



Transportation
Safety Board
of Canada

Bureau de la sécurité
des transports
du Canada



STATISTICAL SUMMARY AIR TRANSPORTATION OCCURRENCES IN 2019

Canada 

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Statistical summary: Air transportation occurrences in 2019

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Statistical Summary

Air Transportation Occurrences in 2019

The TSB gathers and uses transportation occurrence data during the course of its investigations to analyze safety deficiencies and identify risks in the Canadian air 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 reading this summary to avoid drawing conclusions that cannot be supported by statistical analysis.

Throughout this document, there are instances where categories of occurrences sum to more than the total number of occurrences. For example, if a single occurrence involves an aeroplane and a glider, the occurrence count will increase by one in each aircraft category but the occurrence itself will be counted only once in the total of occurrences.

The 2019 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 database at 05 March 2020. Since the occurrence data are constantly being updated in the live database, the statistics may change slightly over time.

Also, as many occurrences are limited to data gathering, information recorded on some occurrences may not have been verified.

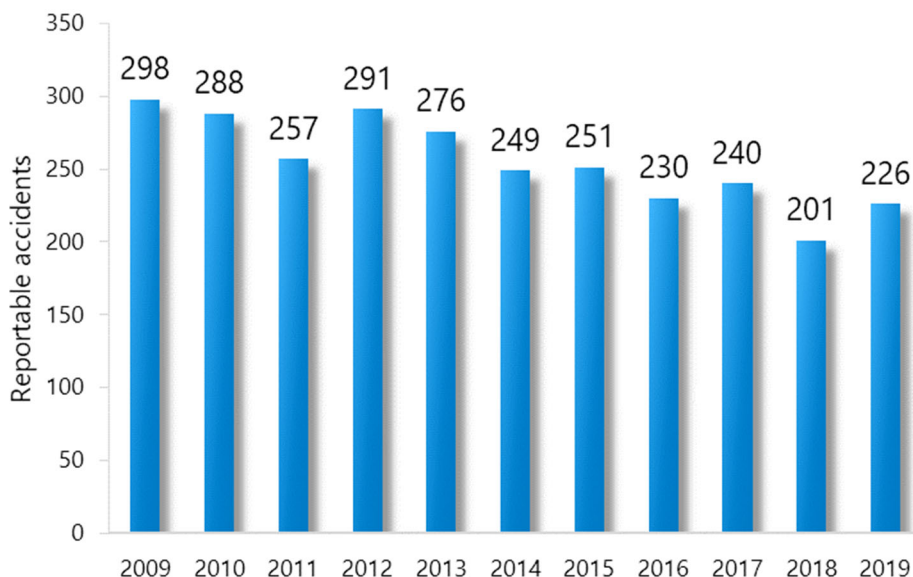
Overview of accidents and fatalities

Accident counts

Air transportation 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 [TSB Regulations](#).¹

In 2019, a total of 226 air transportation accidents were reported to the TSB (Table 1 and Figure 1). This number is higher than the previous year's total of 201 accidents but 12% fewer than the average of 258 reported in the prior 10 years 2009–2018. Most (209) of the accidents in 2019 took place in Canada and involved Canadian-registered aircraft. Ten accidents in Canada involved foreign-registered aircraft, and 8 accidents involving Canadian-registered aircraft took place outside Canada.² In general, the number of air transportation accidents has been decreasing in the last decade.

Figure 1. Air transportation accidents reported to the TSB, 2009 to 2019



There were 199 accidents involving Canadian-registered aircraft (excluding ultralights) in 2019 (Table 2). This is above the 2018 count of 173 accidents, but still 11% below the average of 223 accidents in the preceding 10 years 2009–2018. If the 18 accidents involving ultralights are included in the count, there were 217 accidents involving Canadian-registered aircraft in 2019.

¹ *Transportation Safety Board Regulations*, at <https://laws-lois.justice.gc.ca/eng/regulations/SOR-2014-37/index.html> (last accessed on 22 June 2020)

² While 209 + 10 + 8 sums to 227, one accident in Canada involved two aircraft; one Canadian-registered and one foreign-registered. This accident is counted only once in the total, which is 226. This situation is repeated elsewhere in this document, and the reader is reminded that categories may sum to more than totals.

Aircraft type

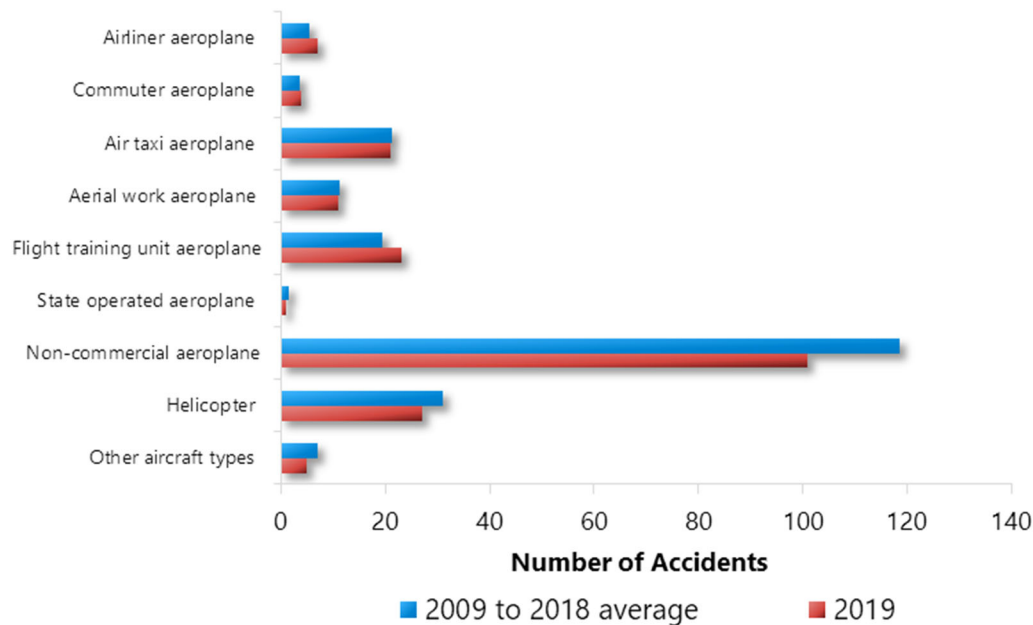
Of the 226 air transportation accidents reported to the TSB last year, 176 (78%) involved fixed-wing, powered aeroplanes (other than ultralights) (Table 1); 28 (12%) involved helicopters, 18 (8%) involved ultralights, and 5 accidents (2%) involved other types of aircraft. From 2009 to 2018, the proportion of accidents involving each of these 4 types of aircraft has remained fairly constant: 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 about 3% of accidents each year.

Operator type

There were 83 accidents that involved commercially-operated aircraft in 2019 (Table 1). This is more than the 66 such accidents recorded in 2018, but still 6% below the average of 88 accidents recorded in the 10 years 2009–2018.

Commercially-operated Canadian-registered aeroplanes were involved in 66 accidents in 2019 (Table 2), and 7 of those involved operations under *Canadian Aviation Regulations* (CARs) Subpart 705, which certifies the operation of airliners. This is fewer than the 8 accidents involving Canadian-registered airliners in 2018, but still above the average of 5.5 per year recorded from 2009 to 2018. In 2019, the TSB conducted formal investigations into 4 of the 7 accidents in that year that involved airliners. Two investigations were detailed Class 3 investigations (a collision on the ground, and a runway side excursion), and 2 were Class 4 investigations that were limited in scope (a forced landing after engine failure, and an abnormal runway contact).

Figure 2. Number of accidents involving Canadian-registered aircraft, by aircraft type and operation type, in 2019 compared with the 2009–2018 average



Also in 2019, there were 4 accidents involving Canadian-registered commuter aeroplanes operating under CARs Subpart 704 (Table 2), as well as 26 accidents involving air taxi operations (CARs Subpart 703)—21 involving aeroplanes and 5 involving helicopters. These 26 air taxi accidents are up slightly from the 23

seen in 2018, but still fewer than the average of 33 accidents per year between 2009 and 2018. Flight training units operating under CARs Subpart 406 were involved in 25 accidents in 2019 comprising 23 aeroplanes, 1 helicopter, and 1 ultralight. This is slightly above the average of 22 accidents per year for the period 2009 to 2018.

Overall, 142 air transportation accidents involved non-commercial (i.e., private aircraft) operations (Table 1), compared to 134 in the preceding year. This is 13% below the annual average of 163 accidents from 2009 to 2018. Of the 142 total accidents in the non-commercial (private aircraft) operations category, 101 involved Canadian-registered aeroplanes (Table 2), and 4 of 101 were operating under CARs Subpart 604 with a Private Operator Registration Document (PORL).

Most operators of non-commercial (private) aircraft are classified as recreational operators. Recreational operators are responsible for a significant amount of flying activity in Canada and abroad, and are involved in many accidents each year. In 2019, 131 accidents involved recreational operators (Table 1). This figure is up 7 from 124 in the previous year, but still 17% below the average (156) for the period 2009–2018.

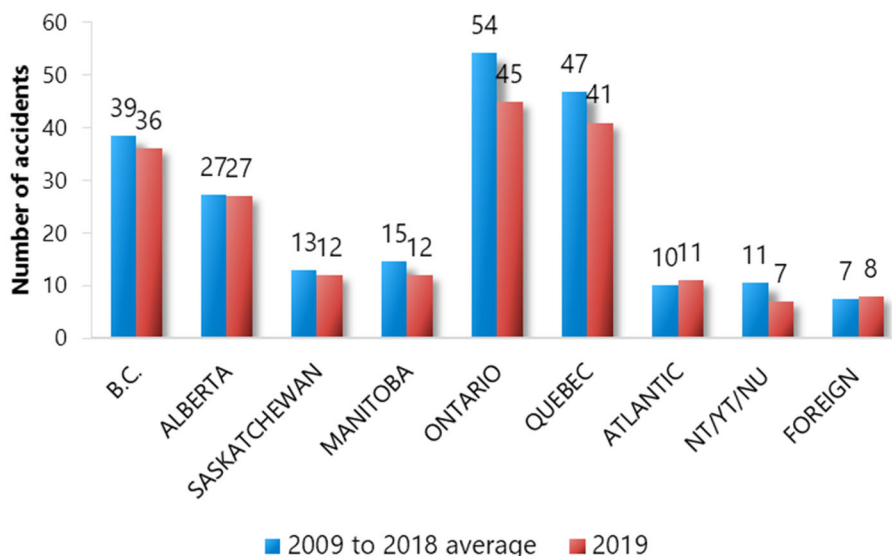
In addition to commercial and private operations, 1 state-operated aircraft was involved in an accident in 2019. The aircraft was operated by a provincial government to perform fire-fighting operations.

