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Canadian aviation amid the COVID-19 pandemic: Part 2. Impact on various flying activities

by Valeriya Mordvinova

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Canadian aviation amid the COVID-19 pandemic: Part 2. Impact on various flying activities

by Valeriya Mordvinova

Introduction

The COVID-19 pandemic has caused an unprecedented disruption to aviation. Air transportation is all about connecting the world through the movement of people and goods. At the start of the pandemic, the movement of people by air was essentially stopped by public health measures and travel restrictions implemented around the world to combat the spread of the virus. In response, airlines grounded their fleets and laid off employees. While passenger numbers and revenues both dwindled, high fixed costs remained, resulting in financial losses. A number of airlines around the world had to file bankruptcy,¹ while others have been kept on financial life support from governments.²

Beyond the airlines, the pandemic touched every aspect of aviation. For instance, airports and air navigation service providers lost revenue as the number of passengers and flights decreased. Flight training units in many countries, including Canada, were closed for a period of time as “non-essential” businesses. General aviation activity declined as people were asked to stay home.

This is the second in a series of articles that examines the impact of COVID-19 on aviation in Canada and looks for signs of recovery up to the end of 2021. The [first article](#) examined the impact on Canada’s large and medium air carriers and found that passenger airlines bore the brunt of this impact, while the increased demand for air cargo was insufficient to offset this decline. This second article focuses on the impacts across various types of flying activities and compares their speed of recovery. After a brief overview of data and methods, the article examines a breadth of flying activities and finds that those such as general aviation, flight training, aerial work and smaller air carriers were able to recover faster than the larger airlines.

Data and methods

Statistics Canada’s [Aircraft Movement Statistics](#) (AMS) use administrative data from NAV CANADA – Canada’s air navigation service provider – on aircraft movements at the 90 airports with NAV CANADA control towers and flight service stations (FSS). Only data on itinerant movements³ are used in this analysis covering the period from 2018 through 2021. The population of airports does not cover all registered aerodromes in Canada (of which there are about 2,000), but only those with NAV CANADA control towers and FSS. This has some impact on the analysis, which is explained in the results section. Data published in the AMS are not seasonally adjusted. To deal with seasonality, and to make variables with different levels comparable to each other, percentage changes from the same month of pre-pandemic 2019 were calculated for several graphs.

Air carriers that transport passengers and cargo in Canada are classified as airline, commuter or air taxi operators based on the size of aircraft operated. Flight training units train pilots for licences and ratings, while aerial work operators are engaged in other commercial air services, such as aerial survey, crop dusting and aerial firefighting.

1. The international Air Transport Association (IATA) (2021a) lists 27 bankrupt airlines and 28 under administration.
2. According to IATA (2021b), by the beginning of October 2021, airlines globally received a total of USD\$243 billion in financial support from governments, including both repayable and non-repayable funds.
3. Itinerant aircraft movements are take-offs and landings, while local movements include touch-and-go’s, stop-and-go’s, missed approaches, etc.



Corporate, or business, aviation involves the transportation of employees by the company or by a corporate aviation company for hire. General aviation refers to private aircraft being flown by their owners.⁴ This article focuses on all these flying activities. They are supported by air navigation service providers (in Canada it is NAV CANADA), airports, fixed base operators and aircraft maintenance organizations, whose activities are outside the scope of this article.

While AMS do not group data by the types of flying activity as defined above (i.e. airline, commuter, air taxi, aerial work, flight training, corporate aviation and general aviation), it has categories that can serve as proxies due to their correlations with the type of flying activity. These groupings are by flight rules, engine category, and type of operation.

Results

Aircraft movements under visual flight rules lead recovery

Every flight is conducted in accordance with either visual or instrument flight rules. Visual flight rules (VFR) flights must be conducted with visual reference to the surface of the earth, and the weather conditions must meet specific requirements which vary depending on the airspace classification (controlled or uncontrolled), time of the day (day or night) and altitude of flight. These flights include most general aviation flights, most flight training, a number of aerial work applications (such as aerial survey and crop dusting), and some air taxi operations. Instrument flight rules (IFR) flights are conducted with reference to flight instruments and can fly in cloud or low visibility. These flights include airline and commuter flights, corporate aviation, a portion of air taxi operations, some aerial work, and some general aviation and training flights.

