



The economic footprint of Bombardier's activities 2021-2025

Report prepared by PwC

March 2022



Bombardier: an important contributor to the Canadian economy

In 2021, Bombardier sold its rail division, thus completing its transition to becoming a “pure play” business jet manufacturer.

A global brand universally perceived as being synonymous with the Canadian aerospace sector, Bombardier has been the main driver of the Quebec and Canadian aerospace industry and is responsible for a significant portion of Canadian knowledge in this field.

Bombardier's activities, whether in R&D, manufacturing or involvement in academia and philanthropic activities, make an important contribution to the Canadian and Quebec economy.

About this report

Bombardier has retained the services of PwC to evaluate the economic benefits stemming from its current and ongoing operations and R&D activities in terms of wealth and jobs creation. Other contributions were also analyzed.

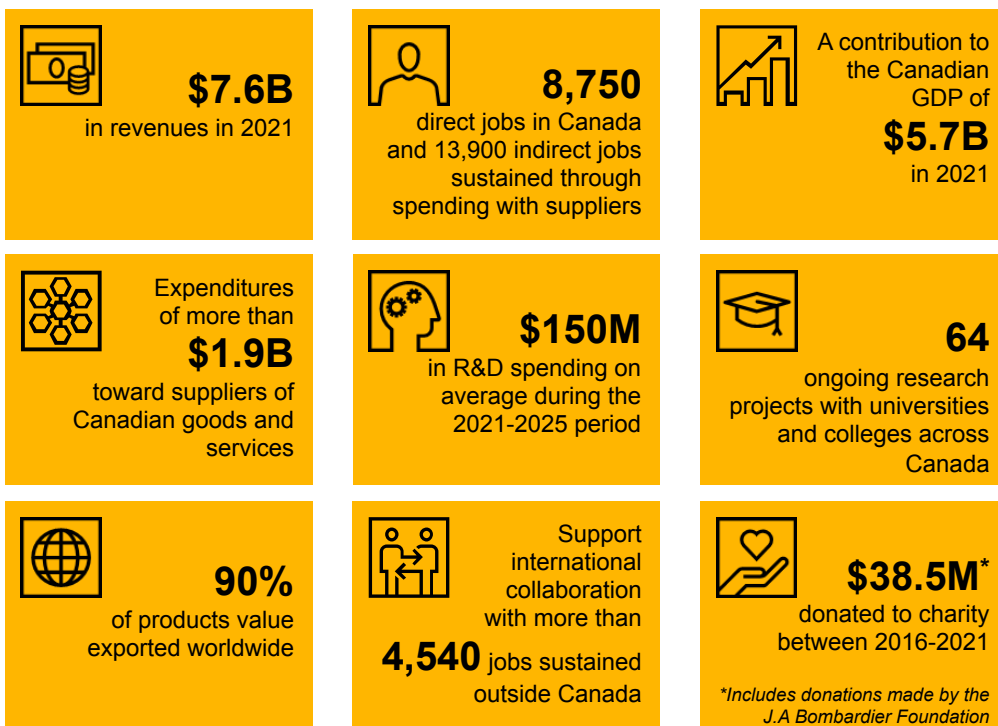
All monetary values are presented in Canadian dollars, unless otherwise stated.

For over 30 years, Bombardier has designed, built and supported one of the largest fleets of business jets, which today stands at more than 5,000 aircraft. In 2021, Bombardier delivered 120 business aircraft, reaching \$7.6B¹ in revenue. In 2021, Bombardier held more than 25% market share in the aerospace manufacturing sector (including parts manufacturers), making it the largest contributor in Canada in this field².

Bombardier's flagship aircraft, the Global 7500, is the world's largest and longest-range business jet. Bombardier's portfolio of aircraft also includes Global 6500, Global 5500, Challenger 650 and Challenger 350 aircraft.

Bombardier's contribution to the Canadian and Quebec economy includes creating value-added jobs, supporting the entire aerospace ecosystem of suppliers and contributing to the strategic positioning of the Canadian aerospace sector. In addition, Bombardier fosters Canada's high-skill pool by training aerospace professionals, and is committed to advancing social causes directly and also through the J. Armand Bombardier Foundation.

