

	Total Movements	Total Itinerant Movements	Total Local Movements	Helicopters	Night Movements
2008	464.6	214.4	250.2	n/a	2.8%
2010	627.0	384.0	218.0	25.0	2.9%

Table 7.1 Annual Noise Studies – Summary Table

Note that there were helicopter movements in 2008 but as per the Tripartite Agreement were not modelled because they were not required to adhere to specific flight tracks. Helicopter movements were modelled in 2010 because of the need to fly specific flight tracks.

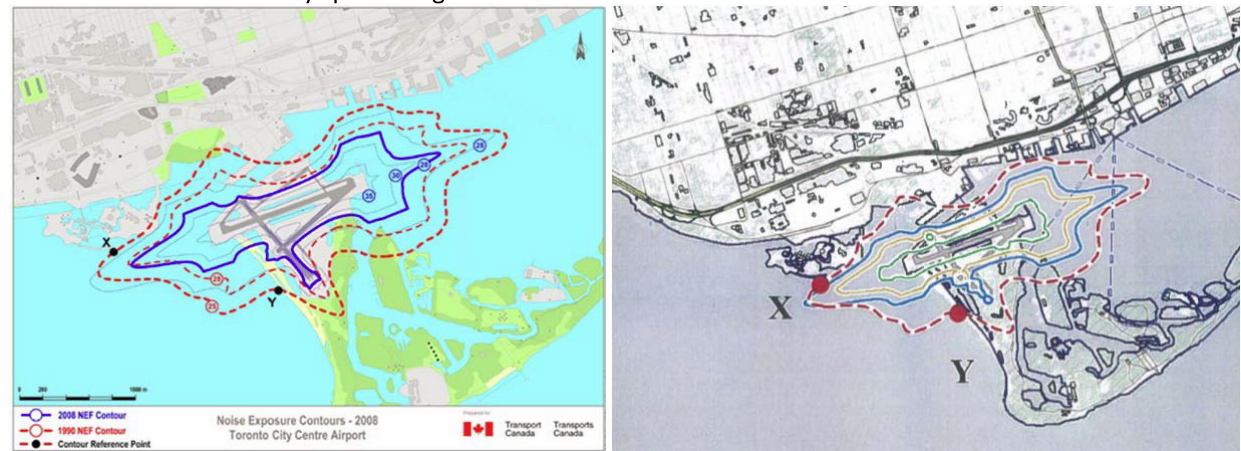


Fig 7.4 2008 / 2010 Annual Noise Studies – Tripartite Agreement Compliance

At present it is not possible to reliably assess the impact of the CS100 aircraft on compliance to the contours Schedule A of the Tripartite Agreement. Once the CS100 sound levels are certified, Transport Canada would need to update the database of its noise modelling software, or advise a suitable substitution (as it is currently done with the Dash8-Q400 which uses the Dash8-Q300 as a surrogate) to enable a reliable review. The US Federal Aviation Administration (FAA) has advised that the ERJ170-100 (Embraer 170), an aircraft added to the US Integrated Noise Model database in May 2013, should be used as a substitution to the CS100 for the time being. However, this aircraft model is not available in Transport Canada NEF-CALC software.

Until an assessment can be made based on the revised commercial fleet and operational patterns, the

current cap of 202 movements is assumed to remain an adequate interpretation of the Tripartite Agreement noise exposure compliance levels, especially as the CS100 is expected to operate at noise levels similar to the Dash8-Q400.

08. GENERAL AVIATION CONSIDERATIONS

General Aviation is a sizeable component of traffic at the Billy Bishop Toronto City Airport. Over 50% of the total aircraft movement traffic is undertaken by general aviation aircraft. Of this general aviation activity, a majority of movements are conducted locally (flights that remain in the vicinity of the airport). This section reviews the potential impacts of the Porter Airlines proposal on general aviation activities.

INFRASTRUCTURE AND CAPACITY

The proposed runway lengthening of Runway 08-26 from 1,216m to 1,569m will not directly affect general aviation operations. The integrity of the two (2) cross-runways are maintained which will enable small aircraft operators to retain access to runways providing optimal crosswind coverage.

Since the lengthening of Runway 08-26 is not associated with taxiway improvements, aircraft requiring the full runway length will be required to backtrack prior to proceeding with a take-off roll which may result in a reduction in the runway capacity. However, general aviation aircraft that do not require the full length of the runway will have the ability to conduct intersection departures which will expedite their departure.

On the aprons, the parking of CS100 aircraft on the Eastern and Western side of the passenger terminal will increase spatial constraints, but appears from initial planning documents to have little or no impact on the current GA operation. Plans to increase the footprint of the passenger terminal building could over time add constraints on general aviation airside activities. This will be subject to the review and approval of the final aircraft parking plans, a review of pushback and ramp operations proposed by Porter Airlines.

NOISE EXPOSURE CONTOURS CONSIDERATIONS

The quantity of operations at the BBTCA are guided by a compliance process of existing operations to the NEF Noise Exposure Forecasts 1990 as contained in Schedule A of the Tripartite Agreement.

A review conducted in 2010 concluded that suitable busy day general aviation provisions had been included in the scenario that led to the development of the 202 daily commercial operations scenarios as follows:

- 147 Daily Itinerant General Aviation Movements (modelled with a mix of generic single piston, twin piston and twin turboprop aircraft)
- 236.9 Daily Local General Aviation Movements (modelled with a mix of generic single piston and twin piston aircraft)
- 4.4% of itinerant movements assumed to be operating at night-time (i.e. between 10pm and 7am)

GENERAL AVIATION JET OPERATIONS

Under a scenario where all jet operations compliant with the Tripartite Agreement noise levels are allowed to operate at BBTCA, a lift of the ban on jet operations would immediately allow small general aviation jet aircraft such as Very Light Jets (VLJ) to operate from the existing runway. The following graph highlights the cumulative noise levels of these aircraft in comparison to the CS100, the Dash8-Q400, the Tripartite Agreement noise limits and other international noise standards.

It highlights that small general aviation jets are quieter than the CS100 and Dash8-Q400. As such, a total lift on the ban of jet aircraft could create new opportunities for general aviation operators at BBTCA.

