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TORONTO CITY AIRPORT

Transportation Assessment of Proposed Jet Activity
Summary Report

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**MOVEMENT
IN URBAN
ENVIRONMENTS**

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EXECUTIVE SUMMARY

BA Group is retained by the City of Toronto as part of the consulting team reviewing the impacts of the proposal by Porter Airlines to operate the new Bombardier CS100 Jet at Billy Bishop Toronto City Airport (BBTCA). The proposal would require an extension of the existing runway to accommodate the longer landing and take-off requirements of the aircraft. The CS100 offers a larger passenger capacity than the Q400 and will offer flights to farther afield destinations than the current Porter Airlines network, including flights to the west coast of Canada and the USA.

BA Group has undertaken analysis that reviews what the potential impacts of approving jets at BBTCA might be to the area surrounding the BBTCA Mainland terminal from a transportation perspective. In addition, building upon the 2012 *Eireann Quay Strategic Transportation Study* that was initiated by the City of Toronto, BA Group has also reviewed a variety of transportation improvements that should be implemented in the short term to address some of the existing capacity and operational issues caused in part by the airport.

BA Group has also reviewed the potential impacts that might arise from further growth in the hourly passenger volumes at BBTCA which, from a traffic impact perspective, is the determining factor for the level of investment required to accommodate future BBTCA traffic volumes.

The following sections highlight the key findings and recommendations from our review.

SUMMARY OF KEY FINDINGS

Overview

- The key factor that determines traffic impacts associated with BBTCA is the amount of hourly passengers, which is determined by the number of flights that occur in the busiest hour.
- Permitting jets could result in an increase in the number of hourly passengers because jets have more seats. It is estimated that jets could add approximately 20 to 25% more hourly passengers during the busiest hour, based on the current number of flight slots that occur.
- The number of hourly flight slots is determined by TPA slot scheduling guidelines and by current operational constraints (e.g. terminal capacity).

Impact of Jets

- The amount of additional vehicular traffic volumes that will be generated by approving jets will depend on what mode of transportation passengers use to get to and BBTCA. If the airport maintains its current mode splits, approving jets would result from an estimated 20% increase in traffic volumes on Eireann Quay.
- Achieving a significant increase in the use of non-auto modes at BBTCA could off-set some or all of the potential increase in traffic.
- Even with no increase in non-auto modes, the additional traffic volumes resulting from the approval of jets will not likely result in any significant impact to intersection operations in the broader study area (i.e. beyond the immediate street network of Lake Shore, Queens Quay, Dan Leckie, and Stadium Road).



- Some minor modifications to the area road network may be required in the immediate street network area in order to accommodate additional traffic generated by jets if significant increases in transit and shuttle use are not achieved. The following improvements / modifications may be required:
 - reconstruct the westbound left turn at Dan Leckie Way / Lake Shore Boulevard to increase capacity;
 - provide new wayfinding signage at Dan Leckie / Lake Shore redirecting BBTCA traffic to utilize Dan Leckie to access the airport; and
 - restrict the existing westbound left at Lake Shore / Bathurst to improve traffic operations and reduce delays.

Potential Growth in Hourly Traffic

- According to the City of Toronto's airport operations consultant (AirBiz), the number of hourly flight slots could potentially be increased to by approximately double based on the capacity is of the existing runway.
- If the hourly passenger volumes are increased, significant levels of additional investment in the area transportation infrastructure will likely be required. An alternative to building infrastructure to accommodate increased hourly passenger demand is to place a cap on the number of hourly flights permitted at BBTCA in order to limit future impacts.

RECOMMENDATIONS FOR IMMEDIATE IMPLEMENTATION

Based on our analysis, the following improvements are recommended for immediate implementation to assist in addressing some existing operational concerns related to BBTCA activity.

1. The temporary off-street taxi & shuttle facility on the Canada Malting lands should be retained until a suitable off-street alternative can be found. Options for replacing the off-street taxi/shuttle facility include:
 - an underground facility below Eireann Quay / Little Norway Park; or
 - incorporating a replacement facility into a redevelopment of the Canada Malting Lands.
2. Implement additional safety improvements at the Queens Quay / Eireann Quay intersection, including:
 - incorporate a 3 second advance phase for the northbound and eastbound pedestrians;
 - improve the crosswalk treatments (e.g. zebra striping, patterned concrete, etc.); and
 - provide a raised crosswalk for the south intersection approach or install speed humps on Eireann Quay as it approaches Queens Quay.
3. Improve access to transit through the following Transportation Demand Management (TDM) strategies:
 - provide a new weather protection canopy along the west side of Eireann Quay from the BBTCA mainland terminal to the intersection of Queens Quay / Bathurst;
 - rebuild the existing TTC streetcar platforms at Bathurst / Eireann Quay to improve their amenity and design.
4. Reconfigure and re-stripe Eireann Quay to improve the visibility of the lane markings and to provide for some operational improvements that achieve the following objectives:



- increase the amount of curb-side space for pick-up drop-off activity;
 - provide a northbound recirculation 'U-Turn' on Eireann Quay so that drivers can re-enter the pick-up / drop-off queue area without having to make a three point turn in the middle of Eireann Quay;
 - improve shuttle access to and from the shuttle loop; and
 - streamline the traffic volumes that are required to travel around the loop directly in front of the future BBTCA mainland terminal building.
5. Reconfigure the parking spaces located on the Canada Malting property as follows:
- convert the current long term parking area into short term parking for private vehicles;
 - revise the pricing structure of the short term parking areas to include a 10 minute free parking grace period to encourage people to use the parking spaces instead of waiting illegally on Eireann Quay; and
 - relocate the existing dedicated Toronto District School Board (TDSB) parking spaces, currently located adjacent to the short term parking spaces, to the proposed new short term parking area (formerly the long term parking area).

RECOMMENDATIONS IF JETS ARE PERMITTED

The following are our recommendations if the City approves jets at BBTCA.

6. The City and Toronto Port Authority (TPA) should set minimum targets for mode shift changes that BBTCA must attain in order to minimize any increase in auto traffic volumes associated with the jets with an initial focus on maximizing use of the Porter Shuttle through increased frequencies and new routes.
7. A program for monitoring the mode splits achieved at BBTCA should be implemented along with an agreement on what recourse will be taken by the TPA if targets are not achieved (e.g. either financial payments or commitments to increase service).
8. In concert with other traffic mitigation efforts, the City should implement a modification to the westbound left turn at the Dan Leckie Way / Lake Shore Boulevard intersection and install wayfinding signage to encourage motorists accessing BBTCA from the west on Lake Shore Boulevard to use Dan Leckie Way as a means of getting to the airport.
9. The City should also consider restricting the westbound left movement at Lake Shore Boulevard / Bathurst Street during the peak periods. The improved westbound left at Dan Leckie Way will have sufficient capacity to accommodate the displaced westbound left turns and the elimination of westbound left turns at Bathurst would provide a significant reduction in delays at the Lake Shore / Bathurst intersection.



