



# AEROSPACE | Metro Montréal 2003

## STRATEGIC PROFILE

**Montreal**International

**The Metro Montréal  
Aerospace Industry**

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## SUMMARY

### Size

Metropolitan Montréal's aerospace industry represents:

- 37,800 jobs at 171 facilities where aerospace accounts for more than 50% of sales<sup>1</sup>;
- More than 95% of aerospace jobs in Québec;
- \$10.5 billion in Québec exports in 2002. Aircraft were Québec's top export in 2001<sup>2</sup>, and accounted for 70% of Canada's aerospace exports<sup>3</sup>.

In addition, in terms of the number of aerospace jobs, Metropolitan Montréal moved into 4th place among North American cities in 2002, up from 5th place the previous year. In fact, Metro Montréal was somewhat less affected by the crisis that crippled the aerospace industry. Cities where large commercial jets are built were hit hardest, while those where military or space contracts are fulfilled or those serving sectors that felt less of the impact (e.g.: regional aircraft), such as Metropolitan Montréal, escaped relatively unscathed.

### Structure

Metropolitan Montréal's aerospace industry is divided into three subsectors<sup>4</sup>:

- Prime contractors and major repair and overhaul centres account for 77% of total jobs, or 29,000 positions at seven companies: Bombardier Aerospace, Pratt & Whitney Canada, CAE, Rolls-Royce Canada, Bell Helicopter Textron, Air Canada (Technical Centre), and Air Transat (Maintenance Centre);
- Equipment manufacturers account for 8% of the jobs, or 2,900 positions at seven companies: CMC Electronics, EMS Technologies Canada, Héroux-Devtek, Honeywell Aerospace, Messier-Dowty, Lockheed Martin Canada, and Thales Avionics Canada;
- Subcontractors and suppliers of special products and services comprise a network of 144 companies with 5,900 jobs, or 16% of the total. These special products and services include machining, avionics, metal treatment, composites, fasteners, tools, and cabin interiors.

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<sup>1</sup> Source: E&B DATA, 2003

<sup>2</sup> Source: Institut de la statistique du Québec, 2003

<sup>3</sup> Source: Institut de la statistique du Québec, 2003

<sup>4</sup> Includes CAE, EMS Technologies Canada, CMC Electronics, Air Canada (Technical Centre), and Air Transat (Maintenance Centre), which are not included in the comparative data in *Metropolitan Montréal Performance Indicators 2002*, published by Montréal International.

## **World Leadership**

The uniqueness of Metropolitan Montréal is bolstered by the presence of two assemblers, Bombardier Aerospace and Bell Helicopter Textron, and by a proven expertise in engine overhaul and repair, landing gear, and avionics. The engine overhaul and repair sector employs more than 7,500 people at major companies such as Pratt & Whitney Canada and Rolls-Royce Canada, as well as specialized SMEs such as Turbomeca Canada and CEL Aerospace. There are more than 5,800 avionics employees at companies such as CAE, CMC Electronics, EMS Technologies Canada, Lockheed Martin Canada, and Thales Avionics Canada. Finally, the landing gear subsector accounts for some 900 positions at companies such as Héroux-Devtek, Messier-Dowty, Performance LT, and Aero Mecachrome.

Metropolitan Montréal is home to several world leaders in the aerospace industry:

- Bombardier Aerospace: The world's third largest commercial aircraft builder, after Boeing and Airbus, and the leader in regional jets;
- Bell Helicopter Textron: The leading producer of rotary wing aircraft;
- Pratt & Whitney Canada: A world leader in supplying engines for business, general aviation, and regional transport aircraft, as well as for helicopters. The company also builds high-tech motors for industrial applications;
- Rolls-Royce Canada: With the largest line of aircraft engines in the world, Rolls-Royce meets all the power requirements of the 500 top airlines;
- CAE: The world's leading supplier of commercial flight simulators (more than 85% of the global market);
- CMC Electronics: A leading specialist in aviation telecommunications. More than 65 airlines now use Satcom (antennas for providing in-flight telephone service, combined with the capacity to transmit operational and navigation data), which was developed by CMC;
- Messier-Dowty: A landing gear specialist that represents 40% of the world market.

## **Research and Development**

Metropolitan Montréal's leadership is reinforced by an almost insatiable desire for innovation. For example:

- Pratt & Whitney Canada has certified 40 new engines in the past eight years, and 20 more are presently in development;
- Bombardier Aerospace has consistently certified one new aircraft every year since 1992. Four new Bombardier models will be rolled out over the next 20 months;
- CAE invests approximately 10% of its revenue in research and development, which ranks it among the top 20 Canadian companies in terms of spending.

Metropolitan Montréal is also consolidating its position as a Canadian leader in the area of in-house research, with its share of research activities rising from 47% in 1998 to 63% in 2000 (a total of \$562 million). These private-sector efforts are backed up by new public-sector initiatives:

- The Consortium for Research and Innovation in Aerospace in Québec (CRIAQ), which was founded in January 2003, is made up of the following universities: École Polytechnique, École de technologie supérieure, Concordia University, Université Laval, McGill University, Université du Québec à Chicoutimi, and Université de Sherbrooke. Its mission is to carry out concerted aerospace research at the pre-competitive stage, and to increase the number of doctorates awarded in fields related to aerospace research. For example, CRIAQ engages in research projects such as developing adhesive wing box components, reducing cabin noise in airplanes and helicopters, and developing components made of thermoplastic composites for the aerospace industry;
- The National Research Council's Aerospace Manufacturing Technology Centre and Institute of Aerospace Research (IAR) have been based in Montréal since September 2002. The IAR is engaged in research and development in fields related to the design, manufacture, performance, use, and safety of aerospace craft. For example, the IAR is working on research projects such as the effects of ice formation on aircraft behaviour, take-off maneuvers, and advanced composites.

## **Investments**

Metropolitan Montréal's aerospace industry is thriving, and foreign companies in particular are intensifying their activities, as shown by the following examples of new investments (new facilities and expansions) that have been announced since 2001:

- CIC Aerospace is investing \$35 million in Montréal in order to build an aircraft spare parts distribution centre combined with an overhaul centre that will provide aircraft repair and maintenance services in Montréal, which will create 160 jobs;
- GE Elano Canada is investing \$33 million in Montréal in order to upgrade and purchase equipment following acquisition of the Aerotech Tubetronics plant at Mirabel. Elano Corporation, a subsidiary of General Electric, specializes in aircraft engine and air duct repair and maintenance;
- Messier-Dowty is investing \$23 million at Mirabel in order to enlarge its plant, which specializes in the manufacture of jumbo jet landing gear;
- Aeroceltic Canada Cargo is investing \$23 million in order to set up a cargo transit centre and aircraft maintenance base in the Mirabel Foreign Trade Zone;
- Aero Mecachrome is investing \$20 million in Montréal for Phase 1 of a plant expansion. The company machines landing gear parts and aircraft wing structures for Airbus, Bombardier, Boeing, and several other major aircraft builders, and is creating 40 new jobs;

- Foreign companies such as Liebherr Aerospace Canada of Germany, Advanced Systems Technologies (AST) of the United States, and Composites Atlantic of the Netherlands have also made a number of other investments in new facilities.

These investments are an indication of Metropolitan Montréal's attractiveness to foreign companies, which already account for 33 facilities and 10,000 jobs in the region (or 28% of total aerospace industry employment), which is clearly becoming increasingly linked to international manufacturing networks.

## **Workforce and Education**

Metropolitan Montréal's aerospace industry employs approximately 5,700 engineers and scientists, 6,300 technicians, 19,400 operators, and 6,400 administrators. A total of nearly 900 university degrees are awarded each year in programs that are directly or indirectly related to the aerospace industry.

In collaboration with Metropolitan Montréal's network of educational institutions, the aerospace industry has established the Centre for Aerospace Manpower Activities in Quebec (CAMAQ), a coordinating body whose mission is to adapt secondary school, college, and university programs to market demand.

As an example, Metropolitan Montréal is home to the École des métiers de l'aérospatiale de Montréal (ÉMAM) and the École nationale d'aérotechnique (ÉNA), Canada's largest aerospace technical training school, and five of Québec's universities (Montréal, McGill, Concordia, Laval, and Sherbrooke) joined together to create a Master's program in aerospace engineering (M.Eng.).

## **International Organizations**

The following are among an impressive number of international organizations that are headquartered in Montréal, which creates a particularly stimulating environment for the aerospace industry:

- International Civil Aviation Organization (ICAO)
- International Air Transport Association (IATA)
- Société internationale de télécommunications aéronautiques (SITA)
- International Federation of Air Traffic Controllers' Associations (IFATCA)
- Conseil international de formation aérospatiale (CIFA)

## **Recent Developments**

Despite the difficulties facing the aerospace industry worldwide, companies based in Metropolitan Montréal remain active, and many new strategic contracts have been landed over the past 12 months, which has kept prime contractors and equipment manufacturers busy:

- Bombardier Aerospace signed a contract with US Airways for a potential value of \$10.4 billion;

- Pratt & Whitney Canada announced that the French Dassault Aviation group opted for its new PW307A engine for their new Falcon 7X business plane, a contract that should bring in approximately US\$3 billion over the next 20 years. The new engine is expected to be certified in 2004, and production is slated to begin in 2005. Pratt & Whitney Canada also announced that Cessna Aircraft chose the PW615F for its new Mustang Citation;
- CAE announced the sale of two Airbus A320 flight simulators: one to Air France and the other to China Eastern Airlines, for a total of approximately \$35 million;
- CMC was selected by Sikorsky to supply its flight management system and emergency control panel. The total value of these contracts could top US\$110 million over the full life of the program, which is estimated at 25 years.

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## 1. THE INDUSTRY

This section describes Metropolitan Montréal's aerospace industry.

### 1.1. SIZE<sup>5</sup>

The aerospace industry in Metropolitan Montréal<sup>6</sup> employs approximately 37,800 people at 171 facilities where aerospace accounts for more than 50% of sales<sup>7</sup>.

### 1.2. STRUCTURE

The facilities in Metropolitan Montréal are divided into three subsectors<sup>8</sup>:

#### **Prime contractors and major repair and overhaul centres**

- 7 companies (17 facilities), employing 29,000 people
- Activity sectors: airplanes, helicopters, engines, flight simulators, maintenance and repair
- Leading employers: Bombardier Aerospace, Pratt & Whitney Canada, CAE, Rolls-Royce Canada, Bell Helicopter Textron, Air Canada (Technical Centre), and Air Transat (Maintenance Centre)

#### **Equipment manufacturers**

- 7 companies (10 facilities), employing 2,900 people
- Activity sectors: landing gear, avionics, products for satellites, defence systems, and systems integration
- Leading employers: CMC Electronics (formerly Marconi Canada), EMS Technologies Canada, Héroux-Devtek, Honeywell Aerospace (formerly AlliedSignal Aerospace Canada), Messier-Dowty, Lockheed Martin Canada, and Thales Avionics Canada (formerly Sextant Avionics Canada)

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<sup>5</sup> The E&B DATA statistics are based on a May 2003 survey of all aerospace industry companies in the Montréal area. The total number of jobs at each facility was counted. Due to methodological differences, statistical data concerning the Montréal area and Canada are hard to compare. Statistics Canada's definition of SIC 3211 (Aircraft and Aircraft Parts) does not encompass facilities engaged in designing and manufacturing flight simulators (such as CAE), software, and information systems for the aerospace industry, or airlines doing routine aircraft maintenance. SIC 3211 is defined as "Establishments primarily engaged in manufacturing aircraft and aircraft assemblies, engines, equipment and parts. Establishments primarily engaged in aircraft repair are included in this industry."

