SNC·LAVALIN

2017 Noise Exposure Contours

Billy Bishop Toronto City Airport

Transport Canada

Environment & Geoscience

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May 6, 2020

Mrs. Vera Haslett
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By email: Vera.Haslett@tc.gc.ca

Subject: Final Report
2017 Noise Exposure Contours – Billy Bishop Toronto City Airport
O/Ref.: 672067-EG-L01-00

Dear Mrs. Haslett,

We are pleased to submit ten hard copies along with a MS Word copy of our final report following the realization of the above-mentioned mandate. You will also receive by email a PDF version.

Please do not hesitate to contact us should you have any question or need additional information.

Best regards,

Jacques Savard, M.Sc.
Team Leader, Acoustics and vibration
Environment & Geoscience

/dg

Encl.

2017 Noise Exposure Contours

Billy Bishop Toronto City Airport

Final Report

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O/Document : 672067-EG-L01-00

May 6, 2020

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Executive Summary

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

The Tripartite Agreement (Agreement) imposes a limit on the expansion of the NEF contours. Sections 14 and 27 of the Agreement require that the 28 NEF contour does not expand beyond the official 25 NEF contour for 1990, except between points "X" and "Y". If the 28 NEF contour does expand beyond the official 25 NEF contour for 1990, aircraft movements have to be controlled in a way to bring back the 28 NEF contour within the official 25 NEF contour for 1990.

The analysis shows that the 28 NEF Contour for 2017, including helicopters in the calculation, does not expand beyond the official 25 NEF Contour for 1990 and remains well within the limit set by the 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 within the limit in the Agreement.

Table i Surface area inside 2017 noise contours

NEF	Surface area (km^2)	
	With helicopters	Without helicopters
35 +	0.38	0.36
30 - 35	0.75	0.69
28 - 30	0.52	0.51
25 - 28	1.43	1.39
Total	**3.08**	**2.94**

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1 Introduction

This document presents the noise contours for the year 2017 for the Billy Bishop Toronto City Airport (Airport).

Environmental noise or community noise, including airport activities, is not regulated by Canada's government, nevertheless Transport Canada's methodology (the methodology) for assessing the perceived noise in the vicinity of airports. This methodology is established across Canada and is used for this study. The interpretation of the results produced 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 Noise Exposure Forecast (NEF) contours. The NEF methodology is not by itself a forecast, but a noise calculation based either on a forecast of future movements or by actual movements. The noise contours for 2017, presented in this report, have been produced using the NEF methodology on the basis of actual movement 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 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 aircrafts, the runway use, 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 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 characteristics.

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 airports and calculates noise levels for the receptor grid. Noise exposure contours are then drawn for the whole study area.

The software does not include sound data for the aircraft DASH-8 Q400. Noise and performance data of DASH-8-300 were used as surrogate. This hypothesis may have a major impact on the noise contours, especially considering that DASH-8 Q400 is the most represented aircraft in terms of the annual number of movements with 46% of all 2017 movements.

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 database of aircraft movements for 2017 from Transport Canada for the Airport 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 for 2017 for the Airport.

The number of movements of the Peak Planning Day is found to be 384 for itinerant movements and 187 for local movements. In comparison, the averages for 2017 are 269 itinerant movements and 89 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 384 itinerant movements and 187 local movements (93 circuits), with a total of 571 aircraft movements.

Helicopters accounted for 8,629 movements in 2017, of which 2,042 were runway operations, mostly Ornge flights using AgustaWestland AW139 helicopters, and 6,587 were helipad operations, mostly Heli Tours with Robinson R44 helicopters.

Excluding helicopter movements, the number of movements of the Peak Planning Day is found to be 342 for itinerant movements, and 187 for local movements. In comparison, the averages for 2017 are 245 itinerant movements, and 85 local movements per day.

Table 1 Peak planning day with helicopters

Itinerant		Local	
Date	Movements	Date	Movements
August 25	409	August 09	316
August 27	402	August 29	234
August 20	385	August 06	198
August 08	377	August 26	196
August 10	376	August 13	180
August 18	370	August 28	172
August 13	365	August 01	164
July 21	458	July 26	250
July 30	411	July 17	186
July 06	404	July 03	172
July 26	404	July 05	168
July 28	392	July 25	166
July 18	376	July 19	166
July 05	372	July 11	160
September 10	389	September 09	238
September 24	379	September 26	170
September 22	373	September 12	170
September 21	359	September 25	164
September 15	357	September 10	162
September 17	356	September 24	156
September 14	350	September 19	138

Table 2 Peak planning day without helicopters

Itinerant		Local	
Date	Movements	Date	Movements
August 08	357	August 09	316
August 25	350	August 29	234
August 10	342	August 06	198
August 24	341	August 26	196
August 16	334	August 13	180
August 27	332	August 28	172
August 09	321	August 01	164
July 21	394	July 26	250
July 26	373	July 17	186
July 06	373	July 03	172
July 18	363	July 05	168
July 04	335	July 25	166
July 28	333	July 19	166
July 05	332	July 11	160
May 24	337	September 09	238
May 19	336	September 26	170
May 23	334	September 12	170
May 10	331	September 25	164
May 03	322	September 10	162
May 11	320	September 24	156
May 15	319	September 19	138

3.1.2 Fleet composition and runway use

The data on the composition of the fleet of all operations at the Airport in 2017 including helicopters is presented in Appendix A. 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, were also referenced.

Figure 1 illustrates 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 2017, compiled from the itinerant movements database from Transport Canada. Detailed data is presented in Appendix B.