RECOMMENDATIONS TO ACCOMMODATE ADDITIONAL GROWTH IN HOURLY ACTIVITY AT THE AIRPORT

If Jets are Approved

10. The City has three options for managing any potential increases in hourly flight activity at BBTCA:

- i. impose a limit on the number of hourly passengers as part of a renegotiation of the Tripartite Agreement.
- ii. make preparations for significant infrastructure improvements to facilitate the increased traffic activity, including:
 - construct an extension of Dan Leckie Way southward from Queens Quay, around the Waterfront School, to connect to Eireann Quay; and
 - extend the pedestrian tunnel from the island to a new entrance pavilion located on the southwest corner of the intersection of Queens Quay / Eireann Quay in order to improve access to the 509 Harbourfront streetcar route.
- iii. do nothing and let the existing road network act as an indirect constraint on the hourly activity.

11. If a cap on the hourly activity is not obtained, the City should, as part of a broader planning framework analysis, carefully weigh all the benefits and drawbacks of doing nothing versus investing in significant infrastructure improvements in order to determine which course of action is most appropriate for the waterfront context.

If Jets are Not Approved

12. If jets are not permitted, there will likely be no opportunity to secure a limit on the hourly activity at BBTCA. As a result, consistent with Options (ii) and (iii), the City will need to weigh the benefits of either implementing significant infrastructure improvements or doing nothing.

COST RECOMMENDATIONS

13. The City should ensure that the costs of transportation improvements necessary to accommodate traffic generated by BBTCA are incorporated into any discussions with TPA. In this regard, preliminary estimates of order of magnitude costs have been developed for planning purposes to evaluate the various transportation improvement alternatives being considered. The preliminary cost estimates for any external infrastructure recommendations are outlined below.

- Approximately \$1-2 million for short term improvements to Eireann Quay and the intersection of Eireann Quay / Queens Quay. The additional cost of constructing a pedestrian canopy to improve access to transit and to enhance the existing TTC transit stops.
- Approximately \$1 million to pay for the recommended modifications to the area road network to accommodate potential traffic increases from jets (e.g. modifications to the intersection of Dan Leckie Way / Lake Shore Boulevard and new wayfinding signage to improve use of this route, restricting westbound left turns at Bathurst Street / Lake Shore Boulevard).



- An additional total investment of approximately \$100-\$300 million dollars would be required if the City chose to attempt to address the potential increased hourly volumes through the least costly new infrastructure options. Of this, approximately \$60 million would be required for the construction of an extension of Dan Leckie Way, and \$40 million to \$300 million would be to construct transit improvement alternatives.

Note that the above estimates are preliminary order of magnitude estimates only and a more detailed cost estimate analysis for all recommended improvements should be undertaken in order to provide additional clarity with respect to the actual cost of these proposals.



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1.0 INTRODUCTION

BA Consulting Group has been retained by the City of Toronto to undertake an analysis of the transportation impacts associated with the proposal by Porter Airlines to operate jet airplanes at Billy Bishop Airport (herein referred to as 'BBTCA'). The City of Toronto will consider the impacts of the assessments.

1.1 THE PROPOSAL

Porter Airlines (herein referred to as 'Porter') is proposing to operate the Bombardier CS100 Jet Airplane at the BBTCA. Permitting jets require an extension of the existing runway to accommodate the longer landing and take-off requirements of the aircraft. From a transportation perspective, the CS100 offers a larger passenger capacity than the current Q400 aircraft (approximately 40 additional passengers per plane). The introduction of the larger jet planes has the potential to increase the amount of vehicular traffic and may have an impact on the area road network in the vicinity of the airport.

1.2 STUDY PURPOSE

The purpose of BA Group's study is to provide the City of Toronto with an assessment of the land-side transportation impacts and considerations associated with the potential for including jet activity. In this regard, this report provides a review of the following:

- the method used to assess the impacts;
- an assessment of the amount of additional vehicular traffic that could be generated by the jet proposal;
- an assessment of the current road network operations in the vicinity of BBTCA and of the potential impact of permitting jets;
- a review of potential physical and operational improvements that could improve both the existing condition and what could be required to accommodate jets;
- a review of the impacts of the potential to increase activity at BBTCA not related to jets;
- high level order of magnitude cost estimates of potential improvements;
- an evaluation of the various potential transportation alternatives for improvements to determine a preferred set of improvements that would be required if jets are permitted; and
- key findings and recommendations.

1.3 STUDY AREA

Two general study areas were considered. A larger study area was considered for the purposes of reviewing the order of magnitude traffic impacts of approving jets at significant intersections within the broader area. This area is bounded by Jameson Avenue to the west, York Street to the east, Lake Ontario to the south, and Front Street to the north.

A second, smaller study area was also analysed for a more detailed assessment of the impacts of permitting jets. The smaller study area is generally bounded by Stadium Road to the west, local Dan Leckie Way to the east, Lake Ontario to the south, and Lake Shore Boulevard to the north.



2.0 BACKGROUND INFORMATION CONSIDERED

This section outlines the background information reviewed as part of our analysis.

2.1 CITY OF TORONTO

The City of Toronto has retained a comprehensive consultant team to review the impacts of the proposed application to allow jets at BBTCA. Airbiz Aviation Strategies (herein referred to 'AirBiz') has been retained to provide an independent assessment of the various operational and programmatic requirements associated with the existing operations at BBTCA and with the potential inclusion of jets. The AirBiz study was relied on in our analysis to develop passenger forecasts associated with the jet activity.

BA Group has also reviewed the material and work previously completed by the City of Toronto as part of the Eireann Quay Strategic Transportation Study, initiated in 2012. That process, which included significant public consultation, resulted in a variety of concepts and ideas for improving the traffic operations and safety of the road network in the vicinity of BBTCA.

