Montréal International

Greater Montréal: A Global Aerospace Hub

The world's best economic promotion agency at your service

BEST ECONOMIC DEVELOPMENT ORGANIZATION 2020
INTERNATIONAL ECONOMIC DEVELOPMENT COUNCIL

BEST INVESTMENT PROMOTION AGENCY 2020
fDi INTELLIGENCE
FINANCIAL TIMES

Content

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Greater Montréal: A Global Leader in Aerospace

Montréal International

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

Source: Ministry of International Relations, 2019.

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

36,100 jobs

200+ companies

Canadian key player

70% of Canadian aerospace R&D

75% of all Québec aerospace production is exported outside Canada

Aerospace workers

1 in 60
people **works in the aerospace sector** in Greater Montréal

4,000
new graduates every year

Source: Ministry of Economy and Innovation, 2021; Ministère de l’Éducation et de l’Enseignement supérieur, 2021; compiled by Montréal International.

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.

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

Source: Aéro Montréal, 2019.

A hub of global leaders established in Greater Montréal

5
OEMs

A diversified aerospace cluster with leading companies

Aerostructures

STELIA

Avior

BOMBARDIER

sonaca MONTRÉAL

MECACHROME

ARCONIC

Interiors

msb design

F/LIST

HUTCHINSON

facc

SAFRAN LANDING SYSTEMS

Landing gears

HÉROUX DEVTEK

LIEBHERR

SAFRAN

MECAER | AVIATION | GROUP

Propulsion

Pratt & Whitney A United Technologies Company

SAFRAN HELICOPTER ENGINES

GE Aviation

Avionics and softwares

Esterline CMC Électronique

CS COMMUNICATION & SYSTEMS CANADA

THALES

Defence

L3 communications MAS

LOCKHEED MARTIN

Simulations

CAE

TRU SIMULATION + TRAINING

Engineering and subcontractors

AKKA PASSION FOR TECHNOLOGIES

Tech Mahindra

(expleo)

AA ASSISTANCE AERONAUTIQUE & AEROSPATIALE

Spatial

MDA

3D impression

AP&C A GE Additive Company

FUSIA AERO ADDITIVE

Outstanding investments in aerospace since 2012

2012

STELIA

$75 M
Opening a fuselage factory

2013

Pratt & Whitney

$275 M
Opening 3 new high-tech production lines

GE Aviation

$61.4 M
Opening a robotics research centre

2014

FUSIA AEROADDITIVE

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

2015

lisi AEROSPACE

Opening a new titanium assembly components production line

2016

Bell Helicopter

Relocation of Bell 505 helicopters production to Greater Montréal

AP&C A GE Additive Company

$31 M
Opening a second plant of metal powders manufacturing

2017

F/LIST

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

THALES

$25 M
Opening a AI Lab

2018

CAE

$1 G
Investment in training innovation

AIRBUS

$4 M
Factory enlargement

2019

AP&C A GE Additive Company

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

IRT

Opening a AI Lab

MITSUBISHI AIRCRAFT CORPORATION

Opening of a Spacejet development centre

2020

LAUAK

Investment in its Mirabel factory to transform it into an advanced technology aeronautics centre of excellence

2021

SOGECLAIR

Investment to increase its offering and modernize its operations

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 Aérocité 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

CRIAQ	Unique model of collaborative industry-led research involving universities and research centres increasing the competitiveness of the aerospace industry.	CSA ASC	Canadian Space Agency (CSA) responsible for advancing the knowledge of space through science.
Canada CNRC·NRC	Government of Canada's largest research organization supporting industrial innovation, the advancement of knowledge and technology development, and fulfilling government mandates.	CTA CENTRE TECHNOLOGIQUE EN AÉROSPATIALE CÉGEP ÉDOUARD-MONTPETIT	College centre specializing in applied research and technology transfer, affiliated with Cégep Édouard-Montpetit.
CDCQ Centre de développement des composites du Québec	Helping businesses involved in the composite sector by providing technical assistance in the area of applied research.	IICAP INSTITUT D'INNOVATION ET DE CONCEPTION EN AÉROSPATIALE DE POLYTECHNIQUE	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.