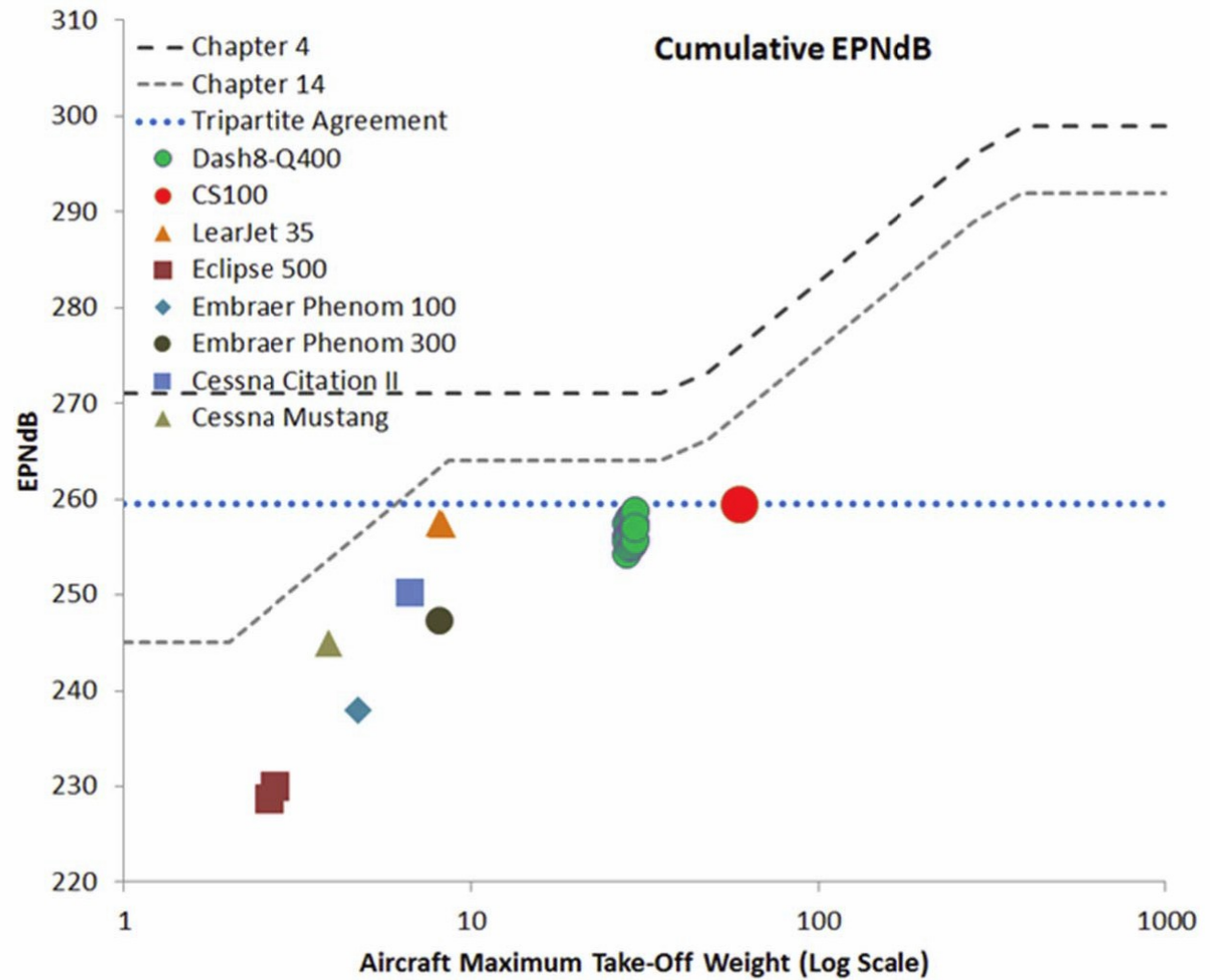


Fig 8.1 Cumulative EPNdB / Noise Certification Standards and Aircraft Compliance

09. CASE STUDIES – WATERFRONT/URBAN AIRPORTS

This section discussed examples of airports currently operating within an urban and/or waterfront area around the world in a manner similar to the Toronto City Centre Airport. Constraints, benefits and impacts are described.

Comparable examples of waterfront airports around the world include the London City Airport (United Kingdom) and the George Best Belfast City Airport (Ireland). Other significant urban airports include the Bromma-Stockholm Airport (Sweden)



Fig 9.1 Location of Airports Investigated as Case Studies

LONDON CITY AIRPORT, UNITED KINGDOM



London City Airport is built on the former Royal Docks with a 1,508m long runway but with a take-off length of 1,199m and landing length of 1,319m. It operates under several restrictions including a curfew on operations between 12:30pm on Saturday and 12:30pm on Sunday.

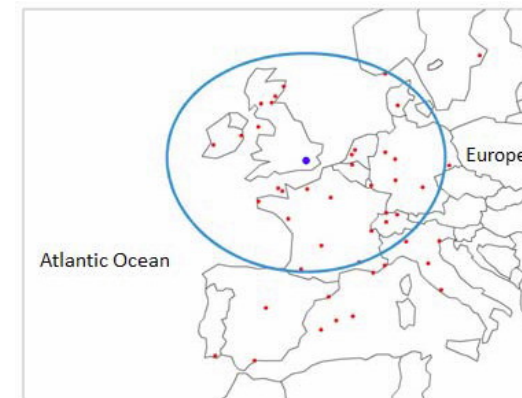
It was formally opened in 1987 as a STOLport (Short Take-Off and Landing Port) with the condition to limit operations to the Dash-7 aircraft or equivalent (7.5 degrees approaches), with a limit of 120 movements per day (40 on weekends) and hours of operations restricted to 630am to 1000pm (900am to 1000pm on Sundays and public holidays). Helicopter movements were prohibited.

In 1992, the runway was extended to 1,508m²¹ and the approach slope reduced to 5.5 degrees to cater for larger aircraft including the BAE146 4-engined jet aircraft and the Dash8. Furthermore, a daily movement cap was increased to 130 daily movements on weekdays and 80 daily movements on weekends. The annual movement limit went from 30,160 to 36,500.

In 1998, further permission was granted to increase annual movements to 73,000, with 240 daily movements on weekdays and 120 daily movements on weekends (220 movements maximum for the total weekend). Restrictions on operations between 12:30pm on Saturday and 12:30pm on Sunday were also introduced.

In 2005, the DLR (Docklands Light Railway) was commissioned with a station integrated to the airport terminal.

In 2009 the airport was given permission to raise the limit on number of flights to the current limit of 120,000 movements with a maximum of 592 daily movements on weekdays. A travel plan was also developed to encourage passengers and staff to use sustainable transport modes and therefore



²¹ London City Airport Consultative Committee (LCACC) website - Airport History

minimising single occupancy vehicles use to/from the airport.

Routes available from London City Airport cover most of central Europe and are within a 500nm range.

The following charts outline the historical traffic at the London City Airport and the relative footprint of the airport in comparison to BBTCA.

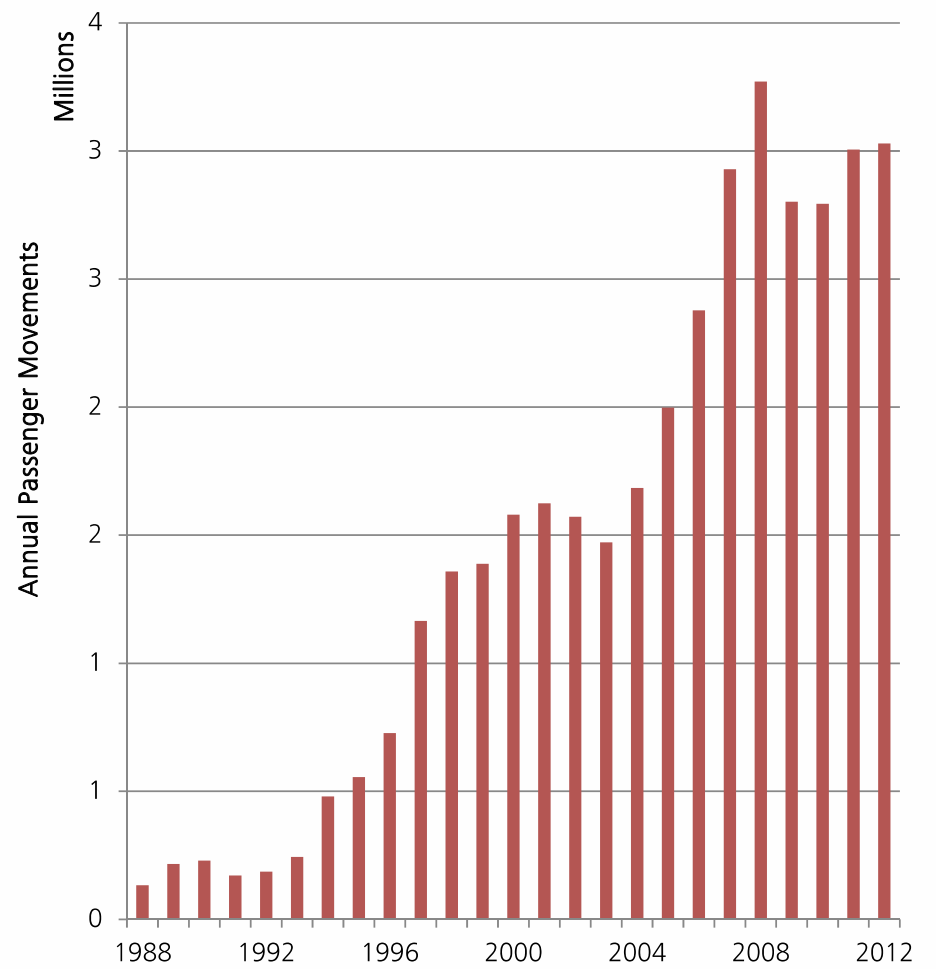
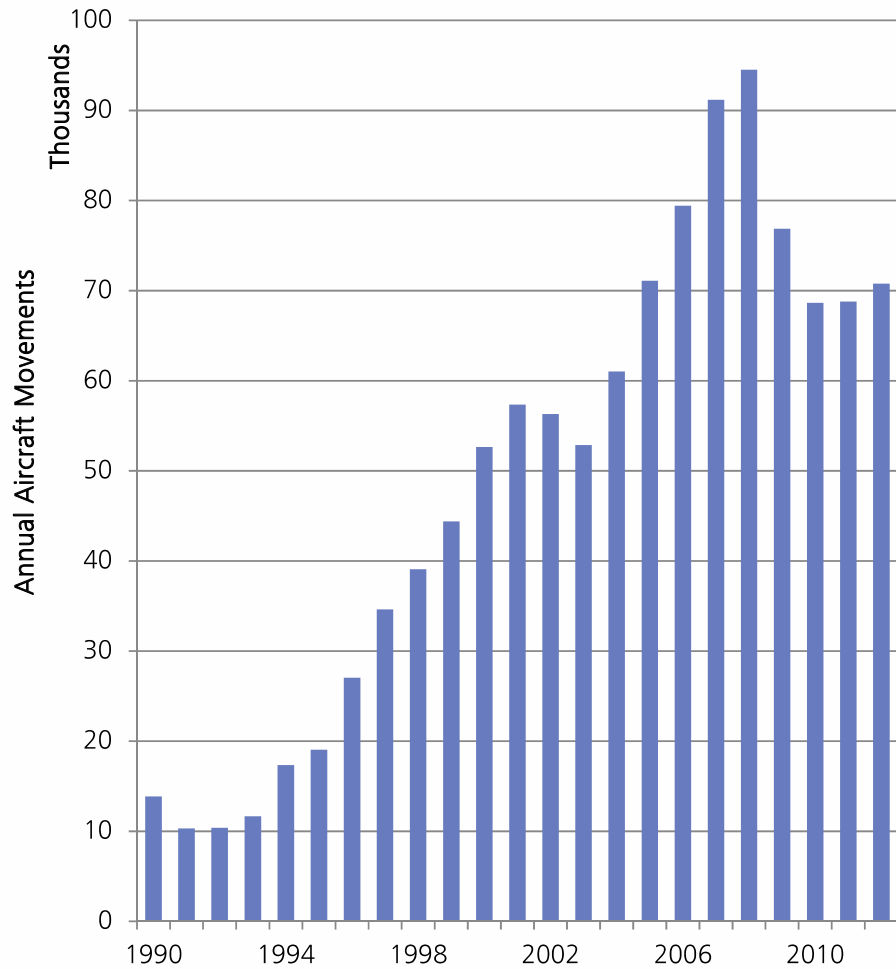


