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Hon. David Emerson, P.C., O.B.C.  
Chair, Aerospace Review  
235 Queen Street  
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Ottawa, ON  
K1A 0H5

Dear Mr. Emerson:

At the outset, I would like to thank you for taking the time to meet with COM DEV and for providing us with this opportunity to provide you with our views on the future of Canada's space industry.

The attached discussion paper offers a "Guiding Framework for Canadian Investments in Space." It reflects our views on immediate actions the government can take to improve the efficiency and effectiveness of its investments in Canada's Space Program and how it can make relatively modest policy changes that have significant potential to enhance competitiveness in the space sector. Our framework includes: a focus on affordable access to space and industry partnership; competition and international collaboration to contain costs; and investment in technology and innovation to leverage long-term sustainable growth and wealth creation.

We also call for a reinvigorated Canadian Space Agency that takes on a more aggressive role as a catalyst for industry-led solutions. Canada is at a crossroads with its Space Program. In due course, it will be of significant benefit to both government and industry for Canada to have a longer-term strategic plan. However, in the near-term, we are confident that even in these times of restraint, Canada can still meet all of its national space requirements, stimulate innovation and technology excellence through a more rigorous approach to decision-making. We hope that our suggestions are useful.

Once again, we appreciate your invitation to provide you with our thoughts directly. We would welcome any further engagement that you may see as being helpful. We wish you every success in your efforts to create the climate within government that will improve and enhance the competitiveness of the space sector. Without being too dramatic, our very future depends on it.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Michael Pley'.

Michael Pley, P.Eng., C.Dir.  
Chief Executive Officer  
COM DEV International Ltd

## **Executive Summary**

### **Aerospace Review: COM DEV's Recommendation for a**

### **Guiding Framework for Canadian Investments in Space**

In times of fiscal austerity, it is now more necessary than ever to ensure that national space investments are balanced, targeted and focussed to maximize political, social and long-term economic benefits. We view the future competitiveness of Canada's space sector hinging upon a guiding framework for Canadian investments in space:

- Affordable access to space and industry partnership.
- Competition and international collaboration to contain costs.
- Investment in technology and innovation leveraging long term sustainable growth and wealth creation.
- A national space agency that acts as a catalyst for industry solutions.

Proposed government tools to enhance industry competitiveness and to maximize the benefits to Canadians for the money being spent include:

- Innovation as an engine for long term sustainable growth.
- Cost versus Specification – industry, agency and user collaboration.
- Industrial and Regional Benefits.
- Export Control Liberalization.

### **Conclusions and Recommendations**

A new guiding framework for affordable Canadian investments in space should include:

- Proactive consideration of alternative approaches to spread program risk by embarking on a portfolio of "small" space programs.
- Industry, agency, user partnerships to ensure specifications are optimised to satisfy national needs within budget to enhance technology development opportunities.
- Competition and international collaboration to contain costs.
- The Canadian Space Agency needs to be re-assessed to enhance its role as a catalyst for industry solutions and technology excellence.

Central to, and we believe missing from Canada's space program, is a concerted and focused technology development strategy that leverages future space investment to reward commercial success, export performance and best-in-class technology. We are convinced that the steps outlined above will create positive, long-term benefits for the Canadian space industry, make the space sector more internationally competitive and fully able of sustain long term growth and technology excellence.

## Aerospace Review: COM DEV's Recommendations for a Guiding Framework for Canadian Investments in Space

Canada has a proud history as a space nation. Canada has concentrated its space investments on achieving key national objectives and has had many firsts in space: in telecommunications, earth observation, resource management, space science and, of course, with our involvement with collaborative international space missions. This unique space heritage is now being challenged by new trends and opportunities in the rapidly changing global space industry. Moreover, in times of fiscal austerity, it is now more necessary than ever to ensure that national space investments are balanced, targeted and focussed to maximize political, social and long-term economic benefits.

Space is an instrument of national sovereignty and security, an engine for innovation and for international collaboration. Space is a critical component in securing and opening up Canada's North, and providing access and communications to all Canadians across our broad territories regardless of where they live. Above all, space is an important instrument for economic growth and wealth creation driven by a key component of Canada's high technology sector.

