

Analysis in Brief

Overview of Canadian Registered Aircraft (as of December 31, 2020)



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Table of contents

1. Introduction.....	4
2. Evolution of aircraft registrations by decade and purpose (1960 to 2020)	4
3. Aircraft category and registration purpose	5
4. Privately registered aircraft	6
4.1 Characteristics of privately registered aircraft.....	6
4.2 Manufacturers of privately registered aircraft.....	6
4.3 Owners of privately registered aircraft	6
5. Commercially registered aircraft	6
5.1 Manufacturers of commercially registered aircraft.....	6
5.2 Country of manufacture of commercially registered aircraft	7
5.3 Engines of commercially registered aircraft	7
5.5 Change in weight of commercially registered aircraft between 2010 and 2020	8
6. Level I air carriers.....	8
7. Additional information.....	9

Overview of Canadian Registered Aircraft (as of December 31, 2020)

1. Introduction

Transport Canada is responsible for Canada's aircraft registration program, which is managed through the Canadian Civil Aircraft Register (CCAR). This report describes some of the characteristics of the aircraft registered in Canada as of December 31, 2020.

As of that date, there was a total of 33,149¹ aircraft registered in Canada: 29,284 airplanes², 2,558 helicopters, 654 gliders, 474 balloons and 179 gyroplanes. Aircraft registrations are categorised by intended purpose (private, commercial or state).³ Commercially registered aircraft can be operated for hire or reward⁴ and are required to meet more rigorous maintenance requirements than those registered for private purposes.

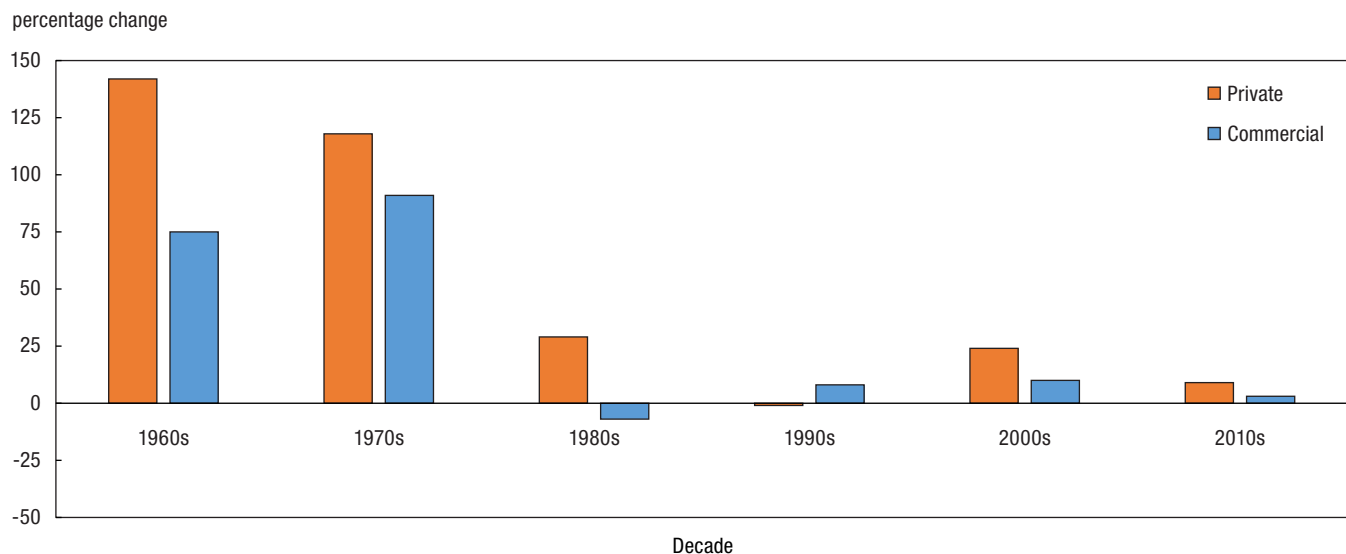
Four of every five (80%) aircraft were privately registered while 19% were commercial and 1% registered as state. According to [AVBuyer](#) – an online source of information on aircraft for sale, aviation services and market intelligence – using January 2020 data Canada was ranked as the country with the third largest number of commercially registered aircraft, behind the United States and China.