<sup>6</sup> Montréal Census Metropolitan Area. As a result, companies such as GE Canada in Bromont and Oerlikon in Saint-Jean-sur-Richelieu are excluded.

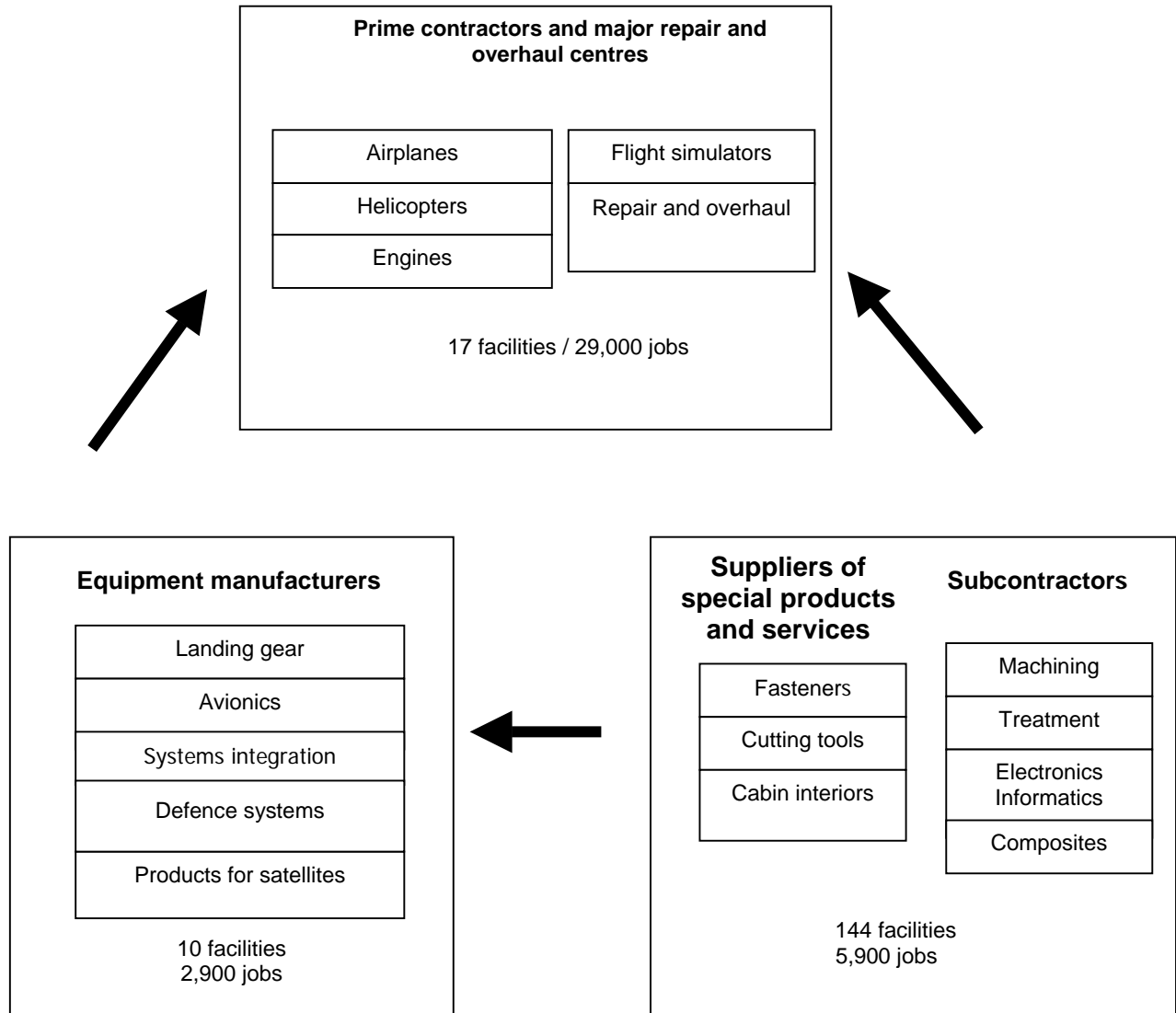
<sup>7</sup> Source: E&B DATA, 2003

<sup>8</sup> Includes CAE, EMS Technologies Canada, CMC Electronics, Air Canada (Technical Centre), and Air Transat (Maintenance Centre), which are not included in the comparative data in *Metropolitan Montréal Performance Indicators 2002*, published by Montréal International.

### Subcontractors and suppliers of special products and services

- 144 facilities, employing 5,900 people
- Examples of activity sectors: fasteners, cutting tools, cabin interiors, machining, metal treatment, composites, and electronic components

Figure 1: Structure of Metropolitan Montréal's aerospace industry



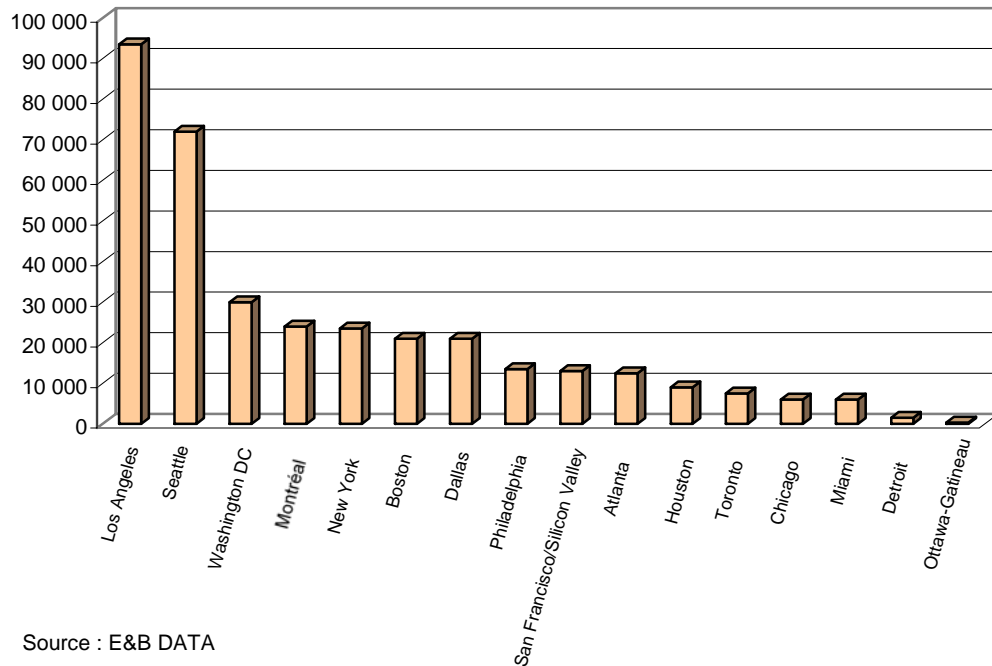
Source: E&B DATA 2003

### 1.3. RANKING AMONG MAJOR NORTH AMERICAN CITIES<sup>9</sup>

Metropolitan Montréal ranks fourth among North American cities in terms of aerospace industry jobs based on employment at large companies (excluding airline engine overhaul shops), improving its position in 2002, moving up from fifth place the year before. In fact, Metro Montréal was somewhat less affected by the crisis that crippled the aerospace industry. Cities where large commercial jets are built were hit hardest, while those where military or space contracts are fulfilled or those serving sectors that felt less of the impact (e.g. regional aircraft), such as Metropolitan Montréal, escaped relatively unscathed.

**Figure 2: Aerospace jobs in major North American cities, 2002**

Private-sector facilities with 100 or more employees



<sup>9</sup> The figures come from the E&B DATA database, derived from a telephone survey, conducted between October 2002 and January 2003, of more than 10,000 technology firms located in North American cities with a population of three million or more (Census Metropolitan Area – CMA – in Canada, Consolidated Metropolitan Statistical Area – CMSA – in the United States). The Ottawa-Gatineau CMA was added to the study. Activities and employment at facilities with 100 or more employees in a CMA were surveyed. Facilities were classified by main activity (which may differ from that of the parent company), rather than by the market for which their products or services are intended.

#### 1.4. FOREIGN OWNERSHIP

19% of the facilities that comprise Metropolitan Montréal's aerospace industry are foreign-owned. These 33 facilities account for 9,861 jobs, or 26% of the industry total. In all, 78.5% of these jobs are at American companies, and the remainder at European companies. The number of foreign-owned facilities and their share of jobs have increased by nearly 2% since 2001.

**Table 1: Breakdown of facilities and jobs by country of origin, 2003**

<b>Country</b>	<b>Facilities</b>	<b>Jobs</b>
United States	19	7,740
United Kingdom	3	1,564
France	8	520
Other (European ownership)	3	37
<b>TOTAL</b>	<b>33</b>	<b>9,861</b>

Source: E&B DATA

## 2. PROFILES OF INDUSTRY LEADERS

This section contains profiles of prime contractors and equipment manufactures and their activities in Metropolitan Montréal.

### **Bombardier Aerospace** ([www.bombardier.com](http://www.bombardier.com))

- Locations: Saint-Laurent, Dorval, and Mirabel
- Number of jobs: 13,500
- Activities: Design and manufacture of aircraft, systems, and components for aviation companies
- Main products: Canadair Regional Jet, Challenger, Global Express
- Comments:
  - World's leading manufacturer of regional jets and 20-to-90-seat turboprops;
  - World's third largest builder of civilian aircraft, after Boeing and Airbus;
  - \$18.7 billion in orders for Bombardier Aerospace worldwide as at January 31, 2003;
  - In April 2003, Bombardier Aerospace signed a contract with US Airways that has a potential value of \$10.4 billion;
  - Certification of a new aircraft every year from 1992 to 2003, including the CRJ900, which went into service in early 2003;
  - Bombardier will roll out four new aircraft over the next 20 months: the Lear 45 XR, the Challenger 300, the Lear 40, and the Global 5000.