Fig 9.2 London City Airport (LCY) Airport Annual Aircraft and Passenger Movements



Fig 9.3 London City Airport (LCY) Airport Overlay

At London City Airport, aircraft noise is taken into account when calculating the annual movements. Aircraft are categorised and assigned a movement value based on each category as follows:

Category	Movement Value	Noise Reference Level	Aircraft Types
A	1.26	91.6-94.5	Airbus 318, BAe 146, Avro RJ85, Embraer 170, Embraer 190, Fokker 70, Dornier 328 Jet, DHC 6
B	0.63	88.6-91.5	ATR42,F50, DHC-8, Do-328, SF340
C	0.31	85.6-88.5	SAAB2000, S360
D	0.16	82.6-85.5	Do-228, DHC-7
E	0.08	Less than 82.6	-

Table 9.1 London City Airport – Noise Category

The following table presents a week of operations based on 20-26 May 2013 at the London City Airport. It also indicates the noise category of the aircraft currently operating.

Aircraft	Engine	MTOW (tonnes)	Movements	Noise Category
Airbus A318	Jet	59	20	A
Embraer 190	Jet	52	336	A
Avro RJ100	Jet	45	155	A
Avro RJ85	Jet	44	202	A
BAe 146-200	Jet	42	12	A
Embraer 170	Jet	39	173	A
Dash8-Q400	Turboprop	29	58	B
Saab 2000	Turboprop	23	36	C
Fokker 50	Turboprop	21	276	B
ATR42	Turboprop	19	33	B
Dornier 328	Turboprop	14	108	B
TOTAL			1409	
AVG DAILY			201	

Table 9.2 Weekly Commercial Movements – 20 May 2013 Schedule

CityJet and BA CityFlyer airlines are the main carriers at London City Airport with 32% and 40% of the seats respectively²². BA CityFlyer has 6 Embraer E-170s and 7 Embraer E-190s in its fleet²³. CityJet's fleet consist of 23 Avro RJ85 Avroliner aircraft, 15 Fokker 50 aircraft and 2 Fairchild Dornier Do-328 aircraft²⁴.

There are a number of constraints existing at London City Airport which are summarised in the Key Operational Specifications table below. These movement restrictions involve; the type of day, hours of specific days and type of aircraft.

Specifications	Value
Number of Runways / Length	1(1508m)
Glide Slope	5.5 degrees or steeper ²⁵
Distance from Downtown	11 km ²⁶
Annual Aircraft/Passenger Movements	111,280 (2011)
Hours of Operations	06:30-22:30 Weekdays 06:30-13:00 Saturday / 12:30-22:30 Sunday
Movement Cap	120,000 Annual Movements 592 on Weekdays (excluding bank holidays etc) 100 Saturday / 200 Sunday / 280 Combined Weekend Additional Restrictions

²² SABRE (20-26 May 2013 schedules)

²³ British Airways website – Fleet Facts

²⁴ CityJet website – Our fleet

²⁵ Boeing Noise Information – London City Airport

²⁶ NATS Document

Noise Cap	Movements weighted through noise category assessment
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Table 9.3 Key Operational Specifications – London City Airport

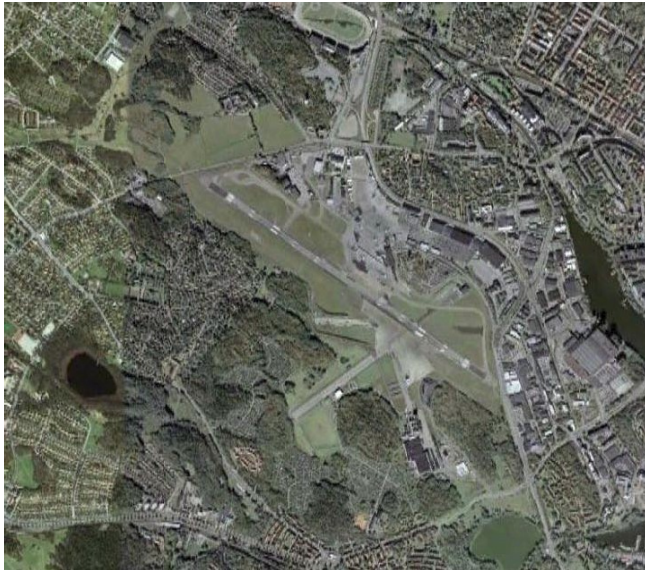
London City airport is connected to the city through public transport. The Docklands Light Railway (DLR) stops at the airport, and provides transportation to the city as well as connections to the London Underground network and rail network through Canning Town. 51% of the passengers commuting to and from London City Airport use the DLR²⁷. A number of local bus routes pass through the airport providing transport to and from the airport in addition personal cars and taxis.

The following table describes high level benefits and drawbacks associated to the operation of the London City Airport from the point of view of the operator.