2. Evolution of aircraft registrations by decade and purpose (1960 to 2020)

The 1960s and 1970s saw rapid expansion of air transportation as well as aircraft ownership in Canada. While both private and commercial registrations grew over these two decades, the former did so at a faster pace, more than doubling during each decade. Commercial registrations increased by 75% in the 1960s and by 91% in the 1970s. By 1980, 72% of all registrations were for private purposes, up from 61% in 1960.

Chart 1

Percentage change in private and commercial aircraft registrations by decade



Source: Transport Canada, Canadian Civil Aircraft Register, National Year-End Summaries.

1. This report is based on valid registrations and excludes cancelled and expired registrations contained in the CCAR file.
2. The term "airplane" is synonymous with Transport Canada's term "aeroplane" and will be used throughout the article for simplicity.
3. Throughout this article, any reference to privately or commercially registered aircraft refers to the purpose indicated on its certificate of registration.
4. Reward is a term from the Canadian Aviation Regulations and means money or other form of payment for the services rendered using the aircraft. This does not include reimbursement of expenses, such as fuel.

Private aircraft registrations grew at a slower pace (+29%) over the 1980s, while commercial registrations decreased by 7%. This decade was characterized by the deregulation of the airline industry formally in 1987, and Air Canada was subsequently privatized in a move to promote airline competition.

Both private and commercial aircraft registrations saw small year-over-year decreases in 1991, and the economic downturn in the early 1990s dampened air travel. However, commercial registrations increased 8% over the decade, while private registrations declined by almost 2%.

The first ten years of the 21st century were characterized by the events of September 11, 2001, the 2003 SARS outbreak and the 2008-2009 economic downturn along with periods of high fuel prices. Despite these factors, private aircraft registrations rose by almost 25% over the decade while commercial registrations also increased, up almost 10%. Annual growth in both peaked in 2008 when an almost 4% year-over-year increase in commercial registrations was recorded, the highest since the 1980s.

Growth in aircraft registrations slowed in the 2010s. Private aircraft registrations grew by less than 10%, with most of this growth in the first half of the decade. Meanwhile, commercial registrations increased by 3% over the decade.

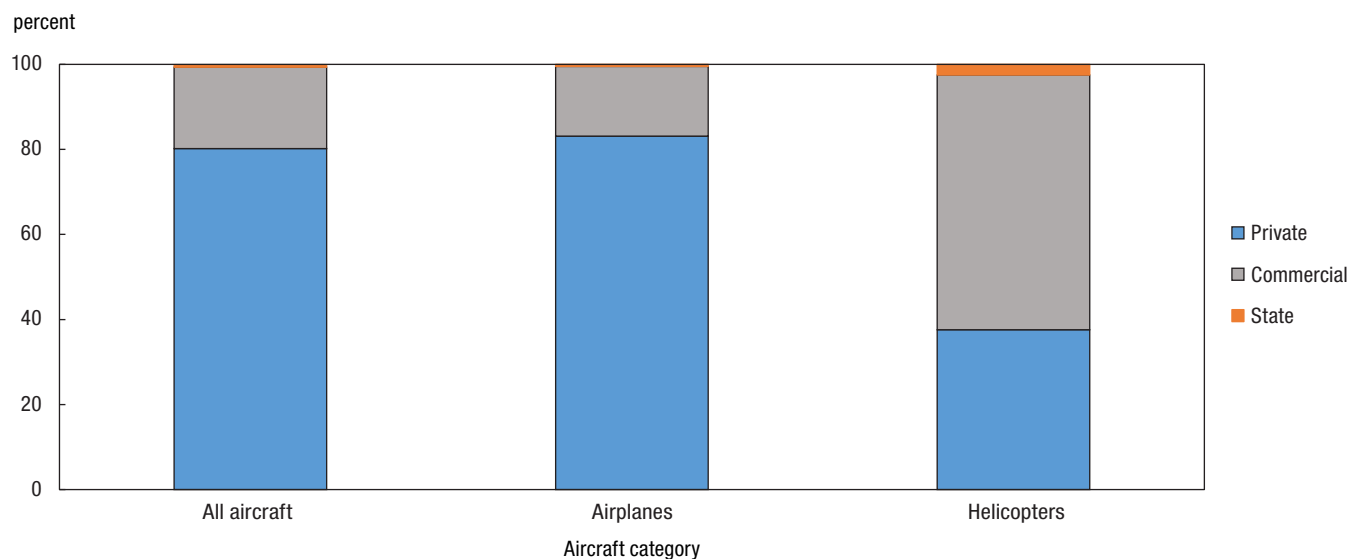
3. Aircraft category and registration purpose

