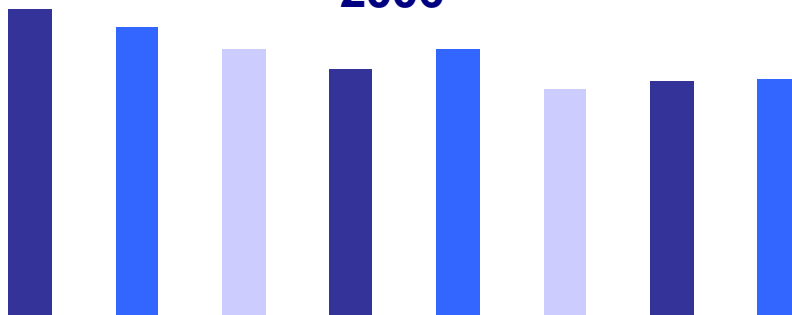




Statistical Summary Aviation Occurrences 2006



Foreword

This document provides users of Canadian aviation safety data with an annual summary of selected statistics on aviation occurrences. Information in this summary is also posted on the Transportation Safety Board of Canada (TSB) web site at www.tsb.gc.ca.

Users of these statistics are advised that, in a live database, the occurrence data are constantly being updated. Consequently, the statistics can change slightly over time. Further, as many occurrences are not formally investigated, information recorded on some occurrences may not have been verified. Therefore, caution should be used when utilizing these statistics. The 2006 statistics presented here reflect the TSB database updated as of 07 December 2007.

To enhance awareness and increase the safety value of the material presented in the TSB *Statistical Summary, Aviation Occurrences 2006*, readers are encouraged to copy or reprint the data presented, in whole or in part, for further distribution (with acknowledgements of the source).

The TSB is an independent agency operating under its own Act of Parliament. Its sole aim is the advancement of transportation safety.

Comments on this document can be forwarded to the following address:

Transportation Safety Board of Canada
Communications Division
Place du Centre
200 Promenade du Portage
4th Floor
Gatineau, Quebec
K1A 1K8

Telephone: (819) 994-3741
Facsimile: (819) 997-2239
E-mail: communications@tsb.gc.ca

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AVIATION OCCURRENCES IN 2006

ACCIDENTS

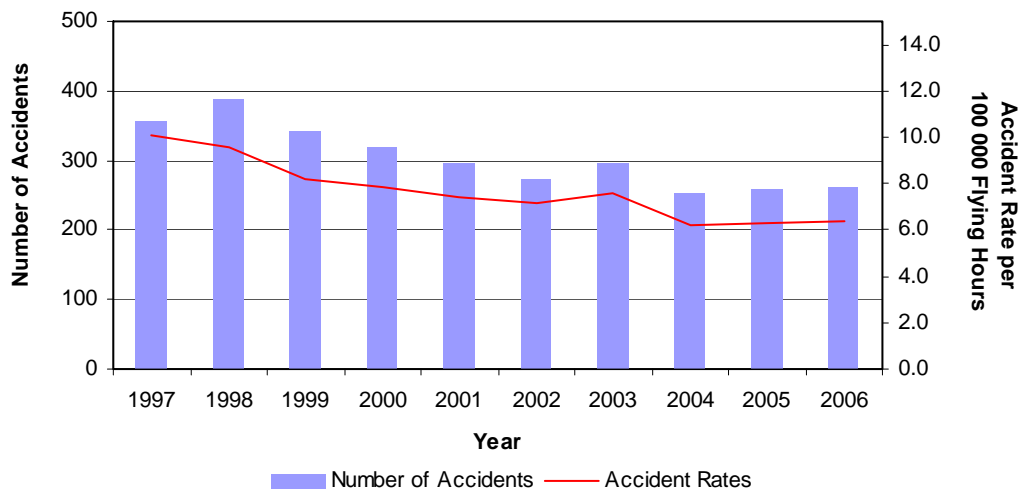
Overview of Accidents and Fatalities (Tables 1, 2, 3 and 8)

In 2006, a total of 304 aviation accidents were reported to the TSB. Of this number, 262 involved Canadian-registered aircraft (excluding ultralights), a 1.2% increase from 2005 (Figure 1).

Flying activity is comparable to last year and the accident rate is unchanged from the 2005 accident rate of 6.3 accidents per 100 000 flying hours. Statistical analysis using linear regression indicates a significant downward trend ($p < .001$)¹ in accident rates over the past 10 years.

The 262 accidents involving Canadian-registered aircraft (excluding ultralights) included 208 aeroplanes² (60 of which were commercially operated) and 56 helicopters. The remaining 4 were balloons, gliders or gyrocopters.

Figure 1 – Accidents and Accident Rates,³ 1997-2006



¹ It is agreed by convention that, for a result to be considered statistically significant, its probability must be lower than 1 in 20 (that is, $p < .05$).

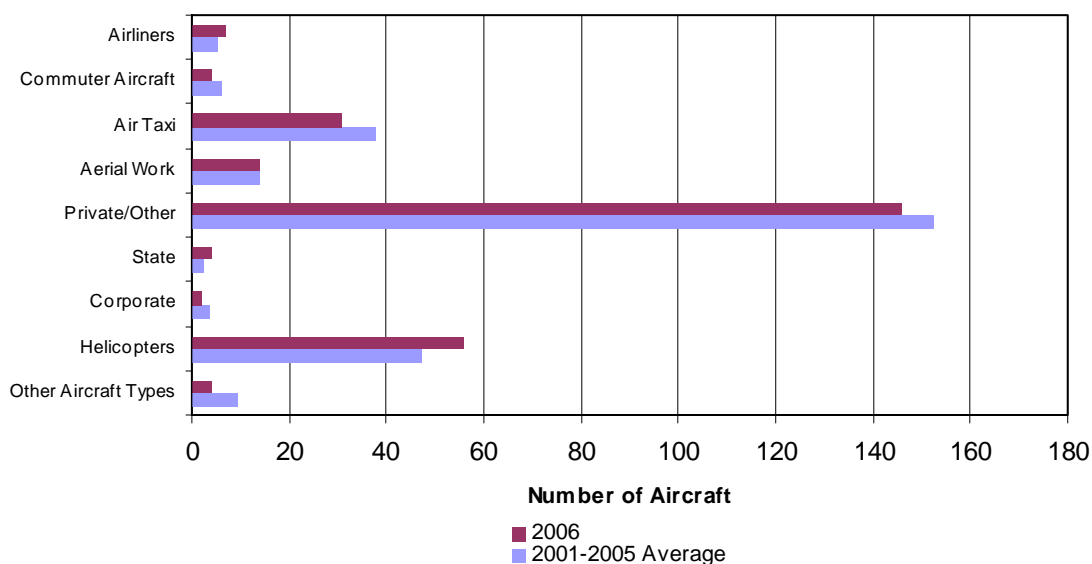
² As some occurrences involve more than one aircraft, users are cautioned to note differences between the number of occurrences and the number of aircraft involved in occurrences. All tables except Table 1 exclude ultralight aircraft; all tables except tables 1 and 4 also exclude balloons, gliders and gyrocopters.