Province or territory

Ontario, with 52 reported accidents (all aircraft types, including ultralights), was the province with the largest number of reported accidents in 2019, as it was in the previous 2 years (Table 7). Ontario also averaged more accidents per year (65) in the 2009–2018 period than any other province or territory, with Quebec having the second-largest average accident count (56) for the same period. British Columbia and Alberta also have high average accident counts compared with the remaining provinces and territories.

Eight accidents that were reportable under TSB Regulations occurred outside Canada in 2019.

Figure 3. Air transportation accidents involving Canadian-registered aircraft in 2019 compared with the 2009–2018 average, by province, territory, or region



The number of accidents involving Canadian-registered aircraft by province or territory (Table 8) is shown in Figure 3. There were 45 accidents reported in Ontario involving Canadian-registered aircraft in 2019, which is 17% below the average number (54) for the years 2009 to 2018. New Brunswick had more accidents (8) than was seen on average (3) over the previous 10 years.

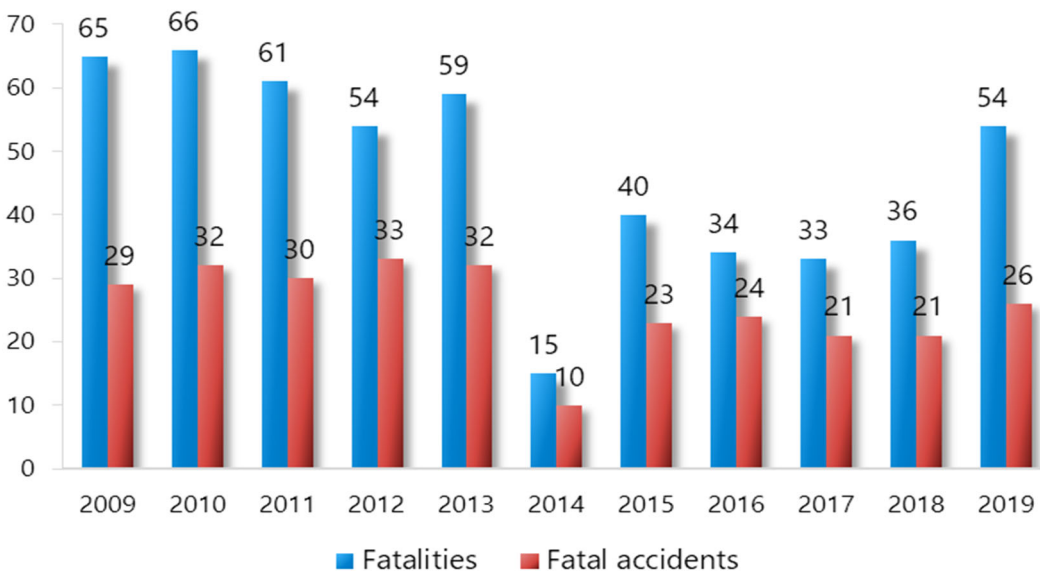
Fatal accidents, fatalities, and serious injuries

The TSB recorded 70 fatalities in the 33 fatal air transportation accidents in 2019 (tables 1 and 4). This is up considerably from 38 fatalities in the 23 fatal accidents in 2018, and is higher than the corresponding averages of 52 fatalities in 30 fatal accidents over the ten years 2009–2018. Of the 33 fatal accidents in 2019, 27 involved fixed-wing, powered aeroplanes, 3 involved helicopters, 3 involved ultralight aircraft, and 1 involved a glider.

Four fatal accidents in 2019, accounting for 11 fatalities, involved foreign-registered aircraft operating in Canada (Table 1). One fatal accident resulting in 2 fatalities occurred outside Canada (in the United States) (Table 4).

Excluding ultralights, there were 26 fatal accidents involving Canadian-registered aircraft in 2019, up from 21 in the preceding year and equal to the average in 2009–2018 (Table 2 and Figure 4). However, the number of fatalities in those accidents was 54, which is more than the 36 reported in 2018 and 17% above the average of 46 in the preceding 10-year period.

Figure 4. Fatal accidents and fatalities involving Canadian-registered aircraft, excluding ultralights, 2009 to 2019



Twenty-five of the 70 aviation fatalities in 2019 involved commercial operations (Table 4): 21 of them under air taxi regulations (CARs 703), 3 under aerial work (CARs 702), and 1 in flight training operations (CARs 406). There were no fatalities involving airliner operations (CARs 705) or commuter operations (CARs 704) in 2019. The remaining 45 (of 70) fatalities in 2019 were linked to private operations, mostly involving recreational operators, with none involving an operator holding a PORD (CARs 604).

With regards to type of aircraft, 58 of 70 fatalities in 2019 resulted from accidents in fixed-wing powered aeroplanes (Table 4). Helicopter accidents resulted in 5 fatalities, as did ultralight accidents. There were also 2 fatalities in one glider accident. Of the 70 total fatalities, 34 were crew members and 36 were aircraft passengers. There were no fatalities among persons on the ground in 2019.

Overall, 31 persons received serious injuries in aircraft accidents in 2019 (Table 5), slightly more than the 28 persons seriously injured in 2018, and just below the average of 34 in the period 2009–2018. Thirteen persons received serious injuries in accidents involving commercial operations in 2019: 1 in an airliner (CARs 705), 8 in air taxi operations (CARs 703), 2 related to aerial work (CARs 702), and 2 with flight-training units (CARs 406). Also in 2019, 18 persons incurred serious injuries in private operations, all of which were classified as recreational operations.

Accident rates

Accident rates as a key safety indicator

A key indicator of aviation safety is the aircraft accident rate, which is calculated as the number of accidents per hours flown or per number of movements (a movement can be a takeoff or a landing). Performing a trend analysis of accident rates for different types of operators can detect emerging safety issues associated with specific operator types and activities.

Activity data (e.g., flight hours) broken out by operator type³ is required to calculate the accident rates that enable trend analysis of specific operator types over time, or comparisons across operator types or geographical regions.

Until 2010, Transport Canada provided activity data broken out by operator type, and the TSB used these data to calculate and publish accident rates across operator types. In 2010, however, Transport Canada informed the TSB that it would no longer provide hours-flown activity data breakouts by operator type, because it had concerns regarding the accuracy of those data. The data were reported to Transport Canada by the commercial operators who were allowed to report all hours under the most restrictive subpart of the *Canadian Aviation Regulations* (CARs), even if they conducted operations under more than one subpart.

Reporting all hours for all subparts under a single total conflates and confounds airline and commuter activity, as well as the activity of many smaller aviation operators that may carry out operations under multiple subparts of the CARs (commuter, air taxi, and/or aerial work) and report their activity as a single total. Furthermore, the movement data as presently reported by Statistics Canada⁴ come from a survey that covers all aircraft movements at Canadian airports, with or without NAV CANADA air traffic control towers and flight service stations.

³ The operator types in the CARs are as follows: airline operations (Subpart 705), commuter operations (Subpart 704), air-taxi operations (Subpart 703), aerial work (Subpart 702), foreign air operations (Subpart 701), and private operators (Subpart 604).

⁴ Statistics Canada, "Aircraft Movement Statistics," at <http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=2715> (last accessed on 19 June 2020).

Because hours-flown and movement data are currently not categorized by CARs subpart when collected by the government, the rate data calculated is for the aviation sector as a whole; there is no differentiation between sectors (e.g., air-taxi operators versus airline operators) or between different types of aircraft (airplane, helicopter, floatplane). Therefore, the accident rate cannot be calculated for any single sector.

Without hours-flown and movement data that are categorized by CARs subpart and aircraft type, it will be more difficult for sector stakeholders to assess risks and determine if mitigation strategies being carried out to improve safety are actually working.

Therefore, in 2019 the Board recommended that

the Department of Transport require all commercial operators to collect and report hours flown and movement data for their aircraft by *Canadian Aviation Regulations* subpart and aircraft type, and that the Department of Transport publish those data.

TSB Recommendation A19-05

Accident rate for Canadian-registered aircraft, in Canada and abroad, per 100 000 hours flown

Overall accident rate

Transport Canada collects information about the number of hours flown by Canadian-registered aircraft. The 2019 overall air transportation accident rate of 3.7 per 100 000 hours flown (Table 3a) was calculated based on the 195 accidents in Canada and abroad involving Canadian-registered aeroplanes and helicopters (excluding ultralights and other aircraft types) and the estimated 5 201 000 hours flown by Canadian-registered aircraft.⁵ This rate is above the 2018 rate of 3.3 accidents per 100 000 flight hours, but below the average rate of 4.9 accidents per 100 000 hours flown each year over the previous 10 years.

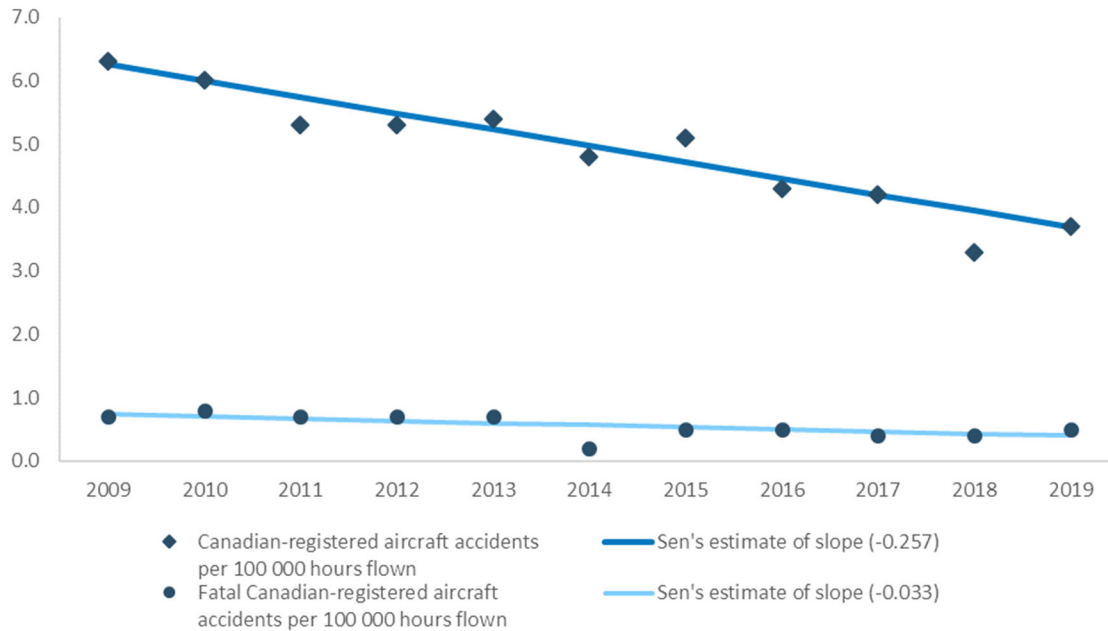
An encouraging observation is that the accident rate for Canadian-registered aircraft has fallen from 6.3 accidents per 100 000 hours flown in 2009 to 3.7 in 2019, a reduction of 41%. Kendall's tau-b correlation and Sen's estimate of slope were used to quantify the trend in Canadian-registered aircraft accident rate and fatal accident rate. Kendall's tau-b (τ_b) correlation coefficient is a nonparametric measure of the strength and direction of association that exists between two variables. Kendall's τ_b was calculated on the 11-year series of accident rate values by year from 2009 to 2019. There was a strong, negative correlation that indicates a downward trend in accident rate per 100 000 hours flown over the period ($\tau_b = -0.8441$, $p = 0.0003$). Sen's estimate of slope, the amount of downward rate change per year, was -0.257 occurrences per 100 000 hours flown per year. A graphical illustration is presented in Figure 5.