There are significant differences in the proportions of registrations by aircraft category and purpose. For example, at the end of 2020 airplanes represented a little more than three quarters of all commercially registered aircraft and over 90% of private registrations. Meanwhile, 60% of all helicopters were commercially registered, and they represented almost one quarter of all commercially registered aircraft.

Helicopters' versatility, ability to land almost anywhere, and the ability to carry slung loads⁵ makes them useful for a variety of commercial applications. However, they are generally slower and more difficult to fly than airplanes and have higher operating costs, making them less suitable for many private aircraft owners.

Chart 2

Percentage of registrations by aircraft category and purpose, December 31, 2020



Source: Transport Canada, Canadian Civil Aircraft Register, December 31, 2020.

5. A slung load is an external load hanging under the helicopter fuselage.

4. Privately registered aircraft

At the end of 2020, of the 26,598 privately registered aircraft most (24,345 or 92%) were airplanes, 962 (4%) were helicopters, while 1,291 (5%) were gliders, balloons or gyroplanes.⁶ Roughly 4 out of 5 (83%) airplanes held private registrations whereas approximately 2 out of 5 (38%) helicopters were privately registered.

4.1 Characteristics of privately registered aircraft

The vast majority (97%) of privately registered airplanes had piston engines, while helicopters were almost evenly split between piston and turboshaft engines⁷. Most private airplanes and helicopters had a single engine. With an average maximum take-off weight (MTOW) of 1,220 kilograms, almost all (99%) privately registered aircraft were light weight (under 7,000 kg).

4.2 Manufacturers of privately registered aircraft

Of privately registered aircraft in Canada, 6,184 (23%) were manufactured by the Cessna Aircraft Company (Cessna)⁸ while 3,159 (12%) were manufactured by Piper Aircraft Inc. (Piper). Together, these two companies accounted for more than a third of all privately registered aircraft in Canada. 10% of privately registered aircraft were manufactured by Van's Aircraft, Quad City Aircraft Corp, Beech Aircraft Corporation (Beechcraft)⁹, Aeronca Incorporated¹⁰ and Zenair Ltd combined.

The most common aircraft types among privately registered aircraft were the Cessna 172, Piper 28 and Cessna 150. There were over 1,000 of each of these types registered for private purposes. The average age of privately registered aircraft was 39 years at the end of 2020, an increase of 7 years compared with 2010.

4.3 Owners of privately registered aircraft

Half of privately registered aircraft owners resided in either Ontario (29%) or Quebec (21%). While British Columbia (BC) has a larger population than Alberta, a little less than 16% of private owners were in BC, while almost 18% were in Alberta. Saskatchewan and Manitoba represented between 5% and 6% of owners, while fewer than 5% of private aircraft owners were in Atlantic Canada and less than 2% from the territories.

5. Commercially registered aircraft

At the end of 2020, 6,345 aircraft were registered commercially in Canada, of which 4,798 (76%) were airplanes, 1,531 (24%) were helicopters and 16 (<1%) were either balloons, gliders or gyroplanes.

5.1 Manufacturers of commercially registered aircraft

Cessna airplanes accounted for a third of all commercially registered airplanes, while 12% were manufactured by De Havilland Aircraft of Canada Limited. Piper and Beechcraft each held an 8% share, while the Boeing Company (Boeing) accounted for 7%. Commercially registered airplanes built by Air Tractor Inc., Bombardier Inc. and Airbus held a 3% to 4% share each.

Of commercially registered helicopters, 633 (41%) were manufactured by Bell Helicopters (Bell)¹¹, 478 (31%) by Aerospatiale¹² and 167 (11%) by the Robinson Helicopter Company. Together, over 80% of commercially registered helicopters were manufactured by one of these companies.

