

Montréal  
International

# Greater Montréal: an AI for Health Hub

INTELLIGENT  
HEALTH  
2020

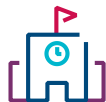


**Anna Soller, Project director, German Europe**  
**Léa Berlinguet, Project director, Life Sciences**

**September 9, 2020**



# Top reasons why you should invest in Montréal for AI



**Canada's University Capital**



Montréal's Yoshua Bengio is the winner of the prestigious **Turing Award 2018** and the most cited computer scientist per day (September 2018)



More than **11,000 university students** enrolled in Artificial Intelligence and data-related programs



**\$1 billion +** funding dedicated to university research



Joëlle Pineau, Associate Professor with the School of Computer Science at McGill University and the Head of the new **Facebook** AI Research lab



The **Canadian government chose Montréal as headquarters** for SCALE AI, Canada's AI supply chain supercluster



**500+ Researchers** MSc, PhD, post-doc and Applied AI students at **Mila**, the world's largest academic research lab specialized in deep learning and reinforcement learning



More than **\$2 billion** in AI investments announced in Greater Montréal since 2016



**Montréal has all the major players, plus a thriving community and ecosystem**

# And we're not the only one saying it



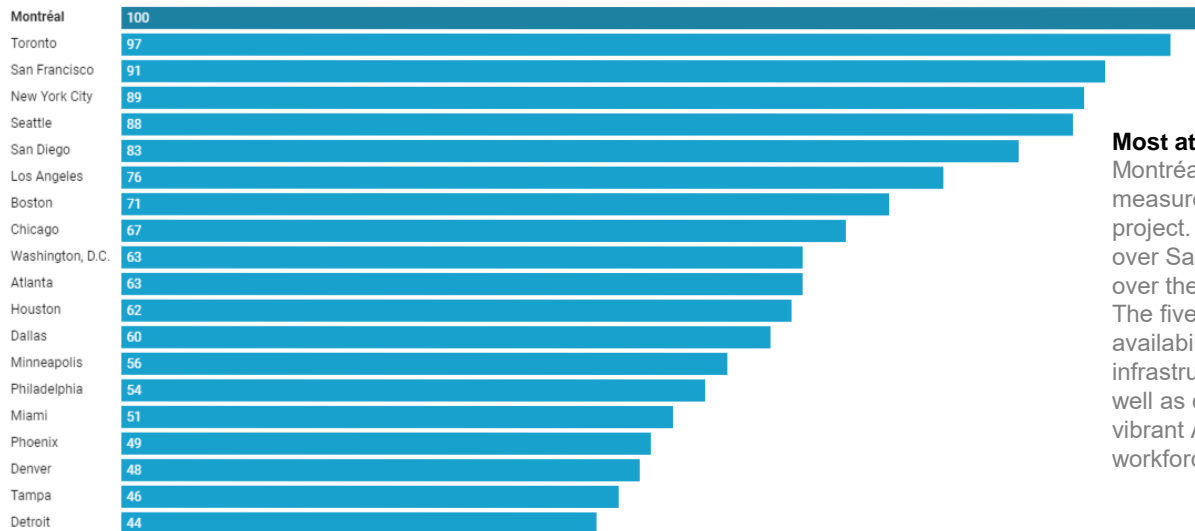
## Financial Times : Montréal, best place in North America for AI investment

Montréal is ranked No. 1 among 20 major cities in Canada and the U.S. for the quality of its artificial intelligence (AI) industry based on a comparative analysis by fDi Benchmark from the Financial Times. This database, which evaluates a site's competitiveness for foreign direct investment (FDI) projects, confirms that Greater Montréal is the most competitive metropolitan region for AI.

QUALITY INDICATOR FOR AI INDUSTRY 20 MAJOR CITIES IN CANADA AND THE U.S. (MONTRÉAL = 100)

### Quality indicator for AI industry

20 major cities in Canada and the U.S. (Montréal = 100)



### Most attractive city for AI

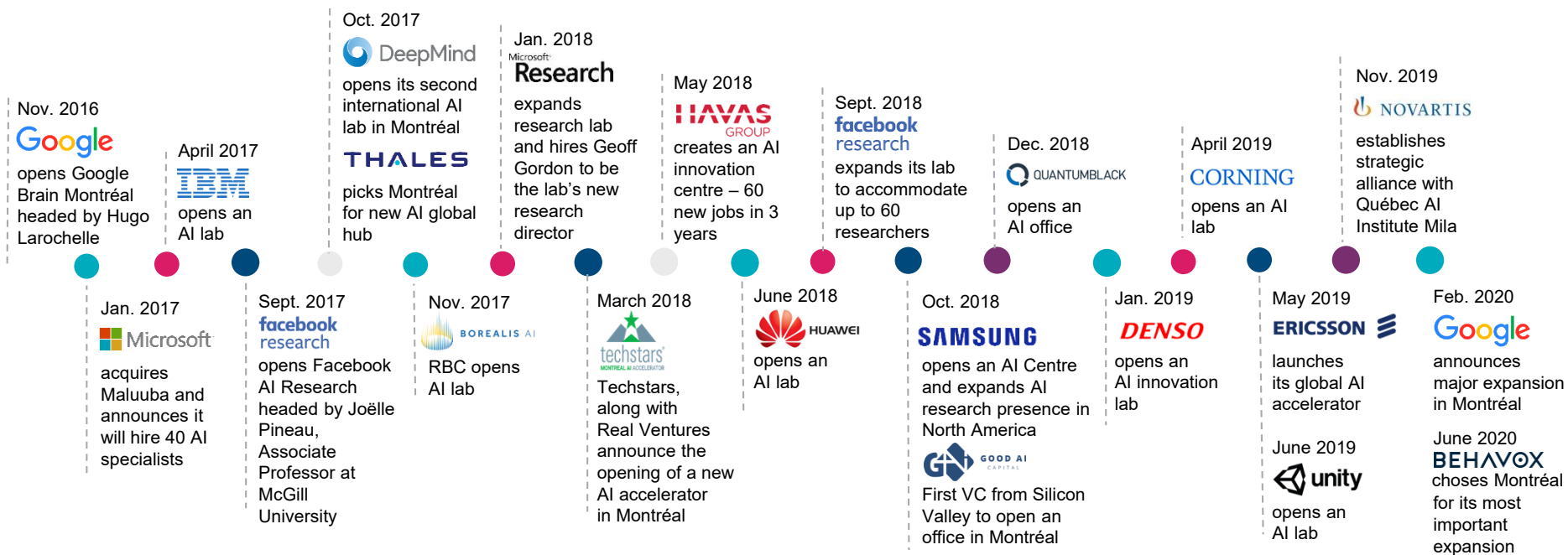
Montréal leads the pack for the quality indicator that measures the most decisive factors for an investment project. The city has a 9% competitive edge in the AI sector over San Francisco, 11% over New York City and 47% over the average of the 20 cities.