### **Pratt & Whitney Canada** ([www.pwc.ca](http://www.pwc.ca))

- Locations: Longueuil and Saint-Hubert
- Number of jobs: 5,700
- Activities: Design, development, manufacture, marketing, and technical support for turbofans, turboprop aircraft, and turboshaft engines to meet the needs of the following markets: regional transport, commercial aviation, helicopters, utility aircraft, auxiliary power units, and industrial applications.
- Main products: Turboprops and turboshaft engines (PT6), turboprops (PW100, PW150A), turboshaft engines (PW200), turbofans (PW300, PW500, PW800, JT15D), and auxiliary power units (PW900).
- Comments:
  - Global mandate for turbofans, turboprops, and low-power turboshaft engines;
  - 823 airlines and 7,969 operators in 183 countries use Pratt & Whitney Canada engines; a total of 53,031 engines have been delivered;
  - 40 new Pratt & Whitney Canada engines have been certified in the past eight years, and 20 aircraft engines are presently being developed;
  - Pratt & Whitney Canada earned ISO 14001 certification, the international standard for environmental management;
  - Pratt & Whitney Canada announced that Eclipse Aviation Corp of Albuquerque, New Mexico selected the PW610F engine for its Eclipse 500 twinjet;

- Pratt & Whitney Canada announced that Cessna Aircraft has chosen the PW615F engine for its new Mustang Citation;
- Pratt & Whitney Canada announced that the French Dassault Aviation group has selected the new PW307A engine for its new Falcon 7X business aircraft, a contract that should generate approximately US\$3 billion over the next 20 years. The new engine is expected to be certified in 2004, and production is slated to begin in 2005.

**CAE ([www.cae.ca](http://www.cae.ca))**

- Location: Saint-Laurent
- Number of jobs: 4,000
- Activities: Design and manufacture of flight simulator equipment for civil and military aviation and flight training equipment.
- Main products:
  - Commercial simulation and training: Commercial flight simulators for almost all airline aircraft and many business jets; visual system design and production;
  - Military simulation and training: Design and manufacture of military flight simulators for fighters, helicopters, heavy cargo and patrol aircraft; design of visual and training systems; production of flight, tactical, and complete mission simulators.
- Comments:
  - World's leading supplier of flight simulators for civilian aircraft, with 85% of the world market in 2002. CAE has sold some 440 simulators to nearly 100 airlines, aviation companies, and training centres in 38 countries around the globe;
  - Production units and training centres are located in 17 countries;
  - Ranked among the top 20 Canadian companies in terms of investment in research and development (approximately 10% of revenue);
  - CAE announced the sale of two Airbus A320 flight simulators, one to Air France and the other to China Eastern Airlines, for a total of approximately \$35 million.

**Air Canada – Technical Centre ([www.aircanada.ca](http://www.aircanada.ca))**

- Location: Dorval
- Number of jobs: 2,600
- Activities and main products: Major repair and overhaul of engines, auxiliary power units (APU), cells, components, and a range of complementary services.

**Rolls-Royce Canada ([www.rolls-royce.com](http://www.rolls-royce.com))**

- Location: Lachine
- Number of jobs: 1,800
- Activities and main products: Repair and overhaul of a wide range of engines for aircraft such as Bombardier's Global Express business jets and the Gulfstream V, as well as Boeing jumbo jets.
- Comments:
  - 38 of the world's 50 largest airlines use Rolls-Royce engines;
  - More than 3,000 Rolls-Royce engines have been delivered to Boeing, and more than 1,500 IAE V2500 engines have been delivered to Airbus.

**Bell Helicopter Textron** ([www.belltextron.com](http://www.belltextron.com))

- Location: Mirabel
- Number of jobs: 1,200
- Activities and main products: Assembly of models 430, 407, 230, 427, 212, 412, 206B, and 206L civilian helicopters, and after-sales service.

**CMC Electronics** ([www.cmcelectronics.ca](http://www.cmcelectronics.ca))

- Location: Saint-Laurent
- Number of jobs: 1,000
- Activities: Design, manufacture, integration, and support for high-tech electronic products, including avionics equipment, satellite communications antennas for aircraft, specialized electronic components, military radios, spatial electronic equipment, infrared cameras, medium and high-end global positioning systems (GPS), and marine electronics equipment.
- Main products: Aviation communication: CMA-2102 (SATCOM High-Gain Antenna Subsystem), CMA-2200 (Intermediate-Gain SATCOM Antenna); a range of direct line-of-sight tactical radios; flight management system.
- Comments:
  - 75% of the market for airlines with Satcom Aero-H/H+ antenna facilities;
  - More than 65 airlines now use CMC's Satcom;
  - CMC delivered its 1,500th Satcom antenna on January 31, 2003;
  - CMC Electronics and Honeywell Aerospace Electronics Systems received the *Canadian-American Business Achievement Award 2002*, which is presented by the *CATAAlliance*, in partnership with *The Canadian-American Business Council (CABC)*. They created and marketed a new generation of jointly developed GPS-smart cockpit systems, which were adopted by 70% of commercial air carriers around the world;
  - Sikorsky chose CMC to supply its flight management system and emergency control panel. The total value of these sales could top US\$110 million over the full life of the program, which is estimated at 25 years.

**EMS Technologies Canada** ([www.elmg.com](http://www.elmg.com))

- Location: Sainte-Anne-de-Bellevue
  - Number of jobs: 600
  - Activities and main products: Designer and producer of TT&C voice and video communication systems (antennas) for the International Space Station; designer and creator of all digital command units (computers and controls) for the Canadarm-2, and integrator of all its joints; designer and creator of the DVB-RCS two-way Internet satellite connection system.
- Comments:
- \$293 million in orders for 2003;
  - 6% to 8% R&D budget for 2003.

**Héroux-Devtek** ([www.herouxdevtek.com](http://www.herouxdevtek.com))

- Locations: Longueuil, Laval, Dorval, and Montréal
- Number of jobs: 500
- Activities and main products:
  - Design, development, manufacture, repair, and reconditioning of landing gear and jacks;
  - Production of aircraft engine components and hydraulic actuators and systems;
  - Surface treatment and machine shop for aircraft structural components.
- Comments:
  - \$40.7 million in new orders from the American armed forces to make landing gear components for the C-5, KC-135, P-3, and C-130 programs.

**Honeywell Aerospace** ([www.honeywell.com](http://www.honeywell.com))

- Location: Saint-Laurent
- Number of jobs: 350
- Activities: Design, manufacture, and sale of high-tech electronic equipment for the military, and products and services for the aerospace industry.
- Main products: Thermal camera systems, night vision goggles, and aircraft engine control systems and accessories. Services include repair and overhaul, as well as complete after-sales service and product support.
- Comments:
  - CMC Electronics and Honeywell Aerospace Electronics Systems received the *Canadian-American Business Achievement Award 2002*, which is presented by the *CATAAlliance*, in partnership with *The Canadian-American Business Council (CABC)*. They created and marketed a new generation of jointly developed GPS-smart cockpit systems, which were adopted by 70% of commercial air carriers around the world.



**Air Transat – Maintenance Centre** ([www.transat.com](http://www.transat.com))

- Location: Dorval
- Number of jobs: 200
- Activities and main products: Major repair and overhaul centre for aircraft engines.

**Messier-Dowty** ([www.messier-dowty.com](http://www.messier-dowty.com))

- Location: Mirabel
- Number of jobs: 200
- Activities and main products: Manufacture and assembly of major landing gear components, primarily for Airbus A-318, A-319, A-320, A-330, and A-340-600 aircraft
- Comments:
  - Messier-Dowty International holds 40% of the world market for landing gear systems;
  - Messier-Dowty equips more than 16,000 aircraft that make approximately 30,000 landings each day.

**Lockheed Martin Canada** ([www.lmco.com](http://www.lmco.com))

- Location: Montréal
- Number of jobs: 150
- Activities and main products: Integration and management of complex electronic systems. Software: firing, programming, mission, training, and instrument landing systems. Integration of cockpit systems. Radar surveillance and reconnaissance system (SSAR) used mainly on the Canadian Armed Forces' Aurora CP-140.

**Thales Avionics Canada** ([www.thales-avionics.com](http://www.thales-avionics.com))

- Location: Saint-Laurent
- Number of jobs: 120
- Activities and main products: Supplier of sensory communication systems.

### 3. SELECT INVESTMENTS

This section contains some examples of companies that have moved into Metropolitan Montréal since 2001, as well as a selection of expansion projects undertaken by aerospace firms that are already established in the region.

#### **CIC Aerospace**

- Investment: \$35 million
- Country of origin: Canada
- Site: Montréal
- Scheduled completion date: N/A
- Number of jobs created: 160
- Description: Construction of an aircraft spare parts distribution centre combined with an overhaul centre in order to provide aircraft repair and maintenance services in Montréal.

#### **GE Elano Canada**

- Investment: \$33 million
- Country of origin: United States
- Activity sector: Manufacture of aerospace parts and products
- Site: Mirabel
- Scheduled completion date: 2003
- Number of jobs created: 0
- Description: Equipment upgrade and purchase following acquisition of the Aerotech Tubetronics plant at Mirabel. Elano Corporation, a subsidiary of General Electric, specializes in aircraft engine and air duct repair and maintenance.

#### **Aeroceltic Canada Cargo**

- Investment: \$23.4 million
- Country of origin: Canada
- Site: Mirabel
- Scheduled completion date: 2003
- Number of jobs created: 100
- Description: Establishment of a cargo transit centre and aircraft maintenance base in the Mirabel Foreign Trade Zone.

**Messier-Dowty**

- Investment: \$23.2 million
- Country of origin: France
- Site: Mirabel
- Scheduled completion date: 2003
- Number of jobs created: None
- Description: Enlargement of its Mirabel plant, which specializes in manufacturing jumbo jet landing gear.

**Aero Mecachrome**

- Investment: \$20 million
- Country of origin: France
- Site: Montréal
- Scheduled completion date: 2003
- Number of jobs created: 40
- Description: Phase 1 of a plan to expand Aero Mecachrome's Montréal shops. The company machines landing gear parts and aircraft wing structures for Airbus, Bombardier, Boeing, and several other large aircraft builders.

**Turbomeca Canada**

- Investment: \$10 million
- Country of origin: France
- Site: Mirabel
- Scheduled completion date: 2003
- Number of jobs created: 50 over two years
- Description: Construction of an overhaul and repair centre in the Mirabel Foreign Trade Zone. The company specializes in helicopter turboshaft engine manufacture and maintenance.

**Ateliers d'Usinage Aero (now Aero Mecachrome)**

- Investment: \$9.2 million
- Country of origin: France
- Site: Montréal
- Scheduled completion date: 2002
- Number of jobs created: 35 jobs over two years
- Description: Enlargement of the Montréal plant. The company machines landing gear parts and aircraft wing structures for Airbus, Bombardier, Boeing, and several other large aircraft builders.

**Aviation Lemex**

- Investment: \$8 million
- Country of origin: Canada
- Site: Longueuil
- Scheduled completion date: 2002
- Number of jobs created: 140
- Description: Enlargement of the Saint-Hubert plant. The company specializes in the manufacture of metal parts for the aerospace industry.

**Performance LT**

- Investment: \$7 million
- Country of origin: Italy
- Site: Laval
- Scheduled completion date: N/A.
- Number of jobs created: 25 over two years
- Description: Acquisition of Performance LT by Mecaer Systems Canada, and expansion of the Laval plant. The company specializes in the manufacture of landing gear components, including cylinders, pistons, axles, and torque arms.

