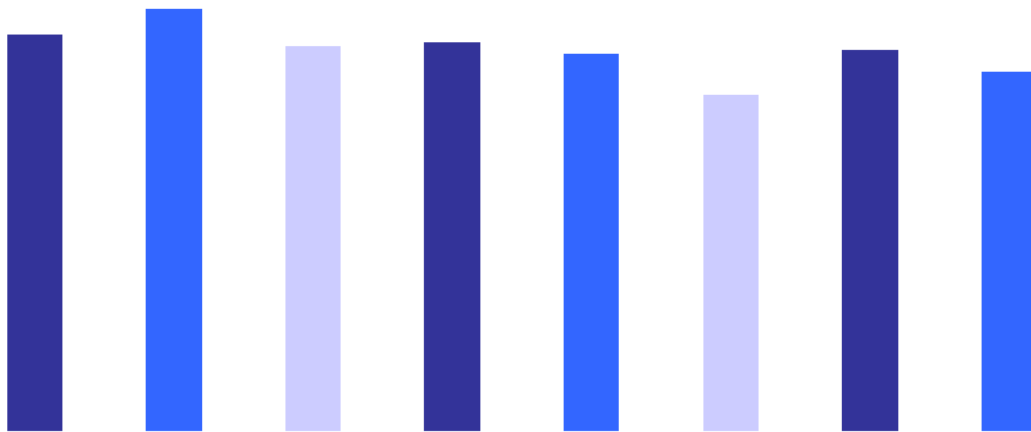




Statistical Summary Aviation Occurrences 2013



Foreword

This document provides Canadians with an annual summary of selected aviation safety data. The TSB gathers and uses this data during the course of our investigations to analyse safety deficiencies and identify risks in the Canadian transportation system.

The 2013 data were collected according to the reporting requirements described in the TSB Regulations in force during that calendar year. On March 12, 2014, the TSB issued new regulations that change the reporting requirements effective July 1, 2014. These changes will be reflected only in the 2014 Statistical Summary.

Information in this summary is also posted on the Transportation Safety Board of Canada (TSB) web site at www.bst-tsb.gc.ca.

Users of these statistics are advised that, in a live database, the occurrence data are constantly being updated. Consequently, the statistics may change slightly over time. Further, as many occurrences are not formally investigated, information recorded for some occurrences may not have been verified. Therefore, caution should be used when utilizing these statistics. The 2013 statistics presented here reflect the TSB database updated as of 24 January 2014.

To enhance awareness and increase the safety value of the material presented in the TSB *Statistical Summary, Aviation Occurrences 2013*, 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.

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Cat. No. TU1-3/2013E

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AVIATION OCCURRENCES IN 2013

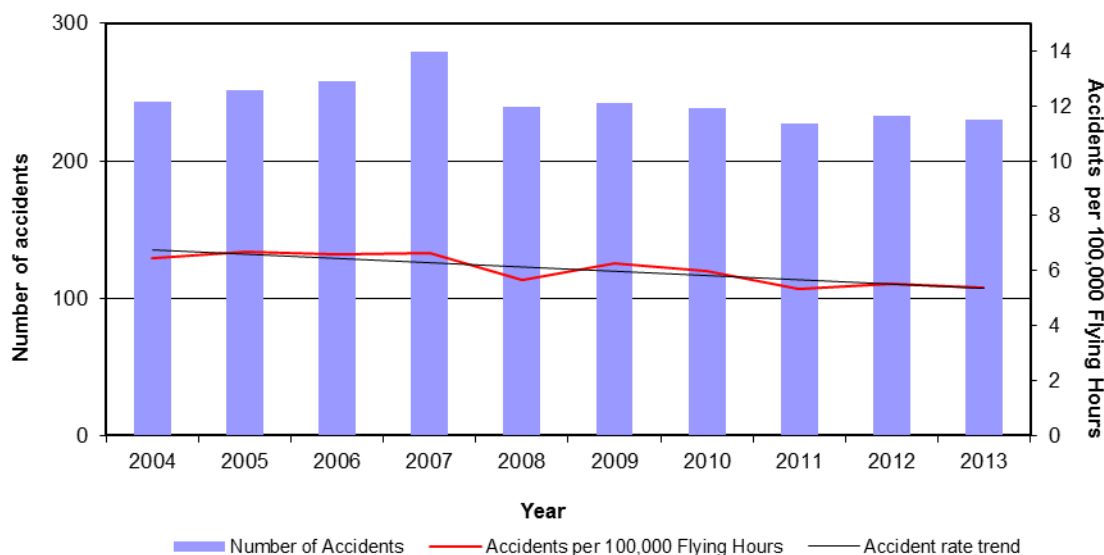
ACCIDENTS

Overview of Accidents and Fatalities (Tables 1, 2, 3a, 3b and 6)

In 2013, a total of 275 aviation accidents were reported to the TSB, a 5% decrease from the 2012 total of 291 and a 4% decrease from the 5-year average of 285. Of the total, 242 involved Canadian-registered aircraft (excluding ultra-lights)¹, similar to 2012 (Figure 1), and unchanged from the 5-year average of 243.

The 2013 estimate of flying activity is 4,261,000 hours, and the accident rate for Canadian-registered aircraft decreased from the 2012 accident rate of 5.5 accidents per 100 000 flying hours to 5.4. Analysis using linear regression indicates a statistically significant downward trend in accident rates ($p < .01$)² over the 10-year period from 2004 to 2013 (Figure 1). Similarly, the 2013 accident rate of 3.9 accidents per 100 000 aircraft movements decreased from the 2012 rate of 4.2 accidents per 100 000 aircraft movements, and that rate has also trended significantly downward ($p < .05$) over the same 10-year period.

Figure 1 – Accidents and accident rates, 2004–2013



The 242 accidents involving Canadian-registered aircraft included 203 accidents involving aeroplanes³ (39 accidents involved commercially operated aeroplanes) and 27 accidents involving helicopters. The remaining 13 accidents involved gliders, gyrocopters, balloons, or rotary-wing UAS (unmanned aircraft systems).

¹ Ultra-light accidents will be presented separately in all subsequent discussion of occurrences involving Canadian-registered aircraft.

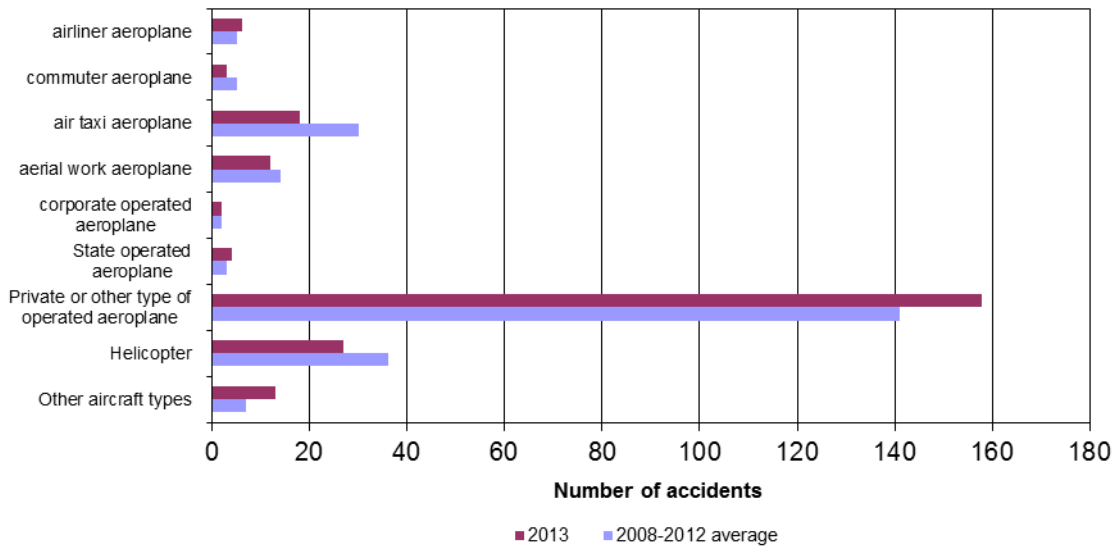
² It is agreed by convention that, for a result to be considered statistically significant, its probability must be lower than 1 in 20 (that is, $p < .05$).

³ As some occurrences involve more than one aircraft, readers are cautioned to note differences between the number of occurrences and the number of aircraft involved in occurrences. All tables except Table 1 exclude ultra-light aircraft; all tables except Tables 1 and 4 also exclude balloons, gliders, gyrocopters, and UAS.