The five criteria assessed are vibrancy of the ecosystem, availability of skilled workers, the business environment, infrastructures and accessibility to international markets as well as quality of life. Montréal ranks highly due to its vibrant AI ecosystem as well as the availability of its skilled workforce.

Source: fDi Benchmark, 2019. • [Get the data](#)

<https://www.montrealinternational.com/en/news/montreal-best-place-in-north-america-for-ai-investment/>

# A few of the world leaders developing their AI expertise in Montréal



## Other foreign companies flourishing in Greater Montréal





A portrait of Yoshua Bengio, a man with grey hair, smiling. The image has a magenta overlay.

## YOSHUA BENGIO

One of the founders of the deep learning movement and winner of the prestigious Turing Award 2018

*Head of the Montréal Institute for Learning Algorithms (MILA)*

A portrait of Joëlle Pineau, a woman with short dark hair, looking to the side. The image has a teal overlay.

## JOËLLE PINEAU

Co-director of the Reasoning and Learning lab at McGill University

*Head of the Facebook AI Research lab in Montréal*

A portrait of Doina Precup, a woman with dark curly hair and glasses, smiling. The image has a magenta overlay.

## DOINA PRECUP

Co-director of the Reasoning and Learning lab at McGill University

*Research Team Lead at DeepMind Montréal*



# 01

## Life Science: A Strategic Sector for Québec



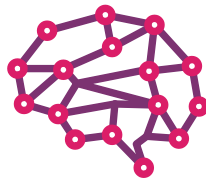
# Internationally-acclaimed fields of expertise



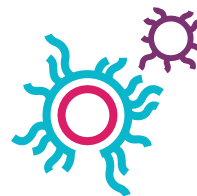
**Oncology**



**Cardio-vascular  
and metabolic  
diseases**



**Neuroscience  
and mental  
health**



**Infectious  
diseases**



**Aging**



**Cellular therapy,  
regenerative medicine**

**Rare diseases**



**Medical imaging  
and cytometry**



**Precision medicine  
(genetics, genomics  
and proteomics)**



**Big Data and  
artificial intelligence**

# Snapshot of foreign companies that have chosen Greater Montréal for their Canadian footprint

 <b>MERCK</b>	 charles river	 <b>Medtronic</b>	 <b>gsk</b>	 <b>abbvie</b>	 <b>McKESSON</b>	 <b>varian</b>	 <b>FRESENIUS MEDICAL CARE</b>
 <b>ZIMMER BIOMET</b>	 <b>SANOFI</b>	 <b>Med Qualis</b> <b>KEYRUS</b> biopharma	 <b>SERVIER</b>	 <b>NOVARTIS</b>	 <b>BIOMÉRIEUX</b>	 <b>ThermoFisher SCIENTIFIC</b>	 <b>Innomar Strategies</b> <small>AmerisourceBergen</small>
 <b>DELPHARM</b>	 <b>Elekta</b>	 <b>GE Healthcare</b>	 <b>Roche</b> Diagnostics	 <b>Otsuka</b>	 <b>JUBILANT DRAXIMAGE</b>	 <b>BIO-RAD</b>	 <b>HERMES MEDICAL SOLUTIONS</b>
 <b>Bristol-Myers Squibb</b>	 <b>BRACCO</b> <small>LIFE FROM INSIDE</small>	 <b>SANDOZ</b>	 <b>valneva</b>	 <b>analogic</b>	 <b>Pierre Fabre Dermo-Cosmétique</b>	 <b>EOS imaging</b>	 <b>Cambrex</b>
 <b>GCBT</b>	 <b>SIEMENS Healthineers</b>	 <b>Lundbeck</b>	 <b>Abbott</b>	 <b>Onco design</b> <small>BIOTECHNOLOGY</small>	 <b>3M</b>	 <b>Guerbet</b>	 <b>Dynacare</b>
 <b>delmar</b> <small>une compagnie de Holding F.I.S.</small>	 <b>ICON</b>	 <b>MEDLINE</b>	 <b>TEVA</b> <small>TEVA CANADA INNOVATION</small>	 <b>LABORATORIES CANADA INC.</b>	 <b>GALDERMA</b>	 <b>PowerHealth Solutions</b>	 <b>ATGen</b>
 <b>INDIVIOR</b>	 <b>icu medical</b> <small>human connections</small>	 <b>DOMAIN THERAPEUTICS</b>	 <b>NICHIKO</b>	 <b>Accreon</b>	 <b>IPSEN</b> <small>Innovation for patient care</small>	 <b>CardinalHealth</b>	 <b>CERTARA</b>