**Pega Precision**

- Investment: \$4.5 million
- Country of origin: Canada
- Site: Montréal
- Scheduled completion date: 2003
- Number of jobs created: 115 jobs over two years
- Description: Enlargement of the Saint-Léonard machine shop. The company specializes in precision machining, manufacturing specialized tools, and mechanical subassembly for the military and aviation industry.

**Liebherr Aerospace Canada**

- Investment: \$4.2 million
- Country of origin: Germany
- Site: Laval
- Scheduled completion date: 2002
- Number of jobs created: 15
- Description: Relocation to a new facility in Laval. The company specializes in the manufacture of air-conditioning systems, flight controls, and landing gear for the aerospace industry.

**CEL Aerospace**

- Investment: \$3.2 million
- Country of origin: Canada
- Site: Longueuil
- Scheduled completion date: 2003
- Number of jobs created: 200 jobs over three years
- Description: Enlargement of the Longueuil plant and acquisition of new equipment. CEL designs and operates tests and test equipment for turbine aircraft engines.

**Advanced Systems Technologies (AST)**

- Investment: \$1 million
- Country of origin: United States
- Site: Longueuil
- Scheduled completion date: 2002
- Number of jobs created: 2
- Description: Establishment of a new service centre for the application and removal of coatings in Saint-Hubert. AST is a unit of subsidiary Pratt & Whitney's Specialty Materials and Services.

## 4. WORKFORCE AND EDUCATION

This section outlines the labour pool for Metropolitan Montréal's aerospace industry in 2003, including employment structure, educational institutions, compensation levels, and the number of university degrees awarded annually.

### 4.1. LABOUR POOL

#### Employment structure by subsector

– Prime contractors and major repair and overhaul centres:	29,000
– Equipment manufacturers:	2,900
– Subcontractors and suppliers of special products and services:	5,900
	-----
Total	37,800

#### Employment structure by type of job<sup>10</sup>

– Engineers/scientists:	5,700
– Technicians:	6,300
– Operators:	19,400
– Administrators:	6,400
	-----
Total	37,800

**Table 2: Structure of employment by subsector and type of job<sup>10</sup>, 2003**

	Engineers/ Scientists	Technicians	Operators	Administrators	Total
Prime contractors and major repair and overhaul centres	4,400	4,800	14,900	4,900	29,000
Equipment manufacturers	400	500	1,500	500	2,900
Subcontractors and suppliers of special products and services	900	1,000	3,000	1,000	5,900
<b>Total</b>	<b>5,700</b>	<b>6,300</b>	<b>19,400</b>	<b>6,400</b>	<b>37,800</b>

<sup>10</sup> Estimate based on 2003 forecasts by the Centre for Aerospace Manpower Activities in Quebec (CAMAQ).

## 4.2. EDUCATIONAL PROGRAMS

This section describes the educational institutions with university and pre-university programs related to the aerospace industry. In collaboration with Metropolitan Montréal's network of educational institutions, the aerospace industry has established the Centre for Aerospace Manpower Activities in Quebec (CAMAQ), a coordinating body whose mission is to adapt secondary school, college, and university programs to market demand. CAMAQ has contributed to the creation of a number of schools and special programs related to aviation.

### 4.2.1 University Programs

- Partnership among five universities (Montréal, McGill, Concordia, Laval, and Sherbrooke).
  - Joint Master's in Aerospace Engineering (M.Eng.), in association with industry members. Major options: Aeronautics and Propulsion, Avionics and Control, Structure and Materials, Aerospace Engineering.

- **McGill University** ([www.mcgill.ca](http://www.mcgill.ca))

Faculty of Engineering:

- Mechanical engineering      B.Sc., M.Sc., and Ph.D.
- Electrical engineering      B.Sc., M.Sc., and Ph.D.
- Computer engineering      B.Sc., M.Sc., and Ph.D.
- Metallurgical engineering      B.Sc., M.Sc., and Ph.D.

- **Concordia University** ([www.concordia.ca](http://www.concordia.ca))

Faculty of Engineering and Computer Science:

- Electrical engineering      B.Eng, M.Sc., M.Eng., and PhD.
- Computer engineering      B.Eng, M.Sc., M.Eng., and PhD.
- Mechanical engineering      B.Eng, M.Sc., M.Eng., and PhD.
- Industrial and administrative engineering      B.Eng, M.Sc., M.Eng., and PhD.

Note: New program: *Graduate Certificate in Software Systems for Mechanical and Aerospace Engineering*

- **École de technologie supérieure – affiliated with the Université du Québec à Montréal** ([www.etsmtl.ca](http://www.etsmtl.ca))

- Mechanical engineering B.Eng., M.Eng.
- Electrical engineering B.Eng., M.Eng.
- Automated production engineering\* B.Eng., M.Eng.
- Aerospace engineering M.Eng.
- Industrial and administrative engineering B.Eng., M.Eng.

\* With an aerospace production option: Aerodynamics, Aeroelasticity, Aircraft Construction, Dynamic Stalling

- **École Polytechnique – affiliated with the Université de Montréal** ([www.polymtl.ca](http://www.polymtl.ca))

- Mechanical engineering B.Sc., M.Sc., and Ph.D.
- Electrical engineering B.Sc., M.Sc., and Ph.D.
- Materials engineering B.Sc., M.Sc., and Ph.D.
- Aerospace engineering M.Sc.
- Industrial and administrative engineering B.Eng., M.Eng.

Note: Several majors are offered, including Avionics, Space Technology, Materials, and Mechatronics

#### 4.2.2 College Programs

- **Cégep Ahuntsic** ([www.collegeahuntsic.qc.ca](http://www.collegeahuntsic.qc.ca))

- Industrial engineering technology
- Industrial electronics technology

- **Cégep André-Laurendeau** ([www.clarendeau.qc.ca](http://www.clarendeau.qc.ca))

- Industrial electronics technology

- **Cégep de Maisonneuve** ([www.cmaisonneuve.qc.ca](http://www.cmaisonneuve.qc.ca))

- Electronics technology
- Electronics design technology

- **Cégep de Saint-Jérôme/Centre de matériaux composites de Saint-Jérôme** ([www.cegep-st-jerome.qc.ca](http://www.cegep-st-jerome.qc.ca))

- Composites processing technology
- Mechanical engineering technology
- Industrial electronics technology

- **Cégep de Saint-Laurent** ([www.cegep-st-laurent.qc.ca](http://www.cegep-st-laurent.qc.ca))

- Electronics technology
- Mechanical engineering technology



- **Cégep du Vieux-Montréal** ([www.cvm.qc.ca](http://www.cvm.qc.ca))
  - Computing centre with CATIA technology, high-performance CAD/CAM system for the aerospace industry
  - Industrial maintenance technology
  - Mechanical engineering technology (Mechanical computer-assisted design and manufacturing (CAD/CAM))
  - Electrical engineering technology (Industrial electronics and instrumentation and automation)
- **John Abbott College** ([www.johnabbott.qc.ca](http://www.johnabbott.qc.ca))
  - Diploma of Collegial Studies in aircraft maintenance technology
  - Aviation management program: commercial aviation pilot management and training
- **Dawson College** ([www.dawsoncollege.qc.ca](http://www.dawsoncollege.qc.ca))
  - Mechanical engineering technology, options: Automation (Computer-Assisted Design and Drawing), Robotics, Numerical Control and Computer-Assisted Manufacturing
  - Industrial design
  - Electronics technology
- **Vanier College** ([www.vaniercollege.qc.ca](http://www.vaniercollege.qc.ca))
  - Industrial electronics technology

#### 4.2.3 Institutions offering Technical Training and Special Trades

- **École nationale d'aérotechnique (ÉNA) – affiliated with Collège Édouard-Montpetit** ([www.collegeem.qc.ca](http://www.collegeem.qc.ca))
  - Diploma of Collegial Studies in aircraft construction technology, aircraft maintenance technology, and avionics
  - CAD/CAM (Computer-Assisted Design and Manufacturing) Centre

Note: ÉNA houses the Conseil international de formation aérospatiale (CIFA) headquarters and the Centre technologique en aérospatiale (technology transfers and school-industry liaison).

- **École des métiers de l'aérospatiale de Montréal (ÉMAM)** ([www.csdm.qc.ca/emam](http://www.csdm.qc.ca/emam))
  - Trade school diplomas in:
    - Aerospace cable and circuit installation
    - Aerospace mechanical assembly
    - Aerospace structural assembly
    - Machining technology
  - Attestations of trade specialty in:
    - Precision sheet-metal work
    - Surface treatment
    - Tooling
    - Machining with numerically controlled machine tools
- **Centre de formation professionnelle Pierre-Dupuy** ([www.pierredupuy.qc.ca](http://www.pierredupuy.qc.ca))
  - Trade school diploma in aviation sheet-metal mechanics
- **Institut supérieur d'électronique** ([www.institut.com](http://www.institut.com))
  - Attestation of Collegial Studies in robotic technology and industrial automatons
- **Institut Teccart** ([www.teccart.qc.ca](http://www.teccart.qc.ca))
  - Industrial electronics technology
  - Electronics technology
  - Attestation of Collegial Studies in industrial networking and automation

### 4.3. COMPENSATION

The following table shows estimated compensation levels in Metropolitan Montréal's aerospace industry. Actual salaries may vary based on specialty, education (post secondary/vocational, DCS, Bachelor or Master's degree), and market conditions. The figures indicate the salary range for new employees with no previous experience.

**Table 3: Compensation levels\*, 2003**

Type of Job	Estimated Average Starting Salaries (No Experience)
Engineers/scientists	\$45,000 to \$50,000/year
Technicians	\$34,000 to \$38,000/year
Operators/assemblers/installers	\$30,000 to \$34,000/year

Source: Survey of major aerospace companies

\* Average pay at prime contractors

#### 4.4. UNIVERSITY DEGREES AWARDED

Every year, approximately 900 university degrees are awarded in Metropolitan Montréal in programs that are directly or indirectly related to the aerospace industry. The following is a breakdown by field of study.

**Table 4: University degrees awarded – aerospace, 2001**

Field of Study	Under-graduate	Master's	Doctorate	Total
Physical sciences	54	21	23	98
Aerospace, aviation, and space engineering	14	26	----	40
Mechanical engineering	408	61	15	484
Industrial and administrative engineering	195	41	----	236
Physical engineering	24	3	2	29
<b>Total</b>	<b>695</b>	<b>152</b>	<b>40</b>	<b>887</b>

Source: Ministère de l'Éducation du Québec

#### 4.5. ENROLMENT

Upwards of 7,500 students are enrolled in programs that are related to the aerospace industry in Metropolitan Montréal universities and technical training schools. The École nationale d'aérotechnique (ÉNA) has more than 1,300 students, and the École des métiers de l'aérospatiale de Montréal (ÉMAM) has more than 800. The breakdown by field of study for universities appears below.

