Canadian Space Agency
Agence spatiale canadienne

# STATE OF THE CANADIAN SPACE SECTOR

## Policy and External Relations

2007

Canada

## TABLE OF CONTENTS



## MISSION STATEMENT
## About the Authors
## About this Report

### About the Authors

The Policy & External Relations Directorate (PER) has prime responsibility for leading the development and implementation of space policies. PER also manages the strategic relationships between the Canadian Space Agency 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. PER 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.

### 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.


*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 2003 to 2007 period. Readers should consult previous editions for information regarding results prior to 2003.* 

## MESSAGE FROM THE PRESIDENT

Dr. Steve MacLean
President

As the newly appointed President of the *Canadian Space Agency* (CSA) I would like to take this opportunity to present the CSA's annual report, the *State of the Canadian Space Sector 2007.*

The Canadian space sector played an important role in the Canadian national economy in 2007 with revenues generating close to $2.5 billion and employing over 6,000 people. Total revenues remained healthy reaching $2.499B while domestic and export revenues represented 60% and 40% of total revenues respectively. I would invite you to read the report and examine the interesting developments which occurred in 2007.

On the international front, 2007 was an extremely interesting year. In spring, we witnessed the coming together of 14 space agencies from across the world with the announcement of an international framework agreement entitled *Global Exploration Strategy: The Framework for Coordination*. This marked the beginning of what promises to be a new era of joint sustainable space exploration and international cooperation.

As a valued partner of NASA, the CSA continued to work closely with our continental neighbours in areas of mutual interest and benefit throughout 2007. I am also extremely proud of Canada's continued membership with the European Space Agency (ESA). As the only non-European participant of this 17 member-state agency, Canada's space industry, science, and research sectors have been able to benefit significantly from this unique association.

I would also like to take this opportunity to reassert my commitment to the future of the Canadian space program and in particular, to the development of a long-term space plan (LTSP) for Canada.

It is important to remember that the CSA operates in a dynamic business environment, which in turn, is internationally driven and based on partnerships with industry. My vision for the LTSP is to ensure that Canada's space activities are pursued in accordance with these domestic needs and priorities while also ensuring that our space sector is positioned to contribute to global initiatives in which Canada has a shared national interest.

Finally, I would like to thank everyone who participated in this annual survey. Without your assistance this report would not be possible.

Sincerely,

Steve MacLean

Dr. Steve MacLean

# EXECUTIVE SUMMARY

In 2007, the Canadian space sector generated total revenues of **$2.499B**, a 0.25% negligible decrease, (or, a $6M loss) over revenues reported during 2006. Nonetheless, over the last five years, total revenues generated by the Canadian space sector have increased by 25%.

During 2007, revenues from domestic and export sources were **$1.496B** and **$1.003B** respectively. Domestic revenues grew 6.8%, from $1.401B to $1.496B, while export revenues experienced a loss of 9.1% (or, $101M).

Over the past five-years, total domestic revenues increased 24.4% and total export revenues increased 25.7%.

In 2007, domestic revenues represented 60% of total revenues, (or, $1.496B of $2.499B) the majority of which were derived from private sources yielding a ratio of **76%/24%** (Private/Public sources) respectively.

Export revenues in 2007 decreased by 9.1% and accounted for 40% of total revenue. The U.S. continued to be the strongest performing export market for Canada's space organizations representing **49.7%** (or, **$499M**) of the $1.104B of total export revenues.

Export revenues from Europe decreased 13.6% between 2006 and 2007 (or, **from $327M to $282M**). European derived revenues accounted for **28.2%** of the overall export revenues, a slightly smaller proportional share than the 29.7% realized in 2006.

Revenues from Asia decreased **10.4%** between 2006 and 2007. However, the Asian markets remained relatively stable, accounting for **11.9%** of total market revenue.

In other markets, export revenues from Oceania almost doubled (from **$24.3M in 2006 to $48M in 2007)**; Export revenues from South America decreased by **20% (from $40M in 2006 to $32M in 2007**); Export revenues from Africa decreased **77% (from $26M in 2006 to $6M in 2007**).

Of the four surveyed space categories, results indicate that ***Space Segment*** revenues decreased during 2007 by **26.9%** ($166M) from 2006**;** ***Ground Segment*** revenues showed a decline of **32.2%** during 2007; ***Applications and Services*** revenues grew by **12.6%** (**$179M**) representing **64.2%** of total space sector revenues; Finally, revenues in the ***Space Research*** category recorded a highest-ever-recorded-total of **$155M**.

***Satellite Communications*** continued to generate the majority of the Canadian space sector's revenues in 2007 with revenues accounting for **73.3%** of the total space sector revenues; Revenues in the ***Earth Observation*** (EO) sector declined by **38.6%;** Revenues for ***Robotics*** declined by **8.8%**, while for the second year in a row, ***Navigation*** revenues increased by **17.4%**; Revenues from ***Space Science*** activities more than doubled and represented **9.1%** of the total space sector revenues.

*Regional-based Space Revenues* for 2007 can be summarized as follows:

- **British Columbia**'s revenues decreased by **37%** and represented **5.5%** of total regional revenues;
- **The Prairies** revenues (Alberta, Saskatchewan and Manitoba) increased **11.3%** during 2007;
- **Ontario** continued to generate the majority share of total space sector revenues in 2007, accounting for **77.2%** of all revenues. Revenues in Ontario grew by **14.5%** during 2007.
- **Quebec**'s overall revenues decreased **59%** and represented **4.9%** of the total space sector revenues in Canada.

The *Workforce by Region* category for 2007 revealed the following results:

- **British Columbia** represented **4.7%** of the nation's space workforce in 2007 employing a total of **304** workers;
- **The Prairies** employed **417** people representing **6.4%** of the space sector workforce;
- **Ontario** once again employed the greatest share of employees in the space sector, reaching **71.7%**. The Ontario space sector workforce increased to **4,644**;
- **Quebec**'s workforce was reduced by **18.2%** with the workforce number decreasing to **824**;
- **Atlantic Canada**'s workforce also reported a decrease of **37%** and employed a total of **292** people.