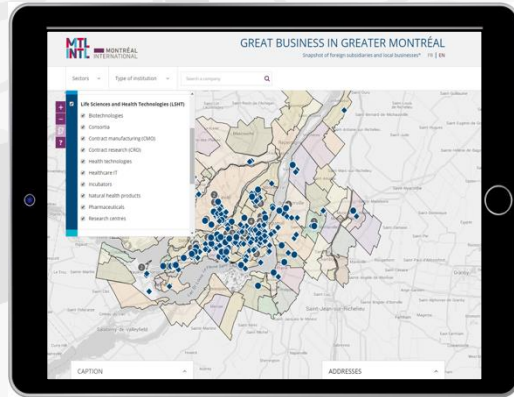
# 02

## A Unique Interconnected & Collaborative Ecosystem

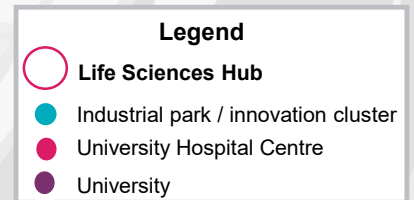
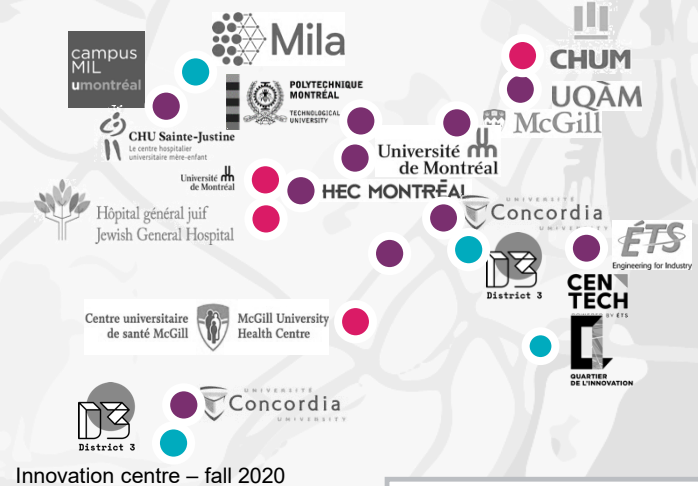


# Major hubs to boost business partnerships throughout the region

Click [here](#) to visit our interactive map of companies



Trudeau  
International Airport



# World-renowned scientific excellence centres and infrastructures

Reputed for our **collaborative approach**  
(Research – Industry – Government)

Recent major investments in **cutting-edge infrastructures**:




**Centre hospitalier  
de l'Université de  
Montréal (CHUM)**

500,000  
ambulatory  
visits/year



**McGill University  
Health Centre  
(MUHC)**

220,000  
ambulatory  
visits/year



**CHU Sainte-Justine,  
Mother & child  
university hospital  
center**

80,000  
ambulatory  
visits/year

Source: CHUM, 2020; MUHC, 2020; CHU Sainte-Justine, 2020.

Research centres		
 CHUM	 Centre universitaire de santé McGill / McGill University Health Centre	 neuro Neurologie Montréal-Hôpital
 Douglas	 MONTREAL HEART INSTITUTE	 IRIC INSTITUTE FOR RESEARCH IN IMMUNOLOGY AND CANCER Université de Montréal
 INRS UNIVERSITÉ DE RECHERCHE À RESEARCH UNIVERSITY	 iugm Institut universitaire de génétique de Montréal	 HSCM FISHC Droits pour la vie
 GenomeQuébec	 IRCM MONTREAL CLINICAL RESEARCH INSTITUTE AFFILIATED WITH UNIVERSITÉ DE MONTRÉAL	 Center for Commercialisation of Cancer IMMUNOTHERAPY
 NRC - CNRC	 Hôpital général juif Jewish General Hospital	 CHU Sainte-Justine Le centre hospitalier universitaire pour enfants Université de Montréal
	 Centre de recherche Hôpital Maisonneuve-Rosemont Centre affilié à l'Université de Montréal	

# Examples of flagship programs to accelerate discovery, development and commercialization

## Pharma/biotechs



**adMare BioInnovations:** Life Science & Health Technology Innovation Hub including the Néomed Innovation Centre, hosting subcontractor research organizations, biotech companies and consultants



**IRICoR:** Accelerating discovery and commercialization of highly innovative therapies in oncology by strong partnerships with industry



**CQDM:** Development of breakthrough tools and technologies that enhance biopharmaceutical R&D productivity



**C3i:** One-stop shop for the development, translation and commercialization of ground-breaking cancer immunotherapies treatments



**CATALIS:** Office mobilizing all stakeholders involved in early clinical research in Quebec

## HealthTech



**Transmedtech Institute:** Transdisciplinary and intersectoral open innovation ecosystem or living lab – To develop next generation medical technologies



**CENTECH:** The ÉTS business incubator and accelerator, ranked among the 20 top performing university incubators in the world. One of two key sector is medical device



**DISTRICT 3:** Startup accelerator and entrepreneurial community located within Concordia University



**MEDTEQ:** Consortium for industrial research and innovation in medical technology



**Health Tech Campus/Campus des technologies de la santé (CTS):** Accelerator for medical technology companies

# The best AI Accelerators and Incubators in the world to help develop tomorrow's breakthroughs



Techstars Montréal AI will select startups that advance the development and application of Artificial Intelligence across all industries and markets.



Powered by ETS, Centech provides mentoring, coaching and financial support to AI companies. The program is run in partnership with Thales.



A partnership with HEC Montréal, CDL-Montréal will run a specialized program focused on Artificial Intelligence and data science to capitalize on Montréal's expertise in the sector.



An accelerator and founder development program for early or idea stage AI-enabled startups.



FounderFuel is an accelerator program providing structured and unstructured mentoring and coaching by proven entrepreneurs over a four-month residency program for two cohorts of 8 to 10 companies per year.



A venture capital firm specializing in incubation, seed, growth financing, and early-stage startup investments. Specialized in the consumer electronics technology market, with a special interest in companies leveraging AI.



Recently ranked as the 8th best Business Incubator – Managed by a University by UBI Global. The Centre has helped establish 125 active startups that employ over 1,200 people and have raised \$110 M to date.