³ Canadian-registered aircraft (excluding ultralights)

Of the 60 commercial aeroplanes (7 airliners, 4 commuter aircraft, 31 air taxi and 14 aerial work) involved in accidents in 2006 (Figure 2), 5 air taxi aircraft and 1 aerial work aircraft were involved in fatal accidents. There were no fatal accidents involving airliners or commuter aircraft. One state aircraft was involved in a fatal accident.

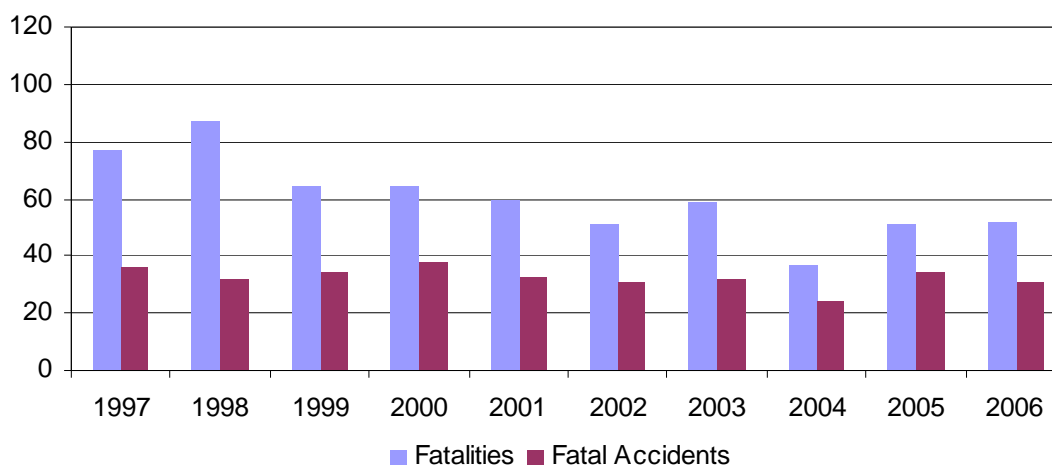
A total of 148 private/corporate/other aeroplanes were involved in accidents, 5% lower than the five-year average of 156. In 2006, 16 such accidents resulted in fatalities, up from 13 in 2005 and equal to the five-year average of 16.

Figure 2—Canadian-Registered Aircraft Involved in Accidents by Aircraft Type, 2006



In 2006, Canadian-registered aircraft, excluding ultralights, were involved in 31 fatal accidents (Figure 3), 8% lower than last year's total of 34 and equal to the 2001–2005 average of 31. The number of fatalities (52) remained the same as the five-year average (52) and the number of serious injuries (39) increased by 5% from the five-year average (37). Passenger fatalities accounted for 43% of aeroplane fatalities in 2006, and crew member fatalities accounted for 57% (excluding fatalities from ultralight accidents).

Figure 3 – Fatalities and Fatal Accidents, 1997–2006



Aeroplanes operated by the state (that is, operated by federal or provincial governments) were involved in 4 accidents in 2006 with 1 fatality.

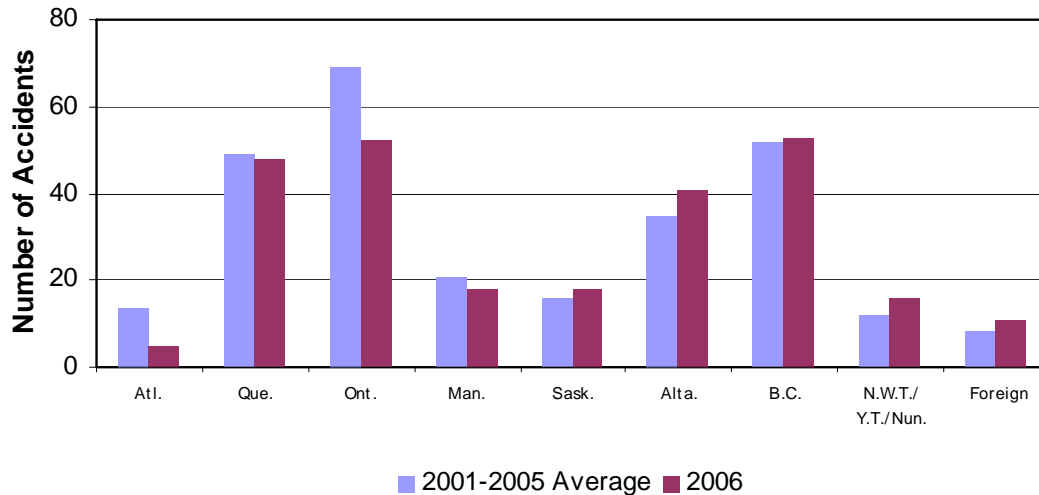
In 2006, there were 56 helicopter accidents, an 18% increase from the five-year average of 47. Of the 56 helicopter accidents, 9 were fatal, resulting in 11 fatalities. Over the past 10 years, the highest proportion of helicopter accidents occurred during air transport operations (30%) and training (13%).