At airports with NAV CANADA control towers and FSS, almost two-thirds of itinerant aircraft movements pre-pandemic (65% in 2018 and 63% in 2019) were by IFR flights. This does not represent all the flights taking place in Canada. The percentage of IFR movements at aerodromes without control towers or FSS would be lower, because much of the general aviation and flight training activity takes place at those aerodromes, and those are primarily VFR flights. The majority of activity at airports with control towers or FSS, on the other hand, is by air carriers who operate under IFR. Since data for aerodromes without control towers or FSS are not available, this analysis will focus on those airports included in AMS.

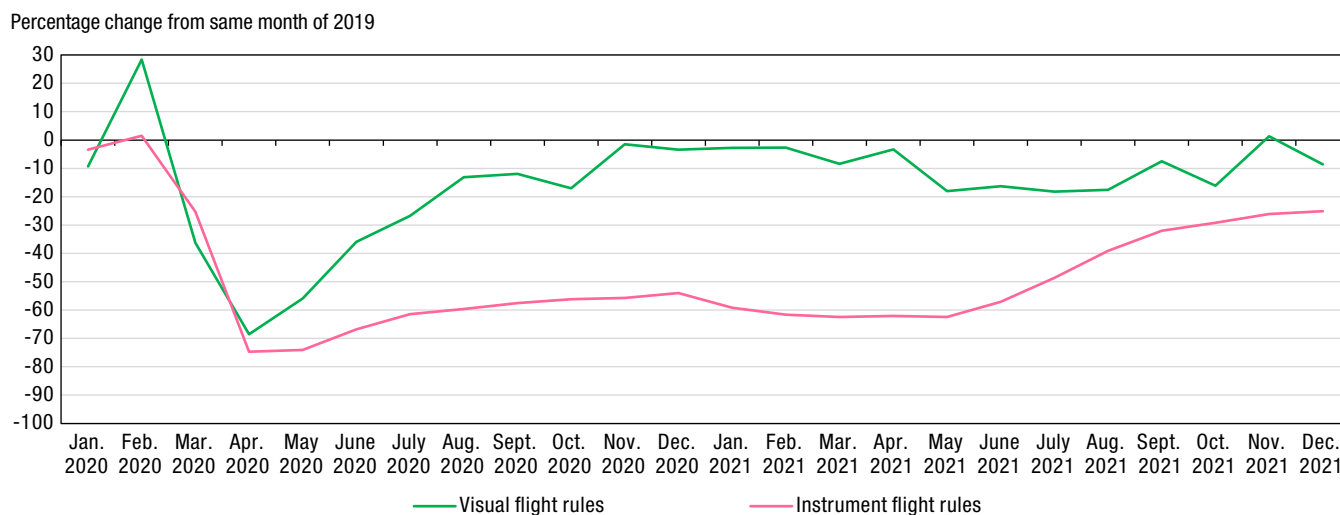
Chart 1 shows the percentage changes from the same month of 2019 in VFR and IFR itinerant aircraft movements at airports with NAV CANADA control towers and FSS. Both IFR and VFR flights were largely curtailed in April 2020 amid public health measures such as physical distancing and advisories to stay home. IFR movements remained well below pre-pandemic levels for many months, but recovered steadily beginning in the summer of 2021 to reach 75% of 2019 level in December 2021.

4. The scope of general aviation can be defined more broadly, but this more narrow scope will be used for the purposes of this article.



Chart 1

Percentage change from the same month of 2019 in itinerant aircraft movements by flight rules at airports with NAV CANADA control towers and flight service stations, monthly, 2020 to 2021



Source: Statistics Canada, Aircraft Movement Statistics.

VFR movements began recovering much earlier, in May 2020, and reached over 95% of pre-pandemic levels in some months of 2021. After two months of closure, flight training began resuming in May and June 2020, with timing varying by province. In later lockdowns, flight training units were allowed to remain open for training and proficiency flights. General aviation flights also resumed or picked up in the summer of 2020. As airspace became almost devoid of airline traffic, aerial work operators were able to conduct more flights than usual, taking advantage of being able to work in airspace that would previously have been too busy. Despite recovering sooner than IFR movements, VFR movements generally stabilized at a slightly lower level than pre-pandemic 2019.