# Strong venture capital funding from various players in Québec

- Since 2018 in Montréal: more than **US\$1.7 billions in VC investments**
- 6 of the 8 most active VCs in Canada in 2019 are based in Montréal
- Example of funding for life science companies:



raised **US\$82.5 M** – September 2019



raised **US\$80 M** – October 2018



raised **US\$60 M** – May 2020



raised **US\$37 M** – January 2020



raised **US\$30 M** – June 2019



raised **US\$29 M** – July 2017

## Private venture capital



## Institutional partners



Caisse de dépôt et placement  
du Québec



Investissement  
Québec



# Montréal is home to Canada's AI cluster headquarters



## **SCALE AI**

Canada's AI supply chain supercluster



Forum  
IA.Québec

## **Québec's AI cluster**

Québec initiative to consolidate its leadership in research, innovation, startup's creation and growth and AI adoption by the industry



## **Other health related Canadian superclusters**



a cross-industry  
collaboration in healthcare,  
communications,  
technology.

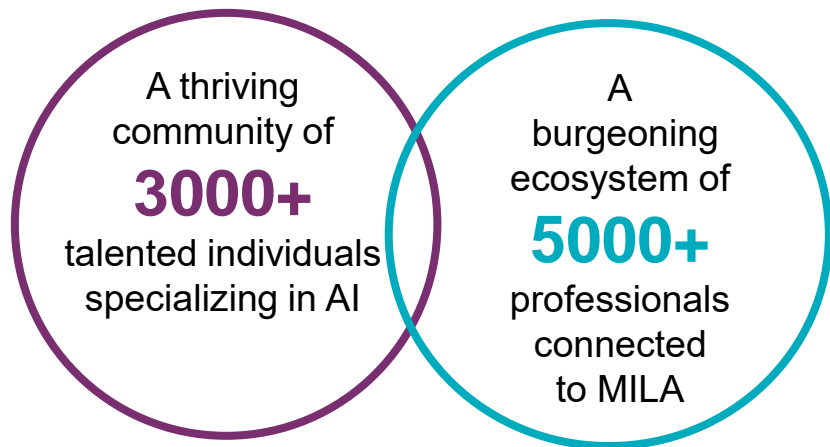
**NGen**

Next Generation  
Manufacturing Canada

The Innovative  
Manufacturing supercluster:  
manufacturing 4.0



# A unique, interconnected & collaborative ecosystem of AI researchers, startups and major players



Example of companies within Mila



**BIOS**

ELEMENT AI



**SAMSUNG**

espace  
cdpq



# Examples of Montréal-based companies using AI in healthcare



**IMAGIA:** developing radiomics biomarkers and clinical decision support systems



**My Intelligent Machines:** accelerating post genomic research by leveraging AI & bioinformatics



**QUANTUMBLACK:** using data, analytics, and design to optimize how drugs are brought to market



**InVivo AI:** facilitating accurate toxicity screening in the earliest phases of drug discovery



**Corstem:** medical imaging analysis and computer vision, using machine learning



**Informed experiments:** distilling the complexity of gene interaction networks with AI algorithms to accelerate cancer research



**Precision analytics:** predictive analytics and cloud computing to handle large datasets



**Diagnos:** early detection of critical health issues through the use of AI



**Mr Young:** AI-powered chatbot designed to help cope with anxiety



**Myelin:** AI synthesis of ASD scientific data



**Innovie Health:** AI solution to drive the most accurate care management strategy for healthcare system



**Arctic Fox AI:** AI-assisted radiology for Alzheimer's and related dementias



**BIOS:** developing neural interfaces to enable AI-based treatments on organs and nerve systems throughout the body



**Zilia:** combines imaging, spectrometry and AI for the detection of biomarkers involved in ocular, neurological and systemic conditions

# Digital Health and Discovery Platform (DHDP), a network of partners working to establish a Canada-wide health data platform



May 23, 2019

**Federal Government Awards \$49 M to Terry Fox Research Institute and Imagia led Consortium to Accelerate Medical Breakthroughs**

Joint project aims to unlock data-driven discoveries in cancer and other diseases to unleash the full potential of personalized healthcare

This award, together with **\$108 M** in cash and \$165 M in in-kind contributions from 97 consortium partners, supports the DHDP that will combine Canadian expertise in **AI and precision medicine**.

## Participants

A starting composition of **95-members across 9 provinces**: 31 healthcare institutions, 9 SMEs and 10 large enterprises, 7 universities, 22 research foundations, granting agencies and NGOs, and all 4 major Canadian AI research labs from **Québec, Alberta and Ontario** including:







# Data access facilitated & AI initiatives within healthcare

## Data lake project CITADEL:

- **The Center for the Integration and Analysis of Medical Data (CITADEL)** of the Centre hospitalier de l'Université de Montréal (CHUM) is one of the initiatives adopted to facilitate learning, teaching and communication:
  - 10 integrated information systems
  - 17.9 million episodes of care
  - 3.6 million patient data

## School of AI in Healthcare (SAIH)

- Devoted to the study of the social, legal and ethical implications of **AI in the health sector**
- Doctors and researchers at the CHUM are pursuing **80 projects involving artificial intelligence**

