FINAL REPORT

2011 Noise Exposure Contours Report for Billy Bishop Toronto City Airport

Transport Canada

SNC-LAVALIN INC.

JUNE 2015

Final Report

O/Ref n° 626687-2011_FV-00

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Subject: 2011 Noise Exposure Contour Report for Billy Bishop Toronto City Airport O/Ref.: 626687-2011_FV-00

Mrs. Canning,

SNC-Lavalin Inc. is pleased to provide you with the final report in PDF format for the above mentioned project. In a few days, you will also receive, by mail, ten paper copies of the present document.

Please do not hesitate to contact us should you require any additional information.

SNC♦LAVALIN INC.

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Acoustics and Vibration

Verified by: Jacques Savard, M.Sc.
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/cg

Encl.

c.c. David Daniel, Airport & Mobile Equipment Technologist

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TEAM WORK

SNC-Lavalin Inc.

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EXECUTIVE SUMMARY

The noise exposure contours for Billy Bishop Toronto City Airport have been computed in accordance with Transport Canada's methodology for NEF (Noise Exposure Forecast). The surface area within contours was also calculated.

The analysis of the contours involved a review of the data to ascertain if the actual 28 Noise Exposure Contour is closer at any point, except in a direction westerly of the Billy Bishop Toronto City Airport between points "X" and "Y", to the official 25 NEF Contour for 1990, than to the official 28 NEF Contour for 1990 (reference Schedule F of the Tripartite Agreement). This condition pertains to Section 34 of the Tripartite Agreement on the preparation of NEF contours.

The Tripartite Agreement imposes a limit on the expansion of NEF contours. Section 27 of the Tripartite Agreement requires that the actual 28 NEF contour does not expand beyond the official 25 NEF contour for 1990, except between points "X" and "Y".

The analysis shows that the 28 NEF contour for calendar year 2011, with helicopters included in the calculation, slightly exceeds the 28 NEF Contour for 1990 for small sections of the contour to the north and north-west of the main runway. However, the extent of the actual 28 NEF contour is not sufficient to bring it closer at any point to the 25 NEF Contour for 1990 than to the 28 NEF Contour for 1990. The 28 NEF contour for calendar year 2011 does not expand beyond the official 25 NEF contour for 1990 and remains well within the limit set by the Tripartite Agreement for the expansion of the NEF contour.

When helicopters are excluded from the calculation, the NEF contours shrink slightly, achieving an even better compliance with the limits set in the Tripartite Agreement.

Table i Surface area inside 2011 noise contours

NEF	Surface area (km^2)	
	With helicopters	Without helicopters
35 +	0.27	0.26
30 - 35	0.60	0.56
28 - 30	0.50	0.46
25 - 28	1.31	1.22
Total	**2.68**	**2.49**

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1 INTRODUCTION

This document presents the noise contours for the year 2011 for Billy Bishop Toronto City Airport.

Environmental noise or community noise, including airports activities, is not regulated by Canada's government. Nevertheless Transport Canada has developed a methodology for assessing the perceived noise in the vicinity of airports. This method is established across Canada and is used for this study. The interpretation of results it produces will be used to establish the magnitude (intensity of noise) and extent (surface area) of areas affected by airport noise.

2 METHODOLOGY

2.1 METRICS AND PARAMETERS

The representation of noise generated by airport operations has been normalized by Transport Canada using NEF or "Noise Exposure Forecast" contours. The NEF methodology is not by itself a forecast, but a noise calculation based either on a forecast of future movements or on actual movements. The noise contours for 2011, presented in this report, have been produced using the NEF methodology on the basis of actual movements data from Transport Canada. The original data is provided to Transport Canada by Nav Canada, the country's civil air navigation services provider, for all airports where Nav Canada operates a control tower.

The index provided by the noise contours is used to show the public areas affected by airport noise. This single number rating is easy to interpret, but nevertheless, requires a complex evaluation process. It takes into account, for each movement of the whole year, the type of aircraft, the runway used, the flight path, the flight distance, and the period of day. Note that the night period is defined from 10 pm to 7 am.

Flight distances and departure flight path directions have been determined according to geographic coordinates of destination airports; themselves drawn from Transport Canada database and specialized publications.

The "Air Traffic Designators" entitled TP 143 published by Transport Canada, specialized databases published by aeronautical sector companies, as well as internal corporate databases, have been used to determine the aircraft caracteristics.

2.2 METHOD OF CALCULATION

NEF-Calc 2.0.6.1 software was used to produce the noise contours. It has been developed by the National Research Council for Transport Canada. Nef-Calc 2.0.6.1 processes operation-related data from airport and calculates noise levels for the receptor grid. Noise exposure contours are then drawn for the whole study area.

The NEF methodology developed by Transport Canada uses the parameter "Peak Planning Day", which will be used to calculate the noise contours. The number of movements of the Peak Planning Day is estimated by averaging the seven busiest days of the three busiest months of the year. The detailed calculation of the Peak Planning Day is presented in Section 3.1.1. The calculated noise contours are representative of a near to worst case 24 hour period.

3 NOISE CONTOURS

3.1 CALCULATION ASSUMPTIONS

The aircraft movements' database from Transport Canada for Billy Bishop Toronto City Airport for 2011 was used to calculate the Peak Planning Day. The composition of the fleet and the average annual runway use have also been computed from the Transport Canada database.

3.1.1 Calculation of Peak Planning Day

Tables 1 and 2 below present the results of the calculation of the Peak Planning Day for itinerant and local movements in 2011 for Billy Bishop Toronto City Airport, with and without helicopters.

Including helicopter movements, the number of movements of the Peak Planning Day is found to be 337 for itinerant movements and 225 for local movements. In comparison, the **averages** for 2011 are 216 itinerant movements and 95 local movements per day.

The number of circuits is half the number of local movements. A movement is either an arrival or a departure; overflights are excluded from the calculation. Overflights are flights transiting in the control zone of the control tower, going to another destination without landing at the airport. Since they have no real operation at the airport, they are excluded from the calculations. Local movements show much more daily variability than itinerant movements.

The calculation of the noise contours has been made for 337 itinerant movements and 225 local movements (113 circuits), with a total of 562 aircraft movements.

Helicopters accounted for 4,223 movements in 2011, of which 2,282 were runway operations, mostly Ornge flights using Sikorsky S-76 helicopters, and 1,941 were helipad operations, mostly Heli Tours with Bell 206 helicopters.