**Table 5: University enrolment – aerospace, 2002-03\***

Field of Study	Under-graduate	Master's	Doctorate	Total
Physical sciences	224	90	93	407
Aerospace, aviation, and space engineering	11	83	----	94
Mechanical engineering	2,923	466	117	3,506
Industrial and administrative engineering	923	383	----	1,306
Physical engineering	192	46	16	254
<b>Total</b>	<b>4,273</b>	<b>1,068</b>	<b>226</b>	<b>5,567</b>

Source: Ministère de l'Éducation du Québec

\* McGill enrolment figures are from 2001

## 5. RESEARCH AND DEVELOPMENT CENTRES

In addition to corporate R&D departments, Metropolitan Montréal is home to a number of public and parapublic research centres that are directly or indirectly related to the aerospace industry. They are profiled below in diminishing order of workforce.

### **Canadian Space Agency**

- Affiliation: Government of Canada
- Location: Saint-Hubert
- Expertise: Coordination of all aspects of Canada's space program, and administration of five sectors:
  - Space Programs, which includes Canada's contribution to the International Space Station
  - Space Operations, which consists of the David Florida Laboratory – space engine test centre – and RADARSAT – Canada's first Earth observation satellite (launched in 1995)
  - Canadian Astronaut Office
  - Space Science
  - Space Technologies, which includes Canada's involvement with European Space Agency programs
- Workforce:
  - Federal public servants: 450
  - Contract employees: 250
  - Students: 75 (on average)
  - Total: 775
- Note: Most employees work at the John H. Chapman Space Centre in Saint-Hubert, which is the Agency's headquarters. The Agency also has offices in Ottawa (Space Science, David Florida Laboratory, liaison suite), Washington, Houston, and Paris.
- Website: [www.espace.gc.ca](http://www.espace.gc.ca)

### **Industrial Materials Institute (IMI)**

- Affiliation: National Research Council of Canada (NRC)
- Location: Boucherville
- Partners: Close collaboration with industry, universities, and government through the creation of interest or technology groups, consortiums, and joint research projects.
- Workforce:
  - Research: 170
  - Administration: 20
  - Total: 190

- Expertise: R&D projects involving the development of computer simulation models and experimental techniques for the validation and optimization of processes; the development and fine-tuning of process technologies involving metals, polymers, ceramics, and their composites; and the development and use of process control systems, such as optic and ultrasonic sensors.
- Website: [www.imi.nrc.ca](http://www.imi.nrc.ca)

#### **Institute of Aerospace Research (IAR)**

- Affiliation: National Research Council of Canada (NRC)
- Location: Montréal
- Industrial partners: Bombardier Aerospace, CAE, Rolls-Royce Canada, Pratt & Whitney Canada, NASA, and many more
- Expertise: Aerodynamics testing, structures and materials research, aeroacoustic research, flight testing, airborne simulation, airborne sensing, aeropropulsion research, icing research, materials processing, advanced manufacturing, non-destructive testing, and diagnostics.
- Website: <http://iar-ira.nrc-cnrc.gc.ca>

#### **Centre de recherche appliquée sur les polymères (CRASP)**

- Affiliation: École polytechnique de Montréal
- Location: Montréal
- Industrial partners: Camoplast, ELF Atochem, IBM, IRSST, Northern Telecom, Shell, 3M, Ford, Matra, SNECMA, ACM Composites, Beauce Composites, and Pultrusion Technique.
- Expertise: Research in the fields of organic matrix composites, plastics, alloys, and polymers in general
- Workforce:
  - Professors and scientists: 20
  - Postgraduate students: 63
  - Postdoctoral interns: 8
  - Researchers: 13
  - Total: 104
- Website: [www.polymtl.ca](http://www.polymtl.ca)

### **Centre de recherche en calcul appliqué (CERCA)**

- Affiliations: Concordia University, McGill University, École Polytechnique, Université de Montréal, and Ministère du développement économique et régional (MDER)
- Location: Montréal
- Industrial partners: Bombardier Aerospace, Environment Canada (Atmospheric Environment Department), GE Canada, Hydro-Québec (Production Group), NATCOM
- Expertise: Study of complex physical systems through mathematical modelling, intensive computing, numeric simulation, and scientific visualization in the fields of industrial mechanics, environmental forecasting, pharmaceutical chemistry, industrial geophysics, nanostructures, scientific visualization, astrophysics, and high-performance computing.
- Workforce:
  - Professors: 17
  - Scientists: 23
  - Project managers: 3
  - Postdoctoral interns: 9
  - Graduate students: 30
  - Other: 7
  - Total: 89
- Website: [www.cerca.umontreal.ca](http://www.cerca.umontreal.ca)

### **POLY-GRAMES (Microwave and Space Electronics Advanced Research Centre)**

- Affiliation: École Polytechnique
- Location: Montréal
- Industrial partners: EMS Technologies Canada, Hydro-Québec, Advantech, and NSI
- Workforce:
  - Professors and scientists: 5
  - Postgraduate students: 60
  - Postdoctoral interns: 5
  - Researchers: 1
  - Technicians: 5
  - Associate researchers: 4
  - Research assistants: 2
  - Administrative staff: 1
  - Other: 5
  - Total: 88
- Expertise: The Centre's focus includes the use of microwaves for space/mobile communications (development of numeric methods and design of integrated active and passive components in centimetric and millimetric bands).
- Website: [www.polymtl.ca](http://www.polymtl.ca)

### **CONCAVE (Concordia Computer-Aided Vehicle Engineering)**

- Affiliation: Concordia University
- Location: Montréal
- Industrial partners: Héroux-Devtek and Pratt & Whitney Canada
- Workforce:
  - Professors: 8
  - Postgraduate students: 47
  - Technicians: 2
  - Administrative staff: 1
  - Total: 58
- Expertise: The Centre's mission is to engage in technology transfers to industries that are active in the field of transportation; to develop safe and efficient transport systems through basic and applied research; and to develop user-friendly expert system software for analyzing, designing, and testing vehicle systems and subsystems.
- Website: <http://encs.concordia.ca/Index/index.htm>

### **Groupe d'analyse des composants mécaniques (GACM)**

- Affiliation: École Polytechnique
- Location: Montréal
- Industrial partners: Pratt & Whitney Canada, Bombardier/Canadair, Hydro-Québec, Howmedica, PWRC, GORE, Flexitallic, DuPont, Marine & Petroleum, and Techmir
- Expertise: Analysis of the behaviour of mechanical components and component testing in order to determine durability in service.
- Workforce:
  - Professors and scientists: 11
  - Postgraduate students: 24
  - Researchers: 3
  - Total: 38
- Website: [www.polymtl.ca](http://www.polymtl.ca)

### **C<sup>2</sup>M<sup>2</sup> (Centre de caractérisation microscopique des matériaux)**

- Affiliation: École Polytechnique
- Location: Montréal
- Industrial partners: Alcan, Oerlikon Aérospatiale, Domfer, Précitech, and Noranda
- Workforce:
  - Professors and scientists: 18
  - Postgraduate students: 13
  - Researchers: 4
  - Total: 35
- Expertise: Materials engineering research into developing generic technologies and solving technical and quality problems with materials. Areas of expertise include metal matrix composites, powder metallurgy, galvanized zinc and alloyed coatings, and the development of new microscopic characterization methods.
- Website: [www.polymtl.ca](http://www.polymtl.ca)

### **Groupe de recherche en mathématiques de l'ingénierie assistée par ordinateur (GRMIAO)**

- Affiliation: École polytechnique de Montréal
- Location: Montréal
- Industrial partners: Hydro-Québec, GEC-Alstom, GE Canada, Centre des technologies du gaz naturel, Bombardier/Canadair, CANMET, Toshiba, and BMA.
- Expertise: GRMIAO focuses on numeric simulation applied to industrial flow with respect to:
  - hydraulic turbine analysis and performance (viscous and turbulent flow in 2D and 3D)
  - external flow calculation for aircraft aerodynamics
  - simulation of electric arc and compressible flow interaction for designing high-power circuit-breakers
  - prediction of pollutant formation in industrial natural gas burners
  - scientific visualization
  - mesh generation
- Workforce:
  - Professors and scientists: 6
  - Postgraduate students: 21
  - Postdoctoral interns: 3
  - Researchers: 3
  - Total: 33
- Website: [www.polymtl.ca](http://www.polymtl.ca)



### **Consortium de recherche et d'innovation en aérospatiale au Québec (CRIAQ)**

- Affiliations: École Polytechnique, École de technologie supérieure, Concordia University, Université Laval, McGill University, Université du Québec à Chicoutimi, and Université de Sherbrooke
- Location: Montréal
- Partners: Bell Helicopter Textron, Bombardier Aerospace, CAE, CMC Electronics, Pratt & Whitney Canada, Techspace Aero, and Thales Avionics Canada
- Associate members: Delastek, Aerospace Industries Association of Canada (AIAC), Canadian Space Agency, and National Research Council of Canada
- Expertise: Low-cost manufacturing; composites, acoustics and icing, modelling and simulation, microelectromechanical systems, multidisciplinary systems design and integration, and avionics
- Workforce:
  - Scientists: 13
  - Administration: 2
  - Total: 15
- Website: [www.criq.aero](http://www.criq.aero)

### **Centre des matériaux composites de Saint-Jérôme (CMC)**

- Affiliation: Cégep de Saint-Jérôme
- Location: Saint-Jérôme
- Workforce:
  - Professors and scientists: 2
  - Technicians: 4
  - Administration: 4
  - Other: 4
  - Total: 14
- Partners: Many partners in Canada and abroad, including the Centre de recherche industriel du Québec (CRIQ), École Polytechnique, the Centre de recherche des fabrications industrielles in Belgium, and the Institut des matériaux composites (IMC) in France
- Expertise: CMC is a technology transfer centre in the realm of composites, and provides computer-assisted design and manufacturing (CAD/CAM), financing and technology transfer, custom training, and testing services.
- Website: [www.citenet.net/cmc](http://www.citenet.net/cmc)

### **Concordia University Centre for Composites (CONCOM)**

- Affiliation: Concordia University
- Location: Montréal
- Industrial partners: Bell Helicopter Textron, CMC Electronics, CIL Canada, Circocraft, Comptank Corporation, CPF Dualam, Dow Chemical Canada, FRE Composites, Les Transports Provost, Noranda CNR Division, Pratt & Whitney Canada, EMS Technologies, and Troy Manufacturing
- Expertise: Composites processing, manufacturing, repair, CAD, and non-destructive testing of composite structures
- Workforce: 13
- Website: <http://encs.concordia.ca/Index/index.htm>

### **Chaire en aéronautique J.A. Bombardier**

- Affiliation: École Polytechnique
- Location: Montréal
- Industrial partner: Bombardier/Canadair
- Workforce:
  - Professors and scientists: 1
  - Postgraduate students: 6
  - Postdoctoral interns: 2
  - Researchers: 1
  - Total: 10
- Expertise: Research activities in aviation, and specifically the effects of ice on aircraft wings, compressible boundary layer stability and transition, and wind power. In collaboration with Bombardier/Canadair, the Chair has developed a variety of codes for predicting ice build-up on aircraft components, which are being used to fine-tune the design of new types of aircraft, such as the Regional Jet and Global Express
- Website: [www.polymtl.ca](http://www.polymtl.ca)

### **Centre technologique en aérospatiale (CTA)**

- Affiliation: École nationale d'aérotechnique (ÉNA), affiliated with Collège Édouard-Montpetit
- Location: Saint-Hubert
- Industrial partners: Ministère du développement économique et régional (MDER) and Ministère de l'Éducation du Québec
- Expertise: The Centre's mission is to support businesses (especially SMEs) in the aerospace sector through the development of new technologies and participation in project implementation. This includes the study and analysis of needs, aviation technology, CATIA technology, and computer-assisted drawing, manufacturing, and design (CAD/CAM)
- Workforce:
  - Research: 2
  - Administration: 5
  - Total: 7
- Website: [www.collegeem.qc.ca/ena/cta/menu.htm](http://www.collegeem.qc.ca/ena/cta/menu.htm)

## 6. SUPPORT FOR BUSINESS

This section describes the various types of support that are available to companies in the aerospace industry. This support can take the form of tax breaks or public or private financial aid. There are also a number of institutions that provide venture capital for companies in this industry, including the Caisse de dépôt et placement du Québec (CDPQ), through CDP Capital – Americas and CDP Capital – Technology Ventures; the Société générale de financement du Québec (SGF); the FTQ Solidarity Fund; and Aerocapital (a subsidiary of GTI Capital).