# 03

## A Deep and Growing Pool of Highly Qualified Talent


**MTL**  
**INTL**

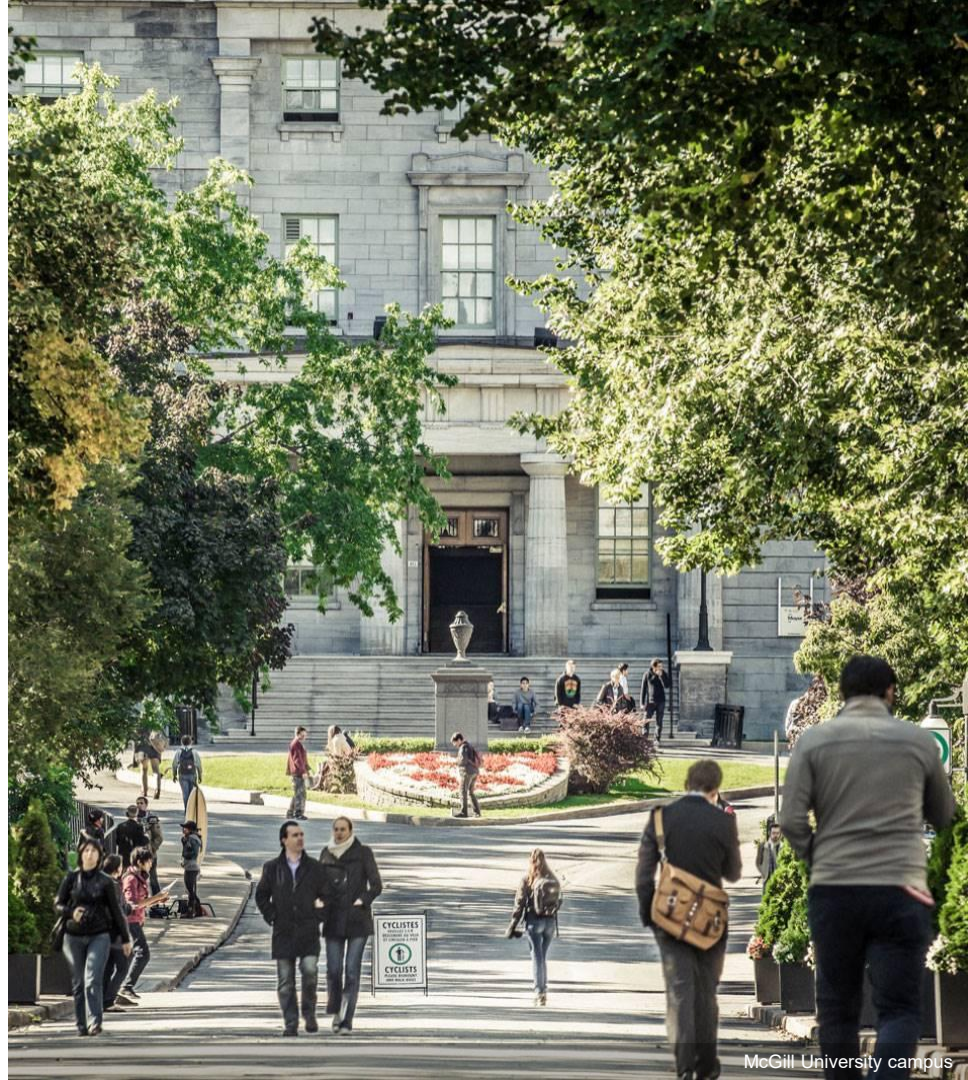
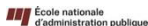
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# The best student city in the Americas and Canada's university capital

- Canada's university capital: 11 university institutions and 60 colleges
- 320,000 post-secondary students, including more than 200,000 university students and 35,500 international university students
- \$1+ billion in funding yearly dedicated to university research
-  Best student city in the Americas  
2019 QS Best Student Cities Rankings



# A large pool of university students in life science and STEM-related programs\* in Québec



More than **50,000**  
university students (80% in Greater Montréal)



More than **16,000**  
graduates (80% in Greater Montréal)



More than **CA\$1 billion**  
in funding yearly  
dedicated to university  
research

\* STEM-related programs include: computer engineering and computer science, mathematics, probabilities and statistics, electrical engineering and mechanical engineering.  
Source: Ministry of Education and Higher Education, 2020; compilation by Montréal International; Research Infosource Inc., 2018.

