

Greater Montréal: A Global Aerospace Hub



The world's best economic promotion agency at your service





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Greater Montréal: A Global Leader in Aerospace



A priority sector for Québec and Greater Montréal



Four priorities

- **Strengthen** and **diversify** the industry structure
- **Bolster** industry **growth**: support projects and invest in the workforce
- **Assist SMEs** in their development
- Promote **innovation**



Major financial support

For the period of 2016–2021:

- An estimated **\$2.8 G** in investments
- **\$510 M** in government contributions
- A **\$250 M** financial framework

QUÉBEC
AEROSPACE
STRATEGY



REDEFINING THE
HORIZON

2016-2026

Québec's aerospace ecosystem, a great asset for your project



43,400 jobs



200+ companies

Canadian key player



57% of the sector sales



70% of R&D



80% of all Québec aerospace production is exported outside Canada



Aerospace workers

Employment growth of **3.1%**
from 2018 to 2019

1 in 50
people **works in the**
aerospace sector in
Greater Montréal

4,000
new graduates
every year

Aéro Montréal: a strong cluster to support the industry



Québec's aerospace cluster grouping all the major decision makers in Québec's aerospace sector, including companies, education and research institutions

Mission

Aéro Montréal's mission is to mobilize stakeholders in Québec's aerospace ecosystem to support its global reach, innovation capacity and growth.

Strategic working groups

Aéro Montréal has created seven working groups and many committees: Growth, Green and Intelligent Supply Chain Development Innovation, Monitoring and Innovative Strategy, Human Resources Growth, Defence and Security, MRO, Remotely Piloted Aircraft System, and about 10 committee focusing on more specific issues.

**INTERNATIONAL
AEROSPACE
WEEK**
MONTREAL
2019



80 specialized events organized by Aéro Montréal and its partners every year from networking events, to training and trade missions.

A hub of global leaders established in Greater Montréal

5
OEMs

BOMBARDIER

Bell
Helicopter
A Textron Company


CAE

 **Pratt & Whitney**
A United Technologies Company

AIRBUS

A diversified aerospace cluster with leading companies

Aerostructures



BOMBARDIER



ARCONIC

Interiors



F/LIST



Avionics and softwares



THALES

Engineering and subcontractors



Landing gears



LIEBHERR



Defence



Spatial



Propulsion



SAFRAN
HELICOPTER ENGINES



Simulations



3D impression



Outstanding investments in aerospace since 2012

2012



\$75 M
Opening a fuselage factory

2014



\$4 M
Opening North American headquarters and a laser-fusion 3D printing factory

2016



Relocation of Bell 505 helicopters production to Greater Montréal



\$31 M
Opening a second plant of metal powders manufacturing

2018



\$1 G
Investment in training innovation



\$4 M
Factory enlargement

2013



\$275 M
Opening 3 new high-tech production lines



\$61.4 M
Opening a robotics research centre

2015



Opening a new titanium assembly components production line

2017



\$20 M
Opening a new production facility of high-class interiors for aircrafts



\$25 M
Opening a AI Lab

2019



\$31 M
Expands its operations in with the increase of its production capacity and the development of 4.0



Opening a AI Lab



Opening of a Spacejet development centre

A dynamic sector offering new investment opportunities

AIRBUS

A major equipment supplier installed in the metropolis provides new opportunities for Québec's aerospace ecosystem.

FLYING WHALES

The creation of new aerospace expertise with the arrival of Flying Whales, specializing in the production of airships dedicated to the transport of heavy goods.

YMX Adrocité Internationale de Mirabel

The Mirabel airport still has available land at its disposal, a prime location for the expansion of the aerospace industry in Québec.



A cutting-edge research hub



Unique model of collaborative industry-led research involving universities and research centres increasing the competitiveness of the aerospace industry.



Canadian Space Agency (CSA) responsible for advancing the knowledge of space through science.



Government of Canada's largest research organization supporting industrial innovation, the advancement of knowledge and technology development, and fulfilling government mandates.



College centre specializing in applied research and technology transfer, affiliated with Cégep Édouard-Montpetit.



Helping businesses involved in the composite sector by providing technical assistance in the area of applied research.