Excluding helicopter movements, the number of movements of the Peak Planning Day is found to be 318 for itinerant movements and 225 for local movements. In comparison, the **averages** for 2011 are 205 itinerant movements and 95 local movements per day.

Table 1 Peak Planning Day With Helicopters

Itinerant		Local	
Date	Movements	Date	Movements
June 30	365	March 13	300
June 5	329	March 20	220
June 3	328	March 29	202
June 14	323	March 14	192
June 15	315	March 12	164
June 29	313	March 15	156
June 10	311	March 19	152
July 14	366	July 5	294
July 15	362	July 14	294
July 19	342	July 9	270
July 7	327	July 27	206
July 8	317	July 19	196
July 5	316	July 1	180
July 12	304	July 15	180
August 5	393	October 5	300
August 12	368	October 22	284
August 26	355	October 23	254
August 4	347	October 6	230
August 16	346	October 9	224
August 19	331	October 29	218
August 17	325	October 8	214

Table 2 Peak Planning Day Without Helicopters

Itinerant		Local	
Date	Movements	Date	Movements
June 30	352	March 13	300
June 14	312	March 20	220
June 3	305	March 29	202
June 15	303	March 14	192
June 5	293	March 12	164
June 10	292	March 15	156
June 27	290	March 19	152
July 14	347	July 5	294
July 15	344	July 14	294
July 19	330	July 9	270
July 7	310	July 27	206
July 5	303	July 19	196
July 22	294	July 1	180
July 12	288	July 15	180
August 5	357	October 5	300
August 12	351	October 22	284
August 4	332	October 23	254
August 26	329	October 6	230
August 16	325	October 9	224
August 17	316	October 29	218
August 19	308	October 8	214

3.1.2 Fleet composition and runway use

The data on the composition of the fleet of all operations at Billy Bishop Toronto City Airport in 2011 is presented in Appendix A, including helicopters. The document TP-143 – Air Traffic Designators from Transport Canada is the primary source of information for the identification of aircraft types. Other sources, such as Transport Canada's aircraft registration database and commercial databases have also been used.

Figure 1 shows the configuration of runways, taken from the Canada Air Pilot. Figures 2 and 3 summarize the composition of fleet and runway use for the airport in 2011, compiled from the itinerant movements database from Transport Canada. Detailed data is presented in Appendix B.

The total number of movements in 2011 was 111,274, divided into 78,659 itinerants movements and 32,615 local movements.

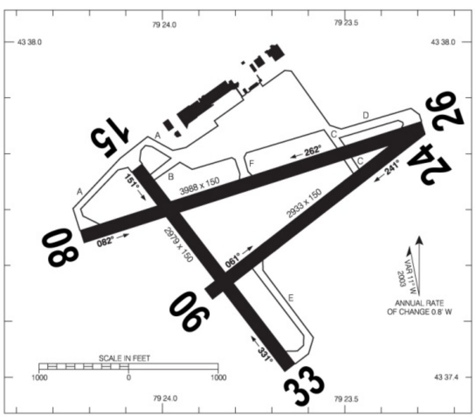

Figure 1 Runway identification

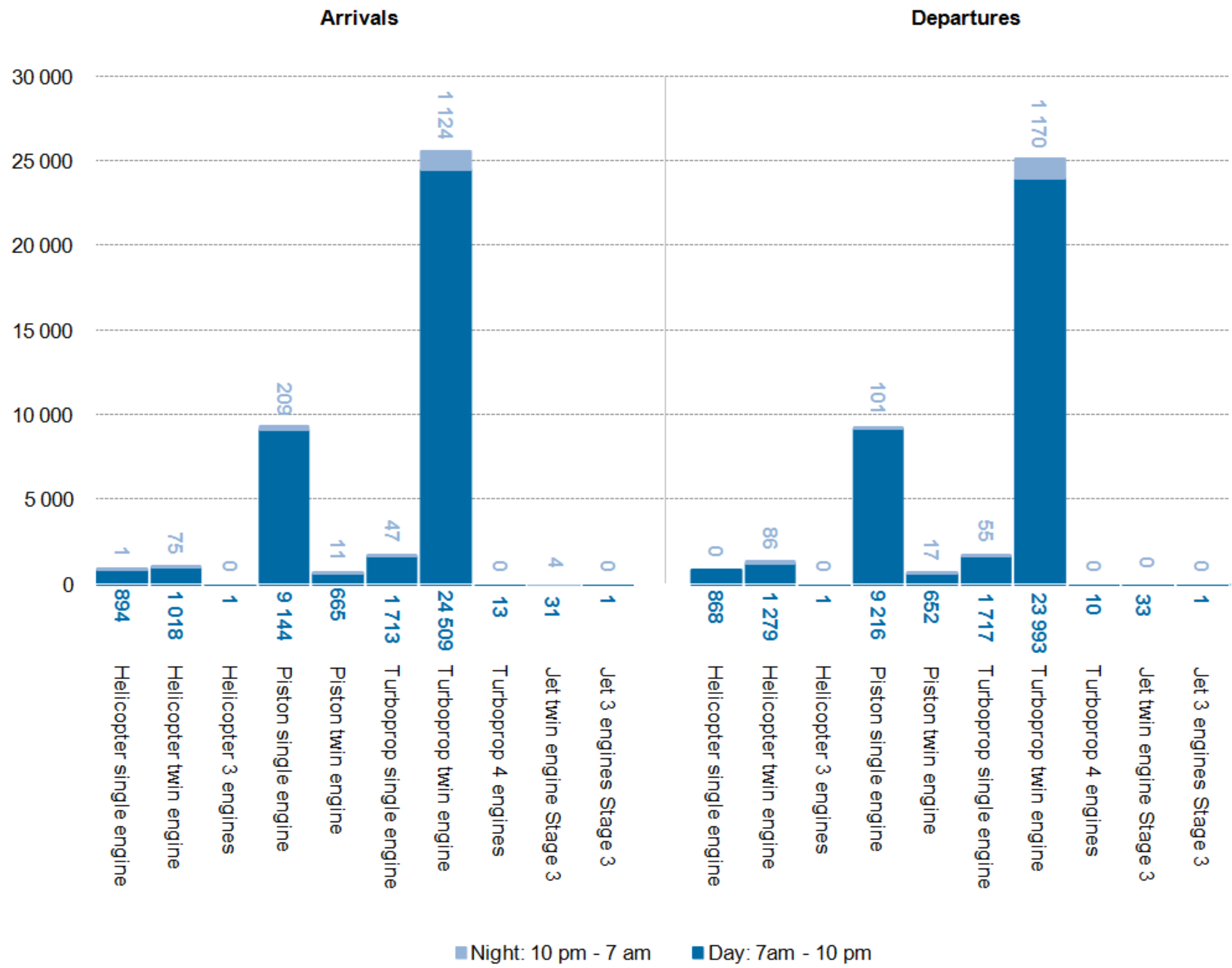

Figure 2 Summary of fleet composition

The movements during the night (10 pm to 7 am) accounted for 3.2% of total movements in 2011. For the calculation of noise contours, using the methodology of Transport Canada, each night-time movement is equivalent to 16.67 daytime movements. The 3,527 night-time movements recorded in 2011 are equivalent to 58,783 daytime movements. The night-time movements represent an important contribution to the noise contours.

