
THE CANADIAN SPACE AGENCY

2007-2008 Estimates

REPORT ON PLANS AND PRIORITIES

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Minister of Industry

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SECTION 1: OVERVIEW

1.1 MINISTER'S MESSAGE



Canada's New Government is committed to fostering a strong, competitive economy that benefits Canada and all Canadians. To achieve this goal, I firmly believe that our government must create an environment that encourages and rewards people who work hard, that stimulates innovation, and that avoids unnecessary regulatory burden. By modernizing and improving Canada's marketplace frameworks, we will ensure stability and fairness while creating new opportunities and choices for businesses, consumers and all Canadians.

Over the past year, our government has taken significant steps to improve Canada's economy. Early in our mandate we presented Budget 2006, which contained measures aimed at improving our quality of life by building a strong economy that is equipped to lead in the 21st century. These measures focused on making Canada's tax system more competitive internationally, and outlined our commitments to reduce paper burden on businesses and to continue to support science and technology in Canada.

Last fall, we presented a long-term economic plan in the Economic and Fiscal Update. *Advantage Canada: Building a Strong Economy for Canadians* focused on creating five Canadian advantages that will give incentives for people and businesses to excel and to make Canada a world leader.

One of these proposed advantages, called the "Tax Advantage," will create conditions more favourable to business in Canada by effectively establishing the lowest tax rate on new business investment in the G7. As well, the "Entrepreneurial Advantage" will ease the regulatory and paperwork burden imposed on business by ensuring that regulations meet their intended goals at the least possible cost.

The Industry Portfolio consists of:

- Business Development Bank of Canada [1]
- Canadian Space Agency
- Canadian Tourism Commission [1]
- Copyright Board Canada
- Industry Canada
- National Research Council Canada
- Natural Sciences and Engineering Research Council of Canada
- Registry of the Competition Tribunal
- Social Sciences and Humanities Research Council of Canada
- Standards Council of Canada [1]
- Statistics Canada

[1] Federal Crown corporations do not prepare Reports on Plans and Priorities.

Through *Advantage Canada*, our government committed to supporting science and technology in Canada, and underscored some of the elements of a science and technology strategy that will sustain research excellence in Canada and increase the competitiveness of the Canadian economy.

Canada's New Government has repeatedly demonstrated that we are committed to getting things done for all Canadians. As we move forward, we will work more closely than ever with our stakeholders and the provincial and territorial governments, and we will continue to foster an environment where the marketplace functions as efficiently as possible, and keep encouraging investment in Canadian innovation and in research and development.

It gives me great pleasure to present the annual *Report on Plans and Priorities* for the Canadian Space Agency, outlining their main initiatives, priorities, and expected outcomes for the upcoming year.

Maxime Bernier
Minister of Industry

1.2 MANAGEMENT REPRESENTATION STATEMENT

I submit, for tabling in Parliament, the 2007-2008 Report on Plans and Priorities (RPP) for the Canadian Space Agency.

This document has been prepared based on the reporting principles contained in the *Guide to the Preparation of Part III of the 2007-2008 Estimates – Reports on Plans and Priorities*.

- It adheres to the specific reporting requirements outlined in the Treasury Board Secretariat (TBS) guidance;
- It is based on the department's Strategic Outcomes and Program Activity Architecture (PAA) that were approved by Treasury Board;
- It presents consistent, comprehensive, balanced and reliable information;
- It provides a basis of accountability for the results achieved with the resources and authorities entrusted to it; and,
- It reports finances based on approved planned spending numbers from the TBS.

Name:

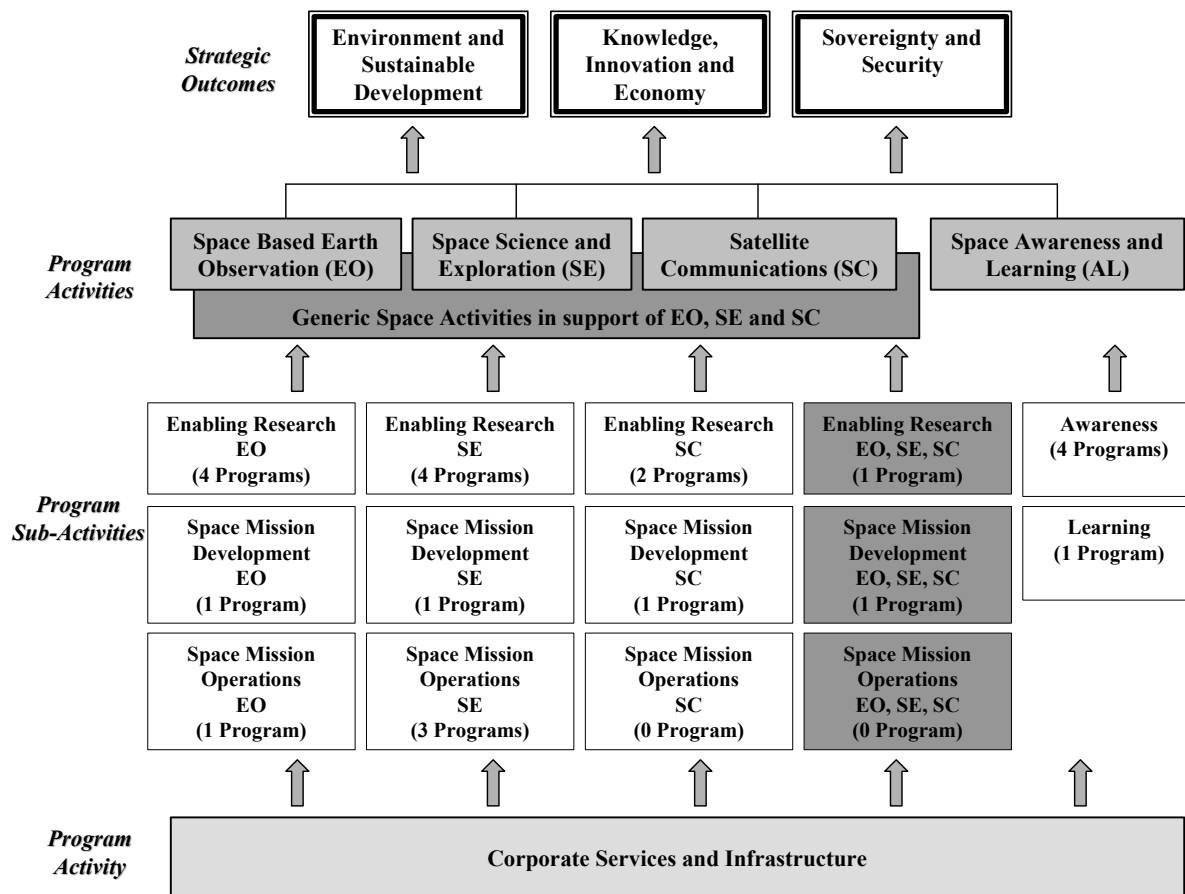
Carole Lacombe, Acting President

1.3 PROGRAM ACTIVITY ARCHITECTURE

The CSA manages the Canadian Space Program according to the Canadian Space Strategy (CSS) approved by the Government of Canada in February 2005. The CSS greatly influenced decision-making at the CSA as it streamlined its Strategic Outcomes and set the long-term priorities for all activities under the Program Activity Architecture (PAA) and thus, since April 1st, 2006. The PAA will remain the same for 2007-2008.

To learn more about the Canadian Space Strategy, go to:

<http://www.espace.gc.ca/asc/eng/resources/publications/default.asp#strategy>



The PAA is divided into six Program Activities that contribute to the CSA's three Strategic Outcomes. The first four are in line with the CSS thrusts: *Space Based Earth Observation*, *Space Science and Exploration*, *Satellite Communications*, and *Space Awareness and Learning*. The fifth Program Activity, *Generic Space Activities*, supports the three scientific and technology thrusts. All Program Activities are supported by the services provided under the *Corporate Services and Infrastructure* Program Activity.

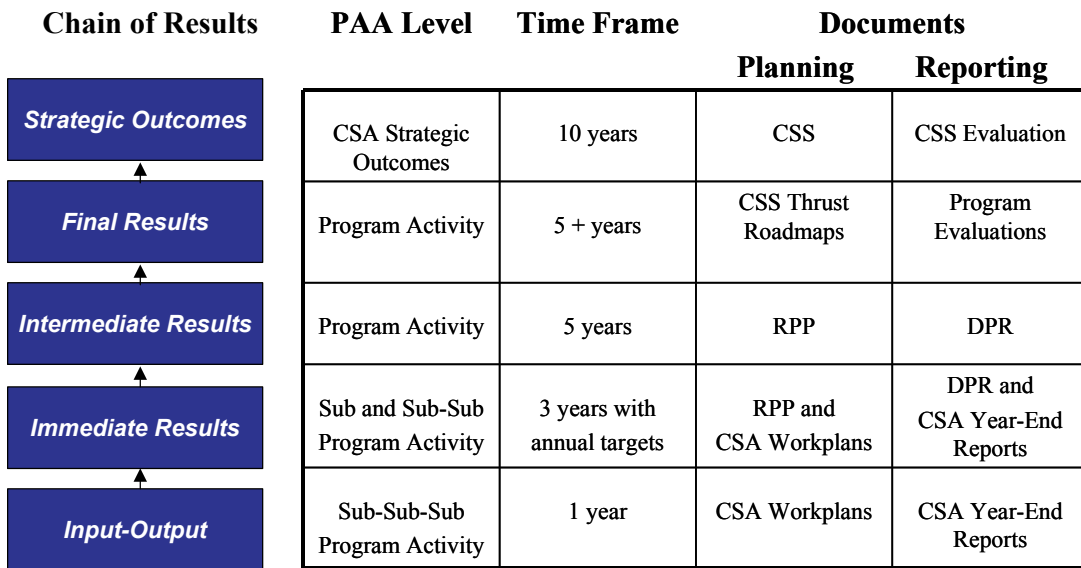
The CSA manages its Program Activities with a comprehensive end-to-end approach by organizing its scientific and engineering programs into three large clusters:

- Through Enabling Research, the CSA provides leadership, co-ordination and support to basic and applied research and experimental development in order to increase the knowledge base, devise new research and applications through space missions, and allow the transfer of intellectual property and proven technologies to Canadian industry, academia, and government organizations.
- Through Space Mission Development, the CSA provides co-ordination and support to the development of space missions through the definition, critical design, manufacturing, integration, testing, calibration, algorithm development, science support and delivery phases leading to launch and early operations of space systems.
- Through Space Mission Operations, the CSA operates manned and unmanned space missions through crew and ground support personnel training, mission analysis and planning, on-orbit ground control operations, system monitoring, maintenance and logistic support, as well as data-handling and delivery.

Implementation of Results-Based Management

The logic chain of results and reporting below depicts how all PAA levels are linked and contribute ultimately to the CSA Strategic Outcomes. It should be noted that financial and performance information as well as management accountability are linked in the corporate planning and reporting documents outlined below.

Program Activity Logic Model



1.4 SUMMARY INFORMATION

RAISON D'ÊTRE

The mandate of the Agency is "*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.*"

The Canadian Space Agency (CSA) is achieving this mandate by implementing the Canadian Space Program (CSP) in co-operation with other government departments/agencies, industries, and universities, as well as international partners. In addition to delivering its own programs, the CSA is responsible for co-ordinating all federal civil space-related policies and programs pertaining to science and technology research, industrial development, and international co-operation.

To learn more about the mandate of the CSA, go to:

<http://www.space.gc.ca/asc/eng/about/mission.asp>

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	368.2	357.4	337.2
HUMAN (FTEs)	708.5	704.4	700.8

CSA STRATEGIC OUTCOMES

The CSA contributes to the three following Strategic Outcomes in line with the Government of Canada's top priorities:

Environment and Sustainable Development: A Space Program that helps Canada understand and protect the environment, and develop its resources in a sustainable manner.

Knowledge, Innovation and Economy: A Space Program that generates knowledge and pushes innovation, while leading (where appropriate) to increased productivity and economic growth through commercialization.

Sovereignty and Security: A Space Program that supports recognition of Canada's sovereignty and the security of its communities.

PRIORITY BY PROGRAM ACTIVITIES	TYPE
<p>Space Based Earth Observation (EO)</p> <p>Develop and operationalize the use of Space Based Earth Observation for the benefits of Canadians.</p>	Ongoing
<p>Space Science and Exploration (SE)</p> <p>Understand the Solar System and the Universe, expand our knowledge on the constituent elements and origins of life, and strengthen a human presence in space.</p>	Ongoing
<p>Satellite Communications (SC)</p> <p>Provide all Canadians with the means to participate in and fully benefit from the global information age.</p>	Ongoing
<p>Space Awareness and Learning (AL)</p> <p>Further public understanding and engagement with regards to space-related issues, ultimately leading to improve the scientific literacy of Canadians.</p>	Ongoing
<p>Generic Space Activities in support of EO, SE, and SC (GSA)</p> <p>Provide leadership, co-ordination and support to EO, SE, and SC through space activities that are generic.</p>	Ongoing
<p>Corporate Services and Infrastructure</p> <p>Implement the government's commitment to modern public service in accordance with the Management Accountability Framework's (MAF) expectations.</p>	Ongoing

CSA CONTRIBUTIONS TO GOVERNMENT OF CANADA OUTCOMES

GOVERNMENT OF CANADA OUTCOMES		
Economy	Social	International
<ol style="list-style-type: none"> 1. <i>An Innovative and Knowledge-Based Economy</i> 2. <i>A Clean and Healthy Environment</i> 3. Strong Economic Growth 4. Income Security and Employment for Canadians 	<ol style="list-style-type: none"> 1. <i>Safe and Secure Communities</i> 2. <i>A Vibrant Canadian Culture and Heritage</i> 3. Healthy Canadians 	<ol style="list-style-type: none"> 1. <i>A Strong and Mutually Beneficial North American Partnership</i> 2. A Safe and Secure World Through International Co-operation 3. A Prosperous Canada Through Global Commerce



CSA Strategic Outcomes

<p>Environment and Sustainable Development:</p> <p>A Space Program that helps Canada understand and protect the environment, and develop its resources in a sustainable manner.</p>	<p>Knowledge, Innovation and Economy:</p> <p>A Space Program that generates knowledge and pushes innovation, while leading (where appropriate) to increased productivity and economic growth through commercialisation.</p>	<p>Sovereignty and Security:</p> <p>A Space Program that supports recognition of Canada's sovereignty and the security of its communities.</p>
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The CSA contributes to the ten Government of Canada Outcomes listed above out of the thirteen measured in the annual *Canada's Performance Report* to Parliament. However, in order to create an even match between the CSA's Program Activities and Government of Canada Outcomes, only the five outcomes highlighted are recorded in the *Canada's Performance Report*. In doing so, the CSA's spending contributes to three key policy areas: Economic Affairs, Social Affairs and International Affairs.

Contributions of Program Activities to Government of Canada Outcomes (GCO)

The Program Activity Space Based Earth Observation (EO) contributes to the GCO “A Clean and Healthy Environment”;

The Program Activity Space Science and Exploration (SE) contributes to the GCO “*A Strong and Mutually Beneficial North American Partnership*”;

The Program Activity Satellite Communications (SC) contributes to the GCO “*Safe and Secure Communities*”;

The Program Activity Generic Space Activities in support of EO, SE and SC (GSA) contributes to the GCO “*An Innovative and Knowledge-Based Economy*”;

The Program Activity Space Awareness and Learning (AL) contributes to the GCO “*A Vibrant Canadian Culture and Heritage*”.

CSA Contributions to Canada Economic Outcomes

The CSA's three strategic outcomes contribute to the development of Canada's economy as measured against the following outcomes outlined in *Canada's Performance* report:

- an innovative and knowledge-based economy;
- a clean and healthy environment;
- strong economic growth; and,
- an income security and employment for Canadians.

The space industry contributes to Canada's economic well-being and helps achieve a higher standard of living and quality of life for all Canadians.

Through its R&D investments and the resulting transfers of applications to the private and public sectors, the CSA's programs and activities attract highly skilled labour that contributes to Canada's knowledge-based economy; helps enhance the Canadian space industry's competitiveness by encouraging dynamic trade relationships with other nations; and increases Canada's ability to compete in the global marketplace.

Earth Observation missions drive many of the changes that are improving our quality of life by helping our government deliver on priorities such as protection of the environment, sustainable development, management of natural resources, understanding climate change, monitoring air quality, and providing support for disaster management.

Satellite communications missions are a key element in linking all Canadians in a communication network including remote and northern communities.

CSA Contributions to Canada Social Outcomes

The CSA three strategic outcomes contribute to Canada's social foundations as measured against the following outcomes outlined in *Canada's Performance* report:

- safe and secure communities;
- a vibrant Canadian culture and heritage; and,
- healthy Canadians.

As part of the *Connecting Canadians* priority, space infrastructure allows access and dissemination of timely health, cultural, security and safety related information to all Canadians no matter where they live in Canada.

Earth Observation, communication and navigation satellites drive many of the changes that improve the quality of life of Canadians by helping our government on managing issues relating to the environment as well as to the safety and security of our population. It contributes to the monitoring of parameters relating to the maintenance of a healthy environment over Canadian territory, and supports disaster management in situations such as floods, forest fires and earthquakes. These satellites also provide essential communication tools to support law and order, enforcement interventions and enhance search and rescue capabilities.