Of the 39 accidents involving Canadian-registered commercial aeroplanes (6 airliners, 3 commuter aircraft, 18 air taxi and 12 aerial work) in 2013 (Figure 2), 7 resulted in fatalities. Five fatal accidents involved air taxis, one fatal accident involved a commuter aircraft, and one fatal accident involved aerial work.

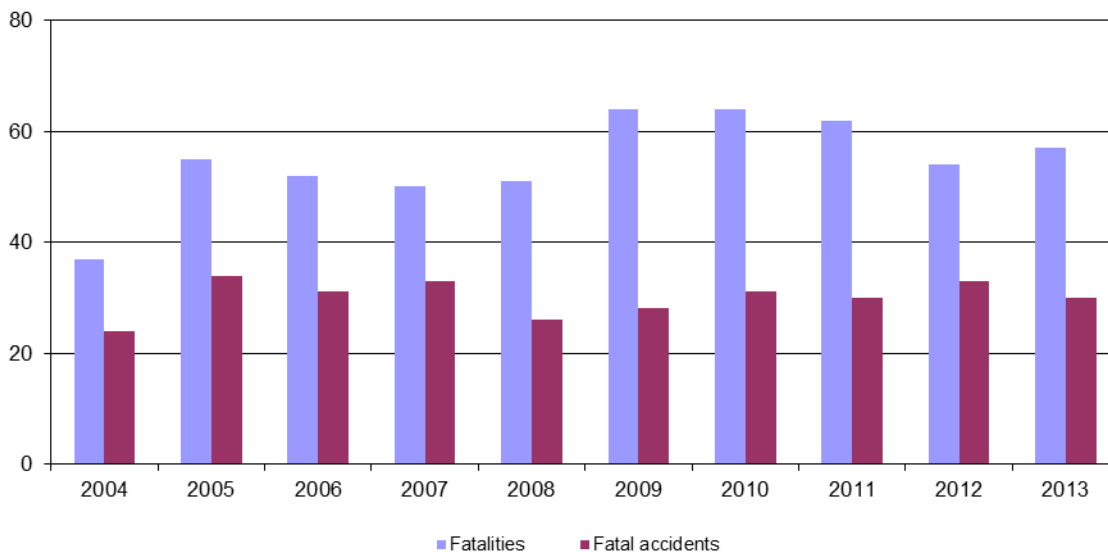
A total of 158 accidents involved Canadian-registered private/other aeroplanes, 12% higher than the 5-year average of 141. In 2013, 14 such accidents resulted in fatalities, down from 19 in 2012, but unchanged from the 5-year average of 14.

Figure 2 – Accidents involving Canadian-registered aircraft, by aircraft type, 2013



In 2013, 30 fatal accidents involved Canadian-registered aircraft other than ultra-lights (Figure 3), slightly lower than the 2012 total of 33 but unchanged from the 5-year average of 30. The number of fatalities (57), while up from the 2012 total of 54, was slightly lower than the 5-year average of 59, and the number of serious injuries (19) was substantially lower than the 2012 total of 39 and the 5-year average of 36.

Figure 3 – Fatalities and fatal accidents, 2004-2013



In 2013, for all reportable accidents, crew fatalities accounted for 67% of aircraft fatalities, passenger fatalities accounted for 30%, and ground fatalities accounted for 3%.

In 2013, 27 accidents involved Canadian-registered helicopters, yielding a 24% decrease from the 5-year average of 36. Six of those accidents were fatal, resulting in 12 fatalities. Over the past 10 years, the highest proportion of helicopter accidents occurred during air transport operations (39%), pleasure/travel (15%), and training (7%).

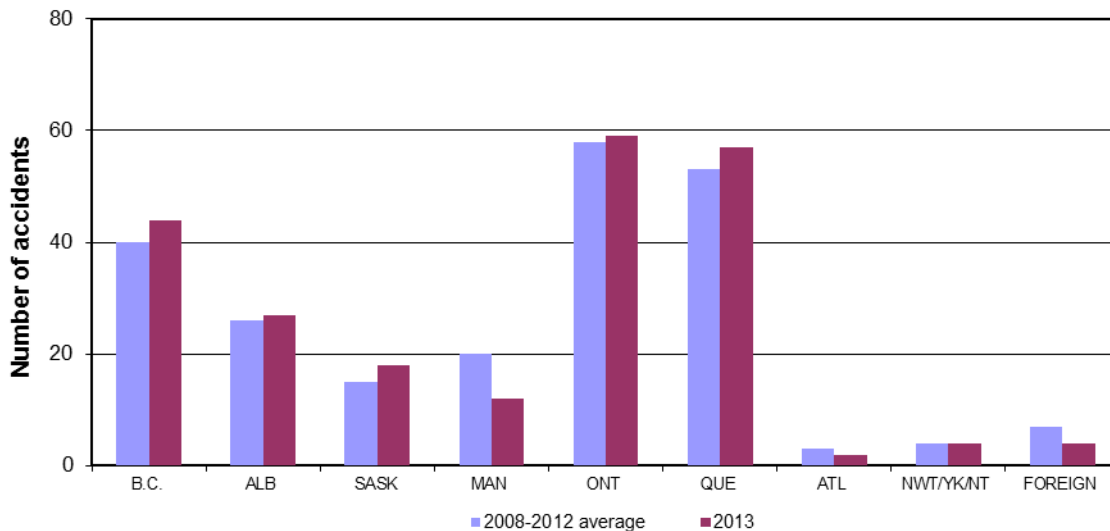
In 2013, 23 accidents in Canada involved Canadian-registered ultra-light aircraft, a 21% decrease from the 5-year average of 29. Four of these were fatal accidents resulting in 4 fatalities.

In 2013, 10 accidents involved foreign-registered aircraft in Canada, with 2 fatal accidents resulting in 2 fatalities.

Accidents by Selected Categories

Province (Table 8): In 2013, Quebec and Ontario each accounted for 24% of Canadian-registered aircraft accidents, and British Columbia accounted for 18%, all approximately proportional to the number of registered aircraft in those provinces⁴. In five of the six most populous provinces (Ontario, Quebec, British Columbia, Alberta, and Saskatchewan), the total Canadian-registered aircraft accidents were slightly higher than the 5-year average (Figure 4).

Figure 4 – Accidents involving Canadian-registered aircraft, by province, 2013



Accident Events and Phases (Tables 11 and 12): Accidents may be analyzed in more detail by examining the nature and distribution of selected events contributing to an occurrence. Tables 11 and 12 show counts of accidents involving selected event types within each phase of flight.

Although a single accident may involve more than one event within a phase, that accident is only counted once in the phase total. Therefore, the total of events within a phase will not sum to phase event totals. For example, in the "take-off" phase, if an occurrence involves both "loss of control" and "power loss" events, the occurrence is counted in each event category, but only once in the phase total. As well, approximately 5% of aeroplane accidents and 25% of helicopter accidents involve events in more than one phase of flight (not including "post-impact"), so the accidents shown in Figure 5 and Figure 6 sum to more than the total of accidents.

⁴ Transport Canada Canadian Civil Aircraft Registry

In 2013, the distribution was similar to that of 2012. The greatest numbers of aeroplane accidents were associated with landing (55%) and take-off (19%) phases of flight, followed by en route (16%) and approach (15%) phases. The greatest numbers of helicopter accidents were associated with landing (44%), takeoff (26%), and manoeuvring⁵ (26%) phases of flight, followed by en route (19%) and approach (11%) phases. The figures below show the distribution of accidents per phase of flight for the period 2004-2013.