2.2 TORONTO PORT AUTHORITY

Dillon Consulting, on behalf of the TPA, has undertaken several studies that review a variety of transportation aspects related to the operation of BBTCA. The following Dillon reports have been reviewed as a part of this study:

- "Strategic Transport Plan – Passenger Survey Summary" (November 2012)
- "Strategic Transport Plan – Passenger Activity Projections" (March 2013)
- "Strategic Transport Plan – 2019 'Do Nothing' Traffic Micro Simulation Assessment" (April 2013)
- "Assessment of Transportation Requirements of Porter Airlines Proposal To Permit Jet Activity" (June 2013)

2.3 STOLPORT CORPORATION

Stolport Corporation (herein referred to as 'Stolport') is the company that operates the vehicular parking for BBTCA. In an effort to review ways in which to improve the access to parking at BBTCA, Stolport has retained an architect who has developed a plan that illustrates a modification to the area road network that could potentially improve traffic operations in the area and access to BBTCA. That plan envisions the relocation of the access to BBTCA into a vehicular tunnel that would start in the centre of Bathurst Street, just south of Lake Shore Boulevard, and pass below Queens Quay where it would then connect directly to a new underground passenger pick-up / drop-off facility and an underground parking garage.

The Stolport concept of constructing a direct vehicular tunnel to access BBTCA was reviewed and considered as part of this study.



2.4 TORONTO DISTRICT SCHOOL BOARD

This study also considers a memorandum prepared by Stuart Anderson of IBI Group for the Toronto District School Board (TDSB). That memo, entitled “*Eireann Quay Traffic Review*”, provided an assessment of the pedestrian safety and traffic operations in the area and how these relate to the operation of the Waterfront School located at Queens Quay and Eireann Quay.

2.5 LEA CONSULTING

LEA Consulting undertook a Transportation Impact Study in June 2013 for the development on the northeast corner of Bathurst Street and Lake Shore Boulevard. That study is entitled: “Transportation Impact Study, 500 Lake Shore Boulevard West.” This study was reviewed for the purposes of estimating future background traffic volumes from area development, and as a general point of comparison with respect to the operation of the intersections the immediate study area.



3.0 CURRENT OPERATIONS

BBTCA is operated by the Toronto Port Authority (TPA) and is located at the western end of Algonquin Island in the Toronto Harbour. Operations at BBTCA can be classified into two distinct groups that are related: airside operations that occur on the island; and groundside operations on the mainland. The two are connected by a frequent ferry service which crosses the western gap in the harbour.

3.1 AIRSIDE OPERATIONS

The transportation study focuses primarily on the groundside transportation impacts associated with vehicular traffic activity. However, a brief overview of key aspects of the airside operations which impact the mainland transportation operations are as follows:

- the existing airside terminal currently has 10 gates for commercial aircraft;
- BBTCA has one runway that is capable of accommodating commercial air traffic;
- BBTCA also has two smaller runways which we understand are occasionally used by small private aircraft;
- the number of daily flights slots available for commercial operations is limited to approximately 202 aircraft and the daily number of planes is regulated through the noise permissions set out in the Tripartite Agreement;
- BBTCA currently has 15-16 hourly flight movements during busiest hour;
- the busiest hourly traffic from the airport generally occurs during the weekday morning peak hours; and the weekday afternoon peak hour.

3.2 MAINLAND OPERATIONS

3.2.1 Future Pedestrian Tunnel Link

A new pedestrian tunnel connection is currently under construction, that will connect the land side passenger terminal at the foot of Eireann Quay and the main airport terminal on the island. The tunnel is expected to be completed in 2014. We understand that the ferry service will continue after completion of the tunnel to continue to provide access for parking and for transporting goods and materials to the island.

An important benefit of the pedestrian tunnel from a transportation perspective will be the reduction of the current activity surges that occur because of the ferry arrival every 15 minutes. The tunnel, once operational, will distribute passengers arriving on the mainland more evenly throughout the busiest hours and therefore reduce the operational impacts experienced on Eireann Quay associated with BBTCA during peak times.

3.2.2 Temporary Canada Malting Taxi / Shuttle Facility

The construction of the pedestrian tunnel has necessitated the closing of a large portion of the turn around and pick-up / drop-off space in the vicinity of the mainland terminal. To make up for the circulation and exchange space lost during the construction phase, a temporary off-street taxi queue area and shuttle bus loop has been constructed on the Canada Malting site as part of the traffic management during construction planning for the pedestrian tunnel.



The temporary shuttle bus loop on the Canada Malting site is dedicated solely to the Porter shuttle bus, which travels around the outside edge of taxi queue area and picks up passengers at a designated waiting area located at the southerly end of the site.

A number of short term and long term parking spaces are also located on the Canada Malting site. The short term parking, which is charged at \$5.00 per half hour through pay and display tickets, is provided for private vehicles waiting for arriving passengers or assisting departing passengers to the ferry. The long term parking is available to passengers through parking gates at the eastern end of the site.

3.2.3 BBTCA Parking

Stolport operates a total of approximately 500 spaces for short and long term parking for BBTCA in three locations, including:

- a lot at the south end of Stadium Road with approximately 200 spaces;
- a variety of lots located on the island totalling approximately 300 spaces; and
- a small number of long term and short term spaces on the Canada Malting lands totalling approximately 30-40 spaces (referred to above).

