



Downsview Aerospace Innovation and Research (DAIR)

## Leveraging the Power of Collaboration

A written Submission to the House of Commons Standing Committee on Industry,  
Science and Technology (INDU)  
in the context of its Study on the Development and Support of the Aerospace Industry

April 2021

## Acknowledgements

DAIR is grateful to the INDU Committee members for choosing to dedicate their valuable time and energy to this study of the future of the Canadian aerospace sector. Our industry is at a critical juncture and the conclusion of your study, along with Government policy decisions, has the power to positively impact its future.

## Introduction

Aerospace is an incredibly important sector for Canada and Ontario. The industry is export-focused, research & development (R&D) intensive and contributes very high-quality jobs to the economy.

Pre-pandemic, the aerospace industry was responsible for over 213,000 jobs in the Canadian economy, generated over \$31 billion in revenues annually, and provided over \$25 billion to its gross domestic product (GDP).<sup>1</sup> Aerospace is also consistently the top-ranked R&D industry in Canadian manufacturing and, notably, 93% of Canadian aerospace manufacturing firms are exporters, which is 44% higher than the manufacturing average.<sup>2</sup>

Ontario is home to a substantial aerospace cluster that accounts for more than \$6.4 billion of the province's annual GDP, and \$500 million of the \$1.4 billion Canada spends annually in R&D is spent in Ontario. Finally, Ontario is home to more than 200 aerospace firms responsible for over 44,000 direct and indirect jobs.<sup>3</sup> These are assets worth protecting.

While the aerospace industry is a fundamental driver of our workforce and economy, it is also one of the hardest-hit sectors in Canada as a result of the COVID-19 pandemic. Indeed, aerospace companies of all sizes have collectively experienced a 40% loss of revenue, and over 50% of them have had to lay off employees.<sup>4, 5</sup>

## Promoting Canada's Innovation Potential

Our Canadian aerospace industry is at a critical juncture. With the sector facing severe financial challenges, a worrying decrease in essential research and technology spending is occurring. This grim reality poses a significant risk for the promising work pursued by Canadian industry and academic leaders, in their efforts to innovate and transform the sector, simultaneously creating more jobs and wealth for Canadians.

When it comes to securing our industry's future, DAIR wholeheartedly supports adopting a top-down approach that includes providing financial assistance to commercial airlines. Some of this support will indeed flow to Original Equipment Manufacturers (OEMs) and eventually down the entire supply chain, including reaching companies focused on aircraft maintenance and overhaul. But make no mistake, this is only a small part of the solution.

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<sup>1</sup> Government of Canada, "State of Canada's Aerospace Industry 2019 Report." [https://www.ic.gc.ca/eic/site/ad-ad.nsf/eng/h\\_ad03964.html](https://www.ic.gc.ca/eic/site/ad-ad.nsf/eng/h_ad03964.html)

<sup>2</sup> Government of Canada, "Aerospace and Defence in Canada". <https://www.ic.gc.ca/eic/site/ad-ad.nsf/eng/ad03909.html>

<sup>3</sup> Ontario Aerospace Council, "Aerospace Quick Facts". <https://theoac.ca/page/AerospaceQuickFacts>

<sup>4</sup> Industry Council Report to the Government of Canada: Restart, Recover and Reimagine Prosperity for All Canadians: An Ambitious Growth Plan for Building a Digital, Sustainable and Innovative Economy". [https://www.ic.gc.ca/eic/site/062.nsf/vwapi/00118a\\_en.pdf/\\$file/00118a\\_en.pdf](https://www.ic.gc.ca/eic/site/062.nsf/vwapi/00118a_en.pdf/$file/00118a_en.pdf)

<sup>5</sup> <https://www.cbc.ca/news/politics/aviation-sector-aid-transportation-committee-1.5892699>

A critical requisite for developing and supporting Canada's aerospace industry is to establish a bottom-up aerospace framework to protect the country's highly skilled aerospace talent and cultivate the R&D, innovation and collaboration necessary to spur novel and sustainable technologies in areas such as green tech and advanced manufacturing. We urge the Government of Canada to act now to prioritize and invest in accelerating aerospace R&D and to focus on developing a thriving aerospace innovation ecosystem for the future.

Prior to the devastating impacts of COVID-19 on the industry, the Canadian aerospace sector had already fallen from fifth to seventh place amongst world leaders.<sup>6</sup> In fact, Canada has already begun to lose its highly skilled workforce and home-grown expertise in aerospace to other countries that are heavily investing in expanding research and innovation in the sector.<sup>7</sup>

The French government, for example, has provided over €15B in financial support for the aerospace industry, which includes conditions requiring reductions in carbon emissions for the industry by 2030, and future-oriented funding earmarked for greening aerospace.<sup>8,9</sup> Through forward thinking measures such as these, governments around the world are looking to seize the opportunity to invest in R&D and position themselves for the competitive global aerospace landscape of the future. They are rapidly eroding Canada's market share through their innovative investments.