Commercially registered aircraft tended to be slightly newer than those with private registrations – their average age was 33 years.

6. Due to rounding, percentages do not add up to 100.

7. A turboshaft engine is a type of gas turbine engine used in helicopters.

8. Cessna Aircraft Company is identified as a manufacturer to maintain continuity despite its current ownership by Textron Aviation.

9. Beech Aircraft Corporation is identified as a manufacturer to maintain continuity despite its current ownership by Textron Aviation.

10. Aeronca Incorporated is identified as a manufacturer to maintain continuity despite its current ownership by Magellan Aerospace.

11. Bell Helicopters is identified as a manufacturer to maintain continuity despite its current operations as Bell Textron Inc.

12. Aerospatiale is identified as a manufacturer to maintain continuity despite its current ownership by Airbus.

The most common type of commercially registered aircraft was the Cessna 172, with Aerospatiale AS350 and Bell 206 helicopters the second and third most common. These were followed by two types of airliners – the De Havilland Dash 8 and the Boeing 737.

5.2 Country of manufacture of commercially registered aircraft

With many aircraft manufacturers, such as Cessna, Piper and Bell, headquartered in the United States (US), about two-thirds (65% or 4,133) of all commercially registered aircraft in Canada were built there.

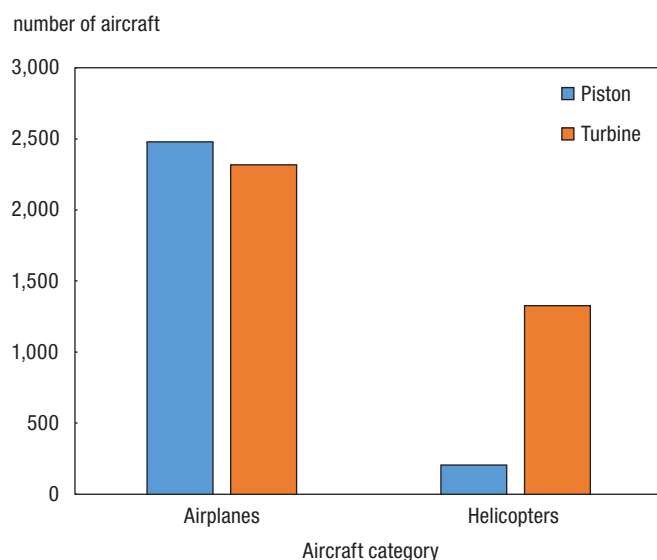
The proportion of commercially registered aircraft built in Canada increased from 15% in 2010 to almost 17% by the end of 2020, resulting from a 9% (+85 aircraft) increase in Canadian-built aircraft combined with a 5% (-201 aircraft) decrease in US-made aircraft.

The largest increase over the last decade came from aircraft built in France (+169). As a result, the proportion of commercially registered aircraft manufactured there grew from 10% in 2010 to 12% in 2020.

5.3 Engines of commercially registered aircraft

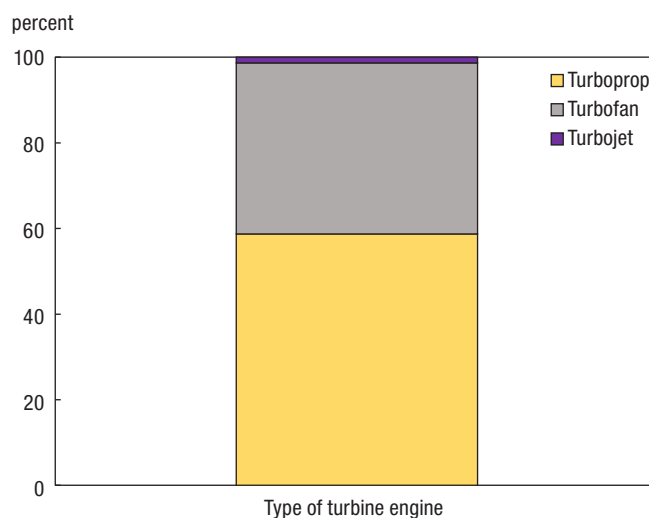
Canada's vast territory and large network of aerodromes¹³ support large-scale commercial aircraft ownership, many with different engine types that reflect varied operational uses. For example, Canada's remote communities rely on air transportation to move people and goods. However, many of these communities have small aerodromes with gravel runways that do not permit the operation of turboprop or turbojet aircraft, while others do not have the volumes that justify larger aircraft. Therefore, many flights to those communities are accomplished with piston and turboprop airplanes. Piston aircraft are also used in flight training, while both pistons and turboprops are common in aerial work applications.

