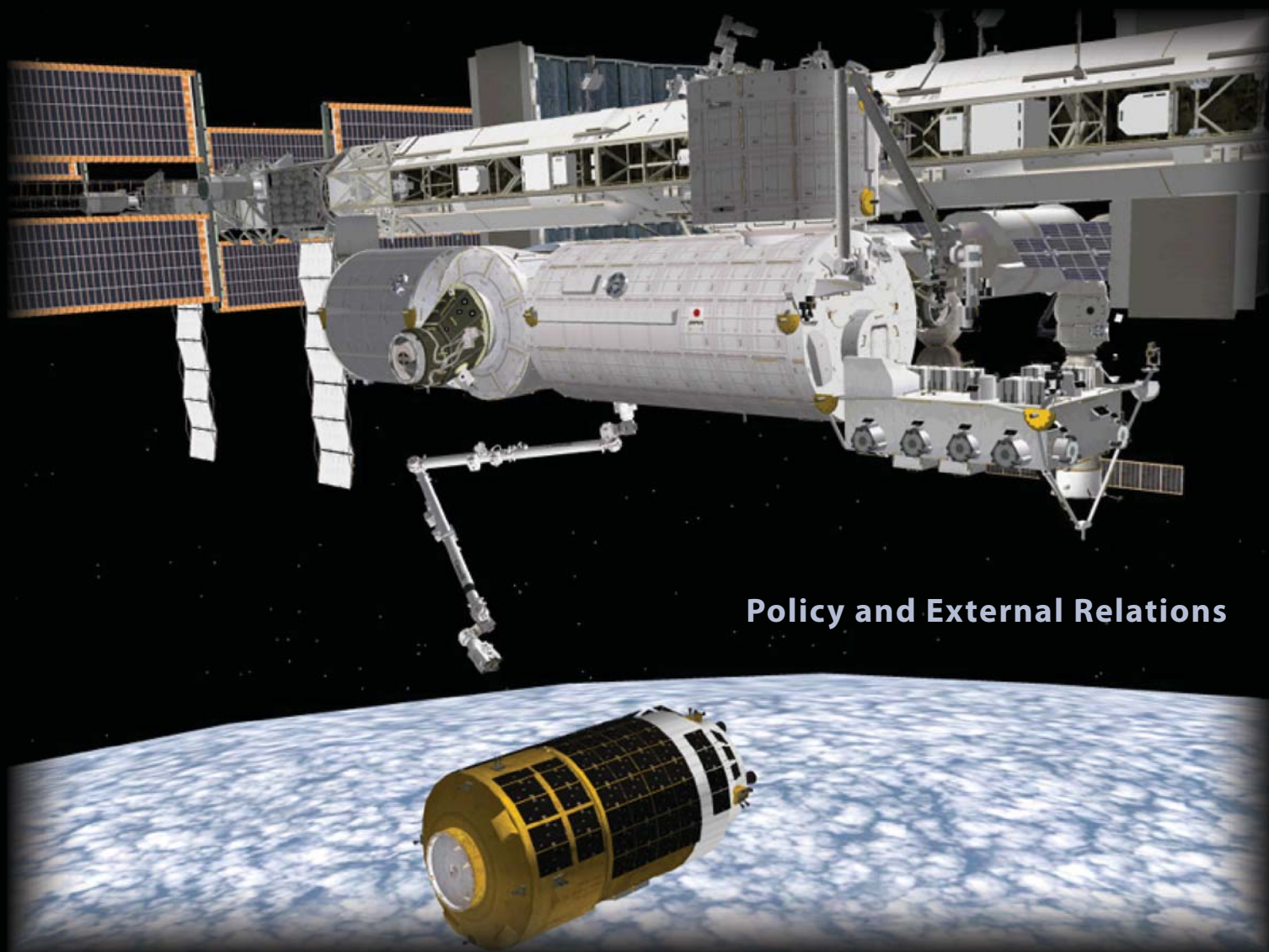




Canadian Space Agency
Agence spatiale
canadienne



STATE OF THE CANADIAN SPACE SECTOR 2009



Policy and External Relations

Canada

Credit: CSA



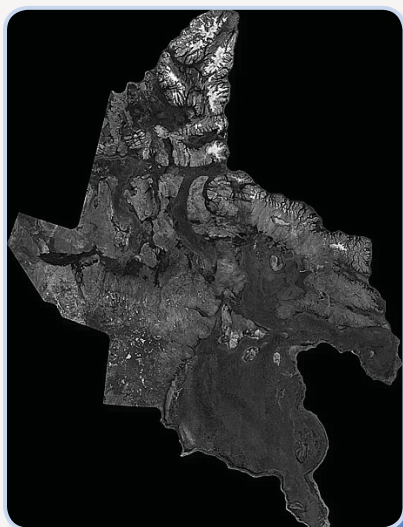
RADARSAT-1 Mosaic of Africa

Credit: CSA



RADARSAT -1 Mosaic of the Maritimes

Credit: CSA



RADARSAT-1 Mosaic of Nunavut

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Note to readers: The Annual Survey of the Canadian space sector has been undertaken since 1996. Comparative analyses of trends across time typically examine a 5-year period. Consequently, in this edition comparison and changes are reported for the 2005 to 2009 period. Readers should consult previous editions for information regarding results prior to 2004. © Government of Canada, 2011. Ce document est également disponible en français.

Cover: The first capture of a free-floating spacecraft by Canadarm2 on September 17th, 2009. Credit: NASA

MANDAT STATEMENT

About the Authors

The Policy & External Relations Directorate (PERD) has prime responsibility for leading the development and implementation of space policies. PERD also manages the strategic relationships between the Canadian Space Agency (CSA) and its domestic and international partners. Key mandates include the development and implementation of strategies relating to co-operation partnerships with domestic stakeholders (Federal and Provincial governments, industry and academia), international agencies and foreign industries. PERD also plays a pivotal role in supporting the commercial initiatives of Canadian space companies in world markets - a core mandate of the CSA - and in providing stakeholders with strategic and timely information.

About this Report

The *State of the Canadian Space Sector* report provides those working in the space sector, government and industry alike, with insight into the sector in which we operate. In turn, this information supports decision-makers in their endeavor to make informed and strategic choices for the future.

The CSA's Policy and External Relations Directorate, has had the prime responsibility in managing this annual survey. Since 1996, the CSA's annual survey, has been tracking the performance of the Canadian space sector. The strong data set is a solid source of longitudinal data on many indicators of performance. For example, a ten-year trend analysis of revenues, both in real dollars and in inflation-adjusted dollars, is available in this report.

The questionnaire follows a census model and reaches out to approximately 200 organizations involved in space activities across Canada. The participants include small to medium enterprises, multinational space companies, not-for-profits, research centers, and universities across Canada.

For more information

Information specific to Canadian space business and industry, including an electronic version of this report, is found at the following address: www.asc-csa.gc.ca (Industry ➤ Publications ➤ External relations).

Acknowledgments

The CSA wishes to acknowledge the contribution of the organizations, both public and private, without which this report would simply not have been possible.

Credit: James Pugsley, Astronomy North



Image of an aurora boréalis, photographed by the AuroraMax Observatory in Yellowknife, Northwest Territories.

***"...to promote the peaceful use
and development of space."***



MESSAGE FROM THE PRESIDENT

I am pleased to take this opportunity to present the Canadian Space Agency (CSA) annual report, *The State of the Canadian Space Sector 2009*. The Canadian space sector plays a valuable role in strengthening the Canadian economy. The Government's Economic Action Plan of 2009 emphasized the importance of developing science and technology to ensure continued growth; as an integral part of S&T, the space sector contributes to the innovativeness and competitiveness of our economy.

The talented men and women who make up the Canadian space workforce are the backbone of the space sector. In 2009, workforce numbers experienced the second fastest growth rate (after 2004) since we started publishing this survey thirteen years ago. The Canadian space sector now employs 7,564 people, of which 3770 are highly qualified professionals.