## TEN YEAR TREND: 1998-2007

### Overall Results : 1998-2007*

| Year | Total Revenues | Domestic Revenues | | Export Revenues | | Workforce |
|---|---|---|---|---|---|---|
| | $ | $ | % | $ | % | n |
| 2007 | 2,498,624,003 | 1,495,641,044 | 60 | 1,002,982,959 | 40 | 6,481 |
| 2006 | 2,504,907,845 | 1,400,914,765 | 56 | 1,103,993,080 | 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 |
| 1999 | 1,425,498,040 | 854,697,263 | 60 | 570,800,777 | 40 | 6,408 |
| 1998 | 1,420,153,485 | 802,255,204 | 56 | 617,898,281 | 44 | 5,930 |

* All currency in Canadian dollars. Values not inflation-adjusted.

## OVERVIEW OF THE REPORT

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 2007 edition profiles the sector over the course of January 1 to December 31, 2007. 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.

### METHODOLOGY

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 form.[1] 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 definitions:

**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

[1] *CSA acknowledges a margin of error in the final results of approximately 2.5%.*

# REVENUES
## Overall Revenues
## Domestic v. Export Revenues

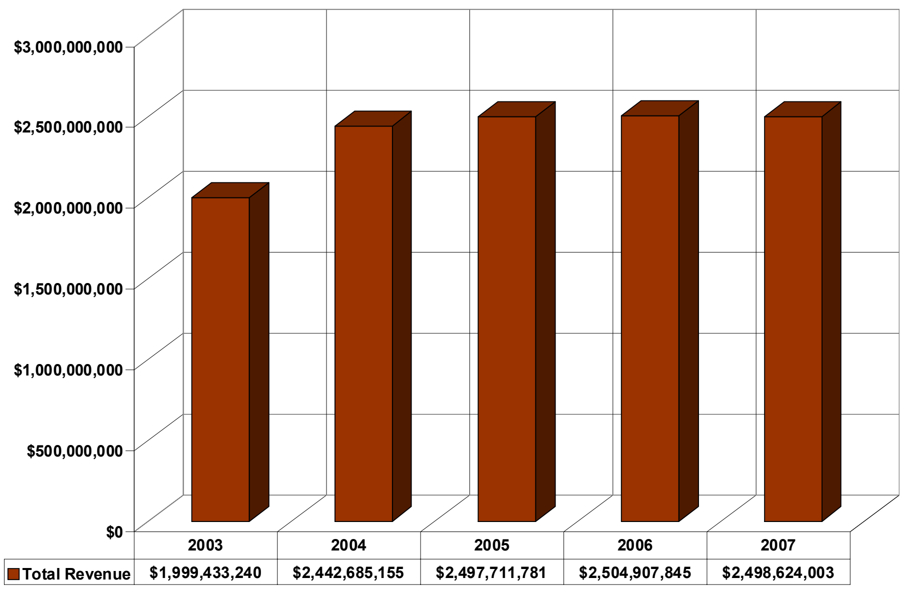
### OVERALL REVENUES

In 2007, the total revenues for the Canadian space sector reached $2.499B a 0.25% decrease (or, $6M) over revenues reported for 2006.

Over the last five years the total revenues generated by the Canadian space sector increased 25%.

Domestic revenues grew by 6.8% (or, by $95M) while export revenues decreased by 9.1% (or, by $101M).

***Total Space Revenues (C$m): 2003-2007***




### DOMESTIC v. EXPORT REVENUES

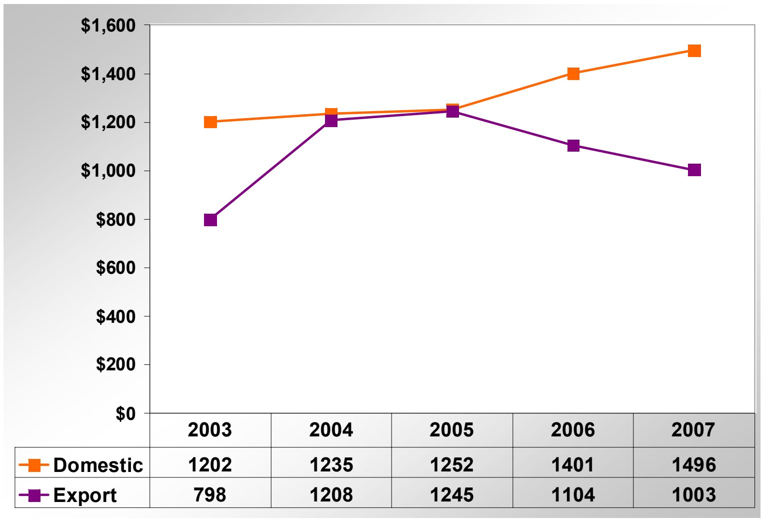
Domestic revenues in 2007 amounted to $1.496B, representing an increase of 6.8% over those reported in 2006 ($1.401B).

In 2007, domestic revenues represented 60% of total revenues, ($1.496B of $2.499) whereas in 2006 they represented 56% of total revenues.

During 2007, export revenues accounted for 40% of total revenues. This is the second straight year reporting a decrease in this proportion from the record high of 50% observed in 2005, and the 44% reported in 2006. Export revenues decreased 9.1% during 2007 (approximately $101M) from $1.104B to $1.003B.

Over the past five years, total export revenues have increased by 25.7%.