Contributing to the development and competitiveness of the aerospace industry in Québec by supplying companies with qualified engineers capable of responding to their needs in innovation and conception.

Research chairs in Aerospace



- ArianeGroup Research Chair on Emerging Materials in Aeronautics and Space
- Canada Research Chair in Precision Robotics
- LARCASE - Active Command, Avionics and Aeroelasticity Research Laboratory
- LASSENA - Laboratory specialized in embedded systems, navigation and avionics



- Computational Aerodynamics Group
- Aerodynamics Laboratory
- Computational Fluid Dynamics Laboratory
- Institute for Aerospace Engineering



- NSERC Chair in Aerospace Design Engineering (NCADE)
- Concordia Center for Composites (CONCOM)
- Concordia Institute of Aerospace Design & Innovation (CIADI)



- Canada Research Chair in Modeling and Control of Unsteady Aircraft Aerodynamics
- Polytechnic Institute of Innovation and Design in Aerospace (IICAP)



World-renowned researchers who make Montréal shine



Catharine C. Marsden

Associate Professor at the Centre for Engineering in Society and the **NSERC Chair in Aerospace Design Engineering** within the Faculty of Engineering and Computer Science at Concordia University.



Tim Lee

Associate Professor at McGill University and a member of Aerodynamic research group. He works on unsteady experimental aerodynamics, wingtip vortex, dynamic-stall flow control, turbulence and transition control.



Wagdi G. Habashi

Professor of Mechanical Engineering at McGill University. He is the initiator of a modern approach to in-flight icing simulation allowing aerodynamic design and icing protection to be addressed simultaneously, with compatible tools.



Martin Lévesque

Holder of the **Canada Research Chair in Multi-Scale Modeling of Advanced Aerospace Materials**, he develops and tests new models to evaluate the mechanical response of advanced materials in the aerospace industry.



Cutting-edge expertise in autonomous aerial vehicles

University labs



McGill University's CIM is an inter-departmental inter-faculty research group including the McGill Aerospace Mechatronics Lab, dedicated to supporting research themes revolving around aeronautical and space systems, more specifically unmanned aerial vehicles (UAVs) and space robotic systems.



Research at the **Networked Autonomous Vehicle (NAV) Lab** at Concordia University includes the avionics and flight controls of unmanned aerial vehicles, as well as intelligent and hybrid control systems.



The Mobile Robotics and Autonomous Systems Lab at Polytechnique Montréal carries out research activities aimed at developing the autonomy of automated systems, in particular those capable of operating in environments shared with humans, including aerial mobile robots.

Examples of companies specializing in drones



Ara Robotique Ara Robotics is developing a UAV autopilot for industrial and commercial applications.



Building on its expertise in the development of autonomous guidance, navigation and control systems, **NGC** has designed a system that enables the operation of unmanned aerial vehicles in proximity to surrounding obstacles.



Humanitas works on a proprietary technology that breaks the one-pilot-one-drone rule and enables one operator with minimum training to fly a fleet of autonomous drones capable of performing complex missions with minimum configuration and management efforts.



Vozwin designs and develops unmanned systems and technologies for industrial and military applications.

Significant government support for the integration of drones in Canada

- The Canadian government is working to safely integrate drones into Canada's transport system:
 - Opening of a centre of expertise based in Greater Montréal for the certification of specialized flight operations
 - Call for R&D project ideas to further strengthen Canada's foothold in the drone industry launched jointly with 3 research centres specialized in aerospace: NRC, CARIC and CRIAQ
 - Creation of drone test centres



Transport
Canada

Transports
Canada



A world-class hub in artificial intelligence



More than 13,000
university students enrolled in
AI and data-related programs



600+ researchers and graduate
students at **Mila, the world's largest**
academic research lab in deep
learning and reinforcement learning



\$3+ billion in AI investments in
Greater Montréal since 2016



Montreal hosts a thriving
ecosystem with R&D centers,
incubators and accelerators



Examples of companies and organizations active in AI applied to the aerospace sector

Cutting-edge expertise

THALES

Thales creates an AI Expertise Research and Technology Centre (cortAIx) with Mila and IVADO focusing on the application of AI in the aerospace sector.