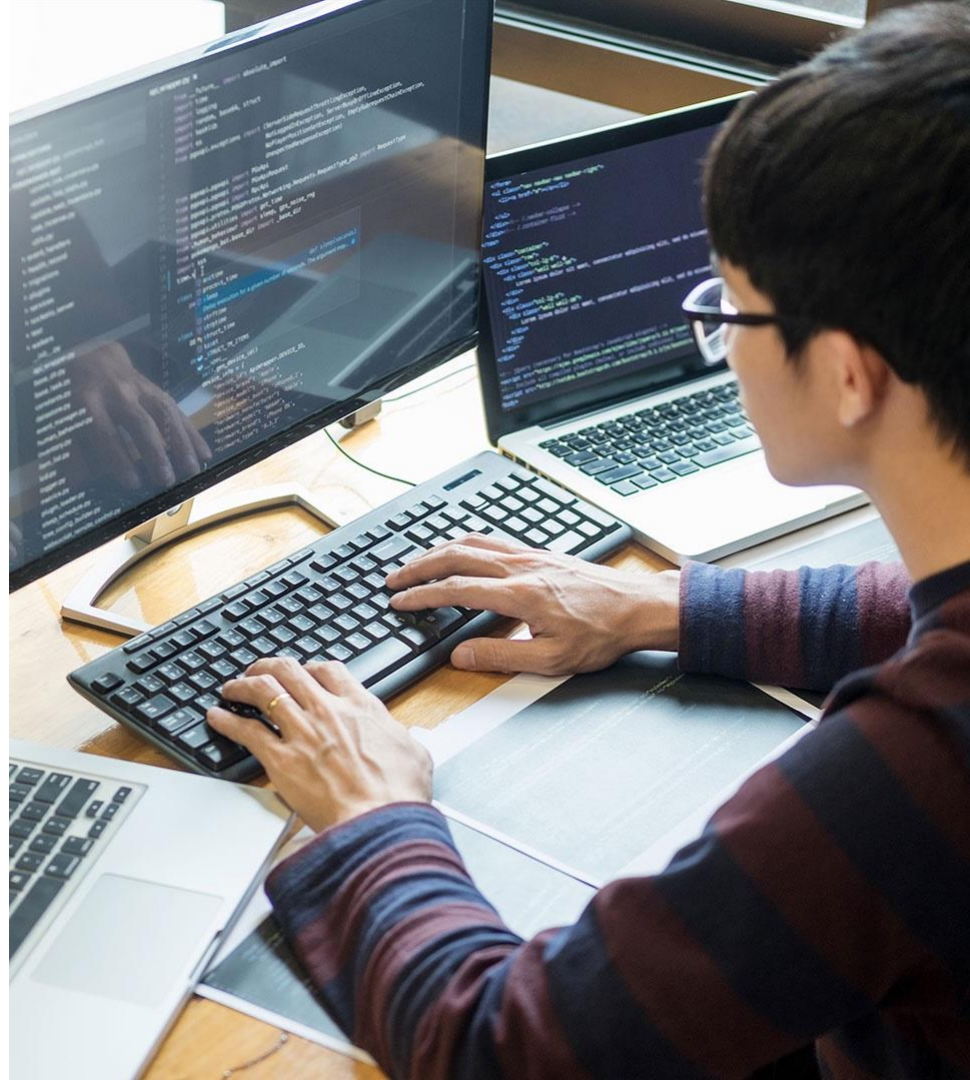
# A pool of highly qualified workers

## Life science and STEM-related occupations in Greater Montréal

### Employees in 2019

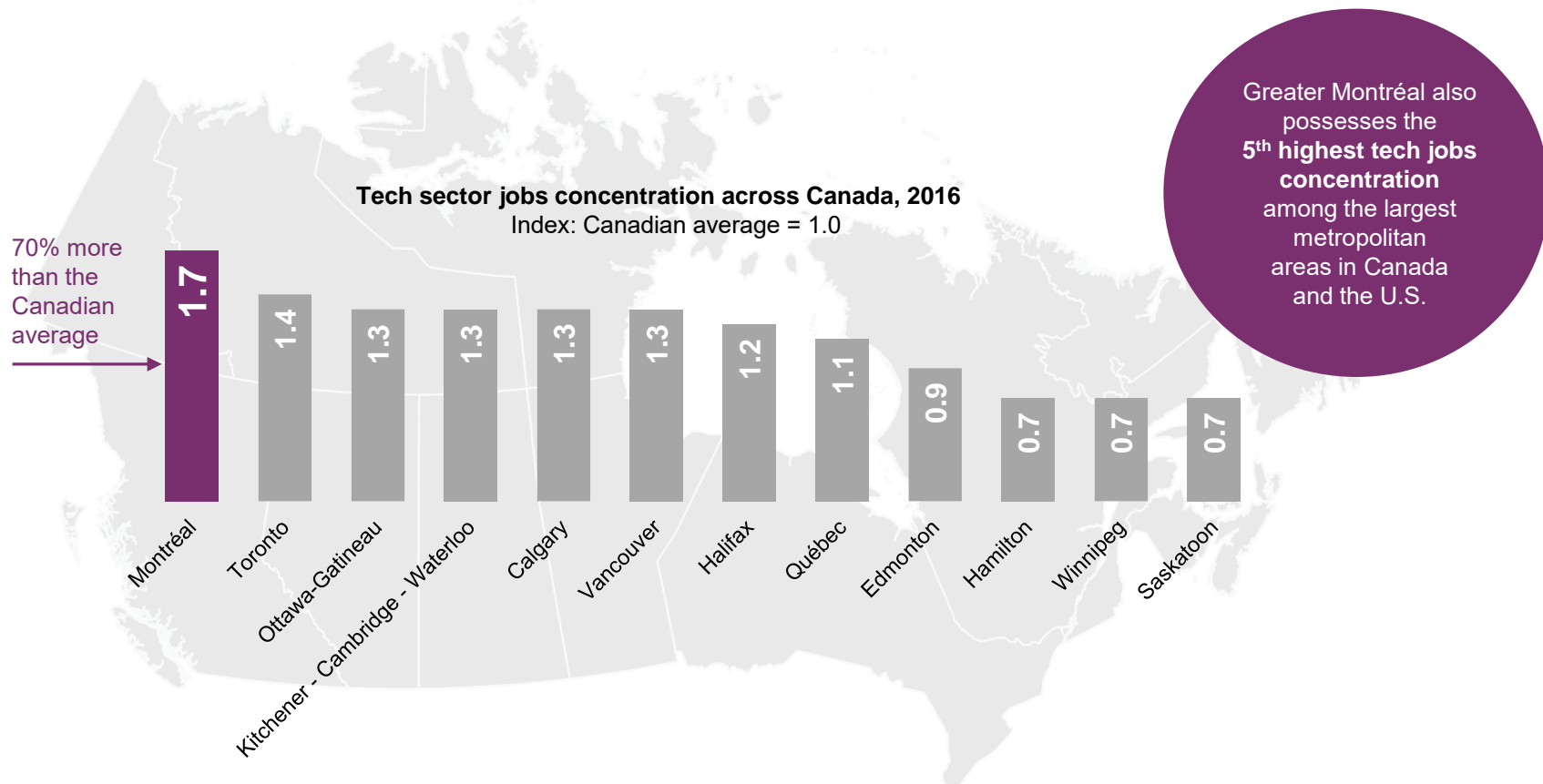
Life science professionals (including chemists, chemical engineers and biologists, etc.)	12,800
Other engineers (including Industrial, manufacturing and computer engineers)	15,900
Computer and information systems professionals	96,700
Mathematicians and statisticians	3,200
<b>Total</b>	<b>134,500</b>

Source: Statistics Canada 2019; National Occupational Classification, 2019.