***Domestic v. Export Revenues: 2003-2007 (C$m)***



# REVENUES
## Domestic Revenues

### 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.

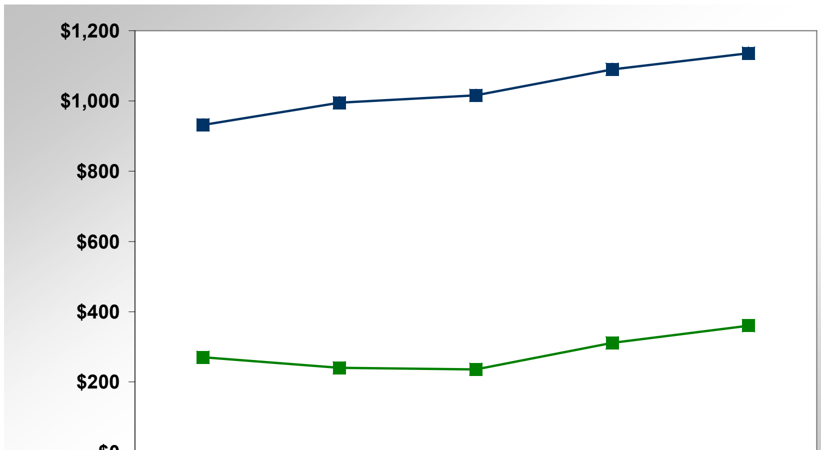
In 2007, the majority of space sector revenue was from private sources, weighted by Satellite Communications, a highly commercial sector.

After a decline between 2003 and 2005, domestic revenues from government sources have increased for the second straight year. As a result, domestic revenues from government sources in 2007 increased 15.8% (or, from $311M in 2006, to $360M in 2007).

Private sources of revenue in 2007 yielded a 4.2% increase, or a total of $1.136M.

The 2007 survey results demonstrate that the overall share of private/public derived sources of domestic revenues yielded a ratio of 76%/24%.

***Sources of Domestic Revenues: Public v. Private: 2003-2007 (C$m)***




| | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|
| Public | 270 | 240 | 236 | 311 | 360 |
| Private | 932 | 995 | 1016 | 1090 | 1136 |

### REVENUES OF CANADA'S LEADING SPACE ORGANISATIONS

In 2007, **98.4%** of total space revenues are accounted for by the activity of the top 30 Canadian organizations, a constant pattern found in the survey results.

The top 44 organizations reported revenues in excess of $1M during 2007 compared with 49 reported in 2005. Moreover, the number of organizations reporting revenues greater than $10M decreased from 20 to 17.

**5 Year Trend**
**Sources of Domestic Revenue: Public v. Private**

2003 Public: $270M
2007 Public: $360M

…or, an increase of 33.3%

2003 Private: $ 932M
2007 Private: $1.136B

…or, an increase of 21.8%

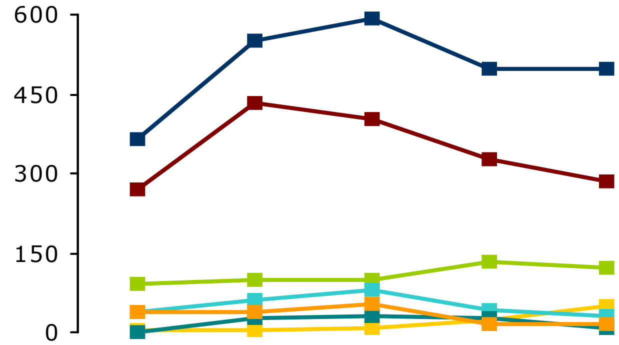
# REVENUES
## Export Revenues

### EXPORT REVENUES

In 2007, export revenues of $1.003B accounted for over 40% of total revenues ($2.499B). Overall export revenues decreased by 9.1% from 2006 levels. The U.S. continues to be the largest market for Canadian space exports in 2007, representing 49.7% (or $499M) of the $1.003B in total export revenues. Export revenues from Europe decreased 13.6% between 2006 and 2007 (or, declining from $327M to $283M).

European derived revenues accounted for 28.2% of the overall export revenues, a slightly smaller proportional share than the 29.7% realized in 2006. Although revenues from Asia decreased 10.4% between 2006 and 2007, the Asian markets remained relatively stable accounting for 11.9% of total export market revenue.

**_Sources of Export Revenues: 2003-2007 (C$m)_**




| | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|
| US | 363 | 552 | 593 | 499 | 499 |
| Europe | 269 | 432 | 401 | 327 | 283 |
| Asia | 91 | 97 | 100 | 134 | 120 |
| Oceania | 2 | 4 | 6 | 24 | 48 |
| S. America | 37 | 60 | 79 | 40 | 32 |
| Africa | 1 | 25 | 30 | 26 | 6 |
| Other | 35 | 38 | 37 | 52 | 16 |

**5 Year Trend**
**Domestic v. Export Revenues**

2003 Domestic revenue: $1.202B
2007 Domestic revenue: $1.496B

…or, an increase of 24.4%

2003 Export revenue: $ 798M
2007 Export revenue: $1.003B

…or, an increase of 25.7%

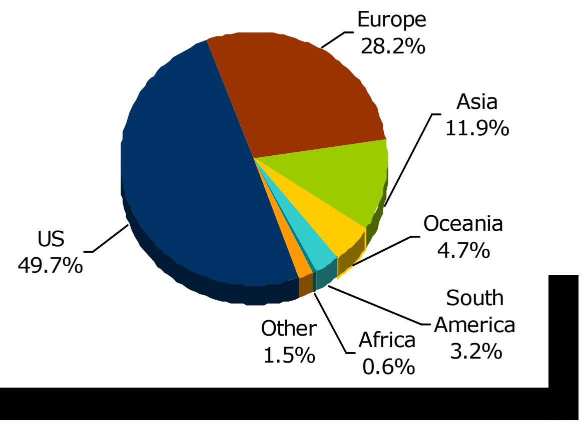
# REVENUES
## Export Revenues

**EXPORT REVENUES CONT.**

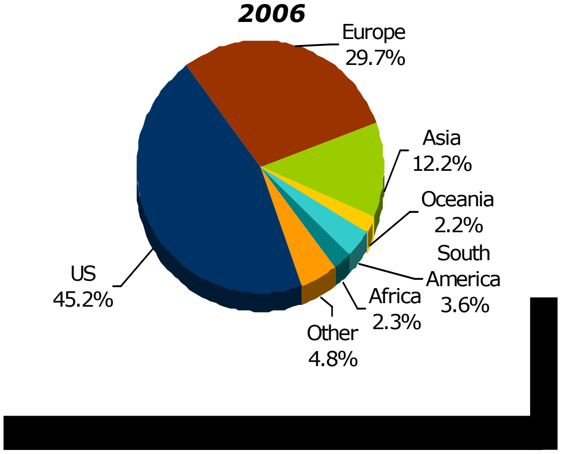
The annual survey also tracks revenue trends from sources outside of traditional trade markets:

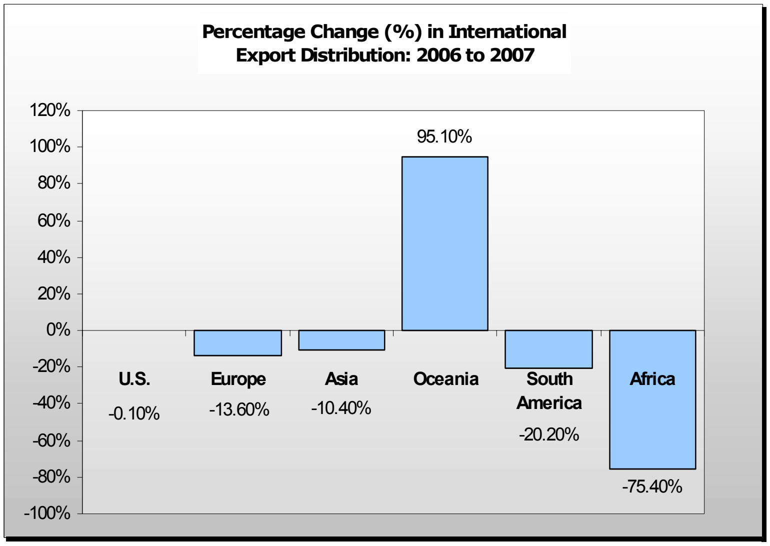
- Export revenues from Oceania doubled (or, from $24M in 2006 to $48M in 2007);
- Export revenues from South America decreased by 20% (or, from $40M in 2006 to $32M in 2007);
- Export revenues from Africa decreased 77% (or, from $26M in 2006 to $6M in 2007).

***Proportion of Export Revenues: 2007***




***Proportion of Export Revenues: 2006***



## REVENUES BY SPACE CATEGORIES

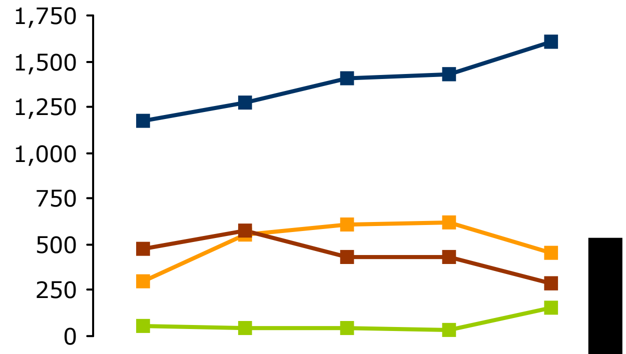
**Space Segment:** Revenues decreased during 2007 by 26.9% ($166M) from 2006. In 2007, space segment revenues represented 18% of the total space sector revenues.

**Ground Segment:** Revenues showed a sharp decline of 32.2% during 2007 (or, dropping from $429M to $291M). In 2007, ground segment revenues represent 11.6% of total space sector revenues.

**Applications and Services:** Revenues grew by 12.6% ($179M) during 2007. Application and Services revenues were the highest reported over the past five years and in 2007, represented 64.2% of total space sector revenues. This category continues to generate the largest portion of revenue.

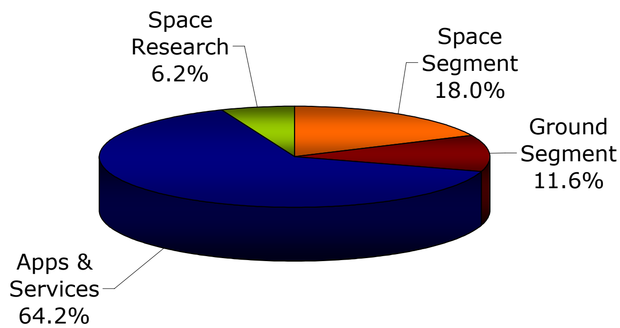
**Space Research:** After a decline in 2006, revenues rebounded significantly reaching its highest ever recorded revenue of $155M. In 2007, space research represented 6.2% of total space sector revenues.

***Total Revenues by Space Category: 2003-2007 (C$m)***




| | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|
| Space Segment | 297 | 553 | 611 | 615 | 449 |
| Ground Segment | 471 | 572 | 428 | 429 | 291 |
| Apps & Services | 1,179 | 1,271 | 1,412 | 1,424 | 1,603 |
| Space Research | 53 | 46 | 46 | 37 | 155 |