We view the future competitiveness of Canada's space sector hinging upon a guiding framework for Canadian investments in space:

- Affordable access to space and industry partnership
- Competition and international collaboration to contain costs
- Investment in technology and innovation leveraging long term sustainable growth and wealth creation
- A national space agency that acts as a catalyst for industry

### **Affordable Access to Space**

In the past, Canada has been quite successful in leveraging modest but genuine technology excellence into a global space presence. Where investments are too risky and costly for the private sector alone to finance, we must be able to demonstrate the payoff to the taxpayer in jobs and economic growth resulting from public investment. In this case, the key challenge for policy-makers is to determine how to maintain budgetary control over programs that, by their very nature, push the technology envelope and thereby assume risk that, if not constrained, can lead to unplanned and politically damaging cost overruns.

The traditional large mission approach is expensive and high risk, and quite literally places all the CSA's program "eggs" in one basket. The pursuit of multiple missions based on smaller platforms provides for more missions with lower cost, a better contained risk portfolio and an improved ability to maintain continuity in niche capabilities that build on Canada's technology strengths. The current RCM program is too far advanced to be abandoned and must be seen to completion. However, in the future, a different approach is required.

Affordable access to space has been clearly demonstrated through programs involving smaller satellite platforms that are relatively cheap to build and more cost effective to launch. Increasingly, complex data and communications services requirements are being met with nimble, low cost, small and micro-satellite systems. The proliferation of small satellite solutions is evidence of this trend throughout the world, and many are real success stories, like Canada's exactEarth™ constellation. Other advantages of pursuing a greater number of smaller missions are:

- Affordability, making it possible to distribute mission activities to a larger number of Canadian stakeholders; both to industry and academia
- More spending goes to technology development that contributes to the creation of new niche capabilities for export markets
- Risk is spread over a broader portfolio

### **Competition and International Collaboration**

To maximize competitiveness in Canada's space sector, it is essential that the government ensure a competitive process for the award of future space investments. A competitive process leads to more innovative outcomes and most often a more significant role for Canadian industry, at the sub-contractor and general supplier levels. Once a prime contractor has been competitively selected for a major space investment, the *Quid Pro Quo* from the prime contractor must be a firm commitment to Canadian industry to provide real and meaningful opportunities for participation. The full scope of the Industrial and Regional Development policy should apply to all major space programs, including a firm commitment to substantial levels of Canadian Content Value (70%). In addition, the prime contractor must achieve agreed minimum levels of Regional and SME content.

Canada's space industry has a long history of international collaboration. Canada is viewed as a reliable partner for complex technology development programs, because we can be counted on to consistently deliver excellence and innovation. International collaboration creates additional opportunities for Canadian industry and allows us to do more by sharing costs with our partners. This approach builds on Canada's technology strengths and has enabled us to participate in various scientific and military missions that we otherwise could not afford.

### **Technology Development – a key to commercial success**

In Canada, government investment in new technology development has virtually ceased. This is particularly so in the case of satellite communications development, the field that represents 70 percent of Canada's total space activity. Canada must reverse its short sighted approach to its space investments or risk losing its current competitive edge. Other nations are investing heavily in technology development to pave the way for industrial recovery. Canada, on the other hand, has abandoned development programs that have traditionally yielded measurable commercial benefits and wealth creation.

COM DEV can point to numerous examples where modest investments in technology development and demonstration have led to very substantial export market products that allowed us to dominate niche technology markets with typically 50 to 80 percent global market share. This information will be provided to the Aerospace Review Secretariat, under separate cover.

Space technology development and the dynamic commercial marketplace are force multipliers with the capacity to create wealth and high-value, sustainable jobs. The commercial space market is never “mature”, as innovation continues to stimulate new services and new applications to satisfy ever increasing global demand. The landscape is highly competitive, and in Europe and the US, respective national governments continue to invest heavily in R&D to enable their domestic space industry to keep pace and prosper in international markets.