Fatal accidents

Figure 5 also illustrates a trend line for fatal accidents. For the 26 fatal accidents involving Canadian-registered aircraft in 2019, the fatal accident rate was 0.5 per 100 000 hours flown. That rate is up slightly from the 2018 rate of 0.4, and is below the 2009 to 2018 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 2009 (Kendall's $\tau_b = -0.5829$, $p = 0.0185$), 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.

⁵ Source of estimated hours flown data: Transport Canada (email communication, 30 March 2020).

Figure 5. Canadian-registered aircraft accidents per 100 000 hours flown, 2009 to 2019



Fatalities

In 2019, 54 fatalities resulted from accidents involving Canadian-registered aeroplanes and helicopters (excluding ultralights), yielding a rate of 1.0 fatalities per 100 000 hours flown. This fatality rate is higher than the 2018 rate of 0.7, and equal to the average yearly rate of 1.0 from 2009 to 2018. Like the accident rate and fatal accident rate, the fatality rate per 100 000 hours flown has shown a downward trend since 2009 (Kendall's $\tau_b = -0.5984$, $p = 0.0118$). The rate of change (Sen's estimate) is -0.100 fatalities per 100 000 hours flown per year.

Accident rate per 100 000 aircraft movements in Canada, for Canadian and foreign-registered aircraft

An alternate method for calculating the accident rate is to compare the accident count to the number of aircraft movements during a year (Table 3b). An aircraft movement is a take-off, landing, or simulated approach by an aircraft, as defined by NAV CANADA. Statistics Canada collects movement information for all aircraft taking off from or landing at Canadian airports. There were 196 accidents in Canada in 2019 involving Canadian-registered and foreign aircraft (excluding ultralights). This is up from the previous year (167) and equivalent to the level seen in 2016 and 2017. The number of aircraft movements in Canada in 2019 was estimated to be 6 408 000,⁶ yielding a rate of 3.1 accidents per 100 000 movements, which is

⁶ The following Statistics Canada tables (last accessed on 12 June 2020)

- 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>
- Table 23-10-0010-01, 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>
- 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>

above the 2018 rate of 2.7 accidents per 100 000 movements, but still below the average rate of 3.5 over the previous 10 years. In 2019, 63 fatalities resulted from accidents involving aeroplanes and helicopters in Canada, yielding a rate of 1.0 fatalities per 100 000 movements of those aircraft types.

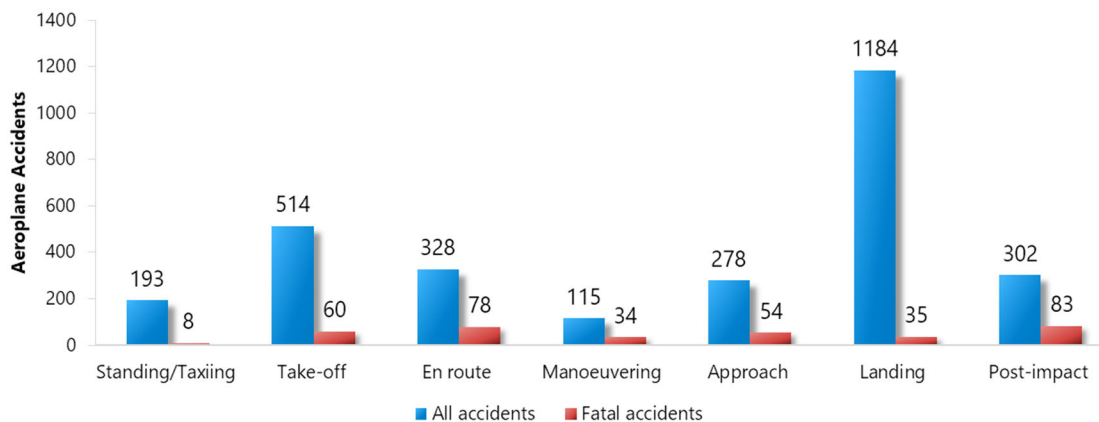
Dangerous goods released

Eight accidents in 2019 involved a release of dangerous goods. This is comparable to the numbers for the preceding 3 years, and slightly above the average of 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 for each of these events. For example, if an airplane 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 two 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 2009 to 2019. Note that if a single accident involves more than one 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 necessarily sum to the total number of accidents for a phase. For example, in the "take-off" 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 22% of aeroplane accidents and 30% of helicopter accidents from 2009 to 2019 involved events in more than a single phase of flight, so the number of accidents shown in the tables, and in figures 6 and 7, sum to more than the total number of accidents.

Figure 6. Aeroplane accidents and fatal accidents having events in specified phases of flight, 2009 to 2019

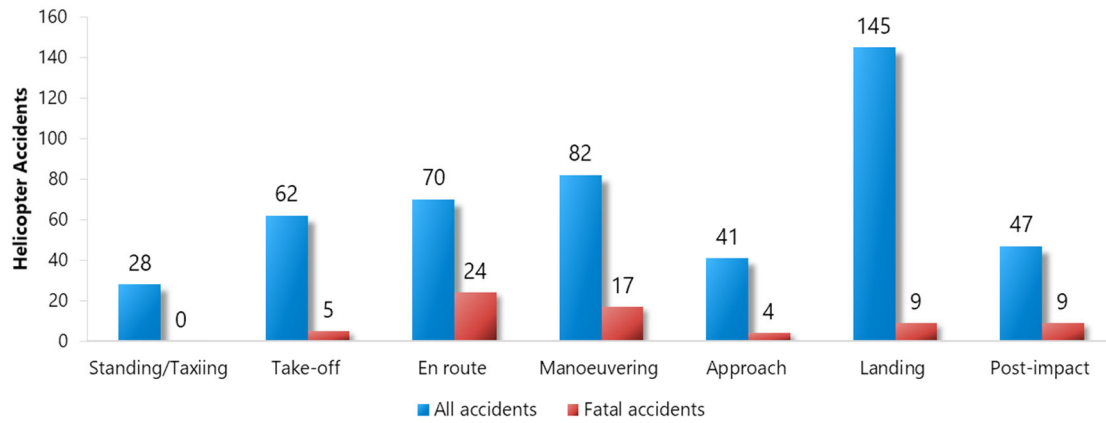


Figures 6 and 7 show the number of aeroplane and helicopter accidents by phase of flight and event category. Over the past 11 years (2009–2019), the distribution of aeroplane accidents (Figure 6) shows more accidents having events during the landing phase (56% of aeroplane accidents) or take-off phase (24%) than in other phases of flight. Helicopter accidents (Figure 7) had events occurring more often during the landing (42%), manoeuvring⁷ (24%), and en route (20%) phases of flight. Note that for both

⁷ Manoeuvring (i.e., low altitude/aerobatic flight operations) does not occur on all flights.

aeroplanes and helicopters, although the landing phase is associated with the largest number of accidents, the en route, take-off, and approach phases are associated with larger numbers of fatal accidents, and maneuvering with the largest proportion of fatal accidents.

Figure 7. Helicopter accidents and fatal accidents having events in specified phases of flight, 2009 to 2019



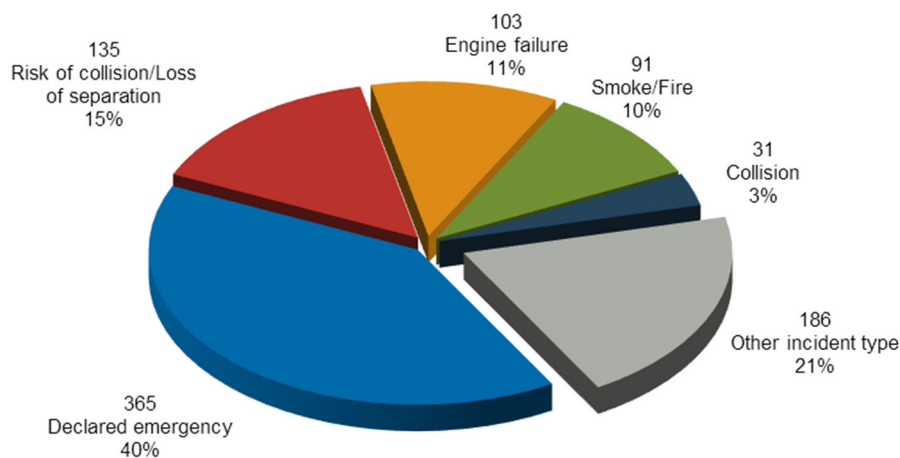
Overview of incidents

Incident counts

In 2019, 911 air transportation incidents were reported under the TSB Regulations (Table 9). This represents an increase of 51 reportable incidents (6%) from 860 in 2018, and is 17% above the average of 777 incidents per year between 2009 and 2018. The apparent increase in incidents over the past few years is partly explained by the introduction of new regulations that became effective July 1, 2014. Under those reporting requirements, aviation incidents to be reported to the TSB were expanded to include those involving aircraft with a maximum certificated take-off weight greater than 2250 kg (formerly 5700 kg) and aircraft being operated under an air operator certificate issued under CARs Part VII—Commercial Air Services.

Overall, reported incidents gradually decreased in number from 2009 until about 2013, but over the most recent five 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 2009 in the two most common incident categories: declared emergency, which accounted for 40% of reported incidents in 2019, and risk of collision/loss of separation, which made up 15% of reported incidents in 2019 (Figure 8). Engine failures made up 11% of incidents, while smoke/fire incidents were 10% of all incidents in 2019. Crew were reported to have been unable to perform their duties 87 times, or in 10% of all reportable incidents in the year. This category includes both flight crew and cabin crew. While the number of reported incidents in this category has been increasing in recent years, part of the increase may be tied to an improved reporting culture in the airline industry.