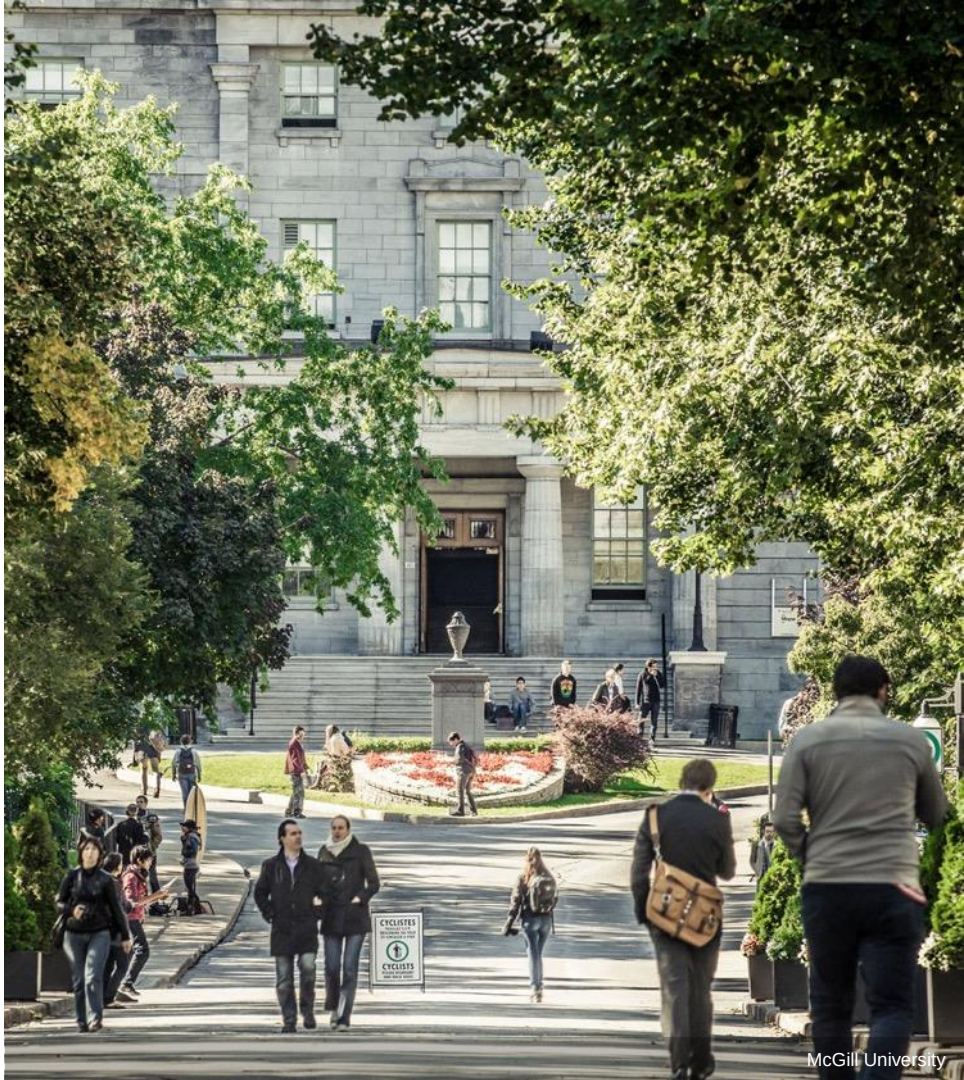
Research chairs in Aerospace

- ArianeGroup Research Chair on Emerging Materials in Aeronautics and Space
- Canada Research Chair in Precision Robotics
- LARCASE - Active Command, Avionics and Aeroservoelasticity 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)



McGill University

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 14,000 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

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

Downtown Montréal

Source: Mila; Montréal International Analysis.

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	CAE launches CAE Rise, a training system focused on real-time data and standardized assessments to improve the continuing education of military pilotes.
Maya HTT	Maya HTT uses AI to improve software solutions for companies in the aerospace industry.
IRT Saint Exupéry	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.

AÉRO MONTRÉAL IVADO

- 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.

