

# PROFILE OF THE AEROSPACE INDUSTRY

 Montreal International

**AÉRO**   
MONTREAL  
Shaping Aerospace



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This profile of Québec and Greater Montréal's aerospace industry is the result of a collaborative effort between Aéro Montréal and Montréal International (MI) and is intended to highlight the sector's main enterprises and performance indicators.

Greater Montréal's aerospace industry<sup>1</sup> represents:

### 1. WITH SEATTLE AND TOULOUSE, ONE OF THE WORLD'S FOREMOST AEROSPACE HUBS

Over the years, Greater Montréal has emerged as a premier aerospace development centre because of a high concentration of prime contractors, OEMs<sup>2</sup>, integrators, MROs<sup>3</sup> and subcontractors and suppliers of specialized products and services. The metro area has developed an international expertise in a variety of fields such as engineering and development, business jet landing gear and interior design, aircraft qualification and certification and flight-testing.

### 2. THE HOME OF 98% OF QUÉBEC'S AEROSPACE INDUSTRY AND A HIGHLY SPECIALIZED CENTRE IN NORTH AMERICA

When viewed in the context of Canada's entire aerospace industry, Québec represents approximately

- 70% of all R&D
- 60% of GDP
- 60% of exports
- 55% of sales
- 50% of the workforce

Moreover, Québec and Greater Montréal have a larger aerospace sector concentration of specialized labour than both in Canada and the United States. In 2010, approximately one out of every 192 workers was employed in the Québec aerospace industry. In the Greater Montréal area, the number was one in every 92. Canadian and American ratios were four and three times lower than Greater Montréal's: one in 389 and one in 269 jobs respectively.

### 3. A POOL OF HIGHLY QUALIFIED WORKERS

Some 212 aerospace companies employ over 42,000 well-qualified individuals who received training in an educational system that collaborates closely with the private sector by offering programs that meet its most up-to-date requirements.

### 4. GROWING SALES

In spite of the recession and the Canadian dollar's increased value against its American counterpart, Québec's aerospace industry's sales grew by an annual average rate of around 6% between 1990 and 2011. They grew by almost 7% in 2011 over 2010 and reached \$11.7 billion.

### 5. AN EXPORT CAPITAL

Greater Montréal's strategic geographical location in North America combined with its extremely competitive transportation infrastructure allows Québec's aerospace industry to export over 80% of its production, thereby making it the province's leading exporter.

### 6. A POSITIVE RESEARCH AND DEVELOPMENT (R&D) ENVIRONMENT FOR COMPANIES

Research and development is fundamental to the aerospace industry's success. Companies invest billions of dollars in R&D annually and their innovations often have an impact on other sectors of the economy. To stimulate the technology sector, Greater Montréal has at its disposal, among other things, a significant network of aerospace-related research organizations, associations and consortia.

### 7. AMONG THE MOST COMPETITIVE OPERATING COSTS IN NORTH AMERICA

According to KPMG (2012), Greater Montréal's total operating costs are the second lowest among North America's largest metropolitan areas specializing in aerospace. When a company locates in Greater Montréal, it can count on significant savings on labour, energy and rental/lease costs.

### 8. A FAVOURABLE TAX STRUCTURE AND HIGHLY COMPETITIVE INCENTIVES

Year after year, Greater Montréal's aerospace companies remain competitive and profitable due notably to one of the world's most favourable total corporate tax burdens. According to KPMG (2010), the tax bill for R&D companies located in Greater Montréal can be up to seven times lower than the average for those based in other large North American metro areas specializing in aerospace. Greater Montréal ranks first in North America and second worldwide in this regard. This cost advantage is due in great measure to the availability of highly competitive incentives such as the R&D tax credits offered by the governments of Canada and Québec.

<sup>1</sup> Because of the nature of the available data, this is primarily a statistical portrait of the entire province's aerospace industry. However, since 98% of all of Québec aerospace activities are concentrated in Greater Montréal, it is also an apt description of the metropolitan region.

<sup>2</sup> OEM: Original Equipment Manufacturer

<sup>3</sup> MRO: Maintenance, Repair and Overhaul





# 1 A PORTRAIT OF THE INDUSTRY



# 1.1

## HIGHEST AEROSPACE GDP IN CANADA

In 2010, Québec's aerospace industry's real GDP<sup>4</sup> was close to \$4 billion.<sup>5</sup> This represents 60% of the total Canadian industry's real GDP, which, in that same year, was over \$6.7 billion.<sup>6</sup>

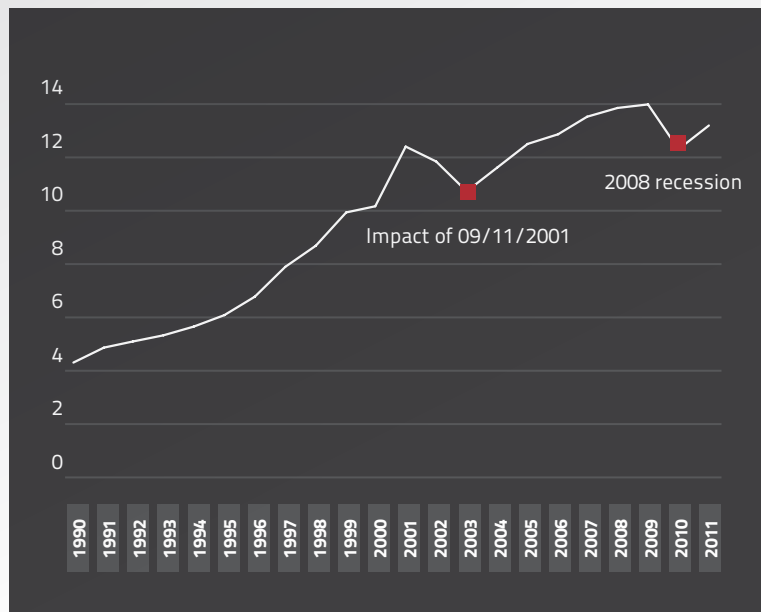
# 1.2

## REVENUE GROWTH

Sales in Québec's aerospace industry have grown consistently since the beginning of the 1990s. Between 1990 and 2011, they rose at an annual average rate of around 6% and, in spite of recessions and the recent rise of the Canadian dollar, Québec's industry has continued to lead the country in sales with over 55% of the market.<sup>7</sup> In 2011, it rang up total revenue of \$11.7 billion, a 6.8% increase over 2010 (\$10.9 billion).<sup>8</sup> Overall, aerospace was the only segment of Québec's manufacturing sector to have experienced continued revenue growth.<sup>9</sup>

ANNUAL AEROSPACE SALES (IN \$BILLION)  
PROVINCE OF QUÉBEC, 1990-2011

CHART 1



<sup>4</sup> Because of the nature of the available data, this is primarily a statistical portrait of the entire province's aerospace industry. However, since 98% of all of Québec aerospace activities are concentrated in Greater Montréal, it is also an apt description of the metropolitan region.

<sup>5</sup> Source: Ministère du développement économique, de l'Innovation et de l'Exportation (MDEIE or Ministry of Economic Development, Innovation and Export Trade), 2012. Unless otherwise indicated, "dollar" (\$) refers to Canadian dollars.

<sup>6</sup> Source: Statistics Canada, 2011

<sup>7</sup> Source: MDEIE, 2012

<sup>8</sup> Source: MDEIE, 2012

<sup>9</sup> Source: The Conference Board of Canada, 2011



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## Bombardier Aerospace – A Québec's Industrial Leader among the Top 3 World's Largest Civil Aircraft Manufacturers

Bombardier's Aerospace Division began with the acquisition of Canadair in 1986. Today, it is Canada's largest aerospace company.

"Every three seconds, a Bombardier aircraft is either taking off or landing somewhere in the world" says **Ms. HÉLÈNE B. GAGNON, Vice President, Public Affairs, Communications and Corporate Social Responsibility.**

The world's third largest civil aircraft manufacturer, Bombardier Aerospace is a leader in the design and manufacture of innovative aviation products for the business (*Learjet*, *Challenger* and *Global* aircraft families), commercial (new *C-Series* program, *CRJ Series* and *Q-Series* aircraft families), amphibious (*Bombardier 415* and *Bombardier 415 MP* aircraft) and specialized aircraft markets. Over 15,000 of its 33,600 employees are located in Greater Montréal facilities in which the company is currently investing significant resources on expansion and modernization.

"It is heartening to see that strong ties unite the sector's various actors, educational institutions and research centres and that competition does not exclude cooperation. *Aéro Montréal* not only connects the major players, but strives to support SMEs. I believe that the depth of the talent pool that we have succeeded in developing over the years and the partnership that we have established with the unions represent two of our cluster's major strengths and factors of attraction," added Ms. Gagnon.

The world's only manufacturer of both planes and trains, Bombardier is present in more than 60 countries, with 70,000 employees working in 76 production and engineering facilities. In 2012, the World Luxury Association listed Bombardier among the Top 100 world's most valuable luxury brands.

# 1.3

## A CRITICAL MASS OF AEROSPACE JOBS AND COMPANIES

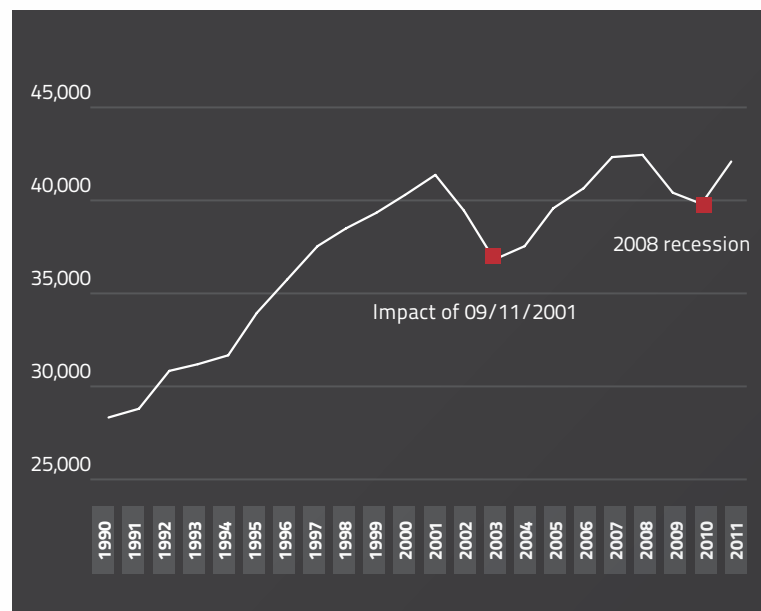
In 2011, 212 companies employed nearly 42,000 specialized workers. This represents 50% of the industry's entire Canadian labour force.<sup>10</sup> Québec ranks sixth, behind the United States, France, Germany, the United Kingdom and Italy in terms of the number of aerospace workers.

The 57% increase in the number of aerospace workers in Québec between 1990 and 2011 represents an annual average growth rate of over 2%. Overall, the industry experienced constant growth over this period except during the economic turbulence of 2001-2008. From 1990 to 2011, employment grew by 3.6% among SMEs and 2.1% among prime contractors, OEMs, integrators and MROs.<sup>11</sup>



**AEROSPACE JOBS**  
PROVINCE OF QUÉBEC, 1990-2011

CHART 2

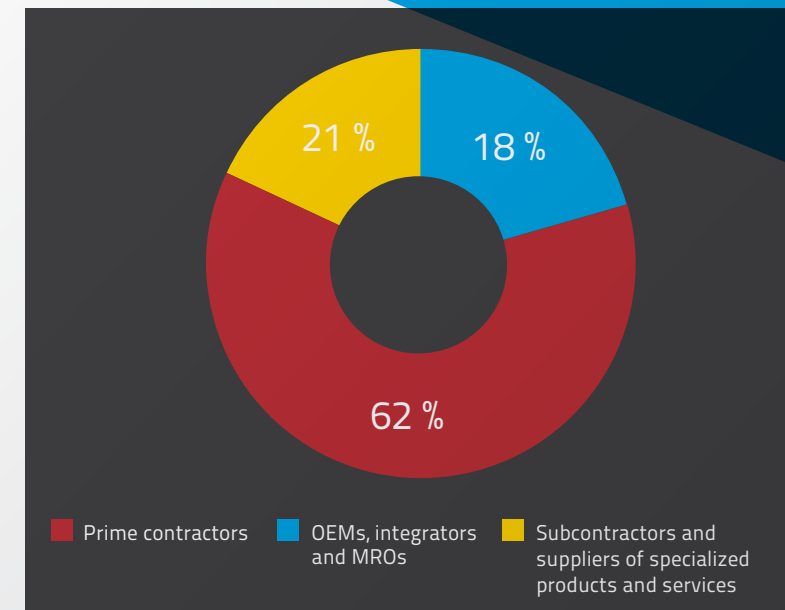


In 2011, prime contractors employed 62% of all aerospace workers, subcontractors and suppliers of specialized products and services 21% and OEMs, integrators or MROs 18%.<sup>12</sup>

Over and above the raw numbers, Québec and Greater Montréal have a larger aerospace sector concentration of specialized labour than both in Canada and the United States. In 2010, approximately one out of every 192 workers was employed in the aerospace industry in Québec and one in 92 in the Greater Montréal area.<sup>13</sup> Canadian and American ratios (one in 389 and one in 269 jobs respectively<sup>14</sup>) were four and three times lower than Greater Montréal's.

**AEROSPACE EMPLOYMENT BY SUBSECTOR (%)**  
PROVINCE OF QUÉBEC, 2011

CHART 3



<sup>10</sup> Source: MDEIE, 2012  
<sup>11</sup> Source: MDEIE, 2012  
<sup>12</sup> Source: MDEIE, 2012  
<sup>13</sup> Source: Statistics Canada, 2011  
<sup>14</sup> Sources: Bureau of Labor Statistics, 2011 and Statistics Canada, 2011



1.4

**CANADA'S  
AEROSPACE EXPORT  
CAPITAL**

Situated near major North American markets and linked to NAFTA<sup>15</sup> by road and rail, Greater Montréal also benefits from one of the globe's busiest interior seaports, adjacent to the downtown area, and two major international airports serving the world's largest centres.

Greater Montréal's transportation infrastructure and its strategic geographical location, bridging Europe and North America, make it a choice site for companies wishing to export their products to foreign markets.

In 2011, Québec's aerospace industry exported over 80% of its production. That represents around \$9.3 billion, a nearly 7% increase over 2010 (\$8.7 billion).<sup>16</sup>

Québec's aerospace exports correspond to over 60% of the 2011 Canadian total.<sup>17</sup> In 2011, the industry generated nearly 12.3% of all Québec manufacturing exports, all sectors considered – a new Québec record.<sup>18</sup> Generally, aerospace is the only Canadian industry to have consistently produced export surpluses.<sup>19</sup>

**Montréal-Trudeau International Airport:**

- Largest Canadian airport east of the Great Lakes
- Natural international air traffic hub between North America and Europe
- Over 50 airlines, most of which are major North American and European carriers
- 130 direct destinations in Canada, the United States and around the world
- Over 13.5 million passengers in 2011, a 5.3% increase over 2010

**Montréal-Mirabel International Airport:**

- A 24/7 all-cargo and business aviation airport
- Among the best operating conditions in North America, due largely to a lack of congestion
- Regularly used by over 20 carriers with steady growth in cargo volume

Close to 200,000 metric tons of freight transit annually through these two airports.<sup>20</sup>

<sup>15</sup> NAFTA: North American Free Trade Agreement

<sup>16</sup> Sources: Institut de la statistique du Québec (ISQ or Québec Institute of Statistics), 2012 and MDEIE, 2012

<sup>17</sup> Source: Statistics Canada, 2012

<sup>18</sup> Source: ISQ, 2012

<sup>19</sup> Source: The Conference Board of Canada, 2011

<sup>20</sup> Source: Aéroports de Montréal, 2011





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## Pratt & Whitney Canada – Nearly 50,000 Aircraft Engines in Service Worldwide

At the outset, 85 years ago, Pratt & Whitney Canada (P&WC) was a small company that provided bush flying operations with repair and maintenance services. Today, P&WC develops and manufactures engines and offers support services to over 10,000 clients around the globe. The company has 9,000 employees, nearly 5,000 of whom are in the Greater Montréal area.

A subsidiary of United Technologies Corporation, a high-technology company based in Hartford, Connecticut, P&WC produces new generation engines for a vast array of helicopters and regional and business aircraft. Nearly 50,000 such engines are currently in service.

“Over the past 15 years, we have designed 70 new engines, an industry record. In fact, P&WC is the Canadian aerospace industry’s number one investor in research and development.

*Every year, we spend an average of \$400 million in the design of the next generation of high-performance aircraft engines,”* states Ms. NANCY GERMAN, Vice President, Communications.