### **The Canadian Space Agency should act as a catalyst for industry solutions**

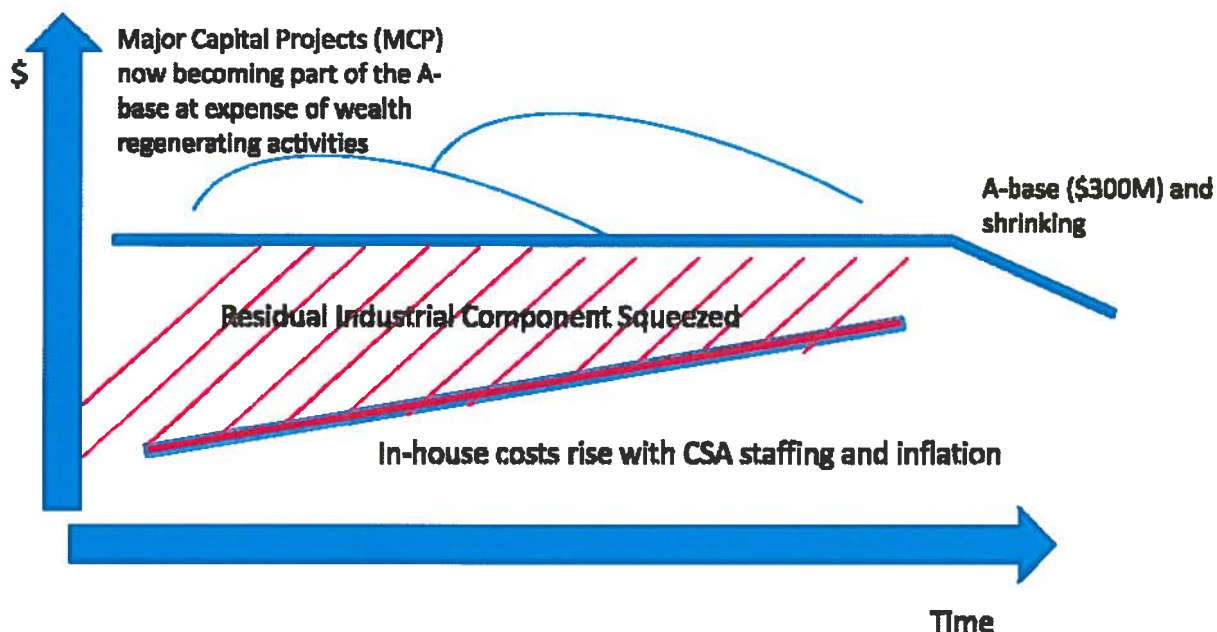
It is our strong view that the CSA should return to its core mission and mandate, i.e. Mission - “to lead the development and application of space knowledge for the benefit of Canadians and humanity”; and Mandate - “to promote the peaceful use and development of space, to advance the knowledge of space through science and to ensure that space science and technology provide social and economic benefits for Canadians.”

Today the CSA appears over-burdened with administrative, financial and bureaucratic procedures and practices. It is felt that too many resources are currently spent inside the CSA with little, if any, direct impact on Canadian competitiveness. First and foremost, government through the CSA is a strategic purchaser and user of space systems and space-sourced data: telecommunications services (secure and non-secure, military and civilian), remote sensing data (for a myriad of utilities in a range of responsibility areas), scientific research (climate change, resource monitoring) or major investments in bilateral programs, as part of international or G8 initiative (ESA or International Space Station). This should remain the CSA’s primary focus.

While program due diligence is essential, greater efficiencies would be realized through enhanced cooperation and partnership between the CSA and industry. The balance needs to be restored. An enhanced partnership model will improve the level of trust, reduce the need for CSA personnel and enhance the CSA’s working relationship with industry; while concurrently providing more resources to industry and greater capabilities to government users. The CSA should concentrate on facilitating access to international partnership opportunities and export markets, reducing barriers to trade, streamlining Canadian export approval processes and facilitating broader international relationships.

The CSA’s staff complement has grown to 750, while its A-Base funding has remained fixed for over a decade, thereby diminishing the available funding to industry and research establishments over time.

## \$ for industry reduced as CSA overhead increases



The space sector has prospered when industry is recognized as the repository of technological and scientific capability and excellence. If the scale tips too far towards government delivery of program requirements, then the competitiveness of Canada's space sector is diminished. Only the private sector can generate sustainable, long-term benefits in the market. The government should review current CSA commitments to identify opportunities to allocate resources from low return, low priority areas to high priority technology development opportunities in the private sector that will generate additional exports and contribute to economic growth. In the future, major new programs or keystone investments must be designed and implemented as smaller, lower cost, lower risk, targeted technology investments that will enhance innovation and competitiveness.