***Proportion of Revenues by Space Category: 2007***



## REVENUES BY SECTOR OF ACTIVITY

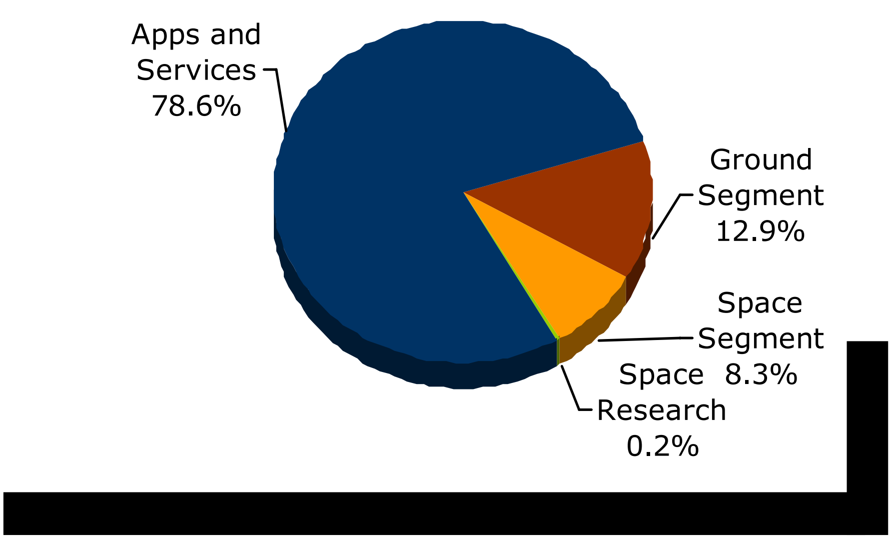
**Satellite Communications**: Although *Satellite Communications* continues to generate the bulk of the Canadian space sector's revenues for the second consecutive year, this sector has not been displaying signs of significant growth.

In 2007, revenues reached $1.832M which represents 73.3% of total space sector revenues. *Satellite Communications* revenues decreased 2.2%, representing a loss of $42 M from 2006 levels.

Of the $1.832B in *Satellite Communications*, 78.6% of revenues (or, $1.441B) derived from activities in ***Applications and Services***. Of the remaining 21.4%, the breakdown is as follows:

- **8.3%** (or, $152M) is generated from **Space Segment activities**;
- **12.9%** (or, $237M) is from generated from **Ground Segment activities**;
- **0.2% (or, $2.5M)** is generated from **Space Research activities**.

***Breakdown of Satellite Communication Revenues: 2007***



# REVENUES
## Revenues by Sectors of Activity

### REVENUES BY SECTOR OF ACTIVITY CONT.

**Earth Observation**: For the second consecutive year revenues for the Earth Observation (EO) sector declined. In 2007, revenues decreased by 38.6% (or, from $273M to $168M). EO revenues represented 6.7% of the total revenues. Since 2003, revenues from this sector experienced an 8.6% loss (or, $16M).

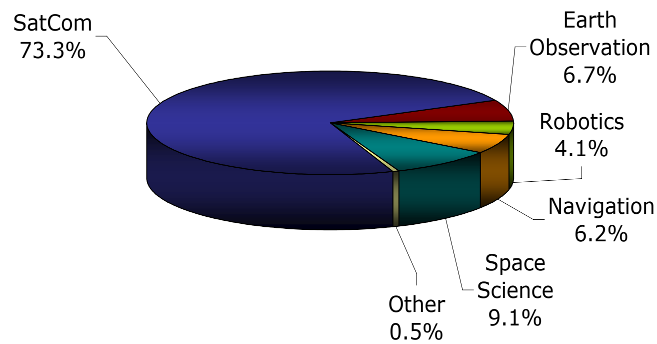
**Robotics**: Revenues for robotics declined by 8.8% (or, from $113M in 2006 to $103M in 2007). Robotics generated 4.1% of total space sector revenues. Over a five-year timeframe (2003-2007) robotics revenues have decreased by 11.2% (or, by $13M).

**Navigation**: For the second year in a row, revenues increased steadily. In 2007, this increase equalled 17.4% (or, an increase of $23M during 2007). Navigation revenues represented 6.2% of the total space revenues. Over the past five years this sector has displayed a decrease of 6%.

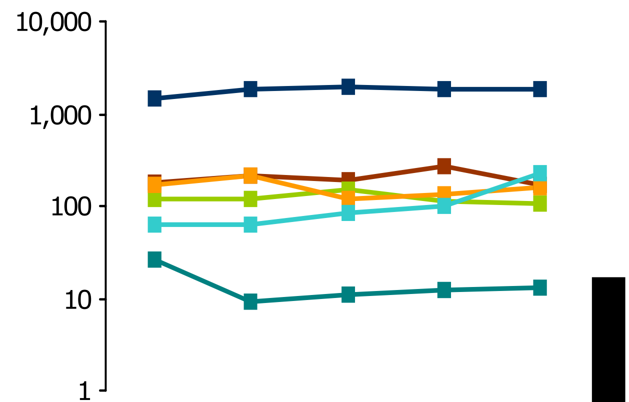
**Space Sciences**: During 2007, revenues from activities related to space sciences more than doubled totalling $228M in 2007. This represents 9.1% of the total space sector revenues. Since 2003, revenues have grown considerably by $166M (or, from $62M to $228M).

**Other**: Space-related activities in areas other than those classified above reported a negligible increase of 0.5% (or, an increase from $12M in 2006 to $13M in 2007). This represents 0.5% (or, $13M) of total space revenues. Over the last five years, revenues from this sector experienced a decrease of 50% (or, a loss of $13M).

***Proportion of Revenues by Sectors of Activity: 2007***




***Total Revenues by Sectors of Activity: 2003-2007 (C$m) (Logarithmic)***




| | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|
| SatCom | 1,447 | 1,827 | 1,938 | 1,874 | 1,832 |
| Earth Obs. | 184 | 211 | 192 | 273 | 168 |
| Robotics | 116 | 122 | 153 | 113 | 103 |
| Navigation | 165 | 212 | 120 | 132 | 155 |
| Space Sci. | 62 | 61 | 84 | 100 | 228 |
| Other | 26 | 9 | 11 | 12 | 13 |

## REVENUES BY REGION

**British Columbia**: In 2007 British Columbia's revenues decreased by 37% (or, by $81M). British Columbia's revenues represented 5.5% of total revenues for the entire space sector. This is a decrease from the 2006 total of 8.2%.

The majority of British Columbia's space revenues in 2007 were generated from domestic markets ($75M) while $63M came from exports. Domestic revenues dropped 39.9% between 2006 and 2007.

Since 2003, overall revenues from British Columbia have decreased by 4.2% (or, by $6M).