Revenues for the Canadian space sector broke through the 3 billion dollar mark in 2009, increasing 8% over 2008 results. Both domestic and export revenues drove this growth; representing 51% and 49% of total revenues, respectively. Revenues increased in all categories surveyed with space segment contributing the largest increases with gains of \$111M. Certain sectors of activity such as space sciences continue to decline and will need investments to turn around this trend.

Earth observation and robotics endure as niche areas in which Canada exceeds. In 2009, the CANADARM2 successfully captured a free-floating spacecraft, reaffirming the important role that Canadian space robotics will play in maintaining and resupplying the International Space Station. Earth observation images continue to be as strategic as they are inspiring to people around the world. In 2009, images gathered from the RADARSAT-1 satellite were woven together to create some of the most impressive Earth observation pictures available, via the [Mosaics project](http://www.asc-csa.gc.ca/eng/satellites/radarsat1/mosaic.asp) (<http://www.asc-csa.gc.ca/eng/satellites/radarsat1/mosaic.asp>).

Collaboration with international partners has fuelled new and exciting opportunities for Canadian space companies and the CSA. Canada is a cooperating member of ESA, which enables Canadian organizations to collaborate on European projects; such as the SMOS and PROBA-2, two satellites launched in 2009. Other partners, such as NASA, continue to support some of Canada's most ambitious space projects. Continued cooperation is assured with the US-Canada Framework Agreement on Outer Space, signed in September of 2009; and with the new Cooperation Agreement between Canada and ESA for space science and technology, signed in December of 2010.

I would like to thank everyone who participated in this annual survey. Without your assistance this valuable profile of the Canadian Space Sector would not be possible.

Sincerely,

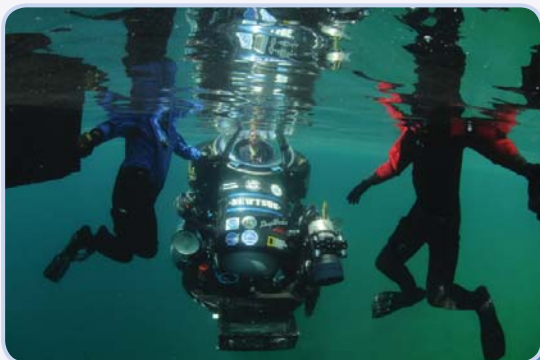


Dr. Steve MacLean
President

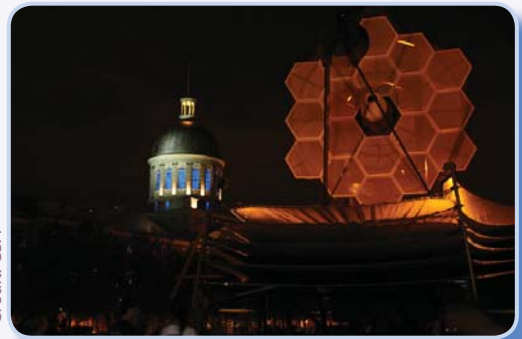


EXECUTIVE SUMMARY

- In 2009, the Canadian space sector generated **total revenues** of **\$3.025B**, reflecting an 8% increase over 2008 results and continuing the upward trend of the past two years. Over the last five years, total revenues generated by the Canadian space sector have increased by 21% or, \$527M;
- Both domestic revenues and export revenues drove the increase in total earnings with 51% and 49% of overall revenues, respectively;
- **Domestic revenues** reached **\$1.534B**, growing at a rate last seen in 2006. Private sources continue to make up the majority of revenues, consistent with previous years' findings (81% private / 19% public sources);
- **Export revenues** remained stable in 2009, reaching **\$1.491B**. Significant gains were made in the export market by organizations operating in Quebec and Atlantic regions. While space exports from Ontario declined slightly in 2009, the province continues to hold the majority of Canada's space export market;
- The Canadian space sector **workforce** grew to an all-time high, adding 822 positions across the country for a total of 7564 space-related employees. Of these, 528 positions were classified as HQP (Highly Qualified Personnel - scientists, engineers and technicians). Workforce increased by 12% in 2009;



Astronaut, Chris Hadfield, dives into Pavilion Lake, B.C. as part of an international research project to study carbonate rock structures.



Credit: CSA

Model of the James Webb Telescope on display in the Old Port of Montreal, July 2009.

- Growth was uneven across the five space sectors surveyed. **Satellite Communications** gained \$180M; **Navigation** decreased by \$12M; **Robotics** increased by a modest \$5M; **Earth Observation** reached \$258M, increasing by \$58M; and **Space Sciences** decreased revenues by \$7M;
- All of the space categories surveyed experienced growth in 2009. **Applications and Services** increased revenues by \$64M; **Space Segment** revenues gained \$111M; and **Ground Segment** gained \$42M. **Space Research** increased revenues by \$15M, reversing the downward trend of the past five years;
- Growth in 2009 was not shared by all, as several of the **top earning companies** experienced less growth than some smaller firms;
- Revenues derived from **manufacturing** have decreased from last year by \$91M for a total of \$605M;¹
- Space Research and Development expenditures totaled \$65.2M in 2009, with 55 organizations currently undertaking space R&D projects;
- Defense related revenues increased by 15% or, \$16M in 2009. Defense revenues totaled \$126M, of which \$100M were export related and \$25M were domestic.

¹ Please note that a typographical error in reporting revenues from manufacturing activities in 2008 has been corrected in this report.

EXECUTIVE SUMMARY (CONTINUED)

Export Revenues for 2009 can be summarized as follows:

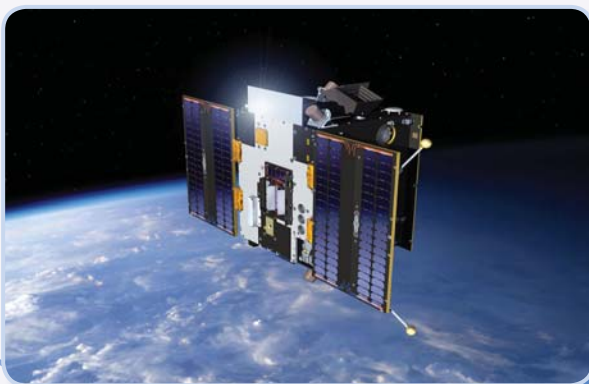
- ▲ The strongest performing export markets for Canada's space organizations continue to be the U.S. and Europe, followed by Asia. However, growth in Europe and Asia was relatively stalled in 2009 compared to the previous year.

Of the \$1.491B in total exports:

- The U.S. market represented 52%, or \$782M;
- The European market represented 27%, or \$408M;
- The Asian market represented 10%, or \$152M;
- The South American market represented 4%, or \$64M;
- Oceania represented 4%, or \$56M;
- Africa represented less than 1%, or \$8M;
- Other markets represented less than 2%, or \$22M.

Regional- Based Space Revenues can be summarized as follows:

- ▲ The proportional share of each region has not changed fundamentally over the last several years.
- British Columbia increased its proportional share slightly, representing 6.04% (\$183M) of total revenues;
- The Prairies decreased their share nominally, representing 7.7% (\$232M) of total revenues;
- For the second year in a row Ontario's proportional share decreased, now 68.7% (\$2.079B) of total revenues, close to 2006 share of revenues;
- Quebec increased moderately to 7.2% (\$216M) of total revenues;
- Atlantic Canada's revenues increased to 10.4% (\$314M) of total revenues.