Chart 3
Engine category – Commercially registered airplanes and helicopters, December 31, 2020



Source: Transport Canada, Canadian Civil Aircraft Register, December 31, 2020.

Chart 4
Turbine engine category – Commercially registered airplanes, December 31, 2020



Source: Transport Canada, Canadian Civil Aircraft Register, December 31, 2020.

13. An aerodrome is a supporting surface (land, water, frozen surface, or other) for use in whole or in part for the arrival, departure or servicing of aircraft. There are nearly 2,000 registered aerodromes in Canada – about 300 of these are certified (airports). The number of aerodromes increases to about 6,000 when one takes into account non-registered aerodromes such as private airstrips.

At the end of 2020, a little over half (52%) of all commercially registered airplanes in Canada had piston engines. With the remaining airplanes being powered by turbine engines, 28% were turboprops, 19% were turbofans and less than 1% were turbojets. (In contrast, most helicopters had turboshaft engines.) Piston engines are most efficient at low airspeeds and low altitudes, turboprop engines at medium airspeeds and altitudes, and turbofan engines at high airspeeds and altitudes. Turbojet engines have been largely replaced in civil aviation by quieter and more fuel efficient turbofans.

Just over half (52%) of commercially registered airplanes had one engine, while 47% had two, and a small number had three or four. The vast majority of helicopters (81%) had one engine, and the rest had two.

Single-engine airplanes are used in flight training, air taxi and many aerial work applications, such as aerial survey, fire patrol, and agricultural aviation. Multi-engine airplanes are used in all categories of commercial operations (airline, commuter, air taxi, aerial work and flight training).

5.4 Weight of commercially registered aircraft

Aircraft weight is often categorized based on the strength of disturbances they create as they pass through the air (wake turbulence). The greater the weight of an aircraft, the stronger the disturbances they produce. Light, medium and heavy wake turbulence categories, which are based on maximum take-off weight (MTOW),¹⁴ are used in this paper to examine aircraft weight.

At the end of 2020, the average MTOW of a commercially registered airplane in Canada was 18,679 kilograms. Over two thirds (69%) of commercially registered airplanes were light weight, used in aerial work, air taxi and flight training. Medium weight airplanes—28% of commercially registered airplanes—include the majority of aircraft used to carry passengers and cargo in airline and commuter operations. The remaining 3% belonged to the heavy wake turbulence category, the wide-body airliners used primarily on long-haul passenger and cargo flights.

5.5 Change in weight of commercially registered aircraft between 2010 and 2020

Between 2010 and 2020, the average MTOW of commercially-registered airplanes increased by 33%. The number of commercially-registered airplanes in the medium and heavy wake turbulence categories grew by 17% (+193 aircraft) and 46% (+46 aircraft) respectively, while the number of those in the light category fell 5% (-184 aircraft).

As a result, the share of commercially registered airplanes in the medium weight category increased from 24% in 2010 to 28% at the end of 2020 and heavy weight airplanes rose from 2% to 3% over this same period. Although the majority of commercially registered airplanes remained in the light weight category, their proportion decreased from 73% in 2010 to 69% at the end of 2020.

Rotary wing aircraft are limited by the capabilities of the rotors in producing lift to offset the weight, and therefore almost all (98%) commercially-registered helicopters in Canada were light weight, while the rest were in the medium category. The average MTOW of a commercially registered helicopter was 2,588 kilograms – an 8% increase from 2010.

6. Level I air carriers

As of the end of 2020, Canadian Level I air carriers¹⁵ had 635 airplanes in their commercial fleets, accounting for 10% of all commercially registered aircraft and 2% of all registered aircraft. Aircraft registered to Level I air carriers were manufactured by one of 5 companies and distributed among 11 aircraft types¹⁶ and 44 models. The average age of aircraft registered to Level I air carriers was 12 years.