**Prairies:** Total revenues for the Prairie region (Alberta, Saskatchewan and Manitoba) increased 11.3% during 2007.

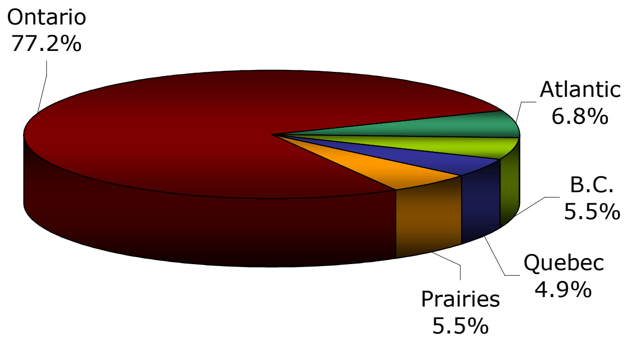
The Prairie region generated 5.5% of the total space sector revenues, a 0.5% proportional increase over 2006 levels.

- Alberta's total revenues increased by 13.9% (or, from $84M to $96M);
- Manitoba, for a second year in a row, experienced a loss in total revenues by 25.2% (or from $10M to $8M);
- Saskatchewan's experienced a gain of 16.8% (or, $4M) after two consecutive years of revenue loss.

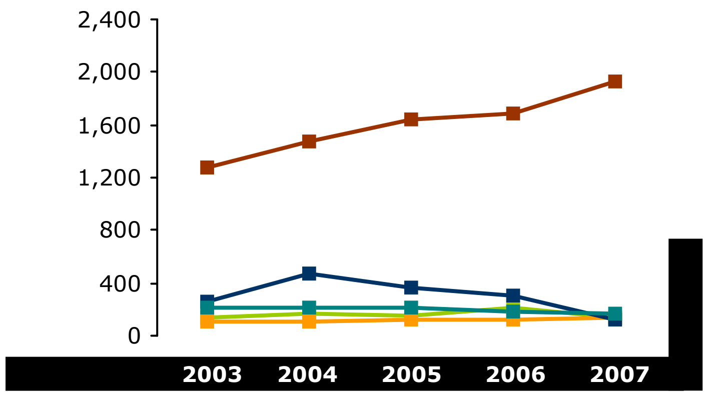
Throughout 2007 Canada's Prairie region continued to derive the majority of its revenues from exports, reporting a total of $113M in revenues from exports.

Over the five-year period between 2003 and 2007, total export revenues from the prairies have risen 66.1% (or, $45M), while overall revenues have increased by 29.2% (or, $31M).

***Regional Proportion of Total Revenues: 2007***




***Revenues by Region: 2003-2007 (C$m)***




| | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|
| B.C. | 144 | 165 | 148 | 219 | 138 |
| Prairies | 106 | 112 | 123 | 123 | 137 |
| Ontario | 1,275 | 1,473 | 1,648 | 1,686 | 1,930 |
| Quebec | 261 | 477 | 367 | 299 | 123 |
| Atlantic | 214 | 217 | 212 | 178 | 171 |

## REVENUES BY REGION CONT.

**Ontario:** Ontario continued to generate the majority of total space sector revenues in 2007 accounting for 77.2% of all revenues. Revenues in Ontario grew by 14.5% during 2007 (or, by $244M) to a total of $1.93B. Between 2003 and 2007, space revenues in Ontario have grown 51.3%. Approximately 69% of Ontario's revenues were derived from domestic sources which increased 18.1% (or, by $205M).

Exports revenues in Ontario increased 7.2% (from $557M to $597M) in 2007. Ontario remains the strongest exporting region in Canada.

Over a five-year span, domestic revenues have grown by 36.6%, growing from $976M in 2003 to $1334M in 2007. Export revenues during this five year period have almost doubled (or, increasing from $300M in 2003 to $597M in 2007).

**Quebec:** During 2007, Quebec's overall revenues decreased 59% (or, by $176M) and represented 4.9% of the total space sector revenues in Canada.

Domestic revenues in Quebec decreased 55.7% (or, by $46M) in 2007. Export revenues also decreased by 60.2% (or, by $131M) during 2007.

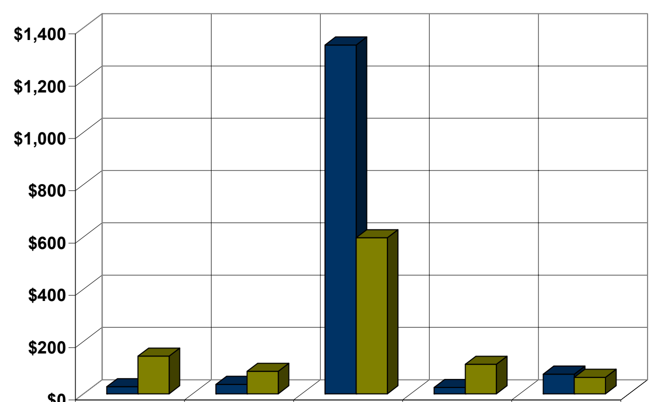
The majority of Quebec's revenues (approximately 70%) are derived from export revenues which amounted to $86M in 2007. Between 2003 and 2007, domestic revenues in Quebec decreased 49.3% (or, by $35M). Export revenues have also decreased by 54.7% (or, by $104M).

**Atlantic:** Revenues in Atlantic Canada decreased 3.9% during 2007 (or, from $178M to $171M). Atlantic Canada represented 6.8% of total space sector revenues.

Approximately 84.2% of Atlantic Canada revenues were generated from exports (or, $144M) while domestic revenues dropped by 21.3% (or, from $33.9M in 2006, to $27M in 2007).

Over the five-year period 2003 to 2007, export revenues from Atlantic Canada have declined 16.7% and domestic revenues have declined 34.1%.