# Montréal, the highest concentration of tech jobs in Canada

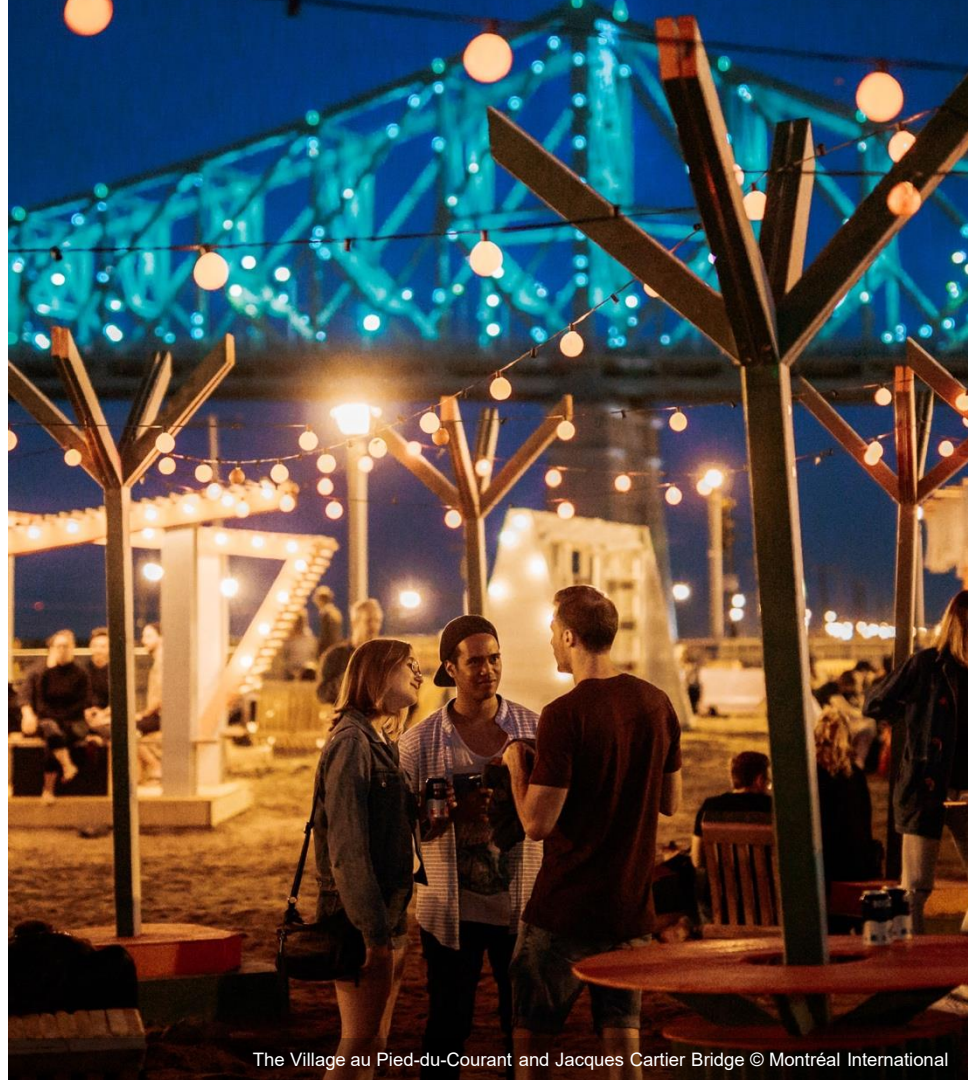


# A new generation ready to take over

More than 11,000 university students are enrolled in Artificial Intelligence and data-related programs in Greater Montréal:

AI-related University programs	Students enrolled, 2017-2018	University graduates, 2017
Computer Sciences	8,104	1,558
Computer Engineering and Computer Science	2,002	374
Mathematics	1,438	262
Applied Mathematics	130	27
Probabilities and Statistics	190	35
<b>Total</b>	<b>11,864</b>	<b>2,256</b>

Source : Ministère de l'Éducation et de l'Enseignement supérieur, 2019;  
compilation Montréal International.



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

# A labor pool of AI-related specialists

AI-related jobs	Employees in 2018
Information Systems Analysts and Consultants	31,100
Computer Programmers	24,200
Computer and Information Systems Managers	10,100
Computer Engineers	4,200
Software Engineers and Designers	7,000
Database Analysts and Data Administrators	4,300
Mathematicians	5,400
<b>Total</b>	<b>86,300</b>

## 86,300 AI-related specialists employed in Greater Montréal

Montréal's workforce of + 2 million is among North America's most dynamic and offers a high degree of stability with turnover rates well below North American averages. **The turnover rate for the IT industry is 11%.**

### EASE OF RECRUITMENT

According to Aon Hewitt\*, Montréal ranks 3<sup>rd</sup> in North America for the lowest overall risk associated with recruiting, employing and relocating workers.

\* Overall workforce risk includes relocation and expatriation; mergers, acquisitions and partnerships; absenteeism; employee health and well-being programs; internal relationships; employment in general; globalization; cultural differences; and talent sources.