In 2006, 28 ultralight aircraft were involved in accidents in Canada, with 1 accident resulting in a single fatality, which is far fewer than in previous years. Fourteen foreign-registered aircraft were involved in accidents in Canada, with 2 resulting in 1 fatality each.

Accidents by Selected Categories

Province (Table 3): In 2006, Ontario and British Columbia each accounted for 20% of Canadian-registered aircraft accidents, while Quebec and Alberta accounted for 18% and 16% respectively. Canadian-registered aircraft accidents were lower than the five-year average in the Atlantic provinces, Quebec, Ontario and Manitoba, and higher than the five-year average in Saskatchewan, Alberta, British Columbia and the Territories (Figure 4).

Figure 4 – Canadian-Registered Aircraft Involved in Accidents by Province, 2006



Events and Phases (Tables 5 to 7): Accidents are frequently classified according to the first event (or abnormal condition) in the sequence of events that led to the occurrence. This classification serves to demonstrate the nature and distribution of safety-significant events, and how these events shift over time. However, the first event should not be construed to be the cause of the accident.

In 2006, the most common first event in aeroplane accidents was a take-off/landing event (21%). Collision with object (14%), power loss (13%) and collision with terrain (12%) were the next most common first events. In helicopter accidents, collision with object (20%) and power loss (18%) were the most common first events.

The statistics show that the first event leading to an accident varies substantially according to the flight phase of the aircraft involved. For aeroplanes, accidents during the landing phase account for about 36% of total accidents. The most common first events in such accidents were landing (such as nose over, tire blow-out, etc.) and control loss. Approximately 23% of aeroplane accidents occur during the take-off phase; in these accidents, power loss and control loss were the most common first events. The en-route phase accounted for about 15% of aeroplane accidents, with power loss being the most common first event in that flight phase.

The approach/landing phase accounted for 30% of helicopter accidents, with the most common first events being collision with object and control loss. The en-route phase (17%) had power loss and collision with terrain as the most common first events. The manoeuvring phase (16%) had collision with object and power loss as the most common first events. About 14% of helicopter accidents occurred in the take-off phase, with collision with object being a common first event.

Operation Type (Table 8): In 2006, aeroplane accidents occurred mainly on recreational flights (46%), followed by air transport (18%) and training flights (16%). Helicopter accidents occurred mainly on air transport flights (52%) and on recreational flights (7%).

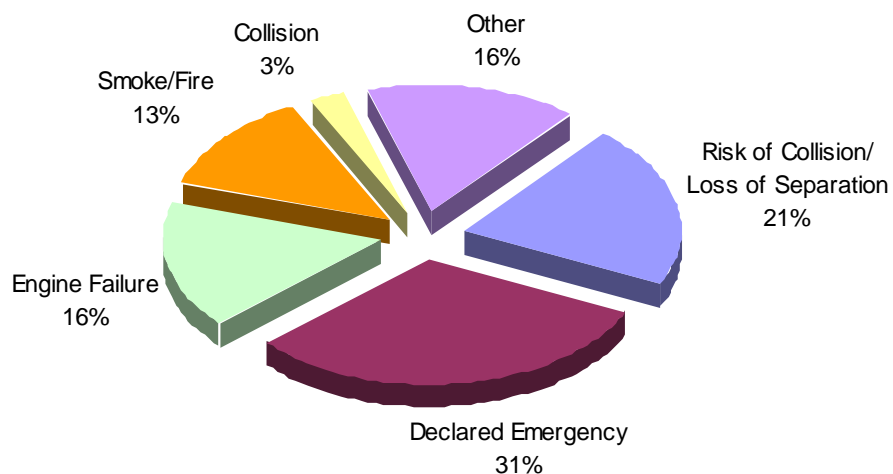
INCIDENTS

Overview of Incidents (Tables 1, 9 and 10)

Pursuant to TSB mandatory incident reporting requirements, 826 incidents were reported in 2006, 658 of which involved Canadian-registered aircraft.

In 2006, the most frequent incident types were declared emergency (31%), risk of collision or loss of separation (21%), and engine failure (16%), with the remainder being mostly smoke/fire incidents (Figure 5).

Figure 5 – Reportable Incidents by Type, 2006



The first event in declared emergency on Canadian-registered aircraft usually involved component failures, the most common of which were landing gear, hydraulic system, and electrical system.

Over the past five years, the majority of risk of collision incidents involving Canadian-registered aircraft had air traffic services (ATS)-related or air proximity events⁴ as their first event.

⁴ Refer to the definitions in Appendix B for explanations for ATS-related and air proximity events.