BOMBARDIER

Bombardier and IVADO sign a strategic agreement aimed to improve productivity in the aerospace industry and to design more efficient aircraft through data valorization and AI.



CAE launches CAE Rise, a training system focused on real-time data and standardized assessments to improve the continuing education of military pilots.

Maya HTT

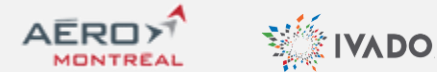
Maya HTT uses AI to improve software solutions for companies in the aerospace industry.



IRT Saint-Exupéry is opening of a specialized outpost in Montréal focusing on the application of AI to the ground and air transportation sector.

Strengthening ecosystem initiatives

- Aéro Montréal and IVADO sign a partnership agreement on AI and its applications for the aerospace sector.



- The Canadian government chose Montréal as headquarters for scale ai, Canada's AI supply chain supercluster

SCALE AI

- The Laboratory of Imaging, Vision and Artificial Intelligence (LIVIA) is a research group accredited by ÉTS, which studies the perception and modeling of dynamic environments (2D and 3D scenes, speech, etc.) using AI techniques for the analysis of satellite and aerial images.



02

A Strategically Located Hub

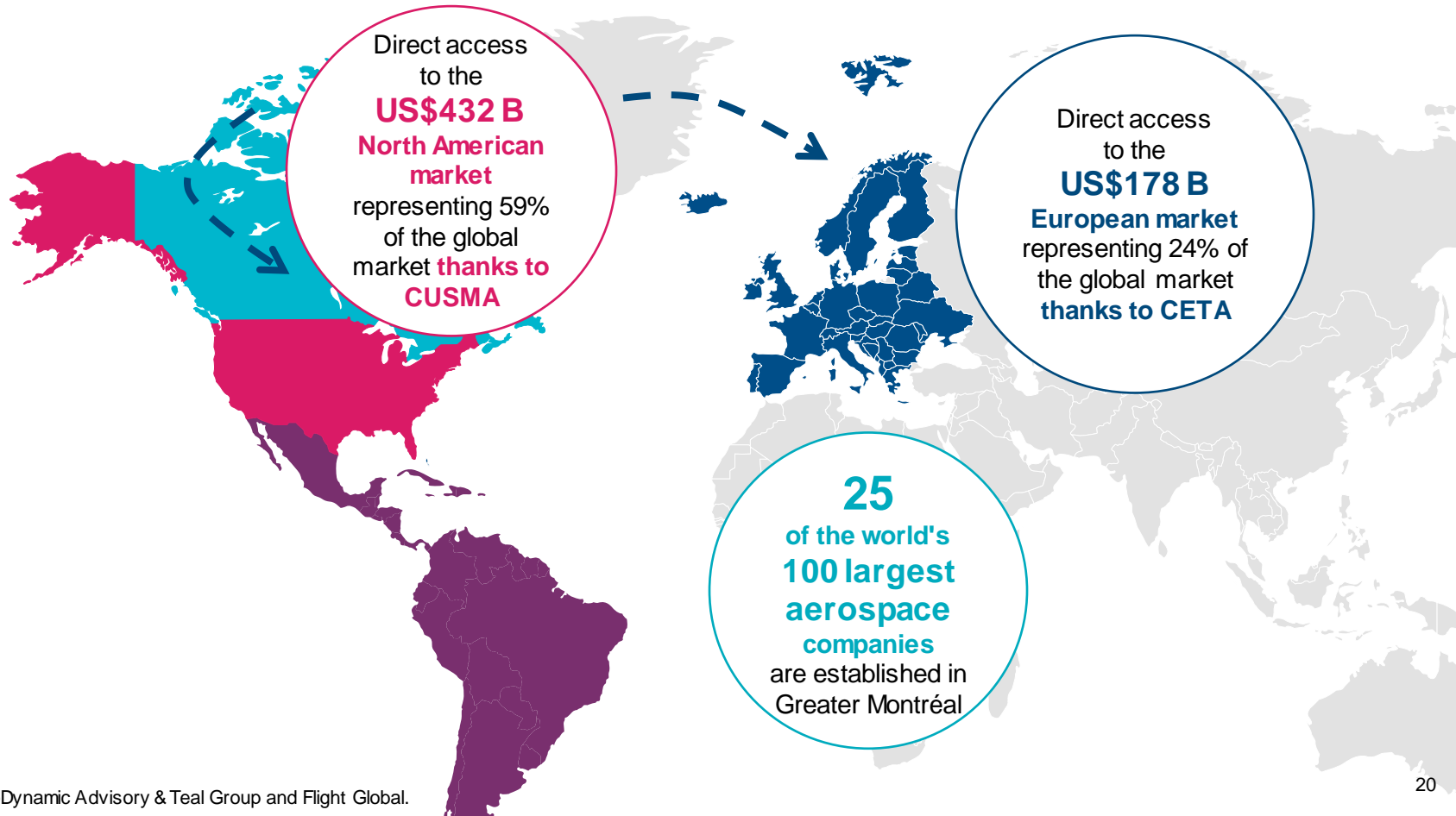
MTL
INTL

Montréal
International



Aerial view of Montréal sky line

Direct access to 83% of the global aerospace market



High quality multimodal transportation infrastructures

Efficient flow of goods across borders

- Canada is ranked 1st out of all G7 countries for the ease of flow of goods across the border. Only Canada has free trade agreements with all G7 countries.
- Accessible, efficient, easy and affordable intermodal transportation (air, sea, land and rail).



Air

Two international airports (Montréal-Trudeau and Montréal-Mirabel) and one general aviation airport (Saint-Hubert) with ample space to build.