VFR movements at airports with control towers (not FSS) were above 2019 levels in some months of 2021. With much less airline traffic, general aviation pilots and flight instructors took advantage of the opportunity to fly to larger airports and practice controlled aerodrome procedures or teach their students to operate at these airports. Therefore, some of the increase in VFR movements at aerodromes with control towers is actually substitution from other aerodromes.

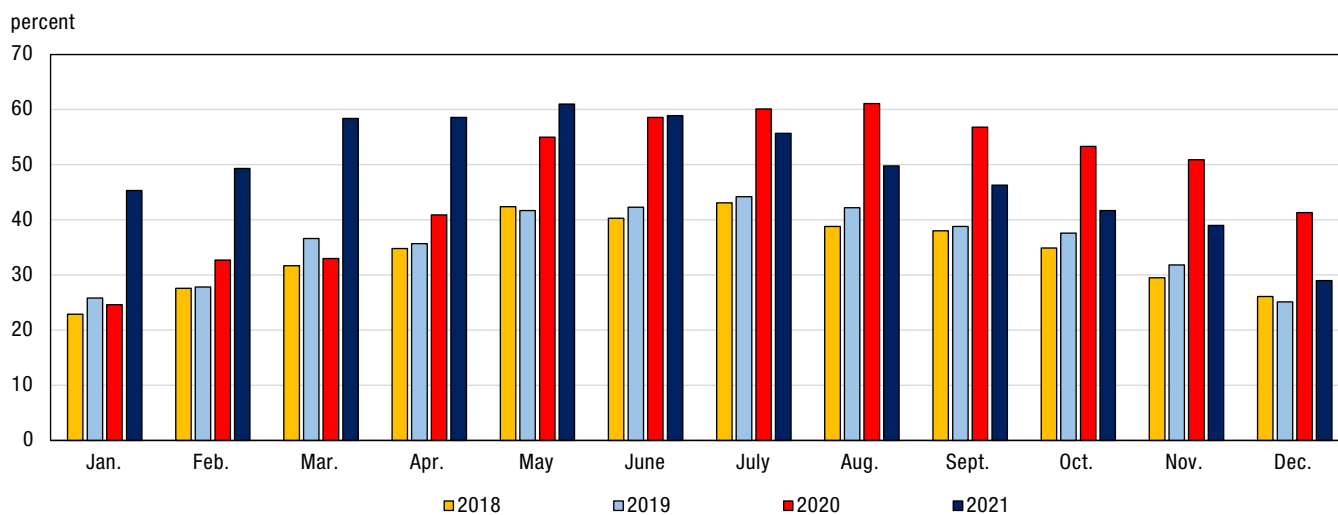
As a result of VFR movements recovering faster than IFR movements, the proportion of VFR itinerant movements at airports with NAV CANADA control towers and FSS increased from a little over a third (37%) of itinerant movements in 2019 to almost half (47%) in 2020. In the eight months from May through December 2020 combined, this proportion was more than half (55%).

VFR flights are much more weather dependent than IFR flights, and there is a clear seasonal pattern, with VFR movements as a proportion of total movements increasing in the summer and decreasing in the winter. Chart 2 shows itinerant VFR movements as a percentage of total itinerant movements for airports with NAV CANADA control towers and FSS by month. In 2018 and 2019, the VFR proportion never reached 45%. Every month beginning in May 2020, percentages are visibly higher than pre-pandemic 2018 and 2019, reaching 61% in August 2020. In the second half of 2021, VFR proportions decreased from previous months as IFR traffic increased.



Chart 2

Itinerant aircraft movements under visual flight rules as a percentage of total itinerant movements at airports with NAV CANADA control towers and flight service stations, monthly, 2018 to 2021



Source: Statistics Canada, Aircraft Movement Statistics.