### 6.1. TAXATION

Tax measures may be available in the form of investment incentives and R&D incentives.

#### 6.1.1 Investment Incentives

- **Capital tax holiday**

When calculating their paid-up capital, companies that were established in Québec in 2003 are entitled to claim a deduction, which can be as high as \$600,000 starting in 2004.

CAPITAL TAX EXEMPTION IN QUÉBEC (IN \$CA)	
2003	2004
250,000	600,000

Only SMEs are entitled to claim the exemption from 2003 to 2005. It will be extended to all companies in Québec in 2006.

- **Tax holiday for new companies**

The Québec government offers new companies that have less than \$15 million in paid-up capital a five-year exemption from income tax, capital tax, and employer contributions to the Health Services Fund. This tax holiday applies as follows:

- **Capital tax:** The exemption applies to 75% of the amount of paid-up capital, and is calculated on the first \$3 million of paid-up capital;
- **Income tax:** The exemption applies to 75% of revenue from an eligible company, and is calculated on the first \$200,000 of revenue;
- **Employer contributions to the Health Services Fund (HSF):** The exemption applies to 75% of salaries paid or deemed to be paid in a taxation year, and is calculated on the first \$700,000 in salaries.

## 6.1.2 R&D Incentives

- **Deduction of all eligible R&D expenses**

The governments of Canada and Québec allow operating and capital expenses to be deducted in the current year or later.
- **17.5% basic tax credit**

The federal government allows a basic tax credit of 17.5% of eligible R&D expenses. For Canadian-controlled small enterprises, this credit can be refundable, and may amount to as much as 35% of the first \$2 million in expenditures.
- **Refundable tax credit of 17.5% of salaries**

The Québec government allows a refundable tax credit of 17.5% of salaries paid for R&D activities. For small enterprises, the credit is increased to 35% for the first \$2 million of salaries paid for R&D.
- **35% refundable tax credit**

The Québec government allows a refundable 35% tax credit applicable to 80% of all eligible R&D expenditures made in Québec (effective rate: 28%) by companies (regardless of size), certified research centres (university, hospital, public research centre), or in connection with a pre-competitive research project. Companies that belong to a research consortium can also claim this tax credit.
- **Tax holiday for foreign researchers**

Foreign scientists and other experts can enjoy a five-year holiday from provincial income tax, applicable to 75% of their personal income, if they move to Québec in order to work in R&D for a company. This tax break extends to foreign postdoctoral interns who sign an employment contract with universities and eligible research centres.

This measure also applies to foreign experts (other than researchers), particularly managers who are wholly dedicated to the management and foreign marketing of innovations.

**Table 6: Net cost of a \$100<sup>11</sup> eligible R&D expense in Québec, 2003  
Manufacturing Sector**

	<b>SME</b>		<b>LARGE COMPANY</b>	
	In-house R&D 35% Tax Credit	R&D by Certified Centre 35% Tax Credit	In-house R&D 35% Tax Credit	R&D by Certified Centre 35% Tax Credit
Québec tax incentives <sup>12</sup>	\$24	\$35	\$16	\$36
Federal tax incentives <sup>13</sup>	\$36	\$31	\$34	\$27
Net cost to company <sup>14</sup>	\$40	\$34	\$50	\$37

Source: Investissement Québec, 2003

<sup>11</sup> 50% salaries, 40% operating expenses, and 10% equipment.

<sup>12</sup> The federal tax credit is taxable in Québec in the year following the claim. For the sake of this example, the credit was included in revenue for the same year in which it is claimed.

<sup>13</sup> The federal tax credit for investments becomes taxable at the federal level in the year following the claim. For the sake of this example, the credit was included in the same year in which it is claimed.

<sup>14</sup> Includes the tax credits and savings resulting from the revenue deduction.

## 6.2. GOVERNMENT FINANCIAL ASSISTANCE

This section describes the main government financial assistance programs that are available to companies in the aerospace industry.

### **Fonds pour l'accroissement de l'investissement privé et la relance de l'emploi (FAIRE)**

- Objectives/characteristics
  - The program is intended to encourage manufacturers to undertake investments that are expected to create substantial economic benefits.
- Type of financial assistance and eligibility conditions
  - Please contact the program administrator for more information concerning eligibility conditions and financing terms.
- Program administrator
  - Investissement-Québec  
393 Saint-Jacques Street, Suite 500, Montréal, Québec, H2Y 1N9  
Tel.: 1 800 461-2433 or (514) 873-4375, Fax: (514) 873-5786  
Website: [www.invest-quebec.com](http://www.invest-quebec.com)

### **SME Financing**

- Objectives and type of financial assistance
  - This financial assistance is intended to help companies to carry out development projects;
  - It takes the form of a repayment guarantee of up to 80% of the net loss on a term loan, a line of credit, or a letter of credit issued by a financial institution. La Financière du Québec can also grant a term loan, a line of credit, or a letter of credit when all other forms of financing prove impossible.
- Eligibility criteria

The company must:

  - be active in one of the following sectors: manufacturing, tourism, recycling, environmental restoration, call centre and the New Economy, information technology with high added value, or research laboratory;
  - demonstrate that the assistance will be used to maintain production and jobs.
- Terms and conditions
  - The minimum amount of financing is \$50,000;
  - The maximum term is 10 years;
  - The terms of the loan must be acceptable to La Financière du Québec;
  - The company can seek a moratorium on principal repayments for a maximum period of two years following completion of the project.

- Program administrator
  - Investissement-Québec  
393 Saint-Jacques Street, Suite 500, Montréal, Québec, H2Y 1N9  
Tel.: 1 800 461-2433 or (514) 873-4375, Fax: (514) 873-5786  
Website: [www.invest-quebec.com](http://www.invest-quebec.com)

### **Industrial Research Assistance Program (IRAP)**

- Objectives/characteristics
  - Program designed to help Canadian SMEs design new technology products, processes, or services, or to improve them, with cost-sharing financing. The program also has a pre-marketing assistance program that is more specifically intended for projects that have reached this stage in the enabling technology, environment, aerospace, and defence sectors.
- Type of assistance
  - Financing varies, depending on project size and complexity:
    - Small projects: 40% to 50% of eligible expenses, to a ceiling of \$150,000, depending on the project and province;
    - Large projects: 40% to 50% of eligible expenses, to a ceiling of \$350,000, depending on the project and province.
  - Marketing assistance component: maximum contribution of 33% of eligible expenses.
  - Pre-marketing assistance component: eligible expenses up to \$1.5 million.
- Eligibility conditions/criteria
  - Fewer than 500 employees;
  - Potential to improve innovative capacity.
- Eligible expenses
  - Eligible expenses include:
    - Feasibility studies;
    - Strategic technology planning;
    - Technical analysis;
    - Access to technology and resources in Canada and abroad.
  - For the marketing assistance component, eligible expenses include:
    - Cost of labour, materials, and equipment;
    - Administrative expenses;
    - Cost of acquiring specialized equipment.
- Program administrator
  - National Research Council of Canada (NRC)  
75 De Mortagne Blvd., Suite P-101, Boucherville, Québec, J4B 6Y4  
Tel.: (450) 641-5300, Fax: (450) 641.5301  
Website: [www.nrc.ca](http://www.nrc.ca)



## **Technology Partnerships Canada (TPC)**

- Objectives/characteristics
  - Technology investment fund for supporting R&D and innovation in various fields of advanced technology. In aerospace and defence (including defence industry conversion projects), the focus is on technologies related to:
    - advanced avionic and electronic systems;
    - aircraft engines and engine components;
    - aircraft materials, structures, components, and systems;
    - software and simulators;
    - space industry systems and components, including communications technologies.
  - The following activities qualify for TPC investments:
    - Industrial research;
    - Pre-competitive development;
    - Studies.
- Type of financial assistance
  - Funding of a portion of eligible expenses, to a maximum of 25% to 30% (50% in exceptional cases). TPC investments are conditionally reimbursable.
- Eligible expenses
  - Labour costs;
  - Material and equipment;
  - Specialized equipment;
  - Other costs directly related to the project.
- Program administrator
  - Industry Canada/Technology Partnerships Canada  
300 Slater Street, 10<sup>th</sup> Floor, Ottawa, Ontario, K1A 0C8  
Tel.: 1 800 266-7531, Fax: (613) 954-9117  
Website: [www.strategis.ic.gc.ca](http://www.strategis.ic.gc.ca)

Note: In 2001, Technology Partnerships Canada launched two pilot projects that are intended specifically for SMEs in the aerospace and defence industries:

- The TPC Aerospace and Defence Supplier Development Initiative;
- The Canadian Aerospace Collaborative Technology Development Program.

These programs are described in the following pages.