Bombardier in numbers



Recent milestones

Delivery of Bombardier's 1,000th Global aircraft

In December 2021, Bombardier delivered its 1,000th Global aircraft. This milestone demonstrates the continued popularity, longevity and reliability of the Global family of aircraft, which remains at the forefront of its category.

Announcement of the new Challenger 3500 aircraft

In September 2021, Bombardier introduced the Challenger 3500. The newest member of the Challenger family, who is expected to be in services in the second half of 2022, is designed through a sustainable lens in line with Bombardier environmental objectives.

Publication of the first environmental, social and governance (ESG) report³

In October 2021, Bombardier published its first integrated ESG report, in which Bombardier reaffirmed its commitment to sustainable development and presented its action plan.

Bombardier performed well in 2021, resulting in significant economic benefits

The demand for business jets surged in 2021, approaching historic highs⁴. This trend towards private aviation is being driven by the increased desire for health safety, privacy and comfort. As a result, 2021 witnessed a 7% increase in business jet flights compared to 2019, and the inventory of used aircrafts hit a historic low⁵. Bombardier benefitted from this trend with an order book of \$15.3B at the end 2021, up 14.0% from 2020⁶. Bombardier delivered 120 aircraft to customers in 2021, and its revenues amounted to \$7.6B, which represents almost 50% of all revenues from the aeronautical sector in Quebec (\$15.8B)⁷.

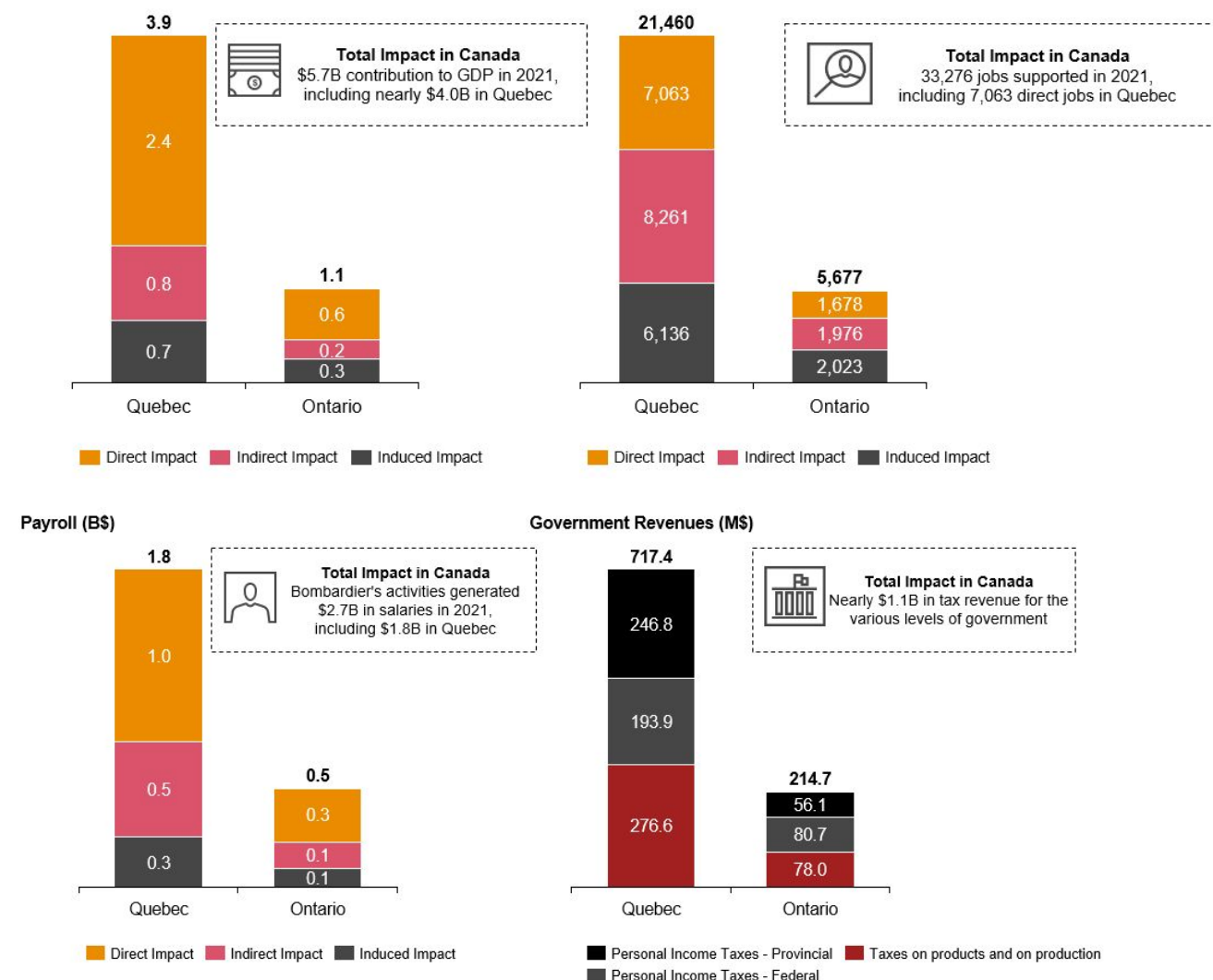
Aircrafts are the main export manufactured product for Quebec, in terms of value, along with aluminum and iron. In 2021, Quebec exported \$7.2B in aircrafts, or 7.6% of Quebec's total export value⁸. Considering that 90% of its aircrafts are intended for international markets, Bombardier was responsible for 70.5% of the value of exported aircraft in Quebec, 5.1% of the value of all exports in Quebec and nearly 1% of all exports made by Canadian companies.

