



Daniel S. Goldberg
President & Chief Executive Officer

September 6, 2012

The Hon. David Emerson
Review Head
Aerospace Review
235 Queen St, Room 141-F
Ottawa ON K1A 0H5

Dear Mr. Emerson:

Telesat Canada is pleased to share its views in connection with the Aerospace Review. Telesat's comments, set out below, are organized into five sections. The first section provides an overview of Telesat and describes several key aspects of the global satellite industry as well as the role of governments; the second section identifies a number of background considerations that should be taken into account when considering policy alternatives available to government; the third section contains Telesat's specific recommendations with supporting reasons; the fourth section describes a present requirement for a polar orbiting satellite constellation for the far North; and the fifth section contains Telesat's concluding comments.

1. Introduction to Telesat and the Satellite Industry

Telesat is a Canadian success story, having grown to become the fourth largest fixed-satellite service provider in the world.

Telesat is a Canadian success story. Since its inception in 1969, Telesat has brought essential and innovative satellite services to every part of Canada. Today, Telesat is a leading global fixed satellite services operator – the fourth largest in the world – and provides reliable and secure satellite-delivered communications solutions worldwide to broadcast, telecom, corporate and government customers worldwide. Headquartered in Ottawa, with offices and facilities around the world, Telesat employs approximately 500 people, more than 80% of whom are in Canada, with a large proportion working in specialized high technology positions. Privately held, Telesat's principal shareholders are Canada's Public Sector Pension Investment Board and Loral Space & Communications Inc.

In order to increase its scale and enhance its competitive position in the highly competitive global market for satellite communications services, Telesat has invested billions of dollars in its

state-of-the-art satellite fleet and ground facilities and is continuing to invest in both replacement and expansion satellites for our fleet. Telesat's revenues in 2011 were \$814 million (approximately 50% of which were derived from Canada), the aggregate value of its contracts with its customers was approximately \$5.4 billion as of June 30, 2012, and it has an asset value of roughly \$6 billion. In light of its substantial recent capital investments in additional satellite capacity and disciplined approach to developing new markets and services, Telesat anticipates that it will achieve record revenues in 2012 and then again in 2013.

The global satellite communications services industry is highly competitive and satellite operators with scale have significant competitive advantages.

Telesat's focus on increasing the size of its satellite fleet and revenue base is a reflection of the facts that (1) the international market for satellite services is highly competitive and (2) satellite operators with significant scale in their operations enjoy a marked competitive advantage over smaller operators. The satellite business is one characterized by fixed cost bases, which means that operators that achieve scale can benefit from substantial economies of scale.

Scale confers meaningful competitive advantages to the larger operators, including improved operating margins (which can lead to more pricing flexibility in the market while still maintaining appropriate rates of return on the substantial capital expenditures and other investments required in the satellite business); the ability to provide customers with in-orbit redundancy and broader geographic coverage through larger satellite fleets; greater leverage with key suppliers, which improves an operator's overall cost structure; greater capacity to invest in research and development activities; and more diversified revenue streams, leading to lower commercial risk and, therefore, lower borrowing costs. In short, the competitive advantages associated with scale in the satellite services business are enormous.

Recognizing the importance of these competitive advantages, Telesat has been making significant investments in its fleet to ensure that it has the profile to continue to compete in the international satellite services industry. As a result of these investments, today Telesat owns and operates 13 satellites, making it the fourth largest fixed satellite services operator in the world. However, although Telesat is much larger than many domestic or regional satellite operators, the two largest satellite operators in the industry – based in the United States and Europe – have roughly four times its scale when measured by the number of satellites or revenue, giving them certain key competitive advantages relative to Telesat. As a result, and notwithstanding its past successes, Telesat has a strong competitive imperative to continue to grow in order to ameliorate its subscale position.

Governments are large consumers of commercial satellite communications services and typically favour their domestic providers.

Governments historically have been a considerable source of demand for commercial satellite communications services, with the U.S. government alone representing the single largest consumer of such services. Although governments acquire satellite services from a broad range of suppliers, including Telesat, there is typically a strong preference for governments to procure services from satellite operators headquartered or otherwise with a large presence in their own jurisdictions. The rationale for this is obvious: governments seek to use their procurement activities to support their domestic operators in order to build domestic capacity and competence, support employment, and enhance the competitiveness of their domestic firms so as to facilitate the export of their services. Securing large government requirements for satellite communications services has been a key factor in the ability of many of Telesat's competitors to achieve scale in the industry.

2. Key Background Considerations for the Development of a Federal Policy Framework that Maximizes the Competitiveness of the Canadian Space Industry

As the Aerospace Review Discussion Paper and other parties participating in this review have noted, Canada has an impressive history of accomplishments in the aerospace and space industries. The Government, in the 2011 Budget, has instituted this review with a view “to develop a federal policy framework to maximize the competitiveness of this export-oriented sector and the resulting benefits to Canadians.”¹

Importantly, the Review is “aimed at producing concrete, fiscally neutral recommendations.”² In other words, a federal policy framework designed to maximize the competitiveness of the sector must be developed within the fiscally-constrained environment Canada (and virtually all other governments in the world) confront at this time. Such fiscal constraints, by necessity, place a premium on developing recommendations and approaches that are targeted, pragmatic and innovative.