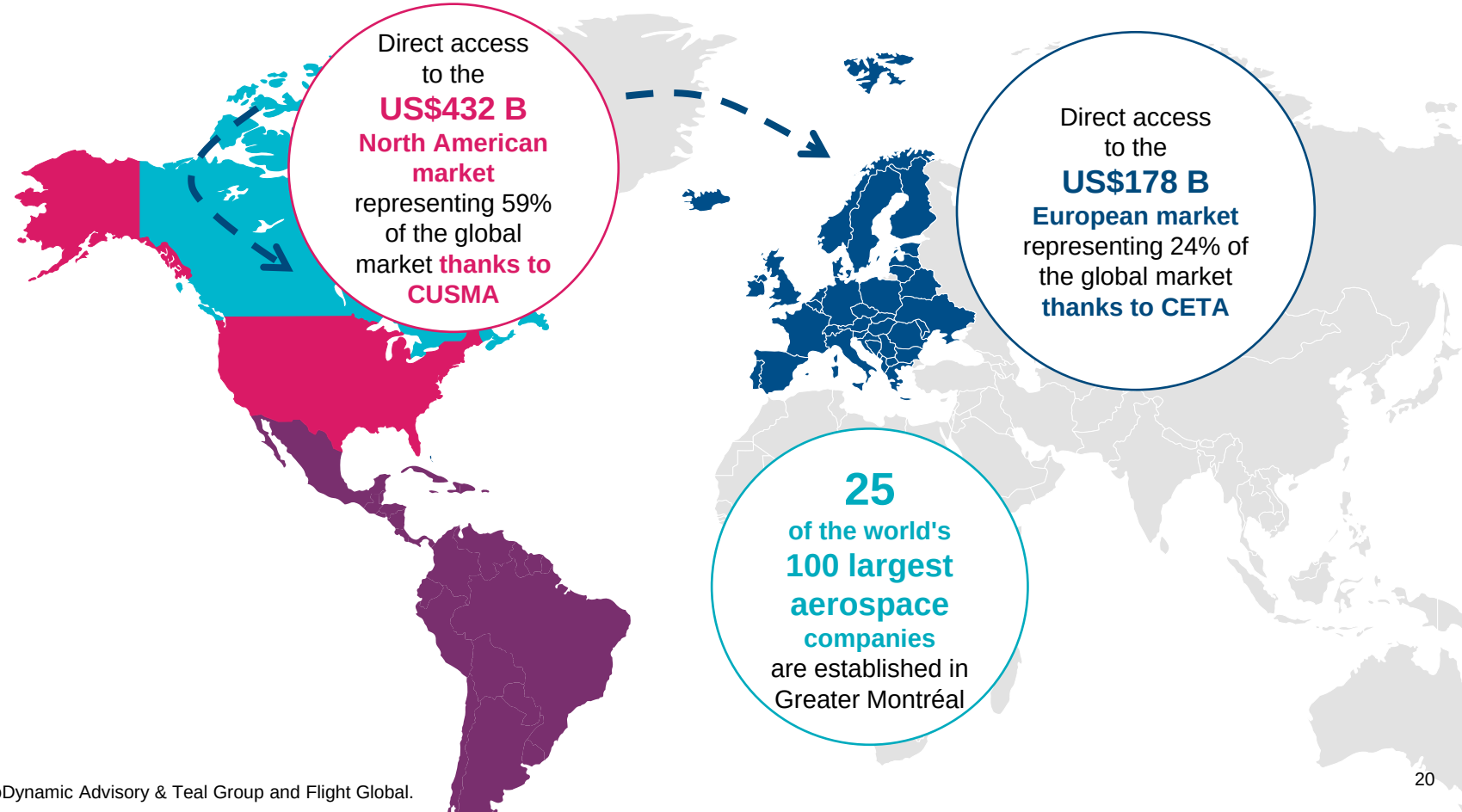
LIVIA
Le laboratoire d'imagerie, de vision et d'intelligence artificielle

02
A Strategically Located Hub

Aerial view of Montréal skyline

MTL INTL Montréal International

Direct access to 83% of the global aerospace market



Direct access to the **US$432 B** **North American market** representing 59% of the global market **thanks to CUSMA**

Direct access to the **US$178 B** **European market** representing 24% of the global market **thanks to CETA**

25 **of the world's 100 largest aerospace companies** are established in Greater Montréal

Source: AeroDynamic Advisory & Teal Group and Flight Global.