The total number of movements in 2017 was 129,155, divided into 98,091 itinerant movements and 31,064 local movements.

Figure 1 Runway identification

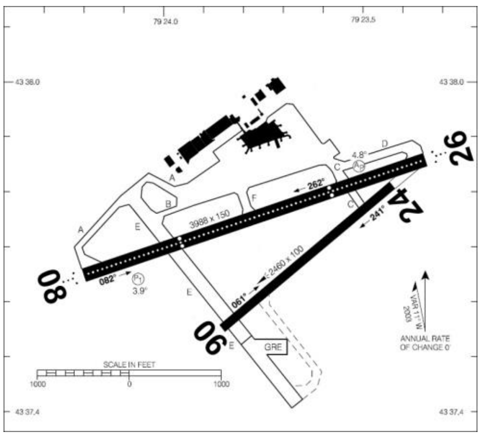
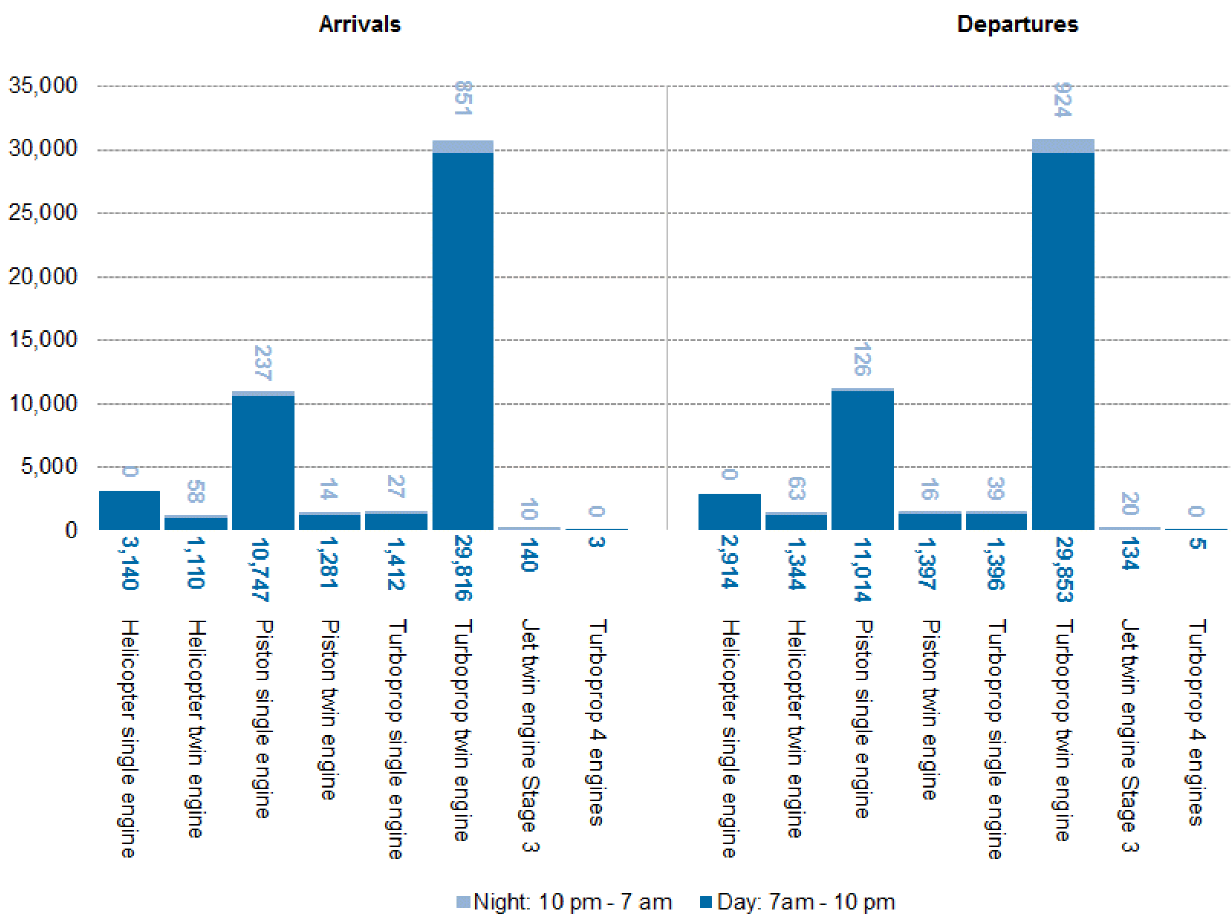


Figure 2 Summary of fleet composition



The movements during the night (10 pm to 7 am) accounted for 2.5% of total movements in 2017. For the calculation of noise contours, using the methodology, each night-time movement is equivalent to 16.67 daytime movements. The 3,215 night-time movements recorded in 2017 are equivalent to 53,594 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 aircraft at the Airport with 48% of all movements. The DASH-8 Q400 alone accounts for 46% of all movements of 2017. They are followed by single engine piston aircraft with 40% of operations.

Figure 3 illustrates the summary of runway use and Table 2 shows the runway use by aircraft types.