Figure 5 - Aeroplane accidents by event phase of flight, 2004-2013

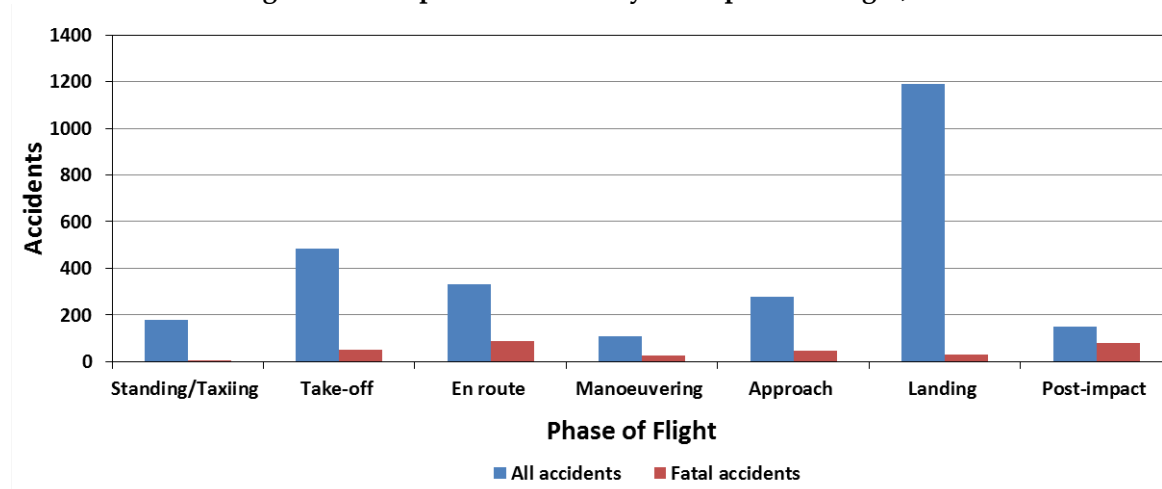
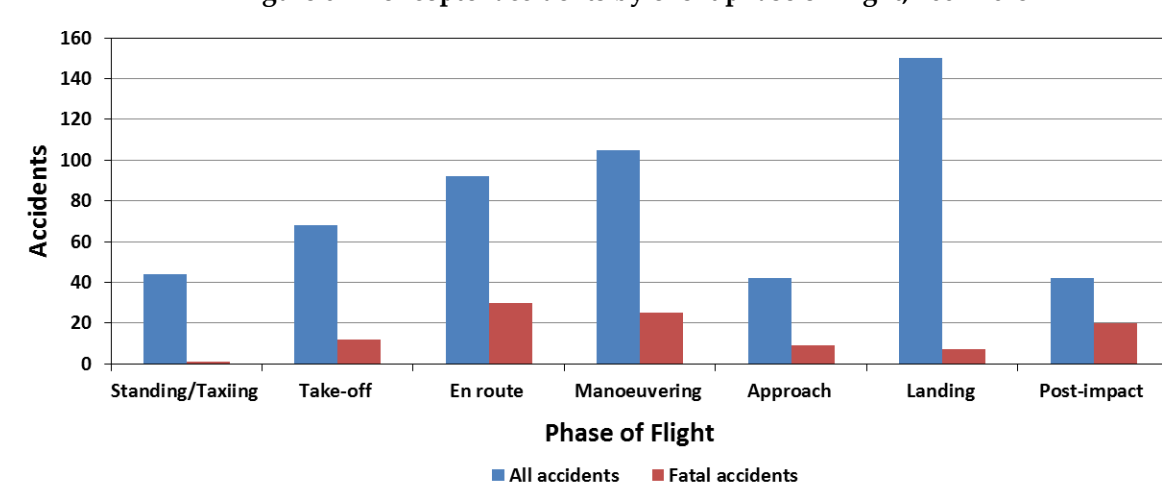


Figure 6 - Helicopter accidents by event phase of flight, 2004-2013



From 2004 to 2013, of the 1192 **aeroplane accidents** with landing phase events, 26% involved missing or going off the runway, 21% involved collision with object, 18% involved landing gear collapse or retraction, and 18% involved a nosedown or overturning event. Of the 485 aeroplane accidents with take-off phase events, 30% involved collision with terrain, 29% involved collision with object, and 27% involved loss of control.

Collision with terrain was the predominant event in **fatal aeroplane accidents** from 2004 to 2013. Collision with terrain was involved in 62% of the 50 fatal aeroplane accidents with takeoff phase events, 68% of 87 fatal aeroplane accidents with en route phase events, 72% of 25 fatal aeroplane accidents with manoeuvring phase events, 70% of 46 fatal aeroplane accidents with approach phase events, and 50% of 30 fatal aeroplane accidents with landing phase events.

⁵ Manoeuvring (i.e., low altitude/aerobatic flight operations) does not occur on all flights.

From 2004 to 2013, of the 150 **helicopter accidents** with landing phase events, 27% involved a hard landing, 23% involved a collision with object, 20% involved loss of control, and 19% involved collision with terrain. Of the 105 helicopter accidents with manoeuvring phase events, 50% involved collision with terrain, 27% involved loss of control, and 26% involved collision with object.

Collision with terrain was also the predominant event in **fatal helicopter accidents** from 2004 to 2013. Collision with terrain was involved in 9 of 12 fatal helicopter accidents with takeoff phase events, 21 of 30 fatal helicopter accidents with en route phase events, 17 of 25 fatal helicopter accidents with manoeuvring phase events, 4 of 9 fatal helicopter accidents with approach phase events, and 6 of 7 fatal helicopter accidents with landing phase events.

Operation Type (Table 6): In 2013, aeroplane accidents occurred mainly on recreational flights (62%), followed by air transport (12%) and training flights (12%). Helicopter accidents occurred mainly on air transport flights (30%) and forest fire management flights (11%).

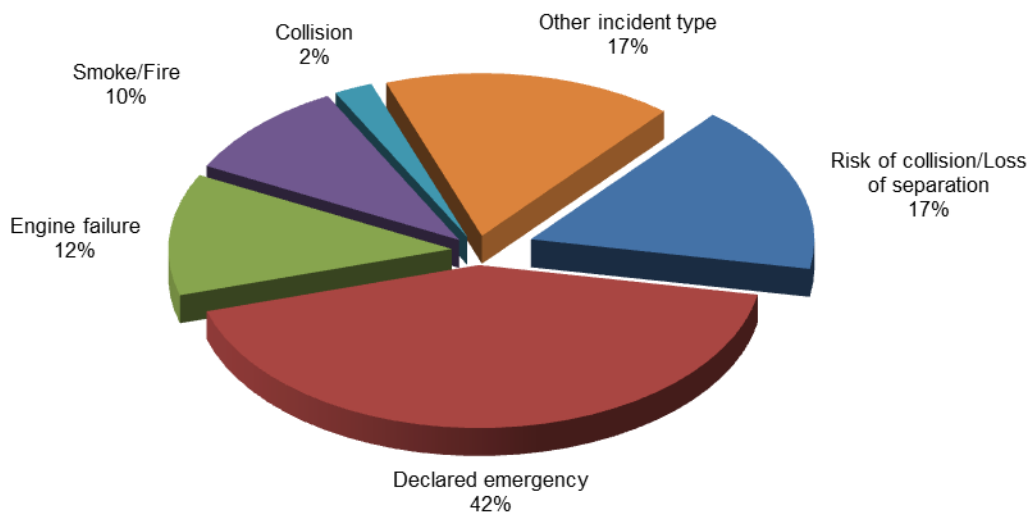
INCIDENTS

Overview of Incidents (Tables 1, 9 and 10)

Pursuant to TSB mandatory incident reporting requirements, 685 incidents were reported in 2013, with 578 involving Canadian-registered aircraft. This is an 8% increase from the 2012 total of 636, but a 10% decrease from the 5-year average of 761. Analysis using linear regression indicates a statistically significant downward trend in incidents ($p < .05$) over the 10 year period from 2004 to 2013.

In 2013, the most frequent incident types involving all Canadian-registered and foreign-registered aircraft were declared emergency (42%), risk of collision or loss of separation (17%), and engine failure (12%) (Figure 7).