Benefits	Drawbacks
<ul style="list-style-type: none"> • Proximity to downtown • High Modal Split of Train users • Direct train-station access • Simple Noise Category System to assess movement cap 	<ul style="list-style-type: none"> • Significant weekend restrictions on operations • Daily movement caps • Highly constrained groundside area

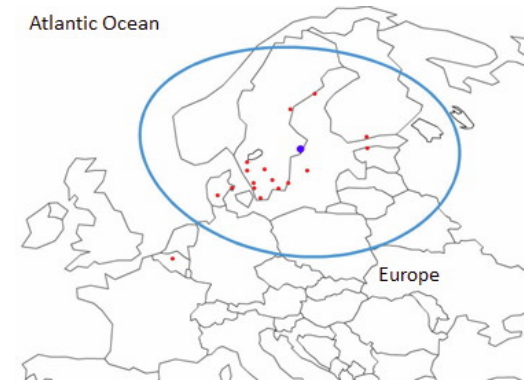
Table 9.4 Benefits and Drawbacks of London City Airport

²⁷ London City Airport website – Visiting the Airport
<http://www.londoncityairport.com/visitingtheairport/GettingHere>
<http://www.londoncityairport.com/AboutAndCorporate/page/AirlinePartnersLocationAndTransportation>



BROMMA-STOCKHOLM AIRPORT, SWEDEN

The Bromma-Stockholm Airport is an urban airport initially commissioned in 1936 and which like similar airports in an urban environment was unable to cater for the introduction of jet aircraft in the 1960s. This led to the relocation of commercial activities to the new Stockholm-Arlanda Airport, which opened from 1960 to 1962, some 35 kilometres north of Stockholm. Bromma Airport remained opened as a domestic airport until 1983, and then as a general aviation facility until Malmö Aviation launched commercial services in 1992. Located 8 kilometres from Stockholm, it predominantly draws business passengers. Bromma Airport's route map is dominated by Swedish Airports and airports within a range of 500nm.



Malmö Aviation currently operates 12 RJ100/RJ85 jet aircraft, but has purchased 5 CS100 and 5 CS300 aircraft with options for additional 10 aircraft. The CS100/300 is a quieter aircraft than the R100/RJ85 ensuring an acceptable replacement. These aircraft will assist Malmö in managing some of the key restrictions that are in place at Bromma Airport, including a cap of 20,000 annual movements for aircraft with a seating capacity exceeding 60 seats with a noise emission which exceeds 86 but not 89 EPNdB as an average for the three measuring points in accordance with ICAO Annex 16, Volume I, Part 2, Chapter 3.²⁸

Restrictions associated with operations at Bromma-Stockholm Airport include the following:

- Check running of engines 2100-0600 may be carried out in connection with take-off only.
- Test running of engines in connection with maintenance may be carried out only during the operational hours of the aerodrome but not later than 2000.
- When aircraft are landing, reversing more than IDLE Reverse should not be applied.

In addition, Bromma-Stockholm Airport is subject to strict operating hours from 6am to 9pm on weekdays, 7am to 3pm on Saturdays and 11am to 9pm on Sundays as well as an annual total cap of

²⁸ Boeing, Airport Noise and Emissions Regulations

80,000 movements. Despite this, the airport has grown to over 2.2 million passengers in 2011 while operating well within the movement cap with less than 46,000 annual movements.

Despite the commissioning of the Arlanda Express from Stockholm-Arlanda Airport in 1999, which reduced the commute to downtown Stockholm to 20 minutes, passenger traffic at Bromma has more than doubled since then, from under 1 million in 1999 to over 2.2 million in 2011. However, it should be noted that both airports are operated by Swedavia, a state-owned company, with Bromma-Stockholm airport scheduled to be handed over to the city of Stockholm in 2039.

The following charts outline the historical traffic at the Bromma-Stockholm Airport and the relative footprint of the airport in comparison to BBTCA.

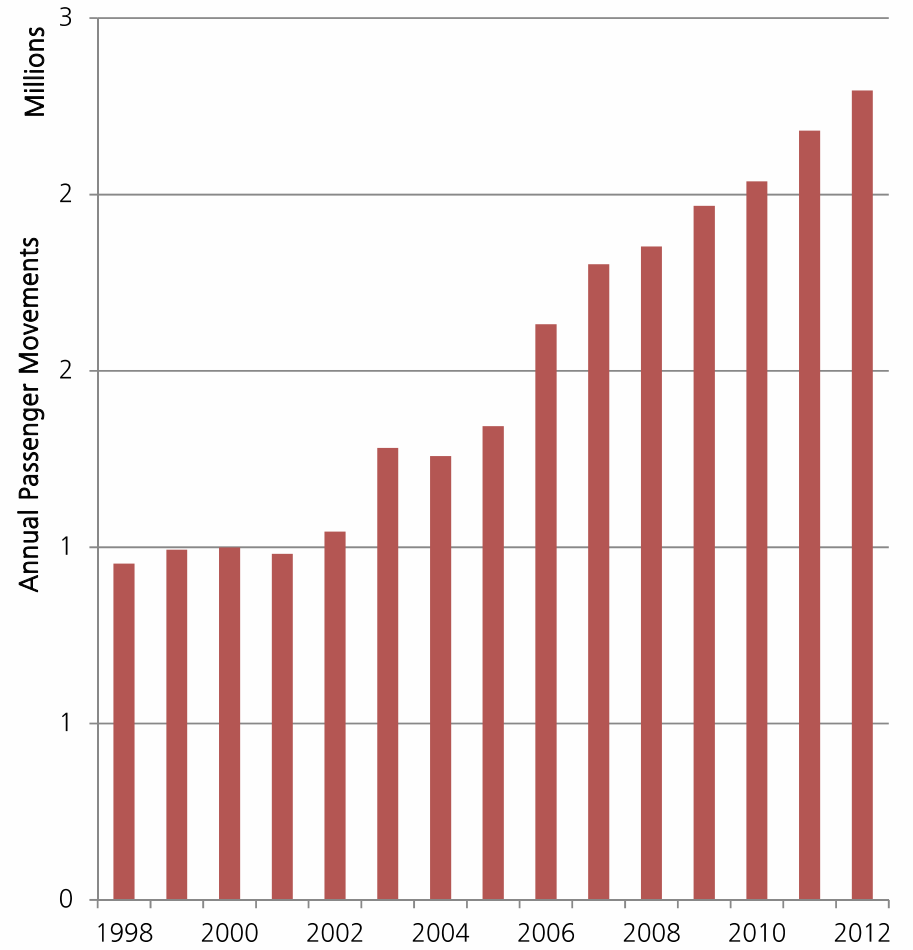
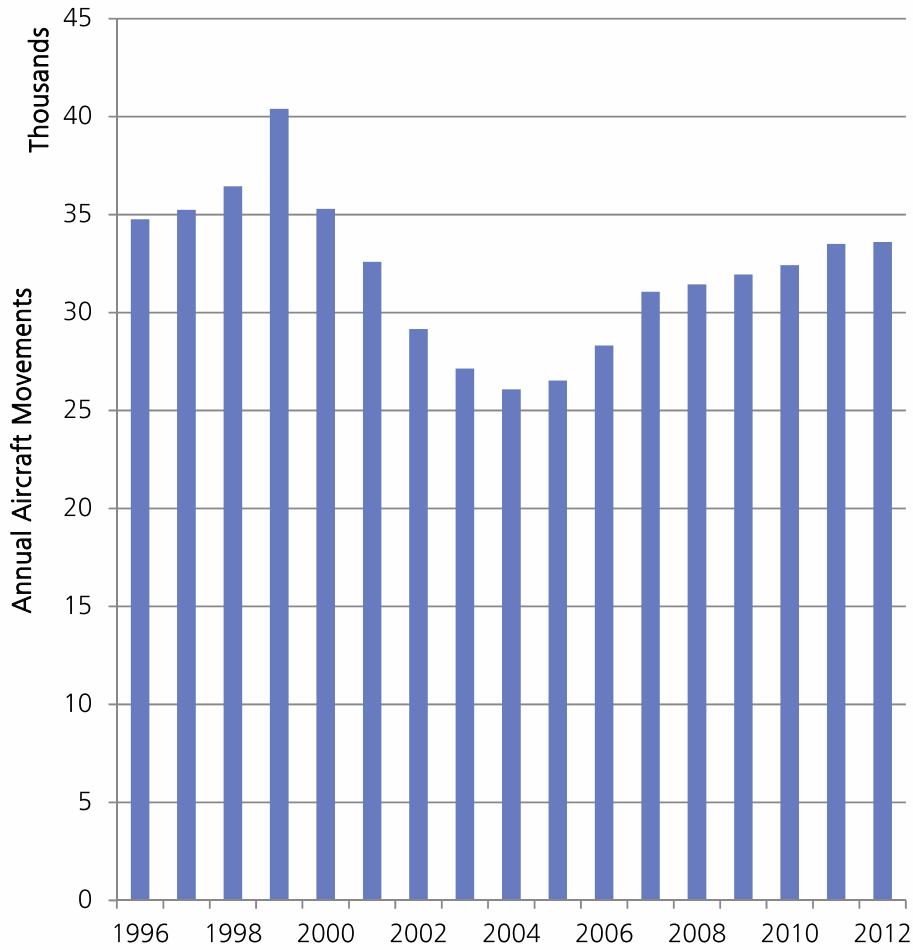