Figure 8. Reportable incidents by type, 2019



The majority of air transportation incidents in 2019 (651) occurred in Canada and involved Canadian-registered aircraft (Table 1). However, 181 incidents involving Canadian-registered aircraft occurred outside Canada in 2019, a number that has increased sharply since 2015 to a peak of 181 in 2017 and again in 2019, and contrasts with an average of 85 per year in the previous 10 years. Declared emergency

and risk of collision/loss of separation were the two most common incident types involving Canadian-registered aircraft outside of Canada. Both of these incident types, while not showing a monotonic trend over the 11-year period of this report, have increased in frequency in a statistically significant manner over the past 5 years. The increase in reportable incidents generally is at least partially linked to improvements in reporting culture in the airline industry, and the adoption of safety management systems (SMS) by many smaller commercial operators, in addition to all of the major Canadian airlines, and the increased use of electronic flight bags and portable devices, both of which make it easier for pilots to report incidents.

In part due to reporting requirements laid out in the TSB Regulations, commercial operations were the source of 95% of the incidents reported to the TSB in 2019 (Table 9). Two-thirds of these involved Canadian-registered airliners operating under CARs Subpart 705. There were 569 incidents reported in 2019 involving Canadian-registered airliners, down 45 from a peak of 614 in 2017 but still 18% above the average of 484 incidents per year 2009–2018.

Foreign air operators (CARs 701) were involved in 85 incidents in 2019, or about 10% of commercial incidents. This is down by half from the 170 incidents reported in 2010.

Data tables

Table 1. Reported air transportation occurrences, 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number of reportable accidents	298	288	257	291	276	249	251	230	240	201	226
Accidents in Canada involving Canadian-registered aircraft	272	273	241	267	262	238	232	214	222	180	209
Accidents outside Canada involving Canadian-registered aircraft	11	1	6	8	4	4	10	8	11	11	8
Accidents in Canada involving foreign-registered aircraft	15	14	10	17	10	7	9	8	7	11	10
Number of accidents by operator type¹	298	288	257	291	276	249	251	230	240	201	226
Commercial	115	109	99	92	84	82	74	63	97	66	83
Airliner (CAR 705)	2	6	4	5	7	4	9	1	9	8	7
Commuter (CAR 704)	6	7	6	5	3	2	3	3	5	1	4
Air taxi (CAR 703)	43	45	38	33	33	34	23	26	28	23	26
Aerial work (CAR 702)	21	29	27	26	21	17	18	16	18	17	21
Foreign air operator (CAR 701)	1	1	2	2	2	0	0	0	4	3	1
Flight training units (CAR 406)	37	19	19	19	17	25	20	17	32	13	25
Other commercial	5	2	3	3	1	1	1	1	2	1	0
Private	177	165	149	185	179	159	172	164	142	134	142
Private operators (CAR 604)	4	2	5	3	4	3	0	5	1	5	4
Recreational	173	162	142	181	175	156	165	152	134	124	131
Other private	0	1	3	1	0	0	7	8	7	7	7
State	3	5	2	3	6	4	1	0	0	2	1
Other/Unknown	6	10	8	12	9	5	5	3	2	0	0
Number of accidents by aircraft type¹	298	288	257	291	276	249	251	230	240	201	226
Aeroplane	224	220	201	205	212	176	197	174	178	153	176
Helicopter	33	31	36	41	27	34	33	28	27	26	28
Ultralight	35	30	17	36	23	32	17	22	25	18	18
Other ²	7	7	3	9	15	8	7	6	10	4	5
Number of aircraft involved in accidents^{1,3}	304	290	261	296	280	253	259	234	247	207	229
Aeroplanes	229	222	204	209	215	179	202	178	184	159	178
Helicopters	33	31	36	42	27	34	33	28	27	26	28
Ultralights	35	30	17	36	23	32	17	22	25	18	18
Other ²	7	7	4	9	15	8	7	6	11	4	5
Number of fatal accidents by aircraft type¹	35	37	35	42	38	14	29	29	22	23	33
Aeroplane	22	29	23	25	25	12	20	22	18	17	27
Helicopter	8	3	8	7	6	0	5	2	2	4	3
Ultralight	4	3	3	8	4	2	4	4	1	2	3
Other ²	1	2	1	2	4	0	0	1	1	0	1
Reportable accident fatalities	72	72	66	63	65	21	47	45	34	38	70
Reportable accident serious injuries	45	35	49	48	22	35	31	18	33	28	31
Accidents in Canada involving foreign-registered aircraft	15	14	10	17	10	7	9	8	7	11	10
Fatal accidents	2	2	2	1	2	2	3	1	0	0	4
Fatalities	2	2	2	1	2	4	4	7	0	0	11
Serious Injuries	3	1	1	4	0	1	0	0	0	4	1
Occurrences with a dangerous good release	3	1	0	1	4	4	6	7	8	7	8
Number of reportable incidents⁴	789	814	673	645	689	741	789	833	939	860	911
Incidents in Canada involving Canadian-registered aircraft	593	587	519	482	541	599	653	620	685	608	651
Incidents outside Canada involving Canadian-registered aircraft	64	78	54	48	38	55	58	117	181	161	181
Incidents in Canada involving foreign-registered aircraft	155	188	126	138	129	102	106	117	106	115	112
Number of reportable incidents by category⁴	789	814	673	645	689	741	789	833	939	860	911
Risk of collision / Loss of separation	153	206	120	102	115	94	111	139	172	141	135
Declared emergency	313	310	275	266	294	313	333	311	348	340	365
Engine failure	107	87	95	92	83	104	110	110	98	91	103
Smoke / Fire	97	80	88	71	67	89	87	85	100	99	91
Collision	10	5	7	5	15	16	8	18	24	26	31
Other	109	126	88	109	115	125	140	170	197	163	186

Data extracted 5 March 2020

- 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, 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number of accidents by aircraft and operator type^{1,2}	250	244	230	239	243	212	227	200	208	173	199
Aeroplane accidents	211	209	192	191	204	170	190	167	171	143	168
Commercial	89	77	71	62	58	55	51	42	71	46	66
Airliner (CAR 705)	2	6	4	5	7	4	9	1	9	8	7
Commuter (CAR 704)	5	6	4	5	3	1	3	3	5	1	4
Air taxi (CAR 703)	35	29	27	19	19	19	12	16	18	18	21
Aerial work (CAR 702)	11	18	14	14	12	8	10	7	12	6	11
Flight training units (CAR 406)	32	16	19	18	16	23	16	16	27	12	23
Other commercial	4	2	3	1	1	0	1	0	0	1	0
Private	121	122	113	122	139	111	138	122	101	96	101
Private operators (CAR 604)	2	2	2	0	3	1	0	5	1	5	4
Recreational	119	119	110	121	136	110	132	114	97	90	94
Other private	0	1	2	1	0	0	6	4	3	2	3
State	1	3	2	1	2	3	1	0	0	2	1
Other/Unknown	3	8	6	6	7	2	1	3	0	0	0
Helicopter accidents	32	29	35	41	27	34	32	27	27	26	27
Commercial	22	27	26	28	22	26	23	18	22	17	16
Private	10	2	9	10	4	7	9	9	5	9	11
State	0	0	0	2	1	1	0	0	0	0	0
Other/Unknown	0	0	0	2	0	0	0	0	0	0	0
Other aircraft accidents ³	7	6	3	7	13	8	7	6	10	4	5
Number of fatal accidents by aircraft and operator type^{1,2}	29	32	30	33	32	10	23	24	21	21	26
Aeroplane accidents	21	28	21	25	24	10	18	21	18	17	23
Commercial	7	12	11	6	8	2	6	3	7	4	8
Airliner (CAR 705)	0	0	1	0	0	0	0	0	1	0	0
Commuter (CAR 704)	0	1	1	1	1	0	0	0	0	0	0
Air taxi (CAR 703)	6	7	6	3	5	1	3	1	1	2	6
Aerial work (CAR 702)	0	4	2	2	1	1	2	1	2	2	1
Flight training units (CAR 406)	1	0	1	0	1	0	1	1	3	0	1
Other commercial	0	0	0	0	0	0	0	0	0	0	0
Private	13	15	10	17	14	8	13	18	11	13	15
Private operators (CAR 604)	0	0	0	0	1	0	0	1	0	1	0
Recreational	13	15	10	17	13	8	13	16	10	13	15
Other private	0	0	0	0	0	0	0	1	1	0	0
State	0	0	0	0	0	0	0	0	0	0	0
Other/Unknown	1	1	0	2	2	0	0	0	0	0	0
Helicopter accidents	7	3	8	7	6	0	5	2	2	4	3
Commercial	5	3	6	5	6	0	4	1	2	1	1
Private	2	0	2	1	0	0	1	1	0	3	2
State	0	0	0	1	0	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	3	0	0	1	1	0	1
Accident fatalities²	65	66	61	54	59	15	40	34	33	36	54
Accident serious injuries²	34	30	43	38	19	28	28	17	27	21	26
Number of incidents by category^{2,4}	657	665	573	530	579	654	711	737	866	769	832
Risk of collision/Loss of separation	137	179	106	92	105	84	101	127	159	134	126
Declared emergency	237	238	224	200	231	277	290	263	316	298	317
Engine failure	94	67	87	77	70	94	102	102	88	79	96
Smoke/Fire	84	69	67	59	55	76	79	75	95	85	83
Collision	8	4	7	4	14	15	7	16	23	21	27
Other	97	108	82	98	104	108	132	154	185	152	183
Number of accidents involving ultralight aircraft	34	30	17	36	23	31	16	22	25	18	18
Fatal accidents	4	3	3	8	4	2	3	4	1	2	3
Fatalities	5	4	3	8	4	2	3	4	1	2	5
Serious injuries	8	4	5	6	3	6	3	1	6	3	4

Data extracted 5 March 2020

- 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 type
- 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. Rate of accidents per 100 000 hours flown by Canadian-registered aircraft in Canada and abroad,¹ 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Accidents	243	238	227	232	231	204	222	194	198	169	195
Fatal accidents	28	31	29	32	30	10	23	23	20	21	26
Fatalities	64	65	59	53	57	15	40	33	32	36	54
Hours flown ² (thousands)	3,871	3,992	4,284	4,393	4,294	4,271	4,334	4,473	4,721	5,050	5,201
Accidents per 100,000 hours	6.3	6.0	5.3	5.3	5.4	4.8	5.1	4.3	4.2	3.3	3.7
Fatal accidents per 100,000 hours	0.7	0.8	0.7	0.7	0.7	0.2	0.5	0.5	0.4	0.4	0.5
Fatalities per 100,000 hours	1.7	1.6	1.4	1.2	1.3	0.4	0.9	0.7	0.7	0.7	1.0

Data extracted 5 March 2020

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

² Source: Transport Canada (2016 to 2019 hours flown are estimated).