The total economic contribution (direct, indirect and induced impacts) of Bombardier's manufacturing activities in Canada in 2021 is estimated at \$5.7B in GDP and 33,276 in full-time jobs. In Quebec alone, Bombardier supported 7,063 direct jobs, which represents 20% of all the jobs in aerospace sector, making it one of the largest employer in the manufacturing industry in the province. These jobs have a high added value since the average salary (before social benefits) of Bombardier employees is nearly 70% higher than the average salary in Quebec⁹.

In addition to providing a high number of value-added jobs, Bombardier contributes to government revenues in Canada, at all levels. Total payroll taxes facilitated by Bombardier in 2021 amounted to \$680M, of which \$380M were collected by provincial governments and \$300M by the federal government. Taxes on products and production are estimated at \$400M. In total, Bombardier's activities have enabled the provincial and federal governments to collect nearly \$1.1B in tax¹⁰.

Economic footprint facilitated by Bombardier operations activities in 2021¹¹

In billions or millions of dollars (in 2022), full-time equivalent jobs (FTE)*



*Due to rounding, the totals may not always add up to the sum of the items.

Bombardier's strong contribution to Canada's economic growth is expected to continue to 2025

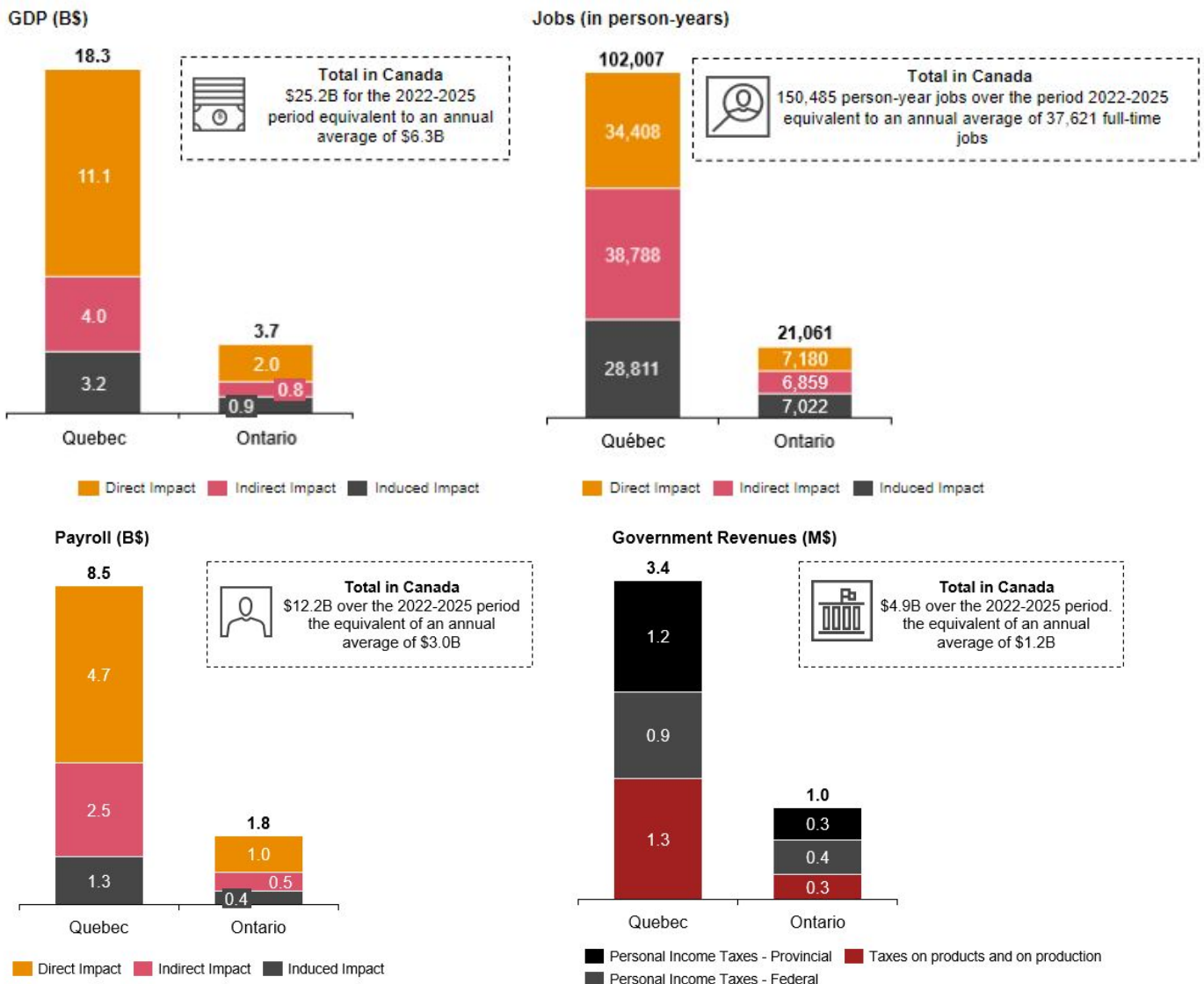


Bombardier is currently forecasting revenues to amount to \$8.4B in 2022 and increase to \$9.4B in 2025, corresponding to an 11% growth. Among market drivers considered as favorable to Bombardier there are the strong macroeconomic conditions, limited pre-owned supply and backlog and pricing increase. However, inflation pressures, supply chain disruptions and geopolitical tensions are some of the factors that could affect the forecast.

The total economic contribution (direct, indirect and induced impacts) of projected manufacturing activities in Canada between 2022-2025 is estimated at \$25.2B in GDP (or an annual average of \$6.3B), 150,485 job-years¹² (or an annual average of 37,621 full-time jobs, including an annual average of 10,400 direct jobs). Overall payroll taxes to be collected in relation to ongoing operations would total \$3.0B, of which \$1.7B will be collected by provincial governments and \$1.3B by the federal government.