Figure 3 Summary of runway use

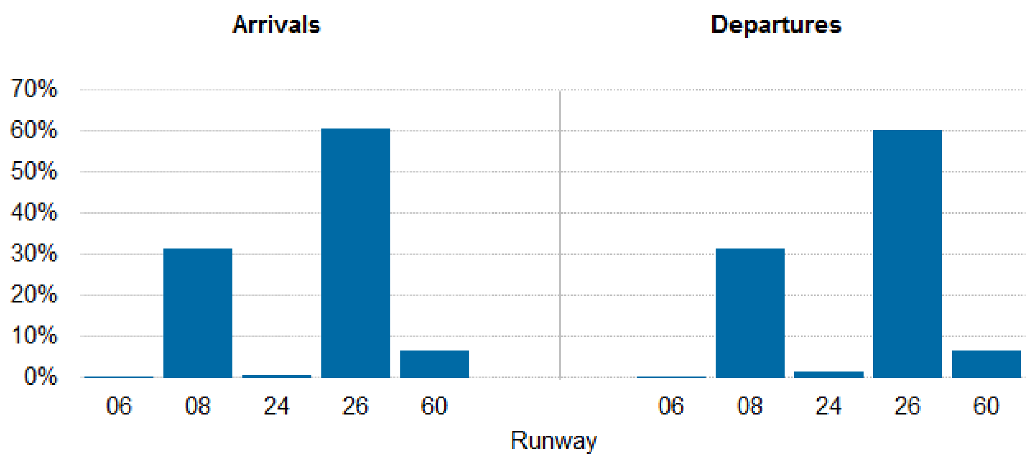


Table 3 Runway use by aircraft category

Runway	Global		Helicopters		Jets		Pistons		Turboprops	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
06	104	6	1	1	0	0	103	4	0	1
	0.2%	0.01%	0.02%	0.02%	0%	0%	1%	0.03%	0%	0.003%
08	15,352	15,512	316	375	41	49	3,989	4,067	11,006	11,021
	31%	31%	7%	9%	27%	32%	32%	32%	34%	34%
24	399	729	3	2	0	0	391	722	5	5
	0.8%	1%	0.1%	0.05%	0%	0%	3%	6%	0.02%	0.02%
26	29,649	29,752	647	697	109	105	7,795	7,760	21,098	21,190
	61%	60%	15%	16%	73%	68%	63%	62%	66%	66%
60	3,341	3,246	3,341	3,246	0	0	0	0	0	0
	7%	7%	78%	75%	0%	0%	0%	0%	0%	0%
Total	**48,846**	**49,245**	**4,308**	**4,321**	**150**	**154**	**12,279**	**12,553**	**32,109**	**32,217**
	100%	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Table 4 indicates the aircraft used in the represented categories defined in the calculation. Aircrafts with a small number of movements in 2017 are not shown in this table; they are described in detail in Appendix A.

Table 4 Aircraft categories

Aircraft categories	Aircraft types
Helicopter single engine	Robinson R44, etc.
Helicopter twin engine	Agusta Westland AW139, etc.
Piston single engine	Cessna series 150/152/172/182/206, Piper PA-28, Cirrus SR22, Gippsaero GA8 Airvan, etc.
Piston twin engine	Piper PA-23/30/31/34, etc.
Turboprop single engine	Pilatus PC-12, Cessna 208 Caravan, etc.
Turboprop twin engine	Dash 8, Beech 100/200/300, Mitsubishi MU-2, etc.
Jet twin engine Stage 3	Dassault Falcon 10, etc.

3.1.3 Flight paths

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

Departure flight paths:

› Runways 06 and 08: right turn at 1.9 DME, heading 141°

› Runways 24 and 26: left turn at 650’ ASL, heading 201°

Approach slopes:

› Runways 06, 08, and 24: 3.5°

› Runway 26: 3.5° (visual) or 4.8° (instrument)

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

Starting April 27, 2017 new departure procedures were introduced:

Departure flight paths:

› Runway 08: right turn at waypoint LODRA (N43 38.31 W79 21.52), heading 090°

› Runway 26: left turn at 800’ ASL, to waypoint EMDOS (N43 31.08 W79 19.28)

3.2 Results

Figure 4 illustrates the Airport's noise contours for 2017 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 excluding helicopters are shown on Figure 5.

The Agreement imposes a limit on the expansion of NEF contours. Section 27 of the Agreement requires that the 28 NEF contour does not expand beyond the official 25 NEF contour for 1990, except between points "X" and "Y". If the 28 NEF contour does expand beyond the official 25 NEF contour for 1990, aircraft movements have to be controlled in such a way to bring back the 28 NEF contour within the official 25 NEF contour for 1990.

The analysis shows that the 28 NEF Contour for 2017, with helicopters included in the calculation, does not expand beyond the official 25 NEF Contour for 1990 and remains well within the limit set by the 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 limit set in the Agreement.