Fig 9.4 Bromma-Stockholm Airport (BMA) Airport Annual Aircraft and Passenger Movements²⁹

²⁹ Transport Styrelsen – Traffic Statistics Swedish Airports



Fig 9.5 Bromma-Stockholm (BMA) Airport Overlay

The following table presents a week of operations based on 20-26 May 2013 at the Bromma-Stockholm Airport.

Aircraft	Engine	MTOW (tonnes)	Aircraft Movements
Avro RJ100	Jet	45	338
Avro RJ85	Jet	44	64
Dornier 328Jet	Jet	15	14
BAE ATP	Turboprop	23	40
ATR72	Turboprop	23	168
Saab 2000	Jet	23	128
ATR42	Turboprop	19	24
Dornier 328	Turboprop	14	14
Saab 34	Turboprop	12	170
Jetstream 31	Turboprop	7	6
TOTAL			966
AVG DAILY			138

Table 9.5 Weekly Commercial Movements – 20 May 2013 Schedule

Malmö remains the main carrier operating scheduled services at Bromma with over 58% of the seats, followed by Braathens Regional operating under the Sverigeflyg with 24% of the seats.³⁰

³⁰ SABRE (20-26 May 2013 schedules)

There are a number of constraints existing at Bromma-Stockholm Airport which are summarised in the Key Operational Specifications table below.

Specifications	Value
Number of Runways / Length	1 (1,668m / 5,472 ft)
Glide Slope	3.5°
Distance from Downtown	8km
Annual Aircraft/Passenger Movements	46,000 / 2.2 million (2011)
Hours of Operations	Monday to Friday – 6:00 to 21:00 Saturday – 7:00 to 15:00 / Sunday – 11:00 to 21:00
Movement Cap	80,000 Annual (including 20,000 aircraft with more than 60 seats and EPNdB between 86 and 89)
Noise Cap	Must not exceed 89 EPNdB, an average for the three points of measurement in accordance with ICAO

Table 9.6 Key Operational Specifications – Bromma-Stockholm Airport

Bromma airport is approximately 8km from Stockholm city. Passengers have the option of; getting the airport coach to/from the city, using either of the two local buses, personal car, or by taxi³¹. A light rail link (Tvärbanan) will be commissioned in 2013 and will operate near the airport providing additional options to passengers³².

³¹ Bromma Stockholm website – Parking & transport
<http://www.swedavia.com/bromma/to-and-from/finding-the-airport/>

³² Swedavia website – Facts about Stockholm Bromma Airport
<http://www.swedavia.com/bromma/about-bromma-stockholm-airport-/about-the-airport/facts-about-the-airport/>

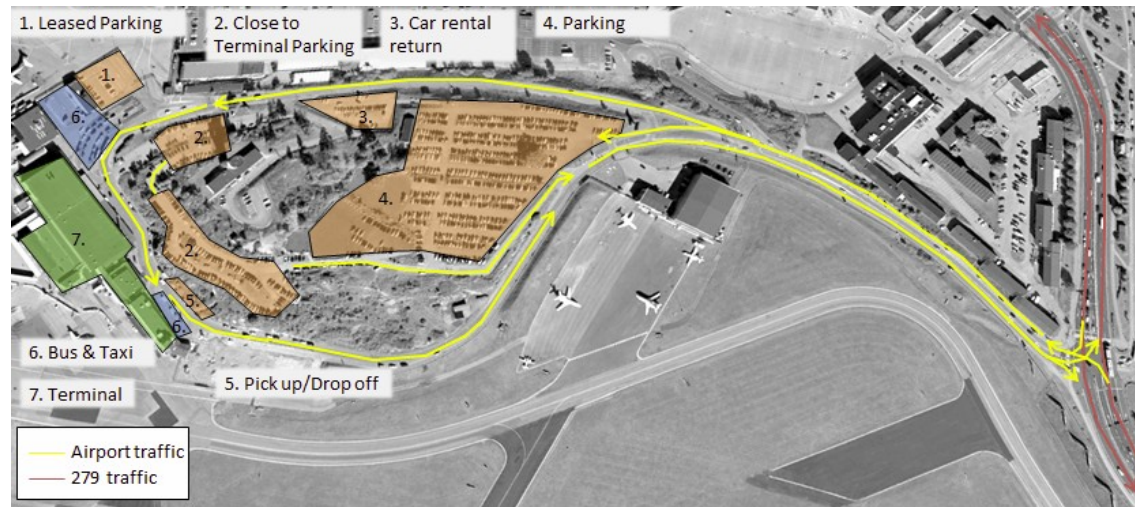


Fig 9.6 Groundside network – Bromma-Stockholm Airport³³

The following table describes high level benefits and drawbacks associated to the operation of the Bromma-Stockholm Airport from the point of view of the operator.

Benefits	Drawbacks
<ul style="list-style-type: none"> • Proximity to downtown • Simple noise cap in place based on average EPNDB level • Reliever Airport to Arlanda-Stockholm (same operator) 	<ul style="list-style-type: none"> • Curfew starts at 9pm. • No on-airport light rail link

Table 9.7 Benefits and Drawbacks of Bromma-Stockholm Airport

³³ Bromma Stockholm Airport website
http://www.swedavia.com/PageFiles/3522/BMA_P_eng.pdf

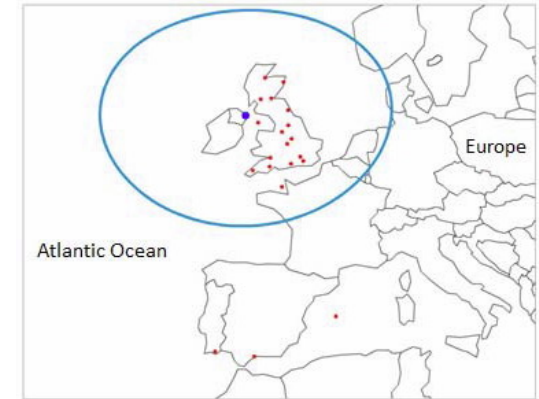


GEORGE BEST BELFAST CITY AIRPORT, NORTHERN IRELAND

Belfast Harbour Airport was opened in 1938 and was mainly used as a RAF Base during World War II. In 1952 the runway was extended to 6,000ft. Scheduled passenger flights were recommenced in 1983³⁴.

A Planning Agreement was signed between Belfast City Airport Limited Short Brothers PLC and The Department of the Environment for Northern Ireland in 1997. This set out the movement cap of 45,000 per 12 months, the seat sale limit of 1.5 million per 12 months (which has since been increased to 2 million) and the operational hours of 06:30-21:30³⁵. Furthermore, the majority of the flights must take off and land over Belfast Lough (Bay) when the wind permits.

In 2008 the airport applied for planning permission to extend the runway by 590m at the north east end of the runway. The extension involved lengthening the runway itself by 350m, a 240 m area comprising of a starter strip and a turning loop. This extension also proposes a retraction of the south west end of the runway by 120m³⁶. The airport comments that the current runway length limits the amount of fuel in aircraft and a longer runway would enable planes to travel further into mainland Europe³⁷. These plans have not been approved and in 2010 Ryanair pulled out of the airport after a public inquiry into the proposed runway extension suffered further delays³⁸.



