STATISTICAL SUMMARY
AIR TRANSPORTATION OCCURRENCES IN 2018

Canada

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Statistical summary: Air transportation occurrences in 2018

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Statistical Summary
Air Transportation Occurrences in 2018

This document is a summary of selected 2018 air transportation safety data.

The Transportation Safety Board of Canada (TSB) gathers and uses this data during the course of its investigations to analyze safety deficiencies and identify risks in the Canadian transportation system.

It should be noted that certain characteristics of the data constrain statistical analysis and identification of emerging trends. These include the small totals of accidents and incidents, the large variability in the data from year to year, and changes to regulations and definitions. The reader is cautioned to keep these limitations in mind when viewing this summary to avoid drawing conclusions that cannot be supported by statistical analysis.

The 2018 data were collected according to the reporting requirements described in the *Transportation Safety Board Regulations* in force during that calendar year.

The statistics presented here reflect the TSB ASIS database at 18 February 2019. Since the occurrence data are constantly being updated in the live database, the statistics may change slightly over time.

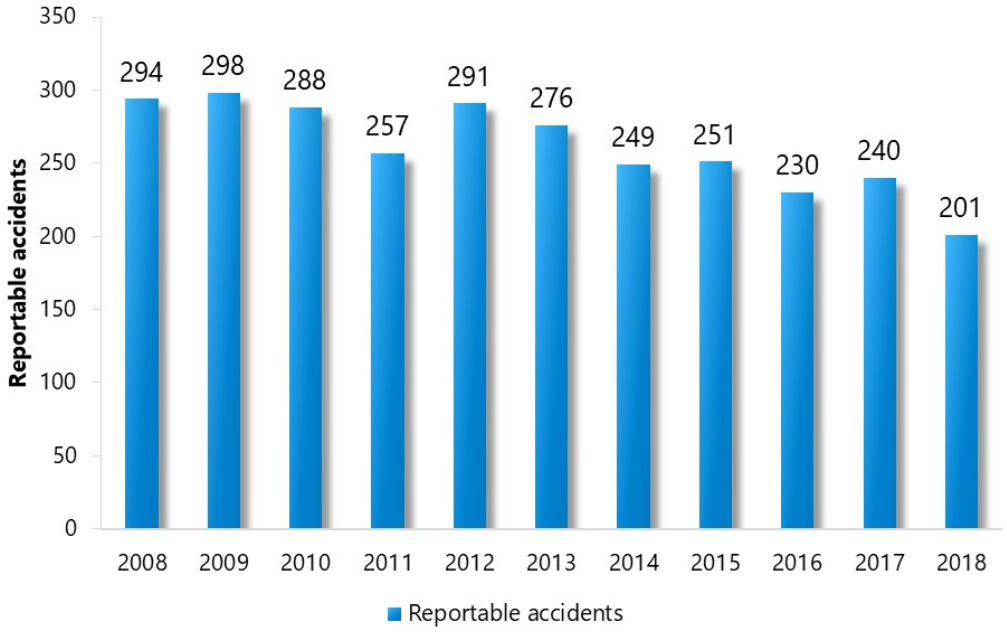
Also, as many occurrences are not formally investigated, information recorded on some occurrences may not have been verified.

Overview of accidents and fatalities

Accident counts

Air transportation safety occurrences are reportable to the TSB if they occur in Canada or if they involve Canadian-registered aircraft and meet the criteria laid out in the *Transportation Safety Board of Canada Regulations*.[1] In 2018, a total of 201 air transportation accidents were reported to the TSB (Table 1 and Figure 1). This number is lower than the previous year's total of 240 accidents, and 25% less than the average of 267 reported in the 10 years from 2008 to 2017. Most (180) of the accidents in 2018 took place in Canada and involved Canadian-registered aircraft. Eleven accidents in Canada involved foreign-registered aircraft, and 11 more accidents involving Canadian-registered aircraft took place outside Canada.

Figure 1. Reportable accidents, 2008 to 2018



Canadian-registered aircraft, excluding ultralights (Table 2), were involved in 173 accidents reported in 2018. This is below the 2017 count of 208 accidents, and 25% below the average of 230 accidents for the prior 10 years. If 18 accidents involving ultralights are included in the count, there were 191 accidents involving Canadian-registered aircraft in 2018.

Aircraft type

Fixed-wing, powered aeroplanes (other than ultralights) were involved in 153 accidents in 2018, and 143 of those involved Canadian-registered aeroplanes (75% of 191 accidents). Canadian-registered helicopters were involved in 26 accidents (14%), Canadian-registered ultralights were involved in 18 accidents (9%), and other types of aircraft in 4 accidents (2%). From 2008 to 2017, the proportion of accidents involving each of these 4 types of aircraft has remained fairly constant;

[1] *Transportation Safety Board Regulations (*SOR/2014-37), at https://laws-lois.justice.gc.ca/eng/regulations/SOR-2014-37/index.html (last accessed on 4 June 2019).

aeroplanes have been involved in roughly 75% of reportable accidents each year, helicopters in about 12% of accidents, ultralights in about 10%, and other aircraft in less than 5% of accidents each year.

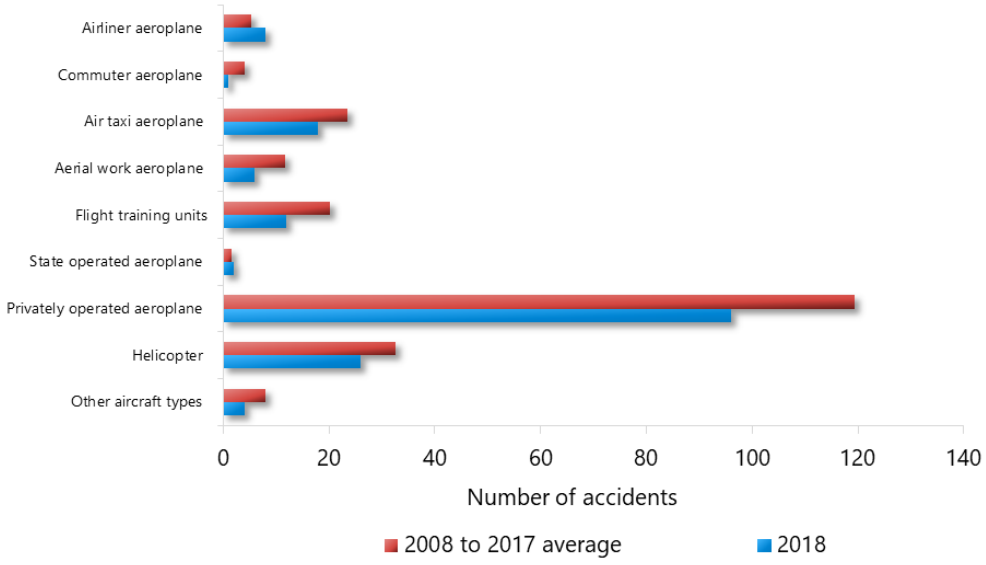
Operator type

Commercial operators were involved in 66 accidents during 2018, which is fewer than the 97 accidents involving this operator type in 2017, and 30% fewer than the average of 94 accidents per year over the previous 10 years. Commercially-operated Canadian-registered aeroplanes were involved in 46 accidents in 2018, and 8 of those involved operations under *Canadian Aviation Regulations* (CAR) subpart 705, which certificates the operation of airliners. One of the 8 airliner accidents in 2018 was formally investigated by the TSB. Severe turbulence encounters resulted in 2 accident reports in 2018, while 2 other accidents involved injuries to cabin crew, 2 involved low-speed collisions on the ground, 1 involved engine power loss, and 1 involved a hard landing. This is fewer than the 9 accidents involving Canadian-registered airliners in 2017, but above the average of 5.4 per year recorded from 2008 to 2017.

Also in 2018, air taxi (CAR 703) accidents numbered 23, with 18 involving aeroplanes and 5 involving helicopters. These 23 air taxi accidents are fewer than the previous year's count of 28, and match 2015 for the fewest air taxi accidents since the inception of the TSB in 1990.

There were 13 accidents involving flight training units (CAR 406) in 2018, down from a peak of 32 in 2017, and slightly more than half (57%) the average number per year (23) from 2008 to 2017.

Figure 2. Number of accidents by operator type (Canadian-registered aircraft)



Overall, 134 accidents involved private operations, compared to 142 in the preceding year. This is 19% below the average of 165 accidents per year observed during the period 2008 to 2017. Of the 134 total accidents in the private operations category, 96 involved Canadian-registered aeroplanes, and 6 of these were operating under CAR 604 with a private operator registration document (PORD).

Recreational operators are responsible for a significant amount of flying activity in Canada and abroad, and are involved in a large number of accidents each year. In 2018, 122 accidents involved recreational operators. This figure is 9% below the

recreational operator accident count from the previous year, and 24% below the average (160) for the period from 2008 to 2017.

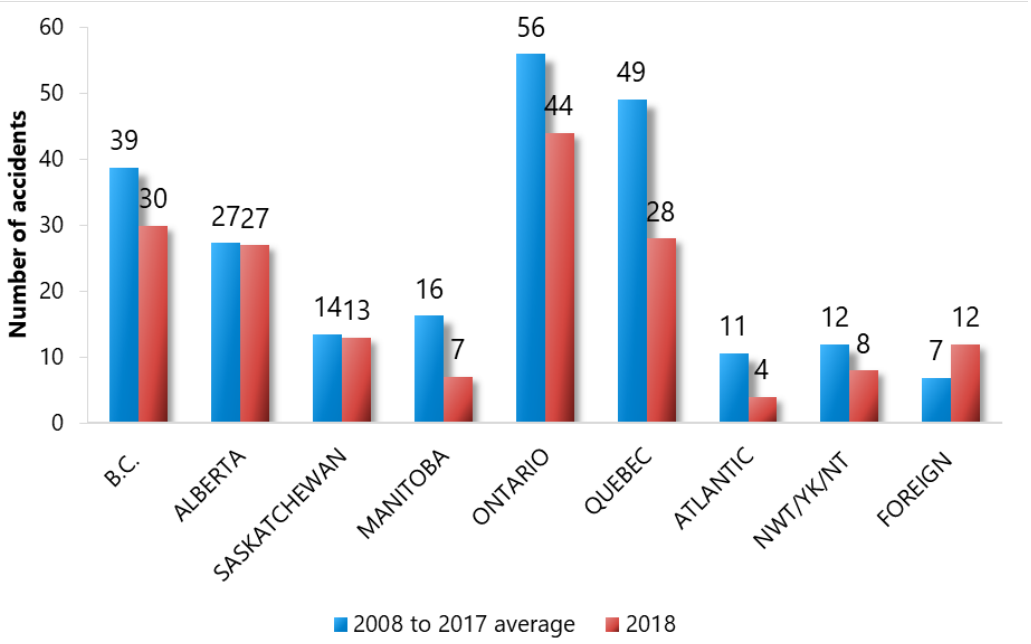
In addition to commercial and private operations, state-operated aircraft accounted for 2 accidents in 2018. Both involved aircraft operated by provincial governments: one during fire-fighting operations and the other in a training accident.

Province or territory

Ontario was the province with the largest number of reported accidents (53) in 2018, as was the case in 2017 with 62 (Table 7). Ontario has also averaged more accidents per year (67) from 2008 to 2017 than any other province or territory. While Quebec has historically had the second-largest accident count—averaging 58 per year from 2008 to 2017—in 2018, British Columbia (36) and Alberta (32) were the site of more accidents than Quebec (31). In addition there was 1 accident in North Atlantic airspace under Canadian control, and 11 accidents outside Canada reportable under TSB regulations.

The number of accidents involving Canadian-registered aircraft by province or territory is shown in Figure 3. There were 44 accidents involving Canadian-registered aircraft reported in Ontario, which is 21% below the average number (56) for the years 2008 to 2017. Quebec had the largest drop in accidents reported (28) relative to its 10-year average (49) than the other provinces or territories.