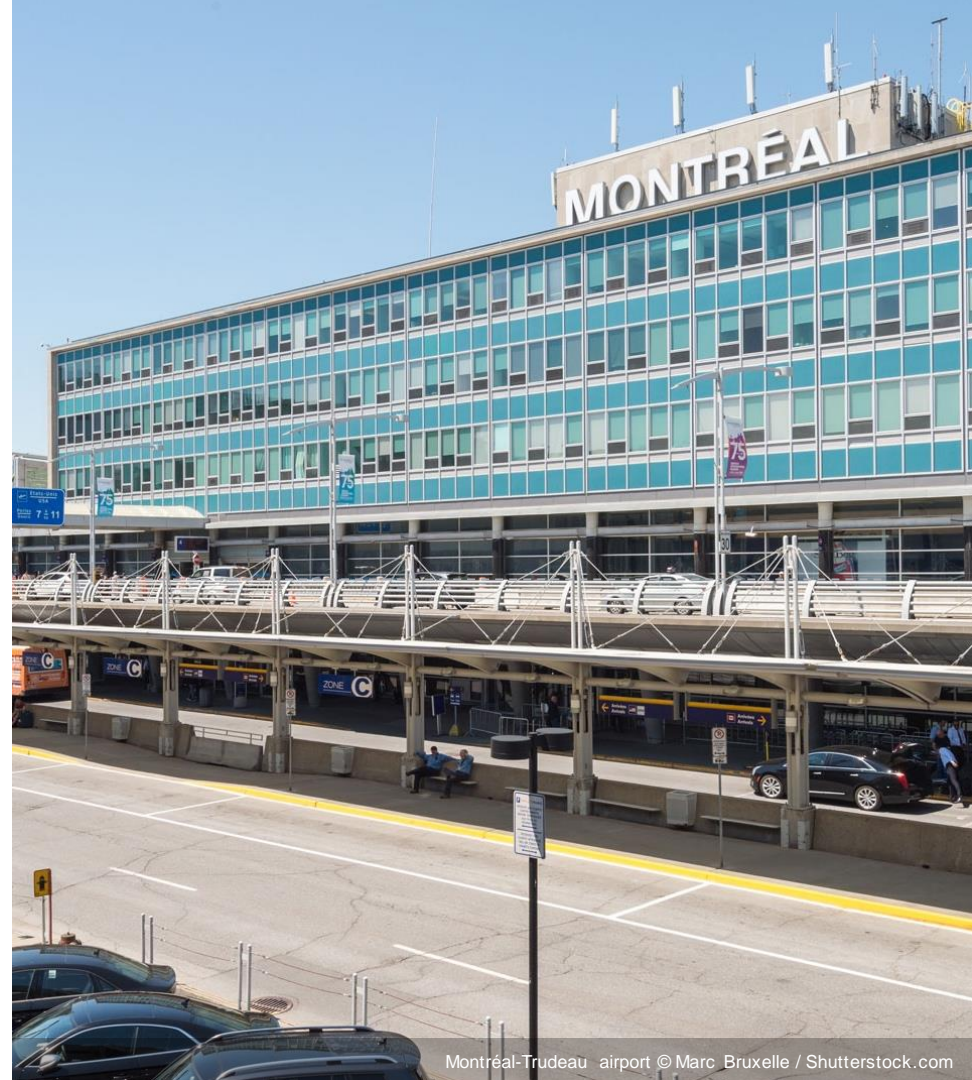
Sea

One of North America's busiest ports, connected to over 100 countries.



Land and rail

Intermodal hub with 32,000 km of railways and located one hour from the U.S. border.



03

A Deep and Growing Pool of Highly Qualified Talent



State-of-the-art university programs in aerospace

Undergraduate programs



- Aerospace Engineering
- Electrical Engineering: Embedded Systems
- Mechanical Engineering: Aviation Concentration / Space Technologies



- Automated Production Engineering: Aeronautical Production Profile