Overall, twin engine turboprops (mostly DASH-8) are the most frequent aircrafts at Billy Bishop Toronto City Airport with 46% of all movements. They are followed by single engine piston aircrafts with 45% of operations.

Figure 3 shows the summary of runway use and Table 3 presents the runway use by aircraft type.

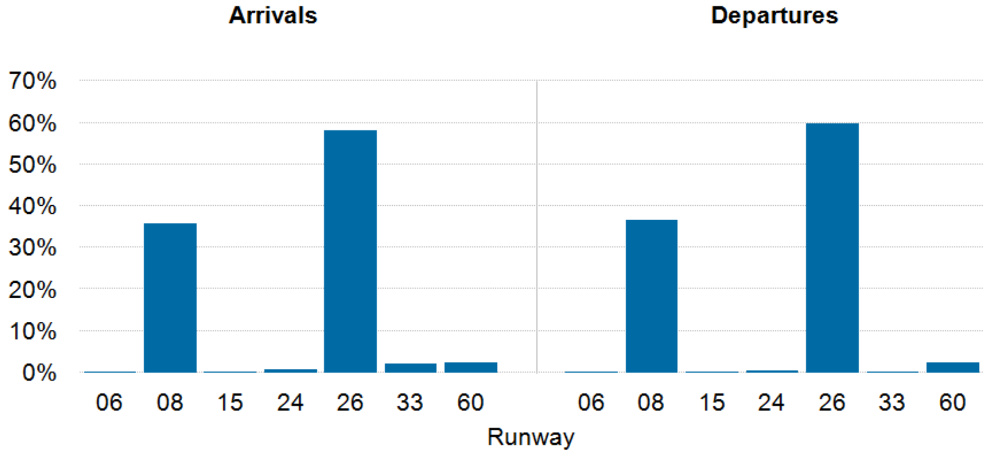

Figure 3 Summary of runway use

Table 3 Runway Use by Aircraft Category

Runway	Global		Jets		Pistons		Turboprops	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
06	118 0.3%	8 0.02%	0 0%	0 0%	116 1%	7 0.1%	2 0.01%	1 0.003%
08	14,151 36%	14,330 37%	16 44%	15 44%	3,479 34%	3,608 36%	10,656 36%	10,707 37%
15	59 0.1%	90 0.2%	0 0%	0 0%	11 0.1%	66 0.7%	48 0.2%	24 0.1%
24	300 0.8%	223 0.6%	0 0%	0 0%	289 3%	219 2%	11 0.04%	4 0.01%
26	22,985 58%	23,517 60%	20 56%	19 56%	5,402 53%	6,004 60%	17,563 60%	17,494 60%
33	835 2%	102 0.3%	0 0%	0 0%	734 7%	84 0.8%	101 0.3%	18 0.1%
60	1,012 3%	929 2%	0 0%	0 0%	71 0.7%	68 0.7%	941 3%	861 3%
Total	39,460 100%	39,199 100%	36 100%	34 100%	10,102 100%	10,056 100%	29,322 100%	29,109 100%

Table 4 shows the main types of aircraft in most represented categories defined in the calculation. Aircraft with a small number of movements in 2011 are not shown in this table; they can be found in detail in Appendix A.

Table 4 Aircraft Categories

Aircraft categories	Aircraft types
Helicopter single engine	Bell 206, Robinson R44, etc.
Helicopter twin engine	Sikorsky S-76, AgustaWestland AW139, etc.
Piston single engine	Cessna series 150/152/172/177/182/185/206/400, Piper PA-28/46, Cirrus SR22, Diamond DA40, Mooney M20, etc.
Piston twin engine	Piper PA-27/30/31/44, Cessna 421, etc.
Turboprop single engine	Pilatus PC-12, Cessna 208, Socata TBM-700, etc.
Turboprop twin engine	Dash 8, Piaggio P-180, Beech 100/200/350, Mitsubishi MU-2, Jetstream 31, Piper PA-31, etc.

3.1.3 Flight paths

Flight paths for departures, arrivals and circuits have been modelled from information gathered from the Canada Air Pilot and the Canada Flight Supplement.

Departure flight paths:

- Runways 06 and 08: right turn at 1.9 DME, heading 141
- Runway 15: right turn at 650’ ASL, heading 201
- Runways 24, 26, and 33: left turn at 650’ ASL, heading 201

Approach slopes:

- Runways 06, 15, 24, and 33: 3.0°
- Runway 08: 3.5°
- Runway 26: 4.8°

Runways 24, 26, and 33 have left hand circuits while runways 06, 08, and 15 have right hand circuits.

3.2 RESULTS

Figure 4 shows the noise contours for Billy Bishop Toronto City Airport, year 2011 actual movements including helicopters, along with the 1990 NEF contours. The 1990 NEF contours were prepared in April 1978 by the Canadian Air Transport Administration of the Ministry of Transport for the Canada Mortgage and Housing Corporation. The noise contours without helicopters are shown on Figure 5.

The analysis of the contours involved a review of the data to, in the language of the Tripartite Agreement, ascertain if the actual 28 Noise Exposure Contour is closer at any point, except in a direction westerly of the Billy Bishop Toronto City Airport between points “X” and “Y”, to the official 25 NEF Contour for 1990, than to the official 28 NEF Contour for 1990 (reference Schedule F of the Tripartite Agreement).