Table 3b. Rate of accidents per 100 000 aircraft movements by Canadian- and foreign-registered aircraft in Canada,¹ 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Accidents	247	250	230	238	235	206	220	196	195	167	196
Fatal accidents	29	32	30	31	28	11	21	23	18	17	29
Fatalities	65	66	60	52	52	17	39	37	30	26	63
Aircraft movements ² (thousands)	6,443	6,327	6,179	6,157	6,024	6,010	6,016	6,023	6,136	6,296	6,408
Accidents per 100,000 aircraft movements	3.8	4.0	3.7	3.9	3.9	3.4	3.7	3.3	3.2	2.7	3.1
Fatal accidents per 100,000 aircraft movements	0.5	0.5	0.5	0.5	0.5	0.2	0.3	0.4	0.3	0.3	0.5
Fatalities per 100,000 aircraft movements	1.0	1.0	1.0	0.8	0.9	0.3	0.6	0.6	0.5	0.4	1.0

Data extracted 5 March 2020

¹ Excluding ultralights, balloons, gyroplanes, gliders, airships, hang gliders and similar aircraft types.

² Source: Statistics Canada (2019 movements are estimated).

Table 4. Aircraft accident fatalities, 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fatalities	72	72	66	63	65	21	47	45	34	38	70
Fatalities in Canada involving Canadian-registered aircraft	68	70	63	61	57	15	39	35	32	28	57
Fatalities outside Canada involving Canadian-registered aircraft	2	0	1	1	6	2	4	3	2	10	2
Fatalities in Canada involving foreign-registered aircraft	2	2	2	1	2	4	4	7	0	0	11
Fatalities by operator type	72	72	66	63	65	21	47	45	34	38	70
Commercial	40	36	40	18	29	4	20	6	15	9	25
Airliner (CAR 705)	0	0	12	0	0	0	0	0	1	0	0
Commuter (CAR 704)	17	1	2	1	5	0	0	0	0	0	0
Air taxi (CAR 703)	19	28	16	12	19	2	12	1	1	5	21
Aerial work (CAR 702)	1	7	8	3	4	2	6	2	7	4	3
Foreign air operator (CAR 701)	0	0	0	0	0	0	0	0	0	0	0
Flight training units (CAR 406)	3	0	2	1	1	0	2	3	5	0	1
Other commercial	0	0	0	1	0	0	0	0	1	0	0
Private	31	32	25	37	33	17	28	39	19	29	45
Private operators (CAR 604)	0	0	2	0	1	0	0	4	0	1	0
Recreational	31	32	23	37	32	17	28	27	17	29	42
Other private	0	0	0	0	0	0	0	8	2	0	3
State	0	0	0	1	0	0	0	0	0	0	0
Other/Unknown	1	4	3	7	3	0	1	0	0	0	0
Crew fatalities by operator type	35	40	37	40	44	15	29	25	26	20	34
Commercial	12	17	20	11	21	3	10	3	11	3	10
Airliner (CAR 705)	0	0	4	0	0	0	0	0	0	0	0
Commuter (CAR 704)	2	1	2	0	2	0	0	0	0	0	0
Air taxi (CAR 703)	7	11	7	7	14	1	4	1	1	0	8
Aerial work (CAR 702)	1	5	5	2	4	2	4	1	4	3	1
Foreign air operator (CAR 701)	0	0	0	0	0	0	0	0	0	0	0
Flight training units (CAR 406)	2	0	2	1	1	0	2	1	5	0	1
Other commercial	0	0	0	1	0	0	0	0	1	0	0
Private	22	22	16	25	21	12	20	22	15	17	24
Private operators (CAR 604)	0	0	2	0	1	0	0	1	0	1	0
Recreational	22	22	14	25	20	12	20	18	14	17	21
Other private	0	0	0	0	0	0	0	3	1	0	3
State	0	0	0	1	0	0	0	0	0	0	0
Other/Unknown	1	1	3	3	2	0	1	0	0	0	0
Passenger fatalities by operator type	37	31	29	22	20	6	18	20	8	18	36
Commercial	28	18	20	6	8	1	10	3	4	6	15
Airliner (CAR 705)	0	0	8	0	0	0	0	0	1	0	0
Commuter (CAR 704)	15	0	0	1	3	0	0	0	0	0	0
Air taxi (CAR 703)	12	16	9	5	5	1	8	0	0	5	13
Aerial work (CAR 702)	0	2	3	0	0	0	2	1	3	1	2
Foreign air operator (CAR 701)	0	0	0	0	0	0	0	0	0	0	0
Flight training units (CAR 406)	1	0	0	0	0	0	0	2	0	0	0
Other commercial	0	0	0	0	0	0	0	0	0	0	0
Private	9	10	9	12	11	5	8	17	4	12	21
Private operators (CAR 604)	0	0	0	0	0	0	0	3	0	0	0
Recreational	9	10	9	12	11	5	8	9	3	12	21
Other private	0	0	0	0	0	0	0	5	1	0	0
State	0	0	0	0	0	0	0	0	0	0	0
Other/Unknown	0	3	0	4	1	0	0	0	0	0	0
Ground fatalities	0	1	0	1	1	0	0	0	0	0	0
Fatalities by aircraft type	72	72	66	63	65	21	47	45	34	38	70
Aeroplane	39	59	46	44	46	19	35	37	27	30	58
Helicopter	27	7	15	9	12	0	8	3	5	6	5
Ultralight	5	4	3	8	4	2	4	4	1	2	5
Other aircraft type	1	2	2	2	7	0	0	1	1	0	2

Data extracted 5 March 2020

Table 5. Aircraft accidents with serious injuries, 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Serious injuries	45	35	49	48	22	35	31	18	33	28	31
Serious injuries in Canada involving Canadian-registered aircraft	41	34	46	39	22	34	28	17	31	23	27
Serious injuries outside Canada involving Canadian-registered Aircraft	1	0	2	5	0	0	3	1	2	1	3
Serious injuries in Canada involving foreign-registered aircraft	3	1	1	4	0	1	0	0	0	4	1
Serious injuries by operator type	45	35	49	48	22	35	31	18	33	28	31
Commercial	14	17	31	22	11	10	15	8	13	17	13
Airliner (CAR 705)	1	1	10	1	0	0	3	2	8	4	1
Commuter (CAR 704)	1	4	7	2	2	0	0	0	0	0	0
Air taxi (CAR 703)	6	6	9	15	6	5	8	4	0	9	8
Aerial work (CAR 702)	3	5	5	1	3	3	3	2	2	2	2
Foreign air operator (CAR 701)	0	0	0	1	0	0	0	0	0	1	0
Flight training units (CAR 406)	3	1	0	0	0	2	1	0	2	1	2
Other commercial	0	0	0	2	0	0	0	0	1	0	0
Private	29	16	18	26	10	23	16	10	20	11	18
Private operators (CAR 604)	3	0	0	0	0	0	0	0	0	1	0
Recreational	26	15	18	26	10	23	14	9	19	7	18
Other private	0	1	0	0	0	0	2	1	1	3	0
State	2	1	0	0	0	0	0	0	0	0	0
Other/Unknown	0	1	0	0	1	2	0	0	0	0	0
Crew serious injuries by operator type	26	22	18	24	13	23	17	8	22	19	16
Commercial	8	8	6	6	4	5	6	3	8	10	2
Airliner (CAR 705)	0	0	0	0	0	0	1	0	3	3	0
Commuter (CAR 704)	0	1	0	2	0	0	0	0	0	0	0
Air taxi (CAR 703)	2	2	2	1	2	2	2	2	0	3	0
Aerial work (CAR 702)	3	4	4	1	2	1	3	1	2	2	1
Foreign air operator (CAR 701)	0	0	0	1	0	0	0	0	0	1	0
Flight training units (CAR 406)	3	1	0	0	0	2	0	0	2	1	1
Other commercial	0	0	0	1	0	0	0	0	1	0	0
Private	17	12	12	18	8	17	11	5	14	9	14
Private operators (CAR 604)	2	0	0	0	0	0	0	0	0	1	0
Recreational	15	11	12	18	8	17	9	5	14	6	14
Other private	0	1	0	0	0	0	2	0	0	2	0
State	1	1	0	0	0	0	0	0	0	0	0
Other/Unknown	0	1	0	0	1	1	0	0	0	0	0
Passenger serious injuries by operator type	19	12	30	23	8	11	14	8	11	9	13
Commercial	6	9	24	15	6	5	9	4	5	7	9
Airliner (CAR 705)	1	1	10	0	0	0	2	2	5	1	0
Commuter (CAR 704)	1	3	7	0	2	0	0	0	0	0	0
Air taxi (CAR 703)	4	4	7	14	4	3	6	2	0	6	7
Aerial work (CAR 702)	0	1	0	0	0	2	0	0	0	0	1
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	1	0	0	0	1
Other commercial	0	0	0	1	0	0	0	0	0	0	0
Private	12	3	6	8	2	5	5	4	6	2	4
Private operators (CAR 604)	1	0	0	0	0	0	0	0	0	0	0
Recreational	11	3	6	8	2	5	5	4	5	1	4
Other private	0	0	0	0	0	0	0	0	1	1	0
State	1	0	0	0	0	0	0	0	0	0	0
Other/Unknown	0	0	0	0	0	1	0	0	0	0	0
Ground serious injuries	0	1	1	1	1	1	0	2	0	0	2
Serious injuries by aircraft type	45	35	49	48	22	35	31	18	33	28	31
Aeroplane	24	28	36	31	13	21	23	10	23	23	26
Helicopter	11	2	8	7	6	6	5	6	3	2	1
Ultralight	8	4	5	6	3	7	3	1	6	3	4
Other aircraft type	2	1	0	4	0	1	0	1	1	0	0