Figure 7 – Reportable incidents by type, 2013



APPENDIX A – AVIATION OCCURRENCE TABLES

Table 1
Reportable aviation occurrences
2004-2013

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Accidents	308	306	303	323	294	297	288	257	291	275
Accidents in Canada involving Canadian-registered aircraft	279	283	278	300	274	271	273	240	267	261
Accidents outside Canada involving Canadian-registered aircraft	9	7	11	13	7	11	1	7	8	4
Accidents in Canada involving foreign-registered aircraft	21	18	14	10	15	15	14	10	17	10
Accidents by operator type	308	306	303	323	294	297	288	257	291	275
Commercial	87	94	105	98	95	74	86	77	73	64
Airliner (705)	3	4	7	4	6	2	6	6	5	6
Commuter (704)	1	7	4	4	5	6	7	6	5	3
Air taxi (703)	58	56	63	53	64	44	44	37	34	32
Aerial work (702)	21	26	30	34	19	20	28	27	26	21
Foreign/Other commercial type (a)	4	2	1	4	2	2	1	1	4	2
State	4	2	4	2	5	4	5	2	4	6
Corporate	6	10	3	10	4	6	2	7	6	6
Private/Other operator type (b)	213	201	191	213	191	215	195	172	208	199
Accidents by aircraft type	308	306	303	323	294	297	288	257	291	275
Aeroplane	221	218	216	243	208	223	220	201	207	211
Helicopter	41	50	56	46	44	33	31	36	40	27
Ultralight	37	31	28	30	29	35	30	17	36	24
Other aircraft type (c)	9	8	4	5	13	7	7	3	8	14
Number of aircraft involved in accidents*	314	314	311	327	300	303	290	261	296	278
Aeroplanes	225	224	223	245	214	228	222	204	211	213
Helicopters	42	51	56	47	44	33	31	36	41	27
Ultralights	38	31	28	30	29	35	30	17	36	24
Other aircraft type(c)	9	8	4	5	13	7	7	4	8	14
Fatal accidents by aircraft type	33	44	34	38	38	34	36	35	42	36
Aeroplane	20	27	24	25	16	21	28	23	25	23
Helicopter	5	10	9	6	9	8	3	8	7	6
Ultralight	6	5	1	5	12	4	3	3	8	4
Other aircraft type (c)	2	2	0	2	1	1	2	1	2	4
Fatalities	57	69	55	56	64	71	70	67	63	63
Serious injuries	37	61	53	65	50	45	36	44	49	22
Accidents in Canada involving foreign-registered aircraft	21	18	14	10	15	15	14	10	17	10
Fatal accidents	3	6	2	0	0	2	2	2	1	2
Fatalities	10	10	2	0	0	2	2	2	1	2
Serious injuries	3	15	1	2	5	3	1	1	4	0
Incidents (d)	865	796	807	874	887	789	815	677	636	685
Incidents in Canada involving Canadian-registered aircraft	645	571	580	622	651	591	583	520	481	539
Incidents outside Canada involving Canadian-registered aircraft	89	79	78	69	78	66	83	55	49	39
Incidents in Canada involving foreign-registered aircraft	164	184	188	224	194	155	188	127	128	126
Incidents by type (d)	865	796	807	874	887	789	815	677	636	685
Risk of collision/Loss of separation	216	174	168	168	172	153	206	120	101	115
Declared emergency	264	222	260	298	314	312	310	275	260	291
Engine failure	134	139	130	129	120	107	87	95	90	83
Smoke/Fire	90	99	102	123	107	97	81	88	71	67
Collision	21	12	21	13	8	9	4	7	5	15
Other incident type	140	150	126	143	166	111	127	92	109	114

Data extracted January 24, 2014.

Accidents and reportable incidents are reported in accordance with the TSB's regulations for mandatory reporting of occurrences.

Breakdowns may not add up to totals. For example, in the total "Accidents by aircraft type", when an occurrence involves an airplane and a helicopter, the occurrence is counted in each category, but only once in the total.

* "Number of aircraft involved in accidents" are aircraft counts, all other data are accident counts.

a. The commercial service type is not available for foreign-registered aircraft.

b. Other operator type contains, but is not limited to, organizations that rent aircraft (i.e., flying schools, flying clubs, etc.).

c. Includes balloons, gyroplanes, gliders, dirigibles, hang gliders and similar aircraft types.

d. Reportable incidents include aeroplanes having a maximum certificated take-off weight (MCTOW) greater than 5700 kg, and rotorcraft having a MCTOW greater than 2250 kg.

Table 2
Occurrences involving Canadian-registered aircraft
2004-2013

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Accidents by aircraft and operator type (a)	252	259	262	284	252	249	244	230	239	242
Aeroplane accidents	203	203	202	234	197	210	209	192	193	203
Commercial	53	57	54	58	63	54	57	49	45	39
Airliner (705)	3	4	7	4	6	2	6	5	5	6
Commuter (704)	1	6	4	4	5	5	6	4	5	3
Air taxi (703)	41	33	30	39	41	36	28	26	20	18
Aerial work (702)	8	14	13	11	12	10	17	14	15	12
Other commercial type	0	0	0	0	0	1	0	0	0	0
State	2	1	4	1	3	2	3	2	2	2
Corporate	4	6	2	7	4	4	2	4	3	4
Private/Other operator type (b)	145	139	142	168	127	152	147	138	143	158
Helicopter accidents	40	49	56	45	42	32	29	35	40	27
Commercial	31	35	50	34	28	19	27	26	27	22
State	1	1	0	1	0	0	0	0	2	1
Corporate	0	0	0	3	0	1	0	1	1	0
Private/Other operator type (b)	8	13	6	7	14	12	2	8	10	4
Other aircraft type (c)	9	8	4	5	13	7	6	3	6	13
Fatal accidents by aircraft and operator type (a)	24	34	31	33	26	28	31	30	33	30
Aeroplane accidents	18	22	22	25	16	20	27	21	25	22
Commercial	3	9	6	7	3	5	12	10	6	7
Airliner (705)	0	0	0	0	0	0	0	1	0	0
Commuter (704)	0	1	0	1	0	0	1	1	1	1
Air taxi (703)	3	6	5	5	3	5	7	6	3	5
Aerial work (702)	0	2	1	1	0	0	4	2	2	1
Other commercial type	0	0	0	0	0	0	0	0	0	0
State	0	0	1	0	0	0	0	0	0	0
Corporate	0	0	0	1	2	0	0	0	0	1
Private/Other operator type (b)	15	13	15	17	11	15	15	11	19	14
Helicopter accidents	4	10	9	6	9	7	3	8	7	6
Other aircraft type (c)	2	2	0	2	1	1	1	1	1	3
Fatalities (a)	37	55	52	50	51	64	64	62	54	57
Serious injuries (a)	27	37	40	56	40	34	31	38	39	19
Incidents by type (d)	734	650	658	691	729	657	666	575	530	578
Risk of collision/Loss of separation	182	150	150	152	149	137	179	105	92	105
Declared emergency	204	152	184	186	235	236	238	224	200	231
Engine failure	118	116	106	108	98	94	67	87	77	70
Smoke/Fire	81	85	86	106	90	84	70	67	59	55
Collision	21	8	18	9	7	7	3	7	4	14
Other incident type	128	139	114	130	150	99	109	85	98	103
Accidents involving ultralight aircraft	36	31	28	30	29	34	30	17	36	23
Fatal accidents	6	5	1	5	12	4	3	3	8	4
Fatalities	10	6	1	6	13	5	4	3	8	4
Serious injuries	7	9	12	7	5	8	4	5	6	3

Data extracted January 24, 2014.

Accidents and reportable incidents are reported in accordance with the TSB's regulations for mandatory reporting of occurrences. Breakdowns may not add up to totals. For example, in the total "Number of accidents by aircraft type", when an occurrence involves an airplane and a helicopter, the occurrence is counted in each category, but only once in the total.

a. Accidents involving Canadian-registered aircraft, excluding ultralights.

b. Other operator type contains, but is not limited to, organizations that rent aircraft (i.e. flying schools, flying clubs, etc.).

c. Includes balloons, gyroplanes, gliders, dirigibles, hang gliders and similar aircraft types.

d. Reportable incidents include aeroplanes having a maximum certificated take-off weight (MCTOW) greater than 5700 kg, and rotorcraft having a MCTOW greater than 2250 kg.

Table 3a**Accident rates involving Canadian-registered aircraft (per hours flown, excluding ultralights and other aircraft types)
2004-2013**

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Accidents	243	251	258	279	239	242	238	227	233	230
Fatal accidents	22	32	31	31	25	27	30	29	32	28
Fatalities	35	52	52	47	50	63	63	60	53	55
Hours flown (thousands) (a)	3,751	3,753	3,917	4,198	4,236	3,859	3,974	4,262	4,204	4,261
Accidents per 100,000 hours	6.5	6.7	6.6	6.6	5.6	6.3	6.0	5.3	5.5	5.4
Fatal accidents per 100,000 hours	0.6	0.9	0.8	0.7	0.6	0.7	0.8	0.7	0.8	0.7
Fatalities per 100,000 hours	0.9	1.4	1.3	1.1	1.2	1.6	1.6	1.4	1.3	1.3

Data extracted January 24, 2014.

Accidents are reported in accordance with the TSB's regulations for mandatory reporting of occurrences.

Canadian-registered aircraft, excluding ultralights, balloons, gyroplanes, gliders, dirigibles, hang gliders and similar aircraft types.

a. Source: Transport Canada (2012 and 2013 hours flown are estimated).

Table 3b**Aircraft accident rates in Canada (per movements, excluding ultralights and other aircraft types)
2004-2013**

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Accidents	253	260	261	277	245	246	250	230	239	234
Fatal accidents	23	36	29	30	21	28	31	30	31	26
Fatalities	43	59	49	44	43	64	64	61	52	50
Aircraft movements (thousands) (a)	5,732	5,730	5,842	6,300	6,339	6,033	5,883	5,720	5,715	6,003
Accidents per 100,000 aircraft movements	4.4	4.5	4.5	4.4	3.9	4.1	4.2	4.0	4.2	3.9
Fatal accidents per 100,000 aircraft movements	0.4	0.6	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.4
Fatalities per 100,000 aircraft movements	0.8	1.0	0.8	0.7	0.7	1.1	1.1	1.1	0.9	0.8

Data extracted January 24, 2014.