Before sharing Telesat's recommendations on a new federal policy framework, it is essential that the following background considerations be taken into account:

- The market for space related goods and services is very much a global market;

¹ Budget 2011, page 86

² Aerospace Review Discussion Paper, page 2

- Given the size of the Canadian economy, Canada's investment in the space sector is dramatically lower than that of the United States, Europe, Russia, China, India and Japan, countries that (not coincidentally) have significant space industries;
- Countries that have a large space industrial base provide significant direct and indirect support to that base, giving companies headquartered or with a meaningful presence in those countries a substantial competitive advantage over companies that do not enjoy the same level of support;
- Although Canada, as a smaller economy, cannot match the magnitude of support provided by the countries noted above, Canada has certain unique attributes (*e.g.*, world's longest coastline, second largest landmass, vast Arctic territory, low population density, wealth of natural resources, highly variable environment/meteorological conditions) that require the Canadian government to make use of space-based services and goods;
- Certain countries that historically have provided significant support to their domestic space industries (*e.g.*, the United States, the United Kingdom, France, Germany, Spain, Italy) are today employing more innovative, cost effective approaches to meet their indigenous space requirements and support their domestic industry because (1) they too are fiscally constrained and (2) past space system procurements designed, in part, to support new technology development frequently have resulted in programs that were dramatically over budget, behind schedule and lacking promised functionality;
- Given that Canada is making fewer space investments than certain other countries (and, as a result, Canadian companies are placed at a competitive disadvantage in the global market), the Government of Canada must be highly targeted and strategic when it does need to procure space related services and goods with a view toward enhancing the competitiveness of the Canadian space sector while at the same time achieving a good value proposition for the Canadian taxpayer;
- Canada is home to certain companies that presently offer globally competitive services and goods in the areas of satellite communications, earth observation and space robotics; and
- As shown in Attachment 1, hereto, (1) the market for satellite communications has grown dramatically over the past ten years and accounts for the lion's share of the Canadian space industry's total revenue, whereas the markets for earth observation and robotics (as well as navigation and space science) have been stagnant over this period of time and represent a small portion of the industry's overall space revenues; and (2) the vast majority of the Canadian space industry's revenue is derived from applications and services – and principally for communications services – as opposed to the sale of manufactured goods.

3. Specific Recommendations

(a) The Government of Canada should use commercial satellite services offered by Canadian satellite services providers to the maximum practical extent to meet Canadian Government requirements and, moreover, should employ other innovative arrangements for acquiring Canadian-supplied commercial space goods and services

As noted above, the leading space faring nations provide significant support to their domestic space industry through their procurement activities. But as also noted above, they are increasingly doing so in a manner that more carefully manages the fiscal, schedule and operational risks that have plagued past space procurement activities. Specifically, governments in countries such as the United States, the United Kingdom, Spain, Italy and Australia are putting in place policies and/or pursuing procurement strategies whereby government satellite service requirements are being met by procuring services from commercial satellite service providers rather than governments acquiring and operating their own satellites. Attachment 2 to this submission contains an overview of a number of these policies and recent innovative procurement activities.

In this regard, Recommendation 1, above, is nearly identical to what is articulated in the U.S. National Space Policy promulgated by the White House in June 2010. After persistent and dramatic cost overruns and schedule delays in U.S. Government procured satellite programs – the U.S. Government Accountability Office estimates costs for major U.S. space programs increased by 321% (US\$11.6 billion) from initial estimates for fiscal years 2011- 2016³ – the U.S. has adopted a policy whereby it will “[d]evelop governmental space systems only when it is in the national interest and there is no suitable, cost-effective U.S. commercial or, as appropriate, foreign commercial service or system that is or will be available” and, moreover, will “[r]efrain from conducting United States Government space activities that preclude, discourage, or compete with U.S. commercial space activities, unless required by national security or public safety.”⁴

The U.K. government was so persuaded by the merits of procuring satellite communications services from commercial satellite service providers rather than owning the satellites themselves that they sold their Skynet military communications satellite to a subsidiary of European aerospace conglomerate EADS and then contracted to use a large portion of that and the follow-on satellites’ capabilities to meet the U.K. military’s requirements. Lewis Moonie, the U.K.’s Junior Defence Minister at the time, said:

³ US Government Accountability Office (GAO) Report on DOD Space Acquisitions, GAO-12-563T, March 21, 2012, page 6, <http://www.gao.gov/products/GAO-12-563T>

⁴ US National Space Policy, June 2010

We are getting this service for a lot less than we would have paid if the Ministry of Defence had followed a traditional procurement route and ordered the satellites itself and operated them using its own personnel. We are also getting a greatly improved service, with security and flexibility built in to cope with the growth in military satellite communications requirements we expect over the next few years. In addition, the Ministry of Defence has also managed to reduce the overall cost of Skynet 5 by around £500 million by applying fresh and innovative thinking. This project is a clear example of how we are now, using Smart Acquisition principles, getting both better military capability and better value for money.⁵

The Australian government, rather than building its own dedicated satellite to meet the regional communications requirements of its military, recently contracted with commercial satellite operator Intelsat to have a communications payload dedicated to the Australian military hosted on an Intelsat commercial satellite. Maj. Gen. Tim McOwan, the Australian Defence Force's senior attaché in the United States at the time, said the decision to pursue a hosted payload instead of procuring a dedicated satellite saved money and accelerated its availability: “If we had been forced to abide by the usual government procurement methodologies, it is highly likely we would have not met the compressed timeline which we had to meet. The cost of an additional payload on a commercial satellite is marginal compared to the total cost of ownership.”⁶

Canada also has experienced substantial cost overruns and schedule delays when procuring its own satellites. As such, Telesat urges the Government to embrace the best practices followed by many of its allies and put in place a policy framework that requires government departments to use commercial satellite services offered by Canadian satellite services providers to the maximum practical extent to meet Canadian Government requirements and, moreover, to employ other innovative arrangements (including government payloads hosted on Canadian satellite operators' satellites) when meeting Canadian Government satellite service requirements. By entering into fixed cost service arrangements with commercial service providers, the Government will shift the risks of cost overruns, schedule delay, functionality shortcomings and service failures from the Canadian taxpayer to the Canadian commercial service provider (just as our commercial customers do today). In addition, such an approach will support Canadian service providers and the domestic industrial base and mitigate, in part, the competitive disadvantage Canadian providers confront when competing against foreign service providers for the requirements of their own governments.