Strengthening investments to facilitate Canadian aerospace R&D now through similar efforts would not only offer long-term benefits; it would also provide the ability to pivot out of the COVID pandemic to emerge as a stronger and more resilient aerospace sector. Without immediate action, Canada will miss a crucial window to secure its global aerospace leadership. It will fall further behind nations that support their domestic industries and have devastating effects on Canada's innovation potential.

**Recommendation:** DAIR recommends that the Government of Canada make immediate investments to foster collaborative aerospace R&D, to future-proof Canada's aerospace R&D advantage and accelerate innovations in key areas of growth for the industry, including the development of clean and sustainable technologies.

## Leveraging the Power of Collaboration

Supporting dynamic and collaborative aerospace innovation ecosystems, such as the one being developed at DAIR, is valuable to all stakeholders. For example, in 2020 DAIR was able to rapidly respond to support COVID-19 research by working on a project to study how to reduce passenger exposure to the virus inside commercial aircraft. By leveraging access to an extensive expertise pool as well as established relationships with industry and academia, DAIR was able to accelerate funding applications and reduce wait times to initiate and advance this key research.

Collaborations such as these also help SMEs to grow by mobilizing their talent and expertise through facilitating knowledge transfer between smaller enterprises and the larger stakeholders, such as Tier 1 and Original Equipment Manufacturers (OEMs). SMEs have a depth of untapped knowledge in key disruptive technologies such as electric vertical takeoff and landing (eVTOL), hybrid-electric propulsion, additive manufacturing, and Unmanned Aerial Vehicles (UAVs) to name

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<sup>6</sup> Jean Charest, The Hill Times: "We're on the brink of losing Canada's aerospace industry". <https://www.hilltimes.com/2020/06/29/254430/254430>

<sup>7</sup> Chris Thatcher, Skies Magazine: "Canadian aerospace facing 'pivotal moment'". <https://skiesmag.com/news/canada-needs-more-to-stay-at-the-forefront-of-aerospace/>

<sup>8</sup> Reuters Staff, Reuters: "France unveils 15 bln euros support plan for aerospace industry". <https://www.reuters.com/article/health-coronavirus-france-aerospace-idUSP6N2D200L>

<sup>9</sup> Reuters Staff, Reuters: "Air France must cut emissions, domestic flights for aid: minister". <https://www.reuters.com/article/us-health-coronavirus-france-economy-idUSKBN22B2EL>

just a few. Support would allow us to focus our energy on these novel technologies, thereby doing justice to what has the potential to become another outstanding Canadian innovation in this important sector of our economy.

There is, in addition, promising opportunities to leverage the similarities the Canadian aerospace sector has with other industries, such as the automotive industry, when it comes to Artificial Intelligence, machine learning, the Internet of Things, advanced manufacturing, and big data. Greater incentive must be created to encourage industries to work together in these challenges, rather than alone and in silos. A common innovation space such as the one DAIR is enabling will benefit these sectors to do so. Exploited wisely, this cross-sector collaboration can bear tangible results for the aviation and aerospace industries alike, from airliners to OEMs, to SMEs across Canada.

## Cultivating a Highly Skilled Workforce in Aerospace

While the focus of our submission is on R&D, it is important to note that DAIR and its partners also see both a short and long-term need for the government, industry, and academic institutions across the country to work together to cultivate our highly skilled workforce. The government has an opportunity to collaborate with organizations such as DAIR to engage Canadian students in this important part of our economy and begin to cultivate the next generation of aerospace champions. Promoting science and technology will also help facilitate a wider exposure to STEM opportunities in aerospace and nurture a valuable culture of innovation. This will facilitate key populations, including marginalized communities, to gain exposure to an industry that offers rewarding and high-quality and income careers.

## Conclusion

To future-proof Canada's aerospace advantage, DAIR recommends the federal government take immediate measures to invest in, and accelerate, R&D and innovation in the industry, specifically through focusing on establishing a powerful, dynamic, collaborative aerospace innovation ecosystem. This is essential to protecting and securing our position as a global aerospace leader.

## About DAIR

Downsview Aerospace Innovation & Research (DAIR) is a not-for-profit whose mission is to revolutionize the collaboration environment by catalyzing innovation in aerospace and beyond.

We support our members by:

- Offering access to state-of-the-art equipment and infrastructure to accelerate leading-edge and sustainable research and technology adoption.
- Creating training solutions for the business and technology challenges of today and tomorrow.
- Providing a platform for industry, academia, and government synergies, to foster and advance R&D partnerships.
- Harnessing our collective voice to advocate for the aerospace industry locally, nationally, and globally.

To learn more, please visit: [www.dairhub.com](http://www.dairhub.com).