

2011



# Invest in Canada

WIRELESS COMMUNICATIONS

Canada's competitive advantages



Canada 

## MAJOR GLOBAL INVESTORS IN CANADA

- Alcatel-Lucent
- Avaya
- Cisco
- Ciena
- Ericsson
- Huawei
- Nokia
- Nokia Siemens Networks (NSN)
- Sanmina-SCI
- SiGe Semiconductor
- Oracle
- Teledyne DALSA
- ZTE Corporation

## LEADING CANADIAN COMPANIES

- BelAir Networks
- Bridgewater Systems
- DragonWave
- Icron
- GLENTEL
- Micralyne
- Miranda Technologies
- Psion Teklogix
- QNX Software Systems
- Redline Communications
- Research In Motion
- Sierra Wireless
- Sinclair Technologies
- Vecima Networks
- VoiceAge
- Widality

## RECENT INVESTMENTS IN CANADA

### TELLABS

At the end of 2010, Tellabs, a Chicago-based wireless company, opened a mobile Internet R & D office in Vancouver to increase its IP expertise and add intelligence to the wireless network.

### HUAWEI

In April 2010, Huawei, a Chinese telecom company, opened a \$67 million\* research facility in Ottawa, creating 70 new jobs. The company eventually plans to employ more than 500 people.

### D-LINK

In 2009, D-Link of Taiwan, specialized in networking, broadband and data communications, expanded their operations in Toronto.

### TECHFORCE TELECOM

Kentucky-based Techforce Telecom opened an office in Calgary in 2009. They offer installation, turn-up and testing services to the telecommunications industry.

\* Unless otherwise noted, all values in this publication are in Canadian dollars.



## CANADA'S ADVANTAGES IN WIRELESS COMMUNICATIONS

**Information and communications technologies (ICT) are one of Canada's most innovative sectors, representing about five percent of Canada's gross domestic product. ICT is one of the four priorities of the Canadian government's science and technology strategy, and is a necessary component for success in the three other priorities identified in this strategy (environmental science and technology; natural resources and energy; health and life sciences). Canada is also positioning its ICT sector for leadership in the global digital economy by developing a forward-planning national Digital Economy Strategy.<sup>1</sup> This strategy aims to help the ICT sector create new products and services, accelerate the adoption of digital technologies, and contribute to improved cyber-security practices by industry and consumers.**

Canadian companies are among world leaders in WiFi, mesh network, WiMAX, RFID, UWB (ultra wide-band) and Software Defined Radio (SDR) technologies. The Canadian wireless market is expected to grow following the upcoming auctioning of the UHF band spectrum.

The Government of Canada provides industry support through the Communications Research Centre Canada (CRC), programs offered under the Centres of Excellence for Commercialization and Research, and the National Research Council (including the NRC Institute for Information Technology). The CRC is the only national laboratory with critical mass and expertise in the four major platforms that form the basic transport mechanism for information delivery across Canada: wireless, broadcasting, satellite, and fibre optics.<sup>2</sup> Since 2007, Canada has invested \$57 million annually to advance research and facilitate commercialization of technologies, products and services.<sup>3</sup>

Wired and wireless telecommunications firms dominate ICT research and development, with \$6.2 billion spent annually in research and development.<sup>4</sup> The Government of Canada encourages R & D through generous Scientific Research and Experimental Development tax incentive programs. Leading multinational telecom companies such as Alcatel-Lucent, Nokia, and Huawei have already benefited from these programs and have chosen to invest in R & D in Canada. Swedish manufacturer Ericsson also selected Canada as the site of its largest R & D and services centre outside of Sweden.

**NEXT-GENERATION NETWORKS:** Canada is a favoured location for some major multinational enterprises, including Alcatel-Lucent, Ericsson, Huawei, Nokia, and Nokia Siemens Networks. Bridgewater Systems has LTE (Long Term Evolution) solutions capable of managing the increasing performance requirements of mobile broadband, while Redline Communications was recognized as one of the first companies in the world to have a complete WiMAX product line certified by the WiMAX Forum. Canada also has an avant-garde outlook on national spectrum policies and standards related to WiMAX bands of interest.

**MOBILE MEDIA:** Canadian companies have demonstrated leadership through unique and innovative end-to-end solutions for email and data communications. This includes leading-edge Research In Motion, renowned for the BlackBerry smartphone, and Sierra Wireless, one of the largest M2M (machine to machine) companies in the world and manufacturer of the AirCard mobile broadband device. Canada is also a strong player in mobile platforms and the distribution of content creation tools.