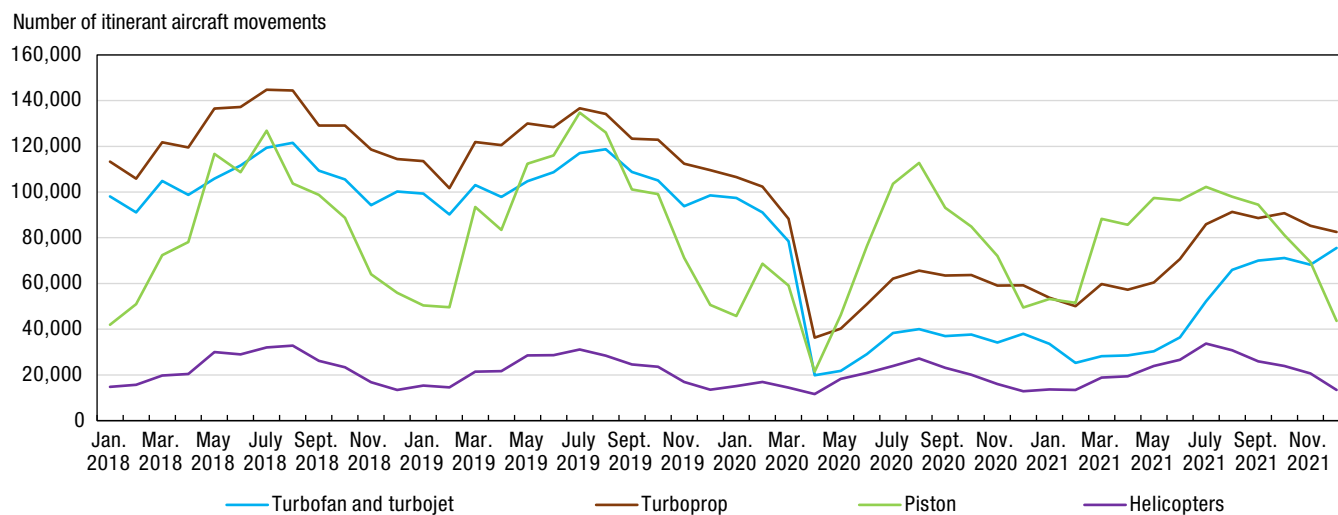
Activity of helicopters and piston airplanes more robust than that of turbine airplanes

Another characteristic that is correlated with the type of flying activity is engine category, which is generally, although not perfectly, correlated with aircraft size. Major airlines operate mostly turbofan aircraft, while regional airlines use turboprops and some smaller turbofans. Commuter carriers fly mostly turboprops, and air taxi operators have pistons and turboprops. Aerial work operators tend to fly pistons and turboprops; flight training is done on piston aircraft, and general aviation is mostly the domain of pistons, but some wealthy individuals own turboprops. Corporate aviation is an outlier, as their fleets consist mostly of business jets that transport small numbers of people at fast speed.

Chart 3 depicts monthly itinerant aircraft movements at airports with NAV CANADA control towers and FSS by type of power plant. The use of all airplanes (i.e. series on the graph other than helicopters) dropped noticeably in April 2020. Then movements by piston aircraft began recovering closer to pre-pandemic levels, while movements by turbine aircraft (turboprops, turbofans and turbojets) remained well below the levels they were at in 2018 and 2019. Movements by turbine-engine airplanes increased over the summer of 2021 and flattened out in autumn, still remaining noticeably below pre-pandemic levels, although higher than at any previous time during the pandemic. This echoes the flight rules data. Flight training, aerial work and general aviation activity was almost back to pre-pandemic levels by late 2020, while air carriers continued to be affected by travel restrictions and a lack of demand. Substitution from smaller aerodromes could also be a factor.



Chart 3
Itinerant aircraft movements by type of power plant, airports with NAV CANADA control towers and flight service stations, monthly, 2018 to 2021



Source: Statistics Canada, Aircraft Movement Statistics.

Helicopters, which include both those with piston and turboshaft engines, are in a league of their own, as their activity was hardly affected. Helicopters are used mostly in aerial work operations that are essential and cannot stop in a pandemic – pipeline patrol, firefighting, transporting workers to oil rigs, and so on. Additionally, some people used helicopter services to fly across the Canada-US border when it was closed to land crossings.

Activity by larger air carriers the slowest to recover

The AMS program also publishes data by type of operation. Chart 4 presents the number of itinerant aircraft movements by type of operation at airports with NAV CANADA control towers and FSS.⁵ Chart 5 shows percentage changes from the same month of 2019.