## **TPC Aerospace and Defence Supplier Development Initiative**

- Objectives/characteristics
  - Program to help SMEs to develop and integrate world-class practices and technologies in commerce and manufacturing. This initiative supports the following types of activities:
    - Quality management systems;
    - Advanced manufacturing systems;
    - Planning and process systems;
    - Robotic cells and systems;
    - Technical data transfer studies;
    - Purchase of equipment that is essential for carrying out project activities.
- Type of financial assistance
  - The total amount of eligible expenses must not exceed \$2 million;
  - Financing of 40% to 50% of eligible expenses.
- Eligibility criteria
  - At least 33% of total revenue in the preceding year must come from sales to the aerospace or defence industry;
  - Annual total sales of less than \$20 million or fewer than 100 employees.
- Eligible expenses
  - Cost of direct labour and direct materials related to the project;
  - Overhead (65% of direct labour costs, or a fixed rate determined by Public Works and Government Services Canada);
  - Fees for consultants and subcontractors who are required in order to carry out the work;
  - Cost of hardware and software required to set up a particular system;
  - Cost of software and site user licenses, depending on needs;
  - Cost of studies carried out.
- Program administrator
  - Technology Partnerships Canada  
300 Slater Street, 10<sup>th</sup> Floor, Ottawa, Ontario, K1A 0C8  
Tel.: 1 800 266-7531, Fax: (613) 954-9117  
Website: [www.strategis.ic.gc.ca](http://www.strategis.ic.gc.ca)

### **Canadian Aerospace Collaborative Technology Development Program (TPC)**

- Objectives/characteristics
  - Program designed to encourage multi-partner R&D projects, and intended for Canadian aerospace and defence suppliers. Partnership program from the Office of Collaborative Technology Development, which consists of the Aerospace Industry Association of Canada (AIAC), the National Research Council of Canada (NRC), and Technology Partnerships Canada (TPC).
- Type of financial assistance
  - Covers 50% of financing costs, to a ceiling of \$1 million per project.
- Eligibility criteria
  - Collaboration at the early stages of R&D with a substantial innovative component that will enable the partners to increase their technological capacity.
  - Eligible partnerships must consist of at least two Canadian aerospace and defence companies, one of which must be an SME. The project leader must be one of the Canadian firms. Academic researchers, government laboratories, and other public agencies may also be project partners. The following fields are eligible:
    - Design technologies;
    - Environmental technologies;
    - Maintenance, repair, and reconditioning technologies;
    - Manufacturing technologies;
    - Materials and construction technologies;
    - Systems technologies;
    - Visualization technologies.
- Program administrator
  - Technology Partnerships Canada  
300 Slater Street, 10<sup>th</sup> Floor, Ottawa, Ontario, K1A 0C8  
Tel.: 1 800 266-7531, Fax: (613) 954-9117  
Website: [www.strategis.ic.gc.ca](http://www.strategis.ic.gc.ca)

### **IDEA – SME Program**

- Objectives/characteristics
  - This program is designed to assist individual SMEs (fewer than 200 employees), or groups of SMEs, in carrying out innovative or RDD (Research, Develop and Design) projects, or projects related to the marketing of products, services, or technologies resulting from RDD work.
- Type of financial assistance
  - Contributions, reimbursable or not, or subsidies:
    - Contributions must not exceed 50% of authorized costs;
    - Subsidies can cover up to 100% of costs.
- Eligible expenses
  - All costs related to:
    - labour;
    - professional services;
    - equipment leasing;
    - process demonstration or development;
    - organization of an exhibition, conference, or seminar.
- Program administrator
  - Economic Development Canada  
800 Victoria Square, Suite 3800, P.O. Box 247, Montréal, Québec, H4Z 1E8  
Tel.: (514) 283-2500, Fax: (514) 496-8310  
Website: [www.dec-ced.gc.ca](http://www.dec-ced.gc.ca)

### **Microbusiness Program**

- Objectives/characteristics
  - This program is intended to support innovate small businesses in the start-up or early growth phase, and provides them with supervision and customized management assistance for two years.
- Type of financial assistance
  - Term financing up to:
    - \$50,000 for established businesses;
    - \$25,000 for new businesses.
- Program administrator
  - Business Development Bank of Canada  
5 Place Ville Marie, Suite 12525, Montréal, Québec, H3B 2G2  
Tel.: (514) 496-7966, Fax: (514) 496-7974  
Website: [www.bdc.ca](http://www.bdc.ca)

## **Canada Small Business Financing (CSBF) Program**

- Objectives/characteristics
  - Loan guarantee program delivered by financial institutions across Canada, intended to give small businesses easier access to term loans in order to cover the purchase or improvement of fixed assets for expanding their operations or creating a new business. Administered under the *Canada Small Business Financing Act*, the Program is a joint initiative of the Government of Canada and private-sector lenders.
- Type of financial assistance
  - Financing of up to 90% of costs related to assets, including taxes and non-refundable duty.
- Eligibility criteria
  - New or established small businesses in Canada;
  - Small businesses whose gross revenue does not exceed \$5 million in the fiscal year during which the loan is applied for.
- Eligible expenses
  - Purchase or improvement of tangible assets or real estate;
  - Purchase of leasehold improvements or improvements to leased premises;
  - Purchase or improvement of new or used equipment required to operate a business enterprise.
- Ineligible expenses
  - Purchase of shares or any other form of corporate holdings;
  - Financing working capital (inventory, receivables, etc.);
  - Financing borrower expenditures or obligations previously covered by a term loan;
  - Purchase of real estate for the purpose of resale;
  - Purchase or improvement of real estate for leasing or subletting (unless active in the hotel, healthcare services, or mini-storage sector).
- Program administrator
  - Industry Canada – Small Business Loan Administration  
8<sup>th</sup> Floor, East Tower, 235 Queen Street, Ottawa, ON K1A 0H5  
Tel.: (613) 954-5540, Fax: (613) 952-0290  
Website: <http://strategis.ic.gc.ca/lfpec>

## **APPENDIX A**

### **LIST OF FACILITIES IN METROPOLITAN MONTRÉAL**

<b>Prime contractors and repair and overhaul centres</b>		<b>Jobs</b>	<b>City/Borough</b>	<b>Breakdown by facility</b>
1	Bombardier Aerospace	13,500	Saint-Laurent	
2			Dorval	
3			Dorval	
4			Dorval	
5			Mirabel	
6			Saint-Laurent	
7			Mirabel	
8	Pratt & Whitney Canada	5,700	Longueuil	
9			Saint-Hubert	
10			Longueuil	
11			Longueuil	
12			Longueuil	
13	CAE	4,000	Saint-Laurent	
14	Air Canada (Technical Centre)	2,600	Dorval	
15	Rolls-Royce Canada	1,800	Lachine	
16	Bell Helicopter Textron	1,200	Mirabel	
17	Air Transat (Engine and Aircraft Maintenance Centre)	200	Dorval	
<b>Total prime contractors and repair and overhaul centres</b>		<b>29,000</b>		

<b>Equipment manufacturers</b>		<b>Jobs</b>	<b>City/Borough</b>	<b>Breakdown by facility</b>
1	CMC Electronics (formerly Marconi Canada)	1,000	Saint-Laurent	
2	EMS Technologies Canada	600	Saint-Anne-de-Bellevue	
3	Héroux-Devtek	500	Longueuil	
4			Laval	
5			Dorval	
6			Montréal	
7	Honeywell Aerospace (formerly AlliedSignal Aerospace Canada)	350	Saint-Laurent	
8	Messier-Dowty	200	Mirabel	
9	Lockheed Martin Canada	150	Montréal	
10	Thales Avionics Canada (formerly Sextant Avionics Canada)	120	Saint-Laurent	
<b>Total equipment manufacturers</b>		<b>2,920</b>		

	<b>Subcontractors and suppliers of special products and services</b>	<b>Jobs</b>	<b>City/Borough</b>	<b>Breakdown by facility</b>
1	Innotech Exeaire Aviation Group	300	Dorval	
2	Howmet (Alcoa Group)	300	Laval	
3	NMF Canada	250	Mirabel	
4	Sargent Canada	230	Saint-Léonard	130
5			Anjou	100
6	GFI (Division of Thomas & Betts)	175	Pointe-Claire	
7	Luminescent Systems Canada (LSI)	175	Dorval	
8	Claro Precision	150	Saint-Léonard	
9	Metcor	150	Saint-Eustache	
10	Placage Tecnickrome	150	Montréal	
11	Harrington Tool & Die	125	Lachine	
12	Avcorp Industries	120	Laval	
13	Vestshell	120	Montréal-Nord	
14	Alphacasting	100	Saint-Laurent	
15	Apollo Microwaves	100	Pointe-Claire	
16	Canadian Steel Foundries	100	Montréal	
17	CP Tech	100	Saint-Laurent	
18	Mecair Aerospace Industries	100	Pointe-Claire	
19	Performance LT	100	Laval	
20	Shellcast Foundries	100	Montréal-Nord	
21	Aero Mecachrome	95	Montréal-Nord	
22	Goodrich	95	Montréal	
23	Aerospace Welding	90	Blainville	
24	CPS Industries	80	Pointe-Claire	
25	ADS Marquez	75	Montréal	
26	GSM Production	75	Saint-Laurent	
27	Moody Industries	75	Terrebonne	
28	Technimeca International	75	Saint-Laurent	
29	Pega Precision	71	Montréal	65
30	Pega Structure		Saint-Laurent	6
31	Avionard & Mirabel Aéro Service	70	Mirabel	
32	Elimetal	70	Saint-Laurent	
33	Leesta Industries	65	Pointe-Claire	
34	Accessair Systems	65	Ste-Catherine	
35	Sermatech Canada	60	Dorval	
36	Wilson Machinery Company	55	LaSalle	
37	Trident Industries	53	Montréal	
38	Verdun Anodizing	50	Verdun	



	<b>Subcontractors and suppliers of special products and services</b>	<b>Jobs</b>	<b>City/Borough</b>	<b>Breakdown by facility</b>
39	Eastern Aerocast	50	Lachine	
40	Guérette Industries	50	Longueuil	
41	Nitrex Metal Technologies	50	Saint-Laurent	
42	Diacarb (Tools)	47	Saint-Laurent	
43	Abipa Canada	45	Laval	
44	CVDS	45	Dollard-des-Ormeaux	
45	Lemex Aviation	40	Saint-Hubert	
46	H. R. T. Aéronautique	40	St-Eustache	
47	Amphitech International	35	Laval	
48	GE Elano Canada	35	Mirabel	
49	MR Société d'Outillage (SOMR)	35	Saint-Laurent	
50	Optimus	35	Saint-Lambert	
51	Profab Industries Lemex	35	Laval	
52	TQF Technologies	35	Saint-Laurent	
53	Deburex Aviation	30	Lavaltrie	
54	Industries de Placage Lego	30	Saint-Léonard	
55	Liebherr Aerospace Canada	30	Laval	
56	Metro Machining Corporation	30	Montréal	
57	Techniprodec	30	Montréal	
58	Techspace Aero Canada	30	Montréal	
59	Vac Aero International	30	Saint-Laurent	
60	Alta Precision	25	Anjou	
61	DMG (Mechanical Machining)	25	Montréal-Nord	
62	Finecast	25	Saint-Laurent	
63	Techman Head Canada (TMH)	25	Boisbriand	
64	JLM Precision	24	Laval	
65	Patenaude Industries	23	Laval	
66	Teco Precision	23	Saint-Laurent	
67	Turbomeca Canada	22	Mirabel	
68	Brechbuhl	20	Saint-Hubert	
69	CEL Aerospace	20	Longueuil	
70	DP Digital Precision	20	Laval	
71	Netur Usinage	20	Saint-Hubert	
72	KHD Canada	19	Saint-Laurent	
73	Aeronef Instruments	18	Dorval	
74	Air Data	18	Ville Mont-Royal	
75	Satori Air Services	18	Saint-Laurent	
76	Sider Tech	18	Longueuil	
77	Aérosystème International	15	Saint-Laurent	