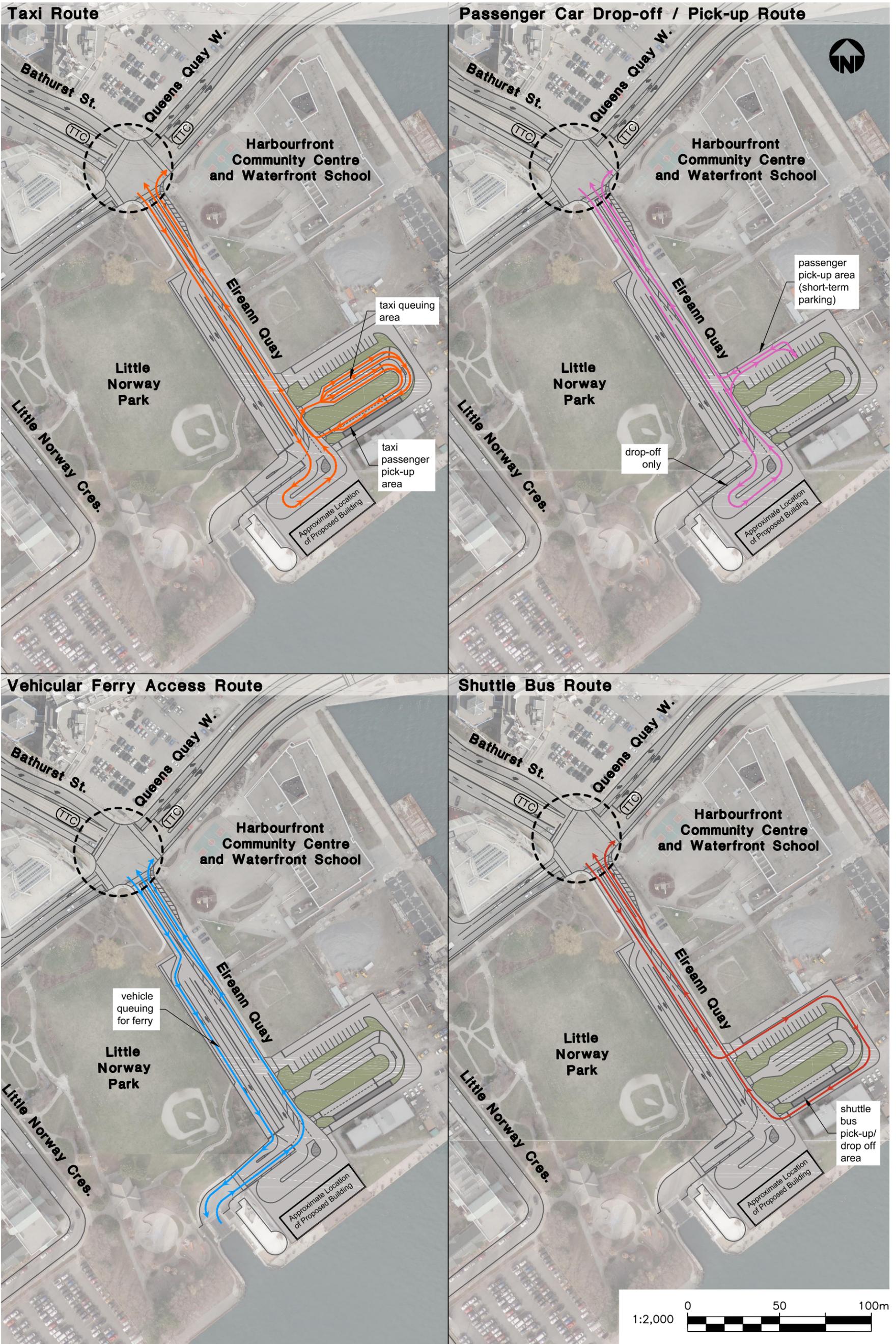
3.2.4 BBTCA Traffic Activity on Eirann Quay

There are four primary types of vehicular activity accessing BBTCA via Eireann Quay:

- Porter shuttle buses;
- private automobiles picking up and dropping off passengers;
- private automobiles accessing the ferry; and
- taxis.

Figure 1 illustrates how the different types of vehicular traffic access BBTCA from Eireann Quay.





Current Vehicular Traffic Activity on Eireann Quay

4.0 SHORT TERM CONSIDERATIONS

4.1 TEMPORARY TAXI / SHUTTLE FACILITY

Given that the temporary off-street taxi and shuttle facility on the Canada Malting lands provides a clear benefit to traffic operations on Eireann Quay, the current facility should be retained until a suitable off-street alternative can be found. Options for replacing the off-street taxi and shuttle facility include:

- an underground facility below Eireann Quay / Little Norway Park; or
- incorporating a replacement facility into a redevelopment of the Canada Malting lands.

4.2 OTHER AREA IMPROVEMENTS

Based on our observations of the current operations on Eireann Quay and in the area, it is our opinion that some improvements to Eireann Quay and the intersection of Queens Quay / Eireann Quay are required in order to address various existing safety, pedestrian, and traffic operation concerns being caused by BBTCA. Based on our analysis, the primary issues that need to be addressed include:

- improving the safety of pedestrians at the intersection of Queens Quay / Bathurst Street;
- streamlining the pick-up / drop-off activity on Eireann Quay in order to reduce the impacts (queuing, illegal parking, etc.) to the adjacent roads and neighbourhood that the that are being caused by the airport;
- improving ingress and egress for the shuttle bus;
- providing more short term parking for private automobiles who are picking up passengers at BBTCA;
- improving the pedestrian environment in the area; and
- improving access to the TTC streetcar.

SAFETY IMPROVEMENTS AT QUEENS QUAY / BATHURST

The City of Toronto has already implemented several improvements to the Queens Quay / Bathurst Street intersection as part of the Eireann Quay Strategic Transportation Study that was initiated in 2012. The following changes were implemented as part of that process:

- a northbound left turn restriction at Queens Quay / Eireann Quay;
- the prohibition of right turns on red for the northbound and eastbound movements at Queens Quay / Eireann Quay;
- an improvement to the pedestrian crossing time at Queens Quay / Eireann Quay;
- a realignment of the pedestrian signal heads;
- a narrowing of the northbound lanes on Eireann Quay; and
- creation of a school bus zone on Eireann Quay just south of Queens Quay.



In addition to the improvements completed to date, there may be additional improvements that should be considered to further benefit pedestrians at the intersection of Queens Quay / Bathurst Street, including:

- modification of the signal timing at Queens Quay / Eireann Quay to include a 3 second advance for pedestrians crossing the street before the corresponding vehicle green time;
- installation of improved crosswalk treatments (e.g. zebra striping or replacing the existing concrete crosswalks with patterned concrete, etc.) at the intersection of Eireann Quay / Queens Quay; and
- the provision of a raised crosswalk for the south intersection approach or installation of speed humps on Eireann Quay as it approaches Queens Quay.

It is noted that speed humps on Eireann Quay have previously been investigated by City staff and have not been installed due to a conflict with the TPA regarding emergency vehicle access. In this regard, the City should re-open this subject with the TPA as part of the current discussions to attempt to resolve their issues so that either speed humps or a raised crosswalk can be installed.

IMPROVE ACCESS TO TRANSIT / PEDESTRIAN IMPROVEMENTS

The following improvements to transit access and pedestrian facilities have been considered:

- provide a new weather protection canopy along the west side of Eireann Quay from the BBTCA mainland terminal to the intersection of Queens Quay / Bathurst Street to improve access to transit; and
- reconstruct the existing TTC streetcar platforms at Bathurst Street / Eireann Quay to provide improved shelters, benches, transit arrival information, and lighting to enhance transit access to BBTCA.