Proba-2 (Project for On board Autonomy)



SMOS (Soil Moisture Ocean Salinity)

METHODOLOGY

In order to measure the changes taking place in Canada's space sector, the CSA undertakes an annual survey and publishes the results in the State of the Canadian Space Sector report. The 2009 edition profiles the sector over the course of January 1ST to December 31ST, 2009. Data is provided in the following areas:

- Overall space revenues;
- Domestic v. export revenues;
- Revenues of Canada's Top 30 organizations developing and/or using space to generate revenues;
- Revenues by sectors of activity (Satellite Communications, Robotics, Earth Observation, Space Science, and Satellite Navigation);
- Revenues by space categories (Space Segment, Ground Segment, Applications and Services, and Space Research);
- Regional Revenues (British Columbia, Prairies, Ontario, Quebec and Atlantic Canada);
- Workforce characteristics.

Questionnaires were sent to over 200 private sector companies, research organizations and universities in Canada who have a defined strategic interest in the space industry.

It is important to note that the company-specific information used to compile this report remains strictly confidential and cannot be released in a manner other than in an aggregate form². Consequently, in certain circumstances, the authors are prevented from providing a more detailed explanation or in-depth analysis of the results.

Respondents are asked to categorize their space activities according to the following definition:

DEFINITION OF CANADA'S SPACE SECTOR

The Canadian space sector is defined as organizations (private, public and academic) whose activities rely on the development and use of space assets and/or space data

Space Segment: Research and Development (R&D), manufacturing, testing, integration and launch of platforms (satellites, spacecraft and robotic systems), complete systems, subsystems and components

Ground Segment: R&D, manufacturing, testing, and integration of facilities on Earth for controlling space-based systems and satellites, for linking satellites to operational terrestrial networks and for processing satellite-derived data

Applications and Services: Development and/or provision of services and value-added products and technologies that are derived from the use of space systems and/or data, and the provision of consulting and engineering services

Fundamental Space Research: Primarily research related to non-commercial or pre-commercial space activities

² CSA acknowledges a margin of error in the final results of approximately 2.5%.

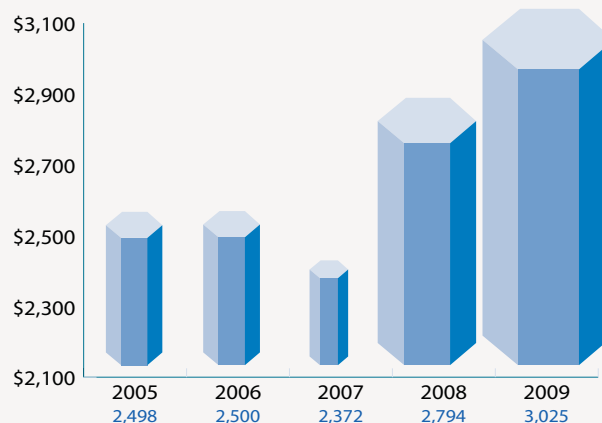
RESULTS

Overall Revenues

Space sector growth in 2009, driven by both domestic and export revenues, continued to be resilient in the face of one of the worst economic crises since the Great Depression. In 2009, total revenues for the Canadian space sector reached an all-time high of \$3.025B, an 8.3% increase (\$231M) over revenues in 2008.

Over the last five years, total revenues generated by the Canadian space sector have increased by 21% or, \$527M. The average growth rate (calculated using Compound Annual Growth Rate³), over the past five years for total revenues is 3.9%, 4.1% for domestic revenues and 3.7% for exports. Growth was slower in 2009 than 2008, but very strong compared to the average rate with total revenues increasing by 8.3% (\$231M), domestic revenues increasing by 10.5% (\$145M), and exports increasing by 6% (\$86M).

Total Space Revenues: 2005-2009 (C\$m)



Domestic vs Export Revenues

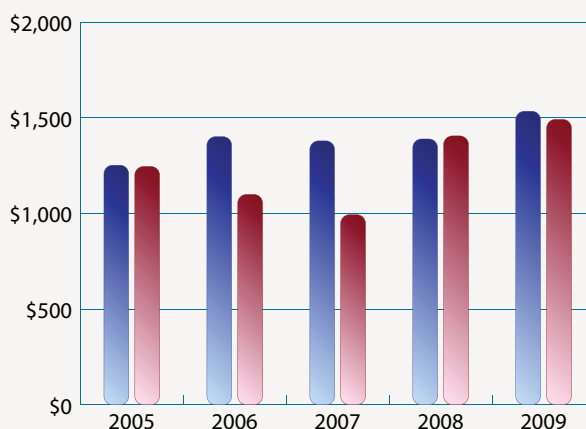
Domestic revenues experienced solid growth, increasing by 10% or, \$145M over 2008 results, reaching \$1.534B in 2009.

Export revenues grew by 6%, or \$86M, reaching an all-time high of \$1.491B.

Export revenues decreased slightly in proportion to domestic revenues, from 50% of total revenues to 49% of revenues in 2009.

With the effects of inflation considered, over the past ten years, domestic revenues have experienced real growth of \$612M, or 66%. By comparison, export revenues, corrected for inflation, have grown by \$710M at a rate of 91% - almost doubling in the span of ten years.

Domestic v. Export Revenues: 2005-2009 (C\$m)



	2005	2006	2007	2008	2009
Domestic	1,252	1,401	1,379	1,389	1,534
Export	1,245	1,099	993	1,405	1,491

³ See Statistics Canada for CAGR formula:
http://www.ic.gc.ca/eic/site/cis-sic.nsf/eng/h_00003.html

RESULTS

Domestic Revenues

Respondents are asked to identify the source of their domestic revenues as either being derived from public (government) or private (non-government) sources.

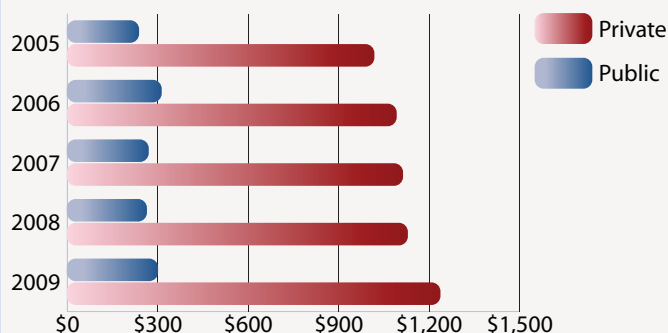
In 2009, the majority of space sector revenues were derived from private sources, weighted by satellite communications.

In 2009, domestic revenues from government sources increased by 14% (from \$262M to \$299M).

Private sources of revenue increased 9.5% (from \$1,127M to \$1,234M).

For the second year in a row, the overall share of private/public derived sources of domestic revenues yielded a ratio of 81%/19%.

Sources of Domestic Revenues
Public v. Private: 2005-2009 (C\$m)



	2005	2006	2007	2008	2009
Public	236	311	268	262	299
Private	1,016	1,090	1,111	1,127	1,235

Revenues Of Canada's Leading Space Organizations

In 2009, 98.1% of the total space revenues were accounted for by the activity of the top 30 Canadian organizations, a constant pattern found in previous survey results, regardless of changes in the composition or rank order of the top 30 organizations.

47 organizations reported revenues in excess of \$1M during 2009, compared with 45 reported in 2008.

Export Revenues

Export revenues remained stable in 2009, managing to keep the big gains that were made in 2008 and increasing by an additional 6%, or \$86M, over 2008 numbers from \$1.405B to \$1.491B in 2009.

In 2009, not all of the top ten earning space organizations benefitted from increased exports; results for some have been effected by double-digit percentage losses over revenues reported in 2008.

Universities and research centers continued to access foreign markets and institutions for business and research grants at a similar rate as in 2008 reaching \$4M in revenues derived from foreign funding.