With a family of 13 engines, the company continues to broaden its product line and operations. For instance, last year, it opened its 300,000 square foot Mirabel Aerospace Centre for flight test operations as well as the assembly of engines for the Bombardier C Series and the PW800 for large business jets.

*“We are pleased to contribute to the development of both Québec’s economy and our industry. Our commitment is further reflected in our active involvement in the advancement of Aéro Montréal’s various projects, particularly the Human Resources and Branding and Promotion working groups that our president, Mr. John Saabas, and I are honoured to lead,”* says Ms. German.

# 1.5

## CANADA'S AEROSPACE INNOVATION HUB

In 2011, approximately 70% of all Canadian aerospace R&D was conducted in the Montréal area.<sup>21</sup> Roughly one-quarter of the region’s workers were involved in this type of activity.<sup>22</sup> The area’s favourable total corporate tax burden, one of the lowest in North America, mainly accounts for this major concentration of R&D activity.<sup>23</sup> Generous tax credits offered by the governments of Canada and Québec are responsible for this considerable cost advantage which has contributed significantly to the establishment of R&D oriented aerospace companies in Greater Montréal. For example, in 2010, Pratt & Whitney Canada, Bombardier and CAE inc. were listed among the top 20 Canadian R&D spenders, all sectors considered.

TOP 5 AEROSPACE R&D COMPANIES IN CANADA PRESENT IN GREATER MONTRÉAL, 2010

TABLE 1

Company	R&D Expenses in Canada (\$million)	R&D Intensity (% of revenue)	Aerospace Activity	Rank in Canada
<b>Pratt &amp; Whitney Canada</b>	395	13.6	Engines for business, general aviation and regional aircraft and helicopters	6
<b>Bombardier*</b>	233	1.1	Business, regional and amphibian aircraft	10
<b>CAE*</b>	117	7.7	Simulation and modelling technology and training services for military and civil aviation	19
<b>MDA*</b>	60.1	8.7	Space robotics and satellite components	38
<b>Héroux-Devtek</b>	12.8	4.0	Landing gear	99

\* The R&D expenses that companies incurred in Canada correspond to their total R&D costs, all activities considered, including those related to aerospace.

21 Source: MDEIE, 2012

22 Source: MDEIE, 2012

23 See section 6. Taxation and Incentives





# 1.6

**A VERY FAVOURABLE INVESTMENT CLIMATE**

Québec and its major metropolitan area, Greater Montréal, constitute fertile ground for growing an aerospace company in North America. Their many incentives,<sup>24</sup> stable economy, dynamic innovation system and vast potential for collaboration make them extremely attractive to aerospace enterprises.

Between 2008 and 2012, many major firms announced expansion or development plans for Greater Montréal. It bears noting that foreign companies were responsible for nearly 50% of the investments listed in Table 2.

<sup>24</sup> See section 6.Taxation and Incentives

**SAMPLE OF AEROSPACE INVESTMENTS ANNOUNCED**  
GREATER MONTRÉAL, 2008-2012

Company	Amount Announced (\$million)	Number of Jobs Announced	Year	Type of Investment	Activity	Country of Origin
<b>Bombardier Aerospace</b>	2,600	3,500	2008	Expansion	■ Design and manufacture of aerospace products	Canada
<b>Pratt &amp; Whitney Canada</b>	1,000	200	2010	Expansion	■ Manufacture of aircraft engines	United States
<b>CAE inc.</b>	714	2,000	2009	Expansion	■ Modelling, simulation and aviation training	Canada
<b>Rolls-Royce Canada</b>	225	n/a	2011	Expansion	■ Aircraft engines and gas turbines for industrial applications	United Kingdom
<b>Esterline CMC Electronics</b>	149	n/a	2009	Expansion	■ Design and manufacture of electronic aviation products	United States
<b>Héroux-Devtek</b>	77	n/a	2008	Expansion	■ Production of landing gear and airframe components and subassemblies	Canada
<b>Aerolia Canada</b>	75	150	2012	Greenfield investment	■ Design and manufacture of fuselage subassemblies	France
<b>GE Aviation</b>	63	80	2010	Expansion	■ Aviation services and production of aircraft engines	United States
<b>Mechtronix Systems</b>	63	n/a	2009	Greenfield investment	■ Assembly and subassembly; ■ Equipment and specialized tools; ■ Software engineering	Canada
<b>GE Aviation</b>	61	90	2012	Expansion	■ Aviation services and production of aircraft engines	United States
<b>Messier-Bugatti-Dowty (Safran Group)</b>	58	60	2012	Expansion	■ Aircraft landing and braking systems	France
<b>LATecis Canada</b>	30	60	2011	Greenfield investment	■ Specialized supplies and services; ■ Equipment and specialized tools; ■ CAD/CAM services	France
<b>Héroux-Devtek</b>	26	n/a	2012	Expansion	■ Production of landing gear and airframe components and subassemblies	Canada



**SAMPLE OF AEROSPACE INVESTMENTS ANNOUNCED**  
GREATER MONTRÉAL, 2008-2012 (CONT.)

TABLE 2

Company	Amount Announced (\$million)	Number of Jobs Announced	Year	Type of Investment	Activity	Country of Origin
<b>Sonaca Montréal</b>	17	n/a	2008	Expansion	<ul style="list-style-type: none"> <li>Development, machining, forming and assembly of large wing panels</li> </ul>	Belgium
<b>RTI Claro</b>	13	n/a	2008	Expansion	<ul style="list-style-type: none"> <li>CNC machining;</li> <li>Assembly and subassembly</li> </ul>	United States
<b>Aeroconseil Canada</b>	13	37	2010	Greenfield investment	<ul style="list-style-type: none"> <li>Specialized supplies and services;</li> <li>Software engineering</li> </ul>	France
<b>Lisi Aerospace Canada</b>	10	150	2008	Expansion	<ul style="list-style-type: none"> <li>Specialized supplies and services;</li> <li>CNC machining</li> </ul>	United States
<b>Liebherr-Aerospace Canada</b>	9	35	2010	Expansion	<ul style="list-style-type: none"> <li>Assembly and subassembly</li> </ul>	Switzerland
<b>Innotech Aviation (Division of IMP Group)</b>	8	n/a	2008	Expansion	<ul style="list-style-type: none"> <li>Maintenance;</li> <li>Repairs;</li> <li>Refurbishment</li> </ul>	Canada
<b>Usinage Nétur</b>	7	n/a	2011	Expansion	<ul style="list-style-type: none"> <li>CNC machining</li> </ul>	Canada
<b>AAA Canada</b>	5	n/a	2008	Expansion	<ul style="list-style-type: none"> <li>Specialized supplies and services</li> </ul>	Canada
<b>Avianor Group</b>	3	n/a	2011	Expansion	<ul style="list-style-type: none"> <li>Assembly and subassembly</li> <li>Maintenance, repairs, refurbishment</li> <li>Testing, control &amp; inspection</li> </ul>	Canada
<b>Electro-kut</b>	2	n/a	2011	Expansion	<ul style="list-style-type: none"> <li>CNC machining;</li> <li>Electro-discharge machining</li> </ul>	Canada
<b>JPC Aviation</b>	2	10	2009	Expansion	<ul style="list-style-type: none"> <li>Electric and electronic systems</li> </ul>	Canada
<b>Amesys Canada</b>	n/a	n/a	2008	Greenfield investment	<ul style="list-style-type: none"> <li>Specialized supplies and services</li> </ul>	France
<b>Thales Canada, Aerospace Division</b>	n/a	145	2008	Greenfield investment	<ul style="list-style-type: none"> <li>Design and integration of avionics suites, etc.</li> </ul>	France

## CAE inc. – The Uncontested Leader in Flight Simulation

*“Back in the 1980s, CAE inc. revolutionized pilot training by building a simulator so realistic that training could be carried out on the ground. However, the best is yet to come, both for us and Montréal’s aerospace cluster,”* says **Mr. MARC PARENT, President and CEO.**

Founded in 1947, CAE inc. is a global leader in modelling, simulation and training for civil aviation and defence. Since its inception, it has sold more than 1,300 civil and military simulators around the world.

Serving some 130 aviation companies and clients in 150 countries, the company employs more than 7,500 workers (3,500 in Montréal) at more than 100 sites and training locations in over 25 countries.

Through its global network of 40 civil aviation, military and helicopter training centres, the company trains more than

80,000 crewmembers yearly. Nearly 90% of its revenue is derived from activities conducted outside of Canada.

*“We develop all of our simulators in Montréal, a city that affords us access to a remarkable pool of engineers and many important R&D funding programs. It bears noting that the majority of the commercial pilots flying our skies today have been trained on simulators that were designed and built in Greater Montréal. Even though we command 70% of the market and our future looks bright, we must continue to innovate. I am confident – it’s in our DNA – and am happy to see that, since the creation of the aerospace cluster, our companies are collaborating to an ever greater extent and, in so doing, are renewing themselves and becoming more competitive,”* says Mr. Parent.

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**SAMPLE OF AEROSPACE INVESTMENTS ANNOUNCED  
GREATER MONTRÉAL, 2008-2012 (CONT.)**

TABLE 2

Company	Amount Announced (\$million)	Number of Jobs Announced	Year	Type of Investment	Activity	Country of Origin
<b>AKKA Group North America</b>	n/a	100	2010	Greenfield investment	■ Engineering consulting	France
<b>Luxell Technologies</b>	n/a	n/a	2010	Greenfield investment	■ Design and manufacture of flat panel displays	Canada
<b>AAA Canada</b>	n/a	210	2011	Expansion	■ Specialized supplies and services	France
<b>Assystem Canada</b>	n/a	100	2011	Expansion	■ CAD/CAM services	France
<b>Bell Helicopter Textron Canada</b>	n/a	100	2011	Expansion	■ Manufacture of rotary wing aircraft	United States
<b>Innotech Aviation (Division de Groupe I.M.P.)</b>	n/a	5	2011	Expansion	■ Maintenance; ■ Repairs; ■ Refurbishment	Canada
<b>Dema Aeronautics</b>	n/a	n/a	2010	Expansion	■ CAO - DAO - FAO services	Italy
<b>Lufthansa Technik</b>	n/a	n/a	2012	Greenfield investment	■ Maintenance; ■ Repairs; ■ Refurbishment	Germany
<b>SITA (Société Internationale de Télécommunications Aéronautiques)</b>	n/a	n/a	2010	Expansion	■ Telecommunications solutions for the air transport industry	Switzerland

1.7

**A STRONG PRESENCE OF FOREIGN SUBSIDIARIES**

Foreign subsidiaries contribute significantly to Greater Montréal's economic development and global recognition for its knowhow and vitality. Companies such as Bell Helicopter Textron Canada, Esterline CMC Electronics, Pratt & Whitney Canada, Rolls-Royce Canada and Sonaca Montréal are responsible for millions of dollars of capital and R&D investments and thousands of jobs, thereby stimulating the region's innovation and productivity.

**SELECTION OF AEROSPACE FOREIGN SUBSIDIARIES  
BY NUMBER OF JOBS (RANGE)  
GREATER MONTRÉAL, 2012**

TABLE 3

Company	Number of Jobs (Range)	Activities	Country of Origin
<b>Pratt &amp; Whitney Canada</b>	5,000-6,500	■ Manufacture of aircraft engines	United States
<b>Bell Helicopter Textron Canada</b>	1,500-2,000	■ Manufacture of rotary wing aircraft	United States
<b>Rolls-Royce Canada</b>	1,000-1,700	■ Aircraft engines and gas turbines for industrial applications	United Kingdom
<b>Esterline CMC Electronics</b>	800-1,150	■ Design and manufacture of electronic aviation products	United States
<b>L-3 MAS</b>	800-1,150	■ Aircraft lifecycle extension services	United States
<b>C&amp;D Zodiac</b>	500-600	■ Assembly and subassembly	France
<b>Howmet Laval Casting (Division of Alcoa)</b>	200-300	■ Casting and forging; ■ Machining; ■ Surface treatment and paint	United States
<b>Sonaca Montréal</b>	200-300	■ Development, machining, forming and assembly of large wing panels	Belgium
<b>RTI Claro</b>	200-300	■ CNC machining; ■ Assembly and subassembly	United States
<b>Messier-Bugatti-Dowty (Safran Group)</b>	200-300	■ Aircraft landing and braking systems	France
<b>SITA (Société Internationale de Télécommunications Aéronautiques)</b>	200-300	■ Telecommunication solutions for the air transport industry	Switzerland



**Montréal International –  
Serving Foreign Aerospace Companies**

MI's main mandate is to attract, retain and expand foreign direct investment for the Greater Montréal area. Between 2005 and 2011, over 24 aerospace companies have benefited from its support. These projects generated \$233 million in direct investment and created over 860 jobs.



**SELECTION OF AEROSPACE FOREIGN SUBSIDIARIES**  
 BY NUMBER OF JOBS (RANGE)  
 GREATER MONTRÉAL, 2012 (CONT.)

TABLE 3

Company	Number of Jobs (Range)	Activities	Country of Origin
<b>Mecachrome Canada</b>	100-200	<ul style="list-style-type: none"> <li>Design and production of complex assemblies made of critical structural parts</li> </ul>	France
<b>Sargent Aerospace Canada</b>	100-200	<ul style="list-style-type: none"> <li>CNC machining;</li> <li>Assembly and subassembly</li> </ul>	United States
<b>Thales Canada, Aerospace Divison</b>	100-200	<ul style="list-style-type: none"> <li>Design and integration of avionics suites, etc.</li> </ul>	France
<b>AAA Canada</b>	100-200	<ul style="list-style-type: none"> <li>Specialized supplies and services</li> </ul>	France
<b>Astronics - Luminescent Systems Canada</b>	100-200	<ul style="list-style-type: none"> <li>Design, manufacture and servicing of lighting and electronic systems</li> </ul>	United States
<b>Aerolia Canada</b>	100-200	<ul style="list-style-type: none"> <li>Design and manufacture of fuselage subassemblies</li> </ul>	France
<b>Mecaer America</b>	50-100	<ul style="list-style-type: none"> <li>Design, engineering, integration, assembly, inspection and maintenance for all types of aeronautical components</li> </ul>	Italy
<b>CP Tech (Division of Technimeca International)</b>	50-100	<ul style="list-style-type: none"> <li>Surface treatment and paint;</li> <li>Testing, Control &amp; inspection</li> </ul>	United States
<b>CDI-Aerospace</b>	50-100	<ul style="list-style-type: none"> <li>CAO - DAO - FAO services;</li> <li>Specialized supplies and services</li> </ul>	United States
<b>Turbomeca Canada (Safran Group)</b>	50-100	<ul style="list-style-type: none"> <li>Design and manufacture of small- and medium-power gas turbines for helicopters</li> </ul>	France







2

INDUSTRY  
LEADERS



The area's leading aerospace players make Greater Montréal one of the industry's three global hubs, along with Seattle and Toulouse. These companies fall into the three following subsectors:

- Prime contractors
- OEMs, integrators and MROs
- Subcontractors and suppliers of specialized products and services

In addition to these companies, Greater Montréal is home to many international civil aviation organizations (IOs) that have helped to make it one of the most important decision-making centres in the world. All of this illustrates the stimulating climate created by Québec's aerospace industry.

### Developmental Engineering – Greater Montréal, a Leading Player in Advanced Technologies

Every year for the past 15, Greater Montréal's aerospace enterprises have succeeded in getting aircraft certified thanks to the close collaboration of many actors ranging from R&D and manufacturing companies to educational institutions.

- **AKKA Technologies**, a European engineering consulting group, currently located in Greater Montréal, provides companies with professional expertise in all phases of project development, from R&D to production; the firm is involved in several fields including aerospace and defence.
- **Assystem Canada** is a French engineering consulting firm dedicated to the development of advanced technologies. It is involved throughout the product lifecycle and in a number of specialty areas.

## 2.1

### PRIME CONTRACTORS THE HEART OF THE AEROSPACE INDUSTRY

Four world leaders are located in Greater Montréal. They alone generate nearly 70% of the Québec aerospace industry's sales.<sup>25</sup> They also employ around 62% of the province's aerospace workforce.<sup>26</sup>

**PRIME CONTRACTORS**  
BY NUMBER OF JOBS (RANGE)  
PROVINCE OF QUÉBEC, 2011<sup>27</sup>

Company	Number of Jobs (Range)	Activity	Country of Origin
<b>Bombardier Aerospace</b>	14,000-15,500	■ Design and manufacture of aviation products for business, commercial and amphibious aircraft markets. World leader in commercial aircraft production.	Canada
<b>Pratt &amp; Whitney Canada</b>	5,000-6,500	■ Design and manufacture of engines for business and regional aircraft and helicopters.	United States
<b>CAE inc.</b>	3,000-4,000	■ Modelling, simulation and aviation training for civil and defence aviation. World's number one supplier of commercial aviation simulators.	Canada
<b>Bell Helicopter Textron Canada</b>	1,500-2,000	■ Manufacture of rotary wing aircraft. The Mirabel facility (Greater Montréal area) holds an exclusive worldwide mandate for Bell Helicopter's commercial helicopter lines. The world's leading producer of rotary wing aircraft.	United States

TABLE 4

<sup>25</sup> Source: MDEIE, 2012

<sup>26</sup> Source: MDEIE, 2012

<sup>27</sup> "Number of jobs" refers to a company's activities in Québec. An enterprise's activities may be located solely in Greater Montréal. Furthermore, "Number of jobs" refers to all company's activities, including the ones in aerospace. These information apply to tables 5 and 6.