Figure 3. Number of accidents involving Canadian-registered aircraft, by province, 2008 to 2018

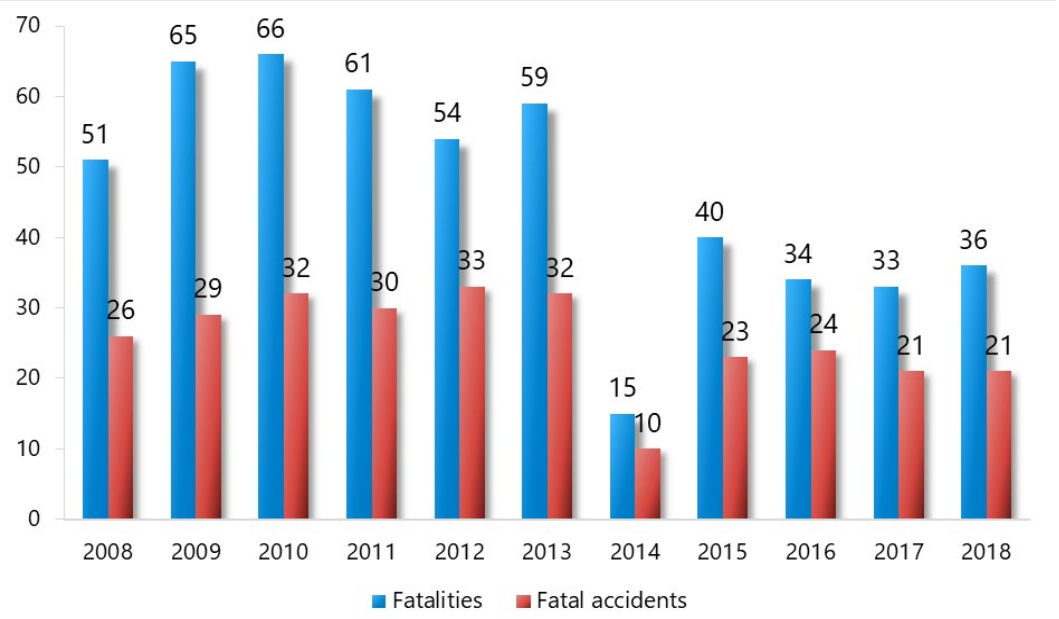


Fatal accidents, fatalities, and serious injuries

The TSB recorded 38 fatalities in 23 fatal air transportation accidents in 2018. This is slightly more than the 34 fatalities in 22 fatal accidents in 2017, but is considerably lower than the corresponding averages of 55 fatalities in 32 fatal accidents over the 10 years from 2008 to 2017. Of 23 fatal accidents in 2018, 17 involved fixed-wing, powered aeroplanes, 4 involved helicopters, and 2 involved ultralight aircraft. All of these aircraft were registered in Canada. Four fatal accidents accounting for 10 fatalities occurred outside Canada (all in the United States).

Excluding ultralights, there were 21 fatal accidents involving Canadian-registered aircraft in 2018, unchanged from the preceding year and 19% below the average for the prior 10-year period (Figure 4). However, the number of fatalities in those accidents climbed to 36, which is more than the 33 reported in 2017 but less than the average of 48 in the years from 2008 to 2017.

Figure 4. Fatal accidents and fatalities involving Canadian-registered aircraft, excluding ultralights, 2008 to 2018



Nine of 38 fatalities involved commercial operations—5 under air taxi regulations (CAR 703) and 4 under aerial work (CAR 702). There were no fatalities involving airliner operations (CAR 705), commuter operations (CAR 704), or flight training units (CAR 406) in 2018. The remaining 29 fatalities in 2018 were linked to private operations, and all of them involved recreational operators, with 1 also involving an operator holding a PORD (CAR 604).

There were no fatal accidents in Canada involving foreign-registered aircraft in 2018.

Fixed-wing, powered aeroplanes were involved in the largest number of fatalities (30) while 6 persons died in helicopter accidents and 2 fatalities involved ultralight aircraft. Of the 38 total fatalities, 20 were crew members and 18 were aircraft passengers. There were no fatalities to persons on the ground in 2018.

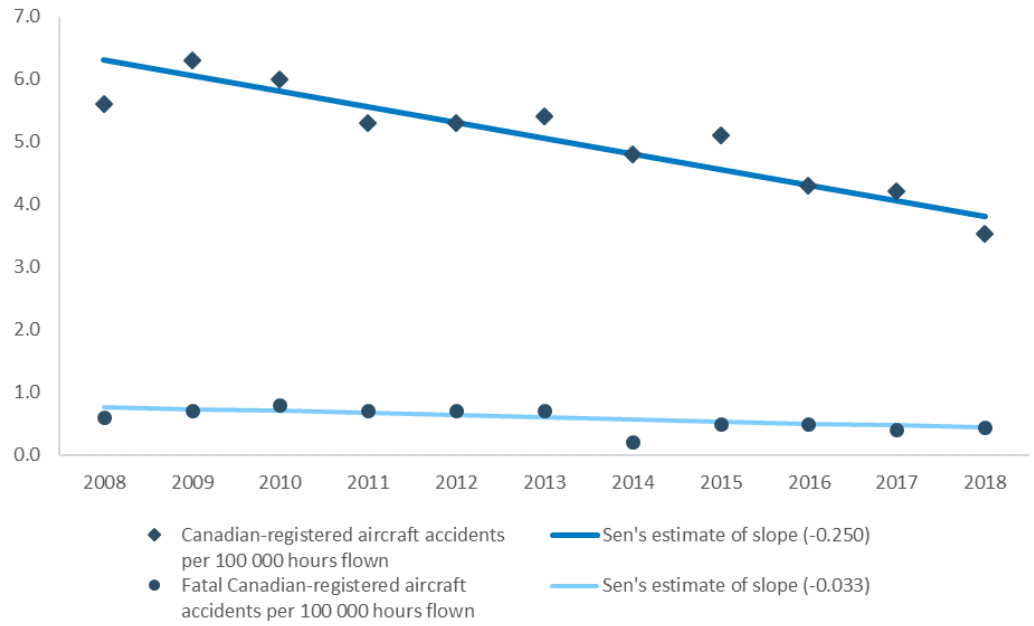
Overall, 28 persons incurred serious injuries in aircraft accidents in 2018. This is down slightly from 2017 when 33 persons received serious injuries, and it is 22% below the average of 36 persons with serious injuries for the years 2008 to 2017. Seventeen persons received serious injuries in accidents involving commercial operations: 4 in airliners (CAR 705), 9 in air taxi operations (CAR 703), 2 related to aerial work (CAR 702), 1 with a foreign air operator (CAR 701), and 1 with a flight training unit (CAR 406). Also in 2018, 11 persons incurred serious injuries in private operations, including 7 in recreational operations and 1 operator with a PORD (CAR 604).

Accident rates

Canadian-registered aircraft accident rate per 100 000 hours flown

An accident rate of 3.5 per 100 000 hours flown was calculated based on the 169 accidents in Canada and abroad in 2018 involving Canadian-registered aeroplanes and helicopters (excluding ultralights and other similar aircraft types), and the estimated 4 796 000 hours flown by Canadian-registered aircraft (Table 3a).[2] This rate is below the 2017 rate of 4.2 accidents per 100 000 flight hours, and the average rate of 5.2 over the previous 10 years.

Figure 5. Canadian-registered aircraft accidents per 100 000 hours flown, and Sen's estimate of slope



The accident rate for Canadian-registered aircraft has fallen from 5.6 accidents per 100 000 hours flown in 2008 to 3.5 in 2018, a reduction of 37%. Kendall's tau-b (τ_b) correlation coefficient is a nonparametric measure of the strength and direction of association that exists between 2 variables. Kendall's τ_b was calculated on the 11-year series of accident rate values by year from 2008 to 2018. There was a strong, negative correlation that indicates a downward trend in occurrence rate per 100 000 hours flown over the period ($\tau_b = -0.8074$, $p = 0.0006$). Sen's estimate of slope, the amount of downward rate change per year, was −0.250 occurrences per 100 000 hours flown per year (Figure 5).

With 23 fatal accidents in 2018 involving Canadian-registered aircraft, the fatal accident rate was 0.4 per 100 000 hours flown. That rate is comparable to the 2017 rate of 0.4, and is below the 2008 to 2017 average of 0.6 fatal accidents per 100 000 hours flown. Although there is a downward trend to the series of fatal accident rates since 2008 (Kendall's $\tau_b = -0.5311$, $p = 0.0298$), the slope of the trend is quite small: Sen's estimate of slope is −0.033 fatal accidents per 100 000 hours flown per year.

In 2018, 36 fatalities resulted from accidents involving Canadian-registered aeroplanes and helicopters (excluding ultralights) , yielding a rate of 0.8 fatalities per 100 000 hours flown. This rate is slightly higher than the 2017 rate of 0.7,

[2] Source: Transport Canada

but below the average rate of 1.1 from 2008 to 2017. Like the accident rate and fatal accident rate, the fatality rate per 100 000 hours flown has trended downward since 2008 (Kendall's $\tau_b = -0.5742$, $p = 0.0152$). The rate of change (Sen's estimate) is −0.105 fatalities per 100 000 hours flown per year.

Accident rate per 100 000 aircraft movements in Canada

An alternate method for calculating accident rate is to compare accident count to number of aircraft movements during a year (Table 3b). There were 167 accidents in Canada involving Canadian-registered and foreign aircraft (excluding ultralights) in 2018. This is fewer than in any of the preceding 10 years, when the average number of accidents was 226. The number of aircraft movements in Canada in 2018 was estimated to be 6 286 thousand,[3] yielding a rate of 2.7 accidents per 100 000 movements, which is below the 2017 rate of 3.3 accidents per 100 000 movements, and the average rate of 3.7 over the previous 10 years. In 2018, 26 fatalities resulted from accidents involving aeroplanes and helicopters in Canada, yielding a rate of 0.4 fatalities per 100 000 movements.

Dangerous goods released

Seven accidents in 2018 involved a release of dangerous goods. While this is lower than the total of 8 accidents with dangerous goods released in 2017, it is higher than the average of about 4 per year over the previous 10 years.

Accident events and phases

For each reported accident, the TSB records 1 or more safety-significant events that occurred, and the phase of flight of each of these events. For example, if an aeroplane suffers engine power loss during takeoff (safety-significant event 1), and then returns to land and has a runway excursion during landing (safety-significant event 2), each of the 2 events and their phase of flight will be recorded for statistical purposes. Tables 11 through 14 show, by phase of flight, how many accidents occurred for each event type from 2008 to 2018. Note that if a single accident involves more than 1 event within a phase of flight, that accident is only counted once in the phase total. Therefore, the total number of accidents for each event within a phase will not sum to the total number of accidents for a phase. For example, in the takeoff phase, if an accident involves both "loss of control" and "power loss" events, the accident is counted once in each event category within the phase, but only once in the overall phase total. As well, approximately 38% of aeroplane accidents and 29% of helicopter accidents involve events in more than 1 phase of flight, so the number of accidents shown in the tables, a well as in Figures 6 and 7, sum to more than the total number of accidents.

Figures 6 and 7 show the number of aeroplane and helicopter accidents by phase of flight and event category. Over the past 11 years (2008 to 2018), the distribution of aeroplane accidents (Figure 6) shows more accidents had events during the landing phase (56% of aeroplane accidents) and takeoff phase (24%) than in other phases of flight. The events in

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[3] Source: Statistics Canada:
- Table 23-10-0003-01, Aircraft movements, by civil and military movements, airports with NAV CANADA towers, monthly, at https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2310000301 (last accessed 4 June 2019).
- Table 23-10-0010-0, Aircraft movements, by civil and military movements, airports with NAV CANADA flight service stations, monthly, at https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2310001001 (last accessed 4 June 2019).
- Table 23-10-0016-01, Aircraft movements, by class of operation and type of operation, airports without air traffic control towers, monthly, at https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2310001601 (last accessed 4 June 2019).

helicopter accidents (Figure 7) occurred more often during the landing (42%), manoeuvering[4] (23%), and en route (22%) phases of flight. Note that for both aeroplanes and helicopters, although the landing phase is associated with the largest number of accidents, the en route, takeoff, and maneuvering phases are associated with larger numbers of fatal accidents.