Data extracted 5 March 2020

Table 6. Accidents involving Canadian-registered aeroplanes and helicopters,¹ by operation type, 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Aeroplane accidents by operation type²	211	209	192	191	204	170	190	167	171	143	168
Training	43	28	28	27	24	27	16	20	31	14	27
Pleasure/Travel	109	108	102	109	127	96	125	112	92	83	83
Business	4	6	7	4	2	9	1	3	1	7	5
Forest fire management	3	2	1	2	3	2	2	1	0	1	2
Test/Demonstration/Ferry	0	6	4	4	4	5	2	2	4	1	3
Aerial application	4	10	4	3	7	4	5	6	6	5	6
Inspection	1	1	0	1	1	0	1	0	1	0	0
Air transport	35	37	35	28	26	22	22	16	27	26	29
Air ambulance	5	2	1	1	0	1	0	3	1	1	1
Sightseeing	2	1	2	6	1	1	1	0	1	1	2
Other/Unknown	8	9	10	8	11	4	16	5	8	6	10
Fatal aeroplane accidents by operation type²	21	28	21	25	24	10	18	21	18	17	23
Training	1	1	1	1	2	1	1	1	3	0	1
Pleasure/Travel	13	15	10	16	11	7	12	15	9	12	12
Business	1	1	0	1	1	1	0	1	0	1	1
Forest fire management	0	2	0	0	0	0	1	0	0	0	0
Test/Demonstration/Ferry	0	0	0	1	1	0	0	1	0	0	1
Aerial application	0	0	0	0	1	0	0	2	1	1	0
Inspection	0	0	0	0	0	0	0	0	0	0	0
Air transport	5	7	8	4	5	1	2	1	2	2	6
Air ambulance	1	0	0	0	0	0	0	0	0	0	0
Sightseeing	0	0	1	0	0	0	1	0	0	0	0
Other/Unknown	0	2	1	3	3	0	2	0	3	2	2
Helicopter accidents by operation type²	32	29	35	41	27	34	32	27	27	26	27
Training	5	0	2	1	1	2	5	1	7	1	2
Pleasure/Travel	5	2	9	8	2	7	8	9	4	6	8
Business	3	0	0	3	1	0	1	0	0	2	2
Forest fire management	4	1	2	1	3	0	2	0	2	2	1
Test/Demonstration/Ferry	0	1	1	0	1	0	0	0	0	1	0
Aerial application	0	3	1	5	0	1	2	1	3	1	3
Inspection	0	1	2	2	2	3	0	1	0	1	0
Air transport	10	15	13	9	8	18	10	7	3	3	9
Air ambulance	0	0	0	1	2	0	0	0	1	0	0
Sightseeing	1	0	0	1	0	1	0	0	1	1	0
Other/Unknown	4	6	5	10	7	2	4	8	6	8	2
Fatal helicopter accidents by operation type²	7	3	8	7	6	0	5	2	2	4	3
Training	1	0	1	1	0	0	0	0	1	0	0
Pleasure/Travel	2	0	2	0	0	0	0	1	0	2	2
Business	0	0	0	1	0	0	1	0	0	0	0
Forest fire management	1	0	1	0	0	0	0	0	0	0	0
Test/Demonstration/Ferry	0	1	1	0	0	0	0	0	0	1	0
Aerial application	0	0	0	0	0	0	1	0	0	0	0
Inspection	0	0	1	0	1	0	0	0	0	0	0
Air transport	3	2	1	1	3	0	3	0	0	0	1
Air ambulance	0	0	0	0	1	0	0	0	0	0	0
Sightseeing	0	0	0	1	0	0	0	0	0	0	0
Other/Unknown	0	0	1	3	1	0	0	1	1	1	0

Data extracted 5 March 2020

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, 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Accidents by province/territory	298	288	257	291	276	249	251	230	240	201	226
Newfoundland and Labrador	3	3	3	5	3	5	6	5	4	4	3
Prince Edward Island	1	0	0	0	0	0	0	0	2	0	0
Nova Scotia	3	7	5	5	5	3	6	2	3	2	1
New Brunswick	2	5	3	3	2	6	2	5	7	1	8
Quebec	68	65	58	71	66	69	51	34	44	31	50
Ontario	74	71	63	67	72	67	74	50	62	53	52
Manitoba	19	27	17	18	13	12	14	17	10	7	17
Saskatchewan	14	18	18	9	19	12	13	10	13	13	12
Alberta	31	25	22	35	29	33	23	38	35	32	29
British Columbia	59	47	43	54	51	30	42	53	39	36	38
Yukon	4	3	8	8	4	4	6	2	4	4	3
Northwest Territories	6	9	6	5	3	3	2	3	2	5	4
Nunavut	3	7	4	3	4	1	2	3	3	1	1
Other airspace under Canadian air traffic control	0	0	1	0	1	0	0	0	1	1	0
Outside Canada	11	1	6	8	4	4	10	8	11	11	8
Fatal accidents by province/territory	35	37	35	42	38	14	29	29	22	23	33
Newfoundland and Labrador	2	1	0	0	0	0	1	0	0	0	2
Prince Edward Island	1	0	0	0	0	0	0	0	0	0	0
Nova Scotia	0	1	1	0	1	1	1	0	0	0	0
New Brunswick	0	2	0	0	0	1	0	1	0	0	1
Quebec	10	10	5	10	5	2	7	7	4	2	9
Ontario	6	9	6	10	9	5	6	5	4	6	6
Manitoba	0	1	1	3	2	0	1	1	3	0	1
Saskatchewan	2	0	3	1	2	1	2	2	2	1	0
Alberta	1	2	4	6	4	1	3	4	3	5	5
British Columbia	8	7	10	9	10	2	4	8	3	4	5
Yukon	1	0	1	1	0	0	0	0	1	0	2
Northwest Territories	1	3	2	0	1	0	0	0	0	1	1
Nunavut	1	1	1	1	0	0	0	0	0	0	0
Other airspace under Canadian air traffic control	0	0	0	0	1	0	0	0	0	0	0
Outside Canada	2	0	1	1	3	1	4	1	2	4	1
Fatalities by province/territory	72	72	66	63	65	21	47	45	34	38	70
Newfoundland and Labrador	18	2	0	0	0	0	1	0	0	0	8
Prince Edward Island	1	0	0	0	0	0	0	0	0	0	0
Nova Scotia	0	2	1	0	1	1	1	0	0	0	0
New Brunswick	0	2	0	0	0	2	0	2	0	0	1
Quebec	16	28	9	11	5	2	16	15	6	4	14
Ontario	12	14	9	19	19	8	10	5	9	8	16
Manitoba	0	1	1	4	5	0	1	2	4	0	3
Saskatchewan	4	0	7	5	3	2	3	2	3	1	0
Alberta	1	4	5	6	5	1	4	4	5	6	8
British Columbia	14	15	16	15	17	3	7	12	4	6	12
Yukon	1	0	1	1	0	0	0	0	1	0	4
Northwest Territories	2	3	4	0	1	0	0	0	0	3	2
Nunavut	1	1	12	1	0	0	0	0	0	0	0
Other airspace under Canadian air traffic control	0	0	0	0	3	0	0	0	0	0	0
Outside Canada	2	0	1	1	6	2	4	3	2	10	2

Data extracted 5 March 2020

Table 8. Accidents involving Canadian-registered aircraft, by province/territory (excluding ultralights), 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Accidents by province/territory	250	244	230	239	243	212	227	200	208	173	199
Newfoundland and Labrador	3	3	3	5	3	4	6	4	3	2	2
Prince Edward Island	1	0	0	0	0	0	0	0	1	0	0
Nova Scotia	1	7	3	3	5	2	5	2	2	1	1
New Brunswick	2	4	3	3	2	6	2	5	5	1	8
Quebec	60	52	52	52	57	57	44	28	39	28	41
Ontario	61	55	56	54	59	53	66	43	51	44	45
Manitoba	19	25	16	15	13	11	13	17	10	7	12
Saskatchewan	12	18	17	8	18	10	12	10	12	13	12
Alberta	28	24	18	30	27	31	21	36	30	27	27
British Columbia	44	38	39	46	44	27	39	43	35	30	36
Yukon	2	3	7	7	4	4	6	1	4	2	2
Northwest Territories	5	8	6	5	3	2	2	3	2	5	4
Nunavut	2	6	3	3	3	1	1	2	3	1	1
Other airspace under Canadian air traffic control	0	0	1	0	1	0	0	0	0	1	0
Outside Canada	10	1	6	8	4	4	10	6	11	11	8
Fatal accidents by province/territory	29	32	30	33	32	10	23	24	21	21	26
Newfoundland and Labrador	2	1	0	0	0	0	1	0	0	0	1
Prince Edward Island	1	0	0	0	0	0	0	0	0	0	0
Nova Scotia	0	1	0	0	1	0	0	0	0	0	0
New Brunswick	0	2	0	0	0	1	0	1	0	0	1
Quebec	8	9	5	4	3	1	6	5	4	2	5
Ontario	5	8	4	9	6	3	5	3	4	5	5
Manitoba	0	1	1	3	2	0	0	1	3	0	1
Saskatchewan	1	0	3	1	2	1	2	2	2	1	0
Alberta	1	2	3	5	4	1	3	4	3	4	5
British Columbia	8	5	9	8	9	2	2	7	2	4	5
Yukon	0	0	1	1	0	0	0	0	1	0	1
Northwest Territories	1	2	2	0	1	0	0	0	0	1	1
Nunavut	1	1	1	1	0	0	0	0	0	0	0
Other airspace under Canadian air traffic control	0	0	0	0	1	0	0	0	0	0	0
Outside Canada	1	0	1	1	3	1	4	1	2	4	1
Fatalities by province/territory	65	66	61	54	59	15	40	34	33	36	54
Newfoundland and Labrador	18	2	0	0	0	0	1	0	0	0	7
Prince Edward Island	1	0	0	0	0	0	0	0	0	0	0
Nova Scotia	0	2	0	0	1	0	0	0	0	0	0
New Brunswick	0	2	0	0	0	2	0	2	0	0	1
Quebec	14	27	9	5	3	1	15	7	6	4	8
Ontario	11	12	7	18	16	4	9	3	9	7	9
Manitoba	0	1	1	4	5	0	0	2	4	0	3
Saskatchewan	2	0	7	5	3	2	3	2	3	1	0
Alberta	1	4	4	5	5	1	4	4	5	5	8
British Columbia	14	13	15	14	16	3	4	11	3	6	12
Yukon	0	0	1	1	0	0	0	0	1	0	2
Northwest Territories	2	2	4	0	1	0	0	0	0	3	2
Nunavut	1	1	12	1	0	0	0	0	0	0	0
Other airspace under Canadian air traffic control	0	0	0	0	3	0	0	0	0	0	0
Outside Canada	1	0	1	1	6	2	4	3	2	10	2