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## Bell Helicopter Textron Canada – Priority to Research and Service

Situated in Mirabel, Bell Helicopter Textron Canada Limited is a division of Bell Helicopter Textron Inc., whose head office is in Fort Worth, Texas. Bell Helicopter is a world leader in the manufacturing of commercial and military helicopters. Considered among the Canadian aerospace industry's flagship companies, it represents one of the great industrial success stories of Montréal's North Shore.

*"We reinvest a significant portion of our revenue in R&D and are constantly involved in numerous projects with Montréal's universities and research centres. I would say that the intensity of our R&D commitment and the quality of our client service represent our two greatest strengths,"* says Mr. **BARRY KOHLER**, President, while noting that *Professional Pilot* readers have ranked Bell's customer service and support first for 18 consecutive years.

Inaugurated in 1986, the 656,000 square foot Mirabel plant employs over 2,000 workers and has the exclusive mandate for the production of Bell Helicopter's commercial aircraft (Bell 206L-4, 407, 412, 429). It also provides complete flight test, certification and support services. To date, over 4,000 helicopters have been built at this facility.

*"The spirit of cooperation that one finds in Montréal's aerospace cluster is due, in my opinion, to the fact that the activities of its four prime contractors differ to such an extent that they feel comfortable collaborating with one another with the clear intent of helping their suppliers to keep pace with them. The result is remarkable vitality, easy access to all that is needed to assemble aircraft and an extraordinarily diverse set of skills and talents,"* says Mr. Kohler.

## 2.2

### OEMs, INTEGRATORS AND MROs – TIER ONE SUPPLIERS

Greater Montréal has a highly diversified OEM, integrator and MRO subsector. The 12 companies located in the region develop a variety of solutions to meet industry's most stringent requirements. They account for around 21% and 18% of Québec's aerospace sales and jobs respectively.<sup>28</sup>

### Business Aircraft, Interior and Landing Gear Design and Manufacturing – Specialities of Greater Montréal's Aerospace Industry

Thanks to evolving innovation processes, some Greater Montréal companies have developed cutting-edge expertise and become world leaders in business aircraft, interior and landing gear design and manufacturing.

- ▶ Headquartered in Montréal, **Bombardier Aerospace** has built a solid reputation in the business aircraft industry with the reliability of its Challenger Series, which has elevated the company's status to that of global leader.
- ▶ **C&D Zodiac**, a French firm, operates Greater Montréal facilities for the design and production of business jet interiors. Because of its capacity for innovation and use of sophisticated materials and equipment, it offers constantly evolving solutions.
- ▶ A Québec-based company, **Héroux-Devtek** is the world's third largest producer of landing gear systems for which it also provides repair and overhaul services.
- ▶ **Messier-Bugatti-Dowty (Safran Group)**, a French company, is the global leader in landing gear systems. Its 220 Montréal area employees are involved in the manufacturing of large and very large landing gear systems.



**OEMs, INTEGRATORS AND MROs**  
BY NUMBER OF EMPLOYEES (RANGE)  
PROVINCE OF QUÉBEC, 2011

TABLE 5

Company	Number of Jobs (Range)	Activity	Country of Origin
<b>Rolls-Royce Canada</b>	1,000-1,700	■ Manufacture and maintenance of aircraft engines and gas turbines	United Kingdom
<b>Héroux-Devtek</b>	1,000-1,700	■ Production of landing gear and airframe components and subassemblies	Canada
<b>Esterline CMC Électronique</b>	800-1,150	■ Design and manufacture of electronic aviation products	United States
<b>L-3 MAS</b>	800-1,150	■ Aircraft lifecycle extension services and aerostructure services	United States
<b>GE Aviation</b>	700-800	■ Aviation services and production of aircraft engines	United States
<b>MDA</b>	600-700	■ Design of satellite systems and subsystems in the commercial and government sectors	Canada
<b>Sonaca Montréal</b>	200-300	■ Development, machining, forming and assembly of large wing panels	Belgium
<b>Messier-Bugatti-Dowty (Safran Group)</b>	200-300	■ Aircraft landing and braking systems	France
<b>Mecachrome Canada</b>	100-200	■ Design and production of complex assemblies made of critical structural parts	France
<b>Thales Canada, Aerospace Division</b>	100-200	■ Design and integration of avionics suites, flight controls, head-up displays, enhanced vision systems and other innovative avionics concepts	France
<b>Aerolia Canada</b>	100-200	■ Design and manufacture of fuselage subassemblies	France
<b>Turbomeca Canada (Safran Group)</b>	50-100	■ Design, manufacture and sale of gas turbines for helicopters	France
<b>Liebherr-Aerospace Canada</b>	25-75	■ Supply of aircraft air management, flight control and actuation systems, hydraulic systems and landing gears	Switzerland

## Héroux-Devtek – Equipment Supplier to the World's Largest Aircraft Manufacturers

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From its inception in 1942, the company that would later become Héroux-Devtek specialized in machine tooling of aircraft components. It was not until 1960 that it began designing and manufacturing landing gear components.

Today, it is a globally active company serving the aerospace and industrial products markets from eleven production facilities in North America. It offers OEMs and first tier suppliers a manufacturing capacity that can meet the requirements of programs of every size and scope.

*"We are the third largest manufacturer of landing gear systems in the world. We are even number one in certain niche markets such as after-sale service and replacement parts for the United States Air Force and Navy," says MR. GILLES LABBÉ, the company's President and CEO and Chairman of Aéro Montréal's Board of Directors.*

Under Mr. Labbé's leadership, revenue grew from \$12 to \$380 million since 1985. Among its over 1,500 employees (900 in the Montréal area), Héroux-Devtek has a team of some 100 engineers, ten of whom work solely on R&D, focusing their attention especially on certain aspects of the Greener Aircraft Catalyst Project launched as part of Québec's 2010-2013 Research and Innovation Strategy and jointly funded by the private sector and the Government of Québec.

*"One of our cluster's strengths, thanks to Aéro Montréal, is its ability to unite all of the industry's prime contractors, equipment manufacturers and SMEs as well as representatives from universities, colleges, research centres and both levels of government in a collaborative effort to strengthen our industry particularly through projects of major strategic importance," Mr. Labbé added.*



# 2.3

## SUBCONTRACTORS AND SUPPLIERS OF SPECIALIZED PRODUCTS AND SERVICES – PILLARS OF THE INDUSTRY

Several aerospace leaders depend on these world-class suppliers for high-quality specialized products required for manufacturing and maintenance. They represent Greater Montréal's most important subsector in terms of facilities and range of services and products.

### Qualification and Certification of Aircraft and Aircraft Products – A Rare Expertise Available in Greater Montréal

Greater Montréal has the technological capacity, advanced facilities and cutting-edge expertise to qualify and certify aircraft and aircraft products.

➤ **Averna**, a test engineering firm located in Greater Montréal, offers a variety of strategies and solutions for conducting specific tests on product lifecycle tailored to its clients' needs.

➤ **Marinvent** conducts systems flight tests and human factors evaluations, as it owns the only aircraft in Canada specially modified for these purposes. Focused exclusively on R&D, it develops advanced technologies to a high state of maturity that it then licenses to leaders in appropriate fields. Marinvent's administrative headquarters is located in St-Bruno-de-Montarville, on the South Shore of Montréal.

**SELECTION OF SUBCONTRACTORS AND SUPPLIERS OF SPECIALIZED PRODUCTS AND SERVICES**  
BY NUMBER OF JOBS (RANGE - 100+)  
PROVINCE OF QUÉBEC, 2011

TABLE 6

Company	Number of Jobs (Range)	Activity	Country of Origin
<b>C&amp;D Zodiac</b>	600-700	■ Design and production of business jet interiors	France
<b>Innotech Aviation (Division of IMP Group)</b>	500-600	■ Aircraft inspection, modification, completion, maintenance and overhaul	Canada
<b>PCO Innovation</b>	500-600	■ Consulting services, specializing in the optimization of innovation processes and implementation of product lifecycle management (PLM) processes	Canada
<b>Averna Technologies</b>	300-400	■ Test engineering solutions	Canada
<b>Avianor Group</b>	300-400	■ Design, engineering, certification, manufacturing, repair (maintenance) and overhaul of cabin interior components	Canada
<b>Howmet Laval Casting (Division of Alcoa)</b>	200-300	■ Complex castings by lost wax process	Canada
<b>RTI Claro</b>	200-300	■ Manufacturing, assembly and finishing of aerospace and telecommunications components	United States
<b>Norduyn</b>	200-300	■ Design and manufacture of lightweight in-flight equipment such as trolleys, baby bassinets, stretchers; ■ Aircraft maintenance, repair, refurbishment	Canada
<b>Excelitas Canada</b>	200-300	■ Research, engineering and manufacturing of components and high-technology electro-optical subsystems	United States
<b>Terminal &amp; Cable TC</b>	200-300	■ Manufacturing of wiring such as electric harnesses and battery cables	Canada



## SELECTION OF SUBCONTRACTORS AND SUPPLIERS OF SPECIALIZED PRODUCTS AND SERVICES

BY NUMBER OF JOBS (RANGE - 100+)

PROVINCE OF QUÉBEC, 2011 (CONT.)

TABLE 6

Company	Number of Jobs (Range)	Activity	Country of Origin
<b>GFI (Division of Thomas &amp; Betts Manufacturing)</b>	200-300	■ Manufacturing of precision sheet metal parts, metal stamping, tool making and die cutting, production of electrical chassis and housings, screen printing, prototype manufacturing, and mechanical, electrical and electronic integration	Canada
<b>Ian Martin</b>	200-300	■ Integrated staffing solutions	Canada
<b>DTI Software</b>	200-300	■ Design and distribution of in-flight entertainment software	Canada
<b>Mechtronix Systems</b>	200-300	■ Design and manufacturing of flight simulation training devices for general, business and commercial aviation; aircraft parts machining and aircraft accessories; manufacture of customized electro-hydraulic and central systems; development and production of automated systems; production of customized machinery and equipment	Canada
<b>SDV Logistiques (Canada)</b>	200-300	■ Logistics and specialty transportation services	Canada
<b>Wainbee</b>	200-300	■ Multi-technology including pneumatics, hydraulics, electromechanics, production tools and filtration	Canada
<b>Shellcast Foundries</b>	200-300	■ Manufacturing of aluminum precision investment castings by lost wax process	Canada
<b>Samuel Specialty Metals Québec</b>	100-200	■ Processing and supply of aluminum products in compliance with commercial and military specifications	Canada
<b>GGI International</b>	100-200	■ Design, engineering and manufacturing of user interface controls for aircraft cabin applications	Canada
<b>Mitchell Aerospace</b>	100-200	■ Manufacturing of precision-engineered light alloys and castings	Canada
<b>Adacel</b>	100-200	■ Design and manufacturing of a wide range of simulation systems for the aerospace, maritime and defence markets	United States
<b>Avior Integrated Products</b>	100-200	■ Design and manufacturing of lightweight structural assemblies	Canada
<b>LISI Aerospace Canada</b>	100-200	■ Manufacture of aeronautical fasteners and assembly components	France

## SELECTION OF SUBCONTRACTORS AND SUPPLIERS OF SPECIALIZED PRODUCTS AND SERVICES

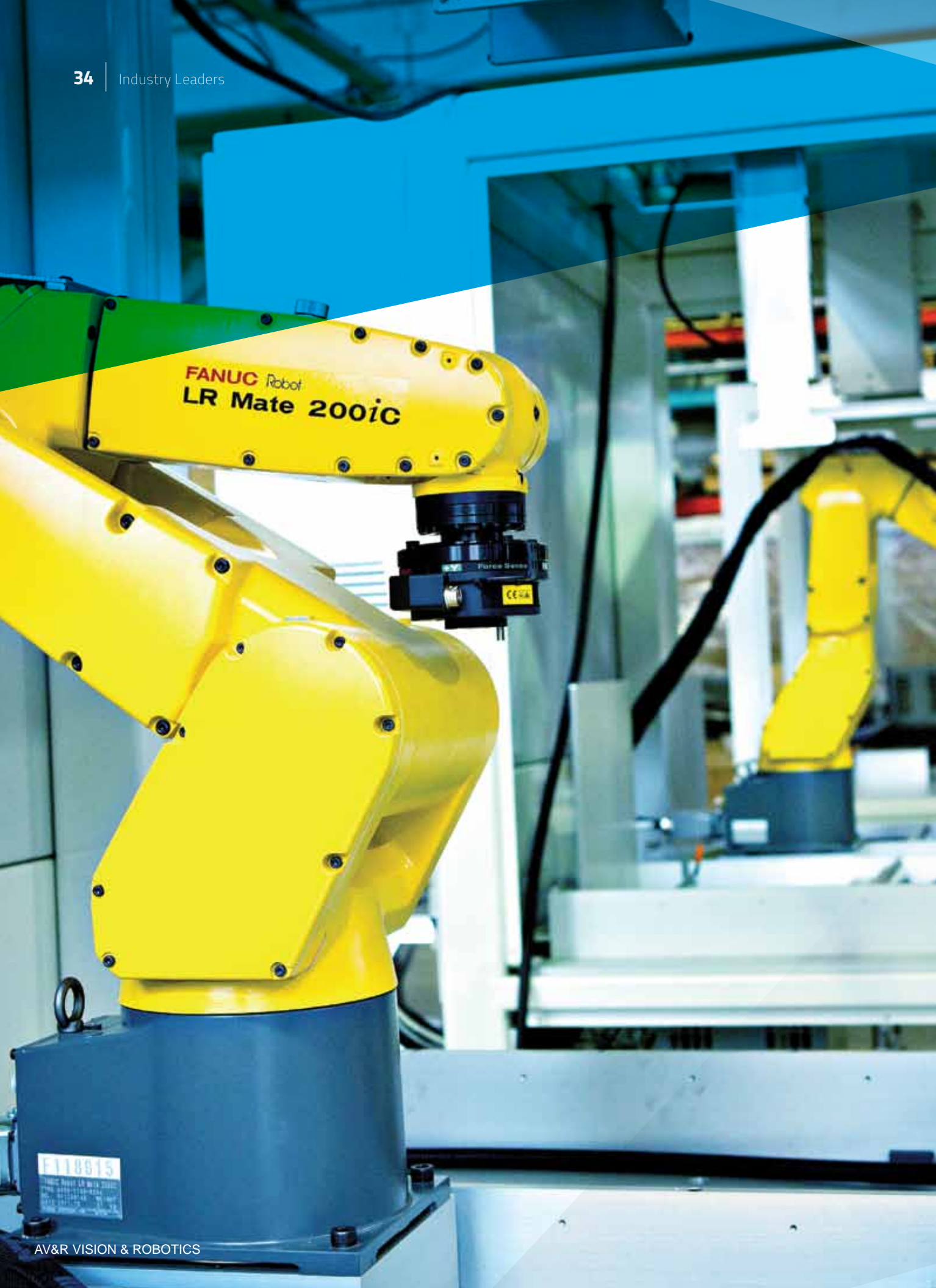
BY NUMBER OF JOBS (RANGE - 100+)

PROVINCE OF QUÉBEC, 2011 (CONT.)

TABLE 6

Company	Number of Jobs (Range)	Activity	Country of Origin
<b>Sargent Aerospace Canada</b>	100-200	■ Machining and assembly of complex metallic components	United States
<b>Titanium Industries</b>	100-200	■ Manufacturing and supply of titanium and nickel mill products	United States
<b>Top Aces</b>	100-200	■ Airborne training services to the Canadian Army, Navy and Air Force	Canada
<b>Ryerson Canada</b>	100-200	■ Distribution and processing of bar, pipe, plate, sheet and forgings to the aerospace industry	United States
<b>Mitec Telecom</b>	100-200	■ Design and supply of radio frequency (RF) products for the telecommunications and satellite communications industries	Canada
<b>Vestshell</b>	100-200	■ Investment casting of ferrous alloys and stainless steels up to 800 lbs	Canada
<b>AAA Canada</b>	100-200	■ Technical services, mainly in situ, on aircraft or aircraft elements (manufacture of aircraft elements, repair, processing, maintenance, etc.)	France
<b>Alphacasting</b>	100-200	■ Precision investment casting by lost wax process, working with over 120 different types of alloys	Canada
<b>Marquez-Transtech</b>	100-200	■ Design, integration, qualification and manufacturing of composite and thermoplastic products	Canada
<b>Elimetal</b>	100-200	■ Electro-discharge and high-precision CNC machining	Canada
<b>Mesotec</b>	100-200	■ Manufacturing of aircraft structural parts and aircraft engine parts	Canada
<b>Meloche Group</b>	100-200	■ Manufacturing of machined components and sub-assemblies for the aeronautics and defence industries	Canada
<b>Accessair Systems</b>	100-200	■ Design and manufacturing of airport equipment for airlines, airport authorities, ground service handlers and cargo handling companies	Canada





**SELECTION OF SUBCONTRACTORS AND SUPPLIERS OF SPECIALIZED PRODUCTS AND SERVICES**  
 BY NUMBER OF JOBS (RANGE - 100+)  
 PROVINCE OF QUÉBEC, 2011 (CONT.)