Figure 6. Aeroplane accidents and fatal accidents with events in specified phases of flight, 2008 to 2018

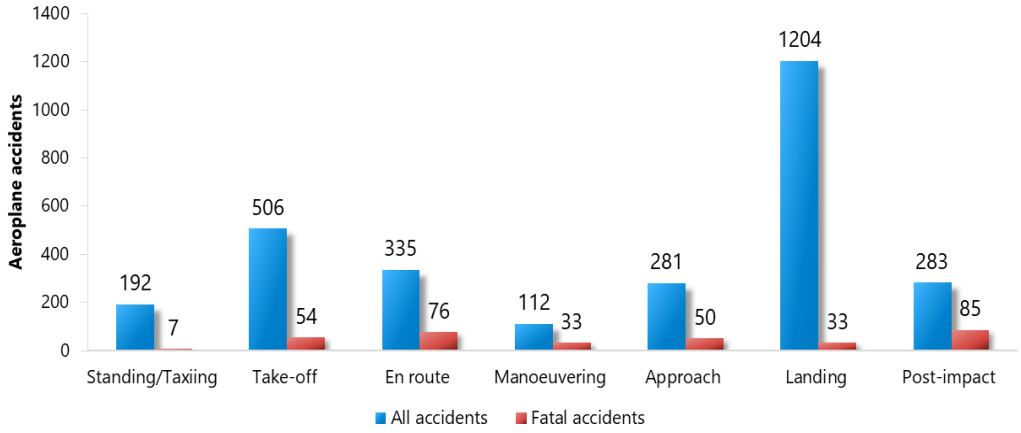
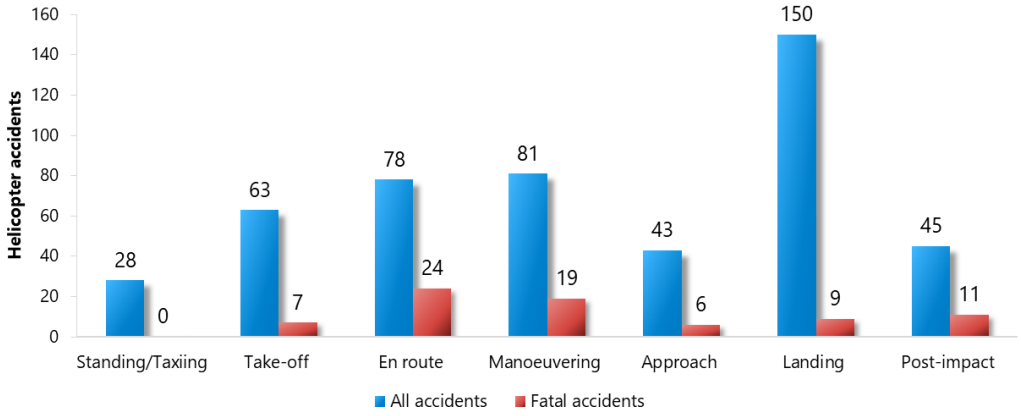


Figure 7. Helicopter accidents and fatal accidents with events in specified phases of flight, 2008 to 2018



4 Manoeuvering (i.e., low altitude or aerobatic flight operations) does not occur on all flights.

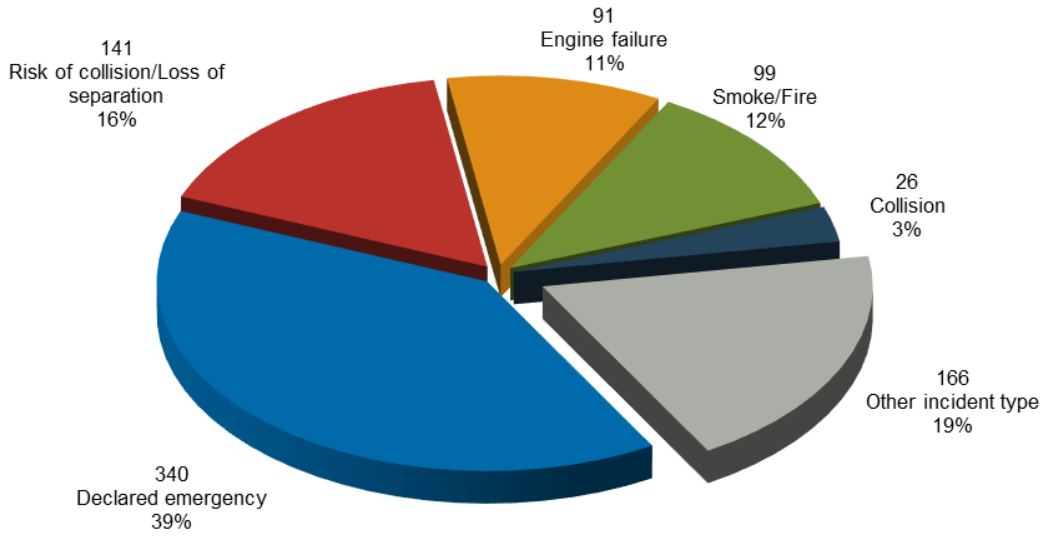
Overview of incidents

Incident counts

There were 863 incidents reported in accordance with the TSB Regulations during 2018 (Table 9). This represents a drop from a peak of 939 reportable incidents in 2017, but remains above the average of 781 incidents per year between 2008 and 2017. However, the apparent increase in incidents over the past few years is partly explained by regulations that became effective July 1 2014. Under those reporting requirements, aviation incidents to be reported now include those involving aircraft with a maximum certificated takeoff weight greater than 2250 kg (formerly 5700 kg) and aircraft being operated under an air operator certificate issued under the *Canadian Aviation Regulations* (CARs) Part VII.

Overall, reported incidents gradually decreased in number until about 2013, but over the past 5 years that number has increased back to approximately the same level as in 2008. The same general pattern (a few years of decreasing counts, followed by several years of increase) is evident since 2008 in the 2 most common incident categories: declared emergency, which accounted for 39% of reported incidents in 2018, and risk of collision/loss of separation, which made up 16% of reported incidents (Figure 8). Engine failure incidents made up 11% of incidents, while smoke/fire incidents were 12% of all incidents in 2018. Crew were reported unable to perform their duties 57 times, or in 7% of all reportable incidents in the year. The latter category is a decrease from last year's peak of 78 reported incidents.

Figure 8. Reportable incidents by type, 2018



The majority of incidents in 2018 (611) occurred in Canada and involved Canadian-registered aircraft. However, 161 incidents involving Canadian-registered aircraft occurred outside Canada in 2018, a number that has increased sharply since 2015 to a peak of 181 in 2017, and remained high in 2018 compared to an average of 76 per year during the previous 10 years. Specifically, declared emergency and risk of collision/loss of separation were the 2 most common incident types involving Canadian-registered aircraft outside Canada. Both of these incident types, while not showing a monotonic trend over the 11-year period of this report, have increased in frequency over the past 5 years. The TSB is working to further analyze the rise in reported incidents, and in particular, the apparent increase in reportable incidents occurring outside Canada.

Commercial operations are the source of 95% of the incidents reported to the TSB, and ⅔ of these involve Canadian-registered airliners operating under CAR subpart 705. In 2018 there were 547 incidents reported involving Canadian-registered airliners, which is down 11% from a peak of 614 in 2017 but still above the average of 488 incidents per year reported from 2008 to 2017. Foreign air operators (CAR 701) were involved in 91 incidents, or about 11% of commercial incidents. This is down by more than half from the 190 incidents reported in 2008, but above last year's count of 80.

Data tables

Table 1

Reportable aviation occurrences

2008-2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Number of reportable accidents	**294**	**298**	**288**	**257**	**291**	**276**	**249**	**251**	**230**	**240**	**201**
Accidents in Canada involving Canadian-registered aircraft	274	272	273	241	267	262	238	232	214	222	180
Accidents outside Canada involving Canadian-registered aircraft	7	11	1	6	8	4	4	10	8	11	11
Accidents in Canada involving foreign-registered aircraft	15	15	14	10	17	10	7	9	8	7	11
Number of accidents by operator type[1]	**294**	**298**	**288**	**257**	**291**	**276**	**249**	**251**	**230**	**240**	**201**
Commercial	124	115	109	99	92	84	82	74	63	97	66
Airliner (CAR 705)	6	2	6	6	5	7	4	9	1	9	8
Commuter (CAR 704)	6	6	7	6	5	3	2	3	3	5	1
Air taxi (CAR 703)	64	43	45	37	33	33	34	23	26	28	23
Aerial work (CAR 702)	19	21	29	27	26	21	17	18	16	18	17
Foreign air operator (CAR 701)	1	1	1	1	2	2	0	0	0	4	3
Flight training units (CAR 406)	26	37	19	19	19	17	25	20	17	32	13
Other commercial	3	5	2	3	3	1	1	1	1	2	1
Private	161	177	165	149	185	179	159	172	164	142	134
Private operators (CAR 604)	2	4	2	5	3	4	3	0	5	1	7
Recreational	157	173	162	142	181	175	156	165	152	134	122
Other private	2	0	1	3	1	0	0	7	8	7	7
State	3	3	5	2	3	6	4	1	0	0	2
Other/Unknown	7	6	10	8	12	9	5	5	3	2	0
Number of accidents by aircraft type[1]	**294**	**298**	**288**	**257**	**291**	**276**	**249**	**251**	**230**	**240**	**201**
Aeroplane	208	224	220	201	205	212	176	197	174	178	153
Helicopter	44	33	31	36	41	27	34	33	28	27	26
Ultralight	29	35	30	17	36	23	32	17	22	25	18
Other[2]	13	7	7	3	9	15	8	7	6	10	4
Number of aircraft involved in accidents[1,3]	**300**	**304**	**290**	**261**	**296**	**280**	**253**	**259**	**234**	**247**	**207**
Aeroplanes	214	229	222	204	209	215	179	202	178	184	159
Helicopters	44	33	31	36	42	27	34	33	28	27	26
Ultralights	29	35	30	17	36	23	32	17	22	25	18
Other[2]	13	7	7	4	9	15	8	7	6	11	4
Number of fatal accidents by aircraft type[1]	**38**	**35**	**37**	**35**	**42**	**38**	**14**	**29**	**29**	**22**	**23**
Aeroplane	16	22	29	23	25	25	12	20	22	18	17

Helicopter	9	8	3	8	7	6	0	5	2	2	4
Ultralight	12	4	3	3	8	4	2	4	4	1	2
Other[2]	1	1	2	1	2	4	0	0	1	1	0
Reportable accident fatalities	**64**	**72**	**72**	**66**	**63**	**65**	**21**	**47**	**45**	**34**	**38**
Reportable accident serious injuries	**49**	**45**	**35**	**49**	**48**	**22**	**35**	**31**	**18**	**33**	**28**
Accidents in Canada involving foreign-registered aircraft	**15**	**15**	**14**	**10**	**17**	**10**	**7**	**9**	**8**	**7**	**11**
Fatal accidents	0	2	2	2	1	2	2	3	1	0	0
Fatalities	0	2	2	2	1	2	4	4	7	0	0
Serious Injuries	5	3	1	1	4	0	1	0	0	0	4
Occurrences with a dangerous good release	**1**	**3**	**1**	**0**	**1**	**4**	**4**	**6**	**7**	**8**	**7**
Number of reportable incidents[4]	**898**	**789**	**814**	**677**	**645**	**689**	**741**	**789**	**833**	**939**	**863**
Incidents in Canada involving Canadian-registered aircraft	656	593	587	522	482	541	599	653	620	685	611
Incidents outside Canada involving Canadian-registered aircraft	68	64	78	54	48	38	55	58	117	181	161
Incidents in Canada involving foreign-registered aircraft	211	155	188	127	138	129	102	106	117	106	115
Number of reportable incidents by category[4]	**898**	**789**	**814**	**677**	**645**	**689**	**741**	**789**	**833**	**939**	**863**
Risk of collision / Loss of separation	176	153	206	120	102	115	94	111	139	172	141
Declared emergency	323	313	310	275	266	294	313	333	311	348	340
Engine failure	121	107	87	95	92	83	104	110	110	98	91
Smoke / Fire	108	97	80	88	71	67	89	87	85	100	99
Collision	9	10	4	7	5	15	16	8	18	24	26
Other	161	109	127	92	109	115	125	140	170	197	166

Data extracted 18 February 2019

[1] Breakdowns may not add up to totals. For example, when an occurrence involves an airplane and a helicopter, the occurrence is counted in each type, but only once in the total.