Accidents are reported in accordance with the TSB's regulations for mandatory reporting of occurrences.

Excluding ultralights, balloons, gyroplanes, gliders, dirigibles, hang gliders and similar aircraft types.

a. Source: Statistics Canada (CANSIM Tables 401-0008, 401-0015, 401-0021).

Table 4
Aircraft accident fatalities
2004-2013

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Fatalities	57	69	55	56	64	71	70	67	63	63
Fatalities in Canada involving Canadian-registered aircraft	45	60	48	53	57	67	68	64	61	55
Fatalities outside Canada involving Canadian-registered aircraft	2	1	5	3	7	2	0	1	1	6
Fatalities in Canada involving foreign-registered aircraft	10	10	2	0	0	2	2	2	1	2
Fatalities by operator type	57	69	55	56	64	71	70	67	63	63
Commercial	25	26	28	19	25	36	36	38	17	28
Airliner (705)	0	0	0	0	0	0	0	12	0	0
Commuter (704)	0	2	0	1	0	17	1	2	1	5
Air taxi (703)	18	17	18	10	20	18	28	16	12	19
Aerial work (702)	0	7	10	9	5	1	7	8	3	4
Foreign/Other commercial type (a)	7	0	0	0	0	0	0	0	1	0
State	0	0	1	0	0	0	0	0	1	0
Corporate	0	1	0	1	7	0	0	2	0	1
Private/Other operator type (b)	32	42	26	36	32	35	34	27	45	34
Crew fatalities by operator type	37	44	32	37	35	35	39	37	40	42
Commercial	11	15	12	12	8	10	17	18	10	20
Airliner (705)	0	0	0	0	0	0	0	4	0	0
Commuter (704)	0	2	0	0	0	2	1	2	0	2
Air taxi (703)	4	9	5	7	6	7	11	7	7	14
Aerial work (702)	0	4	7	6	2	1	5	5	2	4
Foreign/Other commercial type (a)	7	0	0	0	0	0	0	0	1	0
State	0	0	1	0	0	0	0	0	1	0
Corporate	0	1	0	1	2	0	0	2	0	1
Private/Other operator type (b)	26	28	19	24	25	25	22	17	29	21
Passenger fatalities by operator type	20	25	22	19	28	36	30	29	22	19
Commercial	14	11	15	7	16	26	18	20	6	8
Airliner (705)	0	0	0	0	0	0	0	8	0	0
Commuter (704)	0	0	0	1	0	15	0	0	1	3
Air taxi (703)	14	8	12	3	14	11	16	9	5	5
Aerial work (702)	0	3	3	3	2	0	2	3	0	0
Foreign/Other commercial type (a)	0	0	0	0	0	0	0	0	0	0
State	0	0	0	0	0	0	0	0	0	0
Corporate	0	0	0	0	5	0	0	0	0	0
Private/Other operator type (b)	6	14	7	12	7	10	12	9	16	11
Ground fatalities	0	0	1	0	1	0	1	1	1	2
Fatalities by aircraft type	57	69	55	56	64	71	70	67	63	63
Aeroplane	40	45	42	39	34	38	57	47	44	44
Helicopter	5	15	12	8	16	27	7	15	9	12
Ultralight	10	6	1	6	13	5	4	3	8	4
Other aircraft type (c)	2	3	0	3	1	1	2	2	2	7

Data extracted January 24, 2014.

Accidents are reported in accordance with the TSB's regulations for mandatory reporting of occurrences.

Breakdowns may not add up to totals. For example, in the total "Fatalities by aircraft type", when an occurrence involves an airplane and a helicopter, a fatality is counted in each category, but only once in the total.

a. The commercial service type is not available for foreign-registered aircraft.

b. Other operator type contains, but is not limited to, organizations that rent aircraft (i.e., flying schools, flying clubs, etc.).

c. Includes balloons, gyroplanes, gliders, dirigibles, hang gliders and similar aircraft types.

Table 5
Aircraft accident serious injuries
2004-2013

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Serious injuries	37	61	53	65	50	45	36	44	49	22
Serious injuries in Canada involving Canadian-registered aircraft	34	45	51	61	45	41	35	34	40	22
Serious injuries outside Canada involving Canadian-registered aircraft	0	1	1	2	0	1	0	9	5	0
Serious injuries in Canada involving foreign-registered aircraft	3	15	1	2	5	3	1	1	4	0
Serious injuries by operator type	37	61	53	65	50	45	36	44	49	22
Commercial	14	24	20	30	24	11	16	26	20	11
Airliner (705)	0	1	1	0	1	1	1	10	1	0
Commuter (704)	0	0	0	1	2	1	4	2	2	2
Air taxi (703)	10	4	16	15	18	6	7	9	15	6
Aerial work (702)	2	7	2	14	3	3	4	5	1	3
Foreign/Other commercial type (a)	2	12	1	0	0	0	0	0	1	0
State	0	1	2	3	0	2	1	0	0	0
Corporate	0	4	0	1	0	3	0	0	0	0
Private/Other operator type (b)	23	33	31	31	26	29	19	18	29	11
Crew serious injuries by operator type	26	37	28	30	25	26	22	18	25	13
Commercial	8	11	9	10	11	5	6	6	5	4
Airliner (705)	0	1	1	0	0	0	0	0	0	0
Commuter (704)	0	0	0	1	0	0	1	0	2	0
Air taxi (703)	4	2	6	3	9	2	2	2	1	2
Aerial work (702)	2	6	2	6	2	3	3	4	1	2
Foreign/Other commercial type (a)	2	2	0	0	0	0	0	0	1	0
State	0	1	1	1	0	1	1	0	0	0
Corporate	0	2	0	0	0	2	0	0	0	0
Private/Other operator type (b)	18	23	18	19	14	18	15	12	20	9
Passenger serious injuries by operator type	9	22	23	32	25	19	13	25	23	8
Commercial	5	11	10	20	13	6	10	19	14	6
Airliner (705)	0	0	0	0	1	1	1	10	0	0
Commuter (704)	0	0	0	0	2	1	3	2	0	2
Air taxi (703)	5	1	9	12	9	4	5	7	14	4
Aerial work (702)	0	0	0	8	1	0	1	0	0	0
Foreign/Other commercial type (a)	0	10	1	0	0	0	0	0	0	0
State	0	0	1	2	0	1	0	0	0	0
Corporate	0	1	0	1	0	1	0	0	0	0
Private/Other operator type (b)	4	10	12	9	12	11	3	6	9	2
Ground serious injuries	2	2	2	3	0	0	1	1	1	1
Serious injuries by aircraft type	37	61	53	65	50	45	36	44	49	22
Aeroplane	20	41	28	32	29	24	28	31	32	13
Helicopter	6	10	9	13	14	11	3	8	7	6
Ultralight	8	9	12	7	5	8	4	5	6	3
Other aircraft type (c)	3	2	4	13	2	2	1	0	4	0

Data extracted January 24, 2014.

Accidents are reported in accordance with the TSB's regulations for mandatory reporting of occurrences.

Breakdowns may not add up to totals. For example, in the total "Serious injuries by aircraft type", when an occurrence involves an airplane and a helicopter, a serious injury is counted in each category, but only once in the total.

a. The commercial service type is not available for foreign-registered aircraft.

b. Other operator type contains, but is not limited to, organizations that rent aircraft (i.e., flying schools, flying clubs, etc.).

c. Includes balloons, gyroplanes, gliders, dirigibles, hang gliders and similar aircraft types.