Figure 4 NEF contours with helicopters

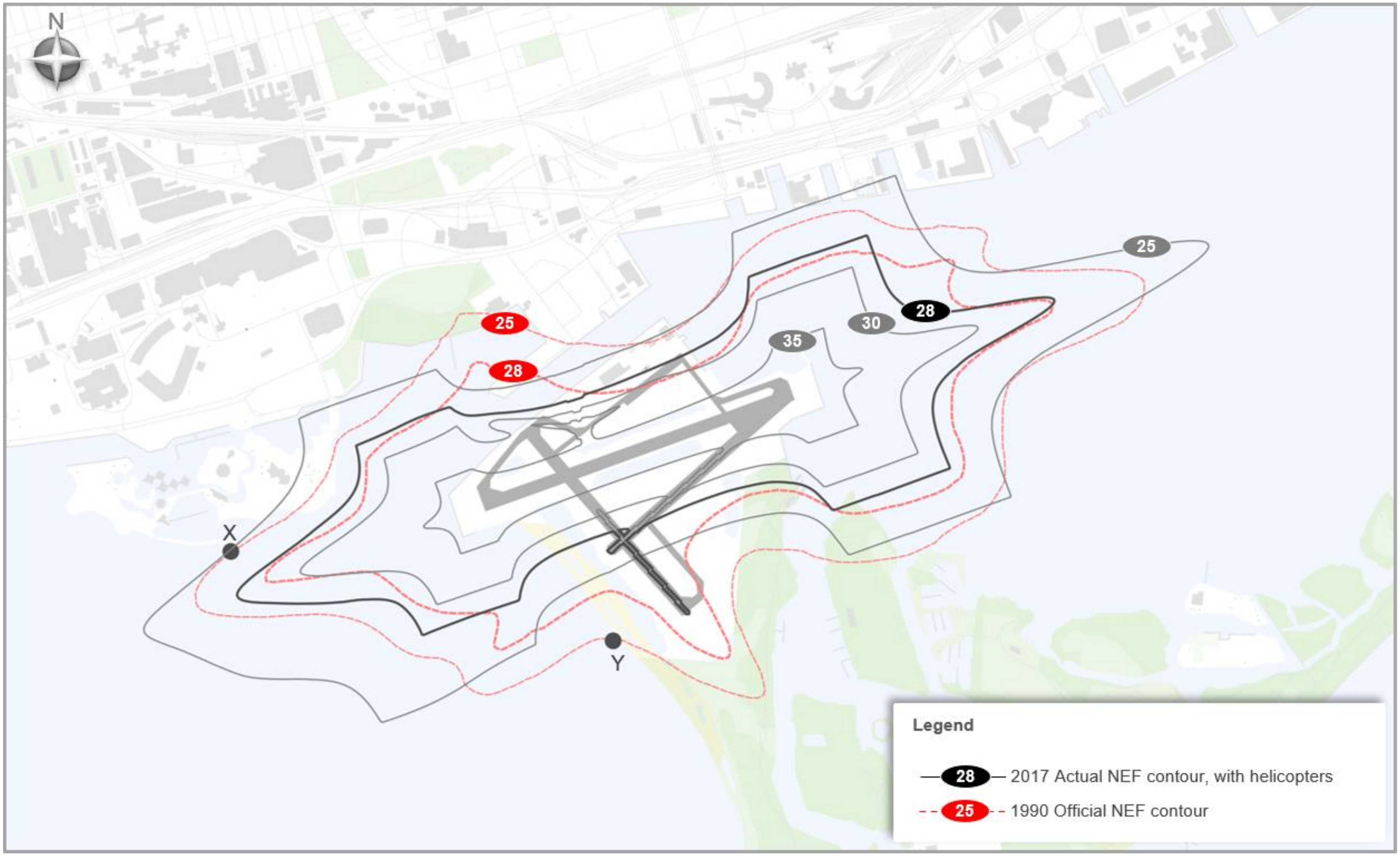


Figure 5 NEF contours without helicopters

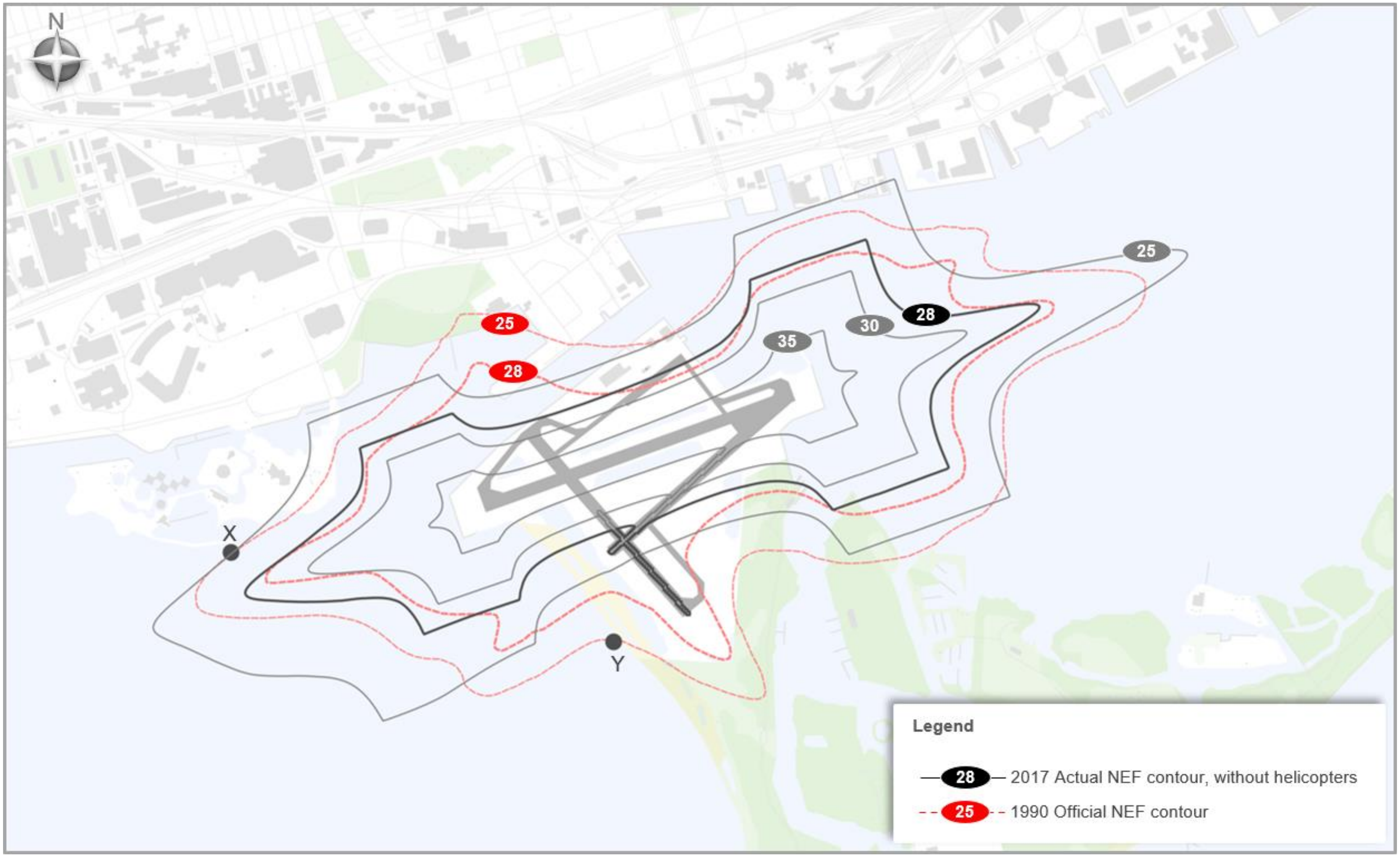


Table 5 shows the surface area within the contours in 2017. It is the total surface area in each range of NEF values.

Table 5 Surface area (km^2)

NEF	Surface area (km^2)	
	With helicopters	Without helicopters
35 +	0.38	0.36
30 - 35	0.75	0.69
28 - 30	0.52	0.51
25 - 28	1.43	1.39
Total	**3.08**	**2.94**

4 Conclusion

The 2017 noise exposure contours for the 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 3.08 square kilometers (km^2) including helicopters, and 2.94 km^2 excluding helicopters. The NEF 28 contour covers an area of 1.65 km^2 including helicopters, and 1.56 km^2 excluding helicopters.

The 28 NEF contours for 2017, with and without helicopters, do not expand beyond the official 25 NEF contour for 1990, the limit set by the Agreement for the expansion of the NEF contour.

5 Bibliography

INTERNATIONAL CIVIL AVIATION ORGANIZATION, Standards and Recommended Practices, Protection of the Environment, Annex 16 to the convention relative to international civil aviation, Volume 1, “Aircraft Noise”, second edition, 1988.

TRANSPORT CANADA, Aviation Group, “NEF micro computer system user manual”, June 1990, TP 6907.

TRANSPORT CANADA, “Land Use Planning in the Vicinity of Airports”, 9th edition, 2013/14, 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	54
A139	M	2	T	R		6,400	AGUSTAWESTLAND	AW-139	AS332	2,292
AA5	L	1	P	F		1,000	AMERICAN	AA-5 Traveler	GASEPF	26