- Electrical Engineering: Embedded Systems in aerospace concentration
- Mechanical Engineering: aerospace concentration



- Aerospace Engineering



- Mechanical Engineering: Aviation Concentration



- Mechanical Engineering - Aeronautical Concentration



- Physical Engineering: Concentration Aeronautical and Aerospace



Graduate programs

Master of Engineering (MEng)
offered in cooperation with all
6 universities

A major professional and technical aerospace training hub



UN CAMPUS DU CÉGEP ÉDOUARD-MONTPÉTTIT

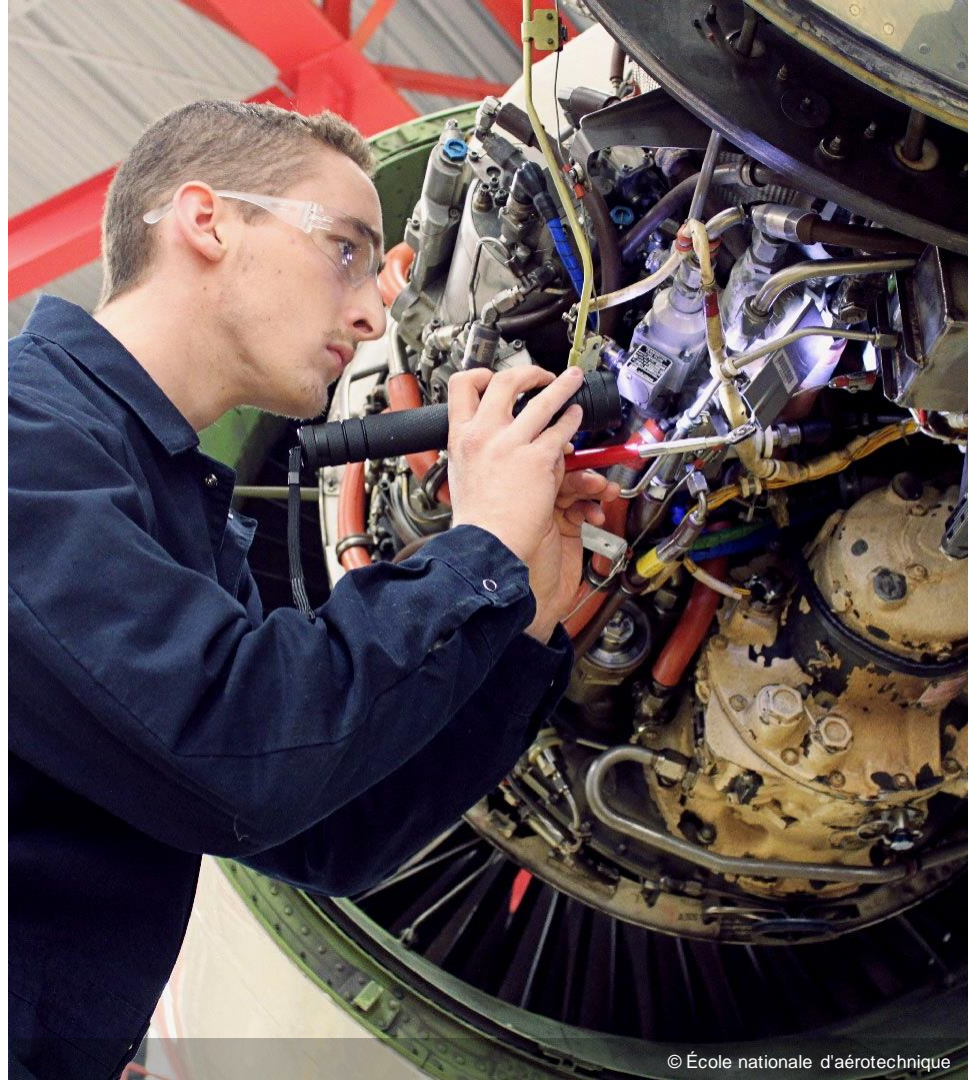
Largest aeronautical technology school in North America