Table 6
Accidents involving Canadian-registered aeroplanes and helicopters by operation type
2004-2013

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Aeroplane accidents by operation type	203	203	202	234	197	210	209	192	193	203
Training	25	16	33	33	30	43	28	28	27	24
Pleasure/Travel	118	116	96	118	83	109	108	102	109	126
Business	4	6	8	15	7	4	6	7	4	2
Forest fire management	3	2	4	0	1	3	2	1	2	3
Test/Demonstration/Ferry	7	5	6	8	4	0	6	4	4	4
Aerial application	3	6	8	8	9	4	10	4	4	7
Inspection	0	1	1	0	1	1	1	0	1	1
Air transport	35	35	37	40	46	34	37	35	28	25
Air ambulance	2	1	3	2	3	5	2	1	1	0
Sightseeing	0	2	3	1	2	2	1	2	6	1
Other/Unknown	6	14	5	9	11	8	9	10	9	11
Aeroplane fatal accidents by operation type	18	22	22	25	16	20	27	21	25	22
Training	4	0	4	3	0	1	1	1	1	2
Pleasure/Travel	10	12	11	10	8	13	14	10	16	10
Business	0	0	1	1	2	1	1	0	1	1
Forest fire management	0	0	0	0	0	0	2	0	0	0
Test/Demonstration/Ferry	0	1	1	4	1	0	0	0	1	1
Aerial application	0	0	0	1	1	0	0	0	0	1
Inspection	0	0	0	0	0	0	0	0	0	0
Air transport	3	7	5	4	3	4	7	8	4	5
Air ambulance	0	0	0	1	0	1	0	0	0	0
Sightseeing	0	0	0	1	0	0	0	1	0	0
Other/Unknown	1	2	1	0	1	0	2	1	3	2
Helicopter accidents by operation type	40	49	56	45	42	32	29	35	40	27
Training	4	3	2	3	6	5	0	2	1	1
Pleasure/Travel	5	11	4	4	9	5	2	9	8	2
Business	0	1	0	5	0	3	0	0	3	1
Forest fire management	4	1	3	0	0	4	1	2	1	3
Test/Demonstration/Ferry	2	0	2	3	0	0	1	1	0	1
Aerial application	1	2	0	2	1	0	3	1	4	0
Inspection	2	0	1	1	0	0	1	2	2	2
Air transport	15	19	29	16	22	10	15	13	9	8
Air ambulance	0	1	0	0	1	0	0	0	1	2
Sightseeing	0	0	0	0	0	1	0	0	1	0
Other/Unknown	7	11	15	12	3	4	6	5	10	7
Fatal helicopter accidents by operation type	4	10	9	6	9	7	3	8	7	6
Training	0	0	0	0	0	1	0	1	1	0
Pleasure/Travel	1	5	0	0	3	2	0	2	0	0
Business	0	1	0	1	0	0	0	0	1	0
Forest fire management	0	0	2	0	0	1	0	1	0	0
Test/Demonstration/Ferry	0	0	1	0	0	0	1	1	0	0
Aerial application	0	0	0	0	0	0	0	0	0	0
Inspection	1	0	0	1	0	0	0	1	0	1
Air transport	2	3	2	3	4	3	2	1	1	3
Air ambulance	0	0	0	0	0	0	0	0	0	1
Sightseeing	0	0	0	0	0	0	0	0	1	0
Other/Unknown	0	1	4	2	2	0	0	1	3	1

Data extracted January 24, 2014.

Accidents are reported in accordance with the TSB's regulations for mandatory reporting of occurrences.

Breakdowns may not add up to totals. For example, in the total "Airplane accidents by operation type", when an occurrence involves a Business and an Inspection airplane, the occurrence is counted in each category, but only once in the total.

Canadian-registered aircraft, excluding ultralights, balloons, gyroplanes, gliders, dirigibles, hang gliders and similar aircraft types.

Table 7
Aircraft accidents by province/territory
2004-2013

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Accidents by province/territory	308	306	303	323	294	297	288	257	291	275
Newfoundland and Labrador	5	5	4	6	7	3	3	3	5	3
Prince Edward Island	0	1	0	0	0	1	0	0	0	0
Nova Scotia	5	0	2	4	6	3	7	5	5	5
New Brunswick	8	6	3	8	1	2	5	3	3	2
Quebec	55	64	56	72	58	68	65	58	71	66
Ontario	92	73	60	81	69	74	71	63	67	72
Manitoba	12	19	21	18	27	19	27	17	18	12
Saskatchewan	13	15	19	23	19	14	18	18	9	19
Alberta	33	34	44	32	33	31	25	22	35	29
British Columbia	60	70	64	46	44	59	47	43	54	51
Yukon	7	5	4	7	7	4	3	8	8	4
Northwest Territories	7	5	5	8	8	6	9	6	5	2
Nunavut	2	2	8	5	8	2	7	4	3	5
Other air space under Canadian air traffic control	0	0	2	0	0	0	0	0	0	1
Outside Canada	9	7	11	13	7	11	1	7	8	4
Fatal accidents by province/territory	33	44	34	38	38	34	36	35	42	36
Newfoundland and Labrador	1	1	0	1	0	2	1	0	0	0
Prince Edward Island	0	0	0	0	0	1	0	0	0	0
Nova Scotia	2	0	0	1	0	0	1	1	0	1
New Brunswick	0	1	1	0	0	0	2	0	0	0
Quebec	6	10	4	6	5	10	9	5	10	5
Ontario	6	7	4	6	7	6	9	6	10	8
Manitoba	2	2	0	3	1	0	1	1	3	2
Saskatchewan	2	1	4	5	0	2	0	3	1	2
Alberta	2	5	6	3	8	1	2	4	6	4
British Columbia	8	16	9	10	10	8	7	10	9	9
Yukon	0	0	1	1	1	1	0	1	1	0
Northwest Territories	1	0	1	1	2	1	3	2	0	0
Nunavut	1	0	0	0	0	0	1	1	1	1
Other air space under Canadian air traffic control	0	0	0	0	0	0	0	0	0	1
Outside Canada	2	1	4	1	4	2	0	1	1	3
Fatalities by province/territory	57	69	55	56	64	71	70	67	63	63
Newfoundland and Labrador	1	2	0	1	0	18	2	0	0	0
Prince Edward Island	0	0	0	0	0	1	0	0	0	0
Nova Scotia	8	0	0	1	0	0	2	1	0	1
New Brunswick	0	1	1	0	0	0	2	0	0	0
Quebec	7	14	7	7	7	16	26	9	11	6
Ontario	22	11	6	7	8	12	14	9	19	18
Manitoba	2	2	0	5	1	0	1	1	4	5
Saskatchewan	2	2	4	6	0	4	0	8	5	3
Alberta	2	8	9	5	12	1	4	5	6	5
British Columbia	8	28	16	17	26	14	15	16	15	15
Yukon	0	0	1	1	1	1	0	1	1	0
Northwest Territories	2	0	6	3	2	2	3	4	0	0
Nunavut	1	0	0	0	0	0	1	12	1	1
Other air space under Canadian air traffic control	0	0	0	0	0	0	0	0	0	3
Outside Canada	2	1	5	3	7	2	0	1	1	6

Data extracted January 24, 2014.

Accidents are reported in accordance with the TSB's regulations for mandatory reporting of occurrences.

Table 8**Accidents involving Canadian-registered aircraft by province/territory (excluding ultralights)****2004-2013**

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Accidents by province/territory	252	259	262	284	252	249	244	230	239	242
Newfoundland and Labrador	5	5	3	5	5	3	3	3	5	3
Prince Edward Island	0	1	0	0	0	1	0	0	0	0
Nova Scotia	3	0	0	3	2	1	7	3	3	5
New Brunswick	5	5	2	7	1	2	4	3	3	2
Quebec	44	56	48	61	50	60	52	52	52	57
Ontario	71	57	52	71	62	61	55	56	54	59
Manitoba	12	18	17	17	24	19	25	16	15	12
Saskatchewan	13	13	18	21	18	12	18	17	8	18
Alberta	29	28	41	31	28	28	24	18	30	27
British Columbia	46	59	53	36	33	44	38	39	46	44
Yukon	6	3	4	6	7	2	3	7	7	4
Northwest Territories	7	5	5	8	8	5	8	6	5	2
Nunavut	2	2	8	5	7	1	6	3	3	4
Other air space under Canadian air traffic control	0	0	0	0	0	0	0	0	0	1
Outside Canada	9	7	11	13	7	10	1	7	8	4
Fatal accidents by province/territory	24	34	31	33	26	28	31	30	33	30
Newfoundland and Labrador	1	1	0	1	0	2	1	0	0	0
Prince Edward Island	0	0	0	0	0	1	0	0	0	0
Nova Scotia	1	0	0	0	0	0	1	0	0	1
New Brunswick	0	1	0	0	0	0	2	0	0	0
Quebec	4	9	3	4	4	8	8	5	4	3
Ontario	2	6	4	6	4	5	8	4	9	5
Manitoba	2	2	0	3	1	0	1	1	3	2
Saskatchewan	2	0	3	4	0	1	0	3	1	2
Alberta	2	2	6	3	4	1	2	3	5	4
British Columbia	6	12	9	9	6	8	5	9	8	8
Yukon	0	0	1	1	1	0	0	1	1	0
Northwest Territories	1	0	1	1	2	1	2	2	0	0
Nunavut	1	0	0	0	0	0	1	1	1	1
Other air space under Canadian air traffic control	0	0	0	0	0	0	0	0	0	1
Outside Canada	2	1	4	1	4	1	0	1	1	3
Fatalities by province/territory	37	55	52	50	51	64	64	62	54	57
Newfoundland and Labrador	1	2	0	1	0	18	2	0	0	0
Prince Edward Island	0	0	0	0	0	1	0	0	0	0
Nova Scotia	1	0	0	0	0	0	2	0	0	1
New Brunswick	0	1	0	0	0	0	2	0	0	0
Quebec	4	12	6	5	6	14	25	9	5	4
Ontario	14	10	6	7	4	11	12	7	18	15
Manitoba	2	2	0	5	1	0	1	1	4	5
Saskatchewan	2	0	3	5	0	2	0	8	5	3
Alberta	2	4	9	5	8	1	4	4	5	5
British Columbia	6	23	16	15	22	14	13	15	14	14
Yukon	0	0	1	1	1	0	0	1	1	0
Northwest Territories	2	0	6	3	2	2	2	4	0	0
Nunavut	1	0	0	0	0	0	1	12	1	1
Other air space under Canadian air traffic control	0	0	0	0	0	0	0	0	0	3
Outside Canada	2	1	5	3	7	1	0	1	1	6