In today's context of environmental change and resource depletion, fundamental and applied research in physical and life sciences and in space exploration is predicted to bring about socio-economic benefits in ways that will greatly improve how we live, prosper, and evolve on our planet. For instance, the development of a surface mobility capability on the Moon will require the use of solar-powered electrical propulsion vehicles, which, in turn, could well lead the way toward spin-off commercialisation of green technologies for the transport vehicles of the future.

Satellite communication is essential to provide all Canadians, no matter where they live in Canada, with timely access to expert knowledge and expertise related to health and education through a range of non-commercial services including: e-government, e-learning, tele-justice, tele-education, as well as tele-medicine in areas such as tele-psychiatry, tele-radiology, tele-surgery, and tele-consultations.

CSA Contributions to Canada International Outcomes

The CSA's three strategic outcomes contribute to establishing Canada's international presence as measured against the following outcomes outlined in *Canada's Performance* report:

- a strong and mutually beneficial North American partnership;
- a safe and secure world through international co-operation; and,
- a prosperous Canada through global commerce.

Space is an essential and strategic tool for Canada to meet its social, economic and foreign policy objectives. Through the development of its space infrastructure, not only is Canada meeting its specific national needs, it is also paving the road for Canada to play a tangible and visible role in responding to issues of interest to the international community.

With its space exploration, science and technology endeavours, which often involve international partners, the CSA plays an influential role in building strong and mutually beneficial partnerships with an increasing number of space-faring countries. In striving to become one of the most advanced, connected and innovative nations in the world, Canada offers and shares tremendous opportunities for the prosperity of global commerce and the safety of the global community through the peaceful use of space.

Priorities of the CSA under the Canadian Space Strategy

The CSA manages the Canadian Space Program according to the Canadian Space Strategy (CSS). The CSS is instrumental in decision-making at the CSA as it streamlines its Strategic Outcomes and sets the long-term priorities for all activities under the Program Activity Architecture (PAA). A priority has been set for each of the four CSS thrust-related Program Activities and two supporting Program Activities that collectively contribute to the success of the Canadian Space Program.

Program Activity: Space Based Earth Observation (EO)			
<i>Strategic Outcomes: Environment and Sustainable Development, Knowledge, Innovation and Economy, and Sovereignty and Security</i>			
Priority: Develop and operationalize the use of Space Based Earth Observation for the benefits of Canadians.			
EXPECTED RESULTS	PLANNED SPENDING (\$ in millions)		
	2007-2008	2008-2009	2009-2010
Delivery, directly or in partnership, of Space Based EO data, products and services in response to operational and scientific user requirements in the fields of Environment, Resource and Land Use Management, and Security and Foreign Policy, supported by access capacity development.	114.1	124.6	113.7

Main Initiatives for Space Based Earth Observation (EO)

Given Canada's international stature and geo-political situation, immense territory, rich natural resources, and the changes now occurring in our climate, innovative Earth observation technologies are becoming increasingly important for our country.

Space Based EO enables environmental understanding, monitoring and prediction with unparalleled coverage and scope. Space Based EO enables measurement of atmospheric composition (chemical species, aerosols, water vapour and clouds), atmospheric dynamics, and changes over time. Atmospheric science permits improved modeling of the atmosphere for weather prediction and analysis of the Earth's climate and its changes. Canada has developed internationally recognized expertise in the study of atmospheric chemistry and dynamics through the development of innovative space instrumentations, data analysis and modeling. Canada also has internationally recognized expertise in space-based cloud probing radar systems and associated data exploitation. Space Based EO enables sustainable management and development of natural resources, land use, fisheries and agriculture. Space Based EO also offers cost-effective wide-area surveillance of land, ice and ocean. This information, which can be only obtained from space-based platforms, is vital to ensure monitoring of areas difficult to access, such as the Northwest Passage. Satellites are thus critical to Canada's security and foreign policy.

At the forefront of EO data development, management and exploitation since the early 1970s, Canada has become a world leader in Synthetic Aperture Radar (SAR) data collection, operations and services with the launch of RADARSAT-1 in 1995 and is about to demonstrate its continued leadership with RADARSAT-2, to be launched in July 2007. Canada's RADARSAT-2 will provide substantially enhanced data products and services, as well as contribute to C-band SAR data continuity. Canadian government users are expected to include Environment Canada, Fisheries and Oceans Canada, Canadian Ice Services, Natural Resources Canada, the Department of National Defence, and the provinces and territories.

For the coming years, RADARSAT-2 operations, the design of a constellation of next generation radar satellites and continuing leadership in innovative atmospheric instrumentation and associated data analysis and modeling will be the CSA's main focus in EO. The CSA will also continue its involvement in the ESA's Earth Observation programs and projects, and pursue the development of a mission related to stratospheric wind transport studies through the Chinook project. The data generated by this latter mission will lead to advances in weather and climate prediction models to provide answers related to the health of ozone layer and climate changes.

Program Activity: Space Science and Exploration (SE)			
<i>Strategic Outcomes: Knowledge, Innovation and Economy, and Sovereignty and Security</i>			
Priority: Understand the Solar System and the Universe, expand our knowledge on the constituent elements and origins of life, and strengthen a human presence in space.			
EXPECTED RESULTS	PLANNED SPENDING (\$ in millions)		
	2007-2008	2008-2009	2009-2010
Increased participation in Canadian and international opportunities in order to expand the scientific knowledge base made available to Canadian academia and R&D communities, in astronomy, space exploration and solar-terrestrial relation as well as physical and life sciences.	138.5	112.5	98.9

Main Initiatives for Space Science and Exploration (SE)

This priority consists of performing research in, on, and from space in order to answer fundamental and applied scientific questions posed by the Canadian and international scientific communities of importance to Canadians. The Canadian scientific community relies on the CSA to contribute the means to answer these basic questions and ensure a dynamic environment for space scientific research in Canada. With a trained and versatile Astronaut Corps, the CSA continues to develop and maintain human space flight expertise to meet the requirements of the space sciences and human exploration programs.

Canada's participation in the International Space Station (ISS) and its contribution of the Mobile Servicing System including Canadarm2 to one of the most ambitious engineering project ever undertaken by mankind clearly demonstrates Canada's leadership in space robotics and provides access to a very unique space laboratory to both Canadian researchers and specialist astronauts. This solid involvement also ensures that Canada remains a partner of choice for future international partnerships that will explore the solar system. Promising Canadian technology avenues such as surface mobility could be considered for future Canadian international space exploration contribution.

The Space Science and Exploration activities have been regrouped under two pillars: Space Astronomy and the Solar System, and Physical and Life Sciences. Over the next three years, a series of Space Astronomy missions will continue to contribute to a better understanding of the early Universe and the internal structure of Sun-like stars. In parallel, the CSA is developing a key element of the James Webb Space Telescope planned for launch in 2013, as well as, contributions to two European Space Agency space astronomy missions - Herschel and Planck. The CSA will also be providing the ultraviolet detectors for the telescope UVIT to the Indian Space Research Organization (ISRO) for the ASTROSAT mission.

As for planetary exploration, participation in the international Global Exploration Strategy (GES) remains the focus. Following completion of this key international framework document, Canada will be in a position to confirm which scientific missions and technologies it will contribute to as part of the overall international exploration roadmap. Moon exploration is currently the main focus of international partners. Under consideration are science-driven missions coupled with technological contributions on the surface of the moon that, through barter agreements with our partners, are expected to afford access to space for our astronaut corps, and, at the same time, provide tangible benefits to Canadians on Earth.

In the immediate term, the Canadian space science and exploration community will continue to work on the development of a meteorological station for NASA's Phoenix mission and the Alpha Particle X-Ray Spectrometer (APXS), two key opportunities in the international collaborative missions to explore Mars and the Moon. The CSA, in partnership with Defense Research and Development Canada (DRDC), has initiated the Near Earth Orbit Surveillance Satellite (NEOSSat) project, a micro-satellite to survey and track the population of near-earth asteroids, comets and satellites. An important goal of this micro-satellite project is to provide a multi-mission micro-satellite bus to enable more frequent and affordable Canadian science and technology missions in the future.

Solar-Terrestrial science improves our understanding of the physics of the sun, the heliosphere, solar storms and the violent changes of the Earth's magnetosphere and ionosphere that can have dramatic impacts on satellites, communications, navigation and human spaceflight. This area of science addresses the impact of solar activity on the magnetosphere and the manifestation of these phenomena on Earth (aurora, geomagnetically induced currents, disturbances to radio signals) and in space (radiation belts, space weather).

Canadian scientists are leading a number of solar-terrestrial research on upcoming Canadian and international space missions such as ePOP (enhanced Polar Outflow Probe) on the Canadian small satellite CASSIOPE, THEMIS (NASA), and Swarm (ESA) for the study of Earth's magnetic field. In addition, two new key international missions, the Canadian-led ORBITALS with a major U.S. contribution for the study of the outer radiation belt, and the Chinese-led Ravens/KuaFu, are under feasibility study.

Physical and Life Sciences research activities have provided results despite the challenges of access to the International Space Station (ISS). Since the resumption of Shuttle flights in mid-2006, Canadian scientists have been using Canada's allocation on the ISS, as well as on other available vehicles to carry out microgravity experiments in fluid physics, human physiology, and materials processing in a combination of basic and applied research.

In the coming years, the CSA will participate in a Foton mission with the Enhanced Osteoporosis Experiments in Orbit (eOSTEO) to study and quantify bone cell activity under weightless conditions and evaluate potential anti-osteoporosis treatments.

Canadian Astronauts will also perform science experiments on behalf of the Canadian and international research communities and continue to participate in the assembly and maintenance of the International Space Station during the upcoming mission STS-118/13A.1, with Canadian Astronaut Dave Williams on board.

The CSA will maintain its international commitment and fulfill its responsibilities to the ISS partnership through the provision of operational, training, logistical, support, and engineering services on the ISS Mobile Servicing System (MSS) and supporting hardware and software.

Program Activity: Satellite Communications (SC)			
<i>Strategic Outcomes: Knowledge, Innovation and Economy, and Sovereignty and Security</i>			
Priority: Provide all Canadians with the means to participate in and fully benefit from the global information age.			
EXPECTED RESULTS	PLANNED SPENDING (\$ in millions)		
	2007-2008	2008-2009	2009-2010
1) Increased access for Canadians to state-of-the-art space communications systems and services to meet their social and economic needs. 2) Better use of space communications, search and rescue, and global navigation satellite systems and applications to improve the efficiency and effectiveness of other government departments and organizations in delivering services to Canadians.	25.1	28.2	29.1

Main Initiatives for Satellite Communications (SC)

Satellite technology has dramatically changed the world of communications. By offering instantaneous global access and global broadcasting, SC technologies have begun to erase the notion of distance, bringing remote regions into a global village and enabling new business models based on broadband services, enhanced personal communications, global navigation, and positioning and localization services.

For this priority, the CSA intends more specifically to increase the connectivity of Canadian communities, support federal government departments in the delivery of programs and services, and Canada's foreign policy objectives.

With the launch of AnikF2 in 2004, the rural and remote areas of Canada are closer than ever to benefiting from tele-services using broadband (Ka-band) capabilities. A range of non-commercial services is supported including: e-government, e-learning, tele-justice, tele-education, and tele-medicine disciplines such as tele-psychiatry, tele-radiology, tele-surgery, and tele-consultations. This satellite technology permits specialists located in main centres to use high definition real-time links, thereby reducing the cost of travel and improving the access and quality of care for every Canadian.

Over the next three years, the operation and use of the Ka-band payload will be one of the main areas of focus for this priority. Another focus will be the development of a high-speed, high-capacity space messaging experimental payload, called Cascade, of interest to resource exploration firms, industrial clients, and remote research communities.

Among other activities contributing to this priority will be the continued efforts deployed through Canada's participation in Europe's navigation satellite program, GalileoSat, a joint undertaking by the European Space Agency (ESA) and the European Union, and the support to Canadian industry's participation in the ESA ARTES program to advance and demonstrate new telecommunications products and services.

For the time horizon covered by this RPP, the CSA will delay its Satellite Communication Ground Segment Technologies and Applications Development programs. These programs are to develop, in co-operation with Canadian industry and other government departments, a selection of products and services that will increase the efficiency and effectiveness of satellite communication systems and the delivery of satellite communications related services.

Program Activity: Generic Space Activities in support of EO, SE, and SC (GSA)			
<i>Strategic Outcomes: Environment and Sustainable Development, Knowledge, Innovation and Economy, and Sovereignty and Security</i>			
Priority: Provide leadership, co-ordination or support to Earth Observation (EO), Space Science and Exploration (SE), and Satellite Communications (SC) Program Activities through technology research and space-qualification activities that are generic in their nature.			
EXPECTED RESULTS	PLANNED SPENDING (\$ in millions)		
	2007-2008	2008-2009	2009-2010
Innovative space technologies, techniques, and design and test methodologies in response to advanced developments required for future space missions and activities.	47.5	48.9	50.4

Main Initiatives for Generic Space Activities in support of EO, SE and SC (GSA)

The Program Activity, *Generic Space Activities*, supports the three scientific and technology thrusts. Generic Space Activities provides support to Enabling Research through the development of high-risk technologies by industry, academia and not-for-profit organizations and through the maintenance of in-house technical capabilities by conducting advanced R&D projects that meet the criteria of excellence in, and relevance to the implementation of the Canadian Space Program.

A new Technology Plan will provide roadmaps and a multi-year implementation plan to guide and prioritize CSA Technology Programs. Priority technologies are defined in consultation with industry and other stakeholders.

Through the Space Technology Development Program, Canada's capabilities are enhanced to support national and international space missions or activities of Canadian interest by awarding new technology development contracts to industry through annual Requests for Proposals.

The transfer and commercialization of space technologies and their applications to other sectors of the economy enhances Canada's industrial competitiveness. This is being achieved by managing the CSA portfolio of patents and intellectual property licenses, by conducting commercialization assessments and developing marketing plans for technologies developed in-house, and for technologies developed within the Canadian industry.

The David Florida Laboratory will continue to support to Space Mission Development by carrying out world-class and cost-effective environmental space-qualification services for the assembly, integration and testing of spacecraft systems.

Program Activity: Space Awareness and Learning (AL)			
<i>Strategic Outcome: Knowledge, Innovation and Economy</i>			
Priority: Further public understanding and engagement with regards to space-related issues, ultimately leading to improving the scientific literacy of Canadians.			
EXPECTED RESULTS	PLANNED SPENDING (\$ in millions)		
	2007-2008	2008-2009	2009-2010
Increased public awareness of Canada's activities in space and space benefits positively affecting the quality of life of Canadians.	6.5	8.0	9.3

Main Initiatives for Space Awareness and Learning (AL)

The Government of Canada is committed to building a 21st century economy through a new focus on science and technology. If Canada is to meet the challenge posed by a truly global economy, Canadians must be encouraged to pursue careers in science and technology, as a skilled pool of human capital is at the heart of an innovative economy. We must encourage science and technology literacy today, particularly among our youth if we are to influence their choice of science and technology careers in the future. Canadians' interest in science and technology must also be engaged by sharing our discoveries and breakthroughs in meaningful ways that communicate how they positively impact Canadians in their daily lives. Space continues to inspire individuals, communities and entire nations to reach for their highest aspirations and challenge the best of their abilities.

Under this priority, the CSA is working with and through a growing number of partners to enhance public understanding and engagement, especially among youth and their families, through a range of learning and awareness initiatives. The Learning Program is reaching out to a greater number of partners and has forged solid relationships with other government departments, science centres and museums, youth and science associations, the private sector, and the education community across Canada. To ensure Canada's capacity to conduct breakthrough science and maintain its leadership in technological innovation, we must be able to attract, develop and retain highly qualified personnel in science and engineering, including those fields related to space. Other activities supporting this priority include media relations and information services, exhibitions and creative services, and awareness events with astronauts, scientists and engineers.

Program Activity: Corporate Services and Infrastructure			
<i>Strategic Outcomes: Environment and Sustainable Development, Knowledge, Innovation and Economy, and Sovereignty and Security</i>			
Priority: Implement the government's commitment to modern public service in accordance with the Management Accountability Framework's (MAF) expectations.			
EXPECTED RESULTS	PLANNED SPENDING (\$ in millions)		
	2007-2008	2008-2009	2009-2010
1) Corporate Services provide an added value to CSA managers in the performance of their duties.	36.5	35.3	35.8
2) Key corporate risks are addressed and mitigated.			

Main Initiatives for Corporate Services and Infrastructure

During the planning horizon of this Report on Plans and Priorities (RPP), the CSA will continue to improve its management practices in accordance with the Management Accountability Framework (MAF). Special attention will be given to the implementation of the Policy on the Management of Resources and Results Structure (MRRS), the Public Service Modernization Act and sound risk management practices.

The CSA will implement the MRRS by:

- Establishing CSA strategic outcome socio-economic indicators; and
- Implementing systematic linkage between financial and performance information and tracking every financial transaction by Program Activity expected results, starting April 1, 2007.

The CSA will implement the Public Service Modernization Act by:

- Finalizing the development of a Strategic Human Resources Plan; and
- Pursuing the renewal of policies and practices and continuing to train for all managers and employees with regards to work relations, classification and staffing in accordance with the Staffing Management Accountability Framework.

The CSA will pursue the integration of risk management into all decision-making processes by:

- Improving specific management practices in order to mitigate the four risks of highest priority identified in the corporate risk assessment profile; and
- Enhancing the Project Approval Management Framework in order to incorporate project and corporate risk assessment as well as mitigation.