- Up to 900 students in one of the following programs:
 - Aircraft maintenance
 - Avionics
 - Aerospace engineering



First school/plant in Canada

- Up to 1,300 students in the following programs:
 - Cable and circuit assembly
 - Aircraft structural assembly
 - Mechanical assembly
 - Toolmaking
 - Aircraft upholstery
 - Machining technique
 - Precision sheet metal work
 - Surface treatment
 - Numerical control machine tool operation



Thanks to its big four university institutions with renown engineering programs, Montréal boasts a large pool of university students and future engineers

University programs related to aerospace	Enrollment in 2018-2019	Graduates 2018
Aerospace Engineering	741	133
Mechanical Engineering	5,150	1,198
Electrical and Electronics Engineering	3,374	759
Industrial Engineering	2,489	639
Computer Engineering	2,193	460
Physical Science	840	181
Engineering Physics	360	68
Mathematics	1,427	286
Total	16,575	3,724



16,500+ university students are enrolled in aerospace related programs

3,500+ graduate every year

Thanks to cutting-edge college programs, Greater Montréal boasts a large pool of students

College programs related to aerospace	Enrolment 2017-2018	Graduates 2017
Mecanical Engineering	516	110
Aircraft Maintenance	423	94
Industrial Electronics	1,140	253
Aerospace Engineering	290	65
Avionics	146	24
Total	2,515	546



2,500+ college students are enrolled in aerospace related programs

Nearly **600 graduate** every year

A pool of high-qualified employees

Selection of professions related to aerospace in Greater Montréal	Number of experts
2146 – Aerospace Engineers	5,100
2232 – Mechanical Engineering Technologists and Technicians	3,600
2133 – Electrical and Electronics Engineers	6,700
2233 – Industrial Engineering and Manufacturing Technologists and Technicians	4,900
2173 – Software Engineer and Designers	4,100
2147 – Computer Engineers (except Software Engineers and Designers)	5,900
2241 – Electrical and Electronics Engineering Technologists and Technicians	7,300
Total – Greater Montréal	37,600



45% of Canada workforce in aerospace is established in Greater Montréal



Village au Pied-du-Courant and Pont Jacques-Cartier © Montréal International

Canada's most bilingual and trilingual population



2.5 million residents speak English, that's 9% more than in Vancouver



55% of the population is bilingual (French and English), compared to 8% in Toronto and 7% in Vancouver



Almost 20% of the population is fluent in three or more languages, compared to 4% in Toronto and 3% in Vancouver