Data extracted January 24, 2014.

Accidents are reported in accordance with the TSB's regulations for mandatory reporting of occurrences.

Table 9
Reportable aircraft incidents
2004-2013

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Incidents by type	865	796	807	874	887	789	815	677	636	685
Risk of collision/Loss of separation	216	174	168	168	172	153	206	120	101	115
Declared emergency	264	222	260	298	314	312	310	275	260	291
Engine failure	134	139	130	129	120	107	87	95	90	83
Smoke/Fire	90	99	102	123	107	97	81	88	71	67
Collision	21	12	21	13	8	9	4	7	5	15
Control difficulties	43	44	41	41	39	24	32	31	33	24
Crew unable to perform duties	55	67	57	65	78	59	50	26	40	58
Dangerous goods-related	0	1	2	3	1	3	1	0	1	3
Depressurization	9	14	9	13	17	6	11	16	15	14
Fuel shortage	13	10	6	8	7	4	9	6	7	2
Failure to remain in landing area	11	11	7	9	18	9	14	11	10	9
Incorrect fuel	2	1	1	0	1	0	0	0	0	0
Slung load released	5	1	3	3	5	3	9	1	1	4
Transmission or gearbox failure	2	1	0	1	0	3	1	1	2	0
Incidents by operator type	865	796	807	874	887	789	815	677	636	685
Commercial	819	732	773	823	857	750	776	637	598	652
Airliner (705)	578	488	528	563	590	498	520	447	409	449
Commuter (704)	91	89	80	75	94	88	85	75	78	90
Air taxi (703)	37	39	52	25	36	43	31	29	26	35
Aerial work (702)	38	22	20	20	24	31	26	15	11	12
Foreign/Other commercial type (a)	144	151	165	196	181	138	170	111	110	111
State	29	28	21	29	17	24	26	14	21	20
Corporate	34	45	30	43	21	29	20	22	20	20
Private/Other operator type (b)	37	40	31	24	33	26	31	25	21	19
Incidents by aircraft type	865	796	807	874	887	789	815	677	636	685
Aeroplane	845	779	787	854	870	771	790	659	624	669
Helicopter	28	20	29	22	19	21	33	20	17	20
Ultralight/Other aircraft type (c)	0	1	1	0	1	1	2	0	0	0
Number of aircraft involved in incidents*	1038	956	974	1031	1052	915	979	779	733	796
Aeroplanes	1008	935	942	1009	1032	892	944	759	716	776
Helicopters	30	20	30	22	19	22	33	20	17	20
Ultralight/Other aircraft type (c)	0	1	2	0	1	1	2	0	0	0
Incidents by province/territory	865	796	807	874	887	789	815	677	636	685
Newfoundland and Labrador	19	25	24	19	21	16	30	14	17	29
Prince Edward Island	2	1	2	1	2	2	0	1	0	2
Nova Scotia	23	14	17	26	20	18	25	19	17	11
New Brunswick	10	11	14	17	12	5	10	7	7	7
Quebec	85	123	101	127	127	97	109	126	107	122
Ontario	248	220	244	264	273	195	176	178	155	166
Manitoba	53	39	43	52	59	46	51	31	31	31
Saskatchewan	22	14	20	19	28	18	19	11	18	27
Alberta	118	108	111	79	89	106	84	82	81	102
British Columbia	142	93	83	133	120	162	156	76	101	99
Yukon	4	3	5	4	4	6	4	3	4	5
Northwest Territories	28	27	25	27	27	14	21	30	17	16
Nunavut	12	16	10	14	17	8	21	19	19	10
Other air space under Canadian air traffic control	10	23	30	23	10	30	26	25	13	19
Outside Canada	89	79	78	69	78	66	83	55	49	39

Data extracted January 24, 2014.

Reportable incidents are reported in accordance with the TSB's regulations for mandatory reporting of occurrences.

Reportable incidents include aeroplanes having a maximum certificated take-off weight (MCTOW) greater than 5700 kg, and rotorcraft having a MCTOW greater than 2250 kg.

Breakdowns may not add up to totals. For example, in the total "Incidents by aircraft type", when an occurrence involves an airplane and a helicopter, the occurrence is counted in each category, but only once in the total.

* "Number of aircraft involved in incidents" are aircraft counts, all other data are incident counts.

a. The commercial service type is not available for foreign-registered aircraft.

b. Other operator type contains, but is not limited to, organizations that rent aircraft (i.e., flying schools, flying clubs, etc.).

c. Includes balloons, gyroplanes, gliders, dirigibles, hang gliders and similar aircraft types.

Table 10
Reportable incidents involving Canadian-registered aircraft
2004-2013

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Incidents by type	734	650	658	691	729	657	666	575	530	578
Risk of collision/Loss of separation	182	150	150	152	149	137	179	105	92	105
Declared emergency	204	152	184	186	235	236	238	224	200	231
Engine failure	118	116	106	108	98	94	67	87	77	70
Smoke/Fire	81	85	86	106	90	84	70	67	59	55
Collision	21	8	18	9	7	7	3	7	4	14
Control difficulties	41	41	31	38	32	18	24	27	31	21
Crew unable to perform duties	51	67	56	63	76	57	49	26	38	56
Dangerous goods-related	0	1	2	3	1	3	1	0	1	3
Depressurization	7	12	9	11	15	3	10	15	13	10
Fuel shortage	10	5	6	4	4	4	6	5	4	2
Failure to remain in landing area	10	10	6	7	16	8	9	10	9	7
Incorrect fuel	2	1	1	0	1	0	0	0	0	0
Slung load released	5	1	3	3	5	3	9	1	1	4
Transmission or gearbox failure	2	1	0	1	0	3	1	1	1	0
Incidents by operator type	734	650	658	691	729	657	666	575	530	578
Commercial	700	604	635	660	704	626	636	546	501	551
Airliner (705)	578	487	524	563	586	494	519	445	409	448
Commuter (704)	91	89	79	75	94	88	85	75	78	90
Air taxi (703)	37	39	52	25	36	43	30	29	25	35
Aerial work (702)	38	22	20	17	24	30	26	15	11	12
Other commercial type (a)	25	24	31	36	32	19	31	22	14	11
State	27	25	20	28	16	21	22	14	18	19
Corporate	26	29	21	23	17	21	17	13	15	15
Private/Other operator type (b)	31	34	27	22	31	25	28	21	18	18
Incidents by aircraft type	734	650	658	691	729	657	666	575	530	578
Aeroplane	715	633	638	673	712	639	642	557	519	562
Helicopter	27	20	29	20	19	21	32	20	16	20
Ultralight/Other aircraft type (c)	0	1	1	0	1	1	1	0	0	0
Number of aircraft involved in incidents*	886	785	803	833	874	773	812	668	619	680
Aeroplanes	857	764	771	813	854	750	779	648	603	660
Helicopters	29	20	30	20	19	22	32	20	16	20
Ultralight/Other aircraft type (c)	0	1	2	0	1	1	1	0	0	0
Incidents by province/territory	734	650	658	691	729	657	666	575	530	578
Newfoundland and Labrador	10	14	13	10	13	7	13	10	10	17
Prince Edward Island	1	0	2	0	1	1	0	0	0	1
Nova Scotia	18	7	12	17	12	13	19	14	9	9
New Brunswick	10	7	9	12	7	3	8	5	7	4
Quebec	66	98	79	90	96	77	90	104	84	96
Ontario	211	175	198	202	222	168	141	148	127	142
Manitoba	43	31	35	43	49	40	45	30	30	27
Saskatchewan	19	11	19	16	26	16	15	11	14	26
Alberta	105	95	99	67	76	92	74	76	75	92
British Columbia	122	85	72	120	103	141	134	68	87	93
Yukon	2	2	3	4	2	6	3	3	3	3
Northwest Territories	27	25	21	27	27	14	19	30	17	16
Nunavut	9	14	10	9	14	7	17	16	15	10
Other air space under Canadian air traffic control	2	7	8	5	3	6	5	5	3	3
Outside Canada	89	79	78	69	78	66	83	55	49	39

Data extracted January 24, 2014.