TABLE 6

Company	Number of Jobs (Range)	Activity	Country of Origin
<b>Abipa Canada</b>	100-200	<ul style="list-style-type: none"> <li>Precision machining, stamping and EDM work; machining, assembly and finishing of aerospace components; manufacturing of metal matrices; manufacturing of dimpling tools.</li> </ul>	Canada
<b>Aerospace Welding</b>	100-200	<ul style="list-style-type: none"> <li>Manufacturing of aircraft mechanical components, subassemblies and ground support equipment</li> </ul>	Canada
<b>Astronics - Luminescent Systems Canada</b>	100-200	<ul style="list-style-type: none"> <li>Design, manufacture and servicing of lighting and electronic systems for the aeronautics industry</li> </ul>	United States
<b>Exova Canada</b>	100-200	<ul style="list-style-type: none"> <li>Testing and analysis of products for compliance with accepted North American and international industry standards, regulations and codes</li> </ul>	Canada
<b>Leesta Industries</b>	100-200	<ul style="list-style-type: none"> <li>Manufacturing of precision components for secondary flight control systems; assembly of hydraulic actuator systems; manufacturing of aero-engine components and precision aerospace parts</li> </ul>	Canada
<b>Maya Simulation Technologies</b>	100-200	<ul style="list-style-type: none"> <li>Development of software for structural, thermal and thermo-fluid analysis</li> </ul>	United States
<b>Mecaer America</b>	100-200	<ul style="list-style-type: none"> <li>Design, engineering, integration, assembly, inspection and maintenance for all types of wheel and skid landing gear</li> </ul>	Italy
<b>MSB Design</b>	100-200	<ul style="list-style-type: none"> <li>Mechanical engineering services, including mechanical design, 3D design, prototype manufacturing, small production runs and mechanical fastening</li> </ul>	Canada
<b>Airbase Services</b>	100-200	<ul style="list-style-type: none"> <li>Maintenance and repair of cabin and cargo hold equipment (e.g., seats, in-flight entertainment systems, phones, galley equipment); manufacturing of seat covers</li> </ul>	Canada
<b>Tecnickrome Aéronautique</b>	100-200	<ul style="list-style-type: none"> <li>Surface treatment, heat treatment, shot peening, non-destructive testing, assembly and inspection of subassemblies, and the repair and overhaul of aircraft and military components (landing gear and steering components)</li> </ul>	Canada



## Air Carriers - The Industry's Major Customers

Nearly one-third of Québec's air carriers operate out of the Greater Montréal area and serve international markets with an impressive array of aircraft.<sup>29</sup>

### MAIN AIR CARRIERS IN GREATER MONTRÉAL

TABLE 7

Company	Fleet Size	Services
<b>Air Canada</b>	204 planes	▪ Passenger service worldwide
<b>Air Canada Express</b>	158 planes	▪ Passenger service across North America
<b>Exeaire</b>	22 planes	▪ Business travel within North America
<b>Air Transat</b>	18 planes	▪ Passenger service within Canada and to the Caribbean, Europe, United States and Mexico
<b>Pascan Aviation</b>	17 planes	▪ Passenger service within Québec
<b>Passport Hélico</b>	15 helicopters	▪ Passenger service within Québec
<b>Propair</b>	12 planes	▪ Passenger service to northern regions of Québec and Canada and some US destinations
<b>Air Inuit</b>	10 planes	▪ Passenger and cargo service to northern regions of Québec and Canada
<b>Air Richelieu</b>	10 planes	▪ Passenger service and flight training
<b>Nolinor Aviation</b>	9 planes	▪ Passenger and cargo service within North America
<b>Dorval Aviation</b>	7 planes	▪ Passenger service within a 1,000-km radius of Greater Montréal and flight training
<b>Helicraft</b>	6 helicopters	▪ Flight training, aircraft maintenance and chartered flights
<b>Héli-Inter</b>	6 helicopters	▪ Passenger and cargo service, medical evacuation and mining exploration
<b>Max aviation</b>	6 planes	▪ Service for regular and business passengers
<b>Starlink Aviation</b>	6 planes	▪ Chartered passenger flights
<b>Skyservice</b>	4 planes	▪ Chartered flights within North America and air ambulance services



<sup>29</sup> Source: Association québécoise du transport aérien (AQTA or Québec's air transport association), 2012.





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## Montréal – Headquarters to ICAO and the World Capital of Civil Aviation

Since settling in Montréal nearly 70 years ago, the International Civil Aviation Organization (ICAO) has played a pivotal role in the development of the metropolitan area's aerospace industry while benefiting from an environment conducive to enhancing its own global outreach. Representing 191 countries, ICAO is Canada's most important UN agency.

Over the years, its very presence has helped to attract other international organizations (IOs): the International Air Transport Association (IATA) (1949), International Federation of Airline Pilots' Associations (IFALPA) (1978), International Business Aviation Council (IBAC) (1981), International Federation of Air Traffic Controllers' Associations (IFATCA) (1998) and Civil Air Navigation Service Organization (CANSO) (2006). The arrival of Airports Council International (ACI) in 2010 further solidified Montréal's status as the world capital of civil aviation.

*"Our being here is all the more warranted because of Greater Montréal's position among the world's three premiers aerospace hubs, the presence of major industry organizations and the industrial fabric created by several global actors,"* says **MR. RAYMOND BENJAMIN, Secretary General of ICAO.**

Moreover, the diversity among the sector's international organizations located in the city has created a unique synergy because of their complementary activities, particularly those related to training and telecommunications management.

*"Montréal is also known for its ethnic and cultural diversity, lifestyle, safety and reasonable cost of living. All of these factors matter greatly for an organization such as ours as does the unwavering support provided by Montréal International,"* adds Mr. Benjamin.

## International Organizations – Instruments for Multilateral Cooperation and Promotion

Greater Montréal has one of North America's largest clusters of international organizations (IOs), ranking third behind New York and Washington. The arrival of the International Civil Aviation Organization (ICAO) in 1947 allowed Montréal to build a solid reputation in the field of civil aviation and welcome other eminent IOs such as the International Air Transport Association (IATA) and, more recently in 2010, Airports Council International (ACI). Currently, Greater Montréal is home to 10 aerospace IOs (primarily in civil aviation) and their 950 jobs.<sup>30</sup> They constitute an information exchange platform through which many international aviation standards are adopted. This cluster demonstrates the strength of Greater Montréal's aerospace sector and contributes significantly to the region's international reputation.

### INTERNATIONAL ORGANIZATIONS IN AEROSPACE MONTRÉAL

Organization	Role
<b>International Civil Aviation Organization (ICAO)</b>	<ul style="list-style-type: none"> <li>To promote the safe and orderly development of international civil aviation throughout the world</li> <li>To set standards and regulations necessary for aviation safety, security, efficiency and regularity, as well as for aviation environmental protection</li> <li>To serve as the forum for cooperation in all fields of civil aviation among its 191 Member States</li> </ul>
<b>International Air Transport Association (IATA)</b>	<ul style="list-style-type: none"> <li>To increase awareness of the benefits that aviation brings to national and global economies</li> </ul>
<b>Airports Council International (ACI)</b>	<ul style="list-style-type: none"> <li>To represent the interests of airports with international organizations, governments and airlines</li> </ul>
<b>Cospas-Sarsat</b>	<ul style="list-style-type: none"> <li>To provide accurate, timely, and reliable distress alert and location data to help search and rescue authorities assist persons in distress</li> </ul>
<b>International Federation of Airline Pilots' Associations (IFALPA)</b>	<ul style="list-style-type: none"> <li>To provide representation, services and support to its member associations in order to promote the highest level of aviation safety worldwide</li> </ul>
<b>Civil Air Navigation Service Organization (CANSO)</b>	<ul style="list-style-type: none"> <li>To act as the global voice of companies that provide air traffic control and represent the interests of Air Navigation Service Providers worldwide</li> </ul>
<b>International Business Aviation Council (IBAC)</b>	<ul style="list-style-type: none"> <li>To research and collate the requirements of the business aviation community and develop policy/position papers representing the needs and goals of that community</li> </ul>

TABLE 6

<sup>30</sup> Data of 2010. Source: Secor, 2012



TABLE 8

**INTERNATIONAL ORGANIZATIONS IN AEROSPACE**  
MONTRÉAL (CONT.)

Organization	Role
<b>Conseil international de formation aérospatiale (CIFA or international aerospace training council)</b>	<ul style="list-style-type: none"> <li>■ To establish international competency standards in compliance with various government regulations</li> <li>■ To uphold these competency standards by monitoring training (technical and regulatory)</li> <li>■ To act as an advisory body for aerospace technical training</li> </ul>
<b>International Federation of Air Traffic Controllers' Associations (IFATCA)</b>	<ul style="list-style-type: none"> <li>■ To represent over 50,000 air traffic controllers in 137 countries</li> <li>■ To promote safety, efficiency and regularity of international air navigation</li> <li>■ To aid in the development of air traffic control systems, procedures and facilities</li> <li>■ To promote knowledge and professional efficiency among air traffic controllers</li> </ul>
<b>World Airlines Clubs Association (WACA)</b>	<ul style="list-style-type: none"> <li>■ To unite, coordinate, advise and arbitrate the activities of the Airlines/Interlines Clubs throughout the world</li> <li>■ To encourage active participation in all activities demonstrating to the general public the important contribution of international airlines towards a better understanding among the peoples of the world</li> <li>■ To promote air transportation as a mode of travel and promote better service to the travelling public</li> </ul>



BELL HELICOPTER TEXTRON CANADA





# 3

## WORKFORCE AND TRAINING



Greater Montréal is widely recognized for the quality of its aerospace labour force and excellence of the training offered by its educational institutions.

## 3.1 EXTENSIVE EXPERTISE

The aerospace sector and its 42,000 workers represent a broad range of skills and talents. An extensive network of educational institutions and organizations focused on industry needs are largely responsible for the undeniable quality of this workforce.

The following table illustrates the main aerospace and aerospace-related occupations found in the area.

**SELECTION OF AEROSPACE OCCUPATIONS, BY NUMBER OF JOBS (IN THOUSANDS), GREATER MONTRÉAL, 2011**

TABLE 9

Aerospace Occupations	
<b>Aerospace Engineers</b>	4.4
<b>Aircraft Assemblers and Aircraft Inspectors</b>	3.1
<b>Avionics and Instrumentation Technicians and Aircraft Electrical Systems Technicians</b>	2.1
<b>Aircraft Mechanics and Inspectors</b>	1.5
Aerospace Related Occupations	
<b>Electrical Engineers and Electronics Technicians</b>	6.4
<b>Welders and Welding and Brazing Machine Operators</b>	5.2
<b>Computer Engineers</b>	3.6
<b>Mechanical Engineers</b>	3.1
<b>Plastic Products Assemblers, Finishers and Inspectors</b>	1.6

## 3.2 A WORLD-RENOWNED EDUCATIONAL SYSTEM

Home to most of Québec's aerospace training institutions, Greater Montréal is widely recognized for the range of establishments offering state-of-the-art programs in both of Canada's official languages (French and English). With eight universities and many CEGEPs<sup>31</sup>, vocational schools and research centres specializing in aerospace, the area has a considerable pool of future professionals at its disposal and ranks as one of North America's leaders in terms of intellectual vitality.

<sup>31</sup> CEGEP: *collège d'enseignement général et professionnel* (or general and vocational college)

### École nationale d'aérotechnique (ÉNA) – At the Cutting-Edge of Technical Training

Located in the Greater Montréal area and a major force in North America, this institution offers specialized training in aircraft manufacturing, maintenance and avionics using the latest equipment and aircraft (a fleet of 23) worth over \$50 million.







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## Esterline CMC Electronics – Focused on Integration

Formerly known as Canadian Marconi Company, a famous firm founded in 1903, CMC Electronics was acquired by the American company Esterline in 2007. Esterline CMC Electronics is now a world leader in the design, manufacture, sales and support of high-technology electronics products for the civil and military aviation markets.

The company's focus is on delivering innovative cockpit systems integration and avionics solutions as well products for modernizing existing aircraft in compliance with international requirements.

Esterline CMC Electronics has 1,100 employees at its main locations in Montréal, Ottawa, and Chicago. The Montréal facility produces avionics systems, special display system components and hybrid microelectronics.

*"All of our aviation products are related to navigation and flight control, display and vision or on-board communications, as well*

*as the technology associated with SmartDeck, an integrated flight control and display system featuring synthetic vision and automated functions. We have developed a user interface for nearly all cockpit equipment by achieving a remarkable level of integration. In fact, the key word in our development is integration,"* says **MR. GREG YELDON, President.**

While it was once a supplier exclusively of avionics systems, for the past ten years, the company has been offering ever more complete and complex cockpit systems integration solutions based on either its own equipment or that of other specialized manufacturers.

*"I believe that integration is essential not only for us, but for the entire Montréal aerospace cluster. It is already a vibrant network whose best characteristics, in my opinion, are its diversity and openness due to the presence of four rather than just one major player,"* notes Mr. Patrick Champagne, Vice President, Cockpits and Systems Integration.

### Aerospace Training and Research Institutions<sup>32</sup> in the Greater Montréal Area

#### UNIVERSITY TRAINING

- **École de Technologie supérieure (ÉTS)**  
→ AÉROÉTS
- **École Polytechnique de Montréal**  
→ Institute of Innovation and Conception in Aerospace of Polytechnique (IICAP)
- **Concordia University**  
→ Concordia Institute of Aerospace Design and Innovation (CIADI)
- **Université Laval**  
Partnership with Greater Montréal universities<sup>33</sup> for the Masters in Aerospace
- **McGill University**  
→ McGill Institute for Aerospace Engineering (MIAE)
- **Université de Sherbrooke**  
Partnership with Greater Montréal universities<sup>34</sup> for the Masters in Aerospace

#### TECHNICAL TRAINING

- **École nationale d'aérotechnique – ÉNA**

#### VOCATIONAL TRAINING

- **École des métiers de l'aérospatiale de Montréal (ÉMAM)**
- **Institut de formation aérospatiale (IFA) (In-company training)**

### Inter-University Master's Program in Aerospace Engineering – Centred on Industry's Needs

Jointly offered by 11 companies<sup>35</sup>, six Québec-based universities<sup>36</sup> and CAMAQ<sup>37</sup>, this master's in aerospace engineering focuses on industry needs.

### A Bachelor's Program in Aerospace Engineering – A First in Canada

In cooperation with Collège Édouard-Montpetit's ÉNA and two industry leaders, namely Bell Helicopter Textron Canada and Bombardier Aerospace, the École Polytechnique de Montréal introduced officially a program leading to a bachelor's degree in aerospace engineering in March 2010. The first graduates will enter the labor market in 2012.

<sup>32</sup> For a complete description of their activities, please see Table 14

<sup>33</sup> Concordia University, École de technologie supérieure (ÉTS), École Polytechnique de Montréal, McGill University, Université de Sherbrooke, Université Laval

<sup>34</sup> Same institutions as those listed in footnote 33

<sup>35</sup> Bell Helicopter Textron Canada, Bombardier Aerospace, CAE inc., Dassault Systems, Esterline CMC Electronics, Héroux-Devtek, L-3 MAS, MDA, Pratt & Whitney Canada, Rolls-Royce Canada, Thales Canada, Aerospace Division, Turbomeca Canada (Safran Group)

<sup>36</sup> Same institutions as those listed in footnote 33

<sup>37</sup> CAMAQ: Centre d'adaptation de la main-d'œuvre aérospatiale au Québec (or sectorial committee for aerospace manpower)



# 3.3

## CANADA'S UNIVERSITY RESEARCH CAPITAL

Greater Montréal leads all other large Canadian metropolitan areas in terms of funding for university research, which, since 2005, has exceeded \$5 billion.