04

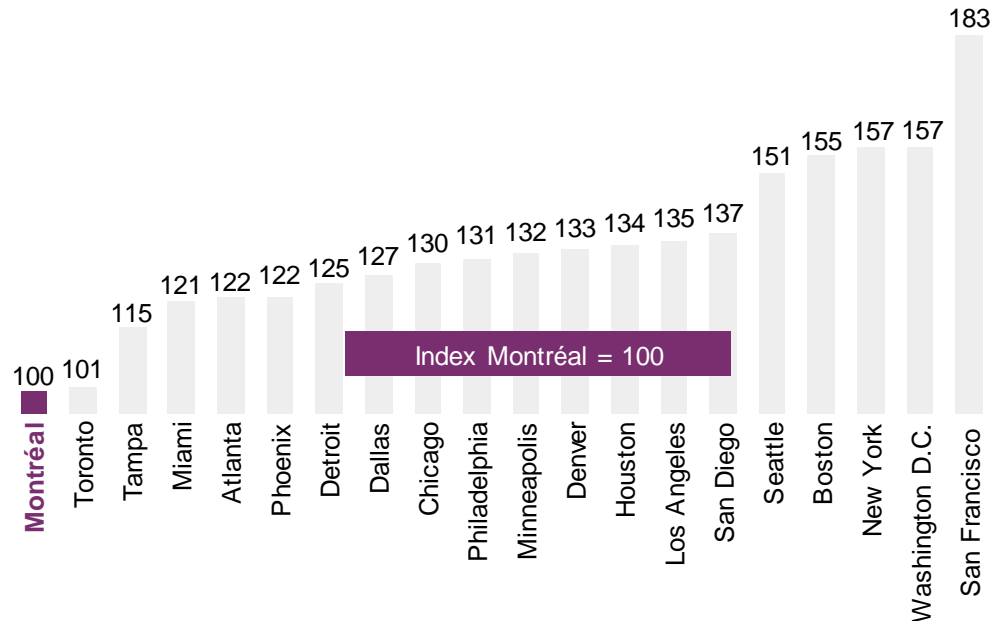
Attractive Operating Costs and Incentives



Operating a business costs less in Greater Montréal than in any other major metropolitan area in Canada and the U.S.

Operating costs index for aerospace manufacturing

20 largest metropolitan areas in Canada and the U.S., 2020



25% cost advantage

compared to the average 20 largest metropolitan areas in Canada and the U.S.

Note: The annual operating cost calculations are based on labor, property and utility costs in US\$.

Source: fDi Benchmark, 2020.

The most competitive salaries in the aerospace industry

Median annual salaries* for 8 typical professions in CA\$

Selection of 8 large metropolitan areas in North America, 2020

	Montréal	Toronto	Chicago	San Diego	Seattle	Boston	San Francisco	New York-Manhattan
R&D Manager (Technical)	\$86,871	\$92,091	\$135,792	\$140,474	\$143,595	\$148,091	\$162,548	\$164,805
Manager (Manufacturing)	\$67,224	\$71,629	\$102,177	\$103,397	\$109,357	\$112,828	\$122,822	\$123,740
Aerodynamics Engineer	\$62,351	\$66,090	\$94,064	\$96,567	\$99,916	\$101,152	\$108,104	\$100,744
Assembler Electromechanical	\$35,292	\$37,607	\$46,901	\$46,970	\$51,607	\$51,007	\$53,863	\$49,720
Industrial Engineer	\$62,049	\$65,779	\$93,201	\$95,649	\$98,997	\$100,215	\$107,066	\$99,727
Mechanic Aircraft	\$45,165	\$48,097	\$68,883	\$66,004	\$70,773	\$72,123	\$78,556	\$72,739
Aeronautical Drafter	\$44,023	\$46,939	\$63,965	\$65,082	\$69,203	\$67,164	\$72,370	\$67,052
Aeronautical Sales Engineer	\$68,272	\$73,137	\$113,272	\$108,119	\$112,848	\$122,091	\$133,916	\$132,909

Note: Salaries based on 5 years of experience. Industry category : Aerospace and Defense (NAICS 3364).

Currency exchange based on the monthly average of June 2020: US\$1.00 = CA\$1.3550.

Source: Economic Research Institute Inc., July 2020.

Advantageous tailor-made incitatives



Major and Innovative Projects

ESSOR Program

Support to major projects with refundable (interest-free & low interest loans) and non-refundable contributions. Investment projects with eligible expenditures of **\$250,000** or more to start a new business or expand (including modernizing) an existing business.

Strategic Innovation Fund

Repayable and non-repayable contributions of **up to 50%** of eligible costs for a project of at least **\$10 M**.