RECONFIGURE EIREANN QUAY TO IMPROVE FLOW AND IMPROVE SHUTTLE BUS ACCESS

Based on our review of existing traffic operations, a reconfiguration of and re-striping of Eireann Quay would improve the visibility of the lane markings for drivers and at the same be an opportunity to make changes to the traffic flows to improve operations. Moreover, given the recommendation that the temporary taxi / shuttle stand on the Canada Malting site be maintained until a suitable off-street replacement can be found, the former taxi queue and ferry queue lanes along the west side of Eireann Quay (known as the 'finger lot') could be repurposed such that these lanes can be used more efficiently to improve overall traffic operations and thus reduce some of the spillover effects being caused by the current lack of capacity on Eireann Quay.

There are a variety of ways in which the existing 'finger lot' traffic lanes can be reconfigured to provide a more efficient traffic configuration. Generally speaking, however, the reconfiguration and re-painting of Eireann Quay and the 'finger lot' would achieve the following objectives:

- the provision of additional overflow curb-side space for pick-up drop-off activity along the improved sidewalk on the west side of Eireann Quay;
- the creation of a northbound recirculation 'U-Turn' on Eireann Quay so that drivers can re-enter the pick-up / drop-off queue area without having to make a three point turn;
- the creation of a dedicated inbound lane for the shuttle bus to access the shuttle loop to improve shuttle access at the terminal; and



- the diversion of all inbound traffic (except for the shuttle) into the new improved entry lane and pick-up / drop-off queue.

PROVIDE ADDITIONAL SHORT TERM PARKING FOR PRIVATE VEHICLE PICK-UP

A key deficiency we have observed during our site visits is a lack in available short term parking for people in private vehicles who are picking up passengers arriving at BBTCA. The lack of availability for short term parking results in vehicles re-circulating on Eireann Quay during peak times by making a 3 point turn at a point just south of Queens Quay in order to re-enter the southbound flow of traffic on Eireann Quay. It also results in illegal parking in the adjacent neighbourhood and on Eireann Quay itself, which causes impacts to the operation of traffic coming to and from the airport.

Additional short term waiting space could be provided by adding new curbside drop-off space along Eireann Quay as part of a reconfiguration of the 'finger lot.' To provide additional short term space, however, the following adjustments to the existing parking spaces on the Canada Malting site are also recommended:

- reconfigure the long-term parking area located on the Canada Malting lands into additional short term parking for private vehicles waiting to pick-up passengers, with a 10 minute free parking grace period to encourage people to use the parking spaces instead of waiting illegally on Eireann Quay;
- change the price structure for the current short term pick-up parking spaces located in the off-street facility to allow for a 10 minute free parking grace period, to encourage people to use the parking spaces instead of waiting illegally on Eireann Quay; and
- relocate the existing designated TDSB parking spaces along the parking row closest to the BBTCA mainland terminal (which are currently the most convenient spaces for airport users) to the rear of the lot.



5.0 BBTCA PASSENGER VOLUMES

5.1 KEY INPUTS

HOURLY PASSENGER FLOWS

Many of the BBTCA's impacts are being measured based on the estimated growth in annual passengers. From a transportation perspective, however, the determining factor for extent of the airport's transportation impacts is the volume of passengers that arrive and depart BBTCA during an hour. This analysis therefore considers the implications of the potential growth in the number of hourly passengers at BBTCA.

5.2 EXISTING PASSENGER LEVELS

Existing passenger activity levels were obtained from information contained in Dillon's March 2013 report entitled: "Passenger Activity Projections." That report contained a detailed breakdown of the number of passengers that arrived and departed from Toronto. The August 2012 passenger numbers included in the Dillon report were noted as beginning to approach peak operations possible at BBTCA during the busiest hour.

It is also noted that the passenger volume data contained in the Dillon report represents Porter Airlines passengers only. To account for additional passenger traffic added by Air Canada, an additional allowance of 63 passengers each way was added to the passenger totals representing 1 additional flight in the morning peak hour and one additional flight in the afternoon peak hour.

TABLE 1 EXISTING PEAK PASSENGER VOLUMES (AUG 2012)

	Arriving	Departing	Two-Way
Morning Peak Hour (9:00am to 10:00am)			
Porter Airlines	220	425	645
Air Canada	65	65	130
Total	285	486	775
Afternoon Peak Hour (5:00pm to 6:00pm)			
Porter Airlines	340	440	780
Air Canada	65	65	130
Total	405	505	910

Notes:

1. Passenger volumes taken from Attachment 1.1 (Additional Baseline Data) contained in Dillon Consulting Report: *Passenger Activity Projections*, March 2013.
2. Air Canada passenger volumes estimated based upon October 3, 2013 schedule available on YTZ website (1 arriving Q400 flight and 1 departing Q400 flight) with an assumed occupancy of 85% (i.e. 74 seats available @ 85% equals 63 passengers).



5.3 FORECAST OF MAXIMIZED OPERATIONS WITHOUT JETS

A forecast was developed for what the busiest design hour would be if the current hourly flight slots (of Q400 planes) were operating at almost full capacity. The forecast was developed under the assumption that passenger volumes will grow within the peak hour by increasing the occupancy of current Q400 planes, while still maintaining the current number of flights (i.e. 8 aircraft 'turns', or approximately 16 flights per hour). These volumes represent the 'Growth Baseline' upon which the impact of approving jets is measured against.

The forecasts for the Growth Baseline are shown in Table 2 below.

TABLE 2 PROJECTED PASSENGER VOLUME DESIGN HOUR FOR GROWTH BASELINE

	Arriving	Departing	Two-Way
Number of Assumed Q400 Flights Per Hour	8	8	16
Hourly Passenger Capacity of Q400 Planes (Based on 68 seats / plane)	545	545	1,090
Assumed Load Factor ¹	85%	85%	--
Total Number of Hourly Passengers	465	465	930
Assumed Connecting Flights Factor ²	25%	25%	--
Number of Hourly Passengers Accessing Mainland	350	350	700

Notes:

1. 85% load factor assumed based on passenger projections set out on Page 32 of June 2013 AirBiz report.
2. 25% connecting flights factor assumed based passenger projections set out on Page 32 of June 2013 AirBiz report.

We understand from the Dillon documentation that Toronto Port Authority (TPA) slot scheduling guidelines currently limit the number of commercial flight movements to approximately the 16 flights per hour that occur currently¹. As has been noted in the AirBiz report however, the existing runway at BBTCA has the ability to accommodate additional commercial movements during the peak hours if the slot scheduling guidelines were changed. This implies that there is the potential to significantly increase the hourly passenger volumes at BBTCA by increasing the number of commercial flights, regardless of whether jets are permitted. A discussion of the impacts to the passenger volumes if this were to occur is set out in Section 5.5.