1.5 DEPARTMENTAL PLANS AND PRIORITIES

Strategic Context of the Canadian Space Agency

International Environment

In the global context, space is recognized by industrialized nations as an essential and strategic tool to meet their social, economic and foreign policy objectives. Accordingly, many governments around the world, traditional and newly emerging space-faring nations, are increasing their investments in space activities, looking for increased consolidation and advancement of their space capabilities. Canada must therefore possess a space infrastructure not only to meet its specific national needs, but also to play a tangible and visible role in responding to issues that interest the international community. Canada has been losing ground internationally in terms of public expenditures in the space sector. The ratio of public investment in space to national Gross Domestic Product (GDP) is a prominent illustration of the decreasing effort of the Canadian Government to finance the national space program. The national effort to finance the space program in 2004 (0.025% of GDP) is almost one third of what it was in 1994 (0.068%)¹. It is notable that both China and India have moved ahead of Canada in their proportional investments to GDP.

International co-operation is critical to the implementation of the Canadian Space Program. Canada can leverage its resources and maximize its return on investment by working in partnership with other space-faring nations. Such partnerships allow for sharing of technical expertise, knowledge and infrastructure, and allow access to areas where Canada has chosen not to invest due to its limited resources. In addition, increasing concerns over issues such as space debris and climate change that transcends national borders favour increasing cooperation between nations with common goals. Canada co-operates with a number of international partners and has ties to various space agencies. Although the United States National Aeronautics and Space Administration (NASA) and the European Space Agency (ESA) remain Canada's longstanding international partners, we are increasingly developing relationships with other foreign space organizations in Japan, India, Sweden, Norway, Germany, and Russia.

To learn more about Canada's international partners, go to:

http://www.space.gc.ca/asc/eng/resources/links_agencies.asp

Canada is regarded as a reliable partner possessing unique technical and scientific capabilities, and as a nation that can meaningfully contribute to the initiatives of foreign space agencies. In particular, emerging space-faring countries in Asia and South America may offer great potential for future co-operation. Consequently, Canada maintains its efforts to establish a foothold in these emerging markets. It is of paramount importance that the CSA continue to work with its stakeholders to ensure that our research community and industry remain competitive vis-à-vis world standards and markets.

¹ EUROCONSULT – CONFERENCE BOARD OF CANADA: *Socio-economic Study and Policy Analysis of Future Canadian Investments in Space-based Robotics Opportunities* (2006)

The perception of Canada's space industry as being internationally competitive is confirmed by the results of the 2005 Annual Survey of the Canadian Space Sector. With annual revenues of \$2.5 billion, of which exports represent 50% (\$1.245 billion)² of the industry's total revenues, Canada has a higher percentage of exports than any other major space-faring nation. The main destinations of Canadian space exports are as follows: 47% generally destined to the US, 32% to Europe and 8% to Asia.³

National Environment

The Canadian Space Agency recognizes that the best means of turning scientific and technological advancements into innovative products and services is through partnerships with Canadian universities and industry. The CSA firmly believes that industry is the best vehicle for providing a broad range of services to diverse groups of users – from individuals to public and private organizations. With its highly skilled workforce, the space industry in Canada not only generates wealth in our economy, but also provides Canadians with competitive products and services that would otherwise have to be obtained from foreign sources.

In 2005, Canada's space industry generated \$2.5 billion in revenues.⁴ Satellite Communications continued to generate the lion's share of the Canadian space sector's revenues with a total of \$1.83 billion. A breakdown of the revenues by sectors of activity is as follows: Satellite Communications: 77.6% (\$1.83 billion); Earth Observation: 8% (\$192 million); Navigation: 4.8% (\$120 million); Robotics: 6.1% (\$153 million); Space Science: 3.4% (\$84 million); and all space-related activities in areas other than those mentioned above: \$11 million.⁵ While small in number of firms, the Canadian space sector is knowledge-intensive and at the forefront of research and innovation. Building on the strengths of 6,710 highly skilled workers,⁶ Canadian firms have acquired world-leading capabilities in niche areas such as earth observation, space robotics, satellite communications and navigation.

Given that the national market is relatively small, it is critical that the Canadian industry be able to leverage foreign investments and generate export sales. Capitalizing on export revenue depends on the industry's ability to commercialize highly competitive products and services, and establish local partnerships. The CSA works very closely with the Canadian space industry and scientists in 25 Canadian universities and 12 research centres on the planning and implementation of the Canadian Space Program.

To learn more about Canadian space-related organizations, go to:

<http://www3.espace.gc.ca/asc/eng/industry/csd.asp>

² State of the Canadian Space Sector 2005; Overall Revenues, Domestic v. Export Revenues

³ State of the Canadian Space Sector 2005; Export Revenues

⁴ State of the Canadian Space Sector 2005; Overall Revenues

⁵ State of the Canadian Space Sector 2005; Revenues by Sector of Activity

⁶ State of the Canadian Space Sector 2005; Space Sector Workforce, Workforce Groups

<http://www.space.gc.ca/asc/eng/industry/state.asp>

Government Environment

The Canadian Space Strategy (CSS) is the framework that guides the CSA in leading Canada's national Space Program (CSP). The CSS is a concise overview that serves as a tool for planning purposes, and provides our stakeholders and partners with insight on Canada's strategic directions regarding space. In keeping with its objective to be an open and transparent organization, the CSS was developed in full consultation with Government of Canada organizations and with its Canadian stakeholders, particularly through the use of the CSA Advisory Council and the thrusts' Advisory Groups. The CSS is reviewed periodically to reflect the changing internal and external environment that characterises and influences Canada's space activities.

In consultation with Government of Canada organizations, the CSA is constantly seeking ways to contribute significantly to the effective and efficient delivery of government programs and services in the fields of: communications, environment and sustainable development, security, intelligence, emergency preparedness, industry development and space science.

The wide range of space applications and technologies used by the Government is reflected in the CSA's three Strategic Outcomes, as well as in a number of partnerships between the CSA and other federal organizations. Sorted by Strategic Outcome, the list of partner organizations include:

- **Environment and Sustainable Development:** Natural Resources Canada including the Canada Centre for Remote Sensing, Environment Canada, Parks Canada, Fisheries and Oceans Canada, Indian and Northern Affairs Canada, and Agriculture and Agri-Food Canada.
- **Knowledge, Innovation and Economy:** The Communications Research Centre of Industry Canada, which manages satellite communications programs on behalf of the CSA, National Research Council Canada, Industry Canada, Natural Sciences and Engineering Research Council of Canada, Canadian Institutes for Health Research, Atlantic Canada Opportunities Agency, Foreign Affairs and International Trade Canada, and the Canadian International Development Agency.
- **Sovereignty and Security:** Department of National Defence, the Canadian Coast Guard, and Public Safety and Emergency Preparedness Canada.

Plans of the Canadian Space Agency

The CSA will achieve its priorities by focusing on the following five elements:

- 1) a strong science capacity;
- 2) a proficient technology base;
- 3) qualified test and operations infrastructures;
- 4) dynamic space industry expanded markets; and,
- 5) national and international partnerships.

Strong Science Capacity

Canada must possess the critical mass of intellectual capital to create and use knowledge. The increasing importance of space in our lives makes it imperative for our country to have a strong space science community capable of generating knowledge within our own borders, and be able to share and exchange knowledge with our international partners. In terms of concrete action, the plan for the CSA to contribute to a strong science capacity, in co-operation with national granting councils and other funding partners, consists of:

- encouraging the entry and emergence of new space science researchers in Canada, particularly through small, short-term projects;
- continuing to support researchers with the proven potential to become world leaders in their fields; and,
- stabilizing long-term support to a critical mass of the best research teams, particularly those in fields identified as Canadian priorities.

Proficient Technology Base

Canada must have its own core technology base to meet its unique requirements, as well as the skills and capabilities that make it an appealing partner for other countries. Our technology base must take into consideration the niche sectors where Canada has established and intends to retain world leadership, but must also be dynamic and innovative to evolve with the changing nature of our national needs and objectives in space, as influenced by national and international environments. The CSA developed a Technology Plan that will guide the development of new technologies. A series of consultations took place to define the key technology areas where Canada should invest. The CSA will promote and stimulate co-operation and complementary research among academic, industry and government organizations when it supports government policy decisions or the development of new technologies and products in Canadian industry.

Qualified Test and Operations Infrastructures

The David Florida Laboratory (DFL) provides world-class and cost-effective environmental space qualification services for the assembly, integration and testing of spacecraft systems and sub-systems to all of the CSA's programs. In order to maintain an appropriate level of space infrastructure, the CSA will encourage private-public partnerships to maximize the efficient utilization of the DFL facilities and equipment based in Canada, as well as increase their access to our international partners provided that Canadian interests and requirements are protected.

Dynamic Space Industry and Expanded Markets

The CSA recognizes that Canada's space industry must be sufficiently large and diverse to meet our needs and goals in space. Canada's space industry must also maintain the high calibre of products and services it has demonstrated to date. However, given that the Canadian market is relatively small, it is critical that the industry be able to leverage foreign investments and generate export sales in order to remain sustainable. Capitalizing on export revenue depends on industry's ability to commercialize highly competitive products and services, as well as the Government of Canada's ability to preserve open trade relations with its closest international partners. In order to help the industry meet and succeed in these challenges, the CSA will align its programs and actions to support technology and application R&D as well as innovation in industry in order to build synergies that will bolster Canadian industry's competitiveness and market development efforts.

National and International Partnerships

Co-operation between scientists in government and academia; co-ordination between industry and the CSA to establish the most relevant technology base; and the alignment between R&D, hardware manufacturers and service providers, are among the many partnerships that must exist in Canada to ensure that we continue to have a dynamic national space program. Given the potential of space to provide applications directly related to the public good, one of the CSA's most important objectives is to accelerate the pace and depth at which Government of Canada departments and agencies use space science, technology and applications to help fulfill their mandates.

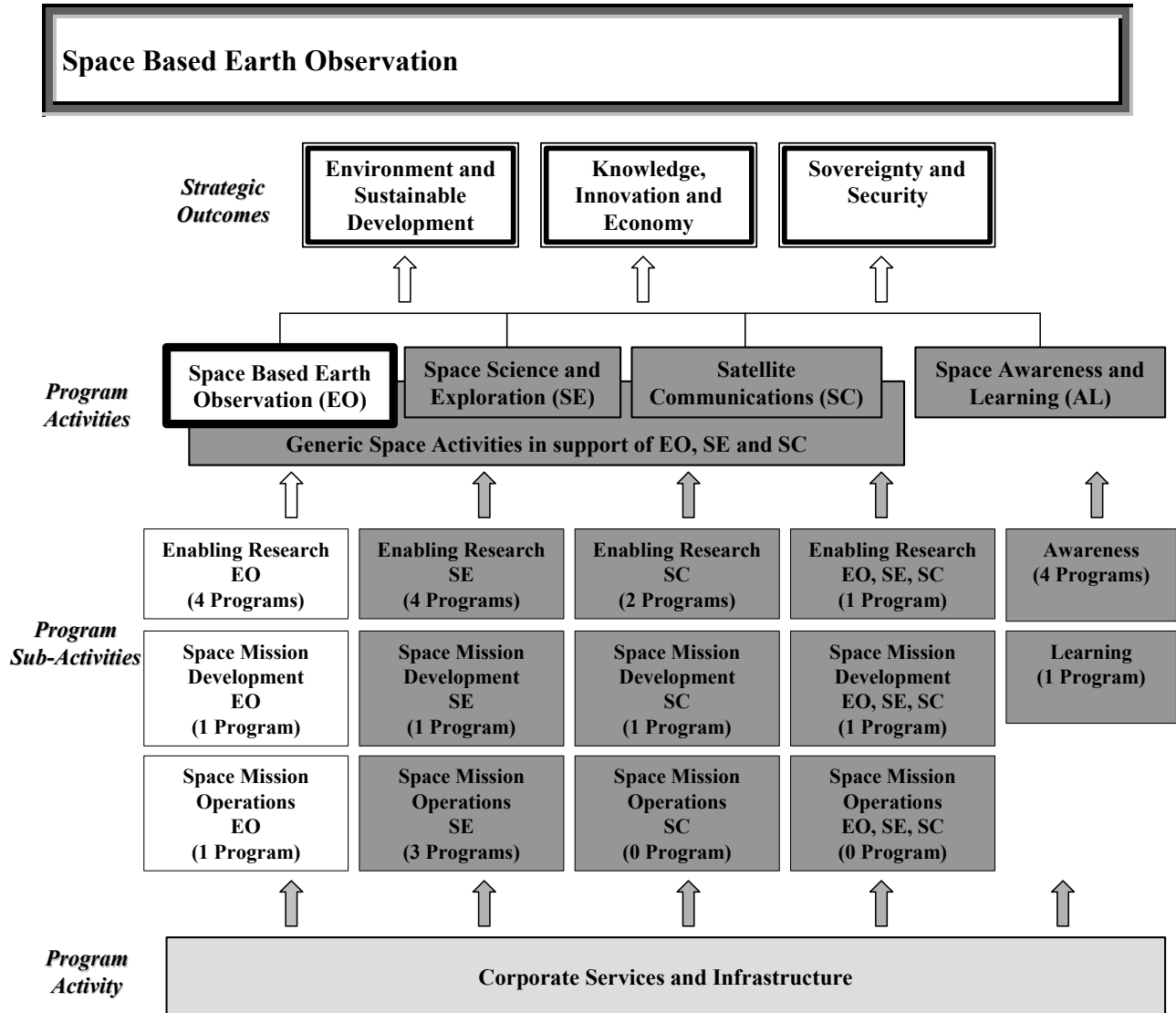
To this end, the CSA's plan consists of:

- seeking new and existing government department requirements in which space can make a positive contribution;
- developing the means to satisfy these needs in co-operation with Canadian industry; and,
- harmonizing its investments and activities with those of client departments as part of an integrated and user-oriented approach.

International co-operation channels are also important to complement our domestic capabilities and strengthen relationships between Canada and foreign governments, scientists and private sector organizations. The CSA plans to continue making a concerted effort to strengthen strategic international partnerships of interest to Canada, while ensuring that our national expertise, products and services make Canada a partner of choice for other nations and private entities.

SECTION 2: ANALYSIS OF PROGRAM ACTIVITIES BY STRATEGIC OUTCOME

The following detailed analysis outlines how Program Activities contribute in various degrees to the attainment of the three Strategic Outcomes and key programs and services contribute to Program Activity priorities, and how the CSA will report on its performance over the coming years.



Program Activity Priority: Develop and operationalize the use of Space Based Earth Observation (EO) for the benefit of Canadians.

Through its Earth Observation Program Activity, the Canadian Space Agency (CSA) recognizes that space offers a unique vantage point for observing the Earth and its environment and improving the quality of life of Canadians. Canada's vast geography and low population density make Space Based EO a cost-effective means to ensure understanding, management and protection of our environment, resources and territory. Earth Observation Satellite data are crucial to helping scientists, policy and decision-makers to understand weather, climate, air quality, oceans, land, geology, natural resources, ecosystems and hazards better. It is also crucial to enhancing human safety and welfare, alleviating human suffering, and protecting the global environment.

In doing so, this priority contributes in many ways to all CSA Strategic Outcomes: Environment and Sustainable Development, Knowledge, Innovation and Economy, and Sovereignty and Security.

SPACE BASED EARTH OBSERVATION (EO)	
PROGRAM ACTIVITY PERFORMANCE MEASUREMENT	
Expected Result #1	Performance Indicators
Delivery, directly or in partnership, of Space Based EO data, products and services in response to operational and scientific user requirements in the fields of Environment, Resource and Land Use Management, and Security and Foreign Policy, supported by access capacity development.	<ol style="list-style-type: none"> 1. Number of RADARSAT operational users and applications; 2. Number of active missions supported directly and indirectly by Canada; 3. Growth in the federal government departments' and agencies' budget allocated to the exploitation of Space Based EO data, data derived information and services in the fields of the Environment, Resource and Land Use Management, and Security and Foreign Policy; and, 4. Number of annual hits on the Canadian Geospatial Data Infrastructure (CGDI) related to CSA-sponsored (directly and/or indirectly) scientific and operational missions.
Planning and Reporting Continuity:	
RPP 2006-2007: http://www.space.gc.ca/asc/eng/resources/publications/rpp-2006.asp - section2-1 DPR 2005-2006: http://www.space.gc.ca/asc/eng/resources/publications/pr-2006.asp - 3.2	

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	114.1	124.6	113.7
HUMAN (FTEs)	92.4	83.2	76.9

The programs under this Program Activity are divided into 3 clusters: Enabling Research, Space Mission Development and Space Mission Operations.

ENABLING RESEARCH – EARTH OBSERVATION

Four Earth Observation Enabling Research Programs with a combination of accomplishments demonstrate how the following expected results will be measured and attained.

1- EO Mission Concepts – Objective: Assume leadership and provide support in enabling research and development of new space mission concepts leading to the realization of CSA or international EO space missions.

Expected Result #1	Performance Indicators
Industry, government and/or academia conduct mission and payload concept and feasibility studies to establish the technical and/or scientific feasibility and relevance of missions or payloads in order to enable CSA decisions on future EO space missions of interest to Canada.	1. Number of concept (mission and payload) or feasibility studies initiated, pursued or completed. (Target: 7 initiated and 1 completed); and, 2. Number of new missions (Phase 0/A) retained for further implementation. (Target: 1)

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	1.3	1.4	0.8
HUMAN (FTEs)	5.1	5.7	1.1

2- European Space Agency (ESA) Programs in EO – Objective: Through key international partnerships enhance the Canadian industry's technological base and provide access to European market for value-added products and services in the field of EO.