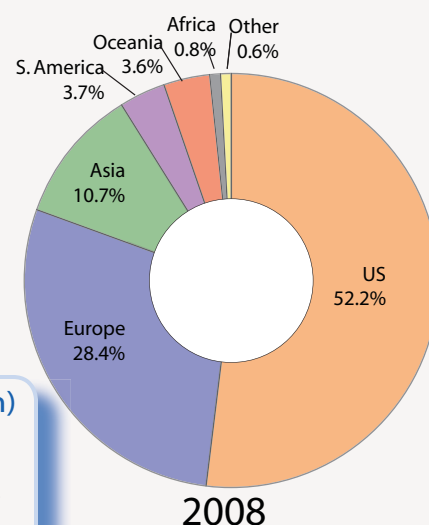
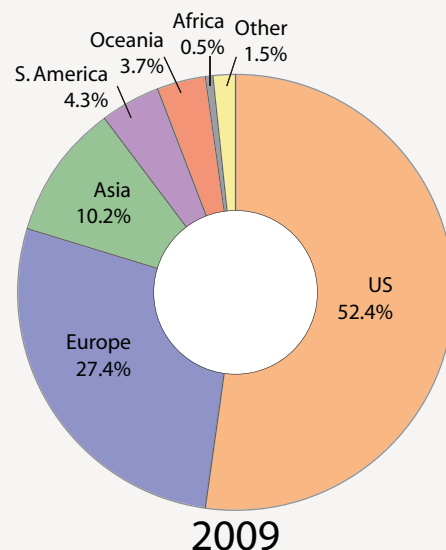
The United States remains the largest market for Canadian space exports, accounting for 52%, or \$782M, of the \$1.491B total exports. Europe remains second overall, accounting for 27% of total exports at \$408M.

RESULTS

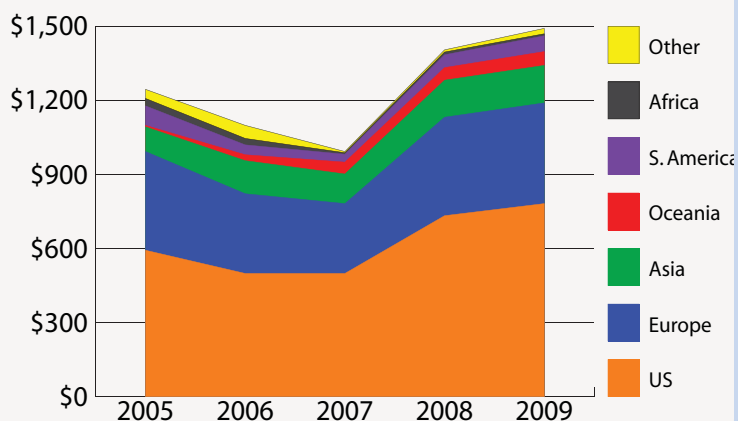
Export Revenues cont.

- Export revenues from the United States drove export gains for the second year in a row, while growth in Europe and Asia remained relatively stalled.
- The American market grew by 7%, or \$49M, over 2008 numbers.
- Exports to Europe increased by 2%, or \$9M, from \$399M in 2008 to \$408M in 2009. Europe accounted for 27% of total exports compared to the 32% share of revenues it had in 2005.
- Export revenues in Asia increased by 1%, or \$2M, from \$150M in 2008 to \$152M in 2009. In 2009, Asia accounted for 10% of total exports compared to the 8% share it had five years ago in 2005.
- Oceania increased export revenues by 9%, or \$4M, from \$51.2M to \$55.6M.
- South America was the fastest growing export market of 2009 increasing by 23%, or \$12M over 2008 results. The region accounted for 4.3% of exports.
- Africa was the only region to experience a decrease in export revenues for 2009. Africa lost 28% of their 2008 revenues, from \$10.8M to \$7.8M in 2009 and continues to account for less than 1% of exports.

Proportion of Export Revenues



Sources of Export Revenues: 2005-2009 (C\$m)



Figures available on Ten Year Trend page 19

RESULTS

Revenues by Space Categories

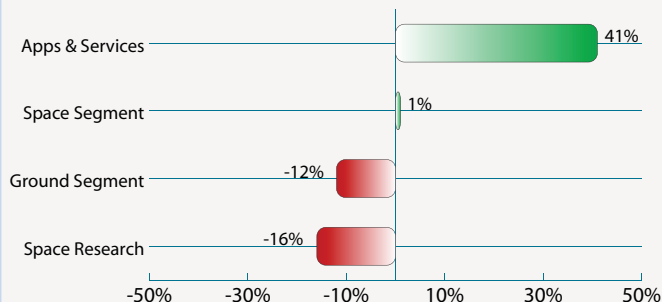
Space Segment: Revenues increased 29%, or by \$111M in 2009, from \$508M to \$619M. In 2009, space segment revenues represented 20% of total space sector revenues.

Ground Segment: Revenues increased 13%, or by \$42M, from \$335M to \$377M. In 2009, ground segment revenues represented 12% of total space revenues.

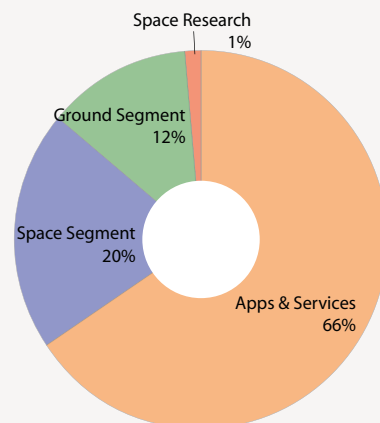
Applications and Services: Growth in Applications and Services slowed in 2009 to a rate of 3%, increasing from \$1.927B in 2008 to \$1.991B in 2009. Despite revenues growing at a slower rate than other categories, Applications and Services continued to represent the majority of total space revenues at 66% of the total.

Space Research: The Space Research category increased revenues from \$24M in 2008 to \$39M in 2009. Growth at 63%, worth \$15M, reversed the downward trend of the previous three years. Space research represented 1% of total space sector revenues in 2009.

Percentage Change of Revenues
by Space Categories over the last 5 years
(2005-2009)



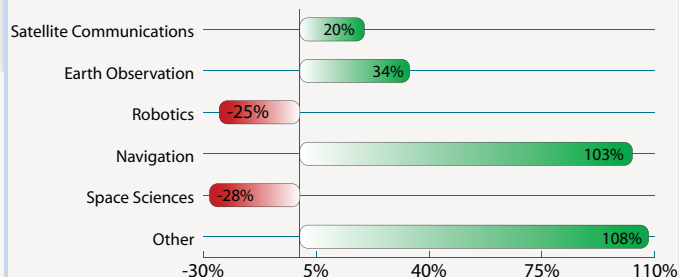
Proportion of Revenues
by Space Categories: 2009



Revenues by Sectors of Activity

In 2009, growth was uneven across the space sectors. Satellite Communication, Earth Observation and Robotics experienced growth, while Space Science and Navigation experienced losses.

Percentage Change of Revenues
by Space Sector of Activity over the last 5 years
(2005-2009)



RESULTS

Revenues by Sectors of Activity cont.

Satellite Communications: This sector is the most commercial activity in the Canadian space sector. In 2009, satellite communications reached \$2.326 Billion. Revenues increased 8%, or by \$180M, from \$2.146B to \$2.326B. The satellite communications sector represented 77% of total space sector revenues in 2009.

Of the \$2.326B in Satellite Communications, \$1.740B (75%) was derived from activities in Applications and Services. Of the remaining 25%, the breakdown is as follows:

- ✦ \$266M is generated from Ground Segment activities;
- ✦ \$313M is generated from Space Segment activities;
- ✦ \$6.5M is generated from Space Research activities;

Over the last 5 years, satellite communications revenues increased 20%, \$388M.

Earth Observation: 2009 was a very strong year for Earth Observation which increased 29%, or by \$58M. Earth Observation revenues represented 9% of total space sector revenues. Over the last 5 years, revenues from this sector have increased 34%.