³⁴ George Best Belfast City Airport – Website -

³⁵ Planning NI – Northern Ireland Planning Portal - Website

³⁶ Civil Aviation Authority Report – Noise Aspects of Planning Application for Runway Extension

³⁷ George Best Belfast City Airport – website – The Runway Extension The Facts

³⁸ Belfast Telegraph – Article on 27th Jan 2012

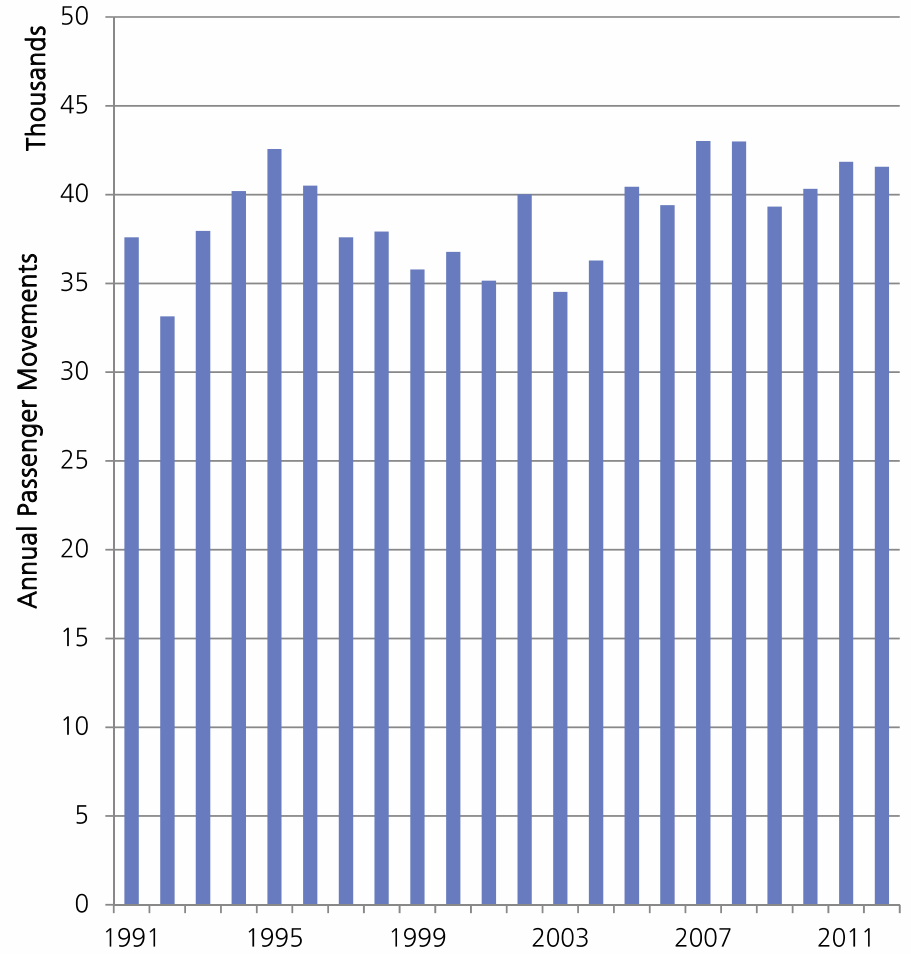
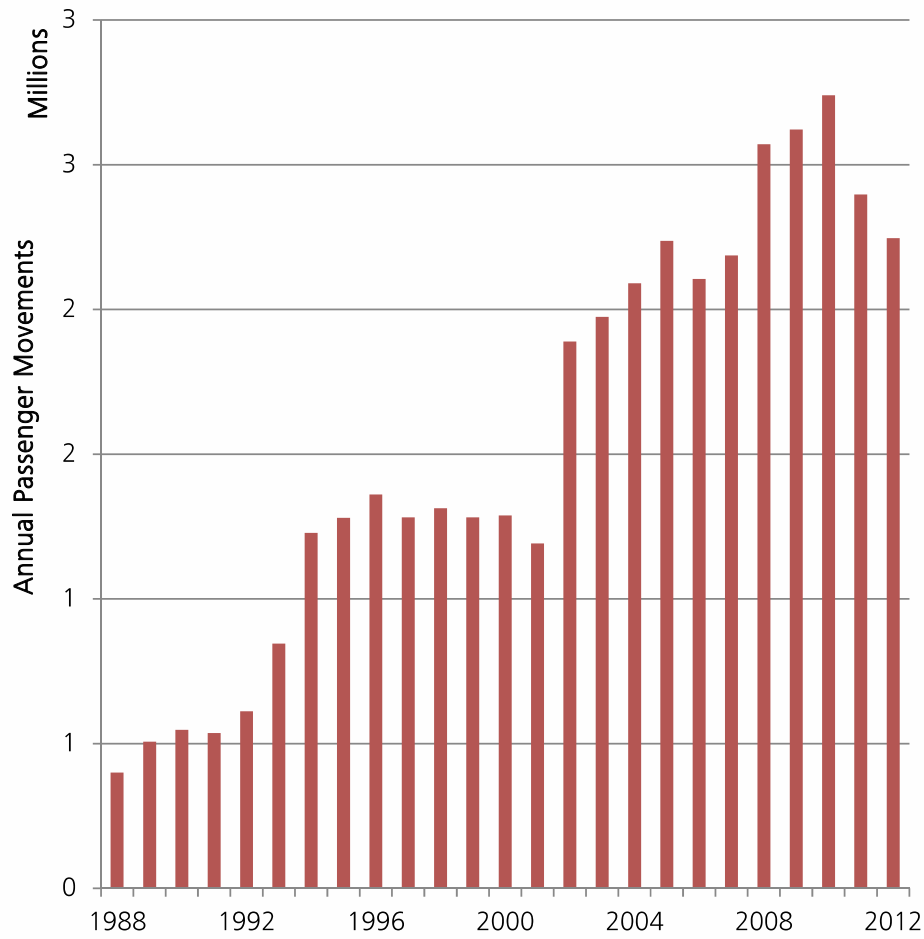


Fig 9.7 George Best Belfast City Airport (BHD) Airport Annual Aircraft and Passenger Movements³⁹

³⁹ Annual Movements taken from Civil Aviation Authority (caa.co.uk)



Fig 9.8 Belfast City Airport (BHD) Airport Overlay

In 2012 Belfast City Airport requested that the Seats for Sale restriction be removed from the agreement and replaced with a noise contour control cap and other noise control measures. This request has been considered and is subject to the outcome of a public consultation process and an independent public examination⁴⁰.

The following table presents a week of operations based on 20-26 May 2013 at the George Best Belfast City Airport.

Aircraft	Engine	MTOW (tonnes)	Movements
Airbus A320	Jet	74	46
Airbus A319	Jet	64	150
Embraer ERJ-195	Jet	52	166
Embraer ERJ-175	Jet	40	28
Dash8-Q400	Turboprop	29	352
Let 410 Turbolet	Turboprop	6	40
TOTAL			782
AVG DAILY			112

Table 9.8 Weekly Commercial Movements – 20 May 2013 Schedule

There are currently 4 airlines operating from Belfast City Airport. The dominant airline is Flybe with 63% of the weekly seats⁴¹. Flybe's fleet consists of 57 Dash 8-Q400 aircraft, 14 Embraer E-195 aircraft and 9 Embraer E-175⁴².

The majority of the flights leaving Belfast City Airport are to UK destinations within a 500nm range. The 3 European destinations shown; Malaga, Faro and Palma, are new destinations for Aer Lingus started this year (2013). Additional European flybe destinations not present in the schedule include Paris, along with winter charter destinations Memmingen and Salzburg⁴³.

There are a number of constraints existing at George Best Belfast City Airport which are summarised in the Key Operational Specifications table below.