⁵ http://www.gov-news.org/gov/uk/news/armed_forces_get_advanced_new_satellite_system/87348.html

⁶ <http://www.space.com/15087-rocket-launch-intelsat-22-satellite.html>

(b) The Government of Canada should encourage use of Canadian commercial space services and capabilities in international cooperative arrangements and otherwise actively promote their export

Space-based networks are expensive and often have capabilities in excess of any one user's requirements. As a result, allied governments often cooperate in the deployment of these networks, sharing the costs of putting them in place and then the functionality of the networks. For example, Canada recently announced it is investing in the U.S. Wideband Global Satellite (WGS) system, an investment that will underwrite the expansion of this global satellite network and entitle Canada to a portion of the network's capacity.⁷ Australia, Denmark, Luxembourg, the Netherlands, and New Zealand also have announced they are making similar investments in WGS.

This cooperative arrangement among these countries provides not just a benefit to each of them, but also to the U.S. manufacturer of the satellites in the network, Boeing. Encouraging "the purchase and use of U.S. commercial space services and capabilities in international cooperative arrangements" is another guideline in the White House's U.S. National Space Policy.⁸ Canada should adopt such a policy as well and actively promote the purchase and use of Canadian commercial space services and capabilities in international cooperative arrangements it is leading or in which it participates.

(c) The Government of Canada should support technology development and innovation through targeted R&D grants and tax breaks and by helping to secure flight opportunities for technology demonstrations for commercially promising services and goods; the Government should support innovation through its procurement activities only when it has been demonstrated the new technology is sufficiently developed such that it represents limited technical, schedule and cost risk

Every country with a substantial space industry provides significant direct and indirect support to its domestic industry, including direct funding and tax relief to promote research and development. In light of the pace of technical progress in the space industry, firms that fail to innovate ultimately will fail. Accordingly, the Canadian government should endeavor to provide certain targeted grants and tax breaks to support research and development by Canadian firms.

⁷ <http://www.forces.gc.ca/site/mobil/news-nouvelles-eng.asp?id=4061>

⁸ "Actively promote the export of U.S. commercially developed and available space goods and services, including those developed by small- and medium-sized enterprises, for use in foreign markets, consistent with U.S. technology transfer and nonproliferation objectives". US National Space Policy, page 11, http://www.whitehouse.gov/sites/default/files/national_space_policy_6-28-10.pdf

Ideally funding would only be given to technology development that has promising commercial prospects, and the application for such funding should contain a showing in this regard. Although it may be difficult for Federal government to make judgments about what technology development projects face promising commercial prospects, governments are routinely required to make judgments about what companies or sectors are deserving of direct or indirect support. One approach could be that grant applications are reviewed by an evaluation board comprised of both public servants and private industry participants. However it is done, some assessment of commercial prospects should be undertaken before funding commitments are made.

Over the past ten years the segment of the Canadian space sector that has experienced the greatest commercial success is services and applications for satellite communications.⁹ Perversely, satellite communications has received limited funding from the Canadian Space Agency, which instead has devoted the lion's share of its technology development budget to Earth Observation, Space Science and Robotics,¹⁰ areas that actually have experienced revenue decreases over the last five years.¹¹ One could argue that the segments that are experiencing commercial success do not require government support and, instead, public funding should be devoted to segments that, because of their lack of commercial success, need assistance. In Telesat's view, such an approach is imprudent.

Funding for technology development is necessarily scarce. Accordingly, funds should be targeted to segments where there is the highest probability that the technology developed will lead to the introduction of services or goods that will enjoy commercial acceptance and success (which, in turn, will lead to the creation or maintenance of strong Canadian companies that employ high skilled workers and generate tax revenue). The probability that this will occur is highest when technology funding is targeted to companies that are developing services and goods in areas where there is long term, sustainable and growing commercial demand and the companies seeking funding have a demonstrable, world class competence in the sector. Funding unproven companies developing products or services for unproven markets is folly at the best of times and certainly a luxury Canada can ill afford in a fiscally constrained environment.

Although the Government's procurement activities can and should support innovation by Canadian companies, history shows that failure to separate technology development from the acquisition of goods or services leads to projects that are over budget, behind schedule and lacking in promised functionality. As an example, the U.S. Government Accountability Office, in addressing the causes of space acquisition problems, recommends that "DOD separate

⁹ Canadian Space Agency – State of the Canadian Space Sector 2010, page 20, http://www.asc-csa.gc.ca/pdf/space_sector_2010.pdf

¹⁰ Canadian Space Agency Report on Plans and Priorities 2012 - 13 Estimates, <http://www.asc-csa.gc.ca/eng/publications/rpp-2012.asp>

¹¹ Canadian Space Agency – State of the Canadian Space Sector 2010, page 12, http://www.asc-csa.gc.ca/pdf/space_sector_2010.pdf

technology discovery from acquisition, follow an incremental path toward meeting user needs, match resources and requirements at program start, and use quantifiable data and demonstrable knowledge to make decisions to move to next phases.”¹² This should not be a surprise: if a space related product or service is still under development, it is difficult to forecast with a high degree of accuracy its total cost, when it will be available or all of its capabilities.