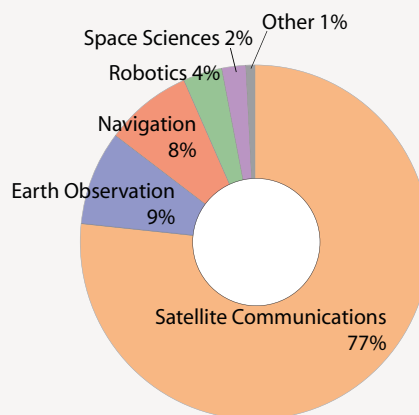
Robotics: Revenues from Robotics increased modestly by 4.5%, or by \$5M, from \$109.6M to \$114.5M, representing 4% of total space sector revenues. Since 2005, revenues from this sector have experienced a decrease of 25%.

Navigation: Revenues from navigation have decreased 5%, or by \$12M, from \$254.5M to \$242.6M, representing 8% of total space sector revenues. Despite this loss, navigation has made important gains in the five year trend analysis. Over the last five years, navigation has doubled revenues, increasing by 103%.

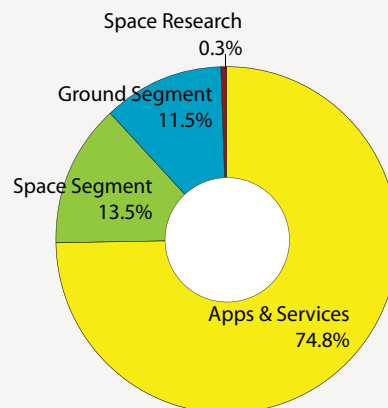
Space Sciences: Revenues from space sciences have continued to decline since 2007. In 2009 the sector decreased by 12%, or by \$7M, from \$68M to \$61M, representing 2% of total space sector revenues. Since 2005, revenues from this sector have decreased 27%.

Other: Revenues from this sector have grown 44%, or by \$7M, from \$16.5M to \$23.7M and represented 1% of total space sector revenues.

Proportion of Revenues by Space Activity: 2009



Breakdown of Satellite Communications Revenues: 2009



RESULTS

Revenues by Region

British Columbia: In 2009, British Columbia's revenues totalled \$183M reflecting an increase of 21% (\$32M). British Columbia's revenues represented 6% of total revenues for the entire space sector.

In 2009, the majority of British Columbia's growth was generated from domestic revenues, while exports remained stalled with less than 1% growth. Domestic revenues rebounded after last year's losses, gaining \$32M, or 56%. Exports gained \$429K (from \$93,606,462 to \$94,035,638).

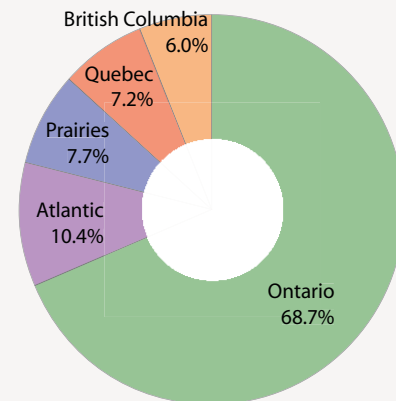
Between 2005 and 2009, B.C.'s total revenues increased 24% (from \$147.8M to \$182.8M). This increase is due to growth in domestic revenues, which have increased by 75% (from \$50.7M to \$88.7M). Export revenues dropped 3.2% over the last five years (from \$97.1M to \$94M).

Prairies (Alberta, Saskatchewan, and Manitoba): The Prairie region was the only region to lose revenues from 2008 to 2009, decreasing slightly by \$2M. The Prairie region continued to hold about 8% of Canada's total space revenues vis-à-vis other provinces. In 2009:

- Alberta held on to most of the gains of last year (in 2008 Alberta doubled its total revenues). However, the province's revenues did decrease slightly 2% (from \$192M to \$188M).
- Saskatchewan decreased total revenues by 21% (from \$37M to \$29M).
- Manitoba was the only region to increase total revenues; reversing the downward trend of the last three years with gains of \$10M over 2008 results.

Despite the setbacks of 2009, the five year trend shows that the Prairie region is in fact growing robustly. In terms of total revenue growth rate, the Prairies outpaced all other regions, growing 88% (from \$123.5M in 2005 to \$232.2M in 2009). This growth was powered by exports, which more than doubled in the last five years with export revenues gaining \$99M, second only to revenue gains in Ontario.

Regional Proportion of Total Revenues: 2009



Ontario: Total revenues for Ontario continued to generate the majority of space sector revenues in 2009, accounting for 69% of all revenues and totalling \$2.079B in 2009.

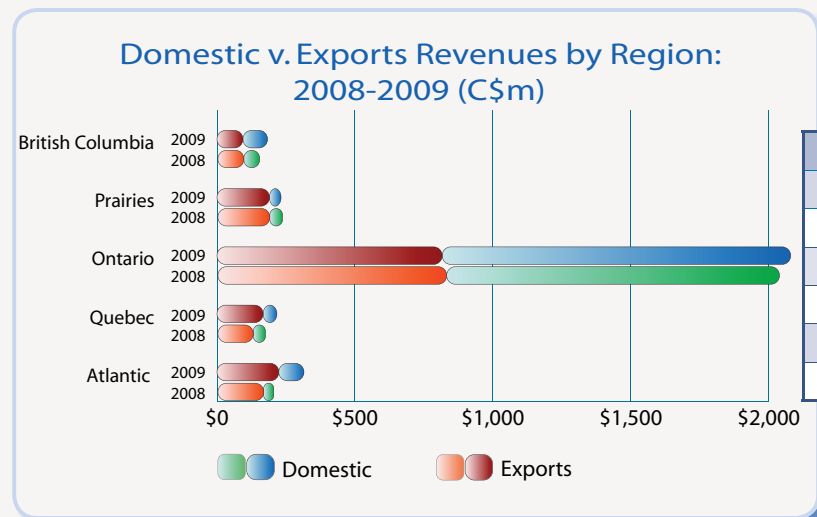
Revenues in Ontario grew a modest 2%, or \$44M from 2008 to 2009. Domestic revenues powered growth in Ontario in 2009; increasing 5%, or \$57M (from \$1.206B in 2008 to \$1.263B in 2009). Exports in Ontario were down 2%, or \$13M, from \$829M in 2008 to \$816M in 2009.

From 2005 to 2009, Ontario revenues have been increasing steadily. Domestic revenues in Ontario have increased by 21%, or \$221M; exports have increased by 35%, or \$210M; and total revenues have increased by 26%, or \$431M.

Quebec: In 2009, Quebec continued to increase revenues in both domestic sales and exports. Total revenues increased 26%, or \$44M; domestic revenues increased by 12%, or \$5.5M; and export revenues increased by 30%, or \$38.8M.

RESULTS

Revenues by Region cont.



	2008		2009	
	Exports	Domestic	Exports	Domestic
British Columbia	94	57	94	89
Prairies	188	46	190	42
Ontario	829	1,206	816	1,263
Quebec	128	44	167	50
Atlantic	166	36	224	91

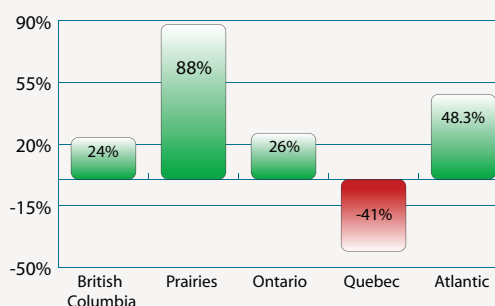
Quebec's revenues have increased for the last two years in a row. However, gains in 2008 and 2009 have not made up for losses that were incurred between 2005 and 2007. For this reason, the five year trend analysis of Quebec still shows decreasing revenues. Over the past five years, total revenues in Quebec have decreased 41% (from 366.7M to \$216.5M); domestic revenues have decreased 55% (from \$109.2M to \$49.6M); and exports have decreased by 35% (from \$257.5M to \$166.8M).