The analysis shows that the 28 NEF Contour for calendar year 2011, with helicopters included in the calculation, slightly exceeds the 28 NEF Contour for 1990 for small sections of the contour to the north and north-west of the main runway. However, the extent of the actual 28 NEF contour is not sufficient to bring it closer at any point to the 25 NEF Contour for 1990 than to the 28 NEF Contour for 1990. The 28 NEF contour for calendar year 2011 does not expand beyond the official 25 NEF contour for 1990 and remains well within the limits set by the Tripartite Agreement for the expansion of the NEF contour.

When helicopters are excluded from the calculation, the NEF contours shrink slightly, achieving an even better compliance with the limits set in the Tripartite Agreement.

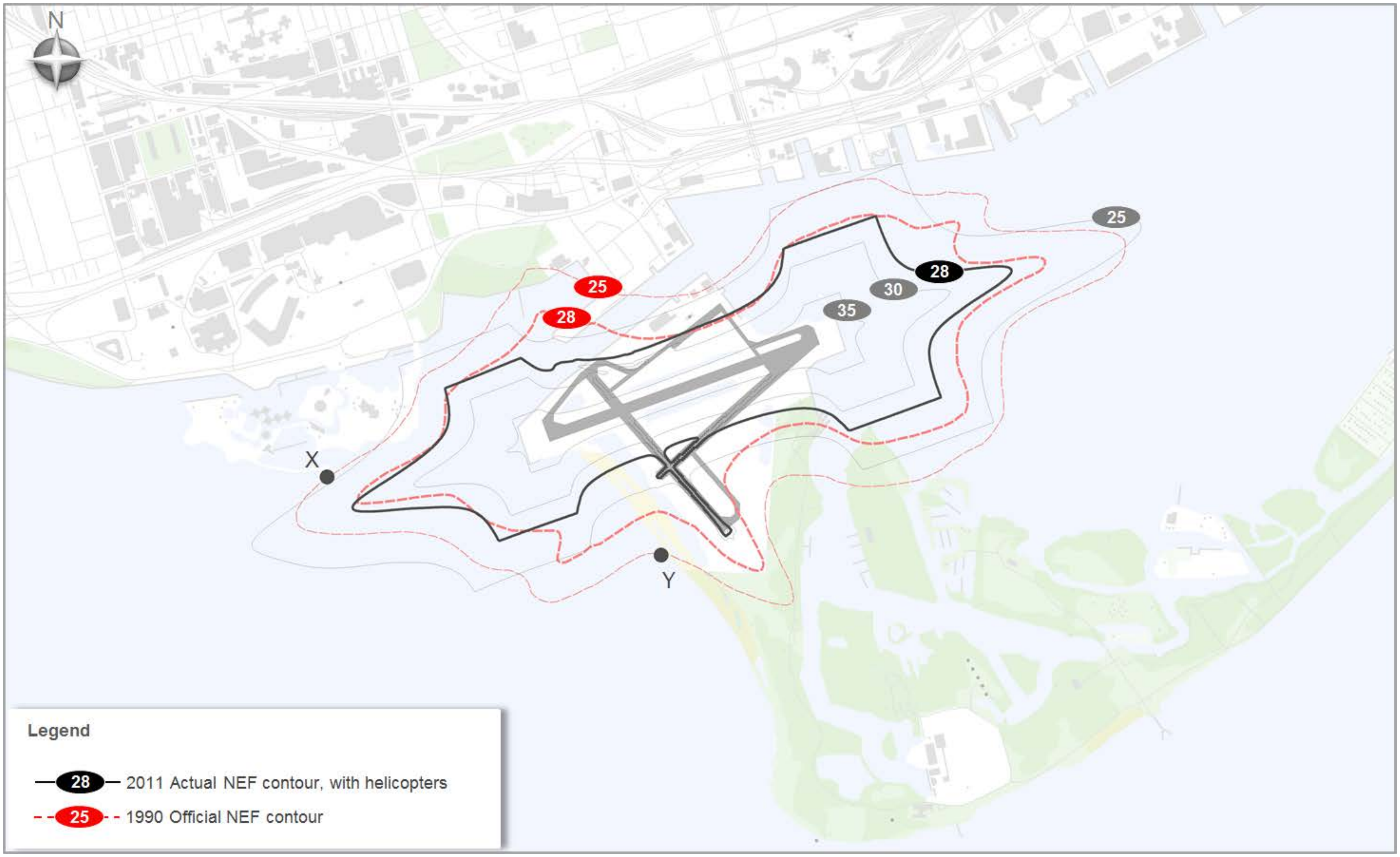

Figure 4 NEF Contours with helicopters

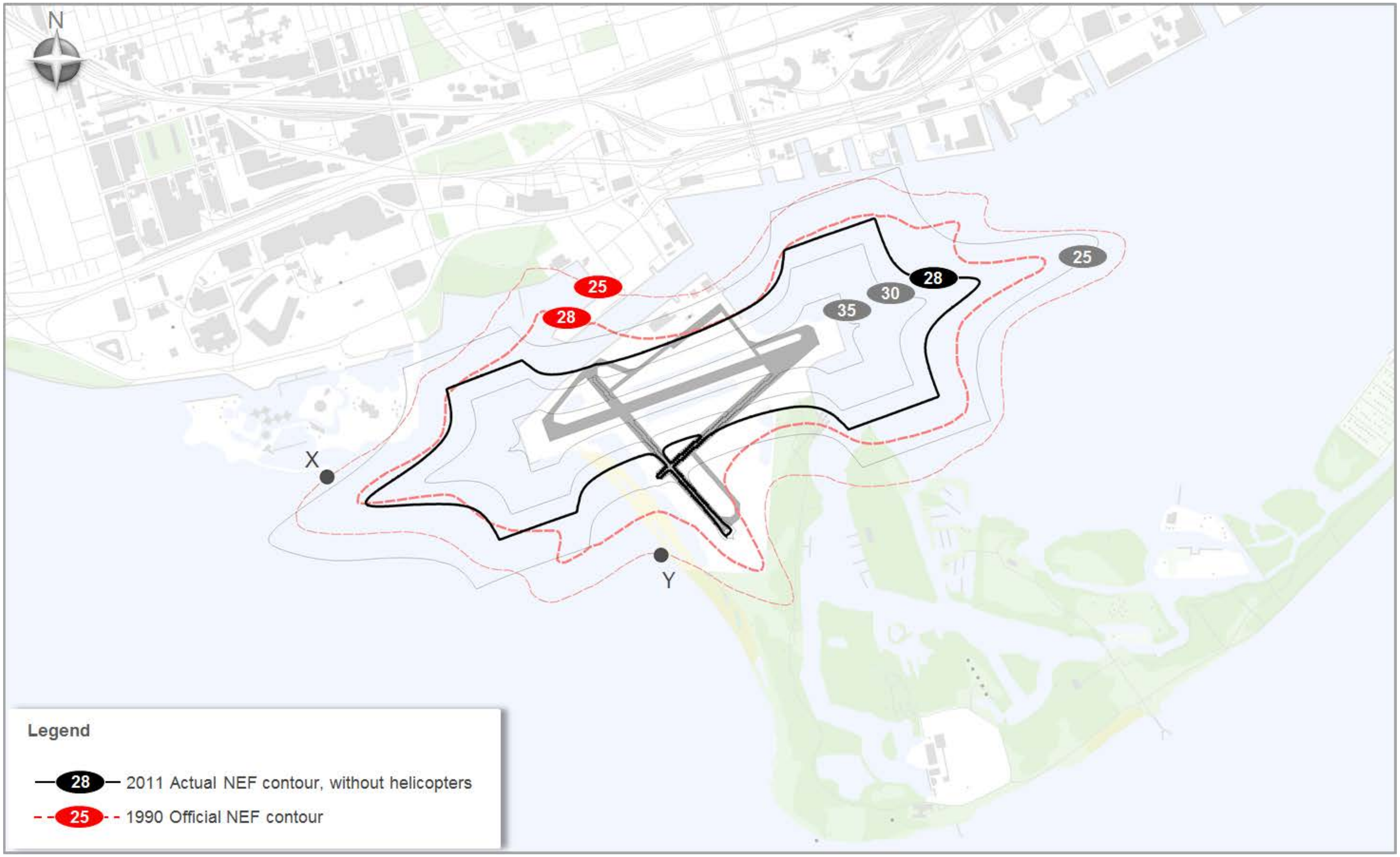

Figure 5 NEF Contours without helicopters

Table 5 shows the surface area within the contours in 2011. It is the total surface area in each range of NEF values.

Table 5 Surface area (km^2)

NEF	Surface area (km^2)	
	With helicopters	Without helicopters
35 +	0.27	0.26
30 - 35	0.60	0.56
28 - 30	0.50	0.46
25 - 28	1.31	1.22
Total	**2.68**	**2.49**

4 CONCLUSION

The 2011 noise exposure contours for Billy Bishop Toronto City Airport have been computed in accordance with Transport Canada methodology. The surface area within contours was also compiled. These contours cover a total area of 2.68 square kilometers if helicopters are included in the calculation, and 2.49 square kilometers if helicopters are excluded. NEF 28 contour covers an area of 1.37 square kilometers if helicopters are included in the calculation, and 1.28 square kilometers if helicopters are excluded.

The actual (2011) 28 Noise Exposure Contours, with and without helicopters, are not closer at any point, including in a direction westerly of the Toronto City Centre Airport between points “X” and “Y”, to the 25 NEF Contour for 1990 than to the 28 NEF Contour for 1990.

The 28 NEF contours for calendar year 2011, with and without helicopters, do not expand beyond the official 25 NEF contour for 1990 and remains well within the limits set by the Tripartite Agreement for the expansion of the NEF contour.

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TRANSPORT CANADA, “Land Use Planning in The Vicinity of Airports”, 8th edition, 2006, TP 1247.