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.

Source: Invest in Canada, 2019; Canadian National, 2019.

Montréal-Trudeau airport © Marc Bruxelle / Shutterstock.com

03

A Deep and Growing Pool of Highly Qualified Talent

MTL INTL Montréal International

State-of-the-art university programs in aerospace

Undergraduate programs

POLYTECHNIQUE MONTRÉAL TECHNOLOGICAL UNIVERSITY	▪ Aerospace Engineering ▪ Electrical Engineering: Embedded Systems ▪ Mechanical Engineering: Aviation Concentration / Space Technologies
ÉTS Le génie pour l'industrie	▪ Automated Production Engineering: Aeronautical Production Profile ▪ Electrical Engineering: Embedded Systems in aerospace concentration ▪ Mechanical Engineering: aerospace concentration
Concordia University	▪ Aerospace Engineering
McGill	▪ Mechanical Engineering: Aviation Concentration
Université de Sherbrooke	▪ Mechanical Engineering - Aeronautical Concentration
Université Laval	▪ 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

ÉNA
ÉCOLE NATIONALE D'AÉROTECHNIQUE
UN CAMPUS DU CÉGEP ÉDOUARD-MONTPETIT

Largest aeronautical technology school in North America

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

École des métiers de l'aérospatiale de Montréal

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 2019-2020	Graduates 2019
Aerospace Engineering	796	145
Mechanical Engineering	5,263	1,211
Electrical and Electronics Engineering	3,613	731
Industrial Engineering	2,480	635
Computer Engineering	2,328	464
Physical Science	832	184
Engineering Physics	374	62
Mathematics	1,416	313
Total	**17,102**	**3,744**

17,000+ university students are enrolled in aerospace related programs

3,500+ graduate every year

Source: Ministère de l'Éducation et de l'Enseignement supérieur, 2021; compiled by Montréal International.

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

College programs related to aerospace	Enrolment 2019-2020	Graduates, 2018
Mecanical Engineering	**515**	127
Aircraft Maintenance	**436**	114
Industrial Electronics	**1,194**	224
Aerospace Engineering	**294**	63
Avionics	**134**	45
Total	**2,573**	**573**

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

Nearly **600 graduate** every year

Source: Ministère de l'Éducation et de l'Enseignement supérieur, 2021; compiled by Montréal International.

A pool of high-qualified employees

Selection of professions related to aerospace in Greater Montréal	Number of experts
2146 – Aerospace Engineers	**3,400**
2232 – Mechanical Engineering Technologists and Technicians	**4,200**
2133 – Electrical and Electronics Engineers	**3,800**
2233 – Industrial Engineering and Manufacturing Technologists and Technicians	**3,600**
2173 – Software Engineer and Designers	**4,400**
2147 – Computer Engineers (except Software Engineers and Designers)	**6,500**
2241 – Electrical and Electronics Engineering Technologists and Technicians	**7,000**
Total – Greater Montréal	**32,900**

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

Source: National Occupational Classification (NOC) 2020 - Statistics Canada 2020; Ministry of Economy, Science and Innovation, 2017.

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

Source: Statistics Canada, 2016.