# 3.4

## A WORKFORCE READY TO MEET THE INDUSTRY'S SKILL REQUIREMENTS

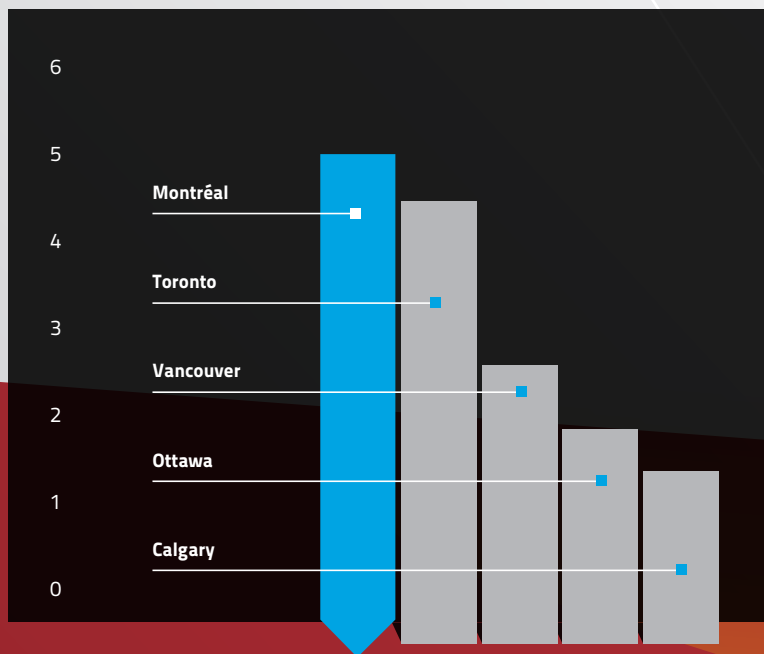
The aerospace industry's needs are constantly evolving and recent graduates must be able to meet its latest requirements. Universities, CEGEPs and vocational schools maintain ongoing collaboration with aerospace companies to ensure that future workers will be qualified and able to contribute to the sector's continued growth.

The aerospace industry is also driving initiatives to interest young people in the field. In association with the Conseil du Loisir Scientifique de la région Métropolitaine (CLSM) and the Foundation of the Society of Automotive Engineers of Canada (SAE), Aéro Montréal launched "The Sky is the Limit!", a series of science presentations intended to demystify the world of aerospace and promote exciting careers in the sector among Grades 5 and 6 students.

The following tables list the aerospace training programs currently offered by universities (Bachelor's, Master's and Ph.D. degrees), CEGEPs (Diploma of College Studies – DEC) and secondary schools (Diploma in Vocational Studies – DEP) and the number students enrolled in and graduating from them.

**UNIVERSITY RESEARCH FUNDING (IN \$BILLION)**  
CANADA'S 5 LARGEST METROPOLITAN AREAS, 2005-2009

CHART 4



### CRIAQ – A Unique and Distinctively Québec Innovation Model

CRIAQ<sup>38</sup> is a non-profit aerospace research and innovation organization founded in 2002 through government of Québec funding. Its mission is to enhance the aerospace industry's competitiveness and collective knowledge base through better training.

It is a unique model for collaborative, industry-led research involving companies, universities and research centres. The consortium develops and stimulates cooperation among industry specialists and researchers in pre-competitive aerospace research projects (manufacturing, composites, avionics and control, modelling, simulation, optimization and system integration and product life cycle management, safety and icing). Projects involve at least two companies and two research units and are normally initiated during the organization's Research Forum. Their average life is three years.

<sup>38</sup> CRIAQ: Consortium de recherche et innovation en aérospatiale au Québec (or Consortium for Research and Innovation in Aerospace in Québec)



**NUMBER OF STUDENTS ENROLLED IN A SAMPLE OF UNIVERSITY-LEVEL  
AEROSPACE AND AEROSPACE-RELATED PROGRAMS**

 (BACHELOR'S, MASTER'S, PH.D.)  
 PROVINCE OF QUÉBEC, 2010<sup>P</sup>

TABLE 10

	Bachelors	Masters	Ph.D.	Total
<b>Aerospace Programs</b>				
<b>Aerospace, Aeronautical and Astronautical Engineering</b>	147	125	---	272
<b>Subtotal (A)</b>	<b>147</b>	<b>125</b>	<b>---</b>	<b>272</b>
<b>Aerospace-Related Programs</b>				
<b>Mechanical Engineering</b>	4,495	575	428	5,498
<b>Computer Science</b>	3,127	927	387	4,441
<b>Electrical Engineering</b>	2,787	687	577	4,051
<b>Industrial Engineering</b>	1,111	264	72	1,447
<b>Computer Engineering</b>	870	176	75	1,121
<b>Physical Sciences</b>	540	183	299	1,022
<b>Engineering Physics</b>	311	37	49	397
<b>Mathematics</b>	599	161	158	918
<b>Subtotal (B)</b>	<b>13,241</b>	<b>2,849</b>	<b>1,887</b>	<b>17,977</b>
<b>Total (A+B)</b>	<b>13,388</b>	<b>2,974</b>	<b>1,887</b>	<b>18,249</b>

<sup>P</sup> : Preliminary data

## Sonaca Montréal – The Wing Panel Specialist

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Belgium-based Sonaca's seven facilities specialize in three product lines: wing leading edge slats, wing skin panels and fuselage sections.

Located in Mirabel, Sonaca's Montréal subsidiary is a world leader in the manufacture of large aluminum structures for the civil aerospace industry. Its core business involves the shot peening forming of integrally stiffened wing and empennage skins.

"Currently, 98% of Bombardier's products are equipped with wing panels manufactured here. We have implemented a strategic plan to remain the world leader in our niche market, namely wing panels of up to 18 metres in length, something that requires advanced know-how. A technology that allows for a 40% reduction in both weight and cost versus traditional techniques gives us a distinct advantage over our competition," explains **MR. PHILIPPE HOSTE, CEO**.

In 2004, Sonaca invested \$30 million over and above acquisition costs in its Mirabel plant. Since then, output and employment have doubled.

"We looked at several sites in North America, but did well to choose Montréal because of the availability of funding from both the federal and provincial governments and other financial partners and the spirit of cooperation that exists in the cluster. I am honoured to chair Aéro Montréal's Supply Chain Development Working Group, out of which sprang the MACH initiative designed to implement programs for improving the competitiveness of scores of SMEs over the next five years. This is essential because everyone knows that performing well locally is no longer sufficient; now, one has to be the best in the world," says Mr. Hoste.



## Aerolia Canada – Another Major Asset for Greater Montréal

A 100% EADS (European Aeronautic Defence and Space Company) subsidiary, Aerolia is heir to a long aerospace tradition having been created in 2009 through the merger of French aerostructure units that had participated in all of the company's various programs.

France's number one aerostructure manufacturer and top specialist in the design and manufacture of fuselage subassemblies, Aerolia intends to offer its knowhow and expertise to the entire global aerospace market. The creation of Aerolia Canada follows the signing of a significant contract with Bombardier in June of 2011 for the design and manufacture of the centre fuselage of its Global 7000 and 8000 corporate jets.

*"This is a first export contract. It is very important to us because it allows us to launch a multidimensional strategic diversification plan and get closer to the North American supply chain. By 2020, we hope that 50% of Group Aerolia's activities will be with new customers,"* said Ms. Marie-Agnès Veve, Aerolia Canada's CEO.

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*"Greater Montréal has a dense and experienced aerospace industrial cluster, widely recognized creativity and excellent research infrastructure including the National Research Council of Canada with which we intend to collaborate. Moreover, I must admit that Montréal International, the ministère du Développement économique, de l'Innovation et de l'Exportation and Investissement Québec extended a remarkably warm welcome to us, giving us yet another reason to move closer to Bombardier Aerospace,"* Ms. Marie-Agnès Veve added.

Aerolia employs 400 individuals at its headquarters and design office in Toulouse. It has nearly 2,600 employees in two other facilities in France and its manufacturing plant in Tunis. Some 150 jobs will be created in the Greater Montréal area.

**NUMBER OF GRADUATES FROM A SAMPLE OF UNIVERSITY-LEVEL AEROSPACE AND AEROSPACE-RELATED PROGRAMS**  
(BACHELOR'S, MASTER'S, PH.D.)  
PROVINCE OF QUÉBEC, 2010<sup>P</sup>

TABLE 11

	Bachelors	Masters	Ph.D.	Total
<b>Aerospace Programs</b>				
<b>Aerospace, Aeronautical and Astronautical Engineering</b>	3	38	---	41
<b>Sous-Total (A)</b>	<b>3</b>	<b>38</b>	<b>---</b>	<b>41</b>
<b>Aerospace-Related Program</b>				
<b>Mechanical Engineering</b>	771	171	32	974
<b>Computer Science</b>	675	246	49	967
<b>Electrical Engineering</b>	539	239	85	863
<b>Industrial Engineering</b>	240	81	9	330
<b>Computer Engineering</b>	202	81	25	308
<b>Physical Sciences</b>	189	41	12	242
<b>Engineering Physics</b>	104	56	41	201
<b>Mathematics</b>	64	7	5	76
<b>Subtotal (B)</b>	<b>2,582</b>	<b>841</b>	<b>230</b>	<b>3,653</b>
<b>Total (A+B)</b>	<b>2,585</b>	<b>879</b>	<b>230</b>	<b>3,694</b>

<sup>P</sup> : Preliminary data



**NUMBER OF STUDENTS ENROLLED IN AND GRADUATING FROM A SAMPLE OF COLLEGE-LEVEL TECHNICAL AEROSPACE AND AEROSPACE-RELATED PROGRAMS (DIPLOMA OF COLLEGE STUDIES – DEC) PROVINCE OF QUÉBEC, 2010<sup>P</sup>**

TABLE 12

	Enrolments	Diplomas
<b>Aerospace Programs</b>		
Aircraft Maintenance Technology	476	43
Aircraft Assembly Technology	274	35
Avionics Technology	125	26
<b>Subtotal (A)</b>	<b>875</b>	<b>104</b>
<b>Aerospace-Related Programs</b>		
Mechanical Engineering Technology	1,802	268
<b>Subtotal (B)</b>	<b>1,802</b>	<b>268</b>
<b>Total (A+B)</b>	<b>2,677</b>	<b>372</b>

<sup>P</sup>: Preliminary data

**NUMBER OF STUDENTS ENROLLED IN AND GRADUATING FROM A SAMPLE OF SECONDARY-LEVEL VOCATIONAL AEROSPACE AND AEROSPACE-RELATED PROGRAMS (DIPLOMA OF SECONDARY STUDIES – DEP) PROVINCE OF QUÉBEC, 2010<sup>P</sup>**

TABLE 13

	Enrolments	Diplomas
<b>Aerospace Programs</b>		
Aerospace Structure Assembly	264	226
Aerospace Mechanical Assembly	93	36
<b>Subtotal (A)</b>	<b>357</b>	<b>262</b>
<b>Aerospace-Related Programs</b>		
Machining Techniques	1,312	594
Precision Sheet Metal Work	160	126
Cabling and Circuit Assembly	86	68
Composite Materials Processing	104	19
Surface Processing	---	16
<b>Subtotal (B)</b>	<b>1,662</b>	<b>823</b>
<b>Total (A+B)</b>	<b>2,019</b>	<b>1,085</b>

<sup>P</sup>: Preliminary data







# 4 AEROSPACE RESEARCH ORGANIZATIONS, ASSOCIATIONS AND CONSORTIA



The main focus of Greater Montréal's aerospace research organizations is research, innovation and training through the dissemination of knowledge. For their part, associations and consortia support the growth and competitiveness of their members. Through their collaborative efforts, these various groups contribute significantly to the vitality and growth of Québec's aerospace industry.





## GREATER MONTRÉAL'S MAIN AEROSPACE RESEARCH ORGANIZATIONS

TABLE 15

Organization	Description
<b>AÉROÉTS</b> École de technologie supérieure (ÉTS)	<ul style="list-style-type: none"> <li>■ AÉROÉTS represents, promotes, and integrates the ÉTS's aerospace teaching and research activities in order to better meet industry needs.</li> </ul>
<b>Canadian Space Agency (CSA)</b>	<ul style="list-style-type: none"> <li>■ The CSA coordinates the space policies and programs of the Government of Canada. It provides services in the four following areas: earth observation, space missions, communications satellites and space awareness and education. It emphasizes international cooperation in order to encourage industrial development and world-class scientific research for the benefit of humanity.</li> </ul>
<b>Centre de recherche industrielle du Québec (CRIQ)</b>	<ul style="list-style-type: none"> <li>■ CRIQ is a leading source of innovation and expertise in the areas of manufacturing technologies, the environment, industrial information and standardization. It plays an important role in the economy by providing industries with the means to become leaders in national and international markets. Its specialized services include research and development, product qualification tests and certification, information, and certification and registration of ISO systems.</li> </ul>
<b>Centre technologique en aérospatiale (CTA)</b>	<ul style="list-style-type: none"> <li>■ The CTA focuses on technological applications for the aerospace industry. Its mission is to provide quality services supporting aerospace innovation and development in machining, composite materials, metrology and avionics.</li> </ul>
<b>Concordia Institute of Aerospace Design and Innovation (CIADI)</b> Université Concordia	<ul style="list-style-type: none"> <li>■ CIADI's mission is to promote awareness and provide leading edge know-how among engineering students in aerospace design and innovation.</li> </ul>
<b>Study group on the management of aeronautical companies (GEME-Aero)</b> Université du Québec à Montréal (UQAM)	<ul style="list-style-type: none"> <li>■ This group studies business practices that promote innovation and technological advancement in aerospace companies.</li> </ul>
<b>Institute of Innovation and Conception in Aerospace of Polytechnique (IICAP)</b> École Polytechnique de Montréal	<ul style="list-style-type: none"> <li>■ IICAP is an aerospace university/private sector partnership. It creates internship and employment opportunities, promotes Québec's aerospace industry and fosters research and innovation.</li> </ul>
<b>National Research Council of Canada's Aerospace Manufacturing Technology Centre (AMTC)</b>	<ul style="list-style-type: none"> <li>■ The AMTC's aim is to develop core competencies and demonstrate modern manufacturing technologies for the civil and military aerospace industry. It investigates technologies in four major research areas: forming and joining of metallic products, fabrication and joining of composite structures, automation, robotics and intelligent manufacturing systems, and advanced material removal.</li> </ul>
<b>National Research Council of Canada's Industrial Materials Institute (IMI)</b>	<ul style="list-style-type: none"> <li>■ The Institute's activities are centred around three programs: competitive materials manufacturing, a new generation of biomedical devices and aluminum technology. It also helps Canadian companies to meet the risks of the new economy by providing them with competitive advantages and the required leverage to grasp opportunities.</li> </ul>
<b>McGill Institute for Aerospace Engineering (MIAE)</b> McGill University	<ul style="list-style-type: none"> <li>■ The MIAE fosters interest in aerospace engineering among undergraduate and graduate students by allowing them to participate in research projects proposed by aerospace companies, visit facilities or enrol in specialized courses.</li> </ul>



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## C&amp;D Zodiac – High-End Aircraft Cabin Interiors

Starting out as a manufacturer of cabin components, this subsidiary of the American firm, C&D, now designs, manufactures and certifies complete aircraft cabins with turnkey interiors (galleys, lavatories, class dividers, video control centres, sidewalls, etc.).

In 2002, Bombardier contracted C&D to outfit the cabins of its business jets, namely the Global 5000, Challenger 605 and Learjet 85. Over the past decade, the company has worked on over 300 Bombardier aircraft and increased its workforce tenfold, from 60 to the current 630 employees.

*“The French company Zodiac Aerospace acquired C&D in 2005 and this gave us the advantage of being part of a large cabin equipment manufacturing group. We are constantly expanding. In the fall of last year, we moved into considerably larger facilities and are now seeking out*

*contracts with other major customers,” says MR. MICHEL BUSSEY, Vice President and General Manager.*

Founded in 1896, when airships and airplanes initially appeared on the scene, Zodiac Aerospace Group currently employs some 21,000 individuals in approximately 100 facilities. It focuses on safety equipment, on-board systems and cabin interiors, the last being C&D Zodiac's speciality, the group's only division dedicated solely to business jet interiors.

*“Being part of Montréal's aerospace cluster constitutes a genuine advantage for C&D Zodiac because we have access to an outstanding network of subcontractors with whom we work to manufacture quality products requiring leading-edge know-how. All of this allows us to look to the future with confidence,” states Mr. Bussey.*





TESTIMONIAL

## Avianor Group – A Multiservice Provider

The Avianor Group was established in 1995 and is involved in the design, manufacturing, repair, overhaul and distribution of aeronautical equipment. It offers a complete range of services: non-destructive testing, avionics, wheel and brake maintenance, cut and sew, seat repair, spare parts, cabin integration, etc.