As a result, the Government should support innovation through its procurement activities only when it has been demonstrated the new technology is sufficiently developed such that it represents limited technical, schedule and cost risk. Prior to such time, the Government should support technology development through targeted funding and technology demonstration opportunities (e.g., arranging in-flight demonstrations of new hardware or services to qualify the efficacy of the new product or service).

(d) When procuring space goods and services, the government should first consult closely with industry to ensure a mutual understanding of functional requirements and industrial capabilities and, moreover, should avoid procurements using detailed technical specifications

There are numerous instances of current and past space procurements that have been encumbered by detailed technical specifications and designs produced within government. Procurement requests such as these can stifle industry’s ability to propose and deliver more cost effective and innovative solutions. A detailed technical specification does not assure that user needs will be met. Indeed it can often have the opposite effect by forcing delivery of what was requested instead of what is truly required.

Government space procurements should be based on needs to be met or problems to be solved. Such an approach to government procurement has been identified by the Review of Federal Support to Research and Development which recommended that “[t]he use of procurement to foster the innovation capacity of Canadian companies requires a revised approach to value-for-money based on outcomes-oriented specifications.”¹³

Close consultation between industry and government on user requirements and industrial capabilities should occur at the outset and before the completion of any detailed technical specifications. This process will allow industry to propose, and the government to assess, alternative solutions to meet the identified user needs, which will promote innovation and reduce costs.

¹² US Government Accountability Office (GAO) Report on DOD Space Acquisitions, GAO-12-563T, March 21, 2012, page 15, <http://www.gao.gov/products/GAO-12-563T>

¹³ Innovation Canada: A Call to Action page 7-4

Canada is not alone in the need to improve government space acquisitions. It is now part of the U.S. National Space Policy that departments and agencies improve space system development and procurement through, inter alia, improved management of requirements and closer engagement with industry.¹⁴

(e) The regulatory framework applicable to Canadian satellite operators should promote the competitiveness of its domestic operators and, at a minimum, be no more burdensome than the regulatory frameworks applicable to foreign competitors

The market for the provision of commercial satellite services is fiercely competitive and Telesat competes with foreign-licensed satellite operators in Canada and in virtually every other country in the world. The satellite industry is a heavily regulated one and governments in which leading satellite operators are located have recognized the need to have regulatory frameworks and policies that promote the competitiveness of their domestic operators. The U.S. National Space Policy, for example, states that departments and agencies shall “minimize, as much as possible, the regulatory burden for commercial space activities and ensure that the regulatory environment for licensing space activities and capabilities is timely and responsive”¹⁵. Similarly, the U.K. Space Agency in its recent Civil Space Strategy stated that: “It is also important that the Agency ensures that the international regulatory environment for orbit and frequency allocations facilitate growth of U.K. markets”.¹⁶

The regulatory policies applicable to Canadian-licensed satellite carriers can and do have a direct impact on their competitiveness in both domestic and global markets. This has been clearly recognized by the Industry Department in a current Consultation document where it stated that “[if] operators choose to be licensed by other countries, under what they may perceive to be a more attractive licensing regime, Industry Canada would lose a key instrument to influence the implementation of these capabilities. It is therefore essential that Canada develop an updated, attractive satellite licensing framework.”¹⁷

Currently Canadian operators are paying significantly more in radio spectrum licensing fees for their satellites than foreign operators are required to pay in their home jurisdictions, operators who compete with Telesat both in Canada and the rest of the world. As Telesat detailed in its recent submission in response to Industry Canada’s recent Consultation, a typical Canadian-licensed satellite incurs annual fees of \$800,000 and more, while the fee for a U.S.-licensed satellite is only approximately US\$120,000. Unless Canada harmonizes its licence fees with

¹⁴ US National Space Policy page 6. http://www.whitehouse.gov/sites/default/files/national_space_policy_6-28-10.pdf. See also US National Security Space Strategy, page 6.

¹⁵ US National Space Policy, page 11

¹⁶ U.K. Space Agency: Civil Space Strategy 2012-2016

¹⁷ Industry Canada, Consultation on the Licensing Framework for Fixed-Satellite Service (FSS) and Broadcasting-Satellite Service (BSS) in Canada

those of the governments licensing satellite operators competing with Canadian operators, Canadian operators will remain at a distinct competitive disadvantage and will have a strong financial incentive to obtain future satellite licences from foreign administrations.

In addition to the need to reform the licensing process, Industry Canada also must provide greater support to Canadian satellite operators in obtaining rights to use orbital locations from the International Telecommunications Union. In order to grow, obtain economies of scale and compete on a global basis, Canadian operators must acquire additional orbital slots and spectrum (including slots and spectrum that can be used for providing service to geographic areas beyond Canada's borders). All of the other governments with a strong domestic satellite services industry actively support their domestic operators in obtaining orbital slots and the associated spectrum that could be used to provide satellite services throughout all regions of the world.¹⁸ Canada must do the same. Absent reform in this critical area, Canadian operators will continue to be at a disadvantage to foreign operators and will continue have a strong incentive to obtain orbital slots from other jurisdictions.

4. The Government of Canada has a range of satellite service requirements in the far North and, consistent with the recommendations herein, should satisfy those requirements by procuring commercial satellite services from Canadian service providers

Over the past five years, the Government of Canada has studied the development of a capability to provide broadband communications infrastructure for sovereignty, safety and security objectives in the North and to allow for meteorological observation in the Arctic to permit weather forecasting, modeling and environmental monitoring. Creating such a capability would greatly enhance the government's ability to deliver on the key objectives of its Northern Strategy, as well as its Canada First Defence Strategy.