5.4 ESTIMATED IMPACT OF ADDING JET ACTIVITY

This section briefly describes the estimated passenger activity projections if jets are permitted at BBTCA. Consistent with the previous section, this assumes that the total number of flight slots in an hour remains constant at 16 (8 arriving and 8 departing).

¹ See page 6 of Dillon Consulting's March 2013 Report: Passenger Activity Projections (see Section 5.0).



The assumed distribution of hourly flight slots between jets and turboprops is set out below.

- 40% of the slots will be utilized by jets (6 total, 3 arriving and 3 departing) ^{see footnote 2 at bottom of page}
- 60% of the slots will continue to be utilized by turboprops (10 total, 5 arriving and 5 departing)

Table 3 summarizes estimated passenger projections resulting from the potential permission for jets.

TABLE 3 PROJECTED PASSENGER VOLUME DESIGN HOUR WITH JETS

	Arriving	Departing	Two-Way
Number of Assumed Q400 Flights Per Hour	5	5	10
Hourly Passenger Capacity of Q400 Planes (Based on 68 seats / plane)	340	340	680
Number of Assumed Jet Flights Per Hour	3	3	6
Hourly Passenger Capacity of Jets (Based on 107 sets per plane)	320	320	640
Combined Passenger Capacity	660	660	1,320
Assumed Load Factor ¹	85%	85%	--
Total Number of Hourly Passengers	560	560	1,120
Assumed Connecting Flights Factor ²	25%	25%	--
Number of Hourly Passengers Accessing Mainland	420	420	840

Notes:

1. 85% load factor assumed based on passenger projections set out on Page 32 of June 2013 AirBiz reports.
2. 25% connecting flights factor assumed based passenger projections set out on Page 32 of June 2013 AirBiz report.

5.5 POTENTIAL FOR INCREASING HOURLY FLIGHT SLOTS

We understand that TPA slot scheduling guidelines currently limit the number of hourly flights to the approximately 16 commercial flights an hour that exist today. Passenger volumes could increase significantly, however, if the slot scheduling guidelines were changed, which would in turn have a significant impact on the groundside terminal and the surrounding area.

The information presented in the AirBiz report indicates that the existing runway at BBTCA could theoretically accommodate up to approximately 30 to 36 flight movements in the peak hour. The following tables therefore summarize the estimated passenger volumes that would be generated by BBTCA increasing the number of flights to the worst case of 30 to 36 per hour. These estimates represent a worst case scenario from a vehicular traffic impact perspective groundside and it is recognized that the maximum number of flights per hour may be less depending on other operational constraints that may exist at BBTCA (e.g. terminal capacity, taxiway capacity, etc.).

² It is conservatively assumed that 40% of hourly slots could be used by jets because 4 out of the 10 existing gates will be able to accommodate jets (see Page 42 of the June 2013 AirBiz report). It is anticipated however that on an overall basis throughout the day that jets will make up a lesser proportion of activity at around 25% (see Page 32 of the June 2013 AirBiz report).



TABLE 4 PROJECTED PASSENGER VOLUME DESIGN HOUR –MAXIMUM CAPACITY, NO JETS

	Arriving	Departing	Two-Way
Number of Assumed Q400 Flights Per Hour ¹	15	15	30
Hourly Passenger Capacity of Q400 Planes (Based on 68 seats / plane)	1,020	1,020	2,040
Assumed Load Factor ²	85%	85%	--
Total Number of Hourly Passengers	865	865	1,730
Assumed Connecting Flights Factor ³	25%	25%	--
Number of Hourly Passengers Accessing Mainland	650	650	1,300

Notes:

1. Based on assumptions provided by AirBiz of 10 gates operating with 1.5 'Turns' per gate, per hour, where 1 turn is equal to one arrival and one departure.
2. 85% load factor assumed based passenger projections set out on Page 32 of June 2013 AirBiz report.
3. 25% connecting flights factor assumed based passenger projections set out on Page 32 of June 2013 AirBiz report.

TABLE 5 PROJECTED PASSENGER VOLUME DESIGN HOUR – MAXIMUM CAPACITY, WITH JETS

	Arriving	Departing	Two-Way
Number of Assumed Q400 Flights Per Hour ¹	12	12	24
Hourly Passenger Capacity of Q400 Planes (Based on 68 seats / plane)	815	815	1,630
Number of Assumed Jet Flights Per Hour ²	6	6	12
Hourly Passenger Capacity of Jets (Based on 107 sets per plane)	640	640	1,280
Combined Passenger Capacity	1,455	1,455	2,910
Assumed Load Factor ³	85%	85%	--
Total Number of Hourly Passengers	1,235	1,235	2,470
Assumed Connecting Flights Factor ⁴	25%	25%	--
Number of Hourly Passengers Accessing Mainland	925	925	1,850

Notes:

1. Based on assumptions provided by AirBiz of 6 gates with Q400 planes operating with 2 'Turns' per gate, per hour, where 1 turn is equal to one arrival and one departure.
2. Based on assumptions provided by AirBiz of 4 Jet gates operating with 1.5 'Turns' per gate, per hour, where 1 turn is equal to one arrival and one departure.
3. 85% load factor assumed based passenger projections set out on Page 32 of June 2013 AirBiz report.
4. 25% connecting flights factor assumed based passenger projections set out on Page 32 of June 2013 AirBiz report.



6.0 VEHICULAR TRAFFIC FORECASTS

6.1 EXISTING TRAFFIC VOLUMES

Existing traffic volumes during the weekday peak hours were utilized for as the basis for understanding the vehicular traffic impacts of the jet proposal. In this regard, existing traffic volumes during the peak hours within the study area were obtained from various traffic counts obtained from the following sources:

- The City of Toronto;
- BA Group's traffic count database;
- Dillon's April 2013 report entitled: *2019 'Do Nothing' Traffic Micro Simulation Assessment*.

In some instances, where the traffic count data was recorded during the non-peak months of activity at BBTCA, the existing traffic volumes were factored (i.e. increased) to reflect the seasonally highest activity levels that currently occurs at BBTCA in August. The resultant factored existing traffic volumes to reflect August activity at BBTCA were used to evaluate peak existing traffic operations.