TRANSPORT CANADA, “Air Traffic Designators”, TP 143, 2009.

FAA, U.S. Department of transportation, Advisory Circular, “Noise Levels for U.S. Certificated and Foreign Aircraft”, 2001.

APPENDIX A

Fleet composition

Aircraft	D1*	D2*	D3*	D4*	Chap.	MTOW	Manufacturer	Model	Equivalent	Number
A109	L	2	T	R		3,000	AGUSTA	A-109, Power	AS332	9
A119	L	2	T	R		3,175	AGUSTA	AW109SP	AS332	3
A139	M	2	T	R		6,400	AGUSTAWESTLAND	AW-139	AS332	634
AA1	L	1	P	F		1,000	AMERICAN	AA-1 Yankee, Trainer, Tr2	GASEPF	6
AA5	L	1	P	F		1,000	AMERICAN	AA-5 Traveler	GASEPF	54
AC11	L	1	P	R		2,000	ROCKWELL	112, 114 Commander, Alpine Commander	RWCM14	19
AC80	L	2	T	R		5,000	AERO COMMANDER	680T, 680V Turbo Commander	CNA441	2
AC90	L	2	T	R		5,000	ROCKWELL	690 Turbo Commander, Jetprop Commander 840	RWCM69	3
AEST	L	2	P	R		3,000	PIPER	PA-60, Aerostar	PA60	4
AS50	L	1	T	F		3,000	AEROSPATIALE	AS-350/550 Ecureuil, Astar, SuperStar, Fennec	AS350	17
AS55	L	2	T	F		3,000	AEROSPATIALE	AS-355/555 Ecureuil 2, TwinStar, Fennec	AS350	22
B06	L	1	T	F		2,000	BELL	206A/B/L, 406, LongRanger (CH-139 JetRanger)	AS350	1,526
B190	M	2	T	R		8,000	BEECH	1900 Airliner (C-12J)	BEC190	36
B212	L	2	T	F		6,000	BELL	212, Twin Two-Twelve (UH-1N, Twin Huey)	AS332	1
B230	L	2	T	R		4,000	BELL	230	AS350	2
B350	M	2	T	R		6,000	BEECH	B300 Super King Air 350	DHC6	248
B407	L	1	T	F		3,000	BELL	407	AS350	10
B412	L	2	T	F		6,000	BELL	412, Griffon (CH-146)	AS350	61
B429	L	2	T	F		3,175	BELL	GlobalRanger	AS350	32
B430	L	2	T	R		5,000	BELL	430	AS332	4
BE10	L	2	T	R		6,000	BEECH	100 King Air (U-21F)	BEC100	120
BE19	L	1	P	F		1,000	BEECH	19 Musketeer Sport, Sport	GASEPF	6
BE20	L	2	T	R		6,000	BEECH	200, 1300 Super King Air, Commuter (C-12A)	BEC200	360
BE23	L	1	P	F		2,000	BEECH	23 Musketeer, Sundowner	GASEPF	4
BE24	L	1	P	R		2,000	BEECH	24 Musketeer Super, Sierra	GASEPF	6
BE30	M	2	T	R		7,000	BEECH	300 Super King Air	BEC300	50
BE33	L	1	P	R		2,000	BEECH	33 Bonanza (E-24)	BEC33	11
BE35	L	1	P	R		2,000	BEECH	35 Bonanza	GASEPV	22
BE36	L	1	P	R		2,000	BEECH	36 Bonanza	GASEPV	94
BE55	L	2	P	R		3,000	BEECH	55 Baron (T-42)	BEC55	34
BE58	L	2	P	R		3,000	BEECH	58 Baron	BEC58	58
BE65	L	2	P	R		4,000	BEECH	65 Queen Air (U-8F Seminole)	BEC58P	2
BE76	L	2	P	R		2,000	BEECH	76 Duchess	BEC76	2
BE90	L	2	T	R		6,000	BEECH	King Air	BEC90	1
BE9L	L	2	T	R		5,000	BEECH	90, A90-E90 King Air (T-44, VC-6)	BEC90	32