### **Government tools to enhance competitiveness:**

In all of the areas noted below, the government can make relatively modest changes to current practices – all at virtually no cost to the Crown – and have a very positive impact on future competitiveness of Canadian space sector firms.

- **Innovation as an engine for long term sustainable growth**

Canada should set an objective to double its share of the global market over the next decade by turning new Canadian space services and products into export sales. Our near-term investments should be targeted at maintaining technology leadership through the reallocation of approved funding to technology development and demonstration. Commercial and/or export market success should be the core selection criteria for future government space investments. By investing in those firms with a proven track record for commercial success, there is a higher likelihood that new technologies will meet market demand and contribute to economic growth and competitiveness.

For Canada, wherever possible, scarce space resources should be invested in those areas where successful implementation will have positive economic spin-offs in domestic or international sales. It is going to be increasingly difficult to compete with the rest of the world, with a CSA budget that is so small and shrinking. With 80% of the global market financed by government, and with no trade restrictions on government “investments” in the area, Canadian commercial space companies will struggle to successfully compete alone without our traditional government partnership.

- **Cost versus Specification – industry, agency and user collaboration**

Since budgetary discipline is essential, a rigorous analysis of the comparative costs and benefits of different program approaches is required to identify new space priorities. It often falls to the role of government to absorb the critical risks that drive forward the science and technologies that eventually establish and release significant commercial benefits. However, containing these early risks lies at the heart of cost control. Even for major programs that are designed to satisfy Canada’s sovereignty and security needs, costs can be stipulated as an early design constraint; provided that a mechanism exists for direct dialogue between industry, agency and end user, these costs can be balanced against scope and performance through the entire program implementation period, not just at the outset. The current approach to program implementation does not lend itself to cost discipline or assessments to identify system performance trade-offs to contain costs. Consequently, mission and/or capability creep are most often dealt with by accepting the expansion or addition of “bells and whistles”, allowing costs to escalate and reallocating funds from other priorities to pay for the over-run.

- **Industrial and Regional Benefits**

Each year Canada spends considerable funds buying high technology products and services abroad, including substantial expenditures to gain access to US space assets. In each major acquisition, IRBs are raised but it has been our experience that they are often not enforced in a manner that enables a crossover between Divisions of major Original Equipment Manufacturers, e.g. the Aircraft Division (who owe the IRBs) and the Space Division (which represents a real opportunity for Canada’s space sector) do not discuss IRB obligations. Consequently, there is a major lost opportunity to attract offsetting space industry benefits. A concerted effort needs to be made to assess the potential benefits of enforcing IRBs in a manner that facilitates such linkages, and that a rigorous policy of enforcement needs to be firmly applied in future.

To foster IRB performance to the benefit of Canadian industry, we recommend the following: more timely upfront consultations with Canadian industry to identify potential high value-added industrial benefits; and a higher evaluation weighting should be applied to space-related offset benefits, particularly when the IRB obligor is a large aerospace company with significant space interests.

- **Export Control Liberalization**

In the past, delays in assessing applications for export licenses has led to the loss of substantial business in China and India. The situation has recently improved; but there is room for greater clarity in terms of government policy with respect to export controls for Russia, India and China; all of which are rapidly growing export markets. We appreciate that virtually everything to do with space is considered to be “dual use,” and subject to a rigorous export licensing process. There are, however, widely available commercial satellite payload components supplied for numerous communications satellites operating in standard commercial frequency bands that should not be lumped together with critical enabling technology for strategic military purposes. By putting all space components and equipment through the same approval “pipe” creates an unnecessary bottleneck in the approval system. Canadian competitiveness could be improved significantly by introducing a more enlightened and intelligent screening process, at the front end of the approval cycle; as our European competitors have done.

### **Conclusions and Recommendations**

Space is an instrument of national sovereignty and security, an engine for innovation and for international collaboration. Space is also an inspiration for scientific, technological and academic excellence and national pride, and above all, an important instrument for industrial growth and wealth creation. By focusing on our competitive strengths and reinforcing success, Canada’s space industry can continue to prosper. In times of restraint, we must concentrate on investments that can generate real and sustained economic growth.

A new guiding framework for affordable Canadian investments in space should include:

- Proactive consideration of alternative approaches to spread program risk by embarking on a portfolio of “small” space programs
- Industry, agency, user partnerships to ensure specifications are optimised to satisfy national needs within budget and to enhance technology development opportunities
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