Expected Result #1	Performance Indicator
Successful development and demonstration of advanced technologies, systems, components, or studies provided for in the contracts awarded by ESA to Canadian firms under EO optional programs.	1. Canadian industrial returns in ESA optional programs in EO. (Target: 84% or higher)

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	10.1	9.1	4.2
HUMAN (FTEs)	-	-	-

3- Science Programs for EO – Objective: Co-ordinate the Canadian EO scientific community in order to pursue world-class research space missions to advance our knowledge of the Earth's atmosphere and of global climate-change phenomena.

Expected Result #1	Performance Indicators
Identified opportunities for Canadian scientists to advance understanding and scientific knowledge of atmospheric environment through the use of space-based observations.	1. Number of scientific publications, reports and conference proceedings acknowledging CSA funding (Target: 70); 2. Number of Highly Qualified Personnel (HQP) involved in the program (Target: 140); 3. Number of operating or approved space science research missions (Target: 6) 4. Number of scientific presentations (Target: 110); 5. Number of research partnerships (nationally and internationally) (Target: 15); and, 6. Number of awards granted in the year under the CSA Grants and Contributions Program (Target: 5).

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	1.2	1.3	1.5
HUMAN (FTEs)	3.0	2.3	2.2

4- EO Application Development Programs – Objective: Enhance Canada's ground receiving and data processing systems, develop and demonstrate EO data value-added applications for commercial use and for Canadian government operations.

Expected Result #1	Performance Indicators
Increasing the use of EO data in public and private sectors through the development and demonstration of applications.	1. Number of new EO applications operationally used (Target: 20); and, 2. Number of new field of applications using EO data (Target: 8).

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	13.6	13.1	14.3
HUMAN (FTEs)	11.3	11.3	11.3

Highlights of Expected Accomplishments – Enabling Research (EO)

- Complete the preparation and initiate the preliminary and detailed design definition phases of the RADARSAT-Constellation. Finalize agreements with partners and stakeholders and develop data policy and commercialization plan.
- Continue the Preparatory Program for the use of RADARSAT-2 Canadian government data allocation valued at \$445 million. This program generated research, pilot and demonstration projects from industry, government, universities as well as international partners. New Requests for Proposals will be initiated following the launch of RADARSAT-2 focussing on applications development of the advanced mode of the new satellite and its operationalization.
- Continue satellite data application development and utilization, technology transfer and demonstration to support the growth of Canada's Earth Observation capabilities and value-added industry.
- As part of the Earth Observation for Sustainable Development for Forest program, a Canada-wide forest map will be used to support the completion of the National Forest Inventory and as a baseline in the greenhouse gas international reporting activities. These five-year long initiatives were co-funded by the CSA, the Canadian Forest Service in collaboration with other government departments, the ten provinces and three territories, and several universities across Canada.
- Implement the Coordinated Earth Observation Marine Surveillance project (CEOMS) that will provide an exhaustive understanding of EO needs and requirements for the Marine Surveillance and Security operational stakeholders among the Government of Canada.
- CSA will continue to support the TIGER initiative with the completion of phase 1 projects and preparation for phase 2. TIGER aims to demonstrate the usefulness of Space Based Earth Observation for water management applications in Africa.
- Support the innovative research and development of application using RADARSAT-1 images acquired over hurricanes. In collaboration with the National Oceanic and Atmospheric Administration (NOAA) and other international organisations, CSA will put in place an announcement of opportunity to exploit the unique dataset acquired under the Hurricane Watch program since 1999. The Announcement of Opportunity will be open to the international research community.
- Develop advanced space-borne instruments and user-oriented applications by Canadian companies through the participation in ESA Programs. For example:
 - Canada will participate in the calibration and validation activities of the Earth Explorer Soil Moisture and Ocean Salinity (SMOS) mission.
 - Canadian companies will develop applications in the field of aquaculture, forestry and subsidence, global wetland and Polar monitoring.

- Many scientific teams will continue with projects exploiting the data generated from the Envisat satellite. For example, scientists from Meteorological Service of Canada are leading an international consortium for the development of coupled chemistry dynamic data assimilation models.
- The CSA will complete the assessment of the requirements of the Canadian government users for an optical/hyperspectral mission and will continue a joint study with the Italian Space Agency (ASI) to identify a multi-sensors mission, including an hyperspectral sensor, to meet both Canadian and Italian users need.

SPACE MISSION DEVELOPMENT – EARTH OBSERVATION

One Earth Observation Space Mission Development Program with a combination of accomplishments demonstrates how the following Expected Results will be measured and attained.

- 1- EO Projects – Objective:** Ensure the development, delivery and commissioning of space-qualified systems for EO missions through effective project, quality and engineering management.

Expected Result #1	Performance Indicators
EO projects' deliverables meet mission objectives at critical steps.	1. Safety and Mission Assurance (including Configuration Management) requirements are identified and met for each project (Target: 100%); In accordance with Treasury Board approved Project Approval and Management Framework (PAMF): 2. Mission objectives are met at critical steps of the projects (Target: 85%); 3. Project cost is maintained within authorized levels (Target: 100%); 4. Risks are identified and mitigation plans prepared for each project (Target: 100%); and, 5. Number of approved projects associated with science support (Target: 2)

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	69.7	82.0	81.3
HUMAN (FTEs)	28.4	19.5	17.9

Highlights of Expected Accomplishments – Space Mission Development (EO)

- The assembly, integration and test of the RADARSAT-2 spacecraft at the David Florida Laboratory, along with the operations-preparations activities at CSA St-Hubert, Quebec, and launch campaign in Baikonur, Kazakhstan, will be completed in time for a launch on a Soyuz rocket in July 2007. The initial phase of the commissioning of RADARSAT-2 will be completed by October 2007.
- The CSA will award a contract to a prime contractor for the preliminary and detailed design of the Chinook mission. Chinook, a Canadian-led atmospheric research satellite mission that will be carrying two experiments: Stratosphere Wind Interferometer For Transport studies (SWIFT) and Atmosphere Research with GPS Occultation (ARGO). This mission will advance our knowledge and understanding of our atmosphere and will provide scientific foundation for the sound policy needed to protect the future health of our planet. The data will lead to advances in weather and climate prediction models that are key tools to provide answers on the health of the ozone layer and climate. The three-year mission is currently planned for 2011-2013.
- The CSA will award a contract to a prime contractor for the preliminary, detailed design and manufacturing of the first satellite for the RADARSAT-Constellation, the follow-on program to RADARSAT-2. Three small satellites will be flown in the configuration of a constellation that will provide up to twice daily all weather, day and night coverage of Canadian territory and of most of the world. It will further improve Canada’s ability to manage its resources and environment and improve environment-monitoring, maritime surveillance and disaster management. The launch of the first satellite is planned for late 2012 followed by the other two satellites in 2013 and 2014 respectively.

SPACE MISSION OPERATIONS – EARTH OBSERVATION

One Earth Observation Space Mission Operations Program with a combination of accomplishments demonstrates how the following expected results will be measured and attained.

1- EO Mission Operations – Objective: Operate the space and ground segments for EO mission operations.

Expected Result #1	Performance Indicators
EO Space Mission Operations meet user/client needs as per mission requirements.	1. System performance, as per mission requirements and resources (Target: 80%); 2. Volume of data acquired or delivered as per mission requirements and resources (Target: 10,000 SAR minutes of RADARSAT-1 data and 350 Gbyte of Scisat-1) and, 3. Number of missions in operational phase associated with science support. (Target: 4)

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	15.7	15.6	9.6
HUMAN (FTEs)	30.1	30.2	30.1

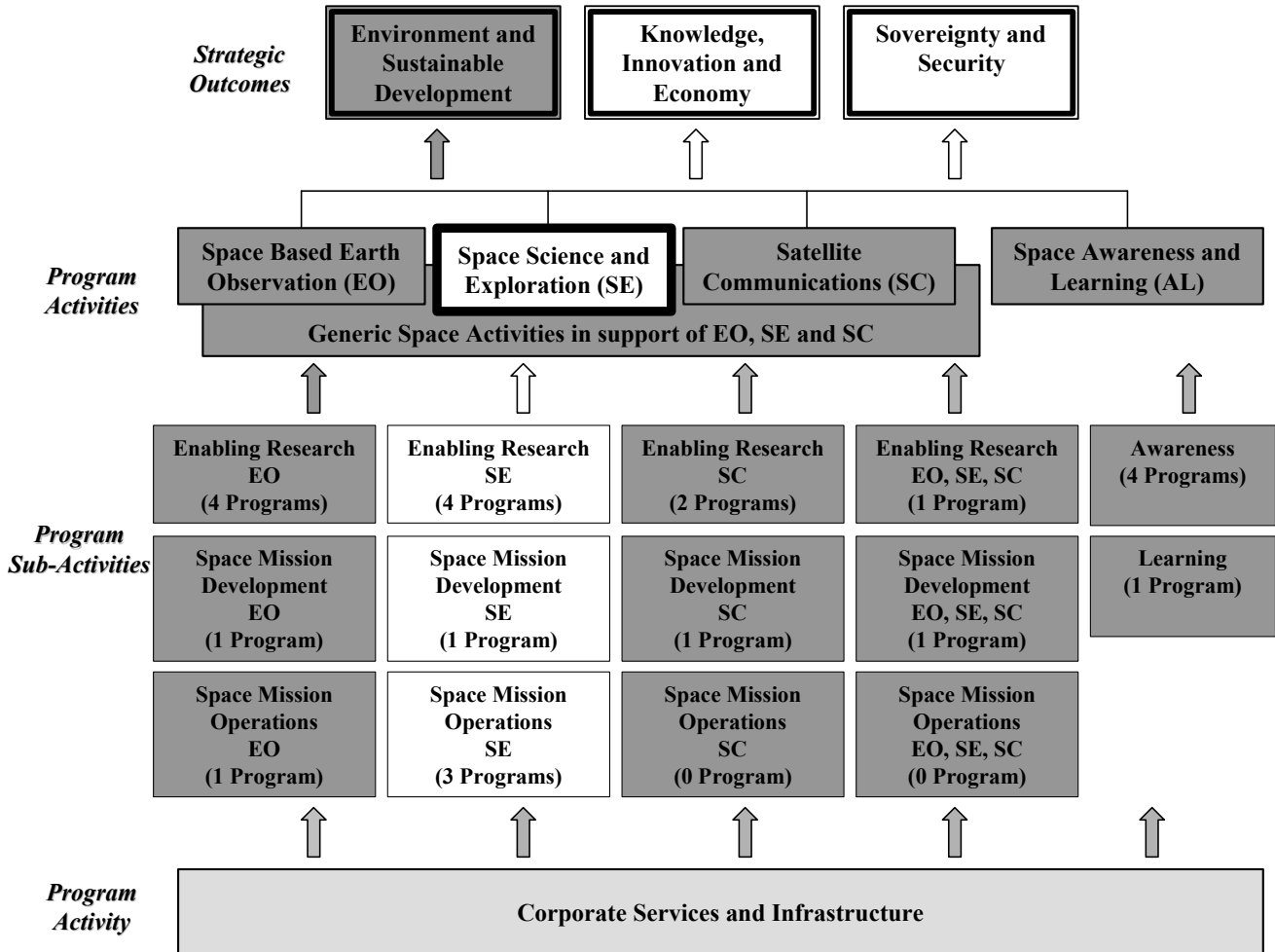
Highlights of Expected Accomplishments – Space Mission Operations (EO)

- RADARSAT-1 operations will continue with the same level of high performance for satellite reliability and image production, ensuring the supply of data until full commissioning of RADARSAT-2 in 2007. A contingency plan is in place to prescribe the use of foreign sensors as backup to RADARSAT-1 in order to continue to meet the needs of operational users until RADARSAT-2 data becomes available.
- Ensure Canada's commitment, as an official member of the International Charter on Space and Major Disasters, to use EO satellites in response to disasters. The CSA regularly contributes RADARSAT data and strategic EO-derived information products upon charter activation
- Canada's SCISAT-1 Atmospheric Chemistry Experiment, launched in August 2003 and operated by the CSA, is yielding an excellent data set. Many articles are being published in peer-reviewed scientific journals and significant scientific results have already occurred that ultimately enhance Canada's understanding and leadership in stratospheric ozone studies. SCISAT focuses on polar ozone budget and dynamics but also contributes to measurements and modeling of mid latitude ozone and upper tropospheric chemistry as well as CFC's greenhouse gases.
- Two major Canadian science instruments are currently orbiting Earth and collecting new environmental data: MOPITT (Measurements of Pollution in the Troposphere) and OSIRIS (Optical Spectrograph and Infra-Red Imaging System). MOPITT, which is aboard the NASA Terra satellite, contributes to our understanding of the sources and pathways of atmospheric pollutants. OSIRIS, which is on-board the Swedish Odin satellite, measures the concentration of various gases in the stratosphere, thereby allowing our scientists to make a significant contribution to the global understanding of stratospheric ozone depletion processes.
- Canada contributed critical subsystems to the cloud probing radar on CloudSat (launched in April 2006) that are functioning perfectly and generating excellent data. The CloudSat mission is, for the first time, measuring the global properties of clouds in order to improve climate-change forecasts. As part of our agreement with NASA relating to CloudSat, the CSA is collaborating with the Meteorological Service of Canada (MSC) to run a comprehensive validation campaign in the Great Lakes region during the winter season.

To learn more about Earth Observation, go to:

<http://www.space.gc.ca/asc/eng/satellites/default.asp?page=observation>

Space Science and Exploration



Program Activity Priority: Understand the Solar System and the Universe, expand our knowledge on the constituent elements and origins of life, and strengthen a human presence in space.

Through this Program Activity, the Canadian Space Agency will sustain and increase Canada’s contribution to the exploration of our solar system and the Universe, and to our knowledge of chemistry, physics and life sciences by carrying out leading-edge experiments in the unique environment of space. The research community and industry will continue to achieve worldwide recognition for excellence, expertise and capabilities in space research and development activities. Space Science and Exploration activities will encourage people at an early stage to pursue education and careers in science and engineering, an essential source of skills in the innovation-based economy.

Continued participation in the International Space Station (ISS) program and full utilization of the ISS facilities contributes to the achievement of the CSA science and exploration objectives. The launch of Dextre, the two-arm dextrous robot joining Canadarm2 and the Mobile Base System on the ISS with a ground controlled capability will further advance the Canadian space robotics technology development which could play a role in future Canadian space exploration activities.

To best achieve this priority, it is also important for the CSA to strategically deploy its Astronaut Corps and actively participate in activities that will leverage Canadian Astronauts' experience, knowledge and skills for flight opportunities. The CSA will develop and maintain a versatile, experienced and healthy Astronaut Corps to further enable science and exploration activities and be a source of inspiration and pride for those watching from Earth.

In doing so, this priority contributes in many ways to the following CSA Strategic Outcomes: Knowledge, Innovation and Economy, and Sovereignty and Security.

SPACE SCIENCE AND EXPLORATION (SE)	
PROGRAM ACTIVITY PERFORMANCE MEASUREMENT	
Expected Result #1	Performance Indicators
Increased participation in Canadian and international opportunities in order to expand the scientific knowledge base made available to Canadian academia and R&D communities in astronomy, space exploration and solar-terrestrial relations, as well as physical and life sciences.	<ol style="list-style-type: none"> 1. Number of participations in Canadian and international space science missions. 2. Rate of successful missions (Total or partial successful Canadian missions/total missions with Canadian participation); and, 3. Number of peer-reviewed papers published in world-class scientific journals as a result of the CSA's participation in Canadian and international missions (papers featuring Canadian academia and/or R&D community).
Planning and Reporting Continuity:	
RPP 2006-2007: http://www.espace.gc.ca/asc/eng/resources/publications/rpp-2006.asp#section2-2 DPR 2005-2006: http://www.espace.gc.ca/asc/eng/resources/publications/pr-2006.asp#3.3	

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	138.5	112.5	98.9
HUMAN (FTEs)	185.0	188.9	182.0

The programs under this Program Activity are divided into 3 clusters: Enabling Research, Space Mission Development and Space Mission Operations.

ENABLING RESEARCH – SPACE SCIENCE AND EXPLORATION

Four Space Science and Exploration Enabling Research Programs with a combination of accomplishments demonstrate how the following expected results will be measured and attained.

1- SE Mission Concepts – Objective: Assume leadership and provide support in enabling research and development of new space mission concepts leading to the realization of CSA or international SE missions.

Expected Result #1	Performance Indicators
Industry, government and/or academia conduct mission and payload concept and feasibility studies to establish the technical and/or scientific feasibility and relevance of missions or payloads in order to enable CSA decisions on future SE space missions of interest to Canada.	1. Number of concept (mission and payload) or feasibility studies initiated, pursued or completed. (Target: 49); and, 2 Number of new missions (Phase 0/A) retained for further implementation. (Target: none)

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	2.0	3.3	3.5
HUMAN (FTEs)	2.5	2.9	2.5

2- ESA Programs in SE – Objective: Through key international partnerships, foster the participation of Canadian academia and the demonstration of Canadian space technologies in European SE missions.

Expected Result #1	Performance Indicator
Successful development and demonstration of advanced technologies, systems, components, or studies provided for in the contracts awarded by ESA to Canadian firms under European Physical and Life programs.	1. Canadian industrial returns in ESA optional programs in SE (Target: 84% or higher).