[2] Includes balloons, gyroplanes, gliders, airships, hang gliders, unmanned aerial vehicles (UAV) and similar aircraft types.

[3] "Number of aircraft involved in accidents" are aircraft counts, all other data are accident counts.

[4] New TSB regulations came into effect on 1 July 2014. Under new reporting requirements aviation incidents include: a) aircraft having a maximum certificated take-off weight greater than 2 250 kg (formerly 5 700 kg); b) aircraft being operated under an air operator certificate issued under CARs Part VII.

Table 2

Occurrences involving Canadian-registered aircraft

2008-2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Number of accidents by aircraft and operator type[1,2]	**252**	**250**	**244**	**230**	**239**	**243**	**212**	**227**	**200**	**208**	**173**
Aeroplane accidents	197	211	209	192	191	204	170	190	167	171	143
Commercial	85	89	77	71	62	58	55	51	42	71	46
Airliner (CAR 705)	6	2	6	5	5	7	4	9	1	9	8
Commuter (CAR 704)	6	5	6	4	5	3	1	3	3	5	1
Air taxi (CAR 703)	41	35	29	26	19	19	19	12	16	18	18
Aerial work (CAR 702)	12	11	18	14	14	12	8	10	7	12	6
Flight training units (CAR 406)	18	32	16	19	18	16	23	16	16	27	12
Other commercial	3	4	2	3	1	1	0	1	0	0	1
Private	104	121	122	113	122	139	111	138	122	101	96
Private operators (CAR 604)	2	2	2	2	0	3	1	0	5	1	6
Recreational	102	119	119	110	121	136	110	132	114	97	89
Other private	0	0	1	2	1	0	0	6	4	3	2
State	3	1	3	2	1	2	3	1	0	0	2
Other/Unknown	5	3	8	6	6	7	2	1	3	0	0
Helicopter accidents	42	32	29	35	41	27	34	32	27	27	26
Commercial	33	22	27	26	28	22	26	23	18	22	17
Private	9	10	2	9	10	4	7	9	9	5	9
State	0	0	0	0	2	1	1	0	0	0	0
Other/Unknown	0	0	0	0	2	0	0	0	0	0	0
Other aircraft accidents[3]	13	7	6	3	7	13	8	7	6	10	4
Number of fatal accidents by aircraft and operator type[1,2]	**26**	**29**	**32**	**30**	**33**	**32**	**10**	**23**	**24**	**21**	**21**
Aeroplane accidents	16	21	28	21	25	24	10	18	21	18	17
Commercial	3	7	12	11	6	8	2	6	3	7	4
Airliner (CAR 705)	0	0	0	1	0	0	0	0	0	1	0
Commuter (CAR 704)	0	0	1	1	1	1	0	0	0	0	0
Air taxi (CAR 703)	3	6	7	6	3	5	1	3	1	1	2
Aerial work (CAR 702)	0	0	4	2	2	1	1	2	1	2	2
Flight training units (CAR 406)	0	1	0	1	0	1	0	1	1	3	0
Other commercial	0	0	0	0	0	0	0	0	0	0	0
Private	13	13	15	10	17	14	8	13	18	11	13
Private operators (CAR 604)	2	0	0	0	0	1	0	0	1	0	1
Recreational	11	13	15	10	17	13	8	13	16	10	13
Other private	0	0	0	0	0	0	0	0	1	1	0

State	0	0	0	0	0	0	0	0	0	0	0
Other/Unknown	0	1	1	0	2	2	0	0	0	0	0
Helicopter accidents	9	7	3	8	7	6	0	5	2	2	4
Commercial	6	5	3	6	5	6	0	4	1	2	1
Private	3	2	0	2	1	0	0	1	1	0	3
State	0	0	0	0	1	0	0	0	0	0	0
Other/Unknown	0	0	0	0	0	0	0	0	0	0	0
Other aircraft accidents[3]	1	1	1	1	1	3	0	0	1	1	0
Accident fatalities[2]	**51**	**65**	**66**	**61**	**54**	**59**	**15**	**40**	**34**	**33**	**36**
Accident serious injuries[2]	**39**	**34**	**30**	**43**	**38**	**19**	**28**	**28**	**17**	**27**	**21**
Number of incidents by category[2,4]	**724**	**657**	**665**	**576**	**530**	**579**	**654**	**711**	**737**	**866**	**772**
Risk of collision/Loss of separation	149	137	179	106	92	105	84	101	127	159	134
Declared emergency	234	237	238	224	200	231	277	290	263	316	298
Engine failure	98	94	67	87	77	70	94	102	102	88	79
Smoke/Fire	90	84	69	67	59	55	76	79	75	95	85
Collision	8	8	3	7	4	14	15	7	16	23	21
Other	145	97	109	85	98	104	108	132	154	185	155
Number of accidents involving ultralight aircraft	**29**	**34**	**30**	**17**	**36**	**23**	**31**	**16**	**22**	**25**	**18**
Fatal accidents	12	4	3	3	8	4	2	3	4	1	2
Fatalities	13	5	4	3	8	4	2	3	4	1	2
Serious injuries	5	8	4	5	6	3	6	3	1	6	3

Data extracted 18 February 2019

[1] Breakdowns may not add up to totals. For example, when an occurrence involves an airplane and a helicopter, the occurrence is counted in each type, but only once in the total.

[2] Excludes ultralight aircraft

[3] Includes balloons, gyroplanes, gliders, airships, hang gliders, unmanned aerial vehicles (UAV) and similar aircraft types.

[4] New TSB regulations came into effect on 1 July 2014. Under new reporting requirements aviation incidents include: a) aircraft having a maximum certificated take-off weight greater than 2 250 kg (formerly 5 700 kg); b) aircraft being operated under an air operator certificate issued under CARs Part VII.

Table 3a

Accident rates involving Canadian-registered aircraft (per hours flown, excluding ultralights and other similar aircraft types)[1]

2008-2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Accidents	239	243	238	227	232	231	204	222	194	198	169
Fatal accidents	25	28	31	29	32	30	10	23	23	20	21
Fatalities	50	64	65	59	53	57	15	40	33	32	36
Hours flown[2] (thousands)	4,243	3,870	3,992	4,283	4,392	4,294	4,271	4,321	4,479	4,716	4,796
Accidents per 100,000 hours	5.6	6.3	6.0	5.3	5.3	5.4	4.8	5.1	4.3	4.2	3.5
Fatal accidents per 100,000 hours	0.6	0.7	0.8	0.7	0.7	0.7	0.2	0.5	0.5	0.4	0.4
Fatalities per 100,000 hours	1.2	1.7	1.6	1.4	1.2	1.3	0.4	0.9	0.7	0.7	0.8

Data extracted 18 February 2019

[1] Canadian-registered aircraft, excluding ultralights, balloons, gyroplanes, gliders, airships, hang gliders and similar aircraft types.
[2] Source: Transport Canada (2008 to 2018 hours flown are estimated).

Table 3b

Aircraft accident rates in Canada (per movements, excluding ultralights and other similar aircraft types)[1]

2008-2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Accidents	245	247	250	230	238	235	206	220	196	195	167
Fatal accidents	21	29	32	30	31	28	11	21	23	18	17
Fatalities	43	65	66	60	52	52	17	39	37	30	26
Aircraft movements[2] (thousands)	6,711	6,380	6,262	6,112	6,097	5,959	5,947	5,946	5,951	5,951	1
Accidents per 100,000 aircraft movements	3.7	3.9	4.0	3.8	3.9	3.9	3.5	3.7	3.3	3.3	####
Fatal accidents per 100,000 aircraft movements	0.3	0.5	0.5	0.5	0.5	0.5	0.2	0.4	0.4	0.3	1700.0
Fatalities per 100,000 aircraft movements	0.6	1.0	1.1	1.0	0.9	0.9	0.3	0.7	0.6	0.5	2600.0

Data extracted 18 February 2019

[1] Excluding ultralights, balloons, gyroplanes, gliders, airships, hang gliders and similar aircraft types.
[2] Source: Statistics Canada (2018 movements are estimated).

Table 4

Aircraft accident fatalities

2008-2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Fatalities	**64**	**72**	**72**	**66**	**63**	**65**	**21**	**47**	**45**	**34**	**38**
Fatalities in Canada involving Canadian-registered aircraft	57	68	70	63	61	57	15	39	35	32	28
Fatalities outside Canada involving Canadian-registered aircraft	7	2	0	1	1	6	2	4	3	2	10
Fatalities in Canada involving foreign-registered aircraft	0	2	2	2	1	2	4	4	7	0	0
Fatalities by operator type	**64**	**72**	**72**	**66**	**63**	**65**	**21**	**47**	**45**	**34**	**38**
Commercial	25	40	36	40	18	29	4	20	6	15	9
Airliner (CAR 705)	0	0	0	12	0	0	0	0	0	1	0
Commuter (CAR 704)	0	17	1	2	1	5	0	0	0	0	0
Air taxi (CAR 703)	20	19	28	16	12	19	2	12	1	1	5
Aerial work (CAR 702)	5	1	7	8	3	4	2	6	2	7	4
Foreign air operator (CAR 701)	0	0	0	0	0	0	0	0	0	0	0
Flight training units (CAR 406)	0	3	0	2	1	1	0	2	3	5	0
Other commercial	0	0	0	0	1	0	0	0	0	1	0
Private	39	31	32	25	37	33	17	28	39	19	29
Private operators (CAR 604)	7	0	0	2	0	1	0	0	4	0	1
Recreational	32	31	32	23	37	32	17	28	27	17	29
Other private	0	0	0	0	0	0	0	0	8	2	0
State	0	0	0	0	1	0	0	0	0	0	0
Other/Unknown	0	1	4	3	7	3	0	1	0	0	0
Crew fatalities by operator type	**35**	**35**	**40**	**37**	**40**	**44**	**15**	**29**	**25**	**26**	**20**
Commercial	8	12	17	20	11	21	3	10	3	11	3
Airliner (CAR 705)	0	0	0	4	0	0	0	0	0	0	0
Commuter (CAR 704)	0	2	1	2	0	2	0	0	0	0	0
Air taxi (CAR 703)	6	7	11	7	7	14	1	4	1	1	0
Aerial work (CAR 702)	2	1	5	5	2	4	2	4	1	4	3
Foreign air operator (CAR 701)	0	0	0	0	0	0	0	0	0	0	0
Flight training units (CAR 406)	0	2	0	2	1	1	0	2	1	5	0
Other commercial	0	0	0	0	1	0	0	0	0	1	0
Private	27	22	22	16	25	21	12	20	22	15	17
Private operators (CAR 604)	2	0	0	2	0	1	0	0	1	0	1
Recreational	25	22	22	14	25	20	12	20	18	14	17
Other private	0	0	0	0	0	0	0	0	3	1	0
State	0	0	0	0	1	0	0	0	0	0	0