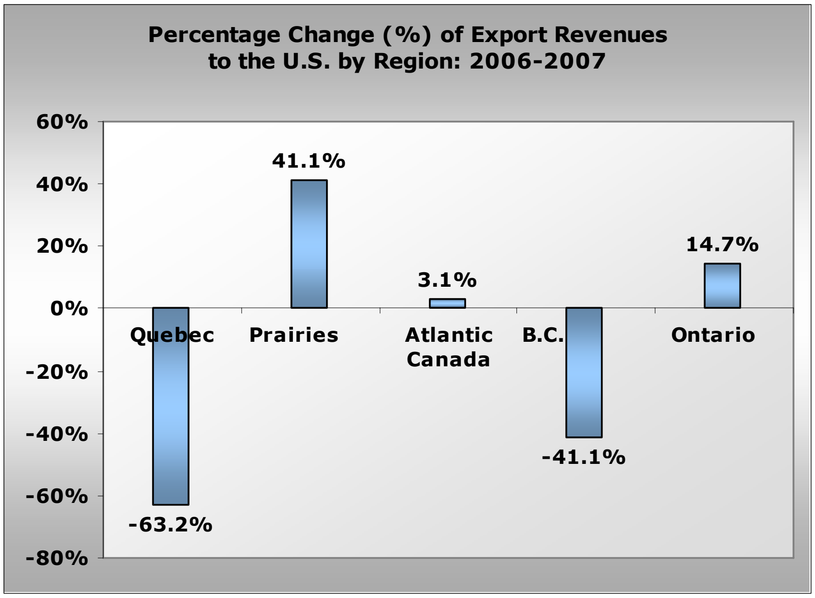
***Domestic v. Export Revenues by Region: 2007 (C$m)***



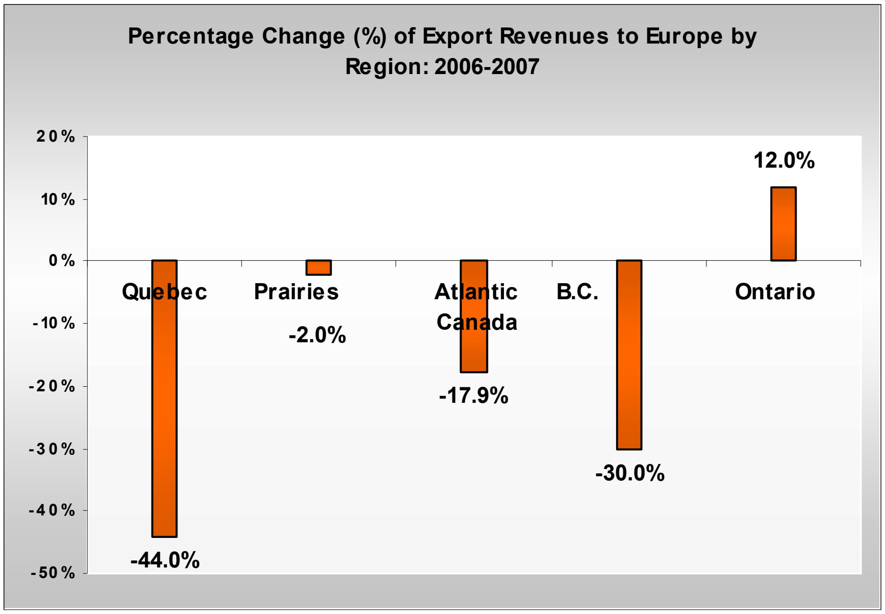

| | Atlantic | Quebec | Ontario | Prairies | B.C. |
|---|---|---|---|---|---|
| Domestic | 27 | 36 | 1334 | 24 | 75 |
| Export | 144 | 86 | 597 | 113 | 63 |

# REVENUES
## Export Revenues by Region

The largest market for Canadian space exports is the **Unites States**. The following graph illustrates the changes over one year in export revenues by region.




**Europe** remains Canada's second largest export market for space. Canada's membership with the European Space Agency (ESA) permits Canadian space organizations to bid for and win ESA contracts. Although exports to Europe experienced a downturn in 2007, Canada has faired extremely well in terms of industrial returns since signing a Cooperation Agreement in 1979.



# SPACE SECTOR WORKFORCE
## Workforce Groups

### SPACE SECTOR WORKFORCE

For a third year in row, the workforce in the Canadian space sector decreased. The number of employees was reduced from 6678 to 6481.

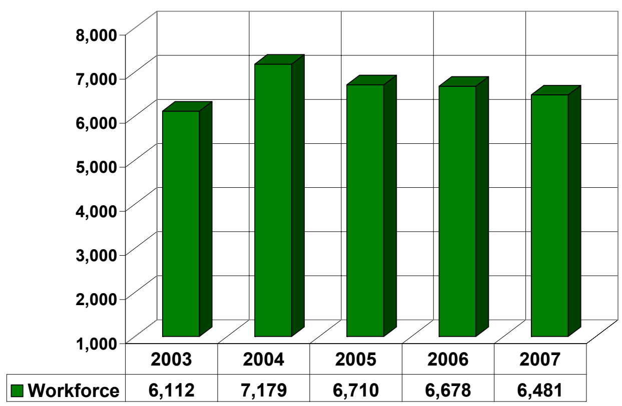
### WORKFORCE GROUPS

*Engineers & Scientists* continued to comprise the largest category of employment in 2007, employing 2144 workers or 33.1% of the total space sector workforce.

Every employment category downsized in 2007, except for *Administration* and *Other*. It was the *Engineers & Scientists* category which was affected the greatest with a total decline of 209 people.