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	8.3	6.7	5.4
HUMAN (FTEs)	-	-	-

3- SE Programs – Objective: Co-ordinate the Canadian SE community in order to pursue world-class research space missions to advance our knowledge of basic physical and chemical processes, the near-Earth space environment and Earth's electromagnetic field, our solar system, the universe and its evolution, as well as the adaptation of humans and other life forms in the weightless environment.

Expected Result #1	Performance Indicators
Identified opportunities for Canadian scientists to advance exploration readiness and scientific knowledge through CSA, national and international research missions.	1. Number of scientific publications, reports and conference proceedings acknowledging CSA funding (Target: 400); 2. Number of Highly Qualified Personnel (HQP) involved in the program (Target: 480); 3. Number of operating or approved space science research missions (Target: 20); 4. Number of scientific presentations (Target: 420); 5. Number of research partnerships (nationally and internationally) (Target: 80); and, 6. Number of awards granted under the CSA Grants and Contributions Program (Target: 20).

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	8.6	10.5	9.5
HUMAN (FTEs)	18.9	19.4	19.4

4- Human Space Flight Expertise – Objective: Maintain a trained, experienced and versatile Astronaut Corps to meet the needs of the Canadian space science and human exploration community and while doing so increase the opportunities of access to space for Canadian scientists.

Expected Result #1	Performance Indicators
Continue to develop and maintain human space flight expertise to meet the requirements of the CSA's space science and human exploration programs.	1 Canadian astronauts are qualified on all flight vehicles such as Shuttle, Soyuz and ISS (Target: 4 on Shuttle, 2 on Soyuz and 1 on ISS); 2. Canadian Astronauts are recruited according to recruitment plan (Target: Basic training developed); and, 3. Number of space flights and missions to which Canadian Astronauts participate (Target: One: STS-118).

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	2.1	4.0	4.1
HUMAN (FTEs)	6.0	6.0	6.0

Highlights of Expected Accomplishments – Enabling Research (SE)

- Conduct a series of national and international workshops to encourage scientific and technical teams to explore future national and international opportunities relating to space science and exploration.
- Release several announcements of opportunity to the space science and technology research communities to develop the next generation of Canadian scientific investigations, space instruments and/or space science missions and to engage Canadian scientists in "low mass, low volume" research on-board ISS and other free-fall platforms. By developing a repertoire of science "on the shelf", Canadian scientists will be able to take advantage of any and all space flight opportunities
- Continue the program of analogue opportunities in planetary exploration utilizing the Houghton crater on Devon Island, Nunavut as a site geologically analogous to the Moon and Mars. Scientific research will be carried out to help us better understand the history of our own planet while preparing us for robotic and human exploration of the Solar System. The CSA will develop relationships with international partners to provide access to unique analogue sites to Canadian researchers all over the world.
- Through partnership with the European Space Agency (ESA), the CSA will position our scientific and industrial partners in future scientific and technological developments relating to the European planetary exploration program called Aurora and the physical and life sciences program called ELIPS-2.
- Continue to actively participate in the International Bed rest-working group that provides Canadian scientists with access to volunteers who participate in this analogue of physiological changes that are seen in the human body in space.
- Maintain a trained and versatile Astronaut Corps to develop and maintain human space flight expertise to meet the requirements of the CSA's space sciences and human exploration programs. One Canadian Astronaut is currently in the final stages of training for Space Shuttle flight STS-118 (ISS assembly mission 13A.1) scheduled for June 2007. Another is training in preparation for assignment to a long-duration space flight on the ISS. Two other Canadian astronauts are expected to be assigned; one to a Space Shuttle flight before 2010 and one to a second long-duration expedition on ISS in the 2012 timeframe. Canadian Astronauts perform additional duties for NASA and with the International Space Station Program.

- The CSA will continue to prepare for an Astronaut Recruitment Campaign, but such recruitment will not take place until new flight opportunities materialize, over and above those currently existing.

SPACE MISSION DEVELOPMENT – SPACE SCIENCE AND EXPLORATION

One Space Science and Exploration Mission Development Program with a combination of accomplishments demonstrates how the following expected results will be measured and attained.

1- SE Projects – Objective: Ensure the development, delivery and commissioning of space-qualified systems for SE missions through effective project, quality and engineering management.

Expected Result #1	Performance Indicators
SE projects' deliverables meet mission objectives at critical steps.	1. Safety and Mission Assurance (including Configuration Management) requirements are identified and met for each project (Target: 100%); In accordance with Treasury Board approved Project Approval and Management Framework (PAMF): 2. Mission objectives are met at critical steps of the projects (Target: 85%); 3. Project cost is maintained within authorized levels (Target: 100%); 4. Risks are identified and mitigation plans prepared for each project (Target: 100%); and, 5. Number of approved projects associated with science support (Target: 15).

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	59.0	30.7	18.8
HUMAN (FTEs)	27.8	23.2	19.7

Highlights of Expected Accomplishments – Space Mission Development (SE)

- The CSA will complete the production and will support the assembly, test and launch of a Canadian meteorological (MET) station for NASA's Phoenix mission. The operations phase will begin after launch of the spacecraft scheduled for August 2007 and landing on Mars expected in early 2008. To have this instrument launched on this mission will position Canada as a respected and reliable provider of planetary science instrumentation, will provide basic scientific knowledge of the Martian atmosphere, and will permit Canadian scientists to have access to all data from the mission.
- Canadian scientific teams will contribute to an Electric Field Instrument (EFI) for the Swarm Earth Explorer mission. The teams will calibrate the instruments in the laboratory and on orbit as well as develop the instrument simulator and data reduction algorithms. These instruments will precisely measure the electric field at satellite altitudes in order to correct the measurements of the Earth's magnetic fields as well as to better understand the distribution of ions in the near-earth magnetosphere.
- The Enhanced Polar Outflow Probe (e-POP) mission, integrated with the CASSIOPE Mission, is scheduled for launch in 2008. It will probe the upper atmosphere and ionosphere region where solar variability exerts influence on global change in various time scales. The scientific data collected by e-POP will help scientists understand particle exchange and energy coupling processes between the Earth's atmosphere and space environment.
- The CSA has agreed to provide the Indian Space Research Organization (ISRO) with the Flight Detector Subsystem, the Ground Test Subsystem, the Calibration Subsystem, and required flight spares for the UltraViolet Imaging Telescope (UVIT) on-board the ASTROSAT satellite. It is scheduled for launch no earlier than 2008. The CSA participation will guarantee 5% of the observing time for Canadian scientists and obtain ASTROSAT astronomic data.
- The CSA will continue the detail design and manufacturing of the Alpha Particle X-ray Spectrometer (APXS) for the Mars Science Laboratory to be launched by NASA in 2009. The Canadian contribution will help scientists to determine the chemical composition of various soil, dust and rock samples on the planet.
- Canada is participating in the James Webb Space Telescope (JWST), a major facility-class space observatory that will be launched in 2013. The JWST is a successor to the highly successful Hubble Space Telescope (HST). Canada is responsible for the design and construction of the Fine Guidance Sensor (FGS), a critical element of the mission, which ensures the very precise pointing of the telescope and the provision to the international astronomical community of simultaneous images. The design of the FGS will be completed with an expected transition to manufacturing in 2007. By virtue of the CSA's contribution, Canadian astronomers will have guaranteed access to 5% of the observing time of the James Webb Space telescope.

- The CSA has delivered the Local Oscillator Source Unit (LSU) to the European Space Agency and it is being integrated in the Heterodyne Instrument for the Far Infrared (HIFI) of the Herschel satellite. The satellite scheduled to be launched in 2008 will carry an infrared telescope and three scientific instruments that will allow scientists to address key science questions such as how galaxies were formed in the early universe and how stars have been forming throughout the history of the universe.
- The NEOSSat mission, a joint CSA-DND mission, is a combination of the Near Earth Space Surveillance (NESS) and the High Earth Orbit Surveillance (HEOS) projects. It is expected that 50% of NEOSSat time will be used to observe the inner portion of the solar system to discover, track and study asteroids and comets. The other 50% of the operating time will be used to track satellites in high-Earth orbit to update the orbit parameters of known satellites flying over the Canadian territory. NEOSSat is scheduled to launch in 2009. A prime contractor will be selected and preliminary and detailed designs will proceed during 2007.
- The CSA will fly the e-OSTEO space mission in September 2007 that will carry three independent Canadian experiments. These experiments focus on bone loss in space that is one of the major obstacles to long duration space flight. The knowledge acquired will also enhance our understanding of bone loss in general and will have potential applications to osteoporosis. The CSA was given this flight opportunity by ESA in return for CSA lending ESA some e-OSTEO hardware for ESA scientists to repeat the bone experiments that were lost in the tragic loss of Columbia in 2003.

SPACE MISSION OPERATIONS – SPACE SCIENCE AND EXPLORATION

Three Space Science and Exploration Mission Operations Programs with a combination of accomplishments demonstrate how the following expected results will be measured and attained.

1- International Space Station (ISS) – Objective: Provide required CSA operations, training and engineering services to the ISS Program.

Expected Result #1	Performance Indicators
CSA robotics operations and engineering services meet ISS Program (ISSP) and Canadian Space Station Program (CSSP) stakeholders' expectations in accordance with the Intergovernmental Agreement (IGA) and the Memorandum of Understanding with NASA.	1. Percentage of active participation of the CSSP team in the various ISS multi-lateral boards and panels managing the ISSP (Target: more than 95%); 2. Availability of Operations Centre (Target: at least 99%); 3. Rate of training delivered vs. training requested (Target: more than 95%); 4. Percentage of MSS system(s) and operational support availability for planned and unplanned events (Target: more than 95%)

	<p>5. Percentage of software and flight products delivered as required/scheduled (Target: more than 95%); and,</p> <p>6. Rate of payload operational support availability for planned and unplanned events (Target: 100%).</p>
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RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	49.6	46.7	47.2
HUMAN (FTEs)	105.4	112.8	110.8

2- SE Mission Operations – Objective: Operate the space and ground segment for SE mission operations.

Expected Result #1	Performance Indicator
SE Space Mission Operations meet mission objectives and user/client expectations.	<p>1. Sponsoring organization's requirements for payload projects are met at critical steps of the operations (Target: 95%); and,</p> <p>2. Number of missions in operational phase associated with science support (Target: 7).</p>

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	3.4	5.1	5.0
HUMAN (FTEs)	1.4	1.7	1.4

3- Human Space Flight Missions Support – Objective: Manage human space flight missions assigned to the Canadian Astronaut Corps to optimize returns of scientific data and on-orbit operational knowledge.

Expected Result #1	Performance Indicators
Ensure and maintain Canadian Astronauts' health and safety for space flight missions.	<p>1. Number of activities and R&D targeted at maintaining Astronauts' Health and Safety (Target: 4 - Radiation, Nutrition, STS-118 support, Cross-cultural study); and,</p> <p>2. Percentage of participation in ISS Medical Boards, Panels and Working Groups (Target: 100%).</p>

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	2.4	2.4	2.3
HUMAN (FTEs)	10.0	10.0	10.0

Highlights of Expected Accomplishments – Space Mission Operations (SE)

- Continue the implementation of the ground control capability for Canadarm2 and the expansion of the ground control scope to include Dextre (Special Purpose Dexterous Manipulator). These new developments will enable additional capabilities to move the robotic arm by ground personnel without involving the on-orbit crew. Further, the expansion of ground control capabilities to the Dextre robot will enable a more efficient on-orbit commissioning reducing significantly astronaut time requirement for this task. The launch of Dextre is now planned for December 2007 or January 2008 on Shuttle mission STS-123/1J/A. The CSA is also responsible for the training and qualification of all astronauts, cosmonauts and ground support personnel involved in the operations of the MSS including Dextre. Canada is the first country to implement and use this type of technology in space operations.
- Establish operational preparedness for the MSS to support ISS maintenance operations. This will entail the preparation and certification of flight products and procedures to support operations that are not yet fully defined. Launch of Dextre will evolve MSS operations from highly planned and concisely tested assembly operations to more generic and holistic maintenance concepts. This will represent a major philosophical shift to Space Mission Design standards and better position Canada to support future exploration program endeavours.
- The delivery of early MSS-6 software releases will provide a major enhancement to the capabilities of the Canadarm2 in order to better facilitate the capture of free flying vehicles. Canadarm2 will be required to capture the first such vehicle, the Japanese free flying H-II Transfer Vehicle, in July 2009. As such, early versions of the software are required for astronaut training, simulation and mission development.
- The CSA responsibilities for MSS operations will be fulfilled: maintaining and providing technical support for MSS hardware and software; launching two spare Canadarm2 joints to orbit in 2007/08 for pre-positioning in case of on orbit failure of the arm during its life; performing repair and overhaul work on the MSS hardware; operating MSS training facilities in Canada; planning and supporting operations of MSS missions; and conducting operations in conjunction with the NASA Houston flight control room from the Remote Multi-Purpose Support Room, a facility directly supporting robotics operations from St-Hubert, Quebec, with a reliable ground segment capability.
- As part of the Shuttle based ISS Assembly and Maintenance mission STS-118/13A.1 Canadian Astronaut Dave Williams will perform three extra vehicular activities to install a third starboard truss segment and relocate solar panels thus increasing the capacity of the ISS to generate power to support science and operational activities.

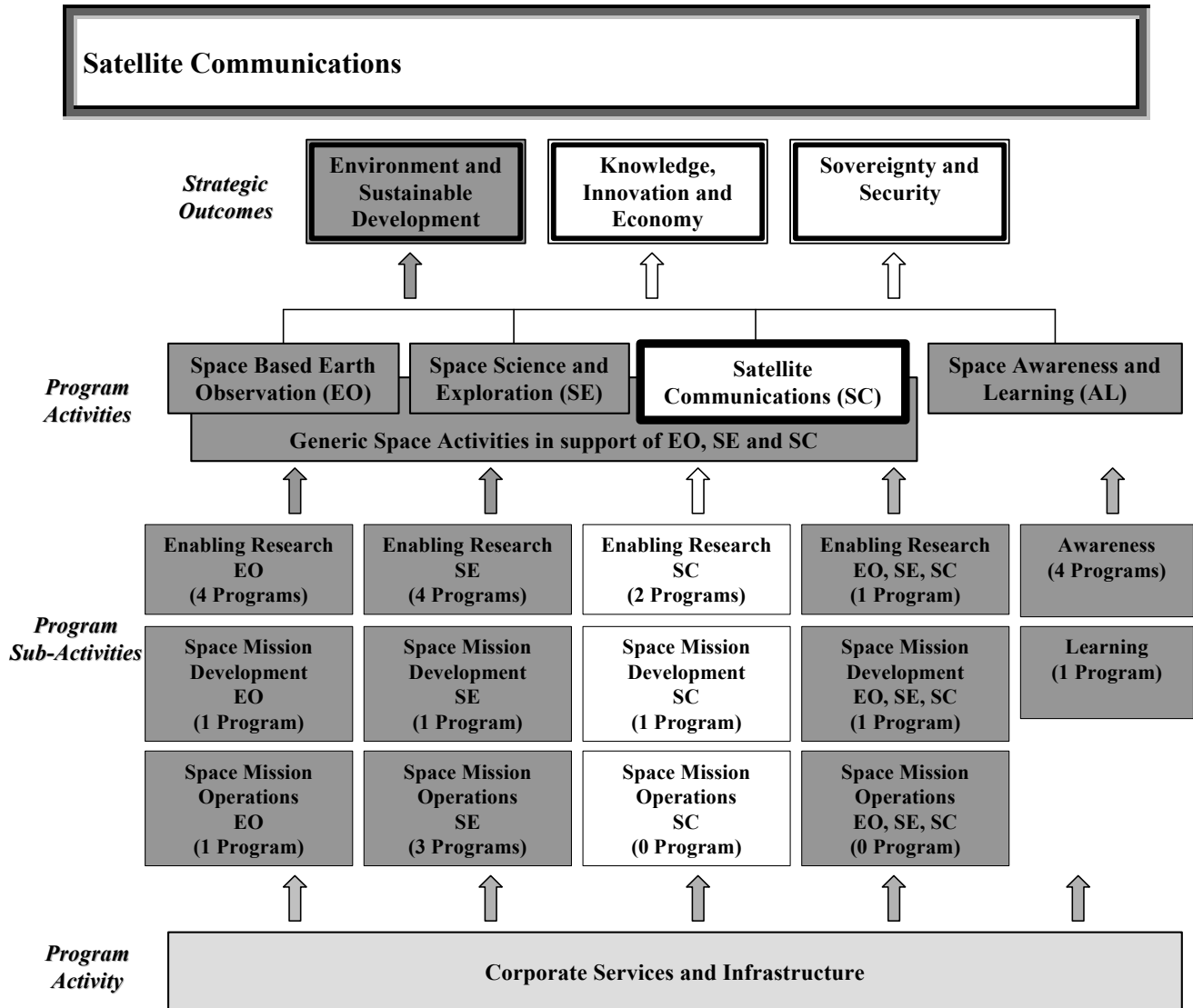
- Operations for the Microvariability and Oscillations of STars (MOST) micro-satellite space telescope, launched in June 2003, will continue. Scientists operating the MOST space telescope have made a major astronomical discovery contradicting previous observations made from Earth-based telescopes on the formation and aging of the Sun and other stars.
- Canadian scientists continue to obtain data from our participation in NASA's Far Ultraviolet Spectroscopic Explorer (FUSE) mission and from the CANOPUS ground-based array of geophysical instruments that complement international solar-terrestrial space probes. Since the initiation of this array in the late 1980's, over 1000 peer-review scientific papers have been published.
- CSA will continue to collect data on the Perceptual Motor Deficit in Space (PMDIS) experiment that seeks to determine the cause of the hand-eye coordination deficits commonly seen in astronauts when they first are in space. PMDIS is the first experiment to use the Canadian International Space Station (ISS) allocation rights. The mission is scheduled to be completed in 2007.
- The CSA is funding the participation of Canadian scientists in the NASA THEMIS mission comprised of a system of 5 satellites and associated ground-observing array for the study of northern lights phenomena. THEMIS will be operational in 2007-2008 and will help to pinpoint where in the magnetosphere the energy of the solar wind transforms explosively into auroras.
- The CSA will continue to support the Microgravity Vibration Isolation System (MVIS) delivered to the European Space Agency (ESA) for integration into its Fluid Science Laboratory (FSL), which will be flown on their Columbus module. Final pre-launch closeout work of all remaining open items will be completed at the Kennedy Space Center, in preparation for a launch in late 2007 on Space Shuttle Mission STS-122/1E. All preparation activities leading to the on-orbit commissioning of the MVIS sub-system will also be supported in 2007. By providing this important component to ESA, Canadian scientists will gain access to this unique laboratory in space.
- Explore how the Advanced Astronaut Medical Support (ADAMS) project can contribute to human exploration in the context of the results of the "Needs and Capacity Study" that was performed in the previous fiscal year. Specifically, this study identified solutions to the delivery of health care on future long duration exploration-class missions, health care needs and solutions for space missions, overlaps with terrestrial remote medicine and capacity within Canada to meet industry, academic, and public sector needs.
- In collaboration with Agri-Food Canada, a one-day bonus menu will be developed for the ISS thus providing a greater variety of nutrition food to astronauts on long-duration missions.