Aircraft	D1*	D2*	D3*	D4*	Chap.	MTOW	Manufacturer	Model	Equivalent	Number
BE9T	L	2	T	R		5,000	BEECH	F-90 King Air	BEC9F	12
BL17	L	1	P	R		2,000	BELLANCA	17 Viking, Super Viking, Turbo Viking	BL26	4
BL8	L	1	P	F		2,000	BELLANCA	8 Decathlon, Scout	GASEPF	16
BN2P	L	2	P	F		3,000	PILATUS BRITTEN-NORMAN	BN-2B Islander, Defender, Maritime Defender	BEC58P	1
C130	M	4	T	R		71,000	LOCKHEED	C-130	C130	12
C140	L	1	P	F		1,000	CESSNA	140	CNA150	4
C150	L	1	P	F		1,000	CESSNA	150, A150, Commuter, Aerobat	CNA150	12,803
C152	L	1	P	F		1,000	CESSNA	152, A152, Aerobat	CNA152	912
C170	L	1	P	F		1,000	CESSNA	170	CNA170	4
C172	L	1	P	F		2,000	CESSNA	172, P172, R172, Skyhawk, Cutlass (T-41)	CNA172	30,348
C175	L	1	P	F		2,000	CESSNA	175, Skylark	GASEPV	2
C177	L	1	P	F		2,000	CESSNA	177, Cardinal	CNA177	125
C180	L	1	P	F		2,000	CESSNA	180, Skywagon 180 (U-17C)	CNA180	95
C182	L	1	P	F		2,000	CESSNA	182, Skylane	CNA182	2,373
C185	L	1	P	F		2,000	CESSNA	185, A185 Skywagon, Skywagon 185 (U-17A/B)	CNA185	122
C195	L	1	P	F		2,000	CESSNA	195 (LC-126)	GASEPV	6
C206	L	1	P	F		2,000	CESSNA	206, P206, T206, TP206, (Turbo) Super Skywagon	CNA206	744
C208	L	1	T	F		4,000	CESSNA	208 Caravan 1, (Super)Cargomaster (C-98, U-27)	CNA208	714
C210	L	1	P	R		2,000	CESSNA	210, T210, (Turbo)Centurion	CNA210	48
C310	L	2	P	R		3,000	CESSNA	310, T310 (U-3, L-27)	CNA310	44
C337	L	2	P	R		2,000	CESSNA	337, M337 (Turbo)Super Skymaster (O-2)	CNA337	17
C340	L	2	P	R		3,000	CESSNA	340	CNA340	30
C404	L	2	P	R		4,000	CESSNA	404 Titan	CNA404	29
C414	L	2	P	R		3,000	CESSNA	414, Chancellor	CNA414	81
C421	L	2	P	R		4,000	CESSNA	421, Golden Eagle, Executive Commuter	CNA421	156
C425	L	2	T	R		4,000	CESSNA	425 Corsair, Conquest 1	CNA425	2
C441	L	2	T	R		5,000	CESSNA	441 Conquest, Conquest 2	CNA441	81
C550	M	2	J	R	3	7,000	CESSNA	550, S550, 552 Citation 2/S2/Bravo (T-47, U-20)	CNA550	24
C72R	L	1	P	R		2,000	CESSNA	172RG Cutlass RG	GASEPV	42
C750	M	2	J	R	3	15,000	CESSNA	750 Citation 10	CNA750	1
C77R	L	1	P	R		2,000	CESSNA	177RG Cardinal RG	CNA17B	8
C82R	L	1	P	R		2,000	CESSNA	R182, TR182 (Turbo)Skylane RG	CNA182	17
CH7A	L	1	P	F		2,000	CHAMPION	7EC/ECA/FC/JC Citabria, Traveler, Tri-Con, Tri-Traveler	GASEPF	2