AC11	L	1	P	R		2,000	ROCKWELL	112, 114 Commander, Alpine Commander	RWCM14	28
AEST	L	2	P	R		3,000	PIPER	PA-60, Aerostar	PA60	20
AR11	L	1	P	F		1,000	AERONCA	11 Chief	CNA150	1
AS50	L	1	T	F		3,000	AEROSPATIALE	AS-350/550 Ecureuil, Astar, SuperStar, Fennec	AS350	13
AS55	L	2	T	F		3,000	AEROSPATIALE	AS-355/555 Ecureuil 2, TwinStar, Fennec	AS350	4
AVID	L	1	P	F		1,000	AVID	All models	FASEPF	1
B06	L	1	T	F		2,000	BELL	206A/B/L, 406, LongRanger (CH-139 JetRanger)	AS350	51
B190	M	2	T	R		8,000	BEECH	1900 Airliner (C-12J)	BEC190	10
B222	L	2	T	R		4,000	BELL	222	AS350	3
B350	M	2	T	R		6,000	BEECH	B300 Super King Air 350	DHC6	755
B407	L	1	T	F		3,000	BELL	407	AS350	4
B412	L	2	T	F		6,000	BELL	412, Griffon (CH-146)	AS350	9
B427	L	2	T	F		3,000	BELL	427	AS350	6
B429	L	2	T	F		3,200	BELL	GlobalRanger	AS350	18
B430	L	2	T	R		5,000	BELL	430	AS350	67
BE10	L	2	T	R		6,000	BEECH	100 King Air (U-21F)	BEC100	208
BE20	L	2	T	R		6,000	BEECH	200, 1300 Super King Air, Commuter (C-12A)	BEC200	232
BE23	L	1	P	F		2,000	BEECH	23 Musketeer, Sundowner	GASEPF	11
BE24	L	1	P	R		2,000	BEECH	24 Musketeer Super, Sierra	GASEPF	8
BE30	M	2	T	R		7,000	BEECH	300 Super King Air	BEC300	81
BE33	L	1	P	R		2,000	BEECH	33 Bonanza (E-24)	BEC33	19
BE35	L	1	P	R		2,000	BEECH	35 Bonanza	GASEPV	64
BE36	L	1	P	R		2,000	BEECH	36 Bonanza	GASEPV	81
BE55	L	2	P	R		3,000	BEECH	55 Baron (T-42)	BEC55	8
BE58	L	2	P	R		3,000	BEECH	58 Baron	BEC58	38
BE60	L	2	P	R		4,000	BEECH	60 Duke	BEC60	10
BE9L	L	2	T	R		5,000	BEECH	90, A90-E90 King Air (T-44, VC-6)	BEC90	62
BE9T	L	2	T	R		5,000	BEECH	F-90 King Air	BEC9F	26