# 04

## Attractive Operating Costs and Incentives





# Most competitive operating costs



**1<sup>st</sup>** clinical trials and life Science R&D Centre<sup>1</sup>

**1<sup>st</sup>** bio-pharma manufacturing<sup>2</sup>

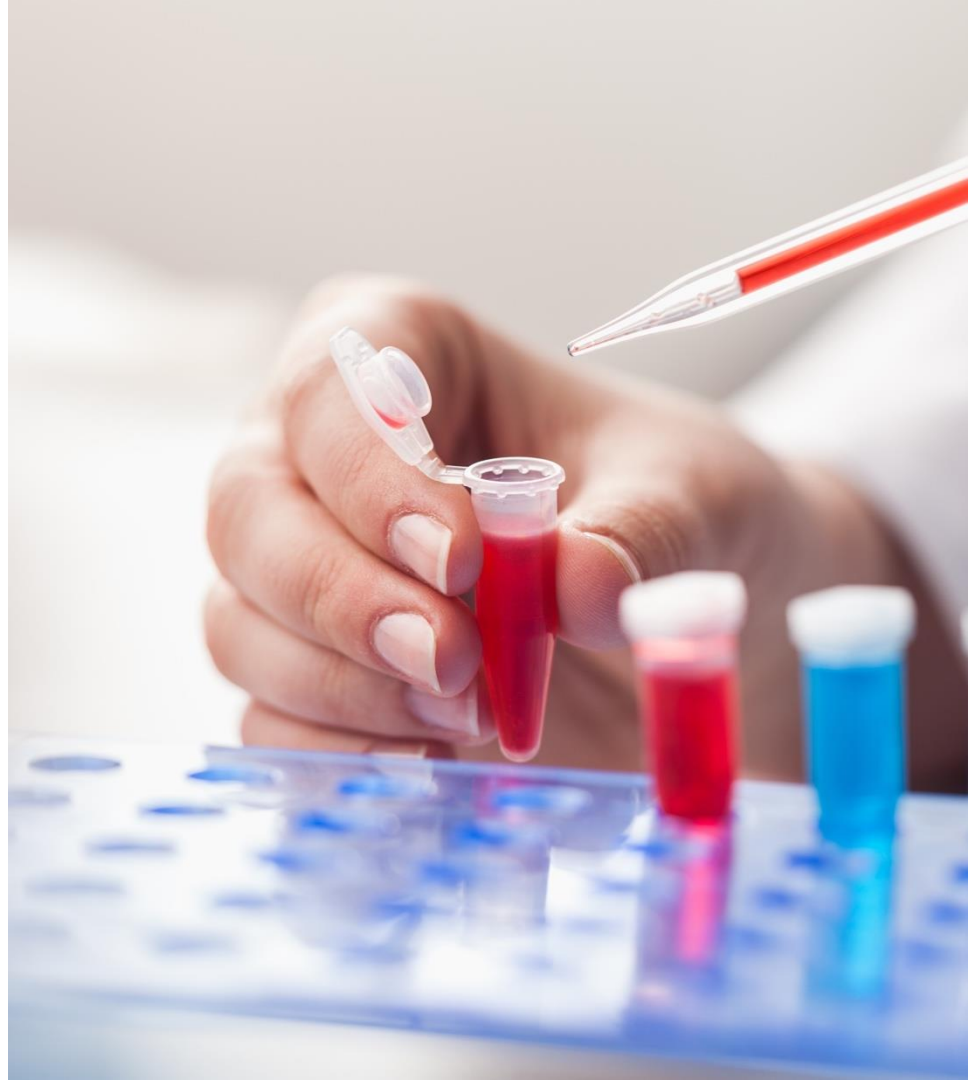
**1<sup>st</sup>** medical devices manufacturing plant

among the **20** largest metro areas in Canada and the U.S.

Source: fDi Benchmark, 2019.

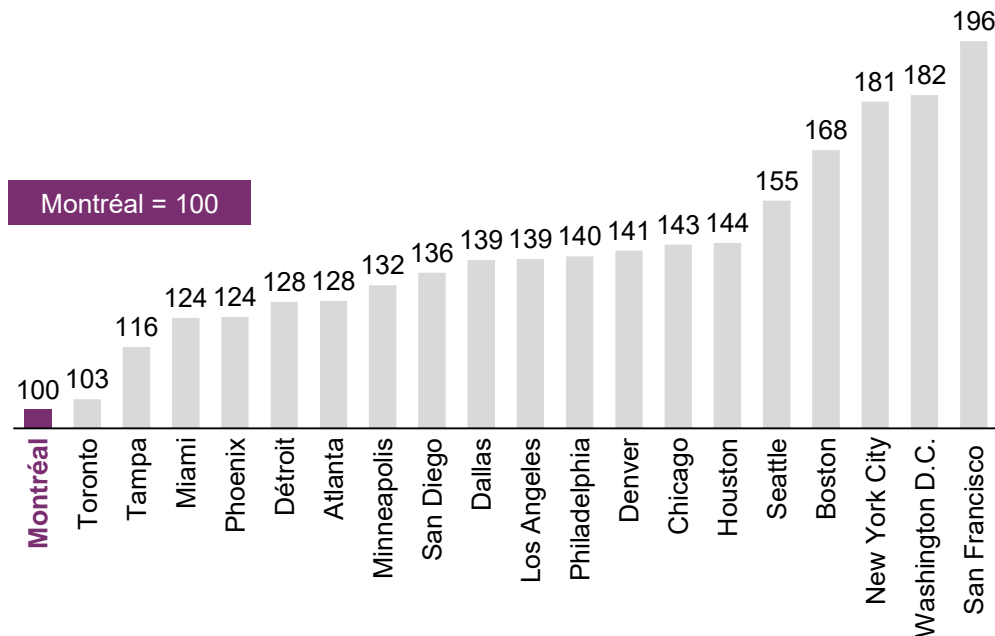
1: Research, discovery, design, development or testing of biotechnology or pharmaceutical related products and/or medical devices.

2: Companies in this industry develop and manufacture therapeutic products and in vitro diagnostics using biotechnology.





# Most competitive operating costs for software development



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

- **1<sup>st</sup> place ranking:** The most competitive operating costs compared to any other major metropolitan area in Canada and the U.S. (2019)
- **29% cost advantage compared** to the average of the 20 largest metropolitan areas in Canada and the U.S. (2019)





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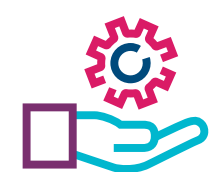
We support businesses  
expanding or relocating  
to Greater Montréal





# Free and confidential services for a faster and more profitable investment

We provide personalized support tailored to your business goals thanks to a team of [80 professionals](#).



Strategic and operational support (business plan, sectoral expertise)



Site selection assistance (regional economic data, comparative reports)



Advice on funding sources (financial and tax incentives)



Strategic assistance to recruit international talent and simplify immigration procedures



Access to an established network of partners, university institutions and research centres



Communication services to announce your project in the region





# A network that opens doors for you

We open all the doors necessary for the growth and success of businesses in the Québec metropolis.

- Legal services
- Recruitment and Human resources
- Communications and Public relations
- Financing and banks
- Insurance
- Real estate
- Accounting
- IT services and technological solutions
- Consulting firms
- Relocation services

Funded by 200 private companies, the governments of Canada and Québec, the *Communauté métropolitaine de Montréal* and the City of Montréal, Montréal International is acting as a driving force.

Canada

Québec

  
Communauté métropolitaine  
de Montréal

Montréal







Montréal  
International

Greater Montréal is already home  
to over 2,000 foreign subsidiaries.

Find out who they are >

Find out why they chose our region >