Other/Unknown	0	1	1	3	3	2	0	1	0	0	0
Passenger fatalities by operator type	**28**	**37**	**31**	**29**	**22**	**20**	**6**	**18**	**20**	**8**	**18**
Commercial	16	28	18	20	6	8	1	10	3	4	6
Airliner (CAR 705)	0	0	0	8	0	0	0	0	0	1	0
Commuter (CAR 704)	0	15	0	0	1	3	0	0	0	0	0
Air taxi (CAR 703)	14	12	16	9	5	5	1	8	0	0	5
Aerial work (CAR 702)	2	0	2	3	0	0	0	2	1	3	1
Foreign air operator (CAR 701)	0	0	0	0	0	0	0	0	0	0	0
Flight training units (CAR 406)	0	1	0	0	0	0	0	0	2	0	0
Other commercial	0	0	0	0	0	0	0	0	0	0	0
Private	12	9	10	9	12	11	5	8	17	4	12
Private operators (CAR 604)	5	0	0	0	0	0	0	0	3	0	0
Recreational	7	9	10	9	12	11	5	8	9	3	12
Other private	0	0	0	0	0	0	0	0	5	1	0
State	0	0	0	0	0	0	0	0	0	0	0
Other/Unknown	0	0	3	0	4	1	0	0	0	0	0
Ground fatalities	**1**	**0**	**1**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**
Fatalities by aircraft type	**64**	**72**	**72**	**66**	**63**	**65**	**21**	**47**	**45**	**34**	**38**
Aeroplane	34	39	59	46	44	46	19	35	37	27	30
Helicopter	16	27	7	15	9	12	0	8	3	5	6
Ultralight	13	5	4	3	8	4	2	4	4	1	2
Other aircraft type	1	1	2	2	2	7	0	0	1	1	0

Data extracted 18 February 2019

Table 5

Aircraft accident serious injuries

2008-2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Serious injuries	**48**	**45**	**35**	**49**	**48**	**22**	**35**	**31**	**18**	**33**	**28**
Serious injuries in Canada involving Canadian-registered aircraft	43	41	34	46	39	22	34	28	17	31	23
Serious injuries outside Canada involving Canadian-registered Aircraft	0	1	0	2	5	0	0	3	1	2	1
Serious injuries in Canada involving foreign-registered aircraft	5	3	1	1	4	0	1	0	0	0	4
Serious injuries by operator type	**48**	**45**	**35**	**49**	**48**	**22**	**35**	**31**	**18**	**33**	**28**
Commercial	23	14	17	31	22	11	10	15	8	13	17
Airliner (CAR 705)	1	1	1	10	1	0	0	3	2	8	4
Commuter (CAR 704)	0	1	4	7	2	2	0	0	0	0	0
Air taxi (CAR 703)	18	6	6	9	15	6	5	8	4	0	9
Aerial work (CAR 702)	3	3	5	5	1	3	3	3	2	2	2
Foreign air operator (CAR 701)	0	0	0	0	1	0	0	0	0	0	1
Flight training units (CAR 406)	1	3	1	0	0	0	2	1	0	2	1
Other commercial	0	0	0	0	2	0	0	0	0	1	0
Private	23	29	16	18	26	10	23	16	10	20	11
Private operators (CAR 604)	0	3	0	0	0	0	0	0	0	0	1
Recreational	23	26	15	18	26	10	23	14	9	19	7
Other private	0	0	1	0	0	0	0	2	1	1	3
State	0	2	1	0	0	0	0	0	0	0	0
Other/Unknown	2	0	1	0	0	1	2	0	0	0	0
Crew serious injuries by operator type	**25**	**26**	**22**	**18**	**24**	**13**	**23**	**17**	**8**	**22**	**19**
Commercial	12	8	8	6	6	4	5	6	3	8	10
Airliner (CAR 705)	0	0	0	0	0	0	0	1	0	3	3
Commuter (CAR 704)	0	0	1	0	2	0	0	0	0	0	0
Air taxi (CAR 703)	9	2	2	2	1	2	2	2	2	0	3
Aerial work (CAR 702)	2	3	4	4	1	2	1	3	1	2	2
Foreign air operator (CAR 701)	0	0	0	0	1	0	0	0	0	0	1
Flight training units (CAR 406)	1	3	1	0	0	0	2	0	0	2	1
Other commercial	0	0	0	0	1	0	0	0	0	1	0
Private	12	17	12	12	18	8	17	11	5	14	9
Private operators (CAR 604)	0	2	0	0	0	0	0	0	0	0	1
Recreational	12	15	11	12	18	8	17	9	5	14	6
Other private	0	0	1	0	0	0	0	2	0	0	2

State	0	1	1	0	0	0	0	0	0	0	0
Other/Unknown	1	0	1	0	0	1	1	0	0	0	0
Passenger serious injuries by operator type	**23**	**19**	**12**	**30**	**23**	**8**	**11**	**14**	**8**	**11**	**9**
Commercial	11	6	9	24	15	6	5	9	4	5	7
Airliner (CAR 705)	1	1	1	10	0	0	0	2	2	5	1
Commuter (CAR 704)	0	1	3	7	0	2	0	0	0	0	0
Air taxi (CAR 703)	9	4	4	7	14	4	3	6	2	0	6
Aerial work (CAR 702)	1	0	1	0	0	0	2	0	0	0	0
Foreign air operator (CAR 701)	0	0	0	0	0	0	0	0	0	0	0
Flight training units (CAR 406)	0	0	0	0	0	0	0	1	0	0	0
Other commercial	0	0	0	0	1	0	0	0	0	0	0
Private	11	12	3	6	8	2	5	5	4	6	2
Private operators (CAR 604)	0	1	0	0	0	0	0	0	0	0	0
Recreational	11	11	3	6	8	2	5	5	4	5	1
Other private	0	0	0	0	0	0	0	0	0	1	1
State	0	1	0	0	0	0	0	0	0	0	0
Other/Unknown	1	0	0	0	0	0	1	0	0	0	0
Ground serious injuries	**0**	**0**	**1**	**1**	**1**	**1**	**1**	**0**	**2**	**0**	**0**
Serious injuries by aircraft type	**48**	**45**	**35**	**49**	**48**	**22**	**35**	**31**	**18**	**33**	**28**
Aeroplane	27	24	28	36	31	13	21	23	10	23	23
Helicopter	14	11	2	8	7	6	6	5	6	3	2
Ultralight	5	8	4	5	6	3	7	3	1	6	3
Other aircraft type	2	2	1	0	4	0	1	0	1	1	0

Data extracted 18 February 2019

Table 6

Accidents involving Canadian-registered aeroplanes and helicopters by operation type[1]

2008-2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Aeroplane accidents by operation type[2]	**197**	**211**	**209**	**192**	**191**	**204**	**170**	**190**	**167**	**171**	**143**
Training	30	43	28	28	27	24	27	16	20	31	14
Pleasure/Travel	83	109	108	102	109	127	96	125	112	92	82
Business	7	4	6	7	4	2	9	1	3	1	8
Forest fire management	1	3	2	1	2	3	2	2	1	0	1
Test/Demonstration/Ferry	4	0	6	4	4	4	5	2	2	4	1
Aerial application	9	4	10	4	3	7	4	5	6	6	5
Inspection	1	1	1	0	1	1	0	1	0	1	0
Air transport	46	35	37	35	28	26	22	22	16	27	26
Air ambulance	3	5	2	1	1	0	1	0	3	1	1
Sightseeing	2	2	1	2	6	1	1	1	0	1	1
Other/Unknown	11	8	9	10	8	11	4	16	5	8	6
Fatal aeroplane accidents by operation type[2]	**16**	**21**	**28**	**21**	**25**	**24**	**10**	**18**	**21**	**18**	**17**
Training	0	1	1	1	1	2	1	1	1	3	0
Pleasure/Travel	8	13	15	10	16	11	7	12	15	9	12
Business	2	1	1	0	1	1	1	0	1	0	1
Forest fire management	0	0	2	0	0	0	0	1	0	0	0
Test/Demonstration/Ferry	1	0	0	0	1	1	0	0	1	0	0
Aerial application	1	0	0	0	0	1	0	0	2	1	1
Inspection	0	0	0	0	0	0	0	0	0	0	0
Air transport	3	5	7	8	4	5	1	2	1	2	2
Air ambulance	0	1	0	0	0	0	0	0	0	0	0
Sightseeing	0	0	0	1	0	0	0	1	0	0	0
Other/Unknown	1	0	2	1	3	3	0	2	0	3	2
Helicopter accidents by operation type[2]	**42**	**32**	**29**	**35**	**41**	**27**	**34**	**32**	**27**	**27**	**26**
Training	6	5	0	2	1	1	2	5	1	7	1
Pleasure/Travel	9	5	2	9	8	2	7	8	9	4	6
Business	0	3	0	0	3	1	0	1	0	0	2
Forest fire management	0	4	1	2	1	3	0	2	0	2	2
Test/Demonstration/Ferry	0	0	1	1	0	1	0	0	0	0	1
Aerial application	1	0	3	1	5	0	1	2	1	3	1
Inspection	0	0	1	2	2	2	3	0	1	0	1
Air transport	22	10	15	13	9	8	18	10	7	3	3
Air ambulance	1	0	0	0	1	2	0	0	0	1	0

Sightseeing	0	1	0	0	1	0	1	0	0	1	1
Other/Unknown	3	4	6	5	10	7	2	4	8	6	8
Fatal helicopter accidents by operation type[2]	**9**	**7**	**3**	**8**	**7**	**6**	**0**	**5**	**2**	**2**	**4**
Training	0	1	0	1	1	0	0	0	0	1	0
Pleasure/Travel	3	2	0	2	0	0	0	0	1	0	2
Business	0	0	0	0	1	0	0	1	0	0	0
Forest fire management	0	1	0	1	0	0	0	0	0	0	0
Test/Demonstration/Ferry	0	0	1	1	0	0	0	0	0	0	1
Aerial application	0	0	0	0	0	0	0	1	0	0	0
Inspection	0	0	0	1	0	1	0	0	0	0	0
Air transport	4	3	2	1	1	3	0	3	0	0	0
Air ambulance	0	0	0	0	0	1	0	0	0	0	0
Sightseeing	0	0	0	0	1	0	0	0	0	0	0
Other/Unknown	2	0	0	1	3	1	0	0	1	1	1

Data extracted 18 February 2019

[1] Canadian-registered aircraft, excluding ultralights, balloons, gyroplanes, gliders, airships, hang gliders and similar aircraft types.

[2] Breakdowns may not add up to totals. For example, when an occurrence involves a business aeroplane and a training aeroplane, the occurrence is counted in each type, but only once in the total.