APPENDIX A – AVIATION OCCURRENCE TABLES

Table 1
Aviation Occurrences and Casualties
1997–2006

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Canadian-Registered Aircraft¹										
Accidents	355	388	341	320	295	274	295	252	259	262
Aeroplanes Involved ²	294	318	286	258	243	210	242	206	206	208
Airliners	8	14	6	9	5	6	7	3	5	7
Commuter Aircraft	12	10	13	4	8	6	9	1	6	4
Air Taxi	110	108	70	45	37	41	35	43	33	31
Aerial Work	10	18	18	19	18	12	17	8	14	14
Corporate	9	11	6	5	4	2	2	4	6	2
State	2	2	2	1	3	4	3	2	1	4
Private/Other ³	143	155	171	175	168	139	169	145	141	146
Helicopters Involved	56	57	46	53	46	56	44	41	50	56
Other Aircraft Involved ⁴	10	17	15	12	9	10	12	9	8	4
Hours Flown (thousands) ⁵	3475	3931	4047	3982	3885	3712	3790	3961	4079	4162
Accident Rate (per 100 000 hours) ⁶	10.1	9.5	8.2	7.8	7.4	7.2	7.5	6.2	6.3	6.3
Fatal Accidents	36	32	34	38	33	31	32	24	34	31
Aeroplanes Involved ²	29	25	28	26	25	23	26	18	22	23
Airliners	0	0	1	1	0	0	0	0	0	0
Commuter Aircraft	0	1	2	1	1	0	0	0	1	0
Air Taxi	11	8	5	3	5	5	5	3	6	5
Aerial Work	0	0	1	2	1	1	3	0	2	1
Corporate	1	1	2	0	1	0	0	0	0	0
State	1	0	0	1	0	2	0	0	0	1
Private/Other ³	16	15	17	18	17	15	18	15	13	16
Helicopters Involved	8	6	4	11	6	6	3	4	10	9
Other Aircraft Involved ⁴	0	2	4	1	3	3	4	2	2	0
Fatalities	77	87	65	65	60	51	59	37	51	52
Serious Injuries	69	49	42	53	37	42	43	27	37	39
Canadian-Registered Ultralight Aircraft										
Accidents	55	37	35	38	35	36	46	36	31	28
Fatal Accidents	7	4	12	5	6	9	7	6	5	1
Fatalities	9	7	19	9	8	12	9	10	6	1
Serious Injuries	7	7	7	10	8	4	14	7	9	12
Foreign-Registered Aircraft										
Accidents in Canada	16	21	21	17	29	13	30	20	18	14
Fatal Accidents	5	5	5	6	8	1	6	3	6	2
Fatalities	11	236	8	16	10	2	8	10	10	2
Serious Injuries	5	3	0	2	5	0	3	2	15	1
All Aircraft: Reportable Incidents	685	771	699	725	853	865	834	910	822	826
Risk of Collision/Loss of Separation	217	181	168	161	204	193	154	223	180	171
Declared Emergency	192	226	207	225	255	280	293	278	224	260
Engine Failure	144	170	155	161	175	160	132	143	148	136
Smoke/Fire	61	106	87	84	107	101	103	94	103	107
Collision	7	4	7	8	19	22	16	21	12	21
Other	64	84	75	86	93	109	136	151	155	131

1 Ultralight aircraft excluded

2 As some accidents may involve multiple aircraft, the number of aircraft involved may differ from the total number of accidents.

3 Other: Contains, but is not limited to, organizations that rent aircraft (that is, flying schools, flying clubs, etc.)

4 Includes gliders, balloons and gyrocopters

5 Source: Transport Canada (hours flown are estimated from 2003)

6 Accident rate does not include "Other Aircraft Involved"

Figures are preliminary as of 07 December 2007.

Table 2**Canadian-Registered Aircraft Involved in Accidents, Accident Rates and Fatalities by Operator Type
1997–2006**

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Accidents										
Aeroplanes Involved										
Airliners	8	14	6	9	5	6	7	3	5	7
Commuter Aircraft	12	10	13	4	8	6	9	1	6	4
Air Taxi	110	108	70	45	37	41	35	43	33	31
Aerial Work	10	18	18	19	18	12	17	8	14	14
Corporate	9	11	6	5	4	2	2	4	6	2
State	2	2	2	1	3	4	3	2	1	4
Private/Other ¹	143	155	171	175	168	139	169	145	141	146
Helicopters Involved	56	57	46	53	46	56	44	41	50	56
Total	350	375	332	311	289	266	286	247	256	264
Hours Flown (thousands)²										
Aeroplanes										
Airliners	1070	1210	1247	1198	1168	1124	1148	1244	1334	1387
Commuter Aircraft	294	329	344	337	322	311	318	326	335	348
Air Taxi	732	805	825	792	754	683	651	655	633	624
Aerial Work	141	173	197	219	242	262	313	337	360	383
State	142	174	196	220	240	258	307	344	385	401
Private/Other/Corporate	553	630	629	612	555	496	463	445	403	373
Helicopters	543	610	609	604	604	578	590	610	629	645
Total	3475	3931	4047	3982	3885	3712	3790	3961	4079	4162
Accident Rates (per 100 000 hours)										
Aeroplanes										
Airliners	0.7	1.2	0.5	0.8	0.4	0.5	0.6	0.2	0.4	0.5
Commuter Aircraft	4.1	3.0	3.8	1.2	2.5	1.9	2.8	0.3	1.8	1.1
Air Taxi	15.0	13.4	8.5	5.7	4.9	6.0	5.4	6.6	5.2	5.0
Aerial Work	7.1	10.4	9.1	8.7	7.4	4.6	5.4	2.4	3.9	3.7
State	1.4	1.1	1.0	0.5	1.3	1.6	1.0	0.6	0.3	1.0
Private/Other/Corporate	27.5	26.3	28.1	29.4	31.0	28.4	36.9	33.5	36.5	39.7
Helicopters	10.3	9.3	7.6	8.8	7.6	9.7	7.5	6.7	7.9	8.7
Total (all aircraft)	10.1	9.5	8.2	7.8	7.4	7.2	7.5	6.2	6.3	6.3
Fatalities: Crew										
Aeroplanes										
Airliners	0	0	2	2	0	0	0	0	0	0
Commuter Aircraft	0	2	2	2	2	0	0	0	2	0
Air Taxi	13	9	6	2	4	1	5	2	6	5
Aerial Work	0	0	1	3	1	1	4	0	2	1
Corporate	0	2	1	0	1	0	0	0	0	0
State	1	0	0	2	0	1	0	0	0	1
Private/Other	16	16	16	20	17	15	15	14	11	16
Helicopters	9	5	5	10	7	6	3	4	8	6
Total	39	34	33	41	32	24	27	20	29	29
Fatalities: Passengers										
Aeroplanes										
Airliners	0	0	0	0	0	0	0	0	0	0
Commuter Aircraft	0	9	0	0	0	0	0	0	0	0
Air Taxi	9	16	4	5	8	7	10	14	2	10
Aerial Work	0	0	0	1	1	0	0	0	3	0
Corporate	2	1	4	0	1	0	0	0	0	0
State	2	0	0	0	0	0	0	0	0	0
Private/Other	13	11	14	6	12	16	16	1	7	7
Helicopters	12	13	6	8	2	0	3	0	7	5
Total	38	50	28	20	24	23	29	15	19	22

1 Other: Contains, but is not limited to, organizations that rent aircraft (that is, flying schools, flying clubs, etc.)

2 Source: Transport Canada (hours flown are estimated from 2003)

Figures are preliminary as of 07 December 2007.