Atlantic Canada (New Brunswick, Newfoundland, Nova Scotia, PEI): In 2009, the Atlantic region continued to grow, increasing revenues at a faster growth rate than any other province at 56%, or \$112M. Growth was strong on the export side, increasing 35%, or \$57.5M; and phenomenal on the domestic side, from \$36M to \$91M.

New Brunswick and Newfoundland drove overall gains in the region. From 2008 to 2009, New Brunswick gained \$52M and Newfoundland gained \$60M. Growth in Nova Scotia was flat, increasing by less than 1%.

Between 2005 and 2009, total revenues have increased 48%, or \$102.4M. Of this, exports have increased 16%, or \$30.4M, and domestic revenues have almost quadrupled from \$18.7M in 2005 to \$90.7M in 2009.

Percentage Change of Total Revenues by Region over the last 5 years (2005-2009)



SPACE SECTOR WORKFORCE

The Canadian space sector workforce experienced an all-time high in 2009, increasing by 12% and adding 822 positions across the country for a total of 7564 space-related employees.

Workforce Groups

Engineers and Scientists continued to comprise the largest category of employment in 2009, employing 2,549 workers, or 34% of the total space sector workforce. All categories of workers showed strong growth in 2009, with the exception of administration. Workers in the **Administration** category make up the second largest proportion of space sector workers at 1,860 people; this number has declined by about 39 people from last year. Employment in the category of **Marketing and Sales** increased by 29%, with 104 more positions than in 2008, reversing the downward trend of the past five years.

The following charts and graphs provide a breakdown of the workforce by space employment categories and the distribution of employment groups working in the Canadian space sector in 2009.

Workforce Groups by Region

British Columbia represented 5% (or, 346 people) of Canada's space workforce in 2009, an increase of 10% from 2008, (or, 32 employees).

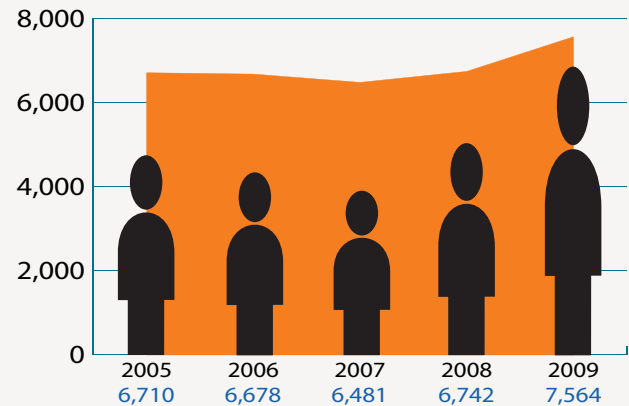
The Prairies represented 10% (or, 731 people) of Canada's space workforce in 2009, an increase of 31% from 2008, (or, 174 employees).

Ontario represented 66% (or, 4,997 people) of Canada's space workforce in 2009, an increase of 7% from 2008, (or, 318 employees).

Quebec represented 11 % (or, 810 people) of Canada's space workforce in 2009, a decrease of 2% from 2008, (or, 19 employees).

Atlantic Canada represented 9% (or, 680 people) of Canada's space workforce in 2009, an increase of 87 % from 2008, (or, 316 employees).

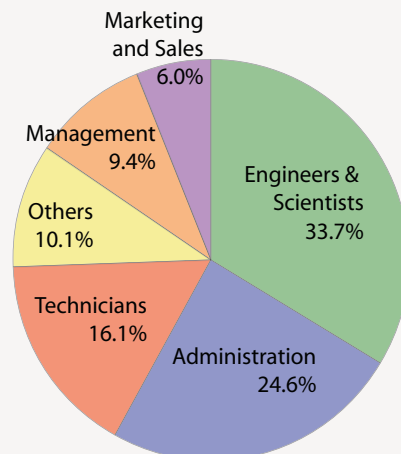
Workforce (2005-2009)



Workforce Groups by Region: 2009

	Management	Engineers & Scientists	Technicians	Marketing and Sales	Administration	Others	TOTAL
B.C.	26	196	68	21	13	22	346
Prairies	51	349	206	73	52	0	731
Ontario	489	1,454	735	268	1,484	568	4,997
Quebec	118	477	93	11	107	5	810
Atlantic	25	73	120	85	205	172	680
TOTAL	709	2,549	1,222	457	1,860	767	7,564

Workforce by Space Employment Categories: 2009



SPACE SECTOR WORKFORCE

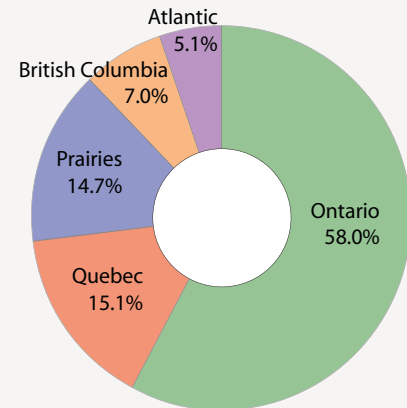
HIGHLY QUALIFIED PERSONNEL (HQP)

The following table reports the percentage of Highly Qualified Personnel (HQP) in relation to each Canadian region, and relative to the national workforce. HQP measurement consists of tracking an approximate number of employed engineers, scientists and technicians in the Canadian space sector. In 2009, HQP in the Canadian space workforce reached 3,770 people.

- 7% of Canada's total space sector HQP work in B.C. while 76.3% of B.C.'s space sector workforce are HQP;
- 14.7% of Canada's total space sector HQP work in the Prairies while 75.9% of the Prairies space sector workforce are HQP;
- 58% of Canada's total space sector HQP work in Ontario while 43.8% of Ontario's space sector workforce are HQP;
- 15.1% of Canada's total space sector HQP work in Quebec while 70.4% of Quebec's space sector workforce are HQP;
- 5.1% of Canada's total space sector HQP work in Atlantic Canada while 28.4% of Atlantic Canada's space sector workforce are HQP.

In sum, Ontario employs the largest share of Canada's HQP workforce. Interestingly, while British-Columbia employs the least amount of space sector employees among all the regions, the region's workforce is highly skilled with 76% of its employees working as engineers, scientists and technicians.

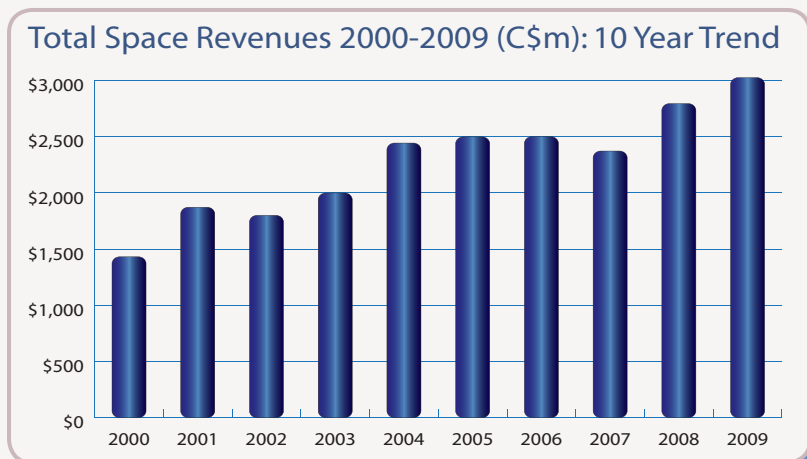
Highly Qualified Personnel
Space Workforce in Canada: 2009



Highly Qualified Personnel (HQP) : Engineers, Scientists and Technicians						
	Total revenues by region (C\$m)	Proportional Share of total revenue	Total n of workforce	Total n of HQP	% of HQP relative to its own provincial workforce	% of HQP relative to national HQP workforce
B.C.	\$183M	6.0%	346	264	76.3%	7.0%
Prairies	\$232M	7.7%	731	555	75.9%	14.7%
Ontario	\$2,079B	68.7%	4,997	2,189	43.8%	58.0%
Quebec	\$216M	7.2%	810	570	70.4%	15.1%
Atlantic	\$314M	10.4%	680	193	28.4%	5.1%