*“I was always convinced that we had to be a multidisciplinary centre. Today, we perform major aircraft maintenance work and seat refurbishment as well as 80% of all wheel and brake maintenance and overhaul in Canada,”* says MR. SYLVAIN SAVARD, President and CEO.

The Group’s Avianor Division is a complete cabin integration specialist, actively involved in the design, engineering, certification, manufacturing, repair (maintenance) and overhaul of cabin interior components. Mirabel Aero Services specializes in aircraft and component maintenance and overhaul (wheels, brakes,

seats and cabin interiors). Aerocas offers NDT services performed by level-2 and level-3 technicians. Moreover, the Avianor Group recently formed a strategic alliance with the Irish firm, Airvod, and took a minority position in the company, to offer, certify and install its patented inflight entertainment system, *Seatcentric*.

With over 350 employees, including 120 technicians, and 200,000 square feet of space, the Avianor Group is a truly vertically integrated service provider, offering airlines the opportunity to significantly reduce downtime.

*“Our greatest challenge is managing growth. The company has doubled in size over the last two years and we are planning to substantially increase our floor space. Going forward, what really matters most is access to qualified manufacturing and maintenance engineers. Fortunately, the Montréal area is blessed with an abundance of such talent,”* says Mr. Savard.



Aéro Montréal represents Québec’s aerospace cluster. Its mission is to mobilize industry players around common goals and concerted actions to increase the cohesion and optimize competitiveness of Québec’s aerospace cluster. Aéro Montréal aims to foster the growth and expansion of the cluster to ensure that it may continue to create wealth for Greater Montréal, Québec and Canada.

### OTHER MAJOR AEROSPACE ASSOCIATIONS OR CONSORTIA, GREATER MONTRÉAL

Association or Consortia	Description
<b>Comité sectoriel de main-d’œuvre en aérospatiale (CAMAQ)</b>	<ul style="list-style-type: none"> <li>■ A meeting place for aerospace industry employer and worker representatives. It encourages greater cooperation among employers, workers, educational institution administrators and government agents involved in manpower planning and training for the aerospace and air transport industries.</li> </ul>
<b>Consortium de recherche et d’innovation en aérospatiale au Québec (CRIAQ)</b>	<ul style="list-style-type: none"> <li>■ A unique model for collaborative, industry-led research involving the private sector, universities and research centres. CRIAQ’s mission is to enhance the aerospace industry’s competitiveness and collective knowledge base through better training.</li> </ul>
<b>Green Aviation Research and Development Network - GARDN</b>	<ul style="list-style-type: none"> <li>■ GARDN is a newly established Network of Centres of Excellence whose mission is to promote aerospace technologies for the protection of the environment. GARDN’s activities are in support of the competitive excellence of Canadian aerospace products and services, economic success of member companies and development and training of highly qualified personnel in the aerospace environmental field.</li> </ul>
<b>The Coalition for a Greener Aircraft (SA<sup>2</sup>GE)</b>	<ul style="list-style-type: none"> <li>■ Through research and development activities, the Coalition for a Greener Aircraft strives to maintain Québec’s competitive position as a world leader in the rapidly changing aeronautics market, given the challenges of climate change and resulting environmental regulations. Its latest project, SA<sup>2</sup>GE (Smart Affordable Green Efficient), is attempting to develop composite fuselage structures, a next generation, more fuel-efficient compressor, landing gear for the future and integrated avionics for cockpit applications.</li> </ul>
<b>Réseau photonique du Québec</b>	<ul style="list-style-type: none"> <li>■ Its mission is to accelerate the development of Québec’s optics/photonics industry, foster national and international networking, promote the sector, support commercialization and sustain innovation in optics/photonics companies.</li> </ul>
<b>Sous-traitance industrielle Québec (STIQ)</b>	<ul style="list-style-type: none"> <li>■ STIQ is an association of Québec-based manufacturers whose mission is to improve supply chain efficiency by helping suppliers to grow, diversify their customer base and identify business opportunities with prime contractors. It provides enterprises with research, evaluation and support services and organizes numerous networking events.</li> </ul>

TABLE 15



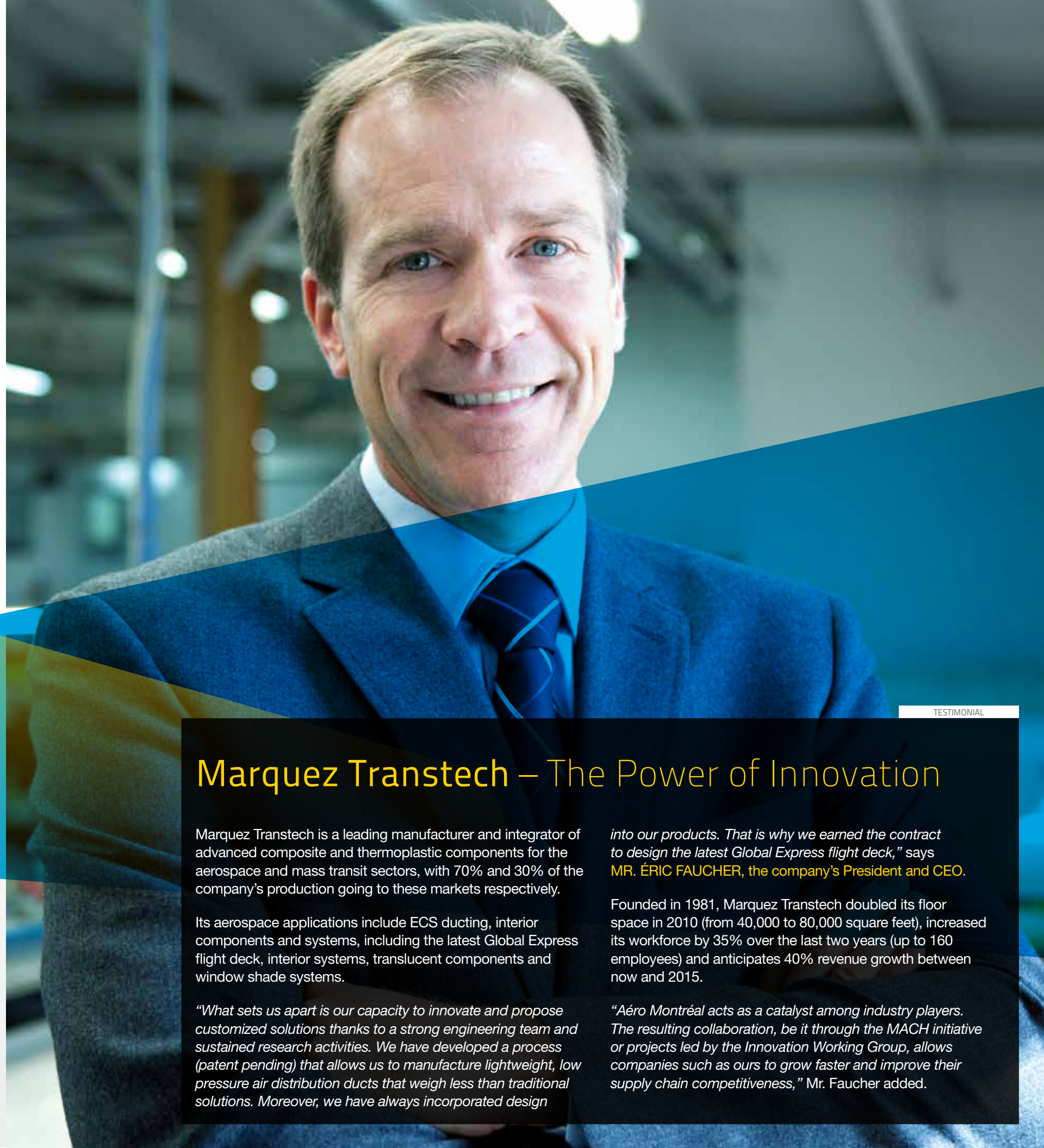
## Aéro Montréal and Some of Its Projects for Ensuring the Global Competitiveness of Québec's Aerospace Industry

### The MACH Initiative – A New Standard of Excellence and Performance

Launched in 2011 with public and private funding, the MACH initiative is designed to optimize the performance of Québec's aerospace supply chain and thereby increase its global competitiveness. Measures deployed as part of the initiative allow suppliers to evaluate their situation, identify opportunities for improvement and take appropriate action. It focuses on three main priorities aimed at improving supplier competitiveness: excellence in leadership, excellence in operations and excellence in planning and human resource development. Excellence is measured on a scale of Mach 1 to Mach 5 allowing for an assessment of a supplier's mastery of 15 business processes and the awarding of a certificate of performance.

### A Galvanizing Project for a More Ecologically Friendly Aircraft – Toward a Greener Air Transport Industry

As part of Québec's 2010-2013 Research and Innovation Strategy, this project's mission is to lay the groundwork for the plane of the future, namely a greener aircraft equipped with intelligent systems, less costly to build and more efficient and effective to operate. The first goal in developing greener aircraft is to reduce carbon emissions and thereby meet society's pressing need to save the environment. The necessity to develop more ecologically friendly aircraft is based on the premise that, in ten years from now, these planes will enjoy a competitive advantage. Québec wants to establish itself as one of world's leaders in the field by then.



TESTIMONIAL

## Marquez Transtech – The Power of Innovation

Marquez Transtech is a leading manufacturer and integrator of advanced composite and thermoplastic components for the aerospace and mass transit sectors, with 70% and 30% of the company's production going to these markets respectively.

Its aerospace applications include ECS ducting, interior components and systems, including the latest Global Express flight deck, interior systems, translucent components and window shade systems.

*"What sets us apart is our capacity to innovate and propose customized solutions thanks to a strong engineering team and sustained research activities. We have developed a process (patent pending) that allows us to manufacture lightweight, low pressure air distribution ducts that weigh less than traditional solutions. Moreover, we have always incorporated design*

*into our products. That is why we earned the contract to design the latest Global Express flight deck," says MR. ÉRIC FAUCHER, the company's President and CEO.*

Founded in 1981, Marquez Transtech doubled its floor space in 2010 (from 40,000 to 80,000 square feet), increased its workforce by 35% over the last two years (up to 160 employees) and anticipates 40% revenue growth between now and 2015.

*"Aéro Montréal acts as a catalyst among industry players. The resulting collaboration, be it through the MACH initiative or projects led by the Innovation Working Group, allows companies such as ours to grow faster and improve their supply chain competitiveness," Mr. Faucher added.*





5

OPERATING  
COSTS



A metropolitan area's operating costs represent one of the main factors influencing a company's decision to invest there. Greater Montréal's labour, energy and lease/rental costs compare very favourably to those of other large North American metro areas. When choosing Montréal metropolitan area, aerospace enterprises can locate close to their North American customers while remaining financially cost-effective.

# 5.1

## AMONG NORTH AMERICA'S MOST ADVANTAGEOUS AEROSPACE OPERATING COSTS

According to KPMG (2012), Greater Montréal's total operating costs are the 2<sup>nd</sup> lowest among North America's largest metropolitan areas specializing in aerospace. By locating in the region, companies can reap significant savings on their labour, energy and lease/rental costs.

**TOTAL OPERATING COSTS FOR AEROSPACE COMPANIES (MONTRÉAL = 100)**  
 SAMPLE OF LARGE NORTH AMERICAN METROPOLITAN AREAS SPECIALIZING IN AEROSPACE, 2012

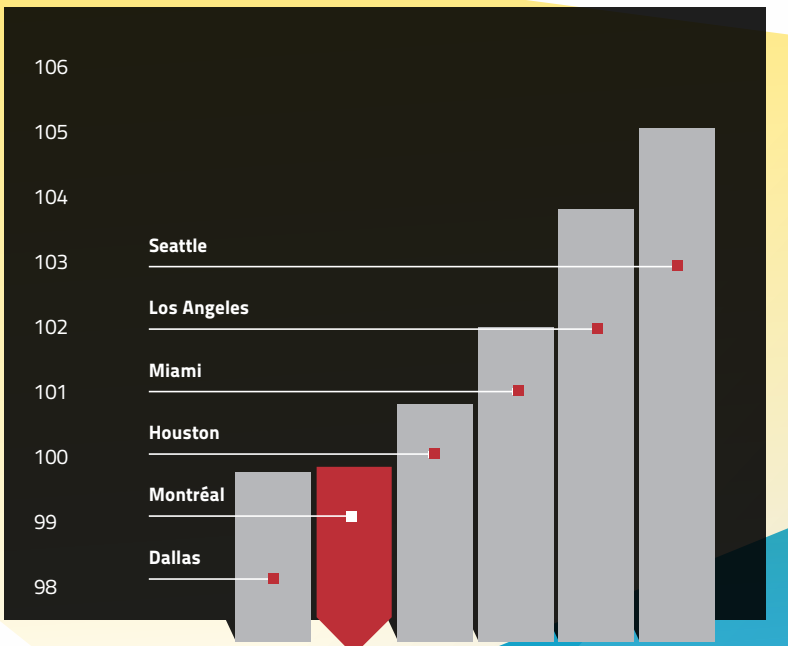


CHART 5



TESTIMONIAL

## Alta Precision – Fully Integrated Machining Services

Specializing in the aerospace industry, Alta Precision does machining of a mix of parts that includes aircraft simulator components, aircraft gearbox housings, miscellaneous engine parts and many landing gear components, for both main gear and nose gear (pistons, cylinders, collars, braces, axles and actuators). Its manufacturing capacity includes machining, special processing, assembly, and painting.

*requirements and capacity to offer complete solutions to our customers by delivering not just parts, as was once the case, but entire systems,” states MR. GUILLERMO ALONSO, JR., the company's president.*

Alta Precision serves both the civil and defence aerospace markets. Except for Héroux-Devtek, its main clients are all outside Québec, which explains why the company derives 90% of its revenue from exports.

Founded in 1979, Alta Precision has nearly 90 employees in the Greater Montréal area, including some 50 machinists. In addition to this, Tekalia Aeronautik employs over 100 workers. The company's expansion strategy calls for, among other things, a facility in the United States to gain greater access to the American military, currently one of its main customers.

*“Ten years ago, we made the strategic decision to focus on landing gear systems. We opened a paint shop and acquired 50% of Tekalia Aeronautik, a surface treatment specialist. What sets us apart from the competition is our vertical integration, constant effort to adapt our processes to meet new industry*

*“As I see it, the strengths of Montréal's aerospace cluster include the presence of a large number of well-trained engineers, access to a network of diversified and experienced subcontractors and the fact that the entire sector is able to speak with one voice,” declared Mr. Alonso.*



## 5.2

COMPETITIVE  
LABOUR COSTS

When compared to other large North American metropolitan areas specializing in the sector, Greater Montréal has very competitive labour costs. According to KPMG (2012), the average total pay package<sup>39</sup> for a Greater Montréal aerospace worker comes to a little over US\$84,000. These same costs are US\$83,164 in Phoenix, US\$83,376 in Miami, US\$86,094 in Dallas, US\$88,588 in Houston, US\$94,624 in Seattle and US\$94,694 in Los Angeles.

The following table summarizes the average wages for a sample of key aerospace occupations in Greater Montréal.

AVERAGE ANNUAL BASE SALARIES (IN US\$) OF SPECIFIC AEROSPACE OCCUPATIONS GREATER MONTRÉAL, 2012	
<b>Aerospace Engineer</b>	96,930
<b>Aerodynamics Engineer</b>	93,687
<b>Electrical Engineer</b>	90,121
<b>Design Engineer</b>	85,252
<b>Industrial Engineer</b>	82,129
<b>Mechanical Engineer</b>	82,118
<b>Chief of Design</b>	80,204
<b>Aircraft Engine Mechanic</b>	61,782
<b>Aircraft Mechanic/Inspector</b>	60,752
<b>Aircraft Structure Repairer</b>	52,402
<b>Welder and Welding and Brazing Machine Operator</b>	45,025
<b>Aircraft Structure Assembler</b>	44,835
<b>Machinist</b>	41,643

Note: 1 US\$ = 1 CA\$

TABLE 16

According to KPMG (2012), employer outlays for statutory plans and other benefits are lower in Greater Montréal. Overall, they represent 29% of an employee's total remuneration package in Montréal metropolitan area as compared to the nearly 33% average for the other large North American metro areas specializing in aerospace. The following table details Québec statutory plan costs for three pay levels.