A detailed listing of the source and date for the traffic count data used in our analysis is provided in the Technical Appendix to this study.

6.2 BBTCA VEHICULAR GROWTH ESTIMATES

6.2.1 Mode Split Assumptions

The amount of vehicular traffic generated by BBTCA depends on the proportion of passengers who use different modes of transportation to get to and from BBTCA. The base mode splits for BBTCA were measured by Dillon Consulting on behalf of the TPA in their Passenger Survey Summary.

In addition to the base existing mode splits (referred to as Scenario A), two additional scenarios were developed that represent the potential for reducing BBTCA traffic through increasing modes used by passengers. The two following scenarios were evaluated:

- Scenario B: with a decrease in the auto / taxi mode split of 10% with a corresponding increase in the use of the shuttle bus; and
- Scenario C: with a decrease of the auto / taxi mode split of 15% with a corresponding increase in shuttle use of 10% and an increase in transit use of 5%.

Table 6 summarizes the mode split assumptions for each scenario.



TABLE 6 BBTCA MODE SPLIT ASSUMPTIONS

	Scenario A Existing Mode Splits	Scenario B Increased Shuttle Use	Scenario C Increased Shuttle and Transit Use
Drive Themselves	5% (5%)	5% (5%)	2.5% (2.5%)
Take a Taxi	46% (49%)	36% (39%)	36% (39%)
Picked Up / Dropped Off	14% (19%)	14% (19%)	12% (17%)
Transit / Walk / Cycle / Other	10% (10%)	10% (10%)	15% (15%)
Airport Shuttle Bus	25% (25%)	35% (35%)	35% (35%)

Notes:

1. 00 (00) – Morning peak hour mode split (Afternoon Peak hour mode split)

6.2.2 Traffic Volume Projections

Projections of the traffic volumes generated by BBTCA were estimated by applying the mode split assumptions above to the passenger volume projections contained in Section 4.0.

The resultant vehicular traffic volume forecasts for BBTCA passengers are noted in Table 7. A detailed method for developing the vehicular trip generation forecasts can be found in the Technical Appendix.

TABLE 7 BBTCA PASSENGER VEHICULAR TRAFFIC VOLUME PROJECTIONS

	Number of Passengers Per Hour	BBTCA Vehicular Traffic Volumes (BBTCA Passenger Traffic Only)		
		Scenario A Existing Mode Split	Scenario B Increased Shuttle Use	Scenario C Increased Shuttle and Transit Use
Existing AM Peak	775	550	N/A	N/A
Existing PM Peak	910	630	N/A	N/A
Growth Baseline	930	635	540	505
Growth Baseline With Jets	1,120	760	650	605
Maximum Theoretical Hourly Capacity Without Jets	1,730	1,175	1,000	940
Maximum Theoretical Hourly Capacity With Jets	2,470	1,675	1,425	1,335

Non-airport vehicular traffic volumes on Eireann Quay (i.e. BBTCA staff and traffic associated with the Waterfront School / Harbourfront Community Centre) were also estimated. These volumes were added to the vehicle trips generated by passengers resulting in a total estimated vehicular traffic volume for Eireann Quay south of Queens Quay. These volumes are shown in Table 8.



TABLE 8 VEHICULAR TRAFFIC VOLUME PROJECTIONS ON EIREANN QUAY

	Number of Passengers Per Hour	BBTCA Vehicular Traffic Volumes (BBTCA Passenger Traffic Only)		
		Scenario A Existing Mode Split	Scenario B Increased Shuttle Use	Scenario C Increased Shuttle and Transit Use
Existing Peak Hour	775 (910)	620 (670)	n/a	n/a
Growth Baseline	930	705 (675)	610 (580)	575 (545)
Growth Baseline With Jets	1,120	830 (800)	610 (580)	675 (645)
Maximum Theoretical Hourly Capacity Without Jets	1,730	1,245 (1,215)	1,070 (1,040)	1,010 (980)
Maximum Theoretical Hourly Capacity With Jets	2,470	1,745 (1715)	1,495 (1465)	1,405 (1375)

Notes:

1. 00 (00) – Morning peak hour traffic volumes (Afternoon Peak hour traffic volumes)

DISCUSSION

The trip generation analysis indicates that permission for jets would increase traffic volumes on Eireann Quay by approximately 20% compared to the growth baseline volume. It is noted however that the impact of permitting jets could be reduced if the private auto and taxi mode split could be reduced from approximately 65% of BBTCA passengers to approximately 55% by increasing the use of the shuttle bus and / or transit. Moreover, the impact of jets (compared to the growth baseline) could likely be completely mitigated if an even higher mode shift change were achieved if the private auto / taxi mode split was reduced to 50% overall (see Scenario C total trips with jets vs. Scenario A Growth Baseline without jets).

If the number of hourly flights were increased to the theoretical maximum capacity of 30-36 flights per hour traffic, volumes would increase significantly. Traffic volumes on Eireann Quay would approximately double compared to the growth baseline volumes without jets. Moreover, under the 30-36 flights per hour passenger volumes, the impact to vehicular traffic volumes on Eireann Quay of permitting jets would also be significantly increased. In this regard, traffic volumes on Eireann Quay would grow by a further 40% compared to 30-36 flights per hour without jets.

6.2.3 Trip Distribution

A directional distribution of traffic from the airport was estimated in order to assess where the vehicle trips travelling to/from BBTCA go. The distribution was estimated using two approaches. A distribution for travellers who reside in Toronto (approximately 50% of travellers at BBTCA) was developed using an analysis of postal code information for passengers provided by the TPA. A trip distribution for business travellers, generally assumed to be destined to/from the downtown area, was developed based on a review of turn restrictions on key routes to/from downtown, and through an assessment of the existing traffic volumes.



6.2.4 Trip Assignments

The estimated trips generated by BBTCA for the various trip generation scenarios were assigned to the road network using the trip distribution approaches outlined above. Figures illustrating the traffic assignment layers for the various traffic generation scenarios are provided in the Technical Appendix.