- Collaborate with Russia on one ISS study looking at astronaut radiation exposure.
- Canada has undertaken a study, in collaboration with international partners, to evaluate cross-cultural training requirements for the ISS environment.
- Canada will continue to actively participate at the International Space Station Program medical boards namely: The Multilateral Medical Policy Board (MMPB), the Multilateral Space Medicine Board (MSMB) and the Multilateral Medical Operations Panels and Working Groups (MMOP).

To learn more about Space Science and Exploration, go to:

<http://www.space.gc.ca/asc/eng/sciences/default.asp> and,

<http://www.space.gc.ca/asc/eng/exploration/default.asp>



Program Activity Priority: Provide all Canadians with the means to participate in and fully benefit from the global information age.

The capability for widespread instantaneous communication of information across long distances enables economic growth, fundamentally changes how society operates, and brings down the barriers of distance and culture. Satellites are the most economical way to connect users in remote communities to advanced communication services, since they eliminate the need for extensive ground-based infrastructure, an important factor for Canada, with its large territory and sparse population. Furthermore, the design of new equipment and applications stimulate innovation within the world economy. Through the Satellite Communications (SC) Program Activity, the CSA will uphold Canada's status as a world leader in satellite communications, and extend the most advanced products and services to all Canadians wherever they are.

In doing so, this priority contributes in many ways to the following CSA Strategic Outcomes: Knowledge, Innovation and Economy, and Sovereignty and Security.

SATELLITE COMMUNICATIONS (SC)	
PROGRAM ACTIVITY PERFORMANCE MEASUREMENT	
Expected Result #1	Performance Indicators
Increased access for Canadians to state-of-the-art space communications systems and services to meet their social and economic needs.	1. Gap between current capabilities and future needs of Canadians for satellite communications and the available or expected system's capacity; 2. Percentage of coverage over Canada by satellite and ground systems in place for commercial and governmental usage; and, 3. Utilization rate of AnikF2 Commercial Ka-band payload for Mutli-Media Services and for the service delivery utilizing the \$50 million government capacity credit.
Expected Result #2	Performance Indicator
Better use of space communications, search and rescue, and global navigation satellite systems and applications to improve the efficiency and effectiveness of other government departments in delivering services to Canadians.	1. Number of joint studies and projects between the CSA and other government departments in the field of satellite communications, navigation and search and rescue.
Planning and Reporting Continuity:	
RPP 2006-2007: http://www.espace.gc.ca/asc/eng/resources/publications/rpp-2006.asp#section2-3 DPR 2005-2006: http://www.espace.gc.ca/asc/eng/resources/publications/pr-2006.asp#3.4	

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	25.1	28.2	29.1
HUMAN (FTEs)	11.8	11.6	12.2

The programs under this Program Activity are divided into three clusters: Enabling Research, Space Mission Development and Space Mission Operations. However, no Space Mission Operations are mentioned in this report.

ENABLING RESEARCH – SATELLITE COMMUNICATIONS

Three Satellite Communications Enabling Research Programs with a combination of accomplishments demonstrates how the following expected results will be measured and attained.

1- SC Mission Concepts – Objective: Assume leadership and provide support in enabling research and development of new space mission concepts leading to the realization of CSA or international SC missions.

Expected Result #1	Performance Indicators
Industry, government and/or academia conduct mission and payload concept and feasibility studies to establish the technical and/or scientific feasibility and the relevance of missions or payloads in order to enable CSA decisions on future SC missions of interest to Canada.	1. Number of concept (mission and payload) or feasibility studies initiated, pursued or completed. (Target: 1 initiated); and, 2. Number of new missions (Phase 0/A) retained for further implementation (Target: 1 mission developed).

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	1.7	8.2	15.6
HUMAN (FTEs)	-	-	-

2- ESA Programs in SC – Objective: Through key international partnerships, enhance the Canadian industry's technological base and provide access to European market for value-added products and services in the field of SC.

Expected Result #1	Performance Indicator
Successful development and demonstration of advanced technologies, systems, components, or studies provided for in the contracts awarded by ESA to Canadian firms under SC programs.	1. Canadian industrial returns in ESA optional programs in SC (Target: 84% or higher).

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	12.8	13.1	10.2
HUMAN (FTEs)	-	-	-

Highlights of Expected Accomplishments – Enabling Research (SC)

- Additional demonstration of Ka-band technology will improve the use of AnikF2 by northern communities for trials of innovative government services and in specific areas of interest to other government departments. This will be done by maintaining processor hubs and developing ground terminals, to provide expanded access to Ka-band user and government services in the North.
- A new detailed system definition study for an advanced experimental communications payload will be initiated in early 2007. It is foreseen that this proposed advanced payload would:
 - Economically enhance Canada's security and emergency response capability over the North-American Continent and more specifically over the Canadian North including the increasingly sensitive North-West passage.
 - Galvanize the Canadian space industry into a common goal of providing flight heritage of new Canadian space technology needed to expand Canadian export sales.
 - Provide industry with an opportunity to enter the new enterprise market at Ka-band and to offer continuity and the potential to expand Multi-media Ka-band consumer services.
 - Initiate the pre-development of a joint DND/CSA microsat missions (M3Msat) to demonstrate space-based automatic identification of ships and low rate data messaging.
- Canada's participation in the European Space Agency (ESA) programs allows our industry to access forward-looking studies on new telecommunications services; to develop new technologies, equipment and applications in multi-media, optical inter-satellite and mobile communications; and to demonstrate satellite-based communications services such as interactive communications services for remote communities and disaster management. For example, Canadian companies will:
 - Design novel space antennas for satellite communications to better manage the coverage according to the number of users present and the power available from the satellite.
 - Develop Galileo ground infrastructure to support the monitoring of the quality of the localisation signal generated by the satellite constellation.
 - Demonstrate the feasibility of novel dielectric filter techniques that greatly improve the performance and the channel capacity of satellite communications systems.

SPACE MISSION DEVELOPMENT – SATELLITE COMMUNICATIONS

One Satellite Communications Space Mission Development Program with a combination of accomplishments demonstrates how the following expected results will be measured and attained.

1- SC Projects – Objective: Ensure the development, delivery and commissioning of space-qualified systems for SC missions through effective project, quality and engineering management.

Expected Result #1	Performance Indicators
SC projects' deliverables meet mission objectives at critical steps.	<p>1. Safety and Mission Assurance (including Configuration Management) requirements are identified and met for each project (Target: 100%);</p> <p>In accordance with Treasury Board approved Project Approval and Management Framework (PAMF):</p> <p>2. Mission objectives are met at critical steps of the projects (Target: 85%);</p> <p>3. Project cost is maintained within authorized levels (Target: 100%); and,</p> <p>4. Risks are identified and mitigation plans prepared for each project (Target: 100%).</p>

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	10.6	6.9	3.3
HUMAN (FTEs)	11.8	11.6	12.2

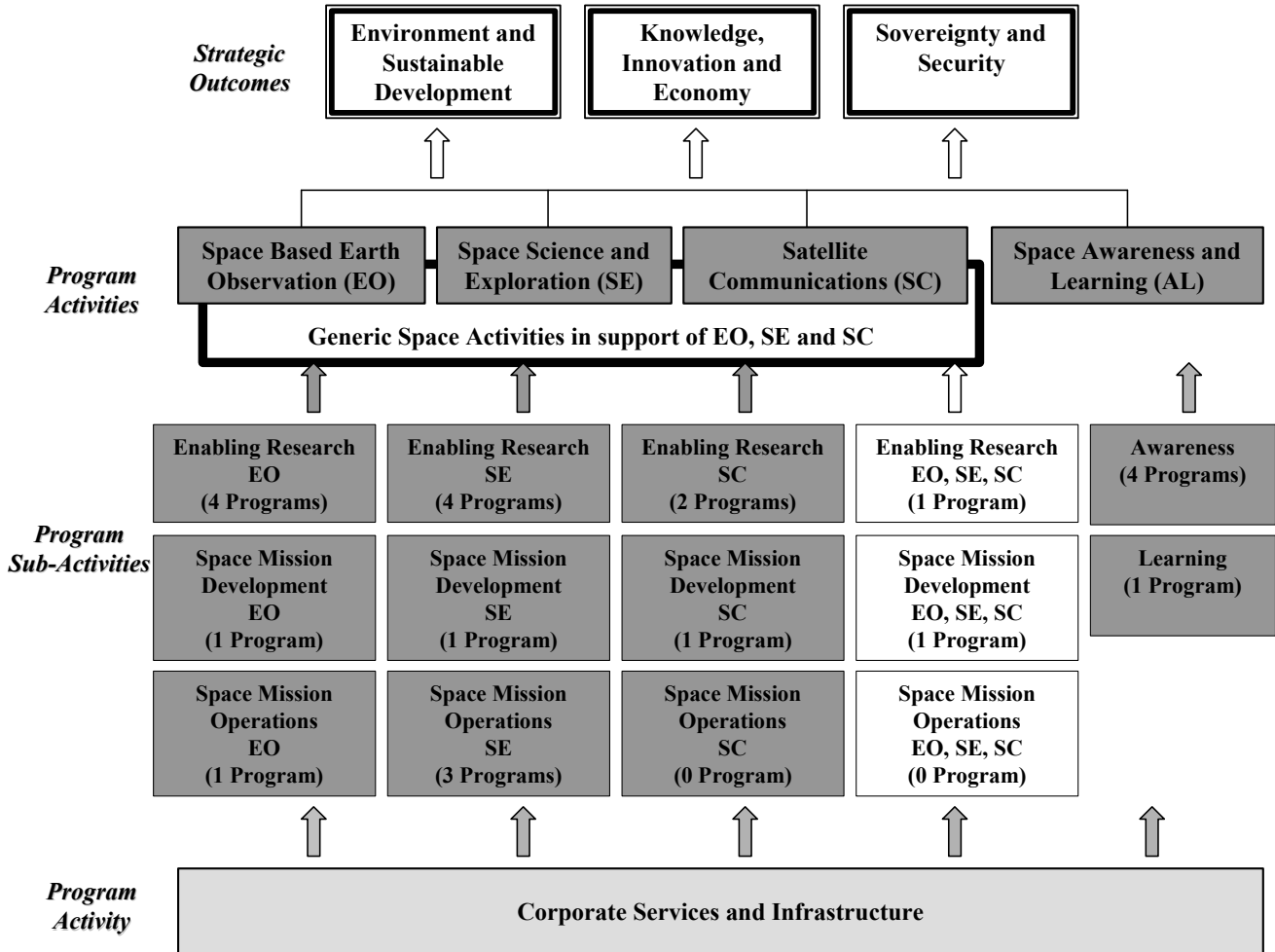
Highlights of Expected Accomplishments – Space Mission Development (SC)

- In 2004-2005, as part of the CASSIOPE Mission Contribution Program, the CSA initiated the development and demonstration of the Cascade telecommunications payload on a small satellite bus. This small satellite spacecraft will be fully designed and constructed by Canadian companies by 2007 and the launch is planned in 2008. Cascade is the precursor of a communication satellite constellation that will help position Canadian industry on the international market, both as a supplier of advanced components and as a service provider of high-volume, high-data-rate telecommunications anywhere in the world.

- CSA and DND are partnering to initiate and manage a second microsatellite project (the first one being NeosSat) which payloads will be an Automatic Identification System (AIS) and a Short Messaging System (SMS), both supported on a microsatellite bus. This project will demonstrate and further develop a multi-mission microsat bus capability; will establish micro-satellites as operationally cost effective; will allow optimization of single-satellite AIS payload in maritime traffic identification; will significantly support canadian industry business development strategies in a global market context; and will provide complementarity with CSA's RADARSAT-Constellation program and with DND's Polar Epsilon program. The launch is planned for late 2009 and end of mission demonstration in 2011.

To learn more about Satellite Communications, go to:
<http://www.space.gc.ca/asc/eng/satellites/default.asp>

Generic Space Activities in support of Earth Observation, Space Science and Exploration, and Satellite Communications



Program Activity Priority: Provide leadership, co-ordination or support to Earth Observation (EO), Space Science and Exploration (SE), and Satellite Communications (SC) Program Activities through technology research and space-qualification activities that are generic in their nature.

The support to Enabling Research is provided through the development of high-risk technologies by industry, academia and non-for-profit organizations and through the maintenance of in-house technical capabilities by conducting advanced R&D projects that meet the criteria of excellence in, and relevance to the implementation of the Canadian Space Program. The support to Space Mission Development is provided by the David Florida Laboratory which carries out world-class and cost-effective environmental space-qualification services for the assembly, integration and testing of spacecraft systems and sub-systems to all of the CSA's programs. In doing so, this priority contributes in many ways to all CSA Strategic Outcomes: Environment and Sustainable Development, Knowledge, Innovation and Economy, and Sovereignty and Security.

GENERIC SPACE ACTIVITIES IN SUPPORT OF EO, SE, AND SC (GSA)	
PROGRAM ACTIVITY PERFORMANCE MEASUREMENT	
Expected Result #1	Performance Indicators
Innovative space technologies, techniques, and design and test methodologies in response to advanced developments required for future space missions and activities.	1. Number of technologies supported through one of the generic R&D programs that are used in a space mission or activity; 2. Number of space missions making use of the DFL; and, 3. Number of peer-reviewed papers as a result of CSA technology generic R&D programs.
Planning and Reporting Continuity:	
RPP 2006-2007: http://www.espace.gc.ca/asc/eng/resources/publications/rpp-2006.asp#section2-4 DPR 2005-2006: Not applicable. The Program Activity appeared in the 2006-2007 PAA.	

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	47.5	48.9	50.4
HUMAN (FTEs)	139.9	144.5	154.5

The programs under this Program Activity are divided into three clusters: Enabling Research, Space Mission Development and Space Mission Operations. However, no Space Mission Operations are mentioned in this report.

ENABLING RESEARCH – GENERIC SPACE ACTIVITIES IN SUPPORT OF EO, SE, AND SC

One Generic Enabling Research Program with a combination of accomplishments demonstrates how the following expected results will be measured and attained.

1- Generic Space Technology Supporting Earth Observation, Science and Exploration, and Satellite Communications – Objective: Assume leadership and provide support in enabling research and development of space-related high-risk technologies leading to the realization of CSA or international EO, SE, and SC missions.

Expected Result #1	Performance Indicators
Development and transfer of advanced space technologies by industry, government, academia and non profit organisations in support of EO, SE, and SC activities of interest to Canada.	1. Number of publications (Target: TBD*); 2. Number of patents (Target: TBD*); 3. Number of technologies brought to higher readiness levels (Target: TBD*);

	<p>4. Number of technologies chosen to enable future space missions and/or commercial products retained by industries (Target: TBD*); and,</p> <p>5. Number of Highly Qualified Personnel (Target: TBD*)</p> <p>*Targets are being recalibrated in the context of the development and implementation of new management and performance frameworks for Generic Space Technology programs.</p>
Expected Result #2	Performance Indicator
Successful development and demonstration of advanced technologies, systems, components or studies provided for in the contracts awarded to Canadian firms under mainly two ESA Programs.	1. Canadian industrial return in ESA optional programs, and at the overall level (Target: 85% or higher).
Expected Result #3	Performance Indicator
Increased number of university scientists and engineers with Ph. D's and/or Master's degrees with research experience addressing real space problems faced by industry and/or government institutions.	1. Number of partnership projects involving industry, universities and the CSA (Target: 5 ongoing projects).