Table 7

Aircraft accidents by province/territory

2008-2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Accidents by province/territory	**294**	**298**	**288**	**257**	**291**	**276**	**249**	**251**	**230**	**240**	**201**
Newfoundland and Labrador	7	3	3	3	5	3	5	6	5	4	4
Prince Edward Island	0	1	0	0	0	0	0	0	0	2	0
Nova Scotia	6	3	7	5	5	5	3	6	2	3	2
New Brunswick	1	2	5	3	3	2	6	2	5	7	1
Quebec	58	68	65	58	71	66	69	51	34	44	31
Ontario	69	74	71	63	67	72	67	74	50	62	53
Manitoba	27	19	27	17	18	13	12	14	17	10	7
Saskatchewan	19	14	18	18	9	19	12	13	10	13	13
Alberta	33	31	25	22	35	29	33	23	38	35	32
British Columbia	44	59	47	43	54	51	30	42	53	39	36
Yukon	7	4	3	8	8	4	4	6	2	4	4
Northwest Territories	8	6	9	6	5	3	3	2	3	2	5
Nunavut	8	3	7	4	3	4	1	2	3	3	1
Other airspace under Canadian air traffic control	0	0	0	1	0	1	0	0	0	1	1
Outside Canada	7	11	1	6	8	4	4	10	8	11	11
Fatal accidents by province/territory	**38**	**35**	**37**	**35**	**42**	**38**	**14**	**29**	**29**	**22**	**23**
Newfoundland and Labrador	0	2	1	0	0	0	0	1	0	0	0
Prince Edward Island	0	1	0	0	0	0	0	0	0	0	0
Nova Scotia	0	0	1	1	0	1	1	1	0	0	0
New Brunswick	0	0	2	0	0	0	1	0	1	0	0
Quebec	5	10	10	5	10	5	2	7	7	4	2
Ontario	7	6	9	6	10	9	5	6	5	4	6
Manitoba	1	0	1	1	3	2	0	1	1	3	0
Saskatchewan	0	2	0	3	1	2	1	2	2	2	1
Alberta	8	1	2	4	6	4	1	3	4	3	5
British Columbia	10	8	7	10	9	10	2	4	8	3	4
Yukon	1	1	0	1	1	0	0	0	0	1	0
Northwest Territories	2	1	3	2	0	1	0	0	0	0	1
Nunavut	0	1	1	1	1	0	0	0	0	0	0
Other airspace under Canadian air traffic control	0	0	0	0	0	1	0	0	0	0	0
Outside Canada	4	2	0	1	1	3	1	4	1	2	4
Fatalities by province/territory	**64**	**72**	**72**	**66**	**63**	**65**	**21**	**47**	**45**	**34**	**38**
Newfoundland and Labrador	0	18	2	0	0	0	0	1	0	0	0

Prince Edward Island	0	1	0	0	0	0	0	0	0	0	0
Nova Scotia	0	0	2	1	0	1	1	1	0	0	0
New Brunswick	0	0	2	0	0	0	2	0	2	0	0
Quebec	7	16	28	9	11	5	2	16	15	6	4
Ontario	8	12	14	9	19	19	8	10	5	9	8
Manitoba	1	0	1	1	4	5	0	1	2	4	0
Saskatchewan	0	4	0	7	5	3	2	3	2	3	1
Alberta	12	1	4	5	6	5	1	4	4	5	6
British Columbia	26	14	15	16	15	17	3	7	12	4	6
Yukon	1	1	0	1	1	0	0	0	0	1	0
Northwest Territories	2	2	3	4	0	1	0	0	0	0	3
Nunavut	0	1	1	12	1	0	0	0	0	0	0
Other airspace under Canadian air traffic control	0	0	0	0	0	3	0	0	0	0	0
Outside Canada	7	2	0	1	1	6	2	4	3	2	10

Data extracted 18 February 2019

Table 8

Accidents involving Canadian-registered aircraft by province/territory (excluding ultralights)

2008-2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Accidents by province/territory	**252**	**250**	**244**	**230**	**239**	**243**	**212**	**227**	**200**	**208**	**173**
Newfoundland and Labrador	5	3	3	3	5	3	4	6	4	3	2
Prince Edward Island	0	1	0	0	0	0	0	0	0	1	0
Nova Scotia	2	1	7	3	3	5	2	5	2	2	1
New Brunswick	1	2	4	3	3	2	6	2	5	5	1
Quebec	50	60	52	52	52	57	57	44	28	39	28
Ontario	62	61	55	56	54	59	53	66	43	51	44
Manitoba	24	19	25	16	15	13	11	13	17	10	7
Saskatchewan	18	12	18	17	8	18	10	12	10	12	13
Alberta	28	28	24	18	30	27	31	21	36	30	27
British Columbia	33	44	38	39	46	44	27	39	43	35	30
Yukon	7	2	3	7	7	4	4	6	1	4	2
Northwest Territories	8	5	8	6	5	3	2	2	3	2	5
Nunavut	7	2	6	3	3	3	1	1	2	3	1
Other airspace under Canadian air traffic control	0	0	0	1	0	1	0	0	0	0	1
Outside Canada	7	10	1	6	8	4	4	10	6	11	11
Fatal accidents by province/territory	**26**	**29**	**32**	**30**	**33**	**32**	**10**	**23**	**24**	**21**	**21**
Newfoundland and Labrador	0	2	1	0	0	0	0	1	0	0	0
Prince Edward Island	0	1	0	0	0	0	0	0	0	0	0
Nova Scotia	0	0	1	0	0	1	0	0	0	0	0
New Brunswick	0	0	2	0	0	0	1	0	1	0	0
Quebec	4	8	9	5	4	3	1	6	5	4	2
Ontario	4	5	8	4	9	6	3	5	3	4	5
Manitoba	1	0	1	1	3	2	0	0	1	3	0
Saskatchewan	0	1	0	3	1	2	1	2	2	2	1
Alberta	4	1	2	3	5	4	1	3	4	3	4
British Columbia	6	8	5	9	8	9	2	2	7	2	4
Yukon	1	0	0	1	1	0	0	0	0	1	0
Northwest Territories	2	1	2	2	0	1	0	0	0	0	1
Nunavut	0	1	1	1	1	0	0	0	0	0	0
Other airspace under Canadian air traffic control	25	3	5	2	10	5	5	4	6	6	3
Outside Canada	4	1	0	1	1	3	1	4	1	2	4
Fatalities by province/territory	**51**	**65**	**66**	**61**	**54**	**59**	**15**	**40**	**34**	**33**	**36**

Newfoundland and Labrador	0	18	2	0	0	0	0	1	0	0	0
Prince Edward Island	0	1	0	0	0	0	0	0	0	0	0
Nova Scotia	0	0	2	0	0	1	0	0	0	0	0
New Brunswick	0	0	2	0	0	0	2	0	2	0	0
Quebec	6	14	27	9	5	3	1	15	7	6	4
Ontario	4	11	12	7	18	16	4	9	3	9	7
Manitoba	1	0	1	1	4	5	0	0	2	4	0
Saskatchewan	0	2	0	7	5	3	2	3	2	3	1
Alberta	8	1	4	4	5	5	1	4	4	5	5
British Columbia	22	14	13	15	14	16	3	4	11	3	6
Yukon	1	0	0	1	1	0	0	0	0	1	0
Northwest Territories	2	2	2	4	0	1	0	0	0	0	3
Nunavut	0	1	1	12	1	0	0	0	0	0	0
Other airspace under Canadian air traffic control	0	0	0	0	0	3	0	0	0	0	0
Outside Canada	7	1	0	1	1	6	2	4	3	2	10

Data extracted 18 February 2019

Table 9

Reportable aircraft incidents[1]

2008-2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Incidents by category[1]	**898**	**789**	**814**	**677**	**645**	**689**	**741**	**789**	**833**	**939**	**863**
Risk of collision/Loss of separation	176	153	206	120	102	115	94	111	139	172	141
Declared emergency	323	313	310	275	266	294	313	333	311	348	340
Engine failure	121	107	87	95	92	83	104	110	110	98	91
Smoke/Fire	108	97	80	88	71	67	89	87	85	100	99
Collision	9	10	4	7	5	15	16	8	18	24	26
Control difficulties	39	24	32	31	33	25	40	29	35	34	41
Crew unable to perform duties	78	59	51	26	40	58	37	46	66	78	57
Dangerous goods-related	1	3	1	0	1	3	4	0	2	0	2
Depressurization	17	6	11	16	15	14	12	16	14	21	13
Fuel shortage	7	4	9	6	7	2	6	17	15	17	10
Failure to remain in landing area	9	7	13	11	10	9	20	17	19	22	13
Incorrect fuel	1	0	0	0	0	0	0	0	1	3	0
Slung load released	5	3	9	1	1	4	5	14	15	21	23
Transmission or gearbox failure	0	3	1	1	2	0	1	1	3	1	0
Incidents by operator type[1,2]	**898**	**789**	**814**	**677**	**645**	**689**	**741**	**789**	**833**	**939**	**863**
Commercial	867	753	781	640	609	656	699	741	785	888	817
Airliner (CAR 705)	589	498	520	448	409	450	428	437	490	614	547
Commuter (CAR 704)	94	87	86	76	79	90	105	82	77	72	60
Air taxi (CAR 703)	35	43	29	29	26	35	81	119	106	103	90
Aerial work (CAR 702)	24	32	28	15	11	12	34	48	43	55	55
Foreign air operator (CAR 701)	190	138	170	109	117	113	82	75	94	80	91
Flight training units (CAR 406)	5	7	9	4	3	4	5	6	12	11	9
Other commercial	3	2	3	2	1	1	0	3	5	1	2
Private	33	38	34	40	35	31	37	51	45	56	52
Private operators (CAR 604)	17	24	15	20	20	18	22	19	20	32	19
Recreational	16	13	19	20	15	13	14	15	13	11	10
Other private	0	1	0	1	0	0	1	17	12	13	23
State	16	22	23	13	20	20	13	15	8	15	11
Other/Unknown	18	9	6	5	4	4	12	15	22	13	12
Incidents by aircraft type[1,2]	**898**	**789**	**814**	**677**	**645**	**689**	**741**	**789**	**833**	**939**	**863**
Aeroplane	881	771	789	659	633	673	715	749	795	892	822
Helicopter	19	21	32	20	17	20	30	47	38	52	43
Ultralight/Other aircraft type[3]	0	1	2	0	0	0	3	8	7	4	4

Number of aircraft involved in incidents[1,4]	**1066**	**914**	**977**	**780**	**742**	**800**	**830**	**887**	**957**	**1063**	**973**
Aeroplanes	1047	891	943	760	725	780	797	832	912	1006	924
Helicopters	19	22	32	20	17	20	30	47	38	53	45
Ultralight/Other aircraft type[3]	0	1	2	0	0	0	3	8	7	4	4
Incidents by province/territory[1]	**898**	**789**	**814**	**677**	**645**	**689**	**741**	**789**	**833**	**939**	**863**
Newfoundland and Labrador	21	16	30	14	17	29	22	30	31	27	35
Prince Edward Island	2	2	0	1	0	2	0	1	4	1	2
Nova Scotia	20	18	25	19	17	11	22	19	17	22	29
New Brunswick	12	5	10	7	7	7	8	9	9	4	8
Quebec	127	97	108	126	107	122	89	116	109	139	141
Ontario	271	195	176	178	155	166	157	152	166	230	144
Manitoba	58	45	51	31	31	31	51	54	47	49	43
Saskatchewan	28	18	19	11	18	27	32	21	25	19	16
Alberta	89	106	84	82	81	103	98	117	110	107	104
British Columbia	119	162	156	76	101	99	132	154	137	101	124
Yukon	4	6	4	3	4	5	6	6	5	5	2
Northwest Territories	27	14	21	30	17	16	25	17	9	20	22
Nunavut	17	8	21	19	19	10	20	15	15	15	19
Other airspace under Canadian air traffic control	35	33	31	27	23	23	24	20	32	19	14
Outside Canada	68	64	78	54	48	38	55	58	117	181	161

Data extracted 18 February 2019

[1] New TSB regulations came into effect on 1 July 2014. Under new reporting requirements aviation incidents include: a) aircraft having a maximum certificated take-off weight greater than 2 250 kg (formerly 5 700 kg); b) aircraft being operated under an air operator certificate issued under CARs Part VII.

[2] Breakdowns may not add up to totals. For example, when an occurrence involves an airplane and a helicopter, the occurrence is counted in each type, but only once in the total.

[3] Includes balloons, gyroplanes, gliders, airships, hang gliders, unmanned aerial vehicles (UAV) and similar aircraft types.

[4] "Number of aircraft involved in accidents" are aircraft counts, all other data are accident counts.