Aircraft	D1*	D2*	D3*	D4*	Chap.	MTOW	Manufacturer	Model	Equivalent	Number
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	6
C10T	L	1	T	R		1,800	CESSNA	P210	CNA210	2
C150	L	1	P	F		1,000	CESSNA	150, A150, Commuter, Aerobat	CNA150	14,083
C152	L	1	P	F		1,000	CESSNA	152, A152, Aerobat	CNA152	1,248
C170	L	1	P	F		1,000	CESSNA	170	CNA170	7
C172	L	1	P	F		2,000	CESSNA	172, P172, R172, Skyhawk, Cutlass (T-41)	CNA172	23,005
C175	L	1	P	F		2,000	CESSNA	175, Skylark	GASEPV	2
C177	L	1	P	F		2,000	CESSNA	177, Cardinal	CNA177	18
C180	L	1	P	F		2,000	CESSNA	180, Skywagon 180 (U-17C)	CNA180	90
C182	L	1	P	F		2,000	CESSNA	182, Skylane	CNA182	6,215
C185	L	1	P	F		2,000	CESSNA	185, A185 Skywagon, Skywagon 185 (U-17A/B)	CNA185	107
C206	L	1	P	F		2,000	CESSNA	206, P206, T206, TP206, (Turbo) Super Skywagon	CNA206	685
C208	L	1	T	F		4,000	CESSNA	208 Caravan 1, (Super)Cargomaster (C-98, U-27)	CNA208	804
C210	L	1	P	R		2,000	CESSNA	210, T210, (Turbo)Centurion	CNA210	30
C303	L	2	P	R		3,000	CESSNA	T303 Crusader	CNA303	2
C310	L	2	P	R		3,000	CESSNA	310, T310 (U-3, L-27)	CNA310	88
C337	L	2	P	R		2,000	CESSNA	337, M337 (Turbo)Super Skymaster (O-2)	CNA337	41
C340	L	2	P	R		3,000	CESSNA	340	CNA340	30
C414	L	2	P	R		3,000	CESSNA	414, Chancellor	CNA414	67
C421	L	2	P	R		4,000	CESSNA	421, Golden Eagle, Executive Commuter	CNA421	60
C441	L	2	T	R		5,000	CESSNA	441 Conquest, Conquest 2	CNA441	29
C550	M	2	J	R	3	7,000	CESSNA	550, S550, 552 Citation 2/S2/Bravo (T-47, U-20)	CNA550	69
C560	M	2	J	R	3	8,000	CESSNA	560 Citation 5	CNA560	1
C72R	L	1	P	R		2,000	CESSNA	172RG Cutlass RG	GASEPV	17
C77R	L	1	P	R		2,000	CESSNA	177RG Cardinal RG	CNA17B	18
C82R	L	1	P	R		2,000	CESSNA	R182, TR182 (Turbo)Skylane RG	CNA182	3
CAMP	L	1	P	F		1,000	PIETENPOL	Air Camper	GASEPF	1
CH7A	L	1	P	F		2,000	CHAMPION	7EC/ECA/FC/JC Citabria, Traveler, Tri-Con, Tri-Traveler	GASEPF	2
CH7B	L	1	P	F		2,000	BELLANCA	7GCBC/KCAB Citabria	BLCH10	2

Aircraft	D1*	D2*	D3*	D4*	Chap.	MTOW	Manufacturer	Model	Equivalent	Number
COL3	L	1	P	F		1,500	LANCAIR	LC40-550FG	BEC58P	5
COL4	L	1	P	F		1,600	CESSNA AIRCRAFT CO.	400 Corvalis TT	BEC58P	74
DA40	L	1	P	F		1,800	DIAMOND AIRCRAFT IND INC	DA 40	GASEPF	90
DA42	L	2	P	R		1,700	DIAMOND	DA42	GASEPV	162
DC3	M	2	P	R		13,000	DOUGLAS	DC-3 (C-41, C-47 Skytrain, Skytrooper, Dakota)	DC3	5
DH2T	L	1	T	F		3,000	DE HAVILLAND	DHC-2 Mk3 Turbo Beaver	CNA441	52
DH8A	M	2	T	R		16,000	DE HAVILLAND	DHC-8-100 Dash 8 (E-9, CT-142, CC-142)	DHC8	15
DH8B	M	2	T	R		16,000	DE HAVILLAND	DHC-8-200 Dash 8	DHC8	1
DH8C	M	2	T	R		20,000	DE HAVILLAND	DHC-8-300 Dash 8	DHC830	10
DH8D	M	2	T	R		26,000	DE HAVILLAND	DHC-8-400 Dash 8	DHC830	59,188
DHC2	L	1	P	F		3,000	DE HAVILLAND	DHC-2 Mk1 Beaver (U-6, L-20)	DHC2	9
DHC7	M	4	T	R		20,000	DE HAVILLAND	DHC-7 Dash 7 (O-5, EO-5)	DHC7	8
DV20	L	1	P	F		1,000	DIAMOND	DA-20/22, DV-20 Katana, Speed Katana	GASEPF	64
E50P	L	2	J	R	3	5,000	Embraer	Phenom 100	CNA501	14
EC20	L	1	T	F		2,000	EUROCOPTER	EC-120 Colibri	AS350	14
EC30	L	1	T	F		2,400	EUROCOPTER	EC130B4	AS350	13
ERCO	L	1	P	F		1,000	ALON	A-2 Aircoupe	GASEPF	2
EUPA	L	1	P	F		600	EUROPA (KIT)	Monowheel	GASEPF	2
EVOL	L	1	T	R		2,000	LANCAIR	Lancair Evolution	GASEPV	2
FA10	M	2	J	R	3	9,000	DASSAULT	Falcon 10, Mystere 10	FAL10	220
G115	L	1	P	R		2,000	GROB	G-115A/B/C/D/E, Bavarian (Heron, Tutor)	GASEPF	4
GA8	L	1	P	F		1,800	GIPPSAERO	GA8 Airvan 8	GASEPV	1,216
GB6T	L	1	T	A		2,000	BERNIER	G-bair 6T (dérivé de CNA206)	CNA206	50
GOLF	L	1	P	F		600	TECNAM	P96 GOLF	GASEPF	4
GSIS	L	1	P	F		500	GENESIS	GENESIS XL	GASEPF	1
GYRO	L	1	P	F		500	AUTOGYRO	ultralight/microlight autogyro/autogire ultra-léger	GASEPV	2
H500	L	1	T	F		2,000	MCDONNELL DOUGLAS	MD-500, MD-530F/MG, Defender, Nightfox	AS350	2
JS32	M	2	T	R		8,000	BRITISH AEROSPACE	BAe-3200 Jetsream Super 31	BAEJ31	34
KODI	M	1	T	F		3,300	QUEST	Quest kodiak	CNA20T	2
L8	L	1	P	F		1,000	LUSCOMBE	8, T8, 50, Master, Silvaire, Observer	GASEPF	66