Activity in all types of operation declined in April 2020, but the number of movements by private aircraft⁶ never fell as much as the others. While air carriers had little demand for their services and flight training units were closed by government rules, general aviation pilots who own their own aircraft were simply advised to stay home. In the interests of aviation safety, and in many cases to satisfy the requirements imposed by insurance companies to fly a minimum number of hours in a given time period, some private aircraft owners continued limited flying in the local area throughout the lockdown periods. Additionally, corporate aircraft are often registered as private, and this type of flying has seen an increase during the pandemic, as the wealthy seek to avoid airline travel for fears of catching the virus (Foley, 2021). These factors were mitigated by terminal closures, shortened operating hours for airport services and similar restrictions that made operations more difficult.

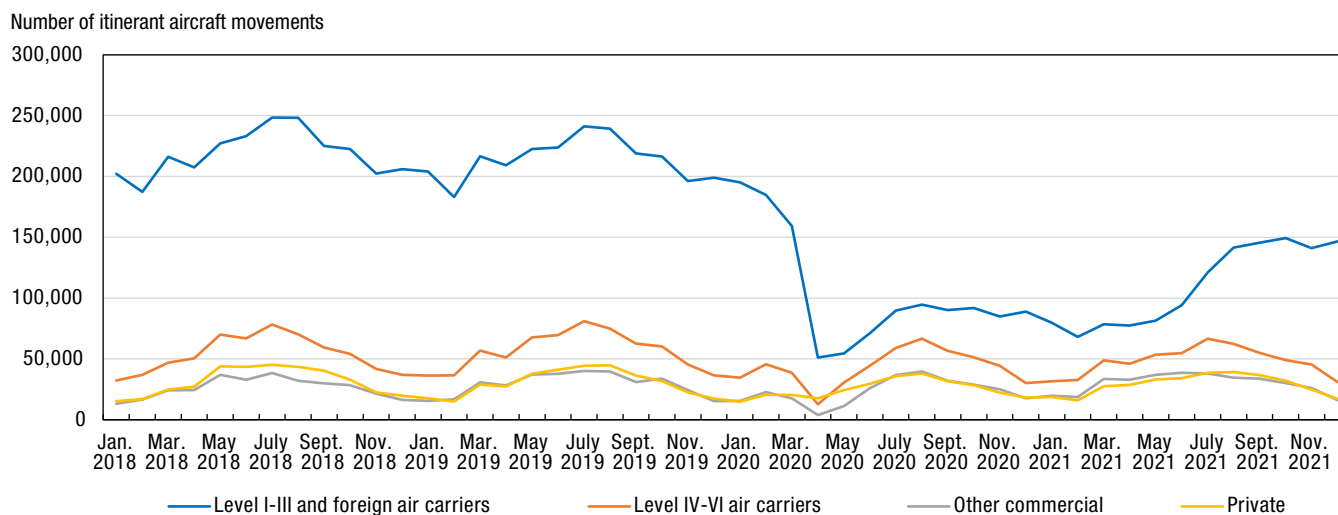
Following the decline at the beginning of the pandemic, private aircraft movements reached pre-pandemic levels by the end of 2020 and fluctuated around those levels in 2021.

5. Government civil and military movements are excluded for readability of the graphs.

6. Type of operation “private” includes movements by aircraft whose registration purpose indicated in the Canadian Civil Aircraft Register is private.