Table 10

Reportable incidents involving Canadian-registered aircraft[1]

2008-2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Incidents by category[1]	**724**	**657**	**665**	**576**	**530**	**579**	**654**	**711**	**737**	**866**	**772**
Risk of collision/Loss of separation	149	137	179	106	92	105	84	101	127	159	134
Declared emergency	234	237	238	224	200	231	277	290	263	316	298
Engine failure	98	94	67	87	77	70	94	102	102	88	79
Smoke/Fire	90	84	69	67	59	55	76	79	75	95	85
Collision	8	8	3	7	4	14	15	7	16	23	21
Control difficulties	32	18	24	27	31	22	36	28	30	33	40
Crew unable to perform duties	76	57	50	26	38	56	35	44	65	74	55
Dangerous goods-related	1	3	1	0	1	3	3	0	2	0	2
Depressurization	15	3	10	15	13	10	10	14	13	19	11
Fuel shortage	4	4	6	5	4	2	3	15	11	16	5
Failure to remain in landing area	7	6	8	10	9	7	17	17	14	18	12
Incorrect fuel	1	0	0	0	0	0	0	0	1	3	0
Slung load released	5	3	9	1	1	4	4	13	15	21	23
Transmission or gearbox failure	0	3	1	1	1	0	0	1	3	1	0
Incidents by operator type[1,2]	**724**	**657**	**665**	**576**	**530**	**579**	**654**	**711**	**737**	**866**	**772**
Commercial	700	629	641	550	504	552	622	674	705	825	743
Airliner (CAR 705)	582	494	519	445	409	449	426	436	489	613	546
Commuter (CAR 704)	94	87	86	76	79	90	105	82	77	72	60
Air taxi (CAR 703)	35	43	29	29	25	35	81	119	106	103	90
Aerial work (CAR 702)	24	31	28	15	11	12	31	47	43	55	55
Flight training units (CAR 406)	5	7	9	4	3	4	5	6	12	11	9
Other commercial	2	2	2	0	0	0	0	1	2	0	1
Private	26	29	29	29	28	25	29	40	37	48	34
Private operators (CAR 604)	11	16	12	11	14	13	17	16	20	32	19
Recreational	15	12	17	18	14	12	11	14	11	11	9
Other private	0	1	0	1	0	0	1	10	6	5	6
State	15	19	19	13	17	19	11	15	6	13	10
Other/Unknown	17	9	5	3	2	4	9	14	14	10	12
Incidents by aircraft type[1,2]	**724**	**657**	**665**	**576**	**530**	**579**	**654**	**711**	**737**	**866**	**772**
Aeroplane	707	639	642	558	519	563	631	672	699	819	731
Helicopter	19	21	31	20	16	20	27	46	38	52	43
Ultralight/Other aircraft type[3]	0	1	1	0	0	0	3	8	6	4	4
Number of aircraft involved in incidents[1,4]	**869**	**772**	**811**	**670**	**619**	**681**	**730**	**800**	**843**	**981**	**877**

Aeroplanes	850	749	779	650	603	661	700	746	799	924	828
Helicopters	19	22	31	20	16	20	27	46	38	53	45
Ultralight/Other aircraft type[3]	0	1	1	0	0	0	3	8	6	4	4
Incidents by province/territory[1]	**724**	**657**	**665**	**576**	**530**	**579**	**654**	**711**	**737**	**866**	**772**
Newfoundland and Labrador	13	7	13	10	10	17	13	20	22	22	22
Prince Edward Island	1	1	0	0	0	1	0	1	4	1	2
Nova Scotia	12	13	19	14	9	9	19	17	12	17	21
New Brunswick	7	3	8	5	7	4	6	9	9	3	7
Quebec	96	77	89	104	84	96	81	103	99	127	122
Ontario	219	168	141	149	127	142	139	141	148	202	129
Manitoba	48	39	45	30	30	27	45	51	44	47	38
Saskatchewan	26	16	15	11	14	26	27	19	25	18	14
Alberta	76	92	74	76	75	93	93	110	103	102	97
British Columbia	102	141	134	68	87	93	125	137	118	100	115
Yukon	2	6	3	3	3	3	5	6	5	3	2
Northwest Territories	27	14	19	30	17	16	25	17	8	20	21
Nunavut	14	7	17	16	15	10	16	14	15	14	16
Other airspace under Canadian air traffic control	13	9	10	6	4	4	5	8	8	9	5
Outside Canada	68	64	78	54	48	38	55	58	117	181	161

Data extracted 18 February 2019

[1] New TSB regulations came into effect on 1 July 2014. Under new reporting requirements aviation incidents include: a) aircraft having a maximum certificated take-off weight greater than 2 250 kg (formerly 5 700 kg); b) aircraft being operated under an air operator certificate issued under CARs Part VII.

[2] Breakdowns may not add up to totals. For example, when an occurrence involves an airplane and a helicopter, the occurrence is counted in each type, but only once in the total.

[3] Includes balloons, gyroplanes, gliders, airships, hang gliders, unmanned aerial vehicles (UAV) and similar aircraft types.

[4] "Number of aircraft involved in incidents" are aircraft counts, all other data are incident counts.

Table 11

Number of accidents involving aeroplanes by phase of flight and selected event category[1]

2008-2018

	###	###	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Standing/Taxiing	**13**	**20**	**17**	**18**	**17**	**23**	**16**	**19**	**16**	**20**	**13**	**192**
Collision with object	6	9	6	6	7	8	6	3	5	9	6	71
Collision with moving aircraft	4	3	1	1	2	1	3	5	4	3	3	30
Nosedown/Overturned	1	1	4	3	3	5	1	3	2	2	0	25
Landing gear collapsed/retracted	0	4	2	3	0	2	1	2	1	3	1	19
Loss of control	0	1	3	0	3	4	1	0	0	0	0	12
Other events	6	9	8	9	9	11	9	12	13	14	10	110
Takeoff	**40**	**49**	**54**	**41**	**54**	**40**	**48**	**53**	**47**	**45**	**35**	**506**
Collision with terrain	9	14	15	11	21	11	10	18	13	15	7	144
Loss of control	7	15	15	12	17	7	18	9	11	7	5	123
Collision with object	14	16	13	9	17	8	11	18	12	8	11	137
Take-off/Landing event	5	13	13	13	19	9	11	11	14	16	11	135
Power loss	14	12	14	11	6	13	16	12	10	11	5	124
Other events	30	34	35	28	33	26	34	50	30	35	31	366
En route	**34**	**42**	**32**	**31**	**30**	**34**	**23**	**29**	**19**	**34**	**27**	**335**
Power loss	18	26	13	14	15	15	14	8	12	15	11	161
Precautionary/Forced landing/Ditching	14	10	11	13	9	8	7	5	4	5	6	92
Collision with terrain	5	9	8	8	7	10	5	4	5	5	5	71
Component/System related	3	4	4	1	2	3	2	3	0	3	1	26
Other events	14	21	20	18	14	18	14	26	8	24	22	199
Manoeuvering	**12**	**3**	**11**	**12**	**11**	**12**	**4**	**11**	**13**	**11**	**12**	**112**
Collision with terrain	3	2	5	6	8	7	1	7	6	7	4	56
Loss of control	3	1	3	1	4	1	1	2	4	5	4	29
Collision with object	4	0	7	1	1	2	1	2	3	1	2	24
Power loss	4	1	1	3	1	0	0	1	2	1	1	15
Other events	6	1	3	9	2	5	3	4	6	2	8	49
Approach	**29**	**31**	**29**	**23**	**21**	**32**	**28**	**25**	**17**	**21**	**25**	**281**
Collision with terrain	8	12	11	7	6	6	7	10	4	7	5	83
Power loss	8	7	7	2	0	11	6	2	3	6	6	58
Collision with object	8	3	6	8	1	7	9	7	6	7	3	65
Component/System related	5	9	2	5	3	3	4	2	0	2	3	38
Precautionary/Forced landing/Ditching	5	4	5	2	2	7	7	1	1	4	5	43
Loss of control	5	3	6	3	4	5	1	4	1	0	1	33
Other events	7	14	9	8	14	10	9	18	12	13	18	132

Landing	**114**	**121**	**112**	**113**	**111**	**116**	**99**	**118**	**113**	**95**	**92**	**1204**
Missed or went off runway	17	24	24	27	26	28	14	30	30	21	17	258
Collision with object	21	23	25	28	26	18	20	29	24	23	27	264
Landing gear collapsed/retracted	28	18	26	24	22	25	17	27	27	23	19	256
Nosedown/Overturned	27	21	18	17	20	20	17	27	33	29	23	252
Loss of control	16	23	20	17	27	19	22	2	3	6	3	158
Hard landing	16	19	23	22	20	13	14	10	17	19	16	189
Collision with terrain	19	16	18	16	18	12	21	20	12	7	10	169
Wheels-up landing	8	12	7	3	7	10	7	10	9	4	5	82
Precautionary/Forced landing/Ditching	5	11	5	3	9	11	5	12	18	18	7	104
Other events	38	39	46	49	42	45	28	77	77	50	58	549
Post-impact	**13**	**13**	**20**	**11**	**19**	**13**	**16**	**37**	**57**	**41**	**43**	**283**
Fire/Explosion/Fumes	9	8	15	6	7	7	6	13	9	5	7	92
Other events	5	6	5	5	12	6	12	24	49	37	37	198

Data extracted 18 February 2019

[1] Breakdowns do not add up to 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.

Table 12

Number of accidents involving helicopters by phase of flight and selected event category[1]

2008-2018

	###	###	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Standing/Taxiing	**3**	**3**	**0**	**6**	**4**	**1**	**4**	**2**	**0**	**1**	**4**	**28**
Collision with terrain	0	1	0	2	1	0	0	1	0	0	0	5
Loss of control	1	0	0	2	0	0	2	1	0	0	0	6
Collision with object	1	0	0	0	0	0	2	1	0	1	1	6
Other events	2	3	0	5	4	1	4	0	0	0	4	23
Takeoff	**7**	**4**	**2**	**7**	**7**	**7**	**9**	**4**	**6**	**5**	**5**	**63**
Loss of control	4	1	1	4	2	0	5	1	4	4	1	27
Collision with terrain	3	2	2	3	1	2	1	2	1	1	2	20
Collision with object	0	1	1	0	4	2	2	1	0	1	2	14
Power loss	1	1	0	2	0	1	1	0	1	0	0	7
Other events	4	1	1	1	2	2	4	1	3	2	2	23
En route	**11**	**11**	**7**	**10**	**9**	**5**	**7**	**4**	**5**	**3**	**6**	**78**
Collision with terrain	6	3	3	3	3	1	3	1	1	1	2	27
Power loss	4	5	3	2	3	1	1	1	3	0	1	24
Precautionary/Forced landing/Ditching	0	1	1	0	1	1	0	1	0	0	0	5
Component/System related	3	1	0	2	0	1	0	1	0	0	0	8
Other events	10	5	4	7	6	4	5	3	4	3	5	56
Manoeuvering	**9**	**7**	**6**	**10**	**11**	**8**	**4**	**8**	**8**	**7**	**3**	**81**
Collision with terrain	4	3	3	6	5	5	2	3	5	3	1	40
Loss of control	2	3	2	2	3	2	2	2	3	4	0	25
Collision with object	2	1	2	3	3	2	1	1	3	3	1	22
Operations related event	1	2	1	2	2	1	0	2	5	3	1	20
Power loss	2	2	1	0	2	1	0	2	1	1	0	12
Other events	5	5	1	3	6	2	2	5	5	5	2	41
Approach	**3**	**5**	**4**	**6**	**7**	**3**	**3**	**3**	**5**	**2**	**2**	**43**
Collision with terrain	2	3	4	1	1	0	0	0	1	0	0	12
Power loss	0	1	0	0	2	0	1	1	3	0	0	8
Loss of control	0	0	1	1	1	0	1	1	2	1	1	9
Collision with object	0	1	0	2	0	0	1	0	1	1	0	6
Other events	2	3	3	3	5	3	2	2	4	1	1	29
Landing	**17**	**15**	**15**	**7**	**13**	**12**	**12**	**18**	**16**	**13**	**12**	**150**
Hard landing	6	2	4	4	4	1	3	1	0	1	2	28
Collision with terrain	5	5	4	2	4	0	3	6	0	0	2	31
Loss of control	6	2	1	1	1	2	4	6	2	1	2	28

Collision with object	3	5	5	2	2	5	5	1	4	3	6	41
Other events	4	9	7	2	4	9	5	10	4	5	5	64
Post-impact	**3**	**4**	**4**	**4**	**2**	**3**	**2**	**5**	**11**	**1**	**6**	**45**
Fire/Explosion/Fumes	2	3	1	2	1	2	0	1	0	0	0	12
Other events	1	1	3	2	1	1	2	4	11	1	6	33

Data extracted 18 February 2019

[1] Breakdowns do not add up to 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.