Aircraft	D1*	D2*	D3*	D4*	Chap.	MTOW	Manufacturer	Model	Equivalent	Number
COL3	L	1	P	F		1,500	LANCAIR	LC40-550FG	BEC58P	34
COL4	L	1	P	F		1,633	CESSNA AIRCRAFT CO.	400 Corvalis TT	BEC58P	224
DA40	L	1	P	F		1,150	DIAMOND	DA40	GASEPF	128
DA42	L	2	P	R		1,700	DIAMOND	DA42	GASEPV	10
DH2T	L	1	T	F		3,000	DE HAVILLAND	DHC-2 Mk3 Turbo Beaver	CNA441	67
DH8A	M	2	T	R		16,000	DE HAVILLAND	DHC-8-100 Dash 8 (E-9, CT-142, CC-142)	DHC8	19
DH8C	M	2	T	R		20,000	DE HAVILLAND	DHC-8-300 Dash 8	DHC830	3
DH8D	M	2	T	R		26,000	DE HAVILLAND	DHC-8-400 Dash 8	DHC830	48,749
DHC1	L	1	P	F		1,000	DE HAVILLAND	DHC-1 Chipmunk	GASEPV	2
DHC2	L	1	P	F		3,000	DE HAVILLAND	DHC-2 Mk1 Beaver (U-6, L-20)	DHC2	14
DHC7	M	4	T	R		20,000	DE HAVILLAND	DHC-7 Dash 7 (O-5, EO-5)	DHC7	11
DV20	L	1	P	F		1,000	DIAMOND	DA-20/22, DV-20 Katana, Speed Katana	GASEPF	19
EC20	L	1	T	F		2,000	EUROCOPTER	EC-120 Colibri	AS350	57
EC30	L	1	T	F		2,370	AEROSPATIALE	AS350 B3	AS350	5
EDGE	L	1	P	F		800	ZIVCO	Edge 540	GASEPV	16
EH10	M	3	T	R		15,000	WESTLAND	EH-101, Merlin, Heliliner, Cormorant	AS332	2
EVSS	L	1	P	F		550	AEROTECHNIK	SPORTSTAR	GASEPF	2
EXPR	L	1	P	F		1,406	AURIGA	PHOENIX	GASEPF	2
FA10	M	2	J	R	3	9,000	DASSAULT	Falcon 10, Mystere 10	FAL10	43
FA62	L	1	P	F		2,000	FAIRCHILD	M-62 (PT-19/23/26, T-19 Cornell)	GASEPF	2
FA7X	M	3	J	R	3	31,298	DASSAULT	FALCON 7X	7373B2	2
FBA2	L	1	P	F		2,000	FOUND	FBA-2, Bush Hawk	GASEPV	5
FDCT	L	1	P	F		560	FLIGHT DESIGN	CTSW	GASEPF	12
FOX	L	1	P	F		703	DENNEY	KITFOX SERIES 5	GASEPF	2
G115	L	1	P	R		2,000	GROB	G-115A/B/C/D/E, Bavarian (Heron, Tutor)	GASEPF	2
GLAS	L	1	P	F		1,043	GLASAIR	GLASAIR 11S-RG	GASEPF	2
GLST	L	1	P	F		889	GLASTAR	GLASTAR	GASEPF	4
H46	M	2	T	F		11,000	BOEING VERTOL	CH-46 Labrador, CH-113 Voyageur (107)	AS332	5
H500	L	1	T	F		2,000	MCDONNELL DOUGLAS	MD-500, MD-530F/MG, Defender, Nightfox	AS350	2
HUSK	L	1	P	F		1,000	CHRISTEN	A-1 Husky	GASEPV	10
J3	L	1	P	F		1,000	PIPER	J-3 Cub (L-4, NE)	GASEPF	1
JS31	M	2	T	R		7,000	BRITISH AEROSPACE	BAe-3100 Jetstream 31 (T.Mk.3)	BAEJ31	215
KODI	M	1	T	F		3,290	QUEST KODIAK	kodiak aircraft	CNA20T	2
LA4	L	1	P	A		2,000	LAKE	LA-4/200, Buccaneer	LA42	50
LNC2	L	1	P	R		1,000	LANCAIR	Lancair 200/235/320/360	GASEPV	8
M20P	L	1	P	R		2,000	MOONEY	M-20, M-20A-J/L/R (non-	M20J	118

Aircraft	D1*	D2*	D3*	D4*	Chap.	MTOW	Manufacturer	Model	Equivalent	Number
								turbocharged)		
M20T	L	1	P	R		2,000	MOONEY	M-20K/M, Bravo, Encore (turbocharged)	M20K	59
M4	L	1	P	F		2,000	MAULE	M-4 Bee Dee, Jetasen, Rocket, Astro Rocket	GASEPF	1
MO21	L	1	P	R		2,000	MOONEY AIRCRAFT INC.	Mark 21	GASEPV	1
MU2	L	2	T	R		5,000	MITSUBISHI	MU-2, Marquise, Solitaire (LR-1)	MU2	219
NAVI	L	1	P	R		2,000	NORTH AMERICAN	NA-145/154 Navion (L-17, U-18)	GASEPV	4
P180	L	2	T	R		6,000	PIAGGIO	P-180 Avanti	SD330	504
P210	L	1	P	R		2,000	CESSNA	P210 Pressurized Centurion	CNA206	4
P28A	L	1	P	F		2,000	PIPER	PA-28-140/150/160/180 Archer, Cadet, Cherokee	PA28CA	546
P28B	L	1	P	F		2,000	PIPER	PA-28-201T/235/236 Cherokee, Dakota	PA28CA	27
P28R	L	1	P	R		2,000	PIPER	PA-28R-180/200/201 Cherokee Arrow, Turbo Arrow	PA28CA	93
P28T	L	1	P	R		2,000	PIPER	PA-28RT Arrow 4, Turbo Arrow 4	PA28CA	18
P32R	L	1	P	R		2,000	PIPER	PA-32R Cherokee Lance, Saratoga SP, Turbo	GASEPV	33
P32T	L	1	P	R		2,000	PIPER	PA-32RT Lance 2, Turbo Lance 2	GASEPV	64
P46T	L	1	T	R		2,000	PIPER	PA-46T Malibu Meridian	PA46	20
PA12	L	1	P	F		1,000	PIPER	PA-12 Super Cruiser	GASEPF	3
PA16	L	1	P	F		1,000	PIPER	PA-16 Clipper	GASEPF	6
PA18	L	1	P	F		1,000	PIPER	PA-18 Super Cub (L-18C, L-21, U-7)	PA18	25
PA24	L	1	P	R		2,000	PIPER	PA-24 Comanche	PA24	96
PA27	L	2	P	R		3,000	PIPER	PA-23-235/250 Aztec, Turbo Aztec (U-11)	PA23AZ	1,495
PA30	L	2	P	R		2,000	PIPER	PA-30/39 Twin Comanche, Turbo Twin Comanche	PA30	141
PA31	L	2	P	R		4,000	PIPER	PA-31/31P Navajo, Chieftain, Mojave, T-1020	PA31	119
PA32	L	1	P	F		2,000	PIPER	PA-32 Cherokee Six, Saratoga, Turbo Saratoga	GASEPV	27
PA34	L	2	P	R		3,000	PIPER	PA-34 Seneca	PA34	38
PA38	L	1	P	F		1,000	PIPER	PA-38 Tomahawk	PA38	5
PA44	L	2	P	R		2,000	PIPER	PA-44 Seminole, Turbo Seminole	PA44	285
PA46	L	1	P	R		2,000	PIPER	PA-46 Malibu, Malibu Mirage	PA46	113
PAY1	L	2	T	R		5,000	PIPER	PA-31T1-500 Cheyenne 1	PA31T	8
PAY2	L	2	T	R		5,000	PIPER	PA-31T-620/T2-620 Cheyenne, Cheyenne 2	CNA441	107
PAY3	L	2	T	R		6,000	PIPER	PA-42-720 Cheyenne 3	CNA441	7
PC12	L	1	T	R		5,000	PILATUS	PC-12, Eagle	CNA20T	2,573