Table 3**Accidents Involving Canadian-Registered Aircraft by Province/Territory
1997–2006**

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Accidents										
Newfoundland and Labrador	9	7	5	14	10	6	9	5	5	3
Prince Edward Island	1	0	0	1	1	0	1	0	1	0
Nova Scotia	4	7	4	9	3	7	1	3	0	0
New Brunswick	6	6	7	5	4	2	1	5	5	2
Quebec	60	42	46	55	48	42	55	44	56	48
Ontario	84	106	106	73	64	74	80	71	57	52
Manitoba	25	29	32	17	28	17	28	12	18	18
Saskatchewan	22	21	22	9	18	18	16	13	13	18
Alberta	46	62	52	39	36	46	34	29	28	41
British Columbia	72	70	40	68	58	41	54	46	59	53
Nunavut ¹	0	0	0	4	2	1	0	2	2	6
Northwest Territories	9	13	14	11	12	4	5	7	5	6
Yukon	5	8	4	6	4	4	4	6	3	4
Outside Canada	12	17	9	9	7	12	7	9	7	11
Total	355	388	341	320	295	274	295	252	259	262
Fatal Accidents										
Newfoundland and Labrador	1	1	1	2	1	1	2	1	1	0
Prince Edward Island	0	0	0	0	0	0	0	0	0	0
Nova Scotia	0	2	0	3	0	2	0	1	0	0
New Brunswick	0	0	0	0	0	0	0	0	1	0
Quebec	7	9	5	5	6	6	5	4	9	3
Ontario	7	4	9	4	6	5	11	2	6	4
Manitoba	1	2	4	0	2	1	0	2	2	0
Saskatchewan	4	2	1	2	0	2	1	2	0	3
Alberta	2	4	5	3	2	2	3	2	2	6
British Columbia	11	5	8	10	11	9	8	6	12	9
Nunavut ¹	0	0	0	3	1	0	0	1	0	0
Northwest Territories	0	0	1	1	3	0	0	1	0	1
Yukon	0	0	0	1	0	0	1	0	0	1
Outside Canada	3	3	0	4	1	3	1	2	1	4
Total	36	32	34	38	33	31	32	24	34	31
Fatalities										
Newfoundland and Labrador	2	1	1	3	3	2	3	1	2	0
Prince Edward Island	0	0	0	0	0	0	0	0	0	0
Nova Scotia	0	4	0	4	0	2	0	1	0	0
New Brunswick	0	0	0	0	0	0	0	0	1	0
Quebec	18	29	9	8	12	14	9	4	12	6
Ontario	8	9	14	5	8	6	27	14	10	6
Manitoba	4	5	7	0	4	1	0	2	2	0
Saskatchewan	9	5	1	2	0	2	1	2	0	3
Alberta	4	10	8	3	4	3	4	2	4	9
British Columbia	22	12	24	19	17	16	13	6	19	16
Nunavut ¹	0	0	0	5	3	0	0	1	0	0
Northwest Territories	0	0	1	3	8	0	0	2	0	6
Yukon	0	0	0	2	0	0	1	0	0	1
Outside Canada	10	12	0	11	1	5	1	2	1	5
Total	77	87	65	65	60	51	59	37	51	52

¹ This territory was created on 01 April 1999.

Figures are preliminary as of 07 December 2007.

Table 4
Canadian-Registered Aircraft Involved in Accidents by First Event and Phase of Flight
1997–2006

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Aeroplanes Involved in Accidents										
by First Event										
Control Loss	33	35	30	41	37	23	27	30	24	21
Power Loss	46	55	41	37	37	28	36	20	32	27
Collision with Object	32	40	36	24	21	16	25	16	19	29
Collision with Terrain	18	18	22	30	17	16	25	19	20	24
Collision with Moving Aircraft	3	3	9	3	3	2	1	3	1	8
Operations-Related Event	13	10	12	5	6	6	5	4	10	5
Component System Malfunction	16	15	18	15	13	14	7	16	11	10
Landing Gear Collapsed/Retracted	18	18	15	8	7	10	9	10	3	3
Runway Overrun	5	5	4	2	1	1	1	2	4	3
Take-off/Landing Event	45	59	53	46	47	45	55	39	34	43
Wheels-up Landing	13	6	9	4	5	9	5	6	5	3
Component System-Related Event	16	13	4	10	9	7	13	3	7	4
Weather-Related Event	12	10	7	15	12	12	9	16	13	5
Aircraft Damage	7	10	1	5	4	3	4	2	4	5
Other/Unknown	17	21	25	13	24	18	20	20	19	18
Total	294	318	286	258	243	210	242	206	206	208
Helicopters Involved in Accidents										
by First Event										
Control Loss	6	10	3	3	5	6	3	3	5	7
Power Loss	9	6	12	9	5	9	11	3	5	10
Collision with Object	6	12	8	14	8	5	3	3	6	11
Collision with Terrain	5	3	6	5	4	9	5	7	9	8
Collision with Moving Aircraft	0	0	0	0	1	0	0	0	0	0
Operations-Related Event	1	0	5	1	2	0	2	6	2	1
Sling-Related Event	2	2	2	2	2	4	2	2	0	4
Dynamic System Malfunction	3	1	0	2	2	2	1	1	0	0
Dynamic Rollover	1	2	0	3	1	3	1	3	4	0
Autorotative Landing	6	1	2	2	3	4	4	0	1	0
Weather-Related Event	0	1	1	3	4	2	1	2	2	3
Aircraft Damage	5	6	3	2	3	1	3	4	5	2
Other/Unknown	12	13	4	7	6	11	8	7	11	10
Total	56	57	46	53	46	56	44	41	50	56
Aeroplanes Involved in Accidents										
by Phase of Flight										
Standing/Taxiing	22	26	17	21	18	22	23	16	19	22
Take-off	64	72	72	59	52	50	47	49	47	44
En Route	43	52	38	39	34	30	40	20	29	35
Manoeuvring	14	22	21	17	15	11	11	8	14	11
Approach	39	28	30	24	36	18	21	23	24	20
Landing	109	112	105	91	87	72	93	83	70	73
Post-Impact	0	0	1	0	0	0	1	1	0	0
Unknown	3	6	2	7	1	7	6	6	3	3
Total	294	318	286	258	243	210	242	206	206	208
Helicopters Involved in Accidents										
by Phase of Flight										
Standing	4	1	4	2	3	2	1	6	5	5
Take-off	9	3	4	9	5	9	5	6	9	10
En Route	14	9	6	8	10	7	6	6	8	12
Hover/Lift	6	13	10	4	5	3	4	4	3	7
Manoeuvring	9	13	8	14	2	9	9	7	4	7
Approach/Landing	14	17	12	13	19	21	18	11	15	13
Unknown	0	1	2	3	2	5	1	1	6	2
Total	56	57	46	53	46	56	44	41	50	56