⁴⁰ Planning NI – Northern Ireland Planning Portal - Website

⁴¹ SABRE (20-26 May 2013 schedules)

⁴² Flybe website – About our fleet

⁴³ George Best Belfast City Airport – Website – Available Routes

Specifications	Value
Number of Runways / Length	1 (1,829m / 6,000 ft)
Glide Slope	3°
Distance from Downtown	5 km
Annual Aircraft/Passenger Movements	41,500 / 2.2 million
Hours of Operations	06:30 to 21:30
Movement Cap	48,000 movements per year (exclude training/military) 4 million seats for sale per year
Noise Cap	n/a

Table 9.9 Key Operational Specifications – Belfast City Airport

When commuting between the Airport and the city, passengers have the option of; a shuttle bus between the airport and the adjacent rail halt in Sydenham, 3 local bus services, personal car or by taxis⁴⁴. However, The annual passengers for Belfast City airport for 2012 consisted of 2,232,913 schedule passengers and 13,289 charter passengers⁴⁵.



Fig 9.9 Groundside network – Belfast City Airport⁴⁶

The following table describes high level benefits and drawbacks associated to the operation of the George Best Belfast City Airport from the point of view of the operator.

Benefits	Drawbacks
<ul style="list-style-type: none"> • Proximity to downtown • Longer Runway • Nearby train station 	<ul style="list-style-type: none"> • Residential dwellings within noise contours • Operations end at 21:30pm • Restrictions on seats for sale • Low public transport usage

Table 9.10 Benefits and Drawbacks of Belfast City Airport

⁴⁴ Belfast City Airport website – To and from the Airport

<http://www.belfastcityairport.com/To-and-from-the-airport.aspx>

⁴⁵ CAA

⁴⁶ George Best Belfast City Airport website

<http://www.belfastcityairport.com/Airport-Information/Airport-layout/Terminal.aspx>

<http://www.belfastcityairport.com/About-Us/Airport-Development-and-Planning/Airport-Reconfiguration.aspx>

SUMMARY

This section has presented several airports in an urban and/or waterfront setting with a development scale similar to Billy Bishop Toronto City Airport in size and passenger movements.

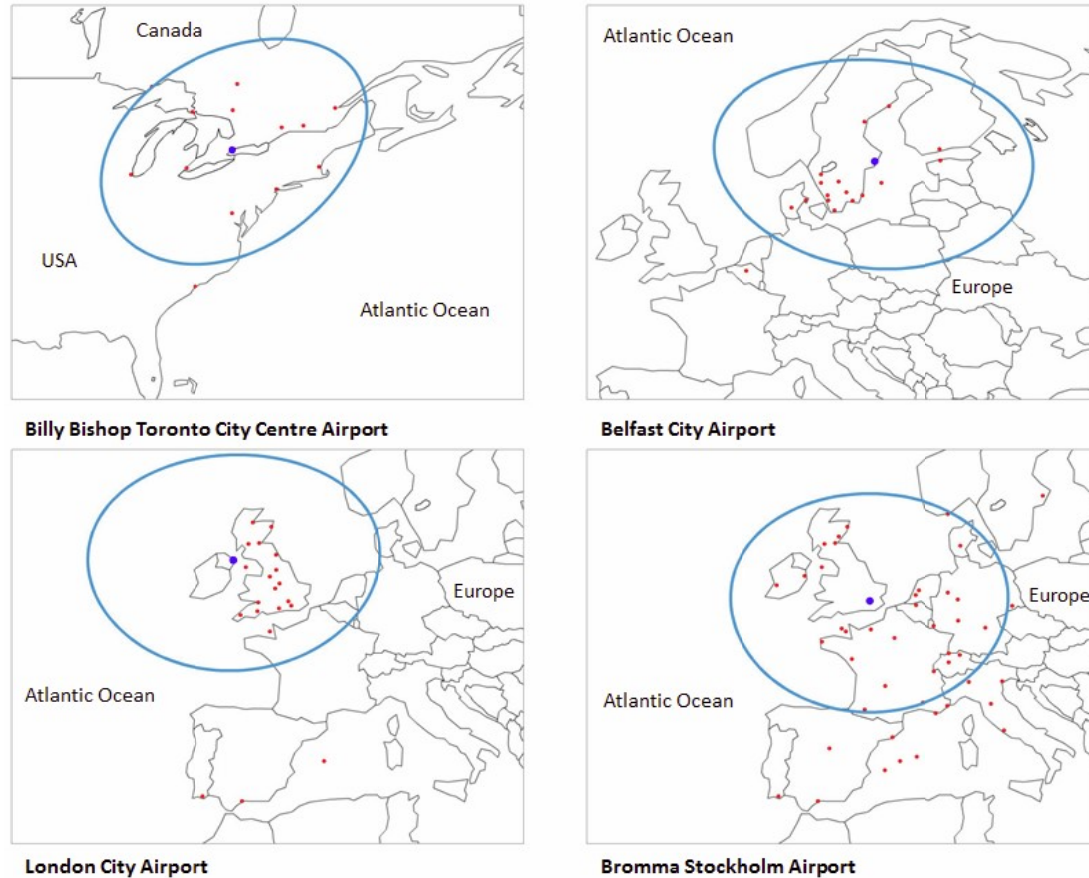


Fig 9.10 Case Study Airports and YTZ Route Network with 500nm Range Circle⁴⁷

⁴⁷ Based on SABRE (20-26 May 2013 schedules) destinations

This summary table highlights the operations at urban airports similar to the Billy Bishop Toronto City Airport. It shows that these comparable airports are all operating within a cap system, but all allow jet aircraft operations.

	Billy Bishop Toronto City Airport	London City Airport	Bromma-Stockholm Airport	George Best Belfast City Airport
IATA Code	YTZ	LCY	BMA	BHD
Country	Canada	United Kingdom	Sweden	United Kingdom
Major Airport	Toronto-Pearson	London Heathrow	Arlanda-Stockholm	Belfast Airport
Distance from City	-	11km	8km	5km
Passengers (2012)	1.9 million	3.0 million	2.2 million	2.3 million
Aircraft (2012)	111,000 (2011)	71,000	47,000	42,000
Jets Allowed	No	Yes	Yes	Yes
Hours of Operation (Weekdays)	6:45-23:00	6:30-22:30	6:00-21:00	6:30-21:30
Approach Slope	3.9°-4.8°	5.5°	3.5°	3.0°
Movement Cap	Noise-Based Quotas Currently 202 daily commercial slots	120,000 annual movements and daily restrictions. Noise-based quotas Partial weekend curfew	80,000 Annual (including 20,000 aircraft with more than 60 seats and EPNdB 86-89)	48,000 annual movements 4 million seats for sale per year
Rail Link	Off-Airport Light Rail	On-Airport Rail Station	Off-Airport Light Rail	Off-Airport Rail Station

Table 9.11 Case Study Airports Summary

10. COSTS ESTIMATE AND FINANCIAL FEASIBILITY

Order of magnitude costs were developed for the proposed runway extension by the BTY Group. The information provided is not sufficiently detailed to allow the project to proceed for a fixed-price tender call; as such the estimate should not be considered as the final estimated cost of the proposed development.

The cost estimate relates solely to the propose runway 08-26 extension at both extremities. Potential impacts have been identified throughout this review that may result in additional costs associated with the upgrade of existing facilities such as runways, taxiways, apron and the passenger terminal building. Total order of magnitude costs estimates were assessed at \$80 million. Further work on the conditions of existing infrastructure such as runways, taxiways, aprons and the passenger terminal building may lead to additional costs that could significantly affect this preliminary estimate.

Financial feasibility of this proposed expansion has yet to be addressed as additional costs that may be indirectly associated to the runway extension have not been fully identified.

11. AIRSPACE CONSIDERATIONS

This review of airspace considerations is intended to provide a cursory review of the supplied study information only. A complete technical analysis for TP308 criteria compliance was not within the scope of this study, therefore any conclusions, conditions, and therefore actual suitability of any instrument flight procedure as proposed is the responsibility of the original design organization.

Porter Airlines is proposing new operations to Billy Bishop Toronto City Airport (CYTZ) using CS100 jet aircraft. A lengthening of the main runway would be required to support this operation. As part of the City of Toronto's assessment of the Porter Airlines proposal, Direct Approach has been requested by Airbiz to review the proponent's instrument approach consultant's conclusions.