Aircraft	D1*	D2*	D3*	D4*	Chap.	MTOW	Manufacturer	Model	Equivalent	Number
PIVI	L	1	P	F		600	PIPISTREL	VIRUS SW	GASEPF	4
PTS1	L	1	P	F		1,000	PITTS	S-1 Special	GASEPF	13
PTS2	L	1	P	F		1,000	PITTS	S-2 Special	GASEPF	12
PTSS	L	1	P	F		700	PITTS	Super Stinker	GASEPV	8
R22	L	1	P	F		1,000	ROBINSON	R-22	AS332	4
R44	L	1	P	F		2,000	ROBINSON	R-44 Astro	AS350	139
RS12	L	1	P	F		442	RANS	S-12 AIRAILE	GASEPF	1
RV10	L	1	P	F		1,200	VAN'S	RV-10	GASEPV	2
RV4	L	1	P	F		1,000	VAN'S	RV-4	GASEPF	2
RV6	L	1	P	F		1,000	VAN'S	RV-6	GASEPF	8
RV7	L	1	P	F		816	VAN'S	RV-7A	GASEPV	10
RV8	L	1	P	F		816	VAN'S	RV 8A	GASEPF	8
S108	L	1	P	F		2,000	STINSON	108 Voyager, Station Wagon	GASEPF	6
S61	M	2	T	R		9,000	SIKORSKY	S-61A/B/D/L/N (CH-124 Sea King)	AS332	9
S76	L	2	T	R		5,000	SIKORSKY	S-76, H-76, AUH-76, Spirit, Eagle (HE-24)	AS332	1,615
S92	M	2	T	R		12,000	SIKORSKY	S-92 Helibus	AS332	62
SF34	M	2	T	R		12,000	SAAB	340 (S100 Argus)	SF340	1
SR20	L	1	P	F		2,000	CIRRUS	SR-20	GASEPF	46
SR22	L	1	P	F		1,500	CIRRUS	SR22	GASEPF	218
SU26	L	1	P	F		1,000	SUKHOI	Su-26	GASEPF	15
SW3	M	2	T	R		6,000	FAIRCHILD SWEARINGEN	SA-226TB, SA-227TT Merlin 3	SAMER3	4
SW4	M	2	T	R		7,000	FAIRCHILD SWEARINGEN	Merlin 4C, Metro2/2A, Metro 3, Metro 3A, Expediter, Merlin 23, 4	SAMER4	13
T6	L	1	P	R		4,000	NORTH AMERICAN	T-6, AT-6, BC-1, SNJ, Texan, Harvard	GASEPF	6
TBM7	L	1	T	R		3,000	SOCATA	TBM-700	CNA441	150
TEX2	L	1	T	R		4,000	RAYTHEON	T-6 Texan 2, CT-156 Harvard 2	GASEPV	6
TOBA	L	1	P	F		1,150	SOCATA	TB 200	GASEPF	2
TRIN	L	1	P	R		2,000	SOCATA	TB-20/21 Trinidad	GASEPF	18
ULAC	L	1	P	F		500	QUAD CITY	ultralight/microlight aircraft/aéronef ultra-léger	GASEPF	4
V22	M	2	T	R		28,000	BELL	V-22, MV-22 Osprey (901)	AS332	2
Z42	L	1	P	F		2,000	ZLIN	Z-42/142/242	GASEPV	18
ZZZ3	L	1	P	A		1,633	PILGRIM	PILGRIM 4000	CNA206	2
ZZZ4	L	1	P	F		1,724	ROBINSON	Robinson Special	GASEPF	2

*D1: Weight:
L – light
M – medium
H – heavy

*D2: Number of engine

*D3: Engine type:
P – pistons
T – turboprops
J – jets

*D4: Landing gear:
F – fixed
R – removable
A – amphibious

APPENDIX B

Movements summary

Fleet summary

Aircraft	Arrivals			Departures			Total
	Day	Night	Total	Day	Night	Total	
Helicopter single engine	894	1	895	868	0	868	1,763
Helicopter twin engine	1,018	75	1 093	1,279	86	1,365	2,458
Helicopter 3 engines	1	0	1	1	0	1	2
Piston single engine	9,144	209	9,353	9,216	101	9,317	18,670
Piston twin engine	665	11	676	652	17	669	1,345
Turboprop single engine	1,713	47	1,760	1,717	55	1,772	3,532
Turboprop twin engine	24,509	1,124	25,633	23,993	1,170	25,163	50,796
Turboprop 4 engines	13	0	13	10	0	10	23
Jet twin engine Stage 3	31	4	35	33	0	33	68
Jet 3 engines Stage 3	1	0	1	1	0	1	2
Total	**37,989**	**1,471**	**39,460**	**37,770**	**1,429**	**39,199**	**78,659**

- Day: 7 am - 10 pm
- Night: 10 pm - 7 am

Runway use - Arrivals

Aircraft	06		08		15		24		26		33		60	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Helicopter single engine	1		4		1				4				884	1
Helicopter twin engine			296	18	43	2	1		547	55	4		127	
Helicopter 3 engines									1					
Piston single engine	115		3,156	76	11		287		4,875	131	700	2		
Piston twin engine	1		242	3			2		388	8	32			
Turboprop single engine	1		643	16	1		8	1	973	30	87			
Turboprop twin engine			9,265	409	1		1		15,234	714	8	1		
Turboprop 4 engines			7						5		1			
Jet twin engine Stage 3			15	1					16	3				
Jet 3 engines Stage 3									1					
Total	**118**	**0**	**13,628**	**523**	**57**	**2**	**299**	**1**	**22,044**	**941**	**832**	**3**	**1,011**	**1**

Runway use - Departures

Aircraft	06		08		15		24		26		33		60	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Helicopter single engine			13						21				834	
Helicopter twin engine	1		458	27	15	2	1		705	55	6		93	2
Helicopter 3 engines									1					
Piston single engine	7		3,322	37	66		211		5,526	64	84			
Piston twin engine			241	7			8		403	10				
Turboprop single engine			671	22	6		3		1,033	33	4			
Turboprop twin engine			9,103	409	1				14,881	761	8			
Turboprop 4 engines			5						5					
Jet twin engine Stage 3			15						18					
Jet 3 engines Stage 3									1					
Total	**8**	**0**	**13,828**	**502**	**88**	**2**	**223**	**0**	**22,594**	**923**	**102**	**0**	**927**	**2**


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