Economic footprint stemming from operations activities between 2022 to 2025

In billions or millions of dollars (in 2022), full-time equivalent jobs (FTE)*



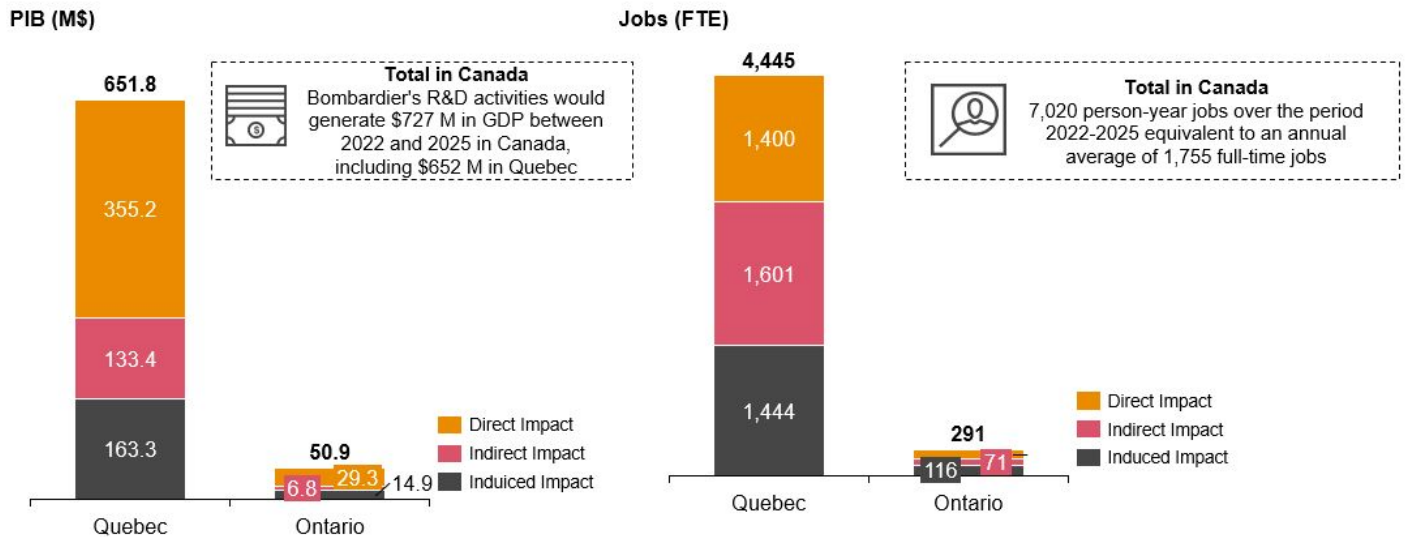
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Bombardier: driving innovation through continuing investment in R&D

The aerospace sector, and Bombardier in particular, are major contributors to innovation in Quebec and Canada, attributable to the significant R&D expenditures that are made every year. Between 2022 to 2025, Bombardier is expecting to spend, on average, \$150M in R&D activities.

Economic footprint stemming from R&D activities between 2022 to 2025

In millions of dollars (in 2022), full-time equivalent jobs (FTE)*



*Due to rounding, the totals may not always add up to the sum of the items.

Bombardier's R&D activities facilitates collaborations with the academic community

Through R&D investment, Bombardier has helped generations in Quebec and Canada to develop new skills in science, engineering and technical jobs. Every year, Bombardier welcomes approximately 1,000 students for a four-month internship. Many of the students and researchers at partner institutions are provided full-time opportunities at Bombardier following their internships, creating a pipeline of expertise and innovation opportunities. Since 2008, Bombardier has collaborated with 37 educational institutions in Canada to carry out innovation projects. The following are some examples of such collaboration:

- **Cyber Security for Aviation:** Aims at addressing security for existing and future aircraft, notably by using artificial intelligence technologies, this CRIAQ project is performed in collaboration with Polytechnique Montréal and included 12 Masters' students and four PhD students. It provides an opportunity to develop embedded security learning systems into the aircraft architecture, allowing for reduced crew through autonomous aircraft operation.
- **Pilot AI:** Bombardier collaborates with Université de Montréal and two industrial partners in a CRIAQ project to develop AI based models for pilots to support control laws development and human factor assessments. The project involves seven students in computer science and artificial intelligence.