Figures are preliminary as of 07 December 2007.

Table 5
Canadian-Registered Aircraft Involved in Accidents
First Event vs. Phase of Flight
1997–2006

	Phase of Flight							Total
	Standing/ Taxiing	Take-off	En Route	Manoeuvring	Approach	Landing	Other/ Unknown	
Aeroplanes Involved in Accidents by First Event								
Control Loss	12	108	14	24	16	124	3	301
Power Loss	0	110	153	31	62	2	1	359
Collision with Object	58	60	22	26	39	51	2	258
Collision with Terrain	5	56	40	26	28	38	16	209
Collision with Moving Aircraft	15	7	4	5	4	1	0	36
Operations-Related Event	7	28	16	4	8	11	2	76
Component System Malfunction	10	26	16	3	32	47	1	135
Landing Gear Collapsed/Retracted	15	10	0	0	0	76	0	101
Runway Overrun	1	3	0	0	0	23	1	28
Take-off/Landing Event	5	75	2	2	17	365	0	466
Wheels-up Landing	0	0	0	0	1	64	0	65
Component System-Related Event	4	20	24	4	11	22	1	86
Weather-Related Event	6	26	32	6	27	13	1	111
Aircraft Damage	32	4	1	1	0	5	2	45
Other/Unknown	36	23	36	12	18	53	17	195
Total	206	556	360	144	263	895	47	2471

	Phase of Flight							Total
	Standing	Take-off	En Route	Hover/Lift	Manoeuvring	Approach/ Landing	Unknown	
Helicopters Involved in Accidents by First Event								
Control Loss	5	9	1	4	9	21	2	51
Power Loss	0	9	25	10	15	19	1	79
Collision with Object	3	12	2	13	16	28	2	76
Collision with Terrain	5	9	15	5	10	14	3	61
Collision with Moving Aircraft	0	0	1	0	0	0	0	1
Operations-Related Event	1	6	1	2	3	6	1	20
Sling-Related Event	0	5	1	7	7	2	0	22
Dynamic System Malfunction	0	2	5	2	2	1	0	12
Dynamic Rollover	1	8	0	0	1	7	1	18
Autorotative Landing	0	0	1	1	2	18	1	23
Weather-Related Event	1	1	9	2	0	6	0	19
Aircraft Damage	9	2	2	5	2	11	3	34
Other/Unknown	8	6	23	8	15	20	9	89
Total	33	69	86	59	82	153	23	505

Figures are preliminary as of 07 December 2007.

Table 6
Canadian-Registered Aeroplanes Involved in Accidents
First Event vs. Aeroplane Type
1997–2006

	Aeroplane Type						
	Airliner	Commuter	Air Taxi	Aerial Work	Corporate	State	Private/Other
Aeroplanes Involved in Accidents by First Event							
Control Loss	2	6	54	10	7	0	222
Power Loss	4	0	67	37	6	1	244
Collision with Object	13	14	51	29	6	6	139
Collision with Terrain	3	5	63	12	4	3	119
Collision with Moving Aircraft	0	0	7	4	1	1	23
Operations-Related Event	1	1	15	6	0	0	53
Component System Malfunction	5	11	36	6	4	5	68
Landing Gear Collapsed/Retracted	5	6	28	2	0	1	59
Runway Overrun	1	1	10	0	0	0	16
Take-off/Landing Event	13	14	106	18	10	3	302
Wheels-up Landing	2	2	20	3	3	1	34
Component System-Related Event	4	1	11	5	4	0	61
Weather-Related Event	1	6	33	6	1	0	64
Aircraft Damage	7	3	9	1	1	1	23
Other/Unknown	9	3	43	9	4	2	125
Total	70	73	553	148	51	24	1552
Aeroplanes Involved in Fatal Accidents by First Event							
Control Loss	0	1	9	1	0	0	22
Power Loss	0	0	3	1	1	0	18
Collision with Object	0	0	4	2	0	1	17
Collision with Terrain	2	3	24	5	2	3	54
Collision with Moving Aircraft	0	0	1	0	1	1	10
Operations-Related Event	0	0	0	0	0	0	4
Component System Malfunction	0	1	0	0	0	0	3
Landing Gear Collapsed/Retracted	0	0	0	0	0	0	0
Runway Overrun	0	0	0	0	0	0	0
Take-off/Landing Event	0	1	1	1	0	0	1
Wheels-up Landing	0	0	0	0	0	0	0
Component System-Related Event	0	0	0	0	0	0	2
Weather-Related Event	0	0	6	0	0	0	6
Aircraft Damage	0	0	0	0	0	0	1
Other/Unknown	0	0	8	1	1	0	22
Total	2	6	56	11	5	5	160

Figures are preliminary as of 07 December 2007.