The Canadian Space Agency, in partnership with the Department of National Defence, Environment Canada and other departments, has defined requirements for such a capability in order to support the provision of broadband communications above 70° North latitude to ships, transport and fighter aircraft, and UAVs/drones performing critical missions such as interceptions, surveillance, and search and rescue as well as to support all other governmental communications requirements in the region, including for permanent and temporary installations (e.g., deep water ports, forward operating bases). The meteorological capability would permit continuous monitoring of the weather and other atmospheric conditions in the North – information which is vital for both governmental and civilian activities in the region – as well as to allow for the development, working in conjunction with allied governments who operate meteorological satellites in other parts of the world, of a comprehensive global weather model.

¹⁸ U.K. Space Agency: Civil Space Strategy 2012-2016

Geostationary satellites – located nearly 36,000 kilometers above the equator – are unable to provide reliable communications to mobile platforms operating above 70 degrees North or useful meteorological imaging of the Earth above 60 degrees North. This lack of capability in the Arctic has prompted the Canadian Space Agency to coordinate the definition of requirements for a new satellite mission, the Polar Communications and Weather (PCW) satellite mission, to meet the Government of Canada’s communications and meteorological service requirements in the North. Without PCW, the government would be unable to achieve the important objectives in the North associated with its contemplated multi-billion dollar investments in Arctic patrol ships, advanced aircraft and UAVs.

By the end of this year DND is expected to complete its definition of requirements for narrowband tactical communications capability throughout the Arctic, requirements not defined in the current PCW User Requirements Document. Adding this capability (a UHF narrowband communications payload) would greatly enhance PCW’s value to Canada as it would provide critical communications links to highly mobile platforms such as the Joint Strike Fighter and smaller land vehicles and naval vessels operating in the Arctic.

In addition to the requirements of the Government of Canada, a number of allied governments have expressed a strong desire to have a broadband communications and meteorological capability in the Arctic. In this regard, just as in the case of the WGS system discussed above, these governments likely would make substantial financial contributions to support the deployment of PCW. And in addition to governmental requirements, PCW could support the requirements in the North of a range of important commercial sectors, including the resource, maritime and aeronautical sectors. Revenues derived from these commercial applications could also be used to underwrite in part the cost of deploying the PCW constellation.

The requirement for PCW is a strong candidate for the Government of Canada to depart from the broken procurement approach it has taken historically for space assets, in which capital and operating costs are paid for by the government, and in which the government assumes the risks of cost overruns, late delivery, capability shortcomings and operational risks over the life of the assets. Instead, the government should move to a service-based acquisition model, similar to that proposed by Telesat for PCW, in which the public sector pays fixed fees as services are delivered. In this model, the commercial sector fully funds the implementation phase and assumes all risks associated with cost and schedule as well as technical performance over the life of the satellites.

Given the interest in PCW from allied governments, PCW also is a strong candidate for the Government of Canada to promote use of Canadian commercial space services in international cooperative arrangements, just as the U.S. government has done with the WGS system. This not only would reduce the cost of the initiative for the Government of Canada, it would support export of state-of-the-art Canadian services and foster the development of Canadian industry.

5. Conclusion

Canada has been a pioneer in the global space industry for decades and has a number of world class companies – including Telesat – that are leaders in this important and growing field. The Aerospace Review represents an important opportunity for the Government to re-examine its current policies and programs to help maximize the competitiveness of this export-oriented and highly competitive sector.

We urge the Government to adopt the recommendations set forth in this submission which we believe will provide increased opportunity, both domestically and abroad, for Canadian space companies to succeed, while respecting the Government’s request for recommendations that are “concrete” and “fiscally neutral”. Moreover, we are confident that these recommendations will not only benefit Canadian space industry participants, but will provide important services and benefits, directly and indirectly, to all Canadians.