Data extracted 5 March 2020

Table 9. Reportable aircraft incidents,¹ 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Incidents by category¹	789	814	673	645	689	741	789	833	939	860	911
Risk of collision/Loss of separation	153	206	120	102	115	94	111	139	172	141	135
Declared emergency	313	310	275	266	294	313	333	311	348	340	365
Engine failure	107	87	95	92	83	104	110	110	98	91	103
Smoke/Fire	97	80	88	71	67	89	87	85	100	99	91
Collision	10	5	7	5	15	16	8	18	24	26	31
Control difficulties	24	32	31	33	25	40	29	35	34	41	25
Crew unable to perform duties	59	51	26	40	58	37	46	66	78	57	87
Dangerous goods-related	3	1	0	1	3	4	0	2	0	2	0
Depressurization	6	11	16	15	14	12	16	14	21	13	23
Fuel shortage	4	9	6	7	2	6	17	15	17	10	5
Failure to remain in landing area	7	12	7	10	9	20	17	19	22	11	9
Incorrect fuel	0	0	0	0	0	0	0	1	3	0	3
Slung load released	3	9	1	1	4	5	14	15	21	23	28
Transmission or gearbox failure	3	1	1	2	0	1	1	3	1	0	1
Incidents by operator type¹²	789	814	673	645	689	741	789	833	939	860	911
Commercial	753	781	637	609	656	699	741	785	888	815	866
Airliner (CAR 705)	498	520	446	409	450	429	437	490	614	547	569
Commuter (CAR 704)	88	87	76	83	95	106	87	79	73	60	66
Air taxi (CAR 703)	42	28	28	22	30	79	114	104	102	90	104
Aerial work (CAR 702)	32	28	15	11	12	34	48	43	55	55	60
Foreign air operator (CAR 701)	138	170	109	117	113	82	75	94	80	91	85
Flight training units (CAR 406)	7	9	4	3	4	5	6	12	11	7	13
Other commercial	2	3	2	1	1	0	2	5	1	2	4
Private	38	34	39	35	31	37	52	45	56	51	56
Private operators (CAR 604)	24	15	19	20	18	22	19	20	32	19	27
Recreational	13	19	20	15	13	14	15	13	11	9	8
Other private	1	0	1	0	0	1	18	12	13	23	22
State	22	23	13	20	20	13	15	8	15	11	6
Other/Unknown	9	6	5	4	4	12	15	22	13	12	12
Incidents by aircraft type¹²	789	814	673	645	689	741	789	833	939	860	911
Aeroplane	771	789	655	633	673	715	749	795	892	819	838
Helicopter	21	32	20	17	20	30	47	38	52	43	77
Ultralight/Other aircraft type ³	1	2	0	0	0	3	8	7	4	4	6
Number of aircraft involved in incidents¹⁴	914	977	776	742	800	830	887	957	1063	970	1009
Aeroplanes	891	943	756	725	780	797	832	912	1006	921	924
Helicopters	22	32	20	17	20	30	47	38	53	45	79
Ultralight/Other aircraft type ³	1	2	0	0	0	3	8	7	4	4	6
Incidents by province/territory¹	789	814	673	645	689	741	789	833	939	860	911
Newfoundland and Labrador	16	30	14	17	29	22	30	31	27	35	29
Prince Edward Island	2	0	1	0	2	0	1	4	1	2	1
Nova Scotia	18	25	19	17	11	22	19	17	22	28	28
New Brunswick	5	10	7	7	7	8	9	9	4	7	11
Quebec	97	108	126	107	122	89	116	109	139	141	144
Ontario	195	176	174	155	166	157	152	166	230	144	166
Manitoba	45	51	31	31	31	51	54	47	49	43	44
Saskatchewan	18	19	11	18	27	32	21	25	19	16	24
Alberta	106	84	82	81	103	98	117	110	107	104	106
British Columbia	162	156	76	101	99	132	154	137	101	123	128
Yukon	6	4	3	4	5	6	6	5	5	2	8
Northwest Territories	14	21	30	17	16	25	17	9	20	22	9
Nunavut	8	21	19	19	10	20	15	15	15	19	15
Other airspace under Canadian air traffic control	33	31	27	23	23	24	20	32	19	14	17
Outside Canada	64	78	54	48	38	55	58	117	181	161	181

Data extracted 5 March 2020

- 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 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Incidents by category¹	657	665	573	530	579	654	711	737	866	769	832
Risk of collision/Loss of separation	137	179	106	92	105	84	101	127	159	134	126
Declared emergency	237	238	224	200	231	277	290	263	316	298	317
Engine failure	94	67	87	77	70	94	102	102	88	79	96
Smoke/Fire	84	69	67	59	55	76	79	75	95	85	83
Collision	8	4	7	4	14	15	7	16	23	21	27
Control difficulties	18	24	27	31	22	36	28	30	33	40	25
Crew unable to perform duties	57	50	26	38	56	35	44	65	74	55	86
Dangerous goods-related	3	1	0	1	3	3	0	2	0	2	0
Depressurization	3	10	15	13	10	10	14	13	19	11	23
Fuel shortage	4	6	5	4	2	3	15	11	16	5	4
Failure to remain in landing area	6	7	7	9	7	17	17	14	18	10	8
Incorrect fuel	0	0	0	0	0	0	0	1	3	0	3
Slung load released	3	9	1	1	4	4	13	15	21	23	28
Transmission or gearbox failure	3	1	1	1	0	0	1	3	1	0	1
Incidents by operator type¹²	657	665	573	530	579	654	711	737	866	769	832
Commercial	629	641	547	504	552	622	674	705	825	741	797
Airliner (CAR 705)	494	519	443	409	449	427	436	489	613	546	568
Commuter (CAR 704)	88	87	76	83	95	106	87	79	73	60	66
Air taxi (CAR 703)	42	28	28	21	30	79	114	104	102	90	104
Aerial work (CAR 702)	31	28	15	11	12	31	47	43	55	55	60
Flight training units (CAR 406)	7	9	4	3	4	5	6	12	11	7	13
Other commercial	2	2	0	0	0	0	1	2	0	1	3
Private	29	29	29	28	25	29	40	37	48	33	45
Private operators (CAR 604)	16	12	11	14	13	17	16	20	32	19	26
Recreational	12	17	18	14	12	11	14	11	11	8	8
Other private	1	0	1	0	0	1	10	6	5	6	12
State	19	19	13	17	19	11	15	6	13	10	6
Other/Unknown	9	5	3	2	4	9	14	14	10	12	10
Incidents by aircraft type¹²	657	665	573	530	579	654	711	737	866	769	832
Aeroplane	639	642	555	519	563	631	672	699	819	728	759
Helicopter	21	31	20	16	20	27	46	38	52	43	77
Ultralight/Other aircraft type ³	1	1	0	0	0	3	8	6	4	4	6
Number of aircraft involved in incidents¹⁴	772	811	667	619	681	730	800	843	981	874	922
Aeroplanes	749	779	647	603	661	700	746	799	924	825	837
Helicopters	22	31	20	16	20	27	46	38	53	45	79
Ultralight/Other aircraft type ³	1	1	0	0	0	3	8	6	4	4	6
Incidents by province/territory¹	657	665	573	530	579	654	711	737	866	769	832
Newfoundland and Labrador	7	13	10	10	17	13	20	22	22	22	15
Prince Edward Island	1	0	0	0	1	0	1	4	1	2	1
Nova Scotia	13	19	14	9	9	19	17	12	17	20	26
New Brunswick	3	8	5	7	4	6	9	9	3	6	8
Quebec	77	89	104	84	96	81	103	99	127	122	123
Ontario	168	141	146	127	142	139	141	148	202	129	146
Manitoba	39	45	30	30	27	45	51	44	47	38	44
Saskatchewan	16	15	11	14	26	27	19	25	18	14	24
Alberta	92	74	76	75	93	93	110	103	102	97	100
British Columbia	141	134	68	87	93	125	137	118	100	114	123
Yukon	6	3	3	3	3	5	6	5	3	2	8
Northwest Territories	14	19	30	17	16	25	17	8	20	21	8
Nunavut	7	17	16	15	10	16	14	15	14	16	14
Other airspace under Canadian air traffic control	9	10	6	4	4	5	8	8	9	5	11
Outside Canada	64	78	54	48	38	55	58	117	181	161	181

Data extracted 5 March 2020

- 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 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Standing/Taxiing	20	17	18	17	23	16	19	16	20	13	14	193
Collision with object	9	6	6	7	8	6	3	5	9	6	5	70
Collision with moving aircraft	3	1	1	2	1	3	5	4	3	3	2	28
Nosedown/Overturned	1	4	3	3	5	1	3	2	2	0	1	25
Landing gear collapsed/retracted	4	2	3	0	2	1	2	1	3	1	2	21
Loss of control	1	3	0	3	4	1	0	0	0	0	0	12
Other events	9	8	9	9	11	9	12	13	14	10	10	114
Takeoff	49	54	41	54	40	48	53	47	45	35	48	514
Collision with terrain	14	15	11	21	11	10	18	13	15	7	14	149
Loss of control	15	15	12	17	7	18	9	11	7	5	10	126
Collision with object	16	13	9	17	8	11	18	12	8	11	17	140
Take-off/Landing event	13	13	13	19	9	11	11	14	16	11	12	142
Power loss	12	14	11	6	13	16	12	10	11	5	12	122
Other events	34	35	28	33	26	34	50	30	35	31	38	374
En route	42	32	31	30	34	23	29	19	34	27	27	328
Power loss	26	13	14	15	15	14	8	12	15	11	12	155
Precautionary/Forced landing/Ditching	10	11	13	9	8	7	5	4	5	6	8	86
Collision with terrain	9	8	8	7	10	5	4	5	5	5	5	71
Component/System related	4	4	1	2	3	2	3	0	3	1	2	25
Other events	21	20	18	14	18	14	26	8	24	22	20	205
Manoeuvring	3	11	12	11	12	4	11	13	11	12	15	115
Collision with terrain	2	5	6	8	7	1	7	6	7	4	5	58
Loss of control	1	3	1	4	1	1	2	4	5	4	0	26
Collision with object	0	7	1	1	2	1	2	3	1	2	5	25
Power loss	1	1	3	1	0	0	1	2	1	1	1	12
Other events	1	3	9	2	5	3	4	6	2	8	12	55
Approach	31	29	23	21	32	28	25	17	21	25	26	278
Collision with terrain	12	11	7	6	6	7	10	4	7	5	8	83
Power loss	7	7	2	0	11	6	2	3	6	6	5	55
Collision with object	3	6	8	1	7	9	7	6	7	3	2	59
Component/System related	9	2	5	3	3	4	2	0	2	3	3	36
Precautionary/Forced landing/Ditching	4	5	2	2	7	7	1	1	4	5	7	45
Loss of control	3	6	3	4	5	1	4	1	0	1	5	33
Other events	14	9	8	14	10	9	18	12	13	18	20	145
Landing	121	112	113	111	116	99	118	113	95	92	94	1184
Missed or went off runway	24	24	27	26	28	14	30	30	21	17	23	264
Collision with object	23	25	28	26	18	20	29	24	23	29	25	270
Landing gear collapsed/retracted	18	26	24	22	25	17	27	27	23	19	17	245
Nosedown/Overturned	21	18	17	20	20	17	27	33	29	23	21	246
Loss of control	23	20	17	27	19	22	2	3	6	3	4	146
Hard landing	19	23	22	20	13	14	10	17	19	16	17	190
Collision with terrain	16	18	16	18	12	21	20	12	7	11	10	161
Wheels-up landing	12	7	3	7	10	7	10	9	4	5	7	81
Precautionary/Forced landing/Ditching	11	5	3	9	11	5	12	18	18	7	7	106
Other events	39	46	49	42	45	28	77	77	50	58	54	565
Post-impact	13	20	11	19	13	16	37	57	41	44	31	302
Fire/Explosion/Fumes	8	15	6	7	7	6	13	9	5	7	5	88
Other events	6	5	5	12	6	12	24	49	37	38	27	221