INTERIM FINDINGS

The CS100 aircraft proposed by Porter is approach category "C" aircraft. These categories are based upon the normal approach speed of the aircraft.

The document that describes the instrument approach and departure design requirements is "TP308 - Criteria for the Development of Instrument Procedures".

Category C aircraft Glidepath angles (GPAs) for either Instrument Landing System (ILS) or Global Navigation System (GNSS) vertical guidance approaches are limited to a normal maximum angle of 3.6°.

An exemption is currently granted on the ILS/DME RWY 26 permitting a Glidepath angle (GPA) of 4.8°. This approach is currently in the Restricted Canada Air Pilot (R-CAP) and authorized for only approach Category A and B aircraft. In order for Porter's aircraft to use a 4.8° GPA approach the exemption must be extended to include Category C aircraft.

The glidepath for the ILS/DME RWY 08 approach is proposed to increase from 3.5° to 3.9°. A new TP308 exemption would be required to authorize this steeper GPA. The resulting approach if approved would need to be moved from the Canada Air Pilot (CAP) and published instead in the R-CAP. This would mean that private IFR aircraft, or aircraft without the required OPS SPEC, would not be authorized to fly this approach. No publicly available ILS would be at CYTZ as a result.

Applications for approval of non-standard instrument approach procedures (IAPs) must be submitted to

Chief Air Navigation Services (ANS) Operations Oversight at Transport, Ottawa. Transport Canada is normally quite hesitant to grant exemptions to the design criteria without significant supporting justification as to why such an exemption is “in the public interest” and how an “equivalent level of safety” can be maintained despite the deviation from criteria. Transport Canada’s willingness to consider these specific approach parameters should be ascertained before committing significant resources.

There were no speed restrictions on any of the airport’s SIDs, STARS, approaches, or departures other than the ‘C’ Category approach issues already discussed. Therefore except for possible increases in wake turbulence separation, no significant adverse airspace or ATC issues are considered likely to occur.

The Toronto-Pearson and Billy-Bishop Airports are co-dependent with regards to the ability to operate aircraft in the general Toronto Terminal Airspace. However that is not affected by the proposed lengthening of the runways.

The approach’s protected airspace would only be expended minimally on those missed approach sections already identified which would not have any effect on the total terminal’s capacity.

Since the Runway 08/26 capacity is not increased by the lengthening, this proposal will not increase the demand on the Toronto Terminal Airspace. Further study should be undertaken with NAV Canada to confirm these interim findings.

12. SUMMARY OF KEY FINDINGS

The key interim findings are listed in the table below and are provided as a reference to where the primary points of concern are at this stage of the study:

Chapter	Topic	Key Interim Findings
04 Design Aircraft	Smaller Jet Aircraft	Current smaller General Aviation jet aircraft will meet the noise requirements within the Tripartite Agreement
	Commercial Jet Aircraft	Current commercial jet aircraft will not meet the noise requirements within the Tripartite Agreement
		Future commercial aircraft similar to the CS100 are expected to be able to meet the noise requirements within the Tripartite Agreement
	CS100	CS100 performance standards are predicated on information from Bombardier
The CS100 will not be certified by Transport Canada until May 2014 (based on current information)		
05 Capacity Assessment	Slot Cap	Is assumed to remain at 202 movements within the Tripartite Agreement
	Runway	The proposed runway extension does not increase runway capacity
		Backtracking by aircraft due to restrictions on Taxiway D will restrict runway operations during certain busy hours
	Terminal	The low passenger forecast is defined at 4.3M passengers/annum
		The medium and high passenger forecast are defined at 4.6M and 4.8M passengers/annum
		The current 10 apron stands are not proposed to be added to within this proposal
Peak hour passenger movements are expected to be 1240 each way, an increase of 50% from the current volumes		

Chapter	Topic	Key Interim Findings
06 Infrastructure Requirements		
	Runway Coding	Runway 08-26 is expected to be revised from a Code 2 runway to a Code 3 runway under this proposal
		The runway is proposed to be extended from 1,216m long to 1,569m long
		Further OLS and AZR review is required to finalize interim requirements defined within this study
		Existing and required pavement ratings for the runway, taxiway and apron require further review
	Proposed Runway Extension	The proposed runway extension appears meet the requirements for the CS100 or similar jet aircraft to operate at BBTCA
	Runway End Safety Areas	These are likely to become a requirement at Canadian airports in the near future. It is unclear at this stage if RESAs will be required at BBTCA regardless of the proposed runway extension. It is clear that if the runway is extended that the RESAs will be required
	Taxiways	Taxiway D is restricted under certain operations within the proposed changes, this will likely reduce the overall runway utilization at busy hours
Apron	The apron will require alteration to accommodate the operation of up to 4 CS100 aircraft	
	CS100 aircraft will only be able to park at the West and East apron areas	
Terminal	The terminal will require expansion in a number of areas to accommodate increased passenger demand	
	The expansion is expected to along the western and eastern faces of the current terminal building	
07 Noise Considerations		
	Aircraft Noise	The CS100 is expected to operate at or below the requirements within the Tripartite Agreement
		Final noise assessment of the CS100 cannot be conducted until more information is available from the manufacturer
		Future jet aircraft, similar to the CS100, are expected to operate at or below the requirements within the Tripartite Agreement
		Current small jet aircraft operate at or below the requirements within the Tripartite Agreement

Chapter	Topic	Key Interim Findings
08 General Aviation		
	GA Operations	GA operations are not expected to negatively affected by the introduction of the CS100
		Some procedural changes on runway operation and use will be required and certain restrictions may apply to GA activities
		Apron changes could require changes to the parking of GA aircraft
		The nature of GA operations could change if the jet ban is lifted and small jet aircraft start to utilize the airport
		The two cross runways remain available for GA activity
09 Case Studies		
	General Findings	Comparable airports operate a variety of restrictions from operating procedures through to hours of operation
10 Cost Estimate and Financial Feasibility		
	Runway Extension	Estimated at \$80M
	Runway Pavement Rating	Not addressed in this study
	Apron Parking Revisions	Not addressed in this study
	Terminal Expansion	Not addressed in this study
	Financial Feasibility	Not addressed in the interim findings
11 Airspace Considerations		
	CS100	Category 'C' approach designation
		Approach procedures will require revision
		Air navigation systems will require upgrading
		Transport Canada review and approval of the proposal is required
	Airspace Management	No significant ATC issues are anticipated
		Review of airspace area capacity and operational procedures of both YYZ and BBTCA is required to define areas of co-management (i.e. missed approach procedures or irregular operations)

13. GLOSSARY

ACI	Airport Council International	MTOW	Maximum Takeoff Weight
ANS	Air Navigation Services	O/D	Origin/Destination
A-PAPI	Asymmetric – Precision Approach Path Indicator	OPS SPEC	Operations Specifications
ASDA	Accelerate Stop Distance Available	PAPI	Precision Approach Path Indicator
BBTCA	Billy Bishop Toronto City Airport	R-CAP	Restricted – Canada Air Pilot
CAEP	Committee on Aviation Environmental Protection	RESA	Runway End Safety Area
CAP	Canada Air Pilot	RNAV	Area Navigation
DME	Distance-Measuring Equipment	TODA	Take-Off Distance Available
E/D	Enplaned-Deplaned	TORA	Take-Off Run Available
EPNdB	Effective Perceived Noise in Decibels	VLJ	Very Light Jet
FAA	Federal Aviation Administration		
GNSS	Global Navigation Satellite Systems		
GPA	Glide Path Antenna		
IAP	Instrument Approach Procedures		
IATA	International Air Transport Association		
ICAO	International Civil Aviation Organization		
ILS	Instrument Landing System		
LDA	Landing Distance Available		

14. REFERENCES

This section outlines references used in the development of this report.

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Runway Presentation

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Air Navigation Data

Including:

Map 1: Runway 08-26 Extension, Air Navigation Data

Maps 2 & 3: Runway 08-26 Obstacle Assessment, Air Navigation Data

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