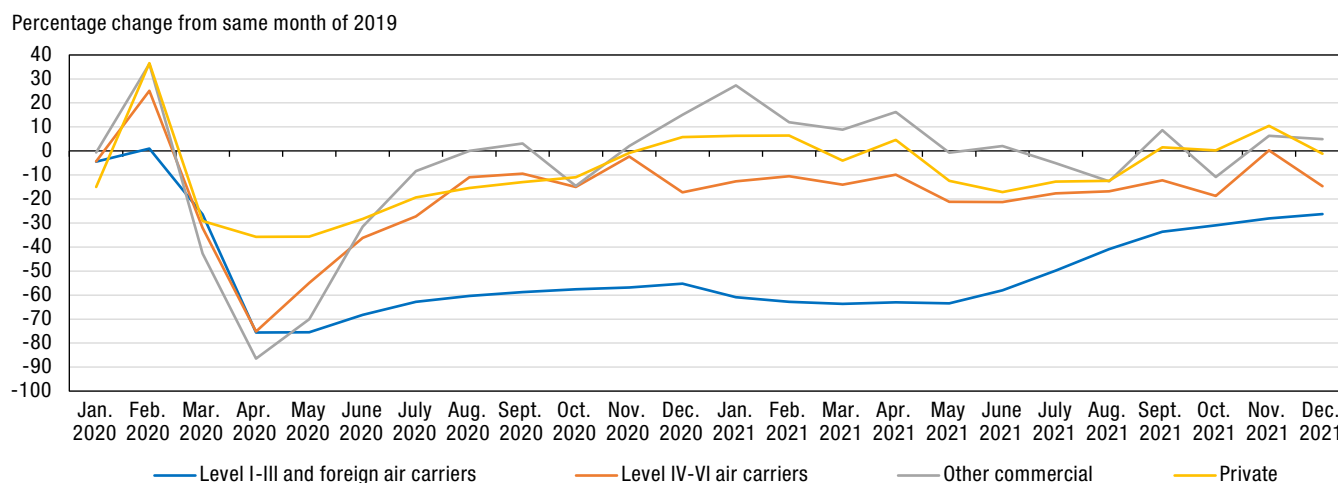


Chart 4
Itinerant aircraft movements by type of operation, airports with NAV CANADA control towers and flight service stations, monthly, 2018 to 2021



Source: Statistics Canada, Aircraft Movement Statistics.

Chart 5
Percentage change from the same month of 2019 in itinerant aircraft movements by type of operation, airports with NAV CANADA control towers and flight service stations, monthly, 2020 to 2021



Source: Statistics Canada, Aircraft Movement Statistics.

After the initial drop, it is the movements by Level I-III and foreign air carriers (which include Canadian airline, commuter and larger air taxi operators, as well as foreign air carriers of any size) that stand out. Before the pandemic, these carriers accounted for by far the largest number of movements at airports with NAV CANADA control towers and FSS. After first dropping in March and April 2020, they remained well below pre-pandemic levels while other types of operation recovered sooner. This echoes the findings in the previous article on airlines; that is, large



and medium carriers continued to experience low demand amid new waves of infections, uncertainty and travel restrictions. The improvement observed in the second half of 2021 is also consistent with the passenger data.

In contrast, small air carriers (Level IV-VI) mostly provide air taxi services to smaller communities, and these vital links are essential to those who live in those remote communities, so they are needed even during the pandemic. Their aircraft movements have recovered to near or above 80% of pre-pandemic levels.

Finally, other commercial movements include flight training and aerial work.⁷ As discussed in relation to flight rules, these activities have recovered or increased their flying to take advantage of less busy airspace. Substitution from flying at small uncontrolled aerodromes to visiting controlled airports could also be a factor. Other commercial movements were above 2019 levels for half a year (from November 2020 through April 2021) but declined to fluctuate around 2019 levels in later months.

Summary and conclusion

The COVID-19 pandemic is the biggest shock to the aviation industry in history⁸, and this article examined its impact on various flying activities in Canada as well as the road to recovery up to December 2021. While all flying activities were affected, some recovered faster than others. AMS data show that movements under instrument flight rules, movements by aircraft with turbine engines, and those by large and medium air carriers remained significantly reduced from pre-pandemic levels as of the end of 2021. In comparison, movements under visual flight rules, movements by aircraft with piston engines, and those by small air carriers, other commercial operators and private aircraft have recovered close to, or in some cases above, pre-pandemic levels.

This suggests that general aviation, flight training and aerial work had a faster recovery than air taxi operations which, in turn, had a stronger recovery than airline operations. It was the challenges faced and actions taken by the larger airlines – grounded fleets, laid off employees and huge financial losses – that garnered the most attention. This is understandable as commercial passenger aviation has a larger economic footprint, and collateral damage was felt throughout the tourism sector.

7. Type of operation “other commercial” includes movements by aircraft whose registration purpose in the Canadian Civil Aircraft Register is commercial, but whose owners are not classified as air carriers. This effectively leaves aircraft owned (or leased) by flight training units and aerial work operators.

8. See, for example, slide 2 in IATA's [Airline Industry Economic Performance – October 2021](#).



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