- **Industrial Research Chair in Advanced Interiors and Systems:** A five year research chair led by Ryerson University, supported by Bombardier and the NSERC. Through this chair Bombardier is developing novel technologies for advanced interiors.
- **Wing Multi Disciplinary Optimization project:** This five year research project focuses on optimization of more flexible wings. It started in 2016 and has been supported by Bombardier and NSERC.

A national network of research collaboration



Bombardier strengthens Quebec's aerospace sector and international relationships



Bombardier's overall activities have enhanced Quebec's competitiveness within the global aerospace sector. Canada's aerospace sector is concentrated in Quebec, and since 2017 has consistently ranked as the second or third most attractive aerospace jurisdiction according to the PwC Global Aerospace Manufacturing Attractiveness Rankings¹³. The following describes key areas in which Bombardier has contributed to Quebec's current position in the aerospace sector and to society's well-being at large.



Activities that support a network of local suppliers

The strength of the Quebec aerospace industry is based on the presence of several prime contractors and world-class OEMs, like Bombardier. Through its operations, Bombardier supports an extensive network of suppliers and subcontractors specializing in a multitude of fields, including parts manufacturers and suppliers of high-performance alloys. The nature and scope of Bombardier's supply requirements, along with its reputation and influence, often serve as a stepping stone for the fast development and growth of these firms.

Bombardier's operations also require professional services including accounting, legal, IT, building maintenance, transport, catering, hotels, etc.

In 2021, Bombardier spent \$1.9B on goods and services provided by Canadian suppliers. In total, Bombardier has dealt with over 700 suppliers that provided goods and services, of which 400 were located in Quebec*.



A strong presence in Ontario and internationally

In 2021, Bombardier supported 1,675 full-time jobs in Ontario. In addition, Bombardier purchased \$ 874.3M of goods and services from Ontario-based suppliers and has dealt with 241 suppliers in the province*. In 2023, the new Bombardier site near Toronto Pearson Airport where final assembly operations of Global series green aircraft will be set to commence. The site features enhanced environmental benefits such as lower energy consumption and GHG emissions, and employment should reach 1,800 FTE over the period in Ontario.

Through the Canada-United States-Mexico Agreement (CUSMA), Bombardier benefits from and helps strengthen relations between these countries. CUSMA facilitates the distribution of value-added activities within the aircraft supply chain and fosters a collaborative environment in North America:

- Manufacturing and services activities at Bombardier's sites in the United States and Mexico supported 3,657 direct full-time jobs in 2021;
- Bombardier's Canadian operations use many suppliers in the US and Mexico, accounting for ~US\$2.2B of Bombardier's Canadian spend in 2021; and
- Overall, with its manufacturing activities and various service centers, Bombardier supports approximately 4,540 jobs outside of Canada.



*This number refers to suppliers with whom Bombardier transacts \$50,000 or more.

Bombardier is committed to achieving important ESG milestones



Significant commitments to achieving ESG objectives

In October 2021, Bombardier published its first integrated ESG report, in which Bombardier reaffirmed its commitment to sustainable development and presented its action plan:

- 25% reduction in greenhouse gas emissions by 2025 relative to 2019;
- 30% reduction in lost-time due to disruptions by 2025 relative to 2020;
- Over 30% women in management by 2025;
- Employee engagement score of at least 75% by 2025;
- Over 50% of R&D investments towards greener aircraft; and
- Maximize use of sustainable aviation fuel (SAF) in flight operations.

In addition, to align with its commitment for transparency, in 2020 Bombardier published the world's first environment program declaration (EPD)-certified aircraft for its Global 7500, a first in the business jet sector. An EPD is a public document that details a product's environmental impact within each stage of its production cycle and lifecycle.



Strong commitment to local communities worldwide

Bombardier aims to be a vector of positive change by supporting the local communities in which it operates through donations, sponsorships and memberships. Between 2016 and 2021, Bombardier invested \$14.1M in local communities worldwide. Bombardier supports local initiatives that promote:

- education and entrepreneurship in the science, technology, engineering and mathematics sectors;
- sustainability and environment; and
- socioeconomic development.