	<b>Subcontractors and suppliers of special products and services</b>	<b>Jobs</b>	<b>City/Borough</b>	<b>Breakdown by facility</b>
78	Gentner	15	Saint-Léonard	
79	Heiplex	15	Rivière-des-Prairies	
80	Modèlerie Dorval	15	Saint-Laurent	
81	Pôle Air Aviation	15	Lachine	
82	FJ Atelier d'Usinage	14	Baie-d'Urfé	
83	MG Lonic	14	Dorval	
84	Apex Precision	13	Vaudreuil	
85	Filetage International	13	Laval	
86	Micron (Automatic Products)	12	Laval	
87	Aerospec Usinage	10	Laval	
88	Aviatron	10	Montréal	
89	Beel Technologies	10	Saint-Bruno-de-Montarville	
90	Eurocopter Canada	10	Dorval	
91	MDS Aero Support Corporation	10	Saint-Laurent	
92	Outillage Guerette	10	Mirabel	
93	Progressive	10	Anjou	
94	Saint-Just Aviation	10	Boucherville	
95	Airnav Électronics	9	Dorval	
96	Lavod (Industries)	9	Laval	
97	Meyer Tools	9	Boucherville	
98	Nav-Aids	9	Saint-Laurent	
99	American Metal Spinning (AMS)	9	Laval	
100	Advantech (Advanced Microwave Technologies)	8	Dorval	
101	Aéro (Atelier d'Usinage)	8	Pierrefonds	
102	Aerocorp Technologies	8	Pierrefonds	
103	Aéronav (Navigation International)	8	Pointe-Claire	
104	Aerospace Technologies	8	Montréal	
105	Air Dynamics Corporation	8	Baie-d'Urfé	
106	Aviall Canada	8	Dorval	
107	Avtech	8	Saint-Hubert	
108	Avtronics	8	Longueuil	
109	C M B Quebec	8	Montréal	
110	Ferndale	8	Montréal	
111	Genitest	8	Montréal	
112	Gilbert (Atelier de Précision)	8	Terrebonne	
113	Javair Aerospace Missile & Armament Corporation	8	Montréal	
114	Micro Avionique	8	Saint-Hubert	

<b>Subcontractors and suppliers of special products and services</b>	<b>Jobs</b>	<b>City/Borough</b>	<b>Breakdown by facility</b>
115 Nu-Tech Associates	8	Dorval	
116 Radio d'Avion RS	8	Saint-Hubert	
117 RMR Tooling Industries	8	Saint-Laurent	
118 Siddhis Aeronautical Designs	8	Saint-Laurent	
119 Taero Aircraft Systems	8	Sainte-Anne-de-Bellevue	
120 Tristar Aerospace	8	Lachine	
121 Farsound Canada	7	Saint-Hubert	
122 Standard Aero	7	Lachine	
123 AASI Applied Aeronautical Systems	6	Montréal	
124 Aero Dynamic	6	Mascouche	
125 APS Aviation	6	Mirabel	
126 B Courteau Mécanique Industrielle	6	Varennes	
127 Norprecision	6	Montréal-Nord	
128 Obsds On-Board Data Systems	6	Mirabel	
129 Preci-Can	6	Saint-Laurent	
130 Centre Technologique en Aérospatiale	5	Saint-Hubert	
131 Moncar Precision	5	Laval	
132 Partenair Design	5	Boucherville	
133 Précision Automatique JRN	5	Montréal	
134 United Aviation Accessories	4	Laval	
135 Amtrex Technologies	4	Saint-Laurent	
136 Canadian Light Aircraft Sales & Service	4	Les Cèdres	
137 Cermar Machine	4	Brossard	
138 Composites Atlantic	4	Mirabel	
139 Sundstrand Aerospace	4	Dorval	
140 Bruel & Kjaer Canada	3	Pointe-Claire	
141 Air Research Technology	2	Saint-Laurent	
142 Dubé Normand Aviation	2	Saint-Anne-des-Plaines	
143 Com-O-Pac	1	Mascouche	
144 Finition Technair	1		
<b>Total subcontractors and suppliers of special products and services</b>	<b>5,857</b>		

**APPENDIX B**

**CANADIAN AND INTERNATIONAL AEROSPACE  
ASSOCIATIONS AND ORGANIZATIONS**

## **ASSOCIATIONS AND ORGANIZATIONS**

### **Aerospace Industries Association of Canada (AIAC)**

60 Queen Street, Suite 1200  
Ottawa, Ontario, K1P 5Y7  
Telephone: (613) 232-4297  
Fax: (613) 232-1142  
Email: [info@aiac.ca](mailto:info@aiac.ca)  
Website: [www.aiac.ca](http://www.aiac.ca)

### **International Air Transport Association (IATA)**

800 Place Victoria, P.O. Box 113  
Montréal, Québec, H4Z 1M1  
Telephone: (514) 874-0202  
Fax: (514) 874-9632  
Website: [www.iata.org](http://www.iata.org)

### **Association québécoise de l'aérospatiale (AQA)**

5300 Chauveau Street  
Montréal, Québec, H1N 3V7  
Telephone: (514) 596-2388  
Fax: (514) 596-3388  
Email: [aqa@cam.org](mailto:aqa@cam.org)  
Website: [www.cam.org/~aqa](http://www.cam.org/~aqa)

### **Centre d'adaptation de la main d'œuvre aérospatiale au Québec (CAMAQ)**

5300 Chauveau Street  
Montréal, Québec, H1N 3V7  
Telephone: 514-596-3311  
Fax: 514-596-3388  
Email: [camaq@cam.org](mailto:camaq@cam.org)  
Website: [www.cam.org/~camaq](http://www.cam.org/~camaq)

### **Conseil international de formation aérospatiale (CIFA)**

(École nationale d'aérotechnique)  
5555 Place de la Savane  
Saint-Hubert, Québec, J3Y 5K2  
Telephone: (450) 678-3560  
Fax: (450) 678-3240  
Website: [www.collegeem.qc.ca/ena/cifa/cifmenu.htm](http://www.collegeem.qc.ca/ena/cifa/cifmenu.htm)

**International Federation of Air Traffic Controllers' Associations (IFATCA)**

1255 University Street, Suite 408  
Montréal, Québec, J3B 3B6  
Telephone: (514) 866-7040  
Fax: (514) 666-7612

**International Civil Aviation Organization (ICAO)**

999 University Street  
Montréal, Québec, H3C 5H7  
Telephone: (514) 954-8219  
Fax: (514) 954-6077  
Email: [icaohq@icao.int](mailto:icaohq@icao.int)  
Website: [www.icao.int](http://www.icao.int)

**Société internationale de télécommunications aéronautiques (SITA)**

770 Sherbrooke Street West  
Suite 2100  
Montréal, Québec, H3A 1G1  
Telephone: (514) 844-4343  
Fax: (514) 982-3590  
Email: [info@sita.int](mailto:info@sita.int)  
Website: [www.sita.int](http://www.sita.int)

**RESEARCH CENTRES**

**Institute of Air and Space Law**

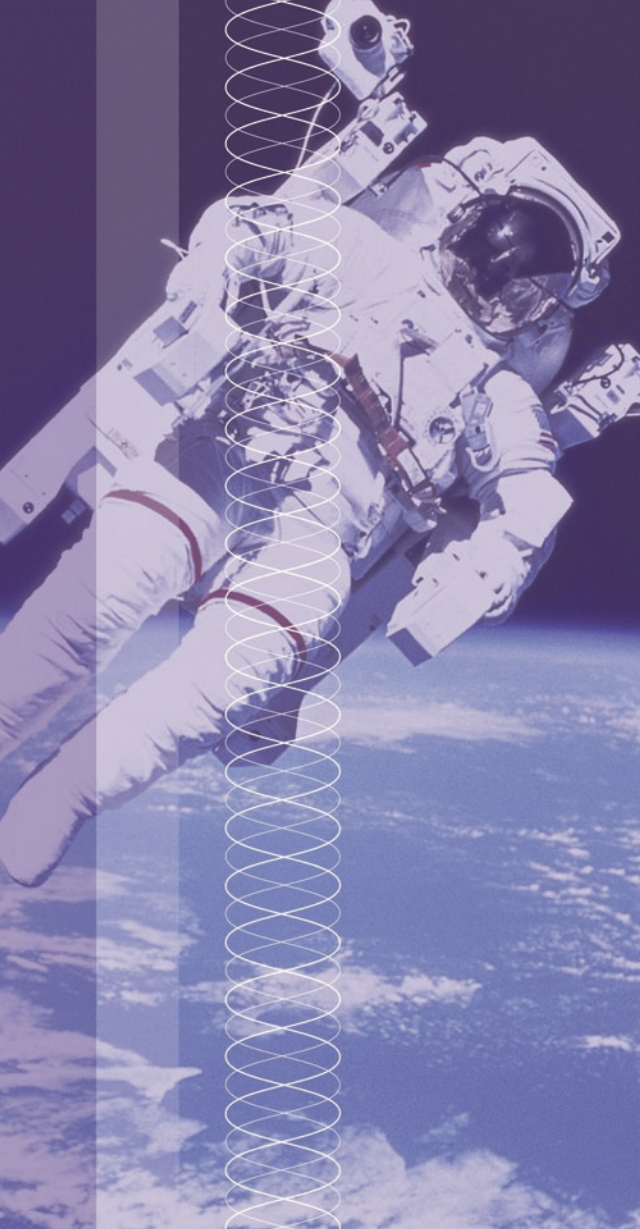
- ◆ Affiliation: McGill University
- ◆ Site: Montréal
- ◆ Workforce: 45 people
- ◆ Expertise: The Institute focuses primarily on graduate studies in law (Master's, doctorate) and research related to air and space law.
- ◆ Website: [www.iasl.mcgill.ca](http://www.iasl.mcgill.ca)

**Aerospace Medical Research Unit**

- ◆ Affiliation: McGill University
- ◆ Site: Montréal
- ◆ Workforce: 9 people
- ◆ Expertise: Group members engage in neurophysiological research, mainly involving human performance in an aerospace setting: adapting to weightlessness, posture control, and the vestibulo-ocular system.
- ◆ Website: <http://landru.medcor.mcgill.ca/amru.html>

### **Centre de recherche sur les transports (CRT)**

- ◆ Affiliation: Université de Montréal (including the École des Hautes Études Commerciales and the École Polytechnique)
- ◆ Industrial partners: Air Canada, Air France
- ◆ Workforce: 129 people
- ◆ Expertise: The CRT is interested in every mode of transportation. It specializes in designing and developing quantitative and computer system models and methods, as well as studying economic policies and issues related to transportation regulation and safety.
- ◆ Contact info:  
Université de Montréal  
Pavillon André-Aisenstadt  
2920 Chemin de la Tour, Suite 3520  
Montréal, Québec, H3T 1J4  
Telephone: (514) 343-7575  
Fax: (514) 343-7121  
Email: [crt@crt.umontreal.ca](mailto:crt@crt.umontreal.ca)  
Website: [www.crt.umontreal.ca](http://www.crt.umontreal.ca)



Picture: Bombardier Inc

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