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	39.7	40.9	42.4
HUMAN (FTEs)	97.9	102.5	112.5

Highlights of Expected Accomplishments – Enabling Research - Generic Space Activities in support of EO, SE, and SC

- A new Technology Plan will provide roadmaps and a multi-year implementation plan to guide and prioritize CSA technology programs. Priority technologies are defined in consultation with industry and other stakeholders. With the creation of a mission database, and the identification of technology requirements, CSA will now be able to develop roadmaps and prioritize technology activities.
- Through the Space Technology Development Program, enhance Canada's capabilities in supporting national and international space missions or activities of Canadian interest by awarding new technology development contracts to industry (mainly to small and medium-size companies) and research organizations through annual Requests for Proposals. For example, Canadian organizations will:

- Develop a pico-second laser source with low weight, volume and power consumption intended for future missions to Mars, Moon, and probably asteroids.
 - Develop a novel computer vision algorithms using three dimensional (3D) models and images to improve the reliability of tracking objects in space in harsh conditions.
 - Advance the development of a drill superstructure, drill rod handling, and autonomy towards a low mass and power efficient design capable of deployment in various planetary exploration scenarios.
 - Develop and demonstrate small satellite autonomy technologies in the following three targeted areas: on-board mission task scheduling, on-board fault recovery, and on-board sensor calibration.
- The CSA will extend an advanced DVB-RCS Test Bed to both the Vancouver and Winnipeg AnikF2 Telesat gateway facilities to ensure testing and demonstration of applications for Government's services to be delivered to Northern Communities through the four Northern beams. It will utilize advanced techniques to test and characterize the Ka-band environment without impacting the trials and services being provided. The Vancouver & Winnipeg test hubs will be further upgraded to have high-speed terrestrial interconnectivity. This high-speed connectivity will be extended to Communications Research Centre (CRC) and to Telesat's R&D laboratories as well for full testing flexibility.
 - The CSA will develop a Canadian technology demonstrator receiver, which will serve as test bed to assess feasibility of aviation safety of life requirements. It is expected that at the end of this decade, dual mode GPS/Galileo receivers will become the standard. Galileo will most likely be the key technology that will provide worldwide precision approach being demanded for many years by air transport customers to produce a position fix. This development effort represents a significant leap forward in the development of GNSS technology.
 - Through the Space Technology Research Program develop long-term high-risk space technologies and maintain in-house technical capabilities by conducting advanced R&D projects that meet the criteria of excellence and relevance in support of the implementation of the Canadian Space Program. For example, the program includes the development of:
 - A novel data processing technique that can enhance the image quality of optical instrument with potential applications for Earth observation and security.
 - A smart thermal radiation coating material, which changes its thermal emittance with temperature and will have significant impact on satellite thermal design.

- A unique high fidelity Synthetic Aperture Radar simulator that supports the development of RADARSAT-Constellation.
- Novel guidance, navigation and control technique for spacecraft formation flying, which is essential for the next generation high performance low cost satellite developments.
- The transfer and commercialization of space technologies and their applications to other sectors of the economy will enhance Canada's industrial competitiveness. This is being achieved by managing the CSA portfolio of patents and intellectual property licenses, by conducting commercialization assessments and developing marketing plans for technologies developed in-house, and for technologies developed within the Canadian industry.
- The CSA will launch the Research Partnership Program with the Natural Sciences and Engineering Research Council of Canada to foster closer industry/university collaboration in space research and development.

SPACE MISSION DEVELOPMENT – GENERIC SPACE ACTIVITIES IN SUPPORT OF EO, SE, AND SC

One Generic Space Mission Development Program with a combination of accomplishments demonstrates how the following expected results will be measured and attained.

1- David Florida Laboratory (DFL) supports the Canadian Space Program – Objective: Provide world-class space qualification services on a national scale, including facilities and expertise in support of the Canadian Space Program and international EO, SE and SC missions.

Expected Result #1	Performance Indicator
Development, provision of expertise and supply of space qualification services, functional and environmental testing of space hardware primarily for CSA sponsored programs and projects, and subsequently to the Canadian space industry and other private and public sector clients.	1. Percentage of satisfied clients (Target: 95% or better).

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	6.6	6.7	6.6
HUMAN (FTEs)	42.0	42.0	42.0

Highlights of Expected Accomplishments – Space Mission Development – Generic Space Activities in support of EO, SE, and SC

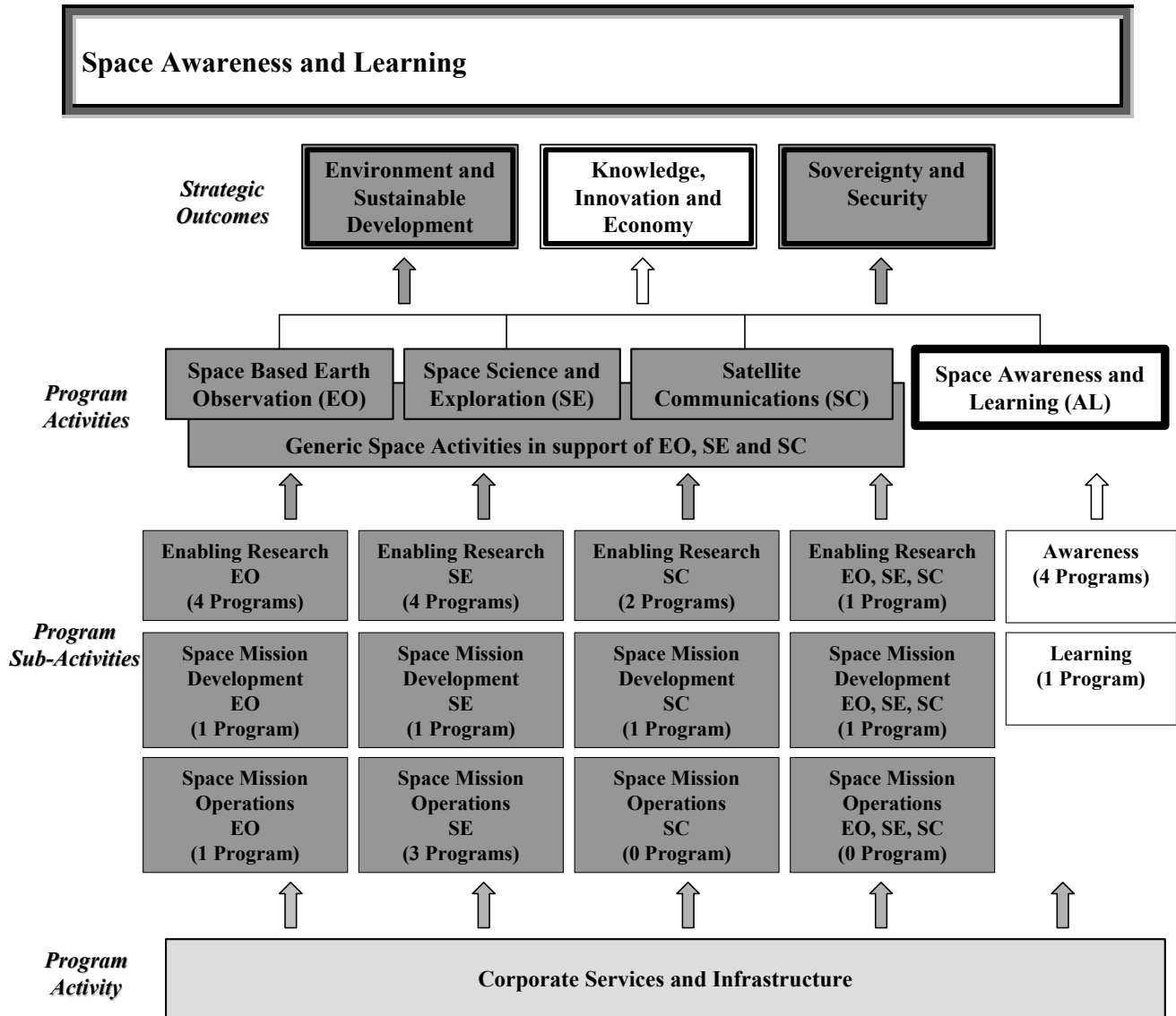
- David Florida Laboratory provides world-class and cost-effective environmental space qualification services for the assembly, integration and testing of spacecraft systems and sub-systems to all of the CSA's programs. Many priority projects will benefit from DFL support, such as for:
 - Earth Observation: RADARSAT-2; Chinook, a Canadian-led mission carrying two experiments; Stratosphere Wind Interferometer for Transport studies (SWIFT), and Atmosphere Research with GPS Occultation (ARGO); and RADARSAT-Constellation;
 - Science and Exploration: CASSIOPE e-POP mission; Phoenix LIDAR and MET instruments; SmallSAT BUS; NeosSat; James Webb Space Telescope (JWST); and the UltraViolet Imaging Telescope (UVIT);
 - Satellite Communications: CASSIOPE Cascade mission; and
 - Commercial Programs: Skynet V, NIMIQ, Terrestar; and SICRAL 1B.

To learn more about Generic Space Technology Supporting Earth Observation, Space Science and Exploration, and Satellite Communications, go to:

<http://www.space.gc.ca/asc/eng/industry/technology.asp>

To learn more about the David Florida Laboratory, go to:

<http://www.space.gc.ca/asc/eng/df/default.asp>



Program Activity Priority: Further public understanding and engagement with regards to space-related issues, ultimately leading to improving the scientific literacy of Canadians.

The Government of Canada is committed to building a 21st century economy by focusing on science and technology. If Canada is to meet the challenge posed by a global economy, Canadians must be encouraged to pursue careers in science and technology – a skilled pool of human capital is at the heart of an innovative economy. We must engage Canadians' interest in science and technology by sharing our discoveries and breakthroughs in meaningful ways that relate to their daily lives. By engaging our youth we will also be fostering science and technology literacy and encouraging them to consider careers in the sciences and technology.

In doing so, this priority contributes to the Strategic Outcomes: Knowledge, and Innovation and Economy.

SPACE AWARENESS AND LEARNING	
PROGRAM ACTIVITY PERFORMANCE MEASUREMENT	
Expected Result #1	Performance Indicator
Increased public awareness of Canada's activities in space and space benefits positively affecting the quality of life of Canadians.	1. Awareness of Canadians measured by telephone survey every three years (Target: Next survey in 2008-2009).
Planning and Reporting Continuity:	
RPP 2006-2007: http://www.espace.gc.ca/asc/eng/resources/publications/rpp-2006.asp#section2-5 DPR 2005-2006: http://www.espace.gc.ca/asc/eng/resources/publications/pr-2006.asp#3.5	

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	6.5	8.0	9.3
HUMAN (FTEs)	26.9	26.8	26.8

The programs under this Program Activity are divided into two clusters: Awareness and Learning.

AWARENESS

Four Awareness Programs demonstrate how the following expected results will be measured and attained.

1- Strategic Communications – Objective: Ensure positioning of the CSA and information supporting the Awareness and Learning program.

Expected Result #1	Performance Indicator
Target audience is reached through outreach activities.	1. Number of initiatives according to targeted audiences (Target: Confirm benchmark).

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	0.5	0.9	1.3
HUMAN (FTEs)	3.6	3.6	3.6

2- Media Relations and Information Services – Objective: Position information through the media and the Web.

Expected Result #1	Performance Indicator
Information is present in the media, particularly on television.	1. Quantity of media initiatives that resulted in informative and positive coverage (Target: Sustain or increase partnerships and initiatives that result in coverage in media).
Expected Result #2	Performance Indicator
Canadians visit the Canadian Space Agency Web site.	1. Number of Canadian visits to the CSA Web site (Target: Sustain or increase visits to the CSA Web site).

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	1.1	1.3	1.4
HUMAN (FTEs)	8.1	8.0	8.0

3- Creative Services, Marketing and Exhibitions – Objective: Position information through direct-marketing activities.

Expected Result #1	Performance Indicator
Target audience receives Canadian Space Agency information.	1. Quantity of products and publications distributed to select audiences through different communications channels (Target: Maintain or increase).
Expected Result #2	Performance Indicator
Target audience receives Canadian Space Agency information through outreach activities with partners.	1. Number of initiatives focused on target audiences (Target: Establish benchmark).

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	1.8	1.9	2.2
HUMAN (FTEs)	5.0	5.0	5.0

4- Astronaut Awareness Tours – Objective: Increase awareness of the Canadian Space Program (CSP) through proactive public appearances by Canadian astronauts throughout Canada.

Expected Result #1	Performance Indicators
Canadians are reached by awareness activities conducted by a Canadian Astronaut.	1. Number of participants reached per astronaut days invested (Target: Gap analysis); 2. Number of events per astronaut days invested - 10% videoconference and 90% visits (Target: 80 events for 72 days of astronauts); 3. Number of provinces and territories visited (Target: 6 provinces and 1 territory); and, 4. Percentage of accepted requests (Target: Approximately 50%).

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	0.2	0.2	0.2
HUMAN (FTEs)	-	-	-

Highlights of Expected Accomplishments – Awareness

The CSA is implementing a proactive and balanced communications strategy focusing on important space achievements. The major communications activities will focus on the following:

- The launch of RADARSAT-2, Canada's next-generation Earth Observation satellite.
- Promotion of the launch of Canadian Astronaut Dave Williams aboard Mission STS-118, who will conduct space walks to continue construction and the scientific use of the International Space Station (ISS).
- The launch of Dextre, the final component and contribution of Canada's space robotics suite to the ISS, a two-armed dexterous manipulator that will enhance construction and maintenance of the ISS.
- The launch of NASA's Phoenix Mars Rover with a Canadian science instrument and weather station aboard.
- The launch of Canada's hybrid small satellite mission CASSIOPE, which contains a high-speed large capacity data communications module (Cascade), and an atmospheric science instrument (e-POP).

- As part of a traveling exhibits program, the development of an interactive exhibit to raise awareness of Canada's scientific expertise and satellite technology supporting sustainable development and the International Polar Year, together with informational products to support museum activities directed at families, youth and educators.
- An increase in outreach activities by astronauts, scientists, engineers and staff taking part in speaking events, conferences or fairs, workshops and presentations.

LEARNING

The Learning Program demonstrates how the following expected results will be measured and attained.

1- Space Learning Program – Objective: Provide Canadian educators and students with targeted educational resources and space learning opportunities to build knowledge and enhance interest in space science and technology.

Expected Result #1	Performance Indicators
Canadian educators and students further their learning related to science and technology through space theme.	1. Number of educators reached through professional development initiatives (Target: Maintain or increase); and 2. Number of students reached through learning activities (Target: Maintain or increase)
Expected Result #2	Performance Indicator
Enhance expertise of Canadian scientists, engineers and physicians in space science, space technology and space medicine through the learning components of the CSA Grants and Contributions Program.	1. Number of students, fellows and medical residents supported through the programs (Target: 19); and, 2. Number of students attending the International Space University supported by the CSA program (Target: 2).

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	2.3	2.9	3.5
HUMAN (FTEs)	5.2	5.2	5.2

Highlights of Expected Accomplishments – Learning

- Increase educator and student participation in space-centred learning initiatives, which encourage youth to pursue studies and careers in the field of science and engineering.

- Enhanced use of targeted and educational space-based materials by not-for-profit and educational institutions, and increased requests for youth-oriented information across Canada.
- Promotion of professional development workshops and the development of teaching materials such as satellite enabled or web-based assisted tele-learning opportunities to respond to the needs of educators.
- Regional tours and partnered initiatives with schools and youth organisations to expand student and educator access to the space science and technology community.
- Implementation of targeted grants, contribution and sponsorship programs in partnership with other federal departments and agencies to support awareness, research and training in space science and technology.
- Through an agreement with the NASA-JSC Aerospace Medicine Clerkship Program and the NASA-KSC Biomedical Office, the CSA's Operational Space Medicine Group will fund four Canadian medical students or residents to attend a four week Aerospace Medicine Elective each year.

To learn more about Space Awareness and Learning, go to:

<http://www.space.gc.ca/asc/eng/media/default.asp>; and,

<http://www.space.gc.ca/asc/eng/educators/default.asp>

Corporate Services and Infrastructure

Program Activity Priority: To implement the government's commitment to modern public service management in accordance with the Management Accountability Framework's (MAF) expectations.

CORPORATE SERVICES AND INFRASTRUCTURE	
PROGRAM ACTIVITY PERFORMANCE MEASUREMENT	
Expected Result #1	Performance Indicator
Corporate Services provide an added value to CSA managers in the performance of their duties.	1. Services provided meet standards set under Government-wide and CSA policies as well as MAF expectations.
Expected Result #2	Performance Indicator
Key corporate risks are addressed and mitigated.	1. Management and mitigation actions are implemented against the four highest priority risks identified in the CSA corporate risk profile.
Planning and Reporting Continuity:	
RPP 2006-2007: http://www.espace.gc.ca/asc/eng/resources/publications/rpp-2006.asp#section2-6 DPR 2005-2006: Not applicable. The Program Activity was not reported in 2005-2006.	

RESOURCES	2007-2008	2008-2009	2009-2010
FINANCIAL (\$ in millions)	36.5	35.3	35.8
HUMAN (FTEs)	252.6	249.5	248.5

1. Corporate Management Services

Corporate services supporting the CSA's activities include: Audit, Evaluation and Review; Communications; Finances; Human Resources; Information Management and Information Technology; Legal Services; Policy, Planning and Relations; President's Office; and Security and Facilities.