Aircraft	D1*	D2*	D3*	D4*	Chap.	MTOW	Manufacturer	Model	Equivalent	Number
LA25	L	1	P	A		2,000	LAKE	LA-250/270 (Turbo)Renegade, Seawolf, Seafury	GASEPF	3
LA4	L	1	P	A		2,000	LAKE	LA-4/200, Buccaneer	LA42	47
LEG2	L	1	P	R		500	PEZETEL	SZD-55-1	GASEPV	2
LNC2	L	1	P	R		1,000	LANCAIR	Lancair 200/235/320/360	GASEPV	2
LNP4	L	1	T	R		1,700	LANCAIR	PropJet 4	CNA20T	2
M20P	L	1	P	R		2,000	MOONEY	M-20, M-20A-J/L/R (non-turbocharged)	M20J	166
M20T	L	1	P	R		2,000	MOONEY	M-20K/M, Bravo, Encore (turbocharged)	M20K	40
M4	L	1	P	F		2,000	MAULE	M-4 Bee Dee, Jetasen, Rocket, Astro Rocket	GASEPF	6
M5	L	1	P	F		2,000	MAULE	M-5, Strata Rocket, Lunar Rocket, Patroller	GASEPF	6
MU2	L	2	T	R		5,000	MITSUBISHI	MU-2, Marquise, Solitaire (LR-1)	MU2	345
P180	L	2	T	R		6,000	PIAGGIO	P-180 Avanti	SD330	40
P210	L	1	P	R		2,000	CESSNA	P210 Pressurized Centurion	CNA206	45
P28A	L	1	P	F		2,000	PIPER	PA-28-140/150/160/180 Archer, Cadet, Cherokee	PA28CA	2,968
P28R	L	1	P	R		2,000	PIPER	PA-28R-180/200/201 Cherokee Arrow, Turbo Arrow	PA28CA	89
P28T	L	1	P	R		2,000	PIPER	PA-28RT Arrow 4, Turbo Arrow 4	PA28CA	9
P32R	L	1	P	R		2,000	PIPER	PA-32R Cherokee Lance, Saratoga SP, Turbo	GASEPV	7
P32T	L	1	P	R		2,000	PIPER	PA-32RT Lance 2, Turbo Lance 2	GASEPV	44
P46T	L	1	T	R		2,000	PIPER	PA-46T Malibu Meridian	PA46	71
PA12	L	1	P	F		1,000	PIPER	PA-12 Super Cruiser	GASEPF	4
PA18	L	1	P	F		1,000	PIPER	PA-18 Super Cub (L-18C, L-21, U-7)	PA18	3
PA22	L	1	P	F		1,000	PIPER	PA-22 Tri-Pacer, Caribbean, Colt	PA22CO	12
PA24	L	1	P	R		2,000	PIPER	PA-24 Comanche	PA24	79
PA27	L	2	P	R		3,000	PIPER	PA-23-235/250 Aztec, Turbo Aztec (U-11)	PA23AZ	373
PA30	L	2	P	R		2,000	PIPER	PA-30/39 Twin Comanche, Turbo Twin Comanche	PA30	111
PA31	L	2	P	R		4,000	PIPER	PA-31/31P Navajo, Chieftain, Mojave, T-1020	PA31	1,784
PA32	L	1	P	F		2,000	PIPER	PA-32 Cherokee Six, Saratoga, Turbo Saratoga	GASEPV	56
PA34	L	2	P	R		3,000	PIPER	PA-34 Seneca	PA34	1,284
PA44	L	2	P	R		2,000	PIPER	PA-44 Seminole, Turbo Seminole	PA44	8
PA46	L	1	P	R		2,000	PIPER	PA-46 Malibu, Malibu Mirage	PA46	147