TEN YEAR TREND: 2000-2009

Overall Results : 2000-2009*



Year	Overall Revenues	Domestic Revenues		Export Revenues		Workforce
	(C\$)	(C\$)	%	(C\$)	%	n
2009	3,024,841,967	1,533,689,499	51	1,491,152,468	49	7,564
2008	2,793,722,219	1,388,532,603	50	1,405,189,616	50	6,742
2007	2,372,145,807	1,379,400,092	58	992,745,715	42	6,481
2006	2,500,364,235	1,400,914,765	56	1,099,449,470	44	6,678
2005	2,497,711,781	1,252,251,094	50	1,245,460,687	50	6,710
2004	2,442,685,155	1,234,981,072	51	1,207,704,083	49	7,179
2003	1,999,433,240	1,201,312,758	60	798,120,482	40	6,122
2002	1,800,139,269	1,072,633,400	60	727,505,869	40	5,789
2001	1,871,511,842	1,077,212,382	58	794,299,460	42	6,275
2000	1,430,941,403	774,729,039	54	656,212,364	46	5,950

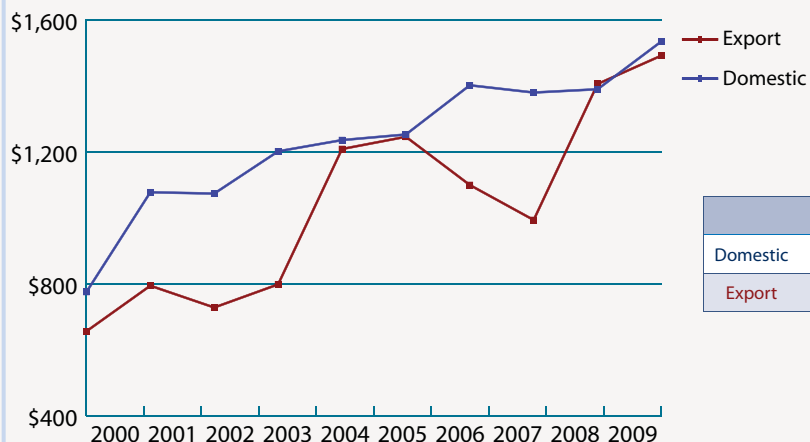
* This chart reflects values not inflation-adjusted.

INFLATION ADJUSTED REVENUES : 2000-2009

Year	Overall Revenues	Domestic Revenues	Export Revenues
	(C\$)	(C\$)	(C\$)
2009	3,024,841,967	1,533,689,499	1,491,152,468
2008	2,796,162,151	1,389,745,295	1,406,416,855
2007	2,435,913,167	1,416,480,379	1,019,432,427
2006	2,628,823,314	1,472,888,367	1,155,934,947
2005	2,652,806,025	1,330,009,039	1,322,796,985
2004	2,660,947,897	1,345,331,091	1,315,616,805
2003	2,228,940,168	1,339,206,634	889,733,533
2002	2,038,497,631	1,214,661,933	823,835,698
2001	2,186,292,121	1,258,394,893	927,897,228
2000	1,702,864,847	921,951,691	780,913,155

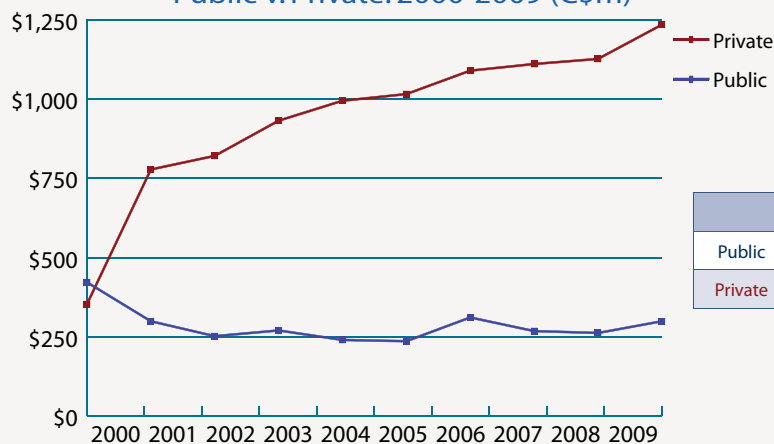
TEN YEAR TREND: 2000-2009

Domestic v. Export Revenues: 2000-2009 (C\$m)



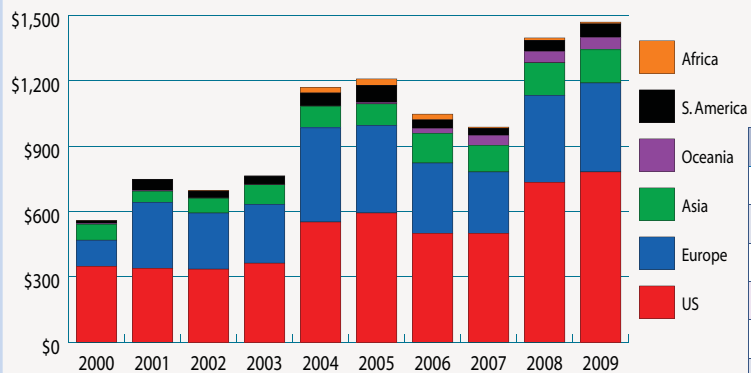
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Domestic	775	1,077	1,073	1,201	1,235	1,252	1,401	1,379	1,389	1,534
Export	656	794	728	798	1,208	1,245	1,099	993	1,405	1,491

Sources of Domestic Revenues
Public v. Private: 2000-2009 (C\$m)



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Public	422	299	252	270	240	236	311	268	262	299
Private	353	778	821	932	995	1,016	1,090	1,111	1,127	1,235

Sources of Export Revenues: 2000-2009 (C\$m)

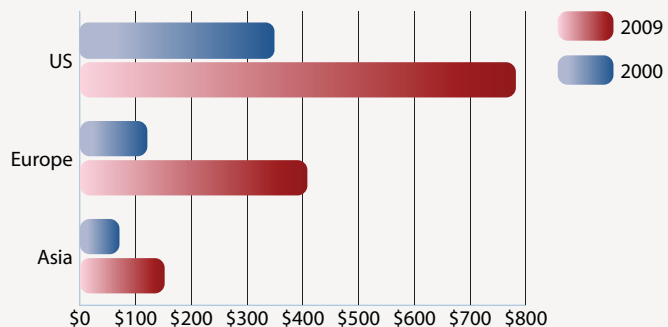


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
US	348	339	336	363	552	593	499	499	733	782
Europe	121	302	258	269	432	401	323	283	399	408
Asia	71	53	68	91	97	100	134	120	150	152
Oceania	5	2	2	2	4	6	24	48	51	56
S. America	13	52	31	37	60	79	40	32	52	64
Africa	2	0	0	1	25	30	26	6	11	8
Other	97	46	33	35	38	37	53	5	9	22

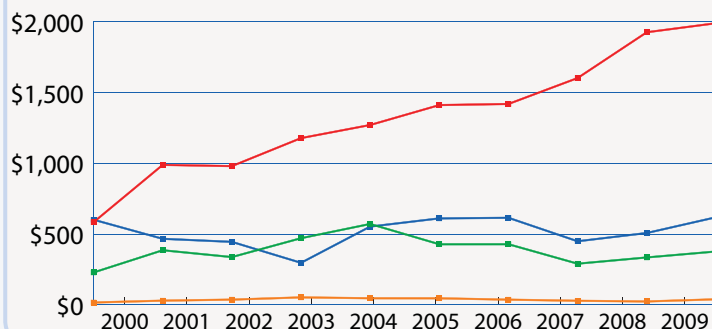
TEN YEAR TREND: 2000-2009

	2000	2009
US	348	782
Europe	121	408
Asia	71	152

Sources of Export Revenues: 2000-2009 (C\$m)