**CONNECTED VEHICLES:** QNX Software Systems and Alcatel-Lucent Canada are at the forefront of mobile broadband with their LTE Connected Car concept, demonstrating how 4G/LTE networks can bring video-on-demand, Internet radio and other wireless broadband services to the automobile. QNX software is already available on more than 250 different car models, including those from GM, BMW, Ford and Mustang.

**MICROELECTRONICS, NANOTECHNOLOGY AND PHOTONICS:** As next-generation networks progress either through LTE or WiMAX, the use of nanomaterials and next-generation power amplifiers will reduce the size, weight and power consumption of some radio equipment.<sup>5</sup> Key players in Canada's nanotechnology ecosystem include Alberta's TRLabs, the University of Alberta's Ultrafast Photonics and Nano-Optics Laboratory, and Simon Fraser University's 4D Labs, among others. Leading centres of photonics research also include the National Research Council's Institute for Microstructural Studies, which houses the Canadian Photonics Fabrication Centre, the University of Ottawa's Centre for Research in Photonics, and McMaster University's Photonics Research Laboratories.

<sup>1</sup> "Government of Canada Launches National Consultations on a Digital Economy Strategy," Industry Canada, May 10, 2010

<sup>2</sup> Centres of Excellence for Commercialization and Research Program Overview, Networks of Centres of Excellence of Canada, [www.nce-rce.gc.ca](http://www.nce-rce.gc.ca)

<sup>3</sup> ICT Investment Gap between Canada and the United States Grows to 40%, CNW news, 22-10-2010

<sup>4</sup> "Bringing green solutions to life - CRC bolsters business case for next generation networks," Communications Research Centre Canada, *Eye on Technology*, Issue 13, Winter 2010

<sup>5</sup> "Bringing green solutions to life - CRC bolsters business case for next generation networks," Communications Research Centre Canada, *Eye on Technology*, Issue 13, Winter 2010



## CANADA'S COMPETITIVE ADVANTAGES

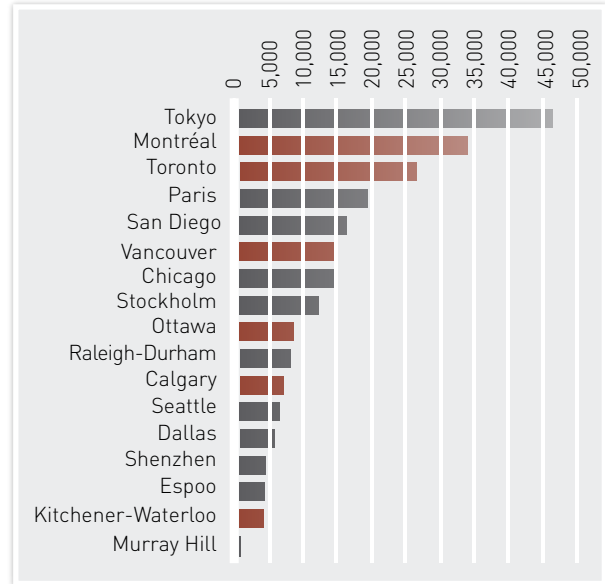
### Advantage:

#### A large pool of experienced, highly trained R & D researchers

With its large number of experienced, highly trained R & D researchers, Canada offers many advantages to companies looking to launch or expand their R & D facilities. With close to 35,000 researchers in Montréal alone, and another 40,000 in Toronto and Vancouver combined, Canada's three largest cities are ideal investment locations. Vancouver, Ottawa, Calgary and Kitchener-Waterloo are also centres of scientific research expertise.

- This chart looks at the estimated total number (for 2011) of researchers involved in research and development activities.

Researchers in research and development (estimates)



Sources: fDi Benchmark; fDi intelligence based on data from the Financial Times Ltd.

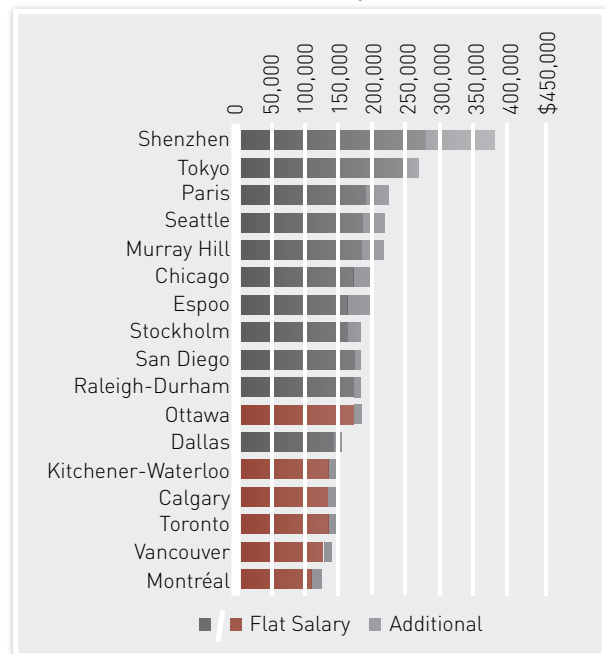
### Advantage:

#### Competitive salary costs in R & D

Executive R & D salary costs in Canada are competitive with cities in Asia, Europe and the United States.

- This chart examines remuneration levels for heads of research and development working in multinational companies. R & D heads, who exercise overall control of their company's R & D function, may direct research units in a limited number of countries or in a large research and development centre for a single product line; the products they oversee are highly technical and require years of development.
- The remuneration figures in the table include flat salary as well as additional compensation such as incentive payments and performance bonuses.

Head of research and development



Sources: fDi Benchmark; Towers Watson, 2010/11 Global 50 Remuneration Planning Report

## CANADA'S COMPETITIVE ADVANTAGES

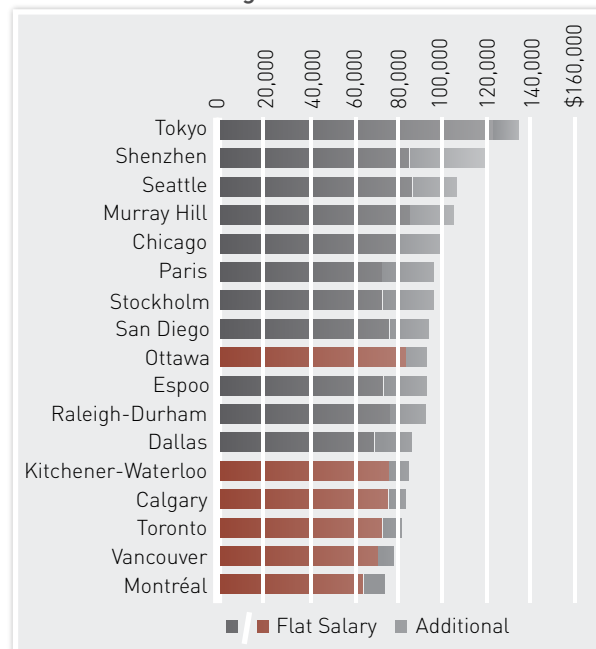
### Advantage:

#### Competitive salary costs in engineering

Senior research engineers work within broad guidelines and may supervise more junior staff. They typically have seven years of experience in the position.

- Remuneration includes flat salary as well as additional compensation, such as incentive payments and performance bonuses.

#### Senior research engineer



Sources: fDi Benchmark; Towers Watson, 2010/11 Global 50 Remuneration Planning Report

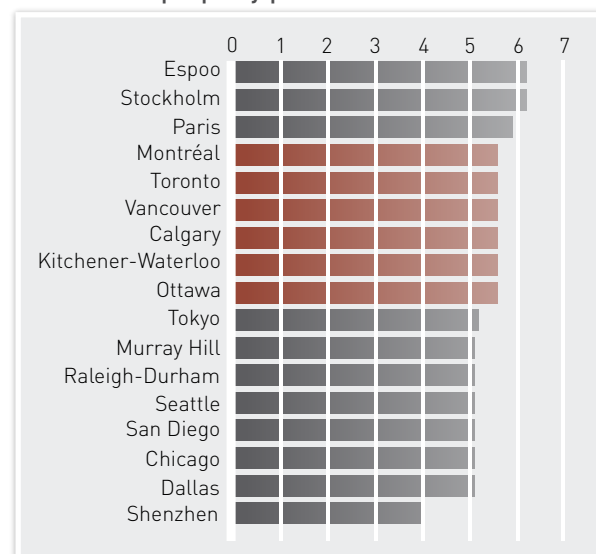
### Advantage:

#### A respect for intellectual property rights

The protection of intellectual property (which includes the protection of patents) is essential for companies that regularly depend on the innovative use of technology to create new products. As this chart indicates, Canada offers a high level of intellectual property protection.

- This table rates selected cities on a scale of 0 to 7, where 0 signifies that intellectual property protection is "very weak" while 7 signifies that it is "very strong."

#### Intellectual property protection



Sources: fDi Benchmark; World Economic Forum, Global Competitiveness Report (2010/11)