Table 7
Canadian-Registered Aeroplanes Involved in Accidents
First Event vs. Pilot Licence Type
1997–2006

	Pilot Licence Type ¹					Total
	Student	Private	Commercial	Senior ² Commercial	Air Transport	
Aeroplanes Involved in Accidents by First Event						
Control Loss	6	18	18	0	10	52
Power Loss	3	15	15	0	11	44
Collision with Object	2	13	18	0	5	38
Collision with Terrain	1	13	34	0	20	68
Collision with Moving Aircraft	0	9	8	0	0	17
Operations-Related Event	2	5	3	0	1	11
Component System Malfunction	1	4	4	0	11	20
Landing Gear Collapsed/Retracted	0	2	0	0	2	4
Runway Overrun	0	2	2	0	3	7
Take-off/Landing Event	2	12	9	0	15	38
Wheels-up Landing	0	0	1	0	1	2
Component System-Related Event	0	2	3	0	2	7
Weather-Related Event	0	8	11	0	7	26
Aircraft Damage	1	1	2	0	1	5
Other/Unknown	2	14	16	0	12	44
Total	20	118	144	0	101	383

1 Accident pilots for whom the licence type is unknown, and pilots with other licence types were excluded.

2 This column represents pilots who had senior commercial licences at the time of their accidents. This licence type was discontinued by Transport Canada on 15 November 1994.

Figures are preliminary as of 07 December 2007.

Table 8
Canadian-Registered Aircraft Involved in Accidents by Operation Type
1997–2006

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Aeroplanes Involved in Accidents										
Training	42	49	43	45	46	20	34	25	16	34
Pleasure/Travel	138	130	130	116	108	102	122	118	116	96
Business	9	15	10	9	10	6	8	5	6	8
Test/Demonstration/Ferry	9	14	9	5	7	7	5	7	5	6
Aerial Application	11	17	9	12	13	6	13	3	6	8
Fire Fighting/Fire Management	2	3	2	3	2	2	2	3	2	5
Survey/Inspection	4	3	2	0	2	5	2	1	7	3
Air Ambulance	3	3	3	0	3	2	1	2	1	3
Air Transport	62	67	67	53	43	49	42	37	36	38
Sightseeing	4	1	0	5	1	1	4	0	2	3
Other/Unknown	10	16	11	10	8	10	9	5	9	4
Total	294	318	286	258	243	210	242	206	206	208
Aeroplanes Involved in Fatal Accidents										
Training	2	5	2	2	2	1	3	4	0	4
Pleasure/Travel	16	11	14	12	10	11	15	10	12	11
Business	2	2	3	3	4	0	0	0	0	1
Test/Demonstration/Ferry	1	2	1	1	2	3	0	0	1	1
Aerial Application	0	0	1	2	0	0	1	0	0	0
Fire Fighting/Fire Management	1	0	0	0	1	0	1	0	0	0
Survey/Inspection	1	0	1	0	0	2	0	0	2	1
Air Ambulance	0	0	0	0	1	0	0	0	0	0
Air Transport	6	4	5	4	4	5	4	3	7	5
Sightseeing	0	0	0	1	0	1	0	0	0	0
Other/Unknown	0	1	1	1	1	0	2	1	0	0
Total	29	25	28	26	25	23	26	18	22	23
Helicopters Involved in Accidents										
Training	9	5	6	11	11	9	6	4	3	2
Pleasure/Travel	6	0	0	3	4	2	1	5	11	4
Business	2	5	1	1	4	6	1	0	1	0
Test/Demonstration/Ferry	4	0	3	4	1	5	0	2	0	2
Aerial Application	0	1	1	2	1	1	2	1	2	0
Fire Fighting/Fire Management	2	10	7	2	2	6	6	4	1	3
Survey/Inspection	5	7	4	4	0	3	8	2	1	1
Air Ambulance	0	1	0	0	1	0	0	0	1	0
Air Transport	15	14	10	11	12	14	11	16	19	29
Sightseeing	0	0	1	0	0	0	0	0	0	0
Other/Unknown	13	14	13	15	10	10	9	7	11	15
Total	56	57	46	53	46	56	44	41	50	56
Helicopters Involved in Fatal Accidents										
Training	0	0	0	2	1	0	0	0	0	0
Pleasure/Travel	0	0	0	1	2	0	0	1	5	0
Business	0	3	0	0	0	1	0	0	1	0
Test/Demonstration/Ferry	1	0	0	1	1	2	0	0	0	1
Aerial Application	0	0	0	0	0	0	0	0	0	0
Fire Fighting/Fire Management	1	0	0	0	0	0	1	0	0	2
Survey/Inspection	1	0	0	1	0	0	1	1	0	0
Air Ambulance	0	0	0	0	0	0	0	0	0	0
Air Transport	3	2	1	1	1	0	0	2	3	2
Sightseeing	0	0	1	0	0	0	0	0	0	0
Other/Unknown	2	1	2	5	1	3	1	0	1	4
Total	8	6	4	11	6	6	3	4	10	9

Figures are preliminary as of 07 December 2007.

Table 9
Incidents Involving Canadian-Registered Aircraft by Incident Type
1997–2006

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Incidents										
Risk of Collision/Loss of Separation	185	149	142	130	170	169	123	182	150	150
Declared Emergency	157	183	173	174	208	231	229	204	152	184
Engine Failure	115	133	121	129	157	134	104	118	116	106
Smoke/Fire	46	86	71	71	92	83	82	81	85	86
Collision	7	3	7	8	17	19	16	21	8	18
Control Difficulties	13	28	18	25	28	28	41	41	41	31
Crew Unable to Perform Duties	13	8	17	15	13	37	48	51	67	56
Dangerous Goods-Related	4	3	3	2	6	0	2	0	1	2
Depressurization	12	19	6	4	15	18	17	7	12	9
Fuel Shortage	2	6	7	1	2	1	6	10	5	6
Failure to Remain in Landing Area	9	8	10	13	4	6	3	10	10	6
Incorrect Fuel	0	0	0	0	0	1	0	2	1	1
Slung Load Released	2	1	5	6	8	3	4	5	1	3
Transmission or Gearbox Failure	1	1	3	2	2	2	1	2	1	0
Total¹	566	628	583	580	722	732	676	734	650	658

1 Incidents involving Canadian-registered aircraft only; Table 1 includes those involving foreign aircraft
Figures are preliminary as of 07 December 2007.

