

Aerospace Review
Mandated by the Government of Canada

Volume 1 – Executive Summary

Beyond the Horizon:
**Canada's Interests
and Future
in AEROSPACE**

November 2012

www.aerospacereview.ca



The Honourable Christian Paradis
Minister of Industry

Dear Minister,

I am pleased to submit *Beyond the Horizon: Canada's Interests and Future in Aerospace*, volume 1 of my report pursuant to the mandate given to me as Head of the Review of Aerospace and Space Programs and Policies. Volume 2, entitled *Reaching Higher: Canada's Interests and Future in Space*, focuses on the space sector.

The over-arching objective of this volume is to outline how public policies and programs can help Canada maintain and build upon its status as a global aerospace power. Relative to gross domestic product, our aerospace industry is the second largest in the world. But conditions are changing, new aerospace players are on the rise, and we will have to up our game if we want to keep our competitive edge in the global aerospace business.

I have aimed to produce a report that is evidence-based, grounded in a long-term perspective on global and industry trends, innovative, and practical. The report summarizes the Review's findings and sets out suggested policy directions. Many of the details underlying its analysis and recommendations can be found in working group reports, research reports, and submissions posted on the Review's website: aerospacereview.ca.

It has been an honour to serve as Review Head. I hope the advice contained in these volumes will prove helpful to the government, and thank you for the opportunity to lead the Review.

Yours sincerely,

A handwritten signature in blue ink that reads "David Emerson". The signature is fluid and cursive, with a long horizontal flourish at the end.

David Emerson

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Executive summary

Canada is among the leading aerospace nations in the world. Its aerospace industry is the fifth largest, and the second largest relative to the size of the economy.

The industry generates \$22 billion in annual revenues, employs a workforce of 66,000, exports 80 per cent of its output, and is the second most research-intensive industry in Canada. It includes the world's third largest commercial aircraft manufacturer, Bombardier, and a wide range of global leaders in everything from helicopters to landing gear, simulators to engines, and aerostructures to maintenance and repair services. It is a strategic sector in every sense of the term.

Yesterday's achievements, however, are no guarantee of tomorrow's success. The conditions that prevailed over the last several decades are being replaced by new and fundamentally different global trends that are dramatically changing the competitive landscape.

The aerospace business is being reshaped by ascendant powers ready to use the resources and influence of the state to build national aerospace industries. These countries' actions create a whole new set of challenges for Canada's aerospace firms.

At the same time, the aerospace supply chain has globalized, as manufacturers such as Boeing, Airbus, and Lockheed Martin shop the world for systems and components reduce the number of suppliers with which they are prepared to deal, and require these suppliers to invest in the research and design of systems that meet their performance specifications. A new aircraft takes years to develop and bring to market and it can remain in service for decades. A company that is frozen out of a supply chain today can lose sales and opportunities for decades.

Defence expenditures among Canada's closest allies are shrinking, and with them markets for Canadian military aerospace products. Civil and military maintenance, repair, and overhaul (MRO) activities – which have fuelled a robust aerospace MRO sub-sector in Canada – are increasingly being retained by manufacturers in pursuit of superior profit margins in “after sales service.” Meanwhile, the highly skilled workforce that has been the backbone of Canadian aerospace is aging, raising the spectre of critical skills shortages.

Of course, fundamental shifts also create new opportunities. The market for fuel-efficient aircraft that address environmental and commercial concerns is strong. As the North opens to more transportation and resource extraction, there is a need for aircraft that can fly long distances in harsh and frigid conditions to help locate and develop natural resources, support environmental stewardship, supply communities and facilities far removed from southern population centres, and respond to emergencies. And as security concerns shift to non-conventional threats, there is demand for airborne technology that can provide ever more sophisticated surveillance and the capability to strike with surgical precision.

The Canadian aerospace sector is therefore at a critical juncture, the urgency of which occasioned this Review of aerospace-related policies and programs. If the sector is to continue to thrive and to benefit the country as a whole, all players – companies, academic and research institutions, unions, and governments – must understand and adapt to changing realities. Success depends on developing the technologies of tomorrow and securing sales in a highly competitive global arena.

Private aerospace companies will ultimately drive competitive leadership in the new global economy. But thoughtful, focused, and well-implemented public policies and programs can play a critical role in facilitating this success, by encouraging aerospace innovations involving enormous financial risk and long timelines; improving industry's access to global markets and supply chains; leveraging government procurements to support industrial development; and helping to build a skilled, adaptable workforce.