## EMPLOYER CONTRIBUTIONS TO STATUTORY PLANS (\$) PROVINCE OF QUÉBEC, 2012

Gross Salary (annual)	75,000	100,000	125,000
<b>Québec Pension Plan</b> (5.025%)	2,341.65	2,341.65	2,341.65
<b>Québec Parental Insurance Plan</b> (employee 0.559%, employer 0.782%)	516.12	516.12	516.12
<b>Employment Insurance</b> employee 1.47%, employer 2.058%)	944.62	944.62	944.62
<b>Health Services Fund</b> (2.7% if total payroll is under \$1 million)	2,025.00	2,700.00	3,375.00
<b>Commission des normes du travail</b> (Labour Standards Board) (0.08%)	51.20	51.20	51.20
<b>Commission de la santé et sécurité au Travail (CSST)</b> (Work Health and Safety Board) (0.6% for the service sector)	384.00	384.00	384.00
<b>Total Contributions</b>	<b>6,262.59</b>	<b>6,937.59</b>	<b>7,612.59</b>
<b>Total Employer Cost</b>	<b>81,262.59</b>	<b>106,937.59</b>	<b>132,612.59</b>

Note: The Act respecting labour standards stipulates that vacation pay must be at least 4% of gross salary. Statutory holidays (+/- 10 days, or 4%) are included in gross salary.

TABLE 17

Fiscal incentives offered by the governments of Canada and Québec, such as R&D tax credits (refundable in Québec), lower a high-technology company's labour costs, thereby contributing to the competitiveness of Greater Montréal aerospace sector. According to KPMG's (2012) aerospace cost scenario, the per-employee value of incentives is over US\$3,600 in Greater Montréal as compared to US\$3,431 in Dallas, US\$3,187 in Houston, US\$2,132 in Miami, US\$1,742 in Phoenix, US\$1,310 in Los Angeles and US\$901 in Seattle. This advantage is especially attractive for high-technology companies for whom labour often represents their single largest cost component.

<sup>39</sup> According to KPMG (2012), total remuneration includes wages and salaries, statutory costs and other benefits.





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## Meloche Group – Integrated Supplier of Components to the Aerospace Industry

Established in 1974 by the father of the company's current president, Meloche Group specializes in precision machining, surface treatment, painting, assembly and manufacturing engineering to produce value-added machined components and subassemblies to meet the specifications of major manufacturers in the aeronautics and defence industries.

The company specializes in precision-machined components from aluminum castings and forgings. It also works with steel, titanium, inconel and composites. It essentially produces small aerostructure parts, fuel connectors and critical aircraft engine parts.

*"We have succeeded in setting ourselves apart from competitors by adopting a vertical integration strategy and relying on process automation and optimization. The current insistence on short delivery times and high standards leave us*

*no other choice, especially with downward price pressure from globalization, even if we manufacture complex components that necessitate complex manufacturing processes and advanced know-how,"* notes MR. HUGUE MELOCHE, President and CEO.

Meloche Group currently employs 155 workers at its Salaberry-de-Valleyfield and Bromont plants. The company is contemplating rapid expansion and acquisition possibilities that will allow it to increase revenue from \$25 to \$100 million over the next seven years.

*"Aerospace being a localized market, we are fortunate to have four major OEMs in the area. However, there is no doubt that, in the future, SMEs such as ours will need to develop the capacity to provide them with complete assemblies and subassemblies in order to continue to share in their success,"* says Mr. Meloche.

# 5.3

## CLEAN, RELIABLE AND AFFORDABLE ENERGY

It is widely recognized that Québec produces and distributes very competitively priced electric energy. According to Hydro-Québec (2011), on April 1, 2011, Greater Montréal ranked first among North America's largest metropolitan areas in terms of the average pre-tax price for large power electricity: approximately 0.05¢/kWh.

### AVERAGE ELECTRICITY RATES

LARGE POWER: 5,000 KWH + (\$/KWH - PRE-TAX)

SAMPLE OF LARGE NORTH AMERICAN METROPOLITAIN AREAS, APRIL 1, 2011

CHART 6



Note: Hydro-Québec calculated these rates, which may vary with usage. The exchange rate used in this study: 1 CA\$ = 0.9926 US\$ (12:00 PM – April 1, 2011).





6

TAXATION AND  
INCENTIVES



Greater Montréal has a very reasonable tax structure due largely to a highly competitive basic corporate tax rate and incentives designed to attract high-technology companies.

# 6.1

## CORPORATE TAXES: 1<sup>ST</sup> IN NORTH AMERICA

Year in and year out, Greater Montréal's aerospace companies remain competitive and profitable thanks especially to one of the world's lightest tax burdens. According to KPMG (2010), the tax bill for R&D enterprises located in the Montréal metro area can be up to seven times lower than the average for those based in other large North American metro areas specializing in aerospace, namely Phoenix, Miami, Seattle, Los Angeles, Dallas and Houston. In this regard, Greater Montréal ranks 1<sup>st</sup> in North America and 2<sup>nd</sup> worldwide. Generous tax credits offered by the governments of Canada and Québec (refundable in the latter) are largely responsible for this cost advantage.

**TOTAL TAX INDEX FOR R&D COMPANIES**  
(AVERAGE FOR US METROPOLITAN AREAS = 100)  
SAMPLE OF LARGE NORTH AMERICAN METROPOLITAN AREAS SPECIALIZING IN AEROSPACE, 2010

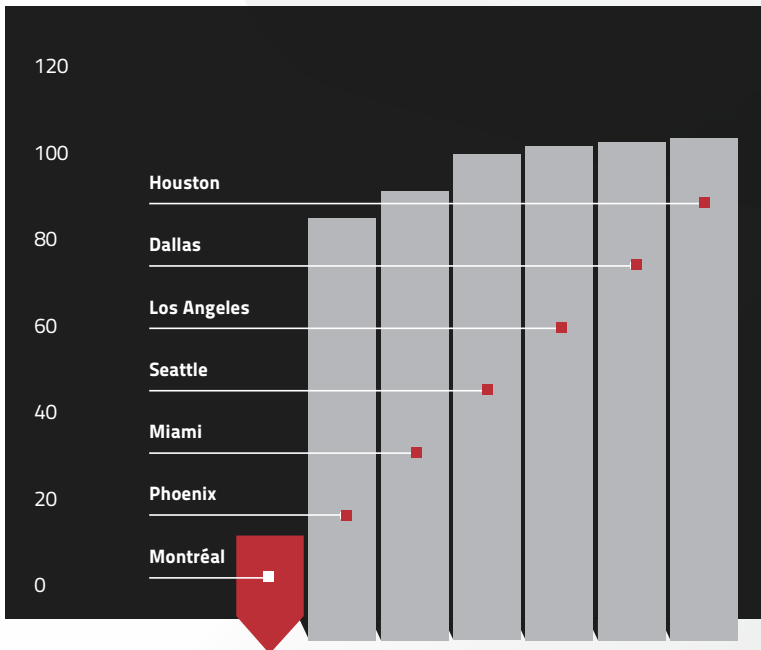


CHART 7

As far as the manufacturing sector is concerned, there too Greater Montréal's businesses enjoy a substantial tax advantage of more than 35% over their counterparts in other large, aerospace-focused North American metro areas. The region is again ranked 1<sup>st</sup> in North America and 2<sup>nd</sup> worldwide.

**TOTAL TAX INDEX FOR MANUFACTURING COMPANIES**  
(AVERAGE FOR US METROPOLITAN AREAS = 100)  
SAMPLE OF LARGE NORTH AMERICAN METROPOLITAN AREAS SPECIALIZING IN AEROSPACE, 2010

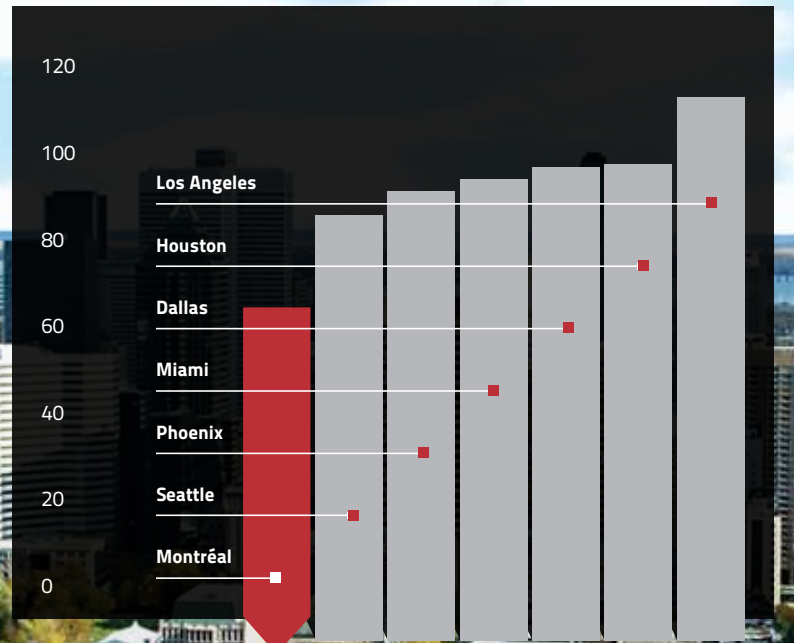
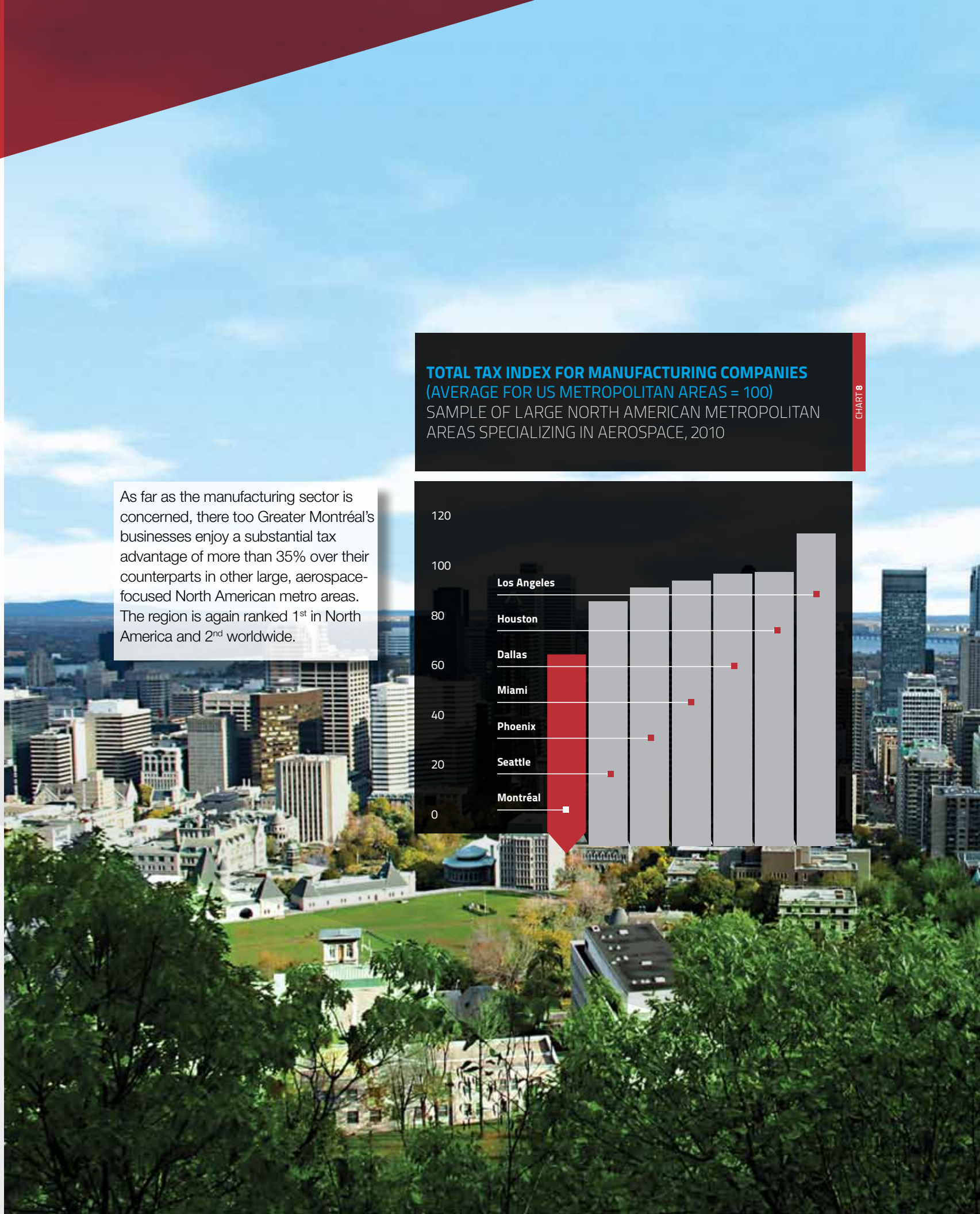


CHART 8







TESTIMONIAL

## AV&R Vision & Robotics – The Champion of Precision

With over 15 years of experience in the field of industrial automation, AV&R Vision & Robotics is known as a world leader in robotic finishing (deburring, profiling, polishing, blending and more) and automated visual inspection (2D and 3D) of gas turbine parts such as blades, variable vanes and blisks/IBRs used in the aerospace and energy fields.

*“When we started out, we were good generalists capable of devising automation solutions by combining vision and robotics. Then, a few years ago, we decided that we would focus on aerospace by developing cutting-edge expertise and targeting a specific niche market. We began to export our solutions everywhere, even Germany and Asia,”* says **MR. ÉRIC BEAUREGARD, President and CEO.**

AV&R Vision & Robotics has 55 employees (45 of whom are engineers), reinvests 10% to 15% of revenue in R&D and

exports 80% of its production. Sales have grown by 20% to 30% annually. Allowing for unprecedented levels of precision, its Automated Blade Profiling System was selected by the Society of Manufacturing Engineers (SME) as one of the 2012 *Innovations That Could Change the Way You Manufacture*, one of the many awards the company has received in the last few years.

*“We have plans to expand both here and in Europe to be closer to our customers, but we feel very much at home in Montréal, at the confluence of technology and European and American business traditions, which, it is worth noting, constitutes a major advantage for our aerospace cluster. Montréal is also known as a delightful city that our clients enjoy visiting,”* added Mr. Beauregard.

# 6.2

## HIGHLY COMPETITIVE INCENTIVES

The governments of Canada and Québec offer many fiscal and financial incentives aimed at encouraging aerospace investment and industrial research. The following section lists the main programs available to aerospace firms.

### 6.2.1 FISCAL INCENTIVES

#### R&D Tax Credit

- The governments of Canada and Québec have offered R&D tax credits since the mid 1980s.
- Canada offers a 20% tax credit<sup>40</sup>; Québec, a 17.5% refundable tax credit.
- Together, these two measures lower R&D costs by more than half.

### SCENARIO (\$): SCIENTIFIC RESEARCH AND EXPERIMENTAL DEVELOPMENT PROGRAMS (RS&DE), 2012

TABLE 18

#### PREMISES:

- Private, foreign-controlled company
- 20 eligible employees @ \$50,000/year
- 100% of its work is related to eligible activities
- Subcontractor: \$200,000
- Equipment: \$150,000

	Federal	Québec	Total
Salaries (\$)	1,000,000	1,000,000	
Proxy amount @ 65 %	650,000		
Subcontractors <sup>(1)</sup>	200,000	100,000	
Equipment	150,000		
Québec SR&ED tax credit <sup>(2)</sup>	(192,500)		
	1,807,500	1,100,000	
<b>Federal tax credit @ 20% Québec tax credit @ 17.5%</b>	<b>361,500</b>	<b>192,500</b>	<b>554,000</b>

Notes: (1) Only 50% of the amount paid to a subcontractor is eligible for the Québec tax credit. Moreover, only R&D related salary and subcontracting costs (50%) are eligible for the provincial tax credit. (2) In calculating the combined credit, the federal tax credit is reduced by the provincial tax credit receivable.

This scenario does not take into account the new measures contained in government of Canada's 2012 budget, which will come into effect at a later time.

<sup>40</sup> As of January 2014, the R&D tax credit will go from 20% to 15%.



### Refundable Tax Credit for Precompetitive, Private Partnership Research Projects

Introduced by the Government of Québec in 2006, this measure is aimed at encouraging companies to form partnerships, thereby allowing them to carry out projects of a scale larger than those that they would normally have pursued on their own.

- It is a 35% refundable tax credit on eligible R&D expenses (current and capital expenses) incurred in Québec and certified by the MDEIE.

#### → Eligible Current Expenses:

- Salaries
- Materials consumed and transformed
- Payments to subcontractors and third parties
- Space leasing/rental expenses
- Facilities or materials
- Administrative costs

#### → Eligible Capital Expenses:

- Furniture
- Office equipment
- Other depreciable property

### Tax Holiday for Foreign Researchers and Specialists

- Originally designed for foreign researchers by the Government of Québec in 1987.
- Made available to foreign specialists in 1999.
- Québec income tax exemption for up to a maximum of five years on
  - 100% an individual's salary for the first two years
  - 75 % for the third year
  - 50 % for the fourth year,
  - 25 % for the fifth year.