Table 10
Canadian-Registered Aircraft Involved in Incidents
Selected Incident Types vs. First Event
2002–2006

Incident Type	First Event	
Risk of Collision/ Loss of Separation	Air Proximity	348
	ATS-Related Event	722
1251 Aircraft Involved	Altitude-Related Event	34
	Runway Incursion	63
	Other	84
Declared Emergency	Landing Gear Failure	180
1000 Aircraft Involved	Hydraulic Failure	133
	Electrical Failure	38
	Other Component Failure	356
	Other	293
Engine Failure	Power Loss – First Engine	250
578 Aircraft Involved	Component Failure	286
	Other	42
Smoke/Fire	Fire/Explosion	305
417 Aircraft Involved	Component Failure	105
	Other	7
Control Difficulties	Component Failure	74
184 Aircraft Involved	Weather-Related Event	51
	Other	59

Figures are preliminary as of 07 December 2007.

APPENDIX B – DEFINITIONS

The following definitions apply to aviation occurrences that are required to be reported pursuant to the *Canadian Transportation Accident Investigation and Safety Board Act* and the associated regulations.

Aviation Occurrence

- a) Any accident or incident associated with the operation of an aircraft; and
- b) Any situation or condition that the Board has reasonable grounds to believe could, if left unattended, induce an accident or incident described in a) above.

Reportable Aviation Accident

An accident resulting directly from the operation of an aircraft where

- a) a person sustains a serious injury or is killed as a result of
 - i) being on board the aircraft;
 - ii) coming into contact with any part of the aircraft or its contents; or
 - iii) being directly exposed to the jet blast or rotor downwash of the aircraft;
- b) the aircraft sustains damage that adversely affects the structural strength, performance or flight characteristics of the aircraft and that requires major repair or replacement of any affected component part; or
- c) the aircraft is missing or inaccessible.

Reportable Aviation Incident

An incident resulting directly from the operation of an aeroplane having a maximum certificated take-off weight (MCTOW) greater than 5700 kg, or from the operation of a rotorcraft having a MCTOW greater than 2250 kg, where

- a) an engine fails or is shut down as a precautionary measure;
- b) a transmission gearbox malfunction occurs;
- c) smoke or fire occurs;
- d) difficulties in controlling the aircraft are encountered owing to any aircraft system malfunction, weather phenomena, wake turbulence, uncontrolled vibrations or operations outside the flight envelope;
- e) the aircraft fails to remain within the intended landing or take-off area, lands with all or part of the landing gear retracted, or drags a wing tip, an engine pod, or any other part of the aircraft;
- f) any crew member whose duties are directly related to the safe operation of the aircraft is unable to perform the crew member's duties as a result of physical incapacitation that poses a threat to the safety of any person, property, or the environment;
- g) depressurization occurs that necessitates an emergency descent;
- h) a fuel shortage occurs that necessitates a diversion or requires approach and landing priority at the destination of the aircraft;

- i) the aircraft is refuelled with the incorrect type of fuel or contaminated fuel;
- j) a collision, risk of collision, or loss of separation occurs;
- k) a crew member declares an emergency or indicates any degree of emergency that requires priority handling by an air traffic control unit or the standing by of emergency response services;
- l) a slung load is released unintentionally or as a precautionary or emergency measure from the aircraft; or
- m) any dangerous goods are released in or from the aircraft.

Serious Injury

An injury that is sustained by a person in an accident and that

- a) requires hospitalization for more than 48 hours, commencing within seven days of the date the injury was received; or
- b) results in a fracture of any bone (except simple fractures of fingers, toes or nose); or
- c) involves lacerations that cause severe haemorrhage or nerve, muscle or tendon damage; or
- d) involves injury to any internal organ; or
- e) involves second- or third-degree burns, or any burns affecting more than 5% of the body surface; or
- f) involves verified exposure to infectious substances or injurious radiation.

ATS-Related Event

Any event related to the provision of air traffic control services including, but not limited to, failure or inability to provide service, emergency handling, or loss of in-flight separation.

Air Proximity Event

A situation in which, in the opinion of a pilot or air traffic services personnel, the distance between aircraft as well as their positions and speed have been such that the safety of the aircraft involved may have been compromised.

Commercial Operators

Commercial operators include carriers that offer a “for-hire” service to transport people or goods, or to undertake specific tasks such as aerial photography, flight training, or crop spraying.

Airliner

An aeroplane used by a Canadian air operator in an air transport service or in aerial work involving sightseeing operations, that has a MCTOW of more than 8618 kg (19 000 pounds) or for which a Canadian type certificate has been issued authorizing the transport of 20 or more passengers.

Commuter Aircraft

An aeroplane used by a Canadian air operator, in an air transport service or in aerial work involving sightseeing operations, in which the aircraft is:

- a) a multi-engined aircraft that has a MCTOW of 8618 kg (19 000 pounds) or less and a seating configuration, excluding pilot seats, of 10 to 19 inclusive;
- b) a turbo-jet-powered aeroplane that has a maximum zero fuel weight of 22 680 kg (50 000 pounds) or less and for which a Canadian type certificate has been issued authorizing the transport of not more than 19 passengers.

Aerial Work Aircraft

A commercially operated aeroplane or helicopter used in aerial work involving

- a) the carriage on board of persons other than flight crew members;
- b) the carriage of helicopter external loads;
- c) the towing of objects; or
- d) the dispersal of products.

Air Taxi Aircraft

A commercially operated aircraft used in an air transport service or in aerial work involving sightseeing operations, in which the aircraft is:

- a) a single-engined aircraft;
- b) a multi-engined aircraft, other than a turbo-jet-powered aeroplane, that has a MCTOW of 8618 kg (19 000 pounds) or less and a seating configuration, excluding pilot seats, of nine or less; or
- c) any aircraft that is authorized by the Minister of Transport to be operated under Part VII, Subpart 3, Division 1 of the *Canadian Aviation Regulations* (CARs).

State Operators

State operators include the federal and provincial governments.

Corporate Operators

Corporate operators include companies flying for business reasons.

Private Operators

Private operators include individuals flying for pleasure. Included are flights on which it is not possible to transport people or cargo on a “for-hire” basis.