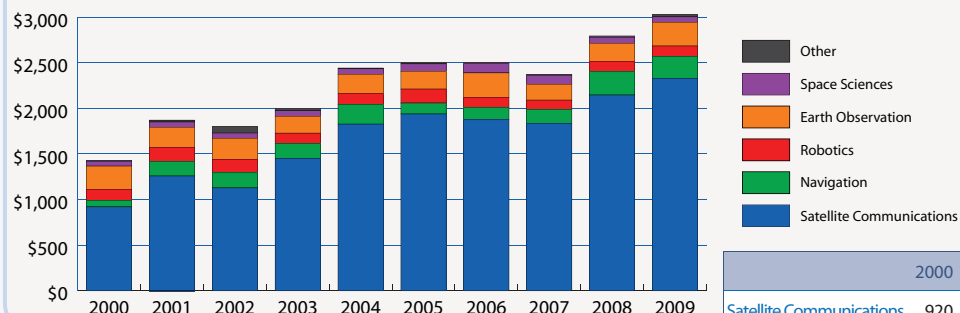


Total Revenues by Space Category: 2000-2009 (C\$m)



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Space Segment	602	467	445	297	553	611	615	449	508	619
Ground Segment	229	386	338	471	572	428	428	291	335	377
Applications and Services	584	989	981	1,179	1,271	1,412	1,420	1,604	1,927	1,991
Space Research	16	30	37	53	46	46	37	29	24	39

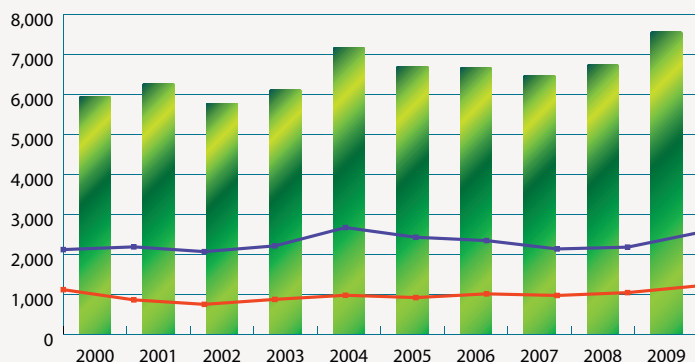
Revenues by Sectors of Activity: 2000-2009 (C\$m)



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Satellite Communications	920	1,261	1,128	1,447	1,827	1,938	1,874	1,832	2,146	2,326
Navigation	67	155	165	165	212	120	132	155	254	243
Robotics	126	156	146	116	122	153	113	103	110	114
Earth Observation	254	219	232	184	211	192	269	168	200	258
Space Sciences	52	59	58	62	61	84	100	102	68	61
Other	12	21	71	26	9	11	12	13	16	24

TEN YEAR TREND: 2000-2009

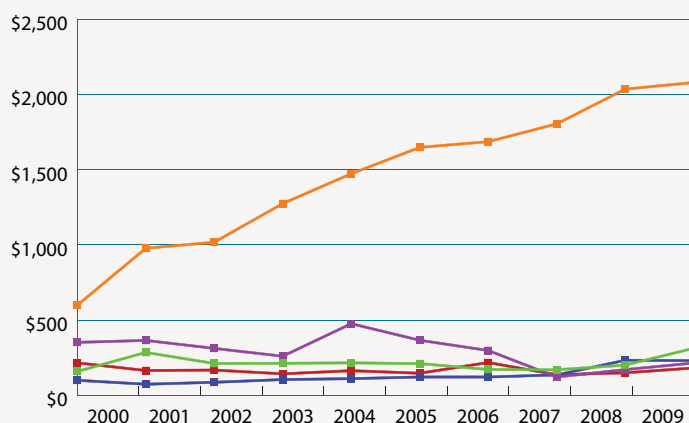
Workforce by Type of Employment: 2000-2009



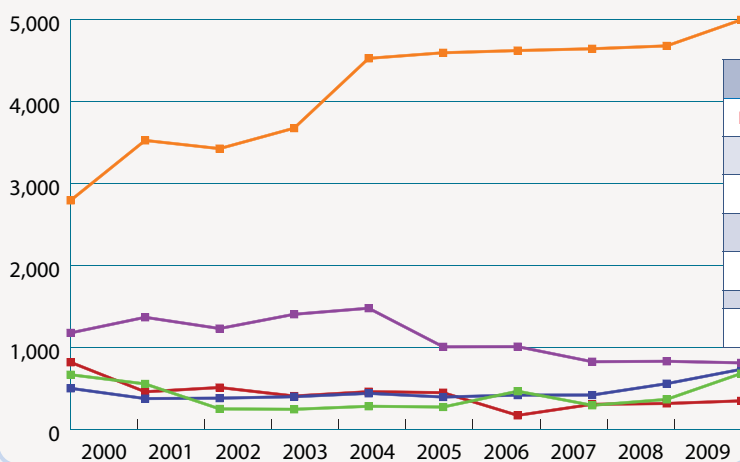
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Workforce	5,950	6,275	5,789	6,122	7,179	6,710	6,678	6,481	6,742	7,564
Engineers & Scientists	2,128	2,196	2,077	2,221	2,679	2,436	2,353	2,144	2,189	2,549
Technicians	1,127	872	760	884	987	929	1,022	982	1,053	1,222

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
British Columbia	217	116	169	144	165	148	219	138	151	183
Prairies	101	75	88	106	112	123	123	137	234	232
Ontario	600	978	1,018	1,275	1,473	1,648	1,686	1,804	2,035	2,079
Quebec	353	366	313	261	477	367	299	123	172	216
Atlantic	160	286	213	214	217	212	173	171	202	314

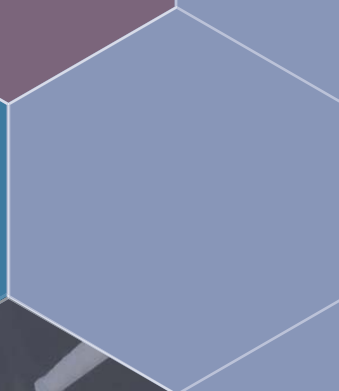
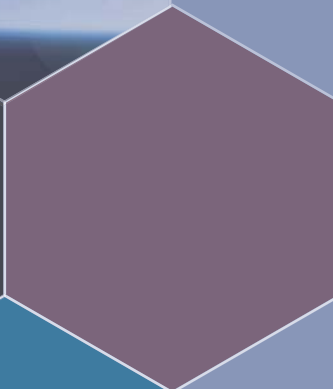
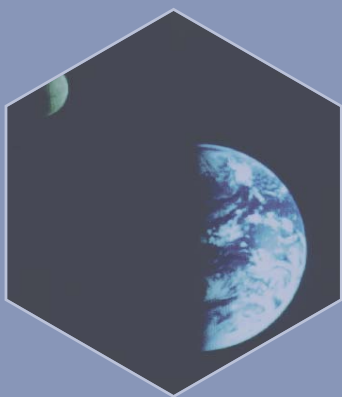
Revenues by Canadian Region: 2000-2009 (C\$m)



Workforce by Canadian Region: 2000-2009



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
British Columbia	817	457	509	405	458	446	169	304	314	346
Prairies	499	374	379	397	438	393	416	417	556	731
Ontario	2,793	3,525	3,425	3,675	4,527	4,595	4,622	4,644	4,679	4,997
Quebec	1,176	1,336	1,229	1,403	1,477	1,006	1,008	824	829	810
Atlantic	665	553	248	243	280	271	464	292	364	680
TOTAL	5,950	6,275	5,789	6,122	7,129	6,710	6,678	6,481	6,742	7,564



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