Sincerely,

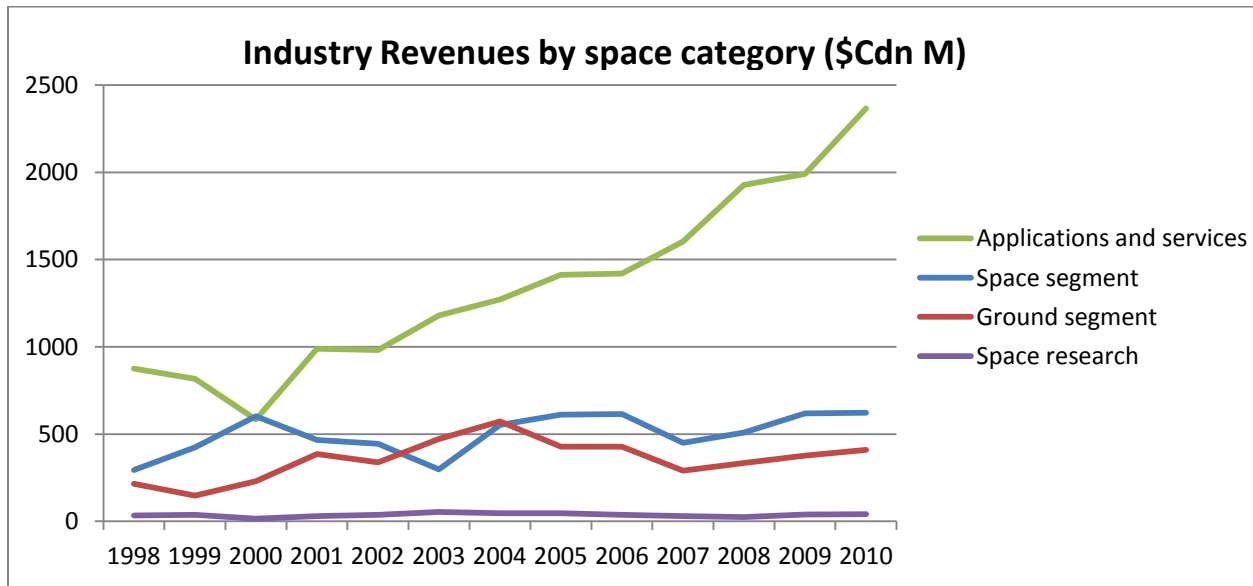
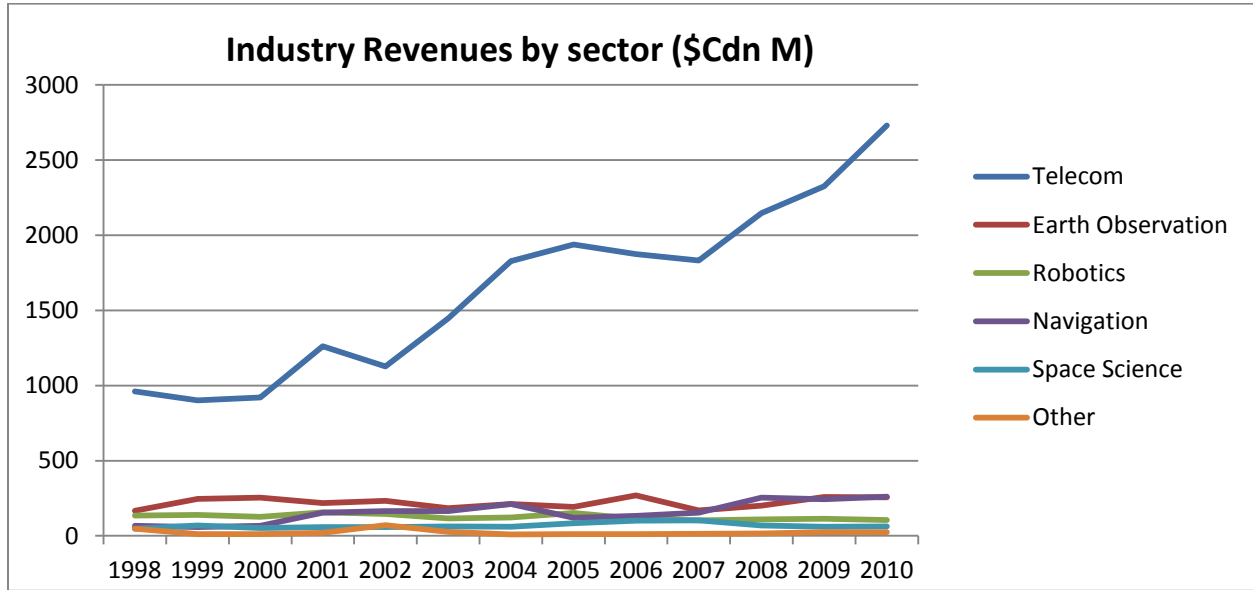
ORIGINAL SIGNED BY
DANIEL S. GOLDBERG

Daniel S. Goldberg

Attachment #1

The following charts demonstrate the dramatic increase in the Telecom space sector revenues relative to all other space sectors, and that of applications and services category, for the period 1998 to 2010

Based on data from the Canadian Space Agency's State of the Canadian Space Sector, surveys from 1998 to 2010, <http://www.asc-csa.gc.ca/eng/industry/state.asp>



Attachment #2

This document presents examples from other countries of their space policies and strategies highlighting the trends towards increased dependence on the commercial sector for critical space-based services. It also includes examples of what other governments have done to assure access to critical space-based services, which includes having payloads hosted on commercial satellites, forming public private partnerships, or becoming the anchor customer in a commercial satellite network.

Government satellite programs have historically focused on dedicated/proprietary systems that provided the required services, such as communications or Earth observation, but which often resulted in overruns and schedule delays. Under this model, federal agencies take responsibility for the design, construction and finance as well as operation and maintenance of the satellite system and the public sector assumes most of the project risk. The rationale for governments to follow this model was initially quite sound. Firstly, the commercial sector was not as mature as it is today, and not as compelling an option as it lacked today's more robust technologies and large global satellite operators. Secondly, the public sector model offered the opportunity of advancing technology and supporting a domestic space industry. However this has often resulted in conflicting mission objectives between providing services which meet critical government requirements and furthering the development of domestic space technologies and industry capabilities which can increase both cost and schedule risks. The GAO report which noted that DOD space acquisitions program costs have increased by 321 percent, or \$11.6 billion, for years 2011 through 2016, has recommended that technology discovery be separated from system acquisition and that an incremental path be followed toward meeting user needs.¹⁹

In recent years Government leaders in other countries have encouraged their space and defence agencies to rely more on the commercial sector for the provision of space-based services. Many countries have put in place policies and strategies to maximize the use of commercial space capabilities and services by having government payloads hosted on commercial satellites and by the government becoming an anchor customer. Such initiatives enable service-providers to attract private investment, develop export markets and stimulate wider market uptake and use of commercial space capabilities and services, and the government gains through better value for money and better capabilities.