This volume recommends that:

1. The list of strategic sectors under the government's Science and Technology Strategy be expanded to include aerospace and space.
2. The government establish a list of priority technologies to guide aerospace-related policies and programs.
3. The government create a program to support large-scale aerospace technology demonstration.
4. The government maintain Strategic Aerospace and Defence Initiative (SADI) funding at current levels – less reallocations recommended in this volume – and modify SADI's terms and conditions to make it a more effective program for stimulating the development of the aerospace and space technologies of the future.
5. The government co-fund a Canada-wide initiative to facilitate communication and collaboration among aerospace companies, researchers, and academics.
6. Application and reporting procedures for programs used by the aerospace industry be simplified and streamlined, especially for smaller companies seeking modest levels of support, and a “one-stop” internet portal be used to provide information on, and links to, those programs.
7. The government endeavour to bring emerging aerospace players into multilateral agreements that create fair, competitive conditions for Canadian aerospace firms, and to clarify rules related to government support for domestic aerospace industries.
8. The government negotiate bilateral agreements with countries where potential market and partnership opportunities are likely to benefit Canada, and the Canadian aerospace and space sectors.
9. Senior-level economic diplomacy be used in a considered and explicit way to encourage foreign governments and companies to give favourable consideration to Canadian aerospace products.
10. The government review export and domestic control regimes to ensure that they are not unnecessarily restrictive and that export permits be issued expeditiously.
11. The government implement a full cost-recovery model for aircraft safety certification.
12. The government co-fund initiatives aimed at strengthening the Canadian aerospace supply chain.
13. When the government seeks to purchase aircraft and aerospace-related equipment, each bidder be required to provide a detailed industrial and technological benefits plan as an integral part of its proposal, and these plans be given weight in the selection of the successful bid.
14. When the government seeks to buy aircraft and aerospace-related equipment, each bidder be required to partner with a Canadian firm for in-service support and to provide that firm with work and data that allow it to strengthen internal capacity and access global markets.

15. Federal programs be used – in collaboration with industry, academia, unions, and provinces – to promote science, technology, engineering, and mathematics studies generally, and aerospace and space careers specifically, among youth; to help college and university students acquire relevant expertise; to bridge new graduates into the aerospace and space workforces; and to bring skilled aerospace and space workers from abroad when efforts to develop labour supply in Canada do not keep up with demand.
16. Mechanisms be developed to support the efforts of aerospace companies to keep their workforces technologically adept and adaptable through continual up-skilling.
17. The government co-fund – with industry, provinces, and academic and research institutions – the purchase and maintenance of up-to-date infrastructure required for aerospace training and research purposes.

These recommendations are practical, fiscally neutral, and fall squarely within the responsibilities of government in a free market economy. They do not substitute the government's judgment for that of the private marketplace, nor the public's money for that of private investors. But they do improve clarity of purpose, remove impediments to performance, and encourage collaboration and partnership. If implemented, they will create conditions for the aerospace sector's success, reducing areas of vulnerability and allowing Canadian companies to take better advantage of opportunities in the global marketplace.

In an international economic environment where change has been breathtakingly rapid, the greatest risks are posed by complacency, and failure to adapt. Inertia would place in jeopardy one of the country's most important industrial sectors and along with it, the critical economic, technological, and security benefits that flow from a healthy and competitive aerospace sector.

Conclusion

Global trends in the first 12 years of the 21st century have had a major impact on Canada. Thanks in part to the country's rich endowment of natural resources, that impact has been largely favourable. But Canadian prosperity and stability are also the result of the creative energies of a skilled and educated population working in a range of advanced industries that are powered by innovation, audacity, and hard work. Prominent among these is the aerospace sector. Maintaining a healthy balance between resource extraction and advanced industries will be critical to economic growth and prosperity in the decades ahead.

This review has been occasioned by the recognition that conditions affecting the vitality and competitiveness of the Canadian aerospace sector have changed in fundamental ways, some threatening, some promising. The international environment is increasingly competitive, with new companies hosted by ambitious governments positioning to challenge incumbents, even as demand rises and a growing premium is placed on fuel efficiency and environmental stewardship.

At the same time, technological and economic transformations, the opening of the North, and the need to protect sovereignty and security in the face of new challenges provide opportunities for the aerospace sector to expand its business while contributing to the realization of Canada's national potential.

The Review has produced recommendations for responding to these realities in practical, meaningful ways, from better-targeted support for R&D, to stronger international agreements and economic diplomacy, to more astute procurement processes, to support for developing and maintaining a highly skilled workforce.

These recommendations are eminently realizable, if government acts on them – and if companies, research and academic institutions, and unions make the necessary investments, demonstrate entrepreneurial spirit, and collaborate effectively – the Canadian aerospace sector will flourish and perform to its full potential through the middle of the century.

We live in an age of short attention spans and immediate gratification. But a sector that requires a decade or more to design and build a new product is, of necessity, oriented towards the future. Success requires all partners not only to think about current conditions, but also to have the foresight to anticipate and react to what lies beyond the horizon.