14. The categories are light (MTOW < 7,000 kg), medium (MTOW 7,000-136,000 kg) and heavy (MTOW > 136,000 kg). With a MTOW in the order of 560,000 kg the Airbus A380 is the only aircraft in the super heavy category; none of these aircraft are registered in Canada.

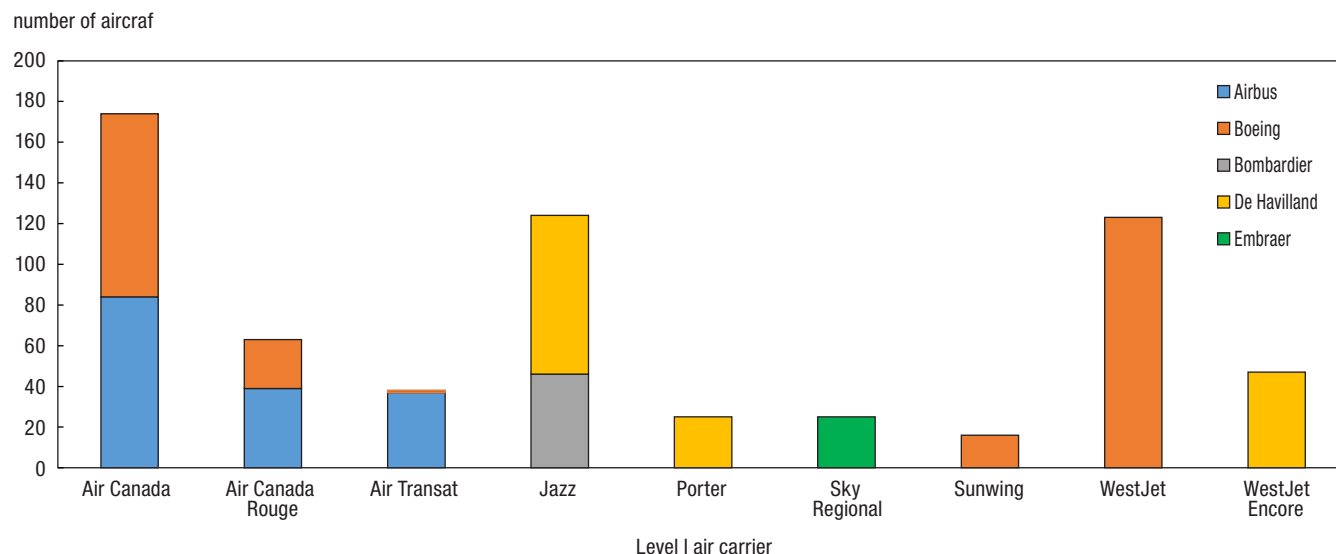
15. In 2020, Level I air carriers included Air Canada (including Air Canada Rouge), Air Transat, Jazz, Porter, Sky Regional, Sunwing and WestJet (including WestJet Encore).

16. All Airbus A320 family aircraft are counted as one type. All Boeing 737 aircraft are counted as one type. All Bombardier CRJ aircraft are counted as one type. All De Havilland Canada Dash 8 aircraft are counted as one type.

The largest number of aircraft registered to Level I air carriers were manufactured by Boeing. The most common aircraft type in these carriers' fleets was the Boeing 737 (158 aircraft), followed by the De Havilland Dash 8 (150 aircraft) and the Airbus A320 family (107 aircraft). Three Level I air carriers – Air Canada, Jazz and WestJet – were the only owners¹⁷ in Canada with 100 or more registered aircraft.

Chart 5

Level I carriers – Aircraft by manufacturer, December 31, 2020



Note: All A220/C Series are recorded as Airbus, and all Dash 8-400s are under De Havilland.

Source: Transport Canada, Canadian Civil Aircraft Register, December 31, 2020.

7. Additional information

The Canadian Civil Aircraft Register contains a wealth of information on Canadian registered aircraft. This article summarized select components, while the complete database can be accessed on [Transport Canada's CCAR website](#).

Previously, two infographics were published based on the CCAR – one on [privately registered aircraft](#), and the other on [commercially registered aircraft](#).

17. In case of a leased aircraft, the lessee is on the certificate of registration and is therefore considered as an owner for the purposes of this article.