¹⁹ US Government Accountability Office (GAO) Report on DOD Space Acquisitions, GAO-12-563T, March 21, 2012, <http://www.gao.gov/products/GAO-12-563T>

US SPACE POLICIES / STRATEGIES

US: National Space Policy 2010

The National Space Policy²⁰ issued in June 2010, clearly enunciates principles, goals and guidelines to be followed by government departments and agencies. The Policy divides space activities into three interdependent sectors: commercial; civil; and, national security.

One of the underlying principles of this Policy is that, “A robust and competitive commercial space sector is vital to continued progress in space. The United States is committed to encouraging and facilitating the growth of a U.S. commercial space sector that supports U.S. needs, is globally competitive, and advances U.S. leadership in the generation of new markets and innovation-driven entrepreneurship.”²¹

The document reinforces what was stated in the previous National Space Policy of 2006, regarding the purchase and use of commercial space capabilities and services to the maximum extent practical, but the 2010 Policy goes much further by instructing departments and agencies to: “Actively explore the use of inventive, nontraditional arrangements for acquiring commercial space goods and services to meet United States Government requirements, including measures such as public-private partnerships, hosting government capabilities on commercial spacecraft, and purchasing scientific or operational data products from commercial satellite operators in support of government missions”²².

US: National Security Space Strategy 2011

The US Department of Defense (DOD) and the Intelligence Community (IC) developed its National Security Space Strategy²³ in compliance with the National Space Policy. In this extract from the Strategy, the theme of greater reliance on commercial space sector is amplified: “Strategic partnerships with commercial firms will continue to enable access to a more diverse, robust, and distributed set of space systems and provide easily releasable data. Strategic partnerships with commercial firms will be pursued in areas that both stabilize costs and improve the resilience of space architectures upon which we rely. Innovative approaches will be explored for their utility in meeting government performance requirements in a cost-effective and timely manner. We will rely on proven commercial capabilities to the maximum extent practicable, and we will modify commercial capabilities to meet government requirements when doing so is more cost-effective and timely for the government. We will develop space systems only when there is no suitable, cost-effective commercial alternative or when national security needs dictate.”²⁴

²⁰US National Space Policy. http://www.whitehouse.gov/sites/default/files/national_space_policy_6-28-10.pdf

²¹ *Ibid.*, p. 3.

²² *Ibid.*, p. 10.

²³ US National Security Space Strategy

http://www.defense.gov/home/features/2011/0111_nsss/docs/NationalSecuritySpaceStrategyUnclassifiedSummary_Jan2011.pdf

²⁴ US National Security Space Strategy p. 9.

http://www.defense.gov/home/features/2011/0111_nsss/docs/NationalSecuritySpaceStrategyUnclassifiedSummary_Jan2011.pdf

US SPACE PROGRAM - ACQUIRING SPACE-BASED SERVICES

US: Space Imagery Data Acquisition

The US National Geospatial-Intelligence Agency (NGA) in 2010 became an anchor customer by entering into ten-year contracts having a total value of \$7.3 billion with DigitalGlobe and GeoEye for satellite imagery (the EnhancedView Program). The purpose of EnhancedView is to provide timely, high-resolution, wide-area imagery to NGA, as well as to the overall intelligence community, DOD, federal agencies, and U.S. allies.

With the US government as a major anchor customer, both DigitalGlobe and GeoEye embarked on plans to add more advanced imaging satellites to their existing fleets. By working with private industry to provide Earth observation images under EnhancedView, government expenditures have been controlled and risks for program performance have shifted to the contracting companies. Under this type of model, which some US lawmakers have referred to as a partnership, the US government is able to procure the images it requires at far greater speed with less cost and less risk than if it had opted to follow a more traditional model of procuring its own, dedicated satellite imaging system.

"The importance of commercial imagery plays into almost everything that NGA does. We are almost exclusively using commercial imagery for all products that we create from a Foundation GEOINT aspect."²⁵

John Goolgasian, Director, Foundation GEOINT Group at NGA

US: Military Satellite Communications – Commercial Satellites

In testifying before the US House Armed Services Subcommittee on Strategic Forces, Ambassador Gregory L. Schulte, Deputy Assistant Secretary of Defense for Space Policy, told the panel that three elements are critical to the U.S. strategy in space: resilience, promoting responsible behavior in space, and energizing the space industrial base. Examples of resiliency, he said, include hosted payloads, augmenting military satellite capability with commercial satellites, and international cooperation to gain access systems put in place by allies.²⁶

Both the National Space Policy and the National Security Space Strategy suggest an increase in the reliance on the commercial sector and the resources of US allies. In 2010 the US Department of Defense spent \$655M on commercial satellite services, a six-fold increase from 2001. In addition, the DoD may spend \$1 billion over the next decade to have military communications payloads hosted on commercial satellites.²⁷

"At the end of the day the user doesn't care where the communications come from. The best way to respond is to make sure the warfighter has an array of communications ... and satellite options. Resilient communications can best be achieved by having flexibility."²⁸

Vince Squitieri, Program Manager for the Communications Program Office, US Navy

²⁵ <http://trajectorymagazine.com/defense-intelligence/item/72-at-a-crossroads.html>

²⁶ <http://www.defense.gov/news/newsarticle.aspx?id=67496>

²⁷ http://www.washingtonpost.com/business/economy/commercial-satellite-firms-may-gain-from-military-piggyback-plan/2012/04/22/gIQATITdaT_print.html

²⁸ <http://defensesystems.com/articles/2012/03/14/satellite-2012-australian-joint-hosted-payload.aspx>