### 6.2.2 FINANCIAL INCENTIVES

#### Strategic Aerospace and Defence Initiative (SADI)

SADI is a \$900-million, five-year initiative created by the Government of Canada in 2007 to encourage strategic research and development (R&D) in the aerospace sector and enhance the competitiveness of Canadian aerospace and defence companies. An additional four-year, \$200 million was added in 2009, bringing the program's grand total to \$1.1 billion over nine years. Between 2007 and 2009, the Federal Government authorized \$500 million for innovative R&D projects that generated an additional \$760 million in investment.<sup>41</sup> The program features:

- repayable contributions to eligible companies for strategic R&D projects;
- contributions equal to approximately 30% of a project's total eligible costs;
- repayments to the Federal Government beginning after a project's completion and extending over 15 years.

#### PME 2.0 and Aéro 2.0

The PME 2.0 program was announced in the Government of Québec's 2012-2013 budget. It is a three-year, \$6 million pilot project designed to increase productivity in small and medium manufacturing companies. Aéro 2.0 is a pilot project aimed at providing aerospace companies with support for integrating information technology into their operations and thereby increasing logistics and supply chain efficiency.

#### ESSOR Program

Created in 2012, this program provides assistance for the development of strategic investment projects. It is funded by the Fond de développement économique du Québec and administered by Investissement Québec and the MDEIE. Financial assistance may be extended for a maximum of 10 years, but may not exceed 50% of a project's total costs. This program targets for-profit enterprises, cooperatives and social economy companies in the following sectors:

- manufacturing;
- software publishing;
- private research;
- environmental services;
- tourism (subject to certain restrictions).

<sup>41</sup> Source: Industry Canada, Industrial Technologies Office, 2010

## Marinvent – Invention Serving Aviation

Even before launching its first commercial product in 1996, Marinvent, a company focused solely on aerospace research and development, already had a dozen patents in hand.

Today, it holds some 20 patents, most of which are related to safety, instrumentation and electronic boards, developments that it owes to the skill of its team of 24 employees working at its company headquarters on Montréal's South Shore, programming centre opened in Moscow and Florida subsidiary.

*"Our calling is to solve problems and reduce risk. For instance, when a cockpit installation runs into unexpected problems, people turn to us. We have an extraordinarily diverse group of extremely high-level experts capable of providing solutions for integration, software, safety, and other problems for all types of aircraft,"* says **MR. JOHN MARIS**, Founder and President of Marinvent, and former test pilot in the Canadian Armed Forces.

The company develops advanced technologies to a high state of maturity that it then licenses to the leaders in the appropriate field. It has three key areas of specialization: Human Factors consulting, Systems Engineering and Flight Test and Certification Services. For instance, Marinvent is currently doing major Human Factors consulting work for NASA and Jeppesen, the world leader in aeronautical information, with which it developed the JeppView software.

*"I believe that the concentration of aerospace expertise and knowledge found within a 30 kilometre radius of our small company is quite unique. Moreover, geographically speaking, Montréal is at the crossroads of the global aerospace industry...midway between Seattle and Toulouse. This is an ideal location to serve both Europe and North America!"* notes Mr. Maris.

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**ESSOR Program (Cont.)**

Support comes in the form of a repayable contribution or guarantee to repay the net loss suffered by a financial institution granting a loan, line of credit or letter of credit. If no other funding is possible, a company may receive a non-refundable contribution.

→ **Eligible Projects**

Capital asset projects with eligible expenditures of \$250,000 and over, including:

- investment projects aimed at creating a new business or expanding (or modernizing) an existing one;
- projects involving the implementation of a process to provide a service or establishment of a manufacturing facility leveraging a proven green technology developed in Québec;
- projects for the construction, modification, expansion or acquisition of a building in order to create new R&D space for research companies without facilities and those with facilities in which they are currently conducting R&D in Québec;
- projects not involving capital asset expenditures, but generating a cumulative payroll increase of \$2 million or more over the first three years following their start date.

The ESSOR program also offers up to 40% or a maximum of \$100,000 for feasibility studies for expanding in Québec.

**Financial Assistance for Job Creation and Training**

The Government of Québec enacted measures in 1998 to meet private sector manpower needs.

Assistance can be in the form of a contribution of:

- up to 25% of eligible costs sustained for the implementation of a training plan; or
- up to 50% of costs incurred for the creation of a human resources department.

A special fund also exists for job creating “major economic initiatives”. To be eligible, a company must:

- submit a project that will have a significant impact on regional employment;
- submit a project that comes on the heels of a major investment; or
- create 50 new full-time, lasting jobs over a 24-month period.

**National Research Council’s (NRC) Industrial Research Assistance Program (IRAP)**

The National Research Council of Canada Industrial Research Assistance Program (NRC-IRAP) provides financial support to qualified small and medium-sized enterprises in Canada to help them develop technologies for competitive advantage. NRC-IRAP operates on a shared-risk model, providing cost-shared financial assistance for research and development projects that meet both the firm and project assessment criteria.

- A Government of Canada program offered for over 60 years and designed specifically for SMEs (500 employees or less).
- Technical assistance available to help clients through every aspect of developing and commercializing innovative, technology-driven new or improved products, services, or processes.
- Solutions provided for over 10,000 SMEs including:
  - technical and business advisory services,
  - financial assistance,
  - access to business information,
  - national and international networking services.
- This program maintains extensive networks with over 100 member organizations and 1,000 private sector suppliers capable of providing SMEs with valuable advice.

In its 2012 budget, the Government of Canada injected an additional \$110 million per year, thereby doubling the assistance allocated to companies served by this program.

**Export Guarantee Program (EGP)**

The Government of Canada’s Export Guarantee Program helps companies manage all kinds of upfront costs. It shares the financial risk with a company’s bank so that it can get the financing needed to break into new markets, increase production for a new order or support foreign investments. Among other things, it provides a financial institution with guarantees on financing for a variety of activities, including:

- work in progress and inventory related to export contracts;
- on-going working capital needs;
- the purchase of equipment.

The export guarantee covers:

- 75% of financed amounts greater than \$500,000, up to a maximum of \$10 million;
- 90% of financed amounts up to a maximum of \$500,000;
- up to 100% of loans when Canadian companies invest outside Canada or provide their foreign subsidiaries with general working capital support.

**Québec Economic Development Program**

In 2005, the Government of Canada introduced this program managed by Canada Economic Development for Québec Regions. Its ultimate objective is to promote the development of eligible Québec-based companies by directly supporting entrepreneurship and company performance. The Agency can help someone to:

- create or start a business,
- plan a business succession,
- improve a business’s productivity,
- innovate, adopt a technology or ensure technology transfer,
- market or export,
- structure a network.

Depending on the nature of a project, the Agency can offer financial assistance in the form of repayable or non-repayable contributions or grants.





APPENDIX



# APPENDIX A

## Methodological Notes

### GDP

Numbers are based on Code 3364, Aerospace Product and Parts Manufacturing, of the North American Industry Classification System (NAICS). Canada's total real aerospace GDP is the average for monthly data compiled by Statistics Canada in 2011.

### Sales

Sales figures for Québec are based on the MDEIE's data and the ones for Canada and the Québec/Canada ratio are based on Statistics Canada's data (NAICS Code 3364, Aerospace Product and Parts Manufacturing).

### Employment

A region's aerospace employment concentration is measured by the ratio of aerospace employment to total employment. Aerospace employment is based solely on the NAICS Code 3364, Aerospace Product and Parts Manufacturing. However, this approach tends to underestimate the total number of aerospace jobs, which, according to the MDEIE, is over 42,000 in 2012. It is used here only to draw regional comparisons based on similar data.

### Exports

Total aerospace exports for Québec are based on the MDEIE's data and the ones for Canada and the Québec/Canada ratio are based on Statistics Canada's data (NAICS Code 3364, Aerospace Product and Parts Manufacturing).

### Recent Investments

Aerospace investment and employment information was borrowed from documents published by Montréal International. Some employment figures in Table 2 were rounded to the closest tenth.

### Occupations

Occupational groups are based on the National Occupational Classification (NOC). NOC's employment data were collected by Statistics Canada.

### Total Operating Costs

These data are from KPMG's annual comparative study, *Competitive Alternatives 2012*, which measures the combined impact of 26 significant cost components that are most likely to vary by location, as applied to different business operations, including aerospace.

### Total Average Labour Costs

The 2012 KPMG analysis of total operating costs is based on a representative aerospace operation composed of 85 workers. To calculate the average labour costs per employee, per category, total cost was divided by 85 or the number of workers in the KPMG model.

In addition to wages and salaries, KPMG (2012) included the following employer contributions:

- **statutory costs:** government pension and health plans, unemployment insurance, and workers compensation.
- **other benefits:** paid time not worked (holidays and vacations), private health insurance and other discretionary benefits.

### Taxation and Financial Incentives

In its *Competitive Alternatives 2010 – Special Report: Focus on Tax*, KPMG assessed the general tax competitiveness of 95 cities in 10 countries in the following industries: electronics assembly, shared services centres, precision components, software design, web and multimedia content development, telecom equipment, medical devices, clinical trials management, electronics systems development, aircraft parts, auto parts, pharmaceutical products, specialty chemicals, plastic products, biomedical R&D, food processing and metal machining.

A company's total tax burden in a given city includes the sum of three components, namely the corporate income tax, other corporate taxes and statutory labour costs. Corporate income tax (at the national, regional and local levels) is a function of a company's sector and geographical location. Other corporate taxes include, among others, capital, sales, property and other miscellaneous taxes. Salary taxes include statutory plan costs and other wage-based taxes. The two latter categories vary with a company's sector and geographical location.

KPMG's analysis is based on information collected between July 2009 and January 2010. All of the above mentioned taxes were in effect on January 1, 2010 and take into account the changes announced during the data collection period that will eventually come into force. The real tax rate includes tax credits, subsidies and across the board tax breaks.

KPMG presents detailed findings for 41 cities with a metro population of at least 2 million. Greater Montréal's relative competitive position is established in relation to this group of cities.



## ANNEXE B

## Sources

COMPILED BY MONTRÉAL INTERNATIONAL		
Charts	Sources	Pages
<b>1, 2 and 3</b>	MDEIE, 2012	<b>6, 8 and 9</b>
<b>4</b>	Statistique Canada, <i>Financial Information of Universities and Colleges Survey, 2008-2009</i> , 2010	<b>48</b>
<b>5</b>	KPMG, <i>Comparative Alternatives</i> , 2012	<b>68</b>
<b>6</b>	Hydro-Québec, <i>Comparison of Electricity Prices in Major North American Cities, Rates in Effect April 1, 2011</i>	<b>73</b>
<b>7 and 8</b>	KPMG, <i>Competitive Alternatives 2010, Special Report: Focus on Tax</i> , 2010	<b>76 and 77</b>

COMPILED BY MONTRÉAL INTERNATIONAL		
Tables	Sources	Pages
<b>1</b>	Research Infosource, 2011	<b>13</b>
<b>2</b>	Economic Development Canada, 2012; fDi Markets, 2012; Investissement Québec, 2011 and Montréal International, 2012	<b>15</b>
<b>3</b>	Aéro Montréal, 2012 (Compilation: STIQ, 2011), MDEIE, 2012 et Montréal International, 2011	<b>19</b>
<b>4-5</b>	Aéro Montréal, 2012 (Compilation: STIQ, 2011) et MDEIE, 2012	<b>25 and 28</b>
<b>6</b>	Aéro Montréal, 2012 (Compilation: STIQ, 2011)	<b>31</b>
<b>7</b>	AQTA, 2012	<b>36</b>
<b>8</b>	Montréal International, 2012	<b>39</b>
<b>9</b>	Statistics Canada, 2011	<b>44</b>
<b>10, 11, 12 and 13</b>	Ministère de l'Éducation, du Loisir et du Sport (MELS), 2011	<b>50, 53 and 54</b>
<b>14 and 15</b>	Aéro Montréal, 2011	<b>60 and 63</b>
<b>16</b>	Economic Research Institute, (data from the Horace + Extranet managed by ISQ), 2012	<b>70</b>
<b>17</b>	BDO Canada, 2012	<b>71</b>
<b>18</b>	Deloitte, <i>Tax Incentive Program in Québec –IT, January 2011</i> and <i>Québec eBusiness Development Tax Credit, March 2011</i>	<b>79</b>



# ABOUT AÉRO MONTRÉAL

[www.aeromontreal.ca](http://www.aeromontreal.ca)

## Mission

Aéro Montréal's mission is to mobilize industry players around common goals and concerted actions to increase the cohesion and optimize the competitiveness of Québec's aerospace cluster. Aéro Montréal aims to foster the growth and expansion of the cluster to ensure that it will continue to create wealth for Greater Montréal, Québec and Canada.

## Strategic Focus Areas

Over the years, Aéro Montréal has created working groups composed of industry players and focused on six strategic areas, namely Branding and Promotion, Innovation, Human Resources, Supply Chain Development, Defence and National Security and Commercialization and Market Development.



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Aéro Montréal, Québec's aerospace cluster, is a strategic think tank created in 2006 that brings together all the major decision makers in Québec's aerospace sector, including companies, educational and research institutions, associations and unions.

### → Branding and Promotion

Québec's aerospace industry is a source of pride both at home and abroad. This group's goal is to increase awareness of Québec's aerospace sector, its players and competitive advantages, and enhance its visibility and outreach.

### → Innovation

The Innovation working group has established an aerospace innovation strategy for Québec. It has also identified and is currently coordinating projects supporting it. Its mandate includes every aspect of aerospace innovation, from conceptualization to commercialization, private sector R&D (R&D and continuous improvement) and public sector and university-based research in cooperation with CRIAQ.

### → Human Resources

The mandate of this strategic area's working group is to oversee the planning, coordination and implementation of a concerted action plan ensuring that the future manpower needs of Québec's aerospace industry will be met. Québec's aerospace sector is a model of excellence and is known the world over for its highly specialized workforce. In 2010, approximately 1 in every 192 Québec workers and 1 in every 92 Greater Montréal workers were employed in the aerospace sector. Equivalent Canadian and American ratios are four times and three times lower than Greater Montréal's ratio and represent 1 in 389 and 1 in 269 workers respectively.

### → Supply Chain Development

This working group's mandate is to oversee the planning, coordination and implementation of a common action plan to increase the competitiveness of subcontractors and, thereby strengthen Québec's aerospace supply chain. The MACH initiative stems from this group's work. It is the result of discussions among cluster members and intended to be a unifying process to support the sector's long-term strategic growth. Centred on collaborative client-supplier relationships, MACH works directly with companies to stimulate supply chain cooperation and innovation and improve supplier performance and competitiveness.

### → Defence and National Security

This group was established to oversee the planning, coordination and implementation of a collective action plan to respond to major defence and national security challenges and promote the industrial capacity of Québec's aerospace cluster in these areas. Its mandate also includes ensuring that Québec's aerospace industry be well positioned for major Federal Government military procurement contracts in the framework the Industrial and Regional Benefits Policy (IRB).

### → Commercialization and Market Development

While ensuring greater synergy among SMEs and other cluster actors, the goal of this strategic area is to ensure Québec SMEs' presence on world markets and promote and foster their development.

# ABOUT MONTRÉAL INTERNATIONAL

[www.montrealinternational.com](http://www.montrealinternational.com)

## Mission

Montréal International (MI) is a non-profit organization created in 1996 as a result of a private-public partnership. Its mission is to contribute to the economic development of Greater Montréal and enhance its international status. MI is financed by some 100 members from the private and institutional sectors, as well as the Governments of Canada and Québec, the Communauté métropolitaine de Montréal and the City of Montréal.

## Mandates

- Attract, retain and expand foreign direct investment
- Attract, retain and expand international organizations
- Attract, welcome and retain foreign talent
- Promote and reinforce Greater Montréal's economic attractiveness and international status

## Services

As a one-stop organization, MI offers a wide range of customized and confidential services free of charge. The organization relies on the expertise of 50 professionals, all whom are specialists in their respective field.

### → Strategic Support

A public/private partnership, MI provides foreign companies with valuable assistance with location, expansion and strategic alliance projects. Companies are given expert advice to help them benefit fully from opportunities for growing their businesses.

### → Knowledge of Fiscal and Financial Programs

Companies locating in Greater Montréal can benefit from a range of government programs. MI can provide them with guidance in identifying the right financial and fiscal incentives as well as various sources of potential funding.

### → International Mobility

MI assists companies and organizations seeking to hire foreign strategic workers, particularly by providing assistance with paperwork and easing the settlement process for these individuals and their families in Greater Montréal.

### → Sectoral Expertise

In addition to coordinating various services required to advance promising projects, MI provides foreign companies contemplating a move to the area with information and advice regarding their sector.

### → Site Selection Data

MI can offer a full range of key comparative data on Greater Montréal's business environment (workforce, costs, taxes, innovation, quality of life, etc.).

### → Government Relations

Investors will benefit from MI's extensive network of relationships with federal, provincial and municipal partners as well as with universities and training and research centres.

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