6.3 TRAFFIC GROWTH FROM OTHER DEVELOPMENT SITES

This analysis also considers future traffic volumes that will be generated by the future development sites located in and around the BBTCA area. These future vehicle trips, which are referred to as background traffic volumes, were extracted from a Lea Consulting transportation report entitled: Transportation Impact Study, 500 Lake Shore Boulevard West, dated June 2013. That report was completed for a proposed mixed use project on the northeast corner of Bathurst Street and Lake Shore Boulevard. Future developments in the area considered in the Lea Consulting report are:

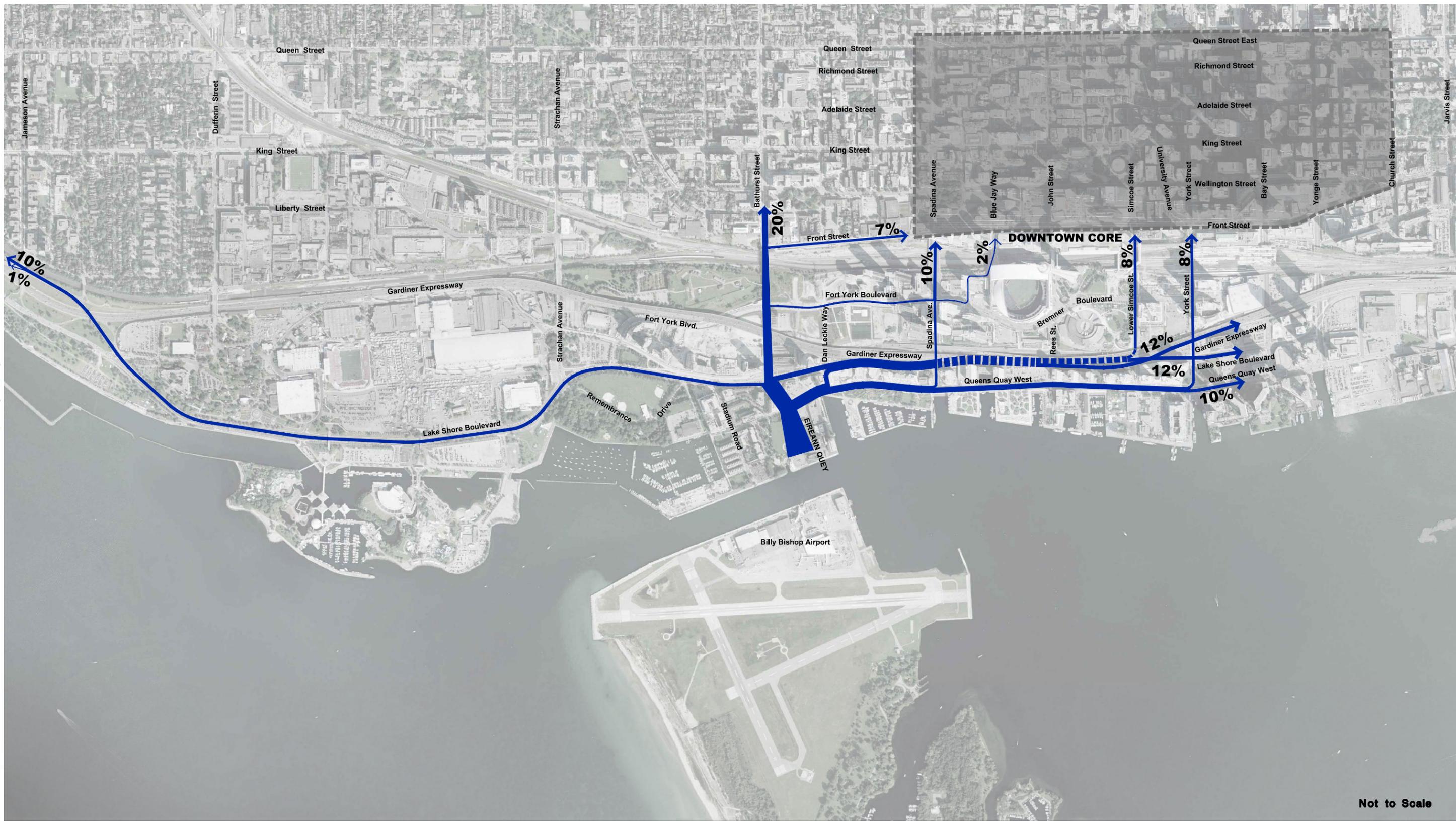
TABLE 9 TRAFFIC VOLUMES FROM OTHER DEVELOPMENT SITES CONSIDERED

Background Development Sites Considered
Blocks 29, 31, 32, 33, 36, 37
32, 36-155 Dan Leckie Way
32-510 Bremner Boulevard
36 South – 170 & 200 Fort York Boulevard
500 Lake Shore Boulevard West
37 – 511 Bremner Boulevard
33 – 511 Bremner Boulevard

Given that the Lea report represents the most recent study in the area, the traffic allowances for future development contained in the Lea Report were adopted in this analysis for the purposes of considering the impact of traffic from future development in the area.

The background development volumes were added to the estimated traffic increases from BBTCA (e.g. with jets) to review their combined impact to the area road network operations. The analysis of the combined impact of background growth and BBTCA traffic increases is provided in Table 11 in Section 7.0 and Table 12 in Section 8.0.





Estimated Vehicular Traffic Access Routes to BBTCA

7.0 REVIEW OF JET TRAFFIC IMPACT

The following section discusses the traffic impact of permitting jets at BBTCA. The impact of permitting jets was measured based on a comparison of the estimated growth baseline traffic volumes without jets (i.e. what the BBTCA passenger volumes are expected to grow by based on the current number of hourly flights) versus the growth baseline traffic volumes with jets.

The impact of jets was measured through use of a VISSIM simulation model for the immediate BBTCA study area. A detailed level of analysis was undertaken within the immediate study area and four representative intersections are reported on:

1. Eireann Quay / Queens Quay / Bathurst Street
2. Lake Shore Boulevard / Bathurst Street
3. Queens Quay / Dan Leckie Way
4. Lake Shore Boulevard / Dan Leckie Way

Impacts at Stadium Road / Lake Shore were also considered, however given that BBTCA traffic volumes are restricted from turning to / from Queens Quay east of Bathurst, the impact to this intersection will generally be small. The impacts at the four intersections noted above were considered to be the key locations to review the impact of increased traffic volumes generated by BBTCA.

7.1 ANALYSIS METHOD

Traffic operations in the immediate study area were modelled and analysed using a VISSIM micro-simulation model. The model was run for the weekday morning peak hour and the afternoon peak hour.

Details regarding how the model was developed and how the area traffic operations were recorded are provided in the Technical Appendix.

7.2 EXISTING OPERATIONS

Existing traffic volumes were modelled to establish the current traffic operations in the area, to serve as a point of comparison for future growth. The estimated intersection operations for the weekday morning and afternoon peak hours associated with the current BBTCA operations are provided in Table 10.