In addition, the J. Armand Bombardier Foundation, one of the largest private foundations in Québec, invested \$24.4M between 2016 and 2021 in local initiatives related to education, health, art and culture. The objectives of the Foundation are to contribute to the development of communities in Canada and to support organizations that promote the development of capacities and human dignity. The Foundation also operates the Musée de l'Ingéniosité and the Yvonne Bombardier Cultural Centre based in Valcourt, the birthplace of J. Armand Bombardier. The museum promotes Quebec's industrial heritage, in addition to its educational component.

Together, Bombardier and the J. Armand Bombardier Foundation invested over \$38.5M in their communities between 2016 and 2021.

Appendix A: Data sources and approach

Data sources

Data on operations and R&D spending for 2021 and their respective projections was provided by Bombardier. PwC allocated the spending to industry categories based on descriptions provided by Bombardier.

Input output analysis

To estimate the economic footprint of Bombardier's activities, we have applied Statistics Canada's input-output multipliers to data provided by Bombardier.

The fundamental philosophy behind economic impact analysis is that spending on goods and services has attendant impacts throughout the economy. For instance, Bombardier's manufacturing activities will generate demand for the inputs to this process, (such as tools and labour) that in turn generates additional demand that extends beyond the initial spending. Our analysis permits the estimation of this cascading effect by using the input-output model of the Canadian economy.

The input-output model used for the purpose of this report estimates the relationship between economic activity for a given good or service and the resulting impacts throughout the economy (including demand for other goods and services and tax revenues). For the purpose of this report, economic impacts were estimated for the following measures of economic activity:

- **GDP (also known as value-added)** – the value added to the economy, or the output valued at basic prices less intermediate consumption¹⁷ valued at purchasers' prices. GDP includes only final goods in order to avoid the double-counting of products sold during a certain accounting period.
- **Employment** – the number of jobs created or supported.
- **Labour income** – the amount earned by the employment expected to be generated (including social benefits such as employer contributions towards pensions and employment insurance).
- **Payroll tax revenue** – the amount of revenue collected by provincial and federal governments for personal income taxes.

Economic impacts are typically estimated at the direct, indirect, and induced levels:

- Direct impacts are those that result directly from the company's expenditures on labour and capital, as well as gross operating profits;
- Indirect impacts arise from the activities of the firms providing inputs to the company's suppliers (in other words, the suppliers of its suppliers);
- Induced impacts are the result of consumer spending by employees of the businesses stimulated by direct and indirect expenditures.

In applying the input-output analysis, we made the following key assumptions:

- Spending breakdown associated with Bombardier's manufacturing and R&D activities is similar to that in the industry as a whole (Aerospace Product and Parts Manufacturing and Scientific Research and Development Services).

Appendix B: Limitations

Limitations

Data limitations and verification: PwC has relied on the information provided by Bombardier regarding the allocations of operating and R&D expenses in Canada. PwC has relied upon the completeness, accuracy, and fair presentation of all information and data obtained from Bombardier and the various sources set out in our report, which were not audited or otherwise verified. The findings in this report are conditional upon such completeness, accuracy, and fair presentation, which have not been verified independently by PwC. Accordingly, we provide no opinion, attestation, or other form of assurance with respect to the results of this study.

Where the information or data provided is not sufficient to conduct the analysis that has been requested, we have made assumptions, as noted throughout the report.

In addition, PwC has relied on Bombardier for information about its environmental commitments, technological development, and technical abilities. PwC has not verified this information.

On March 4th 2022, Bombardier announced it has suspended all activities with Russian clients, including all forms of technical assistance. PwC has not assessed the impact of this announcement on the forecasted activities of Bombardier.

Technology assessment: We are not technical experts and are not in a position to assess the technical aspects of Bombardier activities. Thus, any statement in this report regarding the technical aspects reflects our understanding based on discussions with Bombardier.