Table 13

Number of FATAL accidents involving aeroplanes by phase of flight and selected event category[1]

2008-2018

	###	###	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Standing/Taxiing	**0**	**0**	**0**	**1**	**1**	**1**	**0**	**1**	**2**	**1**	**0**	**7**
Collision with object	0	0	0	0	0	0	0	0	0	0	0	0
Collision with moving aircraft	0	0	0	0	0	0	0	0	0	0	0	0
Nosedown/Overturned	0	0	0	0	0	0	0	0	0	0	0	0
Landing gear collapsed/retracted	0	0	0	0	0	0	0	0	0	0	0	0
Loss of control	0	0	0	0	0	0	0	0	0	0	0	0
Other events	0	0	0	1	1	1	0	1	2	1	0	7
Takeoff	**1**	**6**	**6**	**4**	**6**	**4**	**2**	**9**	**5**	**6**	**5**	**54**
Collision with terrain	1	6	2	1	4	3	0	4	4	5	2	32
Loss of control	0	3	1	2	2	2	1	4	4	2	2	23
Collision with object	0	1	0	1	2	0	0	1	0	1	1	7
Take-off/Landing event	0	0	0	1	1	1	1	0	0	1	0	5
Power loss	0	0	3	1	0	0	1	1	1	1	0	8
Other events	1	2	3	4	3	2	0	7	1	4	4	31
En route	**7**	**8**	**9**	**9**	**8**	**9**	**3**	**7**	**5**	**5**	**6**	**76**
Power loss	1	1	0	2	1	0	0	0	2	0	1	8
Precautionary/Forced landing/Ditching	1	0	0	1	0	0	0	0	1	0	0	3
Collision with terrain	5	4	8	5	6	7	3	4	4	3	5	54
Component/System related	0	0	1	0	0	0	0	1	0	0	0	2
Other events	3	5	4	4	2	5	1	6	2	4	5	41
Manoeuvering	**3**	**0**	**2**	**1**	**4**	**3**	**2**	**4**	**5**	**4**	**5**	**33**
Collision with terrain	2	0	1	1	4	2	1	4	4	4	3	26
Loss of control	2	0	1	0	2	0	1	0	2	2	4	14
Collision with object	0	0	2	0	0	0	0	1	1	1	0	5
Power loss	0	0	0	0	0	0	0	0	0	0	0	0
Other events	0	0	1	1	0	1	1	0	1	1	3	9
Approach	**0**	**6**	**10**	**6**	**5**	**5**	**1**	**5**	**4**	**4**	**4**	**50**
Collision with terrain	0	6	6	4	3	5	0	3	3	3	2	35
Power loss	0	1	1	1	0	1	0	0	0	0	0	4
Collision with object	0	0	2	2	0	0	0	1	1	1	0	7
Component/System related	0	0	0	0	0	0	0	0	0	1	0	1
Precautionary/Forced landing/Ditching	0	0	2	1	0	0	0	0	0	0	0	3
Loss of control	0	2	5	0	1	2	0	0	1	0	0	11
Other events	0	3	4	1	4	1	1	2	2	2	2	22

Landing	**2**	**3**	**3**	**5**	**3**	**3**	**4**	**4**	**5**	**0**	**1**	**33**
Missed or went off runway	1	0	0	0	0	0	1	0	1	0	0	3
Collision with object	1	1	0	1	0	0	0	1	1	0	1	6
Landing gear collapsed/retracted	0	0	0	0	0	0	0	0	0	0	0	0
Nosedown/Overturned	0	0	1	1	1	2	1	0	0	0	1	7
Loss of control	1	0	1	0	0	1	0	0	0	0	0	3
Hard landing	0	0	0	0	1	0	0	0	0	0	0	1
Collision with terrain	1	0	2	2	3	2	2	2	4	0	0	18
Wheels-up landing	0	0	0	0	0	0	0	0	0	0	0	0
Precautionary/Forced landing/Ditching	0	1	0	0	0	1	0	1	0	0	0	3
Other events	0	2	1	1	2	0	2	1	3	0	1	13
Post-impact	**6**	**8**	**13**	**6**	**8**	**8**	**4**	**10**	**9**	**5**	**8**	**85**
Fire/Explosion/Fumes	6	6	12	4	6	7	3	10	7	4	6	71
Other events	1	3	1	2	2	1	2	0	2	1	2	17

Data extracted 18 February 2019

[1] Breakdowns do not add up to 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.

Table 14

Number of FATAL accidents involving helicopters by phase of flight and selected event category[1]

2008-2018

	###	###	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Standing/Taxiing	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Collision with terrain	0	0	0	0	0	0	0	0	0	0	0	0
Loss of control	0	0	0	0	0	0	0	0	0	0	0	0
Collision with object	0	0	0	0	0	0	0	0	0	0	0	0
Other events	0	0	0	0	0	0	0	0	0	0	0	0
Takeoff	**2**	**0**	**0**	**2**	**0**	**2**	**0**	**1**	**0**	**0**	**0**	**7**
Loss of control	0	0	0	0	0	0	0	0	0	0	0	0
Collision with terrain	2	0	0	1	0	1	0	1	0	0	0	5
Collision with object	0	0	0	0	0	1	0	1	0	0	0	2
Power loss	0	0	0	1	0	0	0	0	0	0	0	1
Other events	1	0	0	0	0	0	0	0	0	0	0	1
En route	**2**	**4**	**3**	**2**	**3**	**2**	**0**	**2**	**1**	**1**	**4**	**24**
Collision with terrain	1	2	3	2	2	1	0	1	1	0	2	15
Power loss	0	1	0	0	0	0	0	0	0	0	0	1
Precautionary/Forced landing/Ditching	0	1	0	0	0	0	0	0	0	0	0	1
Component/System related	1	1	0	0	0	0	0	0	0	0	0	2
Other events	2	1	2	1	2	2	0	1	1	1	3	16
Manoeuvering	**4**	**3**	**0**	**4**	**3**	**2**	**0**	**1**	**1**	**1**	**0**	**19**
Collision with terrain	3	2	0	3	1	2	0	1	0	1	0	13
Loss of control	1	2	0	0	1	1	0	0	0	1	0	6
Collision with object	0	0	0	1	0	0	0	0	1	1	0	3
Operations related event	0	1	0	0	2	0	0	0	0	1	0	4
Power loss	1	1	0	0	1	0	0	1	0	0	0	4
Other events	3	2	0	2	2	0	0	0	1	1	0	11
Approach	**2**	**2**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**6**
Collision with terrain	1	2	0	0	0	0	0	0	0	0	0	3
Power loss	0	0	0	0	0	0	0	0	0	0	0	0
Loss of control	0	0	0	1	1	0	0	0	0	0	0	2
Collision with object	0	1	0	0	0	0	0	0	0	0	0	1
Other events	2	0	0	0	1	0	0	0	0	0	0	3
Landing	**1**	**2**	**0**	**1**	**2**	**0**	**0**	**2**	**0**	**1**	**0**	**9**
Hard landing	1	1	0	0	0	0	0	0	0	0	0	2
Collision with terrain	0	2	0	1	2	0	0	1	0	0	0	6
Loss of control	0	0	0	0	0	0	0	1	0	0	0	1

Collision with object	0	1	1	0	0	0	0	0	1	0	2	5
Other events	1	1	0	0	0	0	0	0	0	0	0	2
Post-impact	**2**	**4**	**0**	**1**	**1**	**2**	**0**	**1**	**0**	**0**	**0**	**11**
Fire/Explosion/Fumes	2	3	0	1	1	1	0	1	0	0	0	9
Other events	0	1	0	0	0	1	0	0	0	0	0	2

Data extracted 18 February 2019

[1] Breakdowns do not add up to 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.

Definitions

The following definitions apply to air transportation occurrences that are required to be reported pursuant to the *Canadian Transportation Accident Investigation and Safety Board Act* and the *Transportation Safety Board Regulations*.

Aviation occurrence

Any accident or incident associated with the operation of an aircraft
Any situation or condition that the Board has reasonable grounds to believe could, if left unattended, induce an accident or incident described below

Reportable aviation accident

An accident resulting directly from the operation of an aircraft where

a person is killed or sustains a serious injury as a result of
- being on board the aircraft;
- coming into contact with any part of the aircraft, including parts that have become detached from the aircraft; or
- being directly exposed to jet blast, rotor down wash or propeller wash;

the aircraft sustains structural failure or damage that adversely affects the aircraft's structural strength, performance or flight characteristics and would normally require major repair or replacement of any affected component, except for
- engine failure or damage, when the damage is limited to the engine, its cowlings or accessories; or
- damage limited to propellers, wing tips, antennae, tires, brakes, fairings or small dents or puncture holes in the aircraft's skin; or

the aircraft is missing or inaccessible.

Reportable aviation incident

An incident involving an aircraft having a maximum certificated takeoff weight (MCTOW) greater than 2 250 kg, or of an aircraft being operated under an air operator certificate issued under Part VII of the Canadian Aviation Regulations, where

an engine fails or is shut down as a precautionary measure;
a power train transmission gearbox malfunction occurs;
smoke is detected or a fire occurs on board;
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;
the aircraft fails to remain within the intended landing or takeoff 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;

a crew member whose duties are directly related to the safe operation of the aircraft is unable to perform their duties as a result of a physical incapacitation which poses a threat to the safety of persons, property or the environment;
depressurization of the aircraft occurs that requires an emergency descent;
a fuel shortage occurs that requires a diversion or requires approach and landing priority at the destination of the aircraft;
the aircraft is refuelled with the incorrect type of fuel or contaminated fuel,
a collision, a risk of collision or a loss of separation occurs;
a crew member declares an emergency or indicates an emergency that requires priority handling by air traffic services or the standing by of emergency response services;
a slung load is released unintentionally or as a precautionary or emergency measure from the aircraft; or
any dangerous goods are released in or from the aircraft.

Collision

Collision means an impact, other than an impact associated with normal operating circumstances, between aircraft or between an aircraft and another object or terrain.

Risk of collision

Risk of collision means a situation in which an aircraft comes so close to being involved in a collision that a threat to the safety of any person, property or the environment exists.

Loss of separation

Loss of separation means a situation in which the distance separating 2 aircraft is less than the minimum established in the *Canadian Domestic Air Traffic Control Separation Standards*, published by the Department of Transport, as amended from time to time.

Serious injury

A fracture of any bone, except simple fractures of fingers, toes or the nose
Lacerations that cause severe hemorrhage or nerve, muscle or tendon damage
An injury to an internal organ
Second- or third-degree burns, or any burns affecting more than 5% of the body surface
A verified exposure to infectious substances or injurious radiation
An injury that is likely to require hospitalization

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.

Operation

Operation means the activities for which an aircraft is used from the time any person boards the aircraft with the intention of flight until they disembark.

Operator

Operator has the same meaning as in subsection 101.01(1) of the *Canadian Aviation Regulations*.

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 8 618 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 multi-engined aircraft that has a MCTOW of 8 618 kg (19 000 pounds) or less and a seating configuration, excluding pilot seats, of 10 to 19, inclusive;
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

the carriage on board of persons other than flight crew members;
the carriage of helicopter external loads;
the towing of objects; or
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 single engined aircraft;
a multi engined aircraft, other than a turbo jet powered aeroplane, that has a MCTOW of 8 618 kg (19 000 pounds) or less and a seating configuration, excluding pilot seats, of 9 or less; or
any aircraft that is authorized by the Minister of Transport to be operated under Part VII, Subpart 3, Division 1 of the 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.