CORPORATE MANAGEMENT SERVICES	
PERFORMANCE MEASUREMENT	
Expected Result #1	Performance Indicators
<p>Corporate Services provide an added value to CSA managers in the performance of their duties.</p>	<p>Policy and Planning</p> <ol style="list-style-type: none"> 1. Canadian needs are identified through a number of strategic and socio-economic analyses. (Target: Completed socio-economic studies for future missions in EO, SE and SC) 2. Senior management is accountable for the management of resources and results. (Target: PAA and performance measurement framework approved by TBS) <p>Finance</p> <ol style="list-style-type: none"> 1. Financial statements audited by 2010. (Target: New guidelines set by the General Comptroller are implemented) <p>Human Resources</p> <ol style="list-style-type: none"> 1. Activities, initiatives, guidelines, policies and tools, identified in the Staffing Management Accountability Framework, are drafted and implemented. (Target: 50% of all SMAF elements implemented); and, 2. Human Resources Strategic Management Plan is developed and communicated throughout the CSA. (Target: Finalized plan and 25% of activities implemented) <p>Security and Facilities</p> <ol style="list-style-type: none"> 1. The Policy on Assets and Information Security is implemented by all CSA managers. (Target: The Policy is distributed to all managers).

2- Risk Management

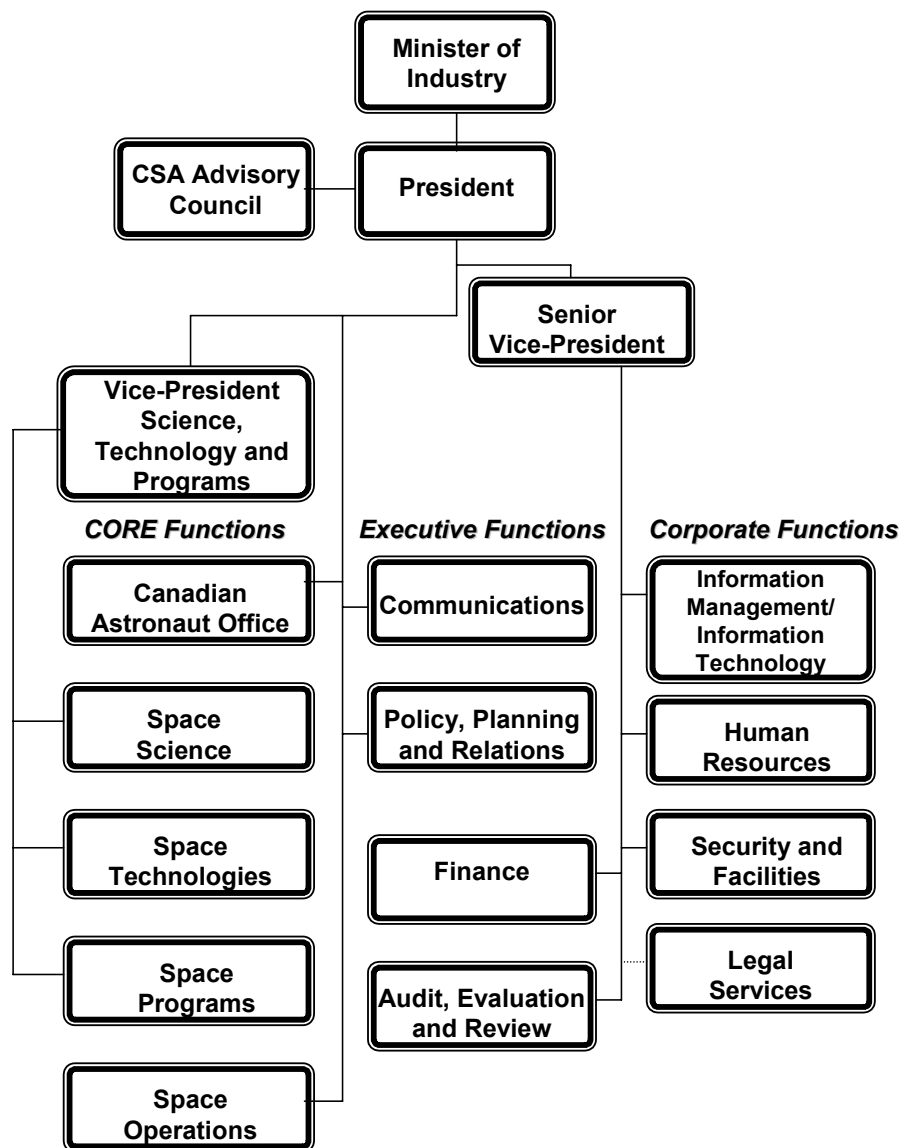
The CSA's capacity to achieve its expected results and strategic outcomes is influenced by its ability to recognize, manage and mitigate risk. In accordance with its commitment to risk-based planning and the integration of risk management into all decision-making processes, the CSA has completed an intensive process of corporate risk identification and assessment. The objective of risk management is to increase the CSA capacity to mitigate the four risks of highest priority in the area of Vision and Strategy, Values and Ethics, Workforce Competencies, and Function/Process Integration.

RISK MANAGEMENT	
PERFORMANCE MEASUREMENT	
Expected Result #1	Performance Indicators
<u>Vision and Strategy:</u> Create a capacity for CSA to strategically plan and allocate its funds based on cutting-edge priorities and in line with Government's objectives.	1. Implementation of a strategic planning cycle aligned with the CSA's current management cycle. (Target: Strategic planning cycle adopted in Spring 2007)
Expected Result #2	Performance Indicators
<u>Values and Ethics:</u> Increase the capacity of the CSA to instil public service values, to develop a working environment free of harassment, and promoting respect for individuals, integrity and honesty.	1. Implement a Public Service Values and Ethics program; (Target: TBD) and,
Expected Result #3	Performance Indicators
<u>Workforce Competencies:</u> Increase the capacity of CSA to maintain a qualified workforce of public servants to deliver CSA's mandate within the government legislative frameworks, policies and rules.	1. The profile of essential qualifications for managers to receive delegation of authority has been established; and, (Target: TBD) 2. The majority of CSA managers are recognized as being qualified for increased delegation of authority. (Target: TBD)
Expected Result #4	Performance Indicators
<u>Function/Process Integration:</u> Increase the capacity of CSA to align its strategies, planning priorities, funding levels, operations and capacity to deliver and to obtain clear understanding and buy-in from managers and staff at all levels.	1. Completed development of socio-economic performance indicators for each of the CSA's strategic outcome and program activity expected results in accordance with the Canadian Space Strategy; (Target: Socio-economic indicators are completed for all program activities and integrated in the RPP 2008-2009) 2. Financial and performance information is integrated in the CSA's work plans by information management systems made available to managers; and, (Target 1: Create systematic links between Work Plan and Financial databases) (Target 2: The Work Plan database is fully implemented and functional for all sectors for the planning and monitoring of 2008-2009) 3. Completed development of a Long-term Investment Plan. (Target: The Plan is approved by CSA Executive Committee)

SECTION 3: SUPPLEMENTARY INFORMATION

3.1 ORGANIZATIONAL INFORMATION

Reporting to the Minister of Industry, the CSA Chief Executive Officer is the President, assisted by the Senior Vice-President and the Vice-President of Science, Technology and Programs. The Policy, Planning and Relations Branch, the Communications Directorate, the Canadian Astronaut Office, and the Space Operations Branch report directly to the President. Three of the core branches report to the Vice-President of Science, Technology and Programs. The five Corporate Services report directly to the Senior Vice-President. Legal Services are provided by the Department of Justice. The organizational chart below became effective as of April 1, 2005.



3.2 DEPARTMENTAL LINKS TO THE GOVERNMENT OF CANADA OUTCOME AREAS

2007–2008

Budgetary							
(\$ in millions)	Operating	Capital	Grants	Contributions and Other Transfer Payments	Total Main Estimates	Adjustments (Planned Spending not in Main Estimates)	Total Planned Spending
<i>Strategic Outcome: The program activities contribute to the three CSA strategic outcomes: Environment and Sustainable Development, Knowledge, Innovation and Economy and Sovereignty and Security.</i>							
Earth Observation (EO)	49.1	67.0	0.5	10.1	126.6	4.2	130.8
Space Science and Exploration (SE)	93.2	49.8	1.2	9.5	153.7	1.1	154.8
Satellite Communications (SC)	6.4	0.2	-	21.3	27.9	-	27.9
Generic Space Activities in support of EO, SE and SC (GSA)	41.9	2.0	0.3	8.6	52.7	-	52.7
Awareness and Learning (AL)	6.0	-	1.0	0.2	7.2	-	7.2
Total	196.6	119.0	2.9	49.7	368.2	5.3	373.5

1. The Program Activity Space Based Earth Observation (EO) contributes to the Government of Canada's "A Clean and Healthy Environment" outcome.
2. The Program Activity Space Science and Exploration (SE) contributes to the Government of Canada's "A Strong and Mutually Beneficial North American Partnership" outcome.
3. The Program Activity Satellite Communications (SC) contributes to the Government of Canada's "Safe and Secure Communities" outcome.
4. The Program Activity Generic Space Activities in support of EO, SE and SC (GSA) contributes to Government of Canada's "An Innovative and Knowledge-Based Economy" outcome.
5. Space Awareness and Learning (AL) contributes to the Government of Canada's "A Vibrant Canadian Culture and Heritage" outcome.

3.3 FINANCIAL TABLES

1. Departmental Planned Spending and Full-Time Equivalents (FTEs)

(\$ in millions)	Forecast Spending 2006-2007	Planned Spending 2007-2008	Planned Spending 2008-2009	Planned Spending 2009-2010
Space Based Earth Observation	136.8	126.6	138.2	127.2
Space Science and Exploration	146.5	153.7	124.9	110.6
Satellite Communications	35.5	27.9	31.2	32.5
Space Awareness and Learning	6.5	7.2	8.8	10.4
Generic Space Activities	48.7	52.7	54.2	56.4
Budgetary Main Estimates (gross) ¹	374.1	368.2	357.4	337.2
Non-Budgetary Main Estimates (gross)	-	-	-	-
Less: Respendable revenue	-	-	-	-
Total Main Estimates	374.1	368.2	357.4	337.2
<i>Adjustments ²:</i>				
Supplementary Estimates				
Operating carry forward	8.7			
Collective agreements compensation	3.8			
Expenditures review procurement savings	(3.2)			
Transfer from Transport Canada Department - for Coordinated Exploitation of Earth Observation for Marine Security (CEOMS)	0.2			
Incremental funding in support of the Internal Audit Policy		0.2		
Reinvestment of royalties from the sale of RADARSAT-1 data	1.6	4.1	4.1	4.1
Capital carry forward (05-06 to 06-07)	1.6			
Capital carry forward (06-07 to 07-08)	(1.0)	1.0		
ARLU				
Reprofiling of funds	(59.5)			
<i>Total adjustments</i>	(47.9)	5.3	4.1	4.1
Total Planned Spending	326.2	373.5	361.5	341.3
Total Planned Spending	326.2	373.5	361.5	341.3
Less: Non-Respendable revenue	4.0	4.9	4.9	4.9
Plus: Cost of services received without charge	4.2	4.7	4.7	4.7
Total Department Spending	326.4	373.3	361.3	341.1
Full-Time Equivalents	618	709	704	701

Note: Due to rounding, decimals may not add up to totals shown.

1. The Program Activities shown in this table include amounts for Corporate Services and Infrastructure.

2. Adjustments are to accommodate approvals obtained since the Main Estimates and include Budget Initiatives, Supplementary Estimates, etc.

2. Voted and Statutory Items

2007-2008			
Vote or Statutory Item	Truncated Vote or Statutory Wording	2007-2008 Main Estimates (\$ in millions)	2006-2007 Main Estimates (\$ in millions)
25	Operating expenditures	185.5	194.4
30	Capital expenditures	119.0	114.7
35	Grants and contributions	52.6	54.3
(S)	Contributions to employee benefit plans	11.1	10.7
Total Department or Agency		368.2	374.1

3. Services Received without Charge

(\$ in millions)	2007-2008
Accommodation provided by Public Works and Government Services Canada (PWGSC)	0.2
Contributions covering employers' share of employees' insurance premiums and expenditures paid by TBS	4.2
Salary and associated expenditures of legal services provided by the department of Justice Canada	0.3
Total 2007-2008 Services received without charge	4.7

4. Summary of Capital Spending by Program Activity

(\$ in millions)	Forecast Spending 2006-2007	Planned Spending 2007-2008	Planned Spending 2008-2009	Planned Spending 2009-2010
Space Based Earth Observation (EO)	26.0	67.0	80.0	79.3
Space Science and Exploration (SE)	27.9	50.9	21.3	11.8
Satellite Communications (SC)	0.1	0.2	3.3	2.3
Space Awareness and Learning (AL)				0.1
Generic Space Activities in support of EO, SE & SC (GSA)	3.1	2.0	1.9	2.2
Total Planned Spending	57.1	120.0*	106.5	95.6

Note: Due to rounding, decimals may not add up to totals shown.

The Program Activities shown in this table include amounts for Corporate Services and Infrastructure.

* The \$120 million includes \$119 million requested in Main Estimates 2007-2008, plus Capital Carry Forward request to be sought through supplementary Estimates (see Table 1).

5.Sources of Respendable and Non-Respendable Revenue

Respendable Revenue

(\$ in millions)	Forecast Revenue 2006-2007	Planned Revenue 2007-2008	Planned Revenue 2008-2009	Planned Revenue 2009-2010
Respendable Revenue	0.0	0.0	0.0	0.0
Total Respendable Revenue	0.0	0.0	0.0	0.0

Non-Respendable Revenue

(\$ in millions)	Forecast Revenue 2006-2007	Planned Revenue 2007-2008	Planned Revenue 2008-2009	Planned Revenue 2009-2010
Space Based Earth Observation				
Royalties from activities related to the RADARSAT program	3.3	4.1	4.1	4.1
Generic Space Activities in support of EO, SE & SC (GSA)				
Testing facilities and services of the David Florida Laboratory	0.7	0.7	0.7	0.7
Satellite Communications				
Revenue of Royalties from intellectual property	0.0	0.1	0.1	0.1
Total Non-Respendable Revenue	4.0	4.9	4.9	4.9
Total Respendable and Non-Respendable Revenue	4.0	4.9	4.9	4.9

Note: Due to rounding, decimals may not add up to totals shown.

6-Resource Requirements by Sector

2007-2008						
(\$ in millions)	Space Based Earth Observation	Space Science and Exploration	Satellite Communication	Space Awareness and Learning	Generic Space Activities in support of EO, SE & SC	Total Planned Spending
Space Programs	68.1	53.6	10.5	0.0	0.0	132.1
Space Technologies	26.1	10.6	14.7	0.0	39.7	91.2
Space Sciences	3.9	21.6	0.0	0.5	0.0	26.0
Canadian Astronauts Office	0.0	4.9	0.0	0.2	0.0	5.2
Space Operations	20.3	50.3	0.3	0.1	7.1	78.1
Corporate Services Sectors	12.4	13.8	2.5	6.4	6.0	41.1
Total	130.8	154.8	27.9	7.2	52.7	373.5

Note:

-Due to rounding, decimals may not add up to totals shown.

-The Program Activities shown in this table include amounts for Corporate Services and Infrastructure.

7-User Fees

Name of User Fee	Fee Type	Fee-Setting Authority	Reason for Planned Introduction of or Amendment to Fee	Effective Date of Planned Change	Consultation and Review Process Planned
Amended Fees charged for the processing of access to information requests filed under the <i>Access to Information Act</i>	Other services (O)	<i>Access to Information Act</i>	Volume change	2007-2008	The number of access requests is increasing; therefore the planned User Fees are increasing accordingly.

8- Internal Audits or Evaluations

2006-2007 Internal Audits or Evaluations

Audits

Management Actions Plans – On-going - Annual Report:

<http://www.space.gc.ca/asc/eng/resources/publications/management-2006.asp>

Management framework of the Space Operations Branch - in-progress - (expected completion by March 31st, 2007)

Contracting Process – in-progress - (expected completion by March 31st, 2007)

Management of Contracts by Sectors – in-progress - (expected completion by March 31st, 2007)

Project Management Processes – in-progress - (expected completion by March 31st, 2007)

Management framework of CASSIOPE Mission Program – Grants & Contributions (G&C) – in-progress - (expected completion by March 31st, 2007)

Management Framework of the Space Science Branch – in-progress - (expected completion by March 31st, 2007)

Evaluations

RADARSAT-1 Program – Major Crown Project (MCP) – in-progress (expected completion by March 31st, 2007);

CASSIOPE-Mission – Grants & Contributions (G&C) – planned (expected completion by March 31st, 2007)

Science & Technologies Program – G&C – planned (expected completion by March 31st, 2007)

The Internal Audit and Evaluation Plan for 2004-2007 was provided to Treasury Board Secretariat but is not currently available on the CSA Website.

2007-2008 Internal Audits or Evaluations

Audits

Management Framework of the Canadian Astronaut Office – planned (expected completion by March 31st, 2008);

Contracting Process – planned (expected completion by March 31st, 2008);

Management of Contracts by Sectors – planned (expected completion by March 31st, 2008);

Management of Travel Expenses, Conferences and Hospitality – planned (expected completion by March 31st, 2008); and

Staffing Operations – planned (expected completion by March 31st, 2008).

Evaluations

RADARSAT-2 Program – Major Crown Project (MCP) – planned (expected completion by March 31st, 2008).

The Internal Audit and Evaluation Plan for 2005-2008 will be made available on the CSA Website in 2007.

Annexes

The annexes are linked to the Report on Plans and Priorities 2007-2008 posted on the Canadian Space Agency Web site at:

<http://www.espace.gc.ca/asc/eng/resources/publications/default.asp#parliament>

8. Details on Project Spending
9. Status Report on Major Crown Projects (MCPs)
10. Details on Transfer Payments Program (TPPs)