Receipt of new data or facts: PwC reserves the right at its discretion to withdraw or revise this report, should we receive additional data or be made aware of facts existing at the date of the report that were not known to us when we prepared this report. The findings are as of February 2022, and PwC is under no obligation to advise any person of any change or matter brought to its attention after such date, which would affect our findings.

Input-output analysis: Input-output analysis does not address whether the inputs have been used in the most productive manner or whether the use of these inputs in this industry promotes economic growth more than their use in another industry or economic activity. Nor does input-output analysis evaluate whether these inputs might be employed elsewhere in the economy if they were not employed in this industry at the time of the analysis. Input-output analysis calculates the direct, indirect, and induced economic impacts that can reasonably be expected to affect the economy based on historical relationships within the economy. This analysis does not take into account fundamental shifts in the relationships within the economy that may have taken place since the last estimation of multipliers by Statistics Canada in 2018, nor shifts that may take place in the future.

Use limitations: This report has been prepared solely for the use and benefit of, and pursuant to a client relationship exclusively with, Bombardier. We understand that Bombardier may share our report with third parties. This report can be released to third parties and/or the public only in its entirety. Any commentary or interpretation in relation to this report either requires PwC's written consent or has to be clearly identified as the interpretation of Bombardier or third parties. Alternatively, these parties are required to add a link to the full deliverable. PwC accepts no duty of care, obligation, or liability, if any, suffered by Bombardier or any third party as a result of an interpretation made by those parties of this report.

Further, no other person or entity shall place any reliance upon the accuracy or completeness of the statements made herein. In no event shall PwC have any liability for damages, costs or losses suffered by reason of any reliance upon the contents of this report by any person other than Bombardier.

This report and related analysis must be considered as a whole: Selecting only portions of the analysis or the factors considered by us, without considering all factors and analysis together, could create a misleading view of our findings. The preparation of our analysis is a complex process and is not necessarily susceptible to partial analysis or summary description. Any attempt to do so could lead to undue emphasis on any particular factor or analysis.

We note that significant deviations from the above-listed major assumptions may result in a significant change to our analysis.

Endnotes

1. All monetary values are presented in Canadian dollars, unless otherwise stated.
2. IbisWorld, 2021. Considering Aircraft, Engine & Parts Manufacturing in Canada. Other major players include Raytheon Technologies Corporation (19.7% market share), Textron Inc. (9.3% market share), The Boeing Company (8.2% market share). The Aircraft, Engine and Parts Manufacturing industry in Canada is characterized by numerous small manufacturers and engineering companies that satisfy local and niche demand for engine components and other supply chain essentials. Ultimately, only the larger companies, such as Bombardier, Raytheon, Textron and Boeing, have the resources and production capacity to handle assembly and more intricate manufacturing processes to produce full aircraft and rotorcraft. With more than 500 industry establishments in 2021, there are still many niche producers across the country.
3. These efforts were previously captured in the corporation's Activity and Corporate Social Responsibility reports.
4. Forbes, 2021. Record Demand For Private Jets Continues As 2021 Winds Down.
5. WingX, 2022. Business Aviation Bulletin.
6. Bombardier, 2021 Financial Statements.
7. Based on the total job numbers in the aerospace sector provided by Statistique Canada.
8. Industry Canada.
9. Institut de la Statistique du Québec, État du marché du travail, 2021. Based on an average hourly wage in 2021 of \$28.8, considering a work week of 37.5 hours and 49 weeks of work per year.
10. Corporate income taxes were not examined in this study.
11. Direct impacts result from business expenditure on suppliers and employees. Indirect (Canadian suppliers) impacts arise from the activities of businesses providing inputs to Bombardier suppliers (in other words, its suppliers' suppliers). Induced (consumer spending by employees) impacts result from consumer spending by employees of the businesses stimulated by the direct and indirect expenditures. Total economic impacts are equal to the sum of direct, indirect, and induced economic impacts.
12. One "job-year" is defined as a year of full-time employment for one worker.
13. PwC, 2021 Aerospace manufacturing attractiveness rankings.