Reportable incidents are reported in accordance with the TSB's regulations for mandatory reporting of occurrences.

Reportable incidents include aeroplanes having a maximum certificated take-off weight (MCTOW) greater than 5700 kg, and rotorcraft having a MCTOW greater than 2250 kg.

Breakdowns may not add up to totals. For example, in the total "Incidents by aircraft type", when an occurrence involves an airplane and a helicopter, the occurrence is counted in each category, but only once in the total.

* "Number of aircraft involved in incidents" are aircraft counts, all other data are incident counts.

a. The commercial service type is not available for foreign-registered aircraft.

b. Other operator type contains, but is not limited to, organizations that rent aircraft (i.e., flying schools, flying clubs, etc.).

c. Includes balloons, gyroplanes, gliders, dirigibles, hang gliders and similar aircraft types.

Table 11
Number of accidents involving aeroplanes by phase of flight and selected event category
2004-2013

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Standing/Taxiing	16	21	20	16	13	20	17	18	17	22	180
Collision with object	5	8	8	6	6	9	6	6	7	8	69
Collision with moving aircraft	1	1	4	2	4	3	1	1	2	1	20
Nosedown/Overturned	4	2	1	0	1	1	4	3	3	5	24
Landing gear collapsed/retracted	1	2	1	1	0	4	2	3	0	2	16
Loss of control	2	0	2	1	0	1	3	0	3	4	16
Other events	8	14	11	10	6	9	8	10	9	12	97
Take-off	57	50	48	51	40	49	54	41	55	40	485
Collision with terrain	11	22	18	10	10	14	15	11	22	11	144
Loss of control	16	18	14	12	7	15	15	12	17	7	133
Collision with object	16	11	18	17	14	16	14	10	17	8	141
Take-off/Landing event	21	10	10	16	5	13	13	13	19	9	129
Power loss	11	12	9	14	14	12	14	11	6	13	116
Other events	43	25	19	26	20	22	27	22	23	20	247
En route	25	34	41	29	34	40	31	31	32	34	331
Power loss	11	14	18	11	18	25	13	14	15	15	154
Precautionary/Forced landing/Ditching	6	8	6	6	14	9	11	13	9	8	90
Collision with terrain	6	8	16	6	5	9	8	8	8	10	84
Component/System related	4	7	5	9	4	8	6	5	6	5	59
Other events	13	14	21	15	13	18	18	15	13	17	157
Manoeuvring	9	17	11	12	12	3	11	12	10	12	109
Collision with terrain	2	10	4	8	3	2	5	6	7	7	54
Loss of control	4	3	1	5	3	1	3	1	4	1	26
Collision with object	3	2	4	2	4	0	7	2	1	2	27
Power loss	0	5	0	0	4	1	1	3	0	0	14
Other events	5	6	5	4	6	1	3	8	3	5	46
Approach	32	31	25	28	29	31	28	23	18	31	276
Collision with terrain	9	14	5	5	8	12	11	7	6	6	83
Power loss	5	9	9	6	8	7	7	2	0	11	64
Collision with object	4	5	4	9	8	3	6	8	1	8	56
Component/System related	8	5	3	6	6	9	2	5	3	3	50
Precautionary/Forced landing/Ditching	7	4	5	1	6	4	5	3	2	7	44
Loss of control	7	3	4	3	5	3	6	3	4	4	42
Other events	11	16	6	13	4	14	9	7	11	8	99
Landing	133	105	116	149	114	122	112	114	111	116	1192
Missed or went off runway	35	37	27	39	21	29	29	31	33	32	313
Collision with object	24	23	30	32	21	23	25	28	26	18	250
Landing gear collapsed/retracted	23	7	16	30	28	18	26	24	22	25	219
Nosedown/Overturned	30	17	21	26	25	22	18	18	20	20	217
Loss of control	29	18	14	25	16	23	20	17	27	19	208
Hard landing	18	11	20	35	16	19	23	22	20	13	197
Collision with terrain	29	20	10	21	19	16	18	16	17	12	178
Wheels-up landing	14	6	5	12	8	12	7	3	7	10	84
Precautionary/Forced landing/Ditching	5	5	8	6	5	11	5	3	9	11	68
Other events	33	40	45	39	32	34	40	44	33	39	379
Post-impact	18	20	12	13	13	13	20	10	17	13	149
Fire/Explosion/Fumes	8	13	7	8	9	8	15	6	6	7	87
Other events	11	7	5	6	5	6	5	4	11	6	66

Data extracted January 24, 2014.

Accidents are reported in accordance with the TSB's regulations for mandatory reporting of occurrences.

Breakdowns do not add up to totals. For example, in the "Take-off" phase, if an occurrence involves both "Control loss" and "Power loss" events, the occurrence is counted in each event category, but only once in the phase total.

Table 12**Number of accidents involving helicopters by phase of flight and selected event category
2004-2013**

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Standing/Taxiing	8	9	6	4	3	3	0	6	4	1	44
Collision with terrain	1	1	2	1	0	1	0	2	1	0	9
Loss of control	0	1	2	1	1	0	0	2	0	0	7
Collision with object	0	1	1	3	1	0	0	0	0	0	6
Other events	7	8	5	2	2	3	0	5	4	1	37
Take-off	7	10	11	7	7	4	2	7	6	7	68
Loss of control	3	4	7	4	4	1	1	4	1	0	29
Collision with terrain	3	3	6	2	3	2	2	3	0	2	26
Collision with object	1	2	2	1	0	1	1	0	4	2	14
Power loss	0	1	2	0	1	1	0	2	0	0	7
Other events	5	5	5	4	6	1	1	1	1	4	33
En route	7	8	12	12	11	11	7	10	9	5	92
Collision with terrain	2	4	5	6	6	3	3	3	2	1	35
Power loss	3	2	6	4	4	5	3	2	3	1	33
Precautionary/Forced landing/Ditching	2	3	3	3	2	1	1	2	3	1	21
Component/System related	2	3	2	0	2	1	1	3	2	1	17
Other events	5	4	3	5	8	5	3	5	4	4	46
Manoeuvring	13	11	14	13	9	7	9	10	12	7	105
Collision with terrain	8	7	5	5	4	3	3	6	6	5	52
Loss of control	3	5	0	7	2	3	2	2	2	2	28
Collision with object	4	0	7	1	2	2	4	2	3	2	27
Operations related event	4	1	4	4	1	1	1	2	1	1	20
Power loss	3	1	0	2	2	2	2	0	2	0	14
Other events	5	4	8	7	5	5	4	3	5	2	48
Approach	2	6	2	4	3	5	4	6	7	3	42
Collision with terrain	2	2	1	1	2	3	4	1	1	0	17
Power loss	0	2	1	1	0	1	0	0	2	0	7
Loss of control	1	2	0	0	0	0	1	1	1	0	6
Collision with object	0	0	0	0	0	1	0	2	0	0	3
Other events	1	2	1	2	2	3	3	3	5	3	25
Landing	15	19	21	16	17	15	15	7	13	12	150
Hard landing	3	2	9	5	6	2	4	4	4	1	40
Collision with terrain	0	5	3	1	5	5	4	2	4	0	29
Loss of control	6	5	4	2	6	2	1	1	1	2	30
Collision with object	3	4	5	4	3	4	4	0	2	5	34
Other events	8	8	7	9	4	9	7	2	5	9	68
Post-impact	4	9	4	4	3	4	4	4	2	4	42
Fire/Explosion/Fumes	2	7	3	3	2	3	1	2	1	2	26
Other events	2	2	1	1	1	1	3	2	1	2	16

Data extracted January 24, 2014.

Accidents are reported in accordance with the TSB's regulations for mandatory reporting of occurrences.

Breakdowns do not add up to totals. For example, in the "Take-off" phase, if an occurrence involves both "Control loss" and "Power loss" events, the occurrence is counted in each event category, but only once in the phase total.

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.