Data extracted 5 March 2020

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 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Standing/Taxiing	3	0	6	4	1	4	2	0	1	4	3	28
Collision with terrain	1	0	2	1	0	0	1	0	0	0	0	5
Loss of control	0	0	2	0	0	2	1	0	0	0	2	7
Collision with object	0	0	0	0	0	2	1	0	1	1	1	6
Other events	3	0	5	4	1	4	0	0	0	4	2	23
Takeoff	4	2	7	7	7	9	4	6	5	5	6	62
Loss of control	1	1	4	2	0	5	1	4	4	1	3	26
Collision with terrain	2	2	3	1	2	1	2	1	1	2	2	19
Collision with object	1	1	0	4	2	2	1	0	1	2	3	17
Power loss	1	0	2	0	1	1	0	1	0	0	0	6
Other events	1	1	1	2	2	4	1	3	2	2	4	23
En route	11	7	10	9	5	7	4	5	3	6	3	70
Collision with terrain	3	3	3	3	1	3	1	1	1	2	1	22
Power loss	5	3	2	3	1	1	1	3	0	1	0	20
Precautionary/Forced landing/Ditching	1	1	0	1	1	0	1	0	0	0	0	5
Component/System related	1	0	2	0	1	0	1	0	0	0	0	5
Other events	5	4	7	6	4	5	3	4	3	5	2	48
Manoeuvring	7	6	10	11	8	4	8	8	7	4	9	82
Collision with terrain	3	3	6	5	5	2	3	5	3	2	2	39
Loss of control	3	2	2	3	2	2	2	3	4	0	2	25
Collision with object	1	2	3	3	2	1	1	3	3	1	4	24
Operations related event	2	1	2	2	1	0	2	5	3	1	6	25
Power loss	2	1	0	2	1	0	2	1	1	0	2	12
Other events	5	1	3	6	2	2	5	5	5	2	7	43
Approach	5	4	6	7	3	3	3	5	2	2	1	41
Collision with terrain	3	4	1	1	0	0	0	1	0	0	0	10
Power loss	1	0	0	2	0	1	1	3	0	0	0	8
Loss of control	0	1	1	1	0	1	1	2	1	1	0	9
Collision with object	1	0	2	0	0	1	0	1	1	0	0	6
Other events	3	3	3	5	3	2	2	4	1	1	1	28
Landing	15	15	7	13	12	12	18	16	13	12	12	145
Hard landing	2	4	4	4	1	3	1	0	1	2	0	22
Collision with terrain	5	4	2	4	0	3	6	0	0	2	1	27
Loss of control	2	1	1	1	2	4	6	2	1	2	3	25
Collision with object	5	5	2	2	5	5	1	4	3	6	2	40
Other events	9	7	2	4	9	5	10	4	5	5	7	67
Post-impact	4	4	4	2	3	2	5	11	1	6	5	47
Fire/Explosion/Fumes	3	1	2	1	2	0	1	0	0	0	3	13
Other events	1	3	2	1	1	2	4	11	1	6	4	36

Data extracted 5 March 2020

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 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Standing/Taxiing	0	0	1	1	1	0	1	2	1	0	1	8
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	1	1	1	0	1	2	1	0	1	8
Takeoff	6	6	4	6	4	2	9	5	6	5	7	60
Collision with terrain	6	2	1	4	3	0	4	4	5	2	5	36
Loss of control	3	1	2	2	2	1	4	4	2	2	2	25
Collision with object	1	0	1	2	0	0	1	0	1	1	1	8
Take-off/Landing event	0	0	1	1	1	1	0	0	1	0	0	5
Power loss	0	3	1	0	0	1	1	1	1	0	1	9
Other events	2	3	4	3	2	0	7	1	4	4	3	33
En route	8	9	9	8	9	3	7	5	5	6	9	78
Power loss	1	0	2	1	0	0	0	2	0	1	2	9
Precautionary/Forced landing/Ditching	0	0	1	0	0	0	0	1	0	0	1	3
Collision with terrain	4	8	5	6	7	3	4	4	3	5	5	54
Component/System related	0	1	0	0	0	0	1	0	0	0	0	2
Other events	5	4	4	2	5	1	6	2	4	5	6	44
Manoeuvring	0	2	1	4	3	2	4	5	4	5	4	34
Collision with terrain	0	1	1	4	2	1	4	4	4	3	4	28
Loss of control	0	1	0	2	0	1	0	2	2	4	0	12
Collision with object	0	2	0	0	0	0	1	1	1	0	0	5
Power loss	0	0	0	0	0	0	0	0	0	0	0	0
Other events	0	1	1	0	1	1	0	1	1	3	2	11
Approach	6	10	6	5	5	1	5	4	4	4	4	54
Collision with terrain	6	6	4	3	5	0	3	3	3	2	2	37
Power loss	1	1	1	0	1	0	0	0	0	0	0	4
Collision with object	0	2	2	0	0	0	1	1	1	0	0	7
Component/System related	0	0	0	0	0	0	0	0	1	0	2	3
Precautionary/Forced landing/Ditching	0	2	1	0	0	0	0	0	0	0	0	3
Loss of control	2	5	0	1	2	0	0	1	0	0	1	12
Other events	3	4	1	4	1	1	2	2	2	2	3	25
Landing	3	3	5	3	3	4	4	5	0	1	4	35
Missed or went off runway	0	0	0	0	0	1	0	1	0	0	0	2
Collision with object	1	0	1	0	0	0	1	1	0	1	2	7
Landing gear collapsed/retracted	0	0	0	0	0	0	0	0	0	0	0	0
Nosedown/Overturned	0	1	1	1	2	1	0	0	0	1	2	9
Loss of control	0	1	0	0	1	0	0	0	0	0	0	2
Hard landing	0	0	0	1	0	0	0	0	0	0	0	1
Collision with terrain	0	2	2	3	2	2	2	4	0	0	1	18
Wheels-up landing	0	0	0	0	0	0	0	0	0	0	0	0
Precautionary/Forced landing/Ditching	1	0	0	0	1	0	1	0	0	0	0	3
Other events	2	1	1	2	0	2	1	3	0	1	2	15
Post-impact	8	13	6	8	8	4	10	9	5	8	4	83
Fire/Explosion/Fumes	6	12	4	6	7	3	10	7	4	6	3	68
Other events	3	1	2	2	1	2	0	2	1	2	1	17

Data extracted 5 March 2020

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 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	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	0	0	2	0	2	0	1	0	0	0	0	5
Loss of control	0	0	0	0	0	0	0	0	0	0	0	0
Collision with terrain	0	0	1	0	1	0	1	0	0	0	0	3
Collision with object	0	0	0	0	1	0	1	0	0	0	0	2
Power loss	0	0	1	0	0	0	0	0	0	0	0	1
Other events	0	0	0	0	0	0	0	0	0	0	0	0
En route	4	3	2	3	2	0	2	1	1	4	2	24
Collision with terrain	2	3	2	2	1	0	1	1	0	2	1	15
Power loss	1	0	0	0	0	0	0	0	0	0	0	1
Precautionary/Forced landing/Ditching	1	0	0	0	0	0	0	0	0	0	0	1
Component/System related	1	0	0	0	0	0	0	0	0	0	0	1
Other events	1	2	1	2	2	0	1	1	1	3	1	15
Manoeuvring	3	0	4	3	2	0	1	1	1	1	1	17
Collision with terrain	2	0	3	1	2	0	1	0	1	1	0	11
Loss of control	2	0	0	1	1	0	0	0	1	0	0	5
Collision with object	0	0	1	0	0	0	0	1	1	0	0	3
Operations related event	1	0	0	2	0	0	0	0	1	0	1	5
Power loss	1	0	0	1	0	0	1	0	0	0	1	4
Other events	2	0	2	2	0	0	0	1	1	0	1	9
Approach	2	0	1	1	0	0	0	0	0	0	0	4
Collision with terrain	2	0	0	0	0	0	0	0	0	0	0	2
Power loss	0	0	0	0	0	0	0	0	0	0	0	0
Loss of control	0	0	1	1	0	0	0	0	0	0	0	2
Collision with object	1	0	0	0	0	0	0	0	0	0	0	1
Other events	0	0	0	1	0	0	0	0	0	0	0	1
Landing	2	0	1	2	0	0	2	0	1	0	1	9
Hard landing	1	0	0	0	0	0	0	0	0	0	0	1
Collision with terrain	2	0	1	2	0	0	1	0	0	0	0	6
Loss of control	0	0	0	0	0	0	1	0	0	0	0	1
Collision with object	1	1	0	0	0	0	0	1	0	2	0	5
Other events	1	0	0	0	0	0	0	0	0	0	1	2
Post-impact	4	0	1	1	2	0	1	0	0	0	0	9
Fire/Explosion/Fumes	3	0	1	1	1	0	1	0	0	0	0	7
Other events	1	0	0	0	1	0	0	0	0	0	0	2

Data extracted 5 March 2020

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 TSB Regulations.

Aviation occurrence

- Any accident or incident associated with the operation of an aircraft, and
- 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; or
- 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 take-off weight (MCTOW) greater than 2250 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 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;

- 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 refueled 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 two 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; or
- 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 8618 kg (19 000 pounds) or less and a seating configuration, excluding pilot seats, of 10 to 19, inclusive; or
- 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 8618 kg (19 000 pounds) or less and a seating configuration, excluding pilot seats, of nine 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.