UK SPACE POLICY / STRATEGY

UK: Space Agency Civil Space Strategy 2012 -2016

The formation of the UK Space Agency was announced in 2010 and tasked to foster growth within the UK space sector and with its stated ambition to seize 10% of the global market by 2030. The UK Civil Space Strategy 2012 - 2016²⁹ outlines how it hopes to achieve growth through progress in the areas of education, innovation and science. The Strategy notes that the “Government will increasingly rely on satellite-derived services and data, because in many areas information gathered from space enables government to make better informed policy”. This Strategy also notes that “by becoming an anchor customer, the public sector could enable service-providers to attract private investment, develop export markets and stimulate wider market uptake.”³⁰

UK : Military Satellite Communications - Private Public Partnership

In 2003 the UK’s Ministry of Defence (MOD) chose Paradigm Secure Communications, a wholly owned subsidiary of EADS, to implement and operate a new Skynet 5 satellite network as well as to take over the operation of MOD’s current Skynet 4 satellite network. Under this \$5 billion arrangement, Paradigm gains revenue from the MOD’s assured capacity, which meets MOD’s projected nominal and surge requirements. Paradigm gains additional revenue from the capacity surplus to MOD’s needs, by selling this to third party users with the approval of MOD. The MOD contract with Paradigm has been extended to 2022 and Paradigm will launch its fourth Skynet 5 satellite in 2013. Canada’s DND was among Paradigm’s first customers.

"We are getting this service for a lot less than we would have paid if the Ministry of Defence had followed a traditional procurement route and ordered the satellites itself and operated them using its own personnel. We are also getting a greatly improved service, with security and flexibility built in to cope with the growth in military satellite communications requirements we expect over the next few years. In addition, the Ministry of Defence has also managed to reduce the overall cost of Skynet 5 by around £500 million by applying fresh and innovative thinking. This project is a clear example of how we are now, using Smart Acquisition principles, getting both better military capability and better value for money."³¹

Lewis Moonie, UK’s Junior Defence Minister, 2002

"Skynet 5 is an excellent example of service delivery and innovative, 'smart' acquisition. We are providing our military personnel with the very best communication services and have delivered the capability on time and made substantial savings in cost."³²

Lord Bach, UK Minister for Defence Procurement, 2005

"Skynet 5 will supply about 2.5 times the capacity of the old system and generate a very significant improvement for our global communications systems - allowing us to pass more data faster. It is an excellent example of a successful private finance initiative deal."³³

Lord Drayson, UK Minister of Defence, 2005

²⁹ UK Space Agency Civil Space Strategy 2012 -2016. <http://www.bis.gov.uk/assets/ukspaceagency/docs/uk-space-agency-civil-space-strategy.pdf>

³⁰ *Ibid.*, p. 18.

³¹ http://www.gov-news.org/gov/uk/news/armed_forces_get_advanced_new_satellite_system/87348.html

³² http://www.gov-news.org/gov/uk/news/pfi_satcom_system_enters_service_with_armed/21084.html

³³ http://www.defencemanagement.com/news_story.asp?id=2909

AUSTRALIA SPACE POLICY / STRATEGY

Australia: “Principles for a National Space Industry Policy”

Australia does not yet have a space policy but it does recognize the need for one. In 2011 the Australian government published its “Principles for a National Space Industry Policy”³⁴. The document highlights the dependence of the nation’s social and economic well being and security on access to space-based systems. In addressing the need to assure access to space, the document realistically points out that “Australia will continue to rely to a substantial degree on international support for critical functions enabled by space systems and the information which comes from them. And Australia will continue to accept a substantial degree of dependence on global supply chains for space system capability.”³⁵ By relying on domestic and international arrangements the Australian Government concludes that it “does not see an Australian satellite manufacturing or launch capability as an essential element of its approach to assured access to critical space-enabled services.”³⁶

The document recognizes relationships with key allies and partners as a priority. “Australia will seek to strengthen and enhance its international partnerships to secure access to space systems and the information they provide.”³⁷

AUSTRALIA SPACE PROGRAMS - ACQUIRING SPACE-BASED SERVICES

Australia: Military Satellite Communications - Hosted Payload

Australia is relying on both its allies and the commercial sector for assured access to military satellite communications (milsatcom) capability. Like Canada and other nations, Australia has partnered with the US Department of Defense by contributing to the build of DOD’s Wideband Global Satellite system, a network of what will be 10 satellites in geostationary orbit, providing broadband connectivity to mobile platforms operating between 65 degrees North and South latitude. To meet Australia’s additional requirements for narrowband tactical milsatcom capability, Australia has contracted with commercial satellite operator Intelsat, to have a UHF milsatcom payload hosted on the Intelsat 22 satellite, launched in March 2012. The Australian military finalized the nearly \$500 million purchase of the UHF payload with Intelsat in April 2010, and subsequently agreed with the U.S. Department of Defense for access to about half of the UHF capacity in exchange for UHF capacity on US DOD satellites.

Maj. Gen. Tim McOwan, the Australian Defence Force's senior attaché in the United States said the decision to pursue a hosted payload instead of procuring a dedicated satellite for the UHF communications mission saved money. "If we had been forced to abide by the usual government procurement methodologies, it is highly likely we would have not met the compressed timeline which we had to meet. The cost of an additional payload on a commercial satellite is marginal compared to the total cost of ownership."³⁸

³⁴ Australian Government Principles for a National Space Industry Policy.

<http://www.space.gov.au/SpacePolicyUnit/Documents/Principles%20for%20a%20National%20Space%20Industry%20Policy.pdf>

³⁵ *Ibid.*, p. 4.

³⁶ *Ibid.*, p. 5.

³⁷ *Ibid.*, p. 6.

³⁸ <http://www.space.com/15087-rocket-launch-intelsat-22-satellite.html>