Aircraft	D1*	D2*	D3*	D4*	Chap.	MTOW	Manufacturer	Model	Equivalent	Number
PAY1	L	2	T	R		5,000	PIPER	PA-31T1-500 Cheyenne 1	PA31T	2
PAY2	L	2	T	R		5,000	PIPER	PA-31T-620/T2-620 Cheyenne, Cheyenne 2	CNA441	11
PAY3	L	2	T	R		6,000	PIPER	PA-42-720 Cheyenne 3	CNA441	30
PAY4	L	2	T	R		6,000	PIPER	PA-42-1000 Cheyenne 400	CNA441	2
PC12	L	1	T	R		5,000	PILATUS	PC-12, Eagle	CNA20T	1,922
PELI	L	1	P	F		500	ULTRAVIA	Pelican	GASEPV	2
PTS2	L	1	P	F		1,000	PITTS	S-2 Special	GASEPF	6
PTSS	L	1	P	F		700	PITTS	Super Stinker	GASEPV	1
R22	L	1	P	F		1,000	ROBINSON	R-22	AS332	1
R44	L	1	P	F		2,000	ROBINSON	R-44 Astro	AS350	5,900
R66	L	1	T	F		1,200	ROBINSON	R-66	AS350	45
RBEL	L	1	P	F		700	MURPHY	Rebel	GASEPF	2
RC3	L	1	P	A		2,000	REPUBLIC	RC-3 Seabee	GASEPF	2
RV10	L	1	P	F		1,200	VAN'S	RV-10	GASEPV	5
RV6	L	1	P	F		1,000	VAN'S	RV-6	GASEPF	18
RV7	L	1	P	F		800	VAN'S	RV-7	GASEPV	6
RV8	L	1	P	F		800	VAN'S	RV-8	GASEPF	8
S108	L	1	P	F		2,000	STINSON	108 Voyager, Station Wagon	GASEPF	1
S58T	M	1	T	F		6,000	SIKORSKY	S-58T/DT/ET	AS350	11
S76	L	2	T	R		5,000	SIKORSKY	S-76, H-76, AUH-76, Spirit, Eagle (HE-24)	AS332	102
S92	M	2	T	R		12,000	SIKORSKY	S-92 Helibus	AS332	20
SA30	L	1	P	F		800	STOLP	Starduster Too	GASEPV	4
SR20	L	1	P	F		2,000	CIRRUS	SR-20	GASEPF	49
SR22	L	1	P	F		1,500	CIRRUS	SR22	GASEPF	580
SW3	M	2	T	R		6,000	FAIRCHILD SWEARINGEN	SA-226TB, SA-227TT Merlin 3	SAMER3	118
SW4	M	2	T	R		7,000	FAIRCHILD SWEARINGEN	Merlin 4C, Metro2/2A, Metro 3, Metro 3A, Expediter, Merlin 23, 4	SAMER4	83
T28	L	2	P	R		4,000	NORTH AMERICAN	T-28, AT-28, Trojan	BEC58P	1
T6	L	1	P	R		4,000	NORTH AMERICAN	T-6, AT-6, BC-1, SNJ, Texan, Harvard	GASEPF	14
TBM7	L	1	T	R		3,000	SOCATA	TBM-700	CNA441	65
TBM8	L	1	T	R		7,400	SOCATA	TBM-850	CNA441	25

Aircraft	D1*	D2*	D3*	D4*	Chap.	MTOW	Manufacturer	Model	Equivalent	Number
TOBA	L	1	P	F		2,000	AEROSPATIALE	Tobago	GASEPF	7
TRIN	L	1	P	R		2,000	SOCATA	TB-20/21 Trinidad	GASEPF	18
VO10	L	1	P	F		2,000	AERO COMMANDER	100 Commander	GASEPF	2
YK50	L	1	P	R		1,000	YAKOVLEV	Yak-50	GASEPV	11
Z42	L	1	P	F		2,000	ZLIN	Z-42/142/242	GASEPV	51

*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

Summary of movements

Fleet summary of itinerant movements

Aircraft	Arrivals			Departures			Total
	Day	Night	Total	Day	Night	Total	
Helicopter single engine	3,140	0	3,140	2,914	0	2,914	6,054
Helicopter twin engine	1,110	58	1,168	1,344	63	1,407	2,575
Jet twin engine Stage 3	140	10	150	134	20	154	304
Piston single engine	10,747	237	10,984	11,014	126	11,140	22,124
Piston twin engine	1,281	14	1,295	1,397	16	1,413	2,708
Turboprop single engine	1,412	27	1,439	1,396	39	1,435	2,874
Turboprop twin engine	29,816	851	30,667	29,853	924	30,777	61,444
Turboprop 4 engines	3	0	3	5	0	5	8
Total	**47,649**	**1,197**	**48,846**	**48,057**	**1,188**	**49,245**	**98,091**

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

Runway use - Arrivals

Aircraft	06		08		24		26		60	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Helicopter single engine			2				7		3,131	
Helicopter twin engine	1		293	21	3		611	29	202	8
Jet twin engine Stage 3			39	2			101	8		
Piston single engine	99	3	3,502	92	384	4	6,762	138		
Piston twin engine	1		389	6	3		887	8		
Turboprop single engine			477	10	5		930	17		
Turboprop twin engine			10,225	293			19,591	558		
Turboprop 4 engines			1				2			
Total	**101**	**3**	**14,928**	**424**	**395**	**4**	**28,891**	**758**	**3,333**	**8**

Runway use - Departures

Aircraft	06		08		24		26		60	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Helicopter single engine			2				3		2,909	
Helicopter twin engine	1		347	26	2		664	30	330	7
Jet twin engine Stage 3			43	6			91	14		
Piston single engine	4		3,597	49	716		6,697	77		
Piston twin engine			416	5	6		975	11		
Turboprop single engine			485	10	5		906	29		
Turboprop twin engine	1		10,224	302			19,628	622		
Turboprop 4 engines							5			
Total	**6**		**15,114**	**398**	**729**		**28,969**	**783**	**3,239**	**7**

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