04

Attractive Operating Costs and Incentives

Mary Queen of the World Cathedral / Skyline of downtown © Tourisme Montréal

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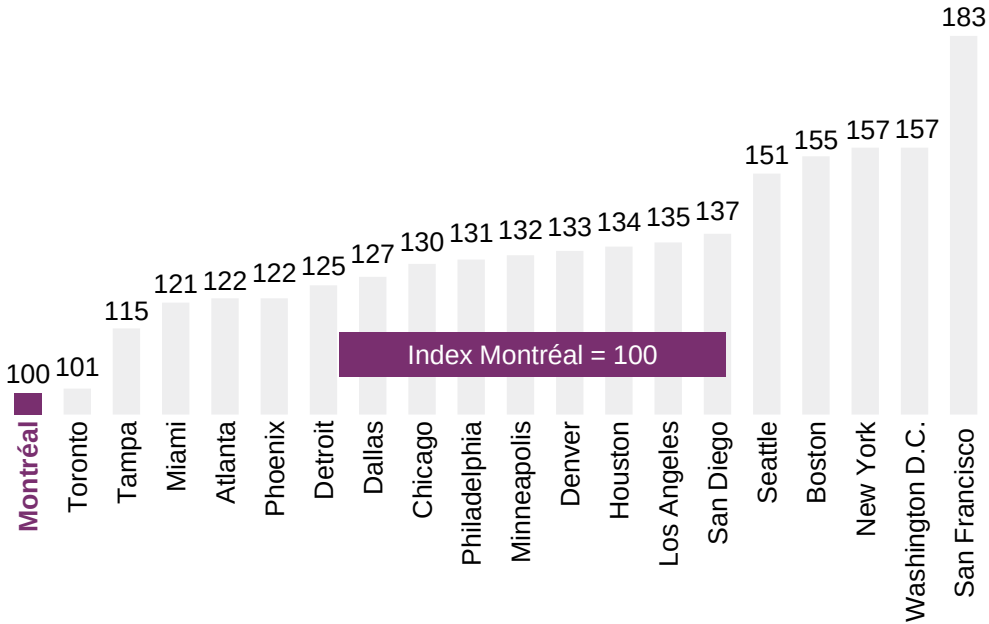
Operating a business costs less in Greater Montréal than in any other major metropolitan area in Canada and the U.S.

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, 2021

	Montréal	Toronto	Chicago	San Diego	Seattle	Boston	San Francisco	New York-Manhattan
R&D Manager (Technical)	**$98,648**	$104,784	$138,232	$142,370	$145,874	$150,531	$165,013	$167,140
Aeronautical Sales Engineer	**$77,533**	$83,231	$115,071	$109,715	$114,547	$123,840	$135,027	$134,747
Manager (Manufacturing)	**$76,344**	$81,520	$104,600	$105,476	$110,698	$114,142	$124,114	$126,267
Aerodynamics Engineer	**$70,585**	$74,932	$96,914	$99,203	$101,910	$103,200	$110,232	$102,749
Industrial Engineer	**$70,420**	$74,762	$95,059	$97,253	$99,972	$101,220	$108,040	$100,609
Mechanic Aircraft	**$51,382**	$54,805	$69,982	$67,163	$71,875	$73,278	$80,131	$73,737
Aeronautical Drafter	**$49,844**	$53,243	$65,144	$66,062	$70,425	$68,305	$73,401	$67,946
Assembler Electromechanical	**$39,977**	$42,687	$47,513	$47,629	$52,453	$51,815	$54,923	$50,427

Note: Base salaries, 5 years of experience. Industry category : Aerospace and Defense (NAICS 3364).
Currency exchange based on the monthly average of May 2021: US$1.00 = CA$1.2126.
Source: Economic Research Institute Inc., June 2021.

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 on Research and 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 Canada and 14% refundable from Québec

SCENARIO

Scientific Research and Experimental Development (SR&ED) tax incentive program

ASSUMPTIONS

- 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

	Canada	Québec
Qualifying salaries and wages	$1,500,000 (A)	$1,500,000 (D)
Other eligible expenses @ 55%[1]	$825,000 (B)	-
Subcontractor[2]	$160,000 (C)	$100,000 (E)
Exclusion on the first $225,000 of R&D expenditures[3]	-	$(225,000) (F)
Deduction of the Québec R&D credit[5]	$(192,500) (G)	-
Total qualifying expenditures	**$2,292,500 (A) + (B) + (C) - (G)**	**$1,375,000 (D) + (E) - (F)**
Refundable Québec credit @ 14%	-	$192,500 (G)
Non-refundable federal credit @ 15%	$343,875 (H)	-
Total tax credit	**$536,375 (G) + (H)**	

Note:
1. 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, 2021; PWC, 2021; Compilation: Montréal International, 2021.

“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

FUSIA
AEROADDITIVE

“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

SII

05

Montréal International's Personalized, Free and Confidential Services

Downtown Montréal © Montréal International

MTL INTL Montréal International

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

Contact us

Montréal International

Montréal International
380 Saint-Antoine Street West
Suite 8000
Montréal, Québec H2Y 3X7

t +1 514-987-8191
www.montrealinternational.com