Canada Economic Program (CED)

Refundable and non-refundable contributions of **up to 50%** of direct project costs up to \$2 M.



Research and Development tax credit

Québec's tax credit for Scientific Research and Experimental Development (R&D)

14% tax credit on salaries and subcontractor fees paid in Québec. It is fully refundable, whether or not the business makes a profit.

Canada's Scientific Research and Experimental Development (SR&ED) tax incentive

15% federal tax credit on eligible activities and expenditures.



Talent development & attraction

Financial Assistance for Job Creation and Training

25% of eligible costs for the implementation of a training program and **50% of costs** incurred for the creation of a human resources department with the creation of 50 jobs or more over two years.

Tax Holiday for Foreign Researchers and Experts

Five-year Québec income tax exemption at the personal level:
100% of salary for the 1st and 2nd year;
75% for the 3rd year; **50%** for the 4th year;
25% for the 5th year.

R&D tax credits: 15% non-refundable from the government of Canada and 14% refundable from Québec

SCENARIO	Canada (Federal)	Québec
Scientific Research and Experimental Development (SR&ED) tax incentive program	\$1,500,000 (A)	\$1,500,000 (D)
	\$825,000 (B)	-
	\$160,000 (C)	\$100,000 (E)
	-	(\$225,000) (F)
	(\$192,500) (G)	-
	\$2,292,500	\$1,375,000
	(A) + (B) + (C) - (G)	(D) + (E) - (F)
	-	\$192,500 (G)
	\$343,875 (H)	-
	\$536,375 (G) + (H)	

ASSUMPTIONS¹

- Private, foreign-controlled company, more than \$75M assets
- 15 eligible employees @ \$100,000/year
- 100% of their work is related to eligible activities
- Subcontractor: \$200,000

Note:

1. This model takes into consideration recent changes made to certain tax credits (2012, 2014 and 2015) and is thus valid as of fiscal 2019.
2. Up to 55% of qualifying salaries and wages, federal only: expenditures should be related to R&D activities.
3. Only 80% of the amount paid to a subcontractor is eligible for a federal tax credit and 50% for Québec tax credit.
4. Québec only: For SMEs (less than \$50M assets) there is an SR&ED tax credit exclusion on the first \$50K of R&D spending. For large companies (more than \$75M assets) and companies under foreign control, the exclusion applies on the first \$225K of R&D spending. This amount is deducted of the qualifying salaries and wages.
5. For the purposes of calculating the combined rate of the credit, the tax credit from the government of Québec is applied against the federal tax credit.

Source: Ministry of Finance of Québec, 2019; PWC, 2019; Compilation: Montréal International, 2019.

“We will leverage Montréal’s unique ecosystem of world class talent and creativity to advance the applications of ethical artificial intelligence world-wide.”

– Patrice Caine, Chairman and Chief Executive Officer, Thales

THALES

“Beyond the sectoral appeal of Greater Montréal, the great plus of the region was the welcome we received. Wanting to set up a French start-up and a new technology in Canada was a double challenge. But from the beginning, we felt supported, accompanied, even pampered. For an SME, this support is huge.”

– Cyrille Chanal, President, FusiA



“The decision to move to Laval (Greater Montréal) and make it our strategic location in North America is based on the excellent infrastructure in place, a business-friendly public administration and the availability of highly qualified and experienced aerospace professionals. Québec provides the ideal environment for F / LIST CANADA to thrive, support its clients effectively and expand its operations across Canada and the United States.”

– Michael Groiss, President and CEO of F / LIST

F / LIST

“In the Montréal area, we found the ideal industrial ecosystem for our future growth and development. The emergence of new technologies and the race to innovate are challenges that force companies to constantly review their priorities and investments. In the aerospace industry, for example, the complexity and ongoing development of embedded systems require businesses to be able to turn on a dime.”

– Jean-Paul Chevée, Director of International Development, SII Group



05

Montréal International's Personalized, Free and Confidential Services



Montréal International, a single point of access to a multitude of personalized, free and confidential services



**Long-term
strategic support**



**Economic data
and communication
services**



**Government
relations facilitation**



**Incentive programs
assistance**



**Foreign workers
immigration
assistance**



**International
recruiting solutions**



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