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 2007:

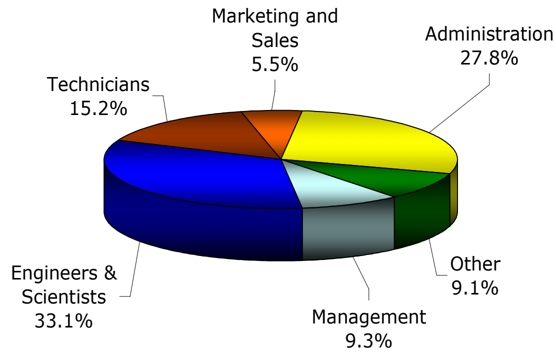
***Space Sector Workforce: 2003-2007***




***Workforce Groups by Region: 2007***

| | BC | Prairies | Ont. | Que. | Atlantic | Total |
|---|---|---|---|---|---|---|
| Mngmt | 43 | 23 | 417 | 109 | 11 | 603 |
| Eng/Sci. | 189 | 263 | 1,124 | 542 | 26 | 2,144 |
| Tech. | 19 | 124 | 694 | 76 | 69 | 982 |
| Mktg/Sls | 15 | 1 | 308 | 10 | 21 | 355 |
| Admin. | 25 | 6 | 1,528 | 86 | 159 | 1,804 |
| Other | 13 | 0 | 573 | 1 | 6 | 593 |
| Total | 304 | 417 | 4,644 | 824 | 292 | 6,481 |

***Workforce by Space Employment Categories: 2007***



## WORKFORCE BY REGION

**British Columbia** represented 4.7% (or, 304 people) of the nation's space workforce in 2007. British Columbia's workforce jumped almost 80% in one year, increasing its workforce by 136 employees;

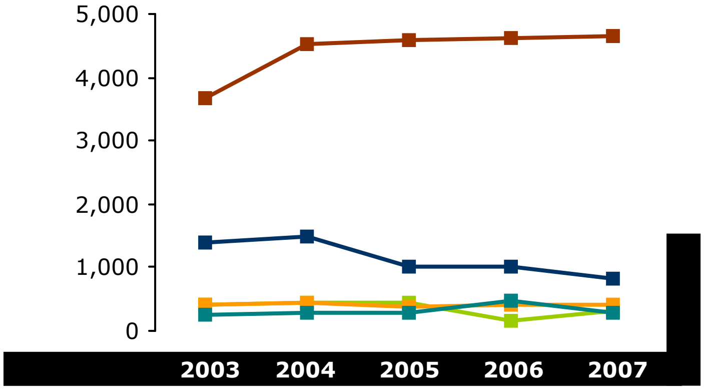
**The Prairies** employment figures remained at 2006 levels. The Prairies continued to represent 6.4% of the space sector workforce in 2007;

**Ontario** employed the greatest share of employees in the space sector, reaching 71.7% in 2007. The Ontario space sector workforce increased marginally by 0.5% in 2007;

**Quebec**'s workforce figures indicate a reduction of 18.2% between 2006 and 2007 (or, a decrease of 184 employees). Quebec represents 12.7% of the nation's space sector workforce;

**Atlantic Canada's** workforce reported a noticeable decrease of 37%, diminishing the number of people employed in the Atlantic Canada by 172 people. Atlantic Canada employed 4.5% of the total space sector workforce in 2007.

***Space Sector Workforce by Region: 2003-2007***




| | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|
| B.C. | 405 | 458 | 446 | 168 | 304 |
| Prairies | 397 | 438 | 393 | 416 | 417 |
| Ontario | 3,675 | 4,527 | 4,595 | 4,622 | 4,644 |
| Quebec | 1,403 | 1,477 | 1,006 | 1,008 | 824 |
| Atlantic | 243 | 280 | 271 | 464 | 292 |

## HIGHLY QUALIFIED PERSONNEL (HQP)

The following table reports the percentage of *Highly Qualified Personnel* (HQP) in relation to each Canadian region. HQP measurement consists of tracking an approximate number of employed 'engineers' and 'scientists' in the Canadian space sector.

- 17.4% of Canada's total "Space Sector HQP" work in Ontario while 24.2% of **Ontario**'s space sector workforce are HQP;
- 0.4% of Canada's total "Space Sector HQP" work in **Atlantic Canada** while 8.9% of Atlantic Canada's space sector workforce are HQP;
- 2.9% of Canada's total "Space Sector HQP" work in **B.C**. while 62.2% of B.C.'s space sector workforce are HQP;
- 8.4% of Canada's total "Space Sector HQP" work in **Quebec** while 65.8% of Quebec's space sector workforce are HQP;
- 4.1% of Canada's total "Space Sector HQP" work in the **Prairies** while 63.1% of the Prairies space sector workforce are HQP;

**Highly Qualified Personnel (HQP): Engineers and Scientists**

| | Total revenues by region (C$m) | % share of total revenue | Total # of workforce | Total # of HQP | % of HQP relative to its own provincial workforce | % of HQP relative to total # of national workforce |
|---|---|---|---|---|---|---|
| **Ontario** | $1.93B | 77.2% | 4644 | 1124 | 24.2% | 17.4% |
| **Atlantic** | $171m | 6.8% | 292 | 26 | 8.9% | 0.4% |
| **B.C.** | $138m | 5.5% | 304 | 189 | 62.2% | 2.9% |
| **QC** | $123m | 4.9% | 824 | 542 | 65.8% | 8.4% |
| **Prairies** | $137m | 5.5% | 417 | 263 | 63.1% | 4.1% |
| **Total** | **$2.499B** | | **6481** | **2144** | | |

## CONCLUSION

Overall, 2007 was a successful year for the Canadian space sector as revenue remained stable at $2.499B and employment levels, although decreasing slightly, also remained relatively constant.

Figures on the distribution of space revenues by region indicate that Ontario maintained its position as the principal generator of regional revenues and the primary employer of HQP.

The five-year trend for domestic and export revenues indicate that these two categories have managed to increase by 24.4% and 25.7% respectively. The five-year trend for public sources of domestic revenues reported 33.3% growth, while private sources of domestic revenue increased by 21.8%.

Throughout 2007, Canadian companies showed their ability to compete internationally as demonstrated by the overall strength of Canadian space exports. Canadian space organizations continued to develop world-renowned expertise in *Satellite Communications* as well as in niche markets such as *Earth Observation*, *Space Robotics* and *Space Science*.

The CSA would like to thank all the Canadian space organizations for their continued participation which remains essential for the production of this report.