making illegal left turns from Eireann Quay to Queens Quay — an average of approximately two per hour. This is marginally lower than the fall 2015 observations. Nearly all illegal left turns were made by private vehicles.

A larger number of vehicles were observed violating the turn prohibitions at Stadium Road and Lake Shore Boulevard, as shown in *Figure 16* and *Figure 17*.

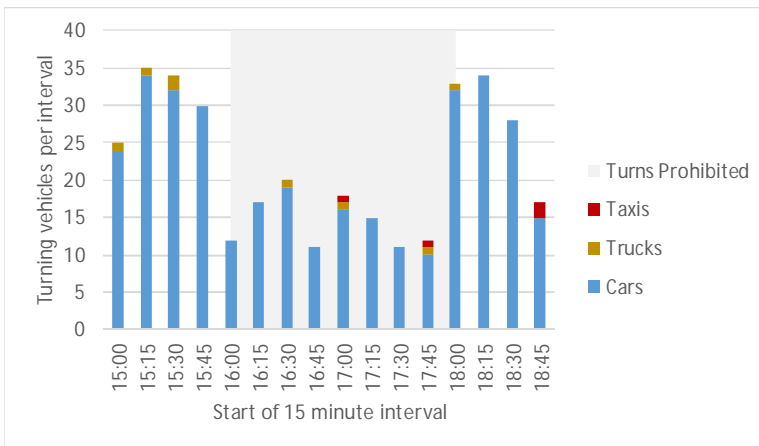
Figure 16: Eastbound Right Turns at Lake Shore Boulevard and Stadium Road



During the morning, a minor number of vehicles were observed violating the eastbound right turn prohibition — an average of 20 per hour between 7:00 and 9:00, or approximately one vehicle every one to two cycles. Only one taxi was observed making this movement.

Given that 24 right turns were observed from Queens Quay to Eireann Quay over the same two-hour period (all private vehicles), it is likely that some of this traffic is airport-related.

Figure 17: Northbound Left Turns at Lake Shore Boulevard and Stadium Road



During the afternoon, a greater number of vehicles were observed violating the northbound left turn prohibition — an average of 59 vehicles per hour between 4:00 and 6:00, or approximately two vehicles per green signal. This is a 42% reduction compared to fall 2015 observations. Nearly all illegal left turns were made by private vehicles.

Given the minimal number of northbound left turns from Eireann Quay to Queens Quay over the same two-hour period (only one vehicle in total), the left turn activity at Lake Shore Boulevard and Stadium Road is not related to traffic leaving the airport (i.e., the mainland terminal facilities on Eireann Quay).

It is likely that the majority of northbound left-turning traffic at Lake Shore Boulevard and Stadium Road is comprised of motorists leaving downtown via Queens Quay and seeking an alternate westbound route to Lake Shore Boulevard that avoids the northbound left turn from Bathurst Street. It is possible that a small amount of left-turning traffic originates from the Stadium Road parking lot that caters largely to airport users and stakeholders. However, this is likely a small number, given the following:

- Over the two-hour period when left turns are prohibited at Lake Shore Boulevard, the origin of northbound traffic was traced back through the Queens Quay intersection:
  - 117 vehicles originated from westbound Queens Quay;
  - 66 northbound vehicles originated from Stadium Road south of Queens Quay;
  - 38 vehicles (approximately) originated north of Queens Quay; and
  - Traffic from south of Queens Quay comprises 30% of northbound traffic at Lake Shore Boulevard. Of this traffic, some would have originated at the Stadium Road parking lot, and some would have originated elsewhere in the community (e.g., yacht clubs; local residents).
- At Lake Shore Boulevard, 116 vehicles turned left and 98 vehicles turned right.
- It is likely that the majority of the 117 vehicles from Queens Quay would have turned left at Lake Shore Boulevard (a right turn would represent an indirect trip for all but locally generated traffic). This would comprise the majority of left turns (if not all) at Lake Shore Boulevard.
- Traffic volumes were surveyed at both intersections at 5-minute intervals. When comparing the same intervals at both intersections, intervals experiencing surges in northbound demand from south of Queens Quay generally correlate to intervals experiencing higher volumes turning right at Lake Shore Boulevard.

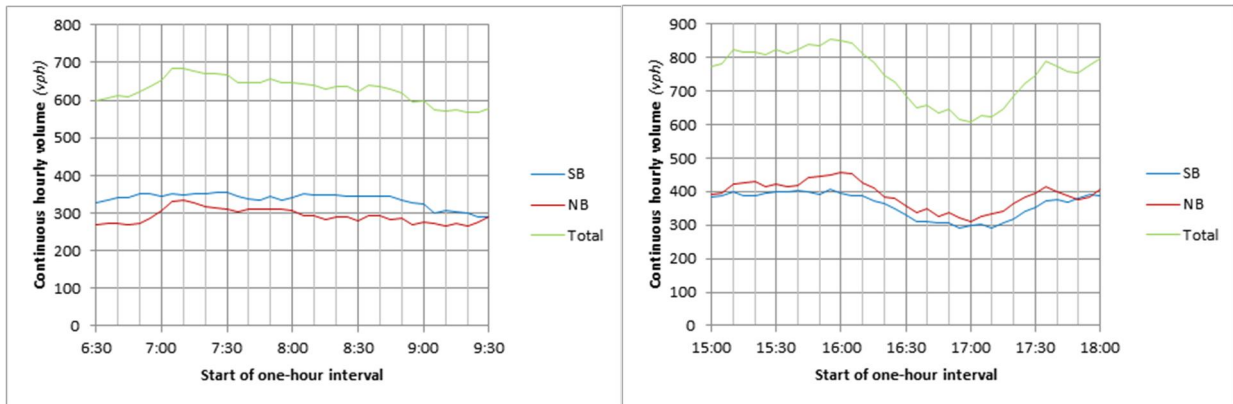
Given the foregoing, it is likely that the majority (if not all) of northbound left turns at Lake Shore Boulevard and Stadium Road during the PM peak period are made by the general public rather than by airport users.

#### 6.4 Eireann Quay Traffic Volumes

The traffic volumes along Eireann Quay were determined from the turning movement counts at the intersection of Queens Quay and Bathurst Street / Eireann Quay.

*Figure 18* illustrates the hourly traffic volumes observed along Eireann Quay. The volumes reflect continuous (“rolling”) hourly traffic volumes (e.g., the data point at 8:25 AM reflects the number of vehicles observed during the one hour between 8:25 and 9:25).

Figure 18: Hourly Traffic Volumes on Eireann Quay

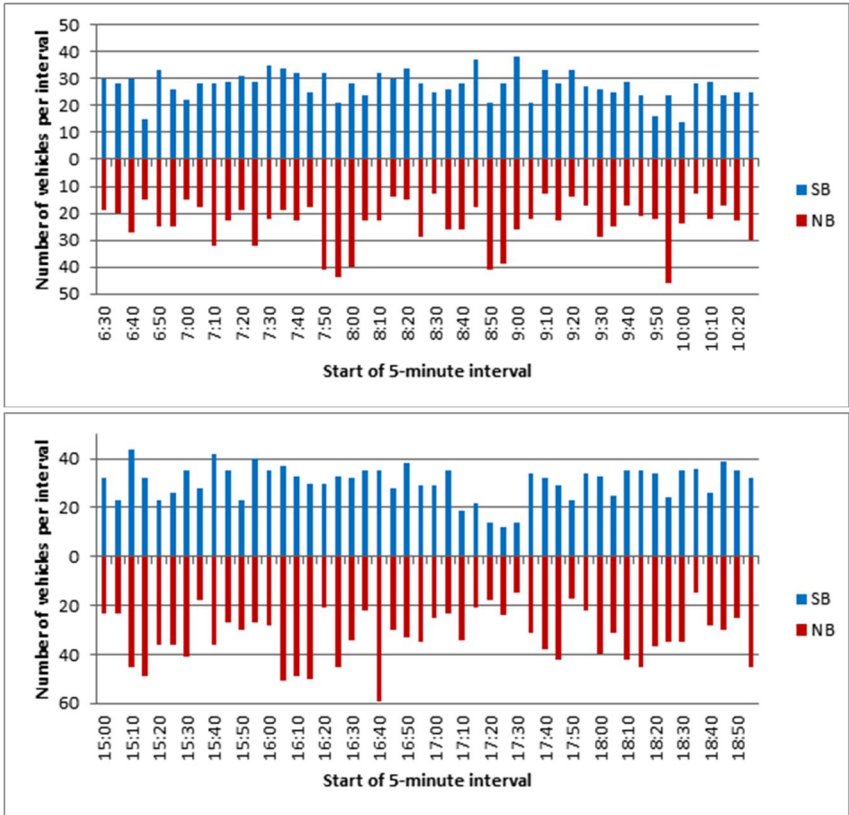


During the morning, the heaviest demand was observed shortly after 7:00 AM, peaking at nearly 700 vph. The volume of traffic on Eireann Quay during the AM peak period is higher than in fall 2015, when the highest demand was approximately 600 vph shortly after 9:00 AM.

During the afternoon, the heaviest demand was observed between approximately 4:00 and 5:00 PM, prior to the start of the downtown / city commuting peak hour, with two-way flows peaking at approximately 850 vph. By the 5:00–6:00 interval, volumes on Eireann Quay fell to approximately 600 vph, before increasing to approximately 800 vph by the 6:00–7:00 PM interval (corresponding to the period with the highest total traffic volumes at Lake Shore Boulevard and Bathurst Street). These values are higher than observed in the fall 2015 surveys (approximately 800 vph after 3:00 PM; approximately 500 vph after 5:00 PM).

Figure 19 illustrates the variation in traffic demand from one five-minute interval to the next. The five-minute volumes illustrate the difference between traffic flow patterns toward and away from the airport, with greater variability for northbound (away) traffic associated with the flight schedule.

Figure 19: 5-Minute Interval Traffic Volumes on Eireann Quay



## 7.0 Queue Surveys

### 7.1 Northbound Queues on Eireann Quay

Surveyors recorded the number of vehicles queued on northbound Eireann Quay at the Queens Quay traffic signals. The number of queued vehicles was recorded at the start of every northbound green signal. Including the northbound right turn lane at Queens Quay, there is room to accommodate a queue of approximately 26 vehicles before blocking the exit to the taxi corral (depending on the number of trucks and buses in the queue, and the spacing between queued vehicles).

Figure 20 illustrates the maximum length of the northbound queue per cycle during the morning surveys; Figure 21 illustrates the results from the afternoon surveys.

Figure 20: Queue Length on Northbound Eireann Quay (Morning Surveys)

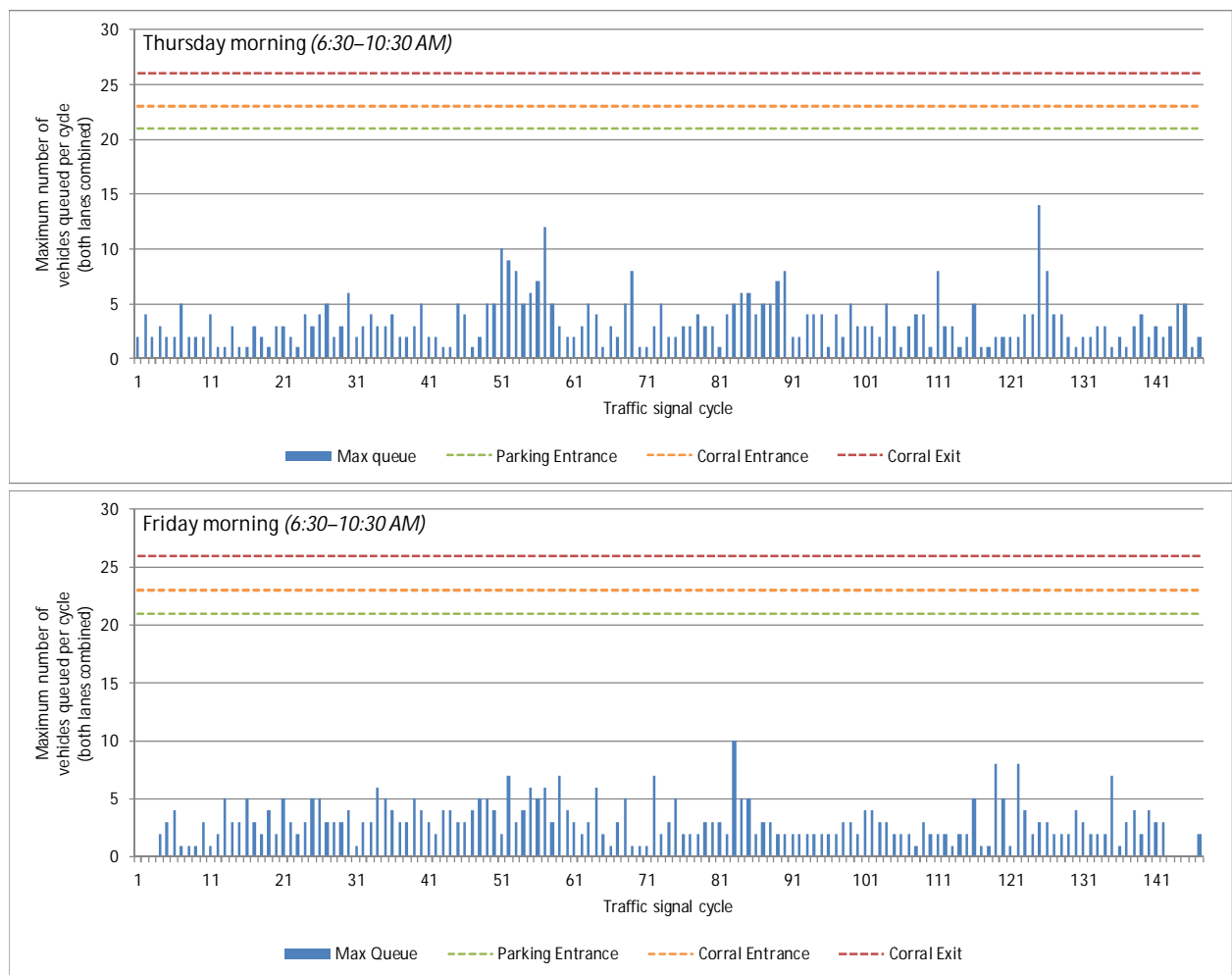
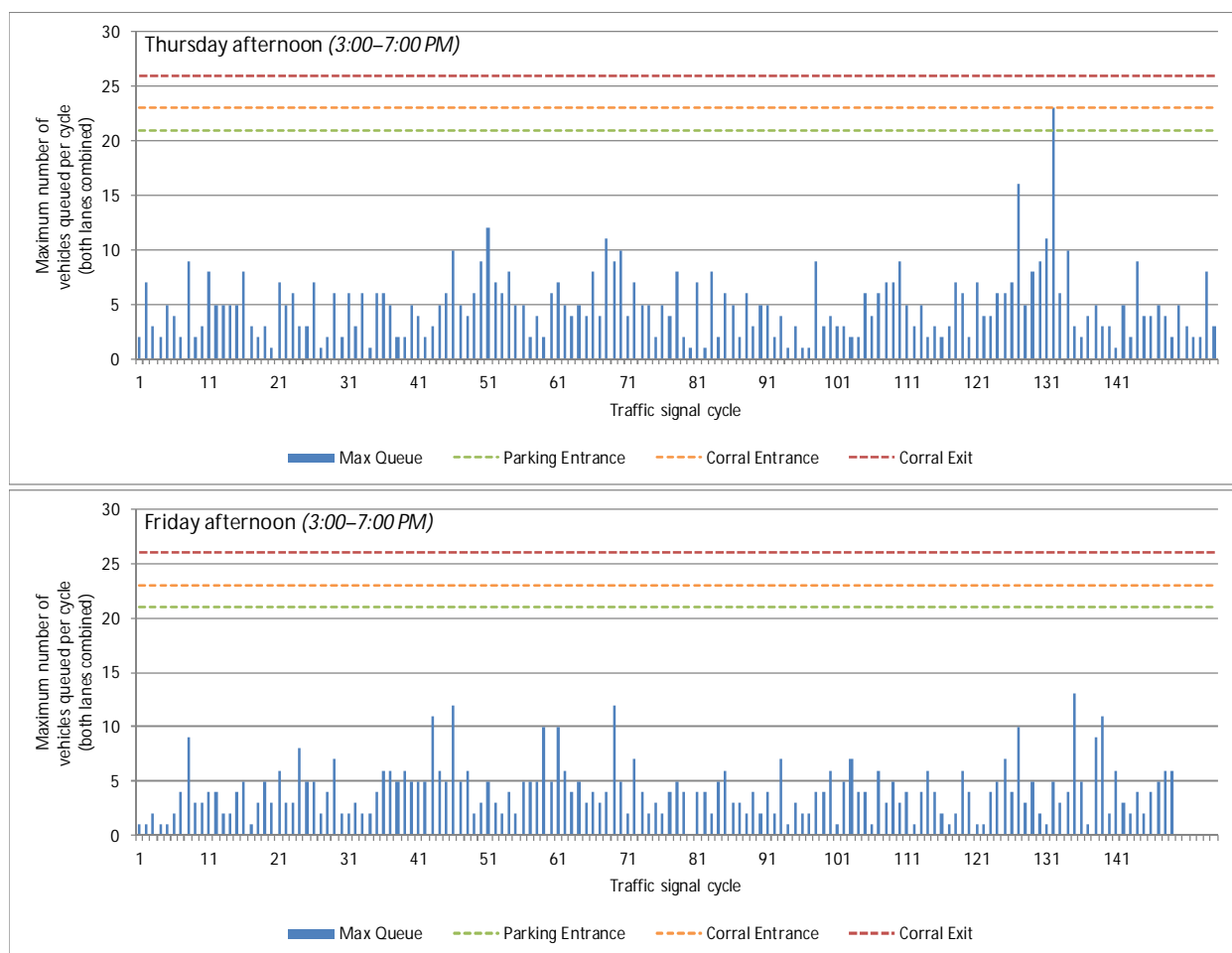




Figure 21: Queue Length on Northbound Eireann Quay (Afternoon Surveys)



During the morning surveys, the queues were typically in the order of five vehicles or less. There were three periods on Thursday morning (at approximately 8:00, 9:00 and 10:00) when longer queues were observed, generally from 8 to 14 vehicles, although queues were not found to reach the entrances to the taxi corral or Canada Malting site parking facilities.

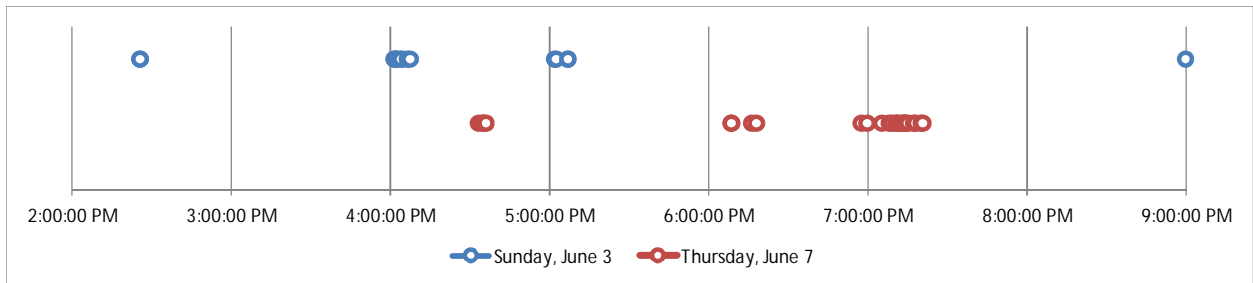
During the afternoon surveys, queues were typically in the order of five vehicles, with occasional queues of 10 to 12 vehicles. On Thursday at approximately 6:20 PM, one queue was observed to reach 23 vehicles, extending approximately to the entrance to the taxi corral.

For the most part, the northbound queues can be reasonably managed and can typically be served on one green signal.

These queues are slightly longer but generally comparable to those observed in the fall 2015 surveys, although short-lived queue surges were more commonly observed in 2018. It is noted that the average cycle length was slightly longer in 2018, which would contribute to slightly longer queues.

The queue length surveys were supplemented by a review of video footage taken on Sunday, June 3 and Thursday, June 7 between 5:00 AM and 11:00 PM. The video footage was used for a high-level review of times when the northbound queue on Eireann Quay reaches the entrance to the taxi corral. As illustrated in *Figure 7.*, there were isolated occurrences on both days when this occurred, although the queue typically cleared after a short period of time. One exception was observed on Thursday evening, when a longer period of queuing was observed between 7:00 and 7:25 PM.

Figure 22: Queue Lengths on Northbound Eireann Quay Extending Beyond Taxi Corral Entrance

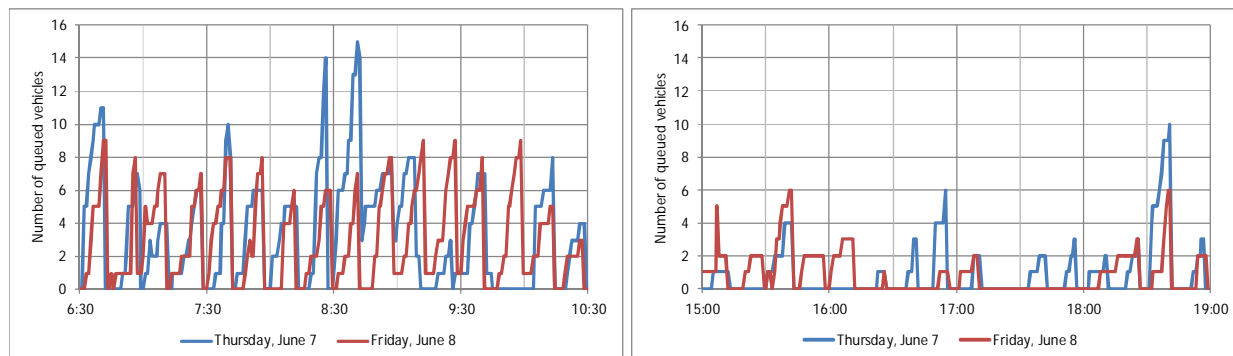


## 7.2

## Ferry Queue

Surveyors recorded the number of vehicles in the Finger Lot waiting to board the ferry; measurements were taken at one-minute intervals. The results are shown in *Figure 23*.

Figure 23: Surveyed Ferry Queues (Finger Lot)



Typically the ferry queue is longest in the early morning. The longest queue at that time was an 11-vehicle queue at 6:40 AM on Thursday. There were two ferry trips on Thursday at approximately 8:25 and 8:40 AM where the queue reached 14 to 15 vehicles. Otherwise, for the rest of the morning, ferry queues were generally in the order of eight vehicles or less. These peak values were generally comparable to the 2015 observations.

During the afternoon, the ferry queues largely remained at five vehicles or less, save for one trip at 6:40 PM on Thursday where 10 vehicles were queued. Other than the 10-vehicle queue, these values are generally comparable to the 2015 observations.

The queue lane is approximately 90 metres long and can accommodate 12 to 15 vehicles depending on how closely spaced the vehicles are queued to each other. Other than the two ferry trips on Thursday morning at 8:25 and 8:40, the observed ferry queue lengths were all 11 vehicles or less.

## Utilization of Pick-Up / Drop-Off Spaces

There are seven parking spaces in the centre of the pick-up / drop-off loop that are made available free of charge for short stay (up to five minutes) parking while picking up or dropping off passengers. The usage of these spaces was recorded on the Thursday of the other surveys, as well as on the subsequent Saturday and Sunday. Rather than surveying the parking spaces manually, the parking utilization was recorded through a review of video footage of the parking spaces. A timestamp was recorded each time a vehicle entered or left one of these parking spaces, allowing for the parking occupancy to be noted at any given time over the day. The parking occupancy profiles were reviewed to determine the times of day when most or all parking spaces are in use.

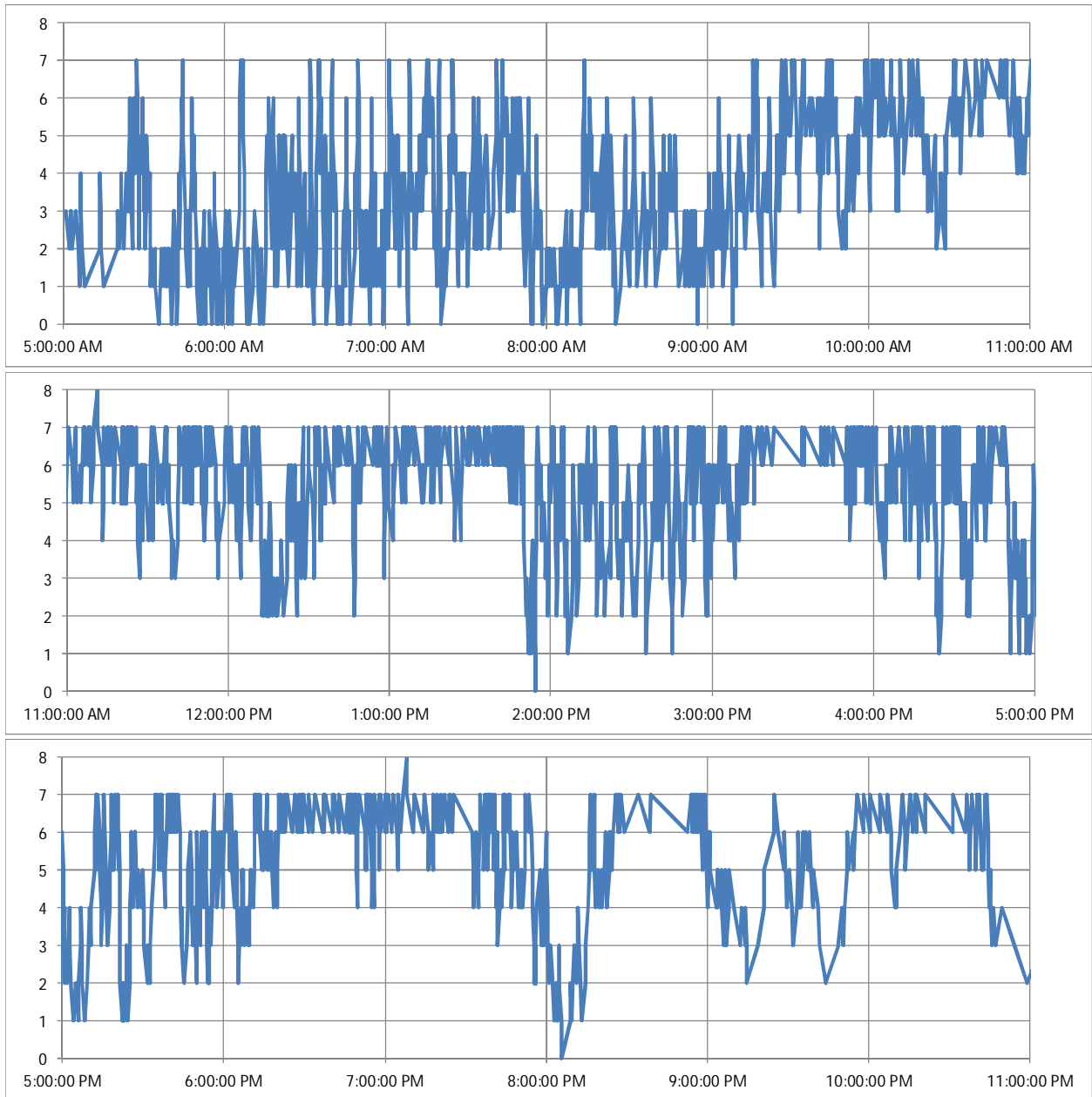
The parking occupancy is illustrated in the following figures:

- *Figure 24* illustrates the parking occupancy on Thursday, June 7;
- *Figure 25* illustrates the parking occupancy on Saturday, June 9; and
- *Figure 26* illustrates the parking occupancy on Sunday, June 10.

The average length of vehicle stay was as follows:

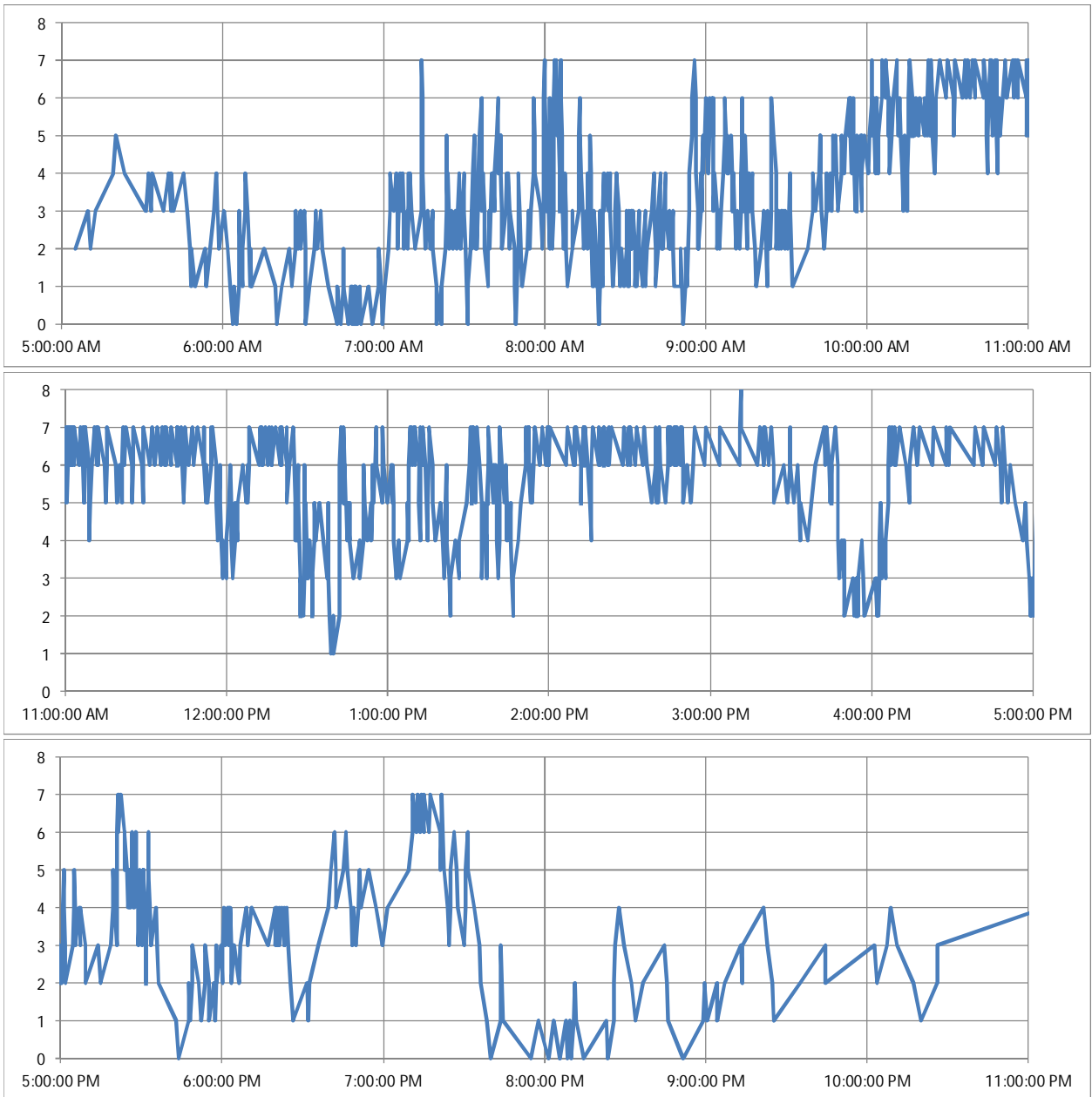
- Thursday: 3.1 minutes/vehicle (1,636 vehicles);
- Saturday: 5.8 minutes/vehicle (725 vehicles); and
- Sunday: 4.2 minutes/vehicle (1,200 vehicles).

Figure 24: Parking Occupancy on Thursday, June 7



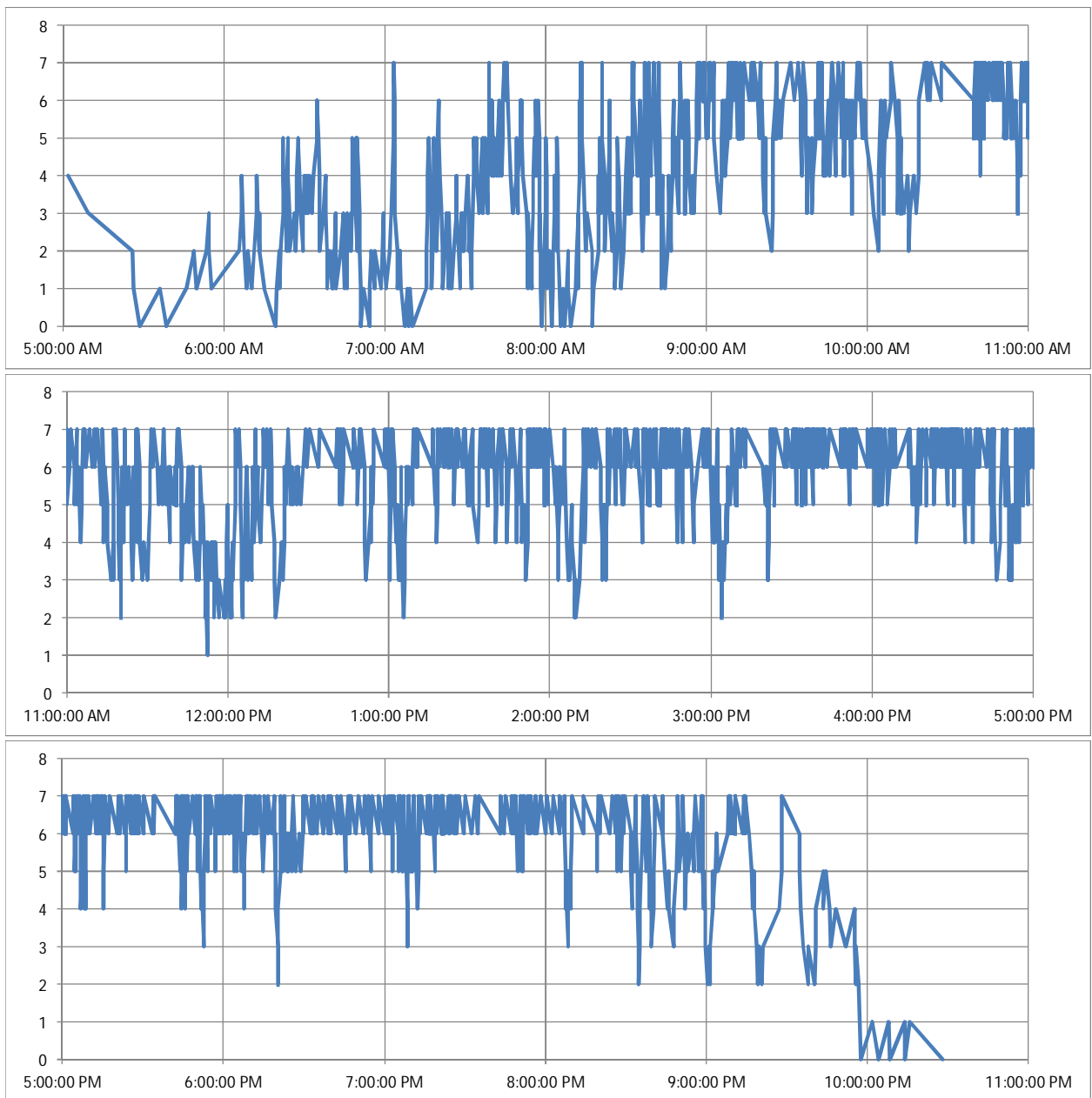
On Thursday, there were usually 5 or more vehicles present between 9:30 AM and 1:50 PM (with brief lulls at 9:45 AM, 10:15 AM, and 12:10 PM). There were also several 40- to 75-minute periods in the afternoon and evening with continuous high demand (3:00–4:00 PM; 6:15–7:30 PM; 8:20–9:00 PM; and 10:00–10:45 PM).

Figure 25: Parking Occupancy on Saturday, June 9



On Saturday, there were usually 5 or more vehicles present between 10:00 AM and 12:30 PM, then again between 2:00 and 3:30 PM and between 4:00 and 5:00 PM. (with brief lulls at 9:45 AM, 10:15 AM, and 12:10 PM).

Figure 26: Parking Occupancy on Sunday, June 10



On Saturday, there were usually 5 or more vehicles present for the majority of the afternoon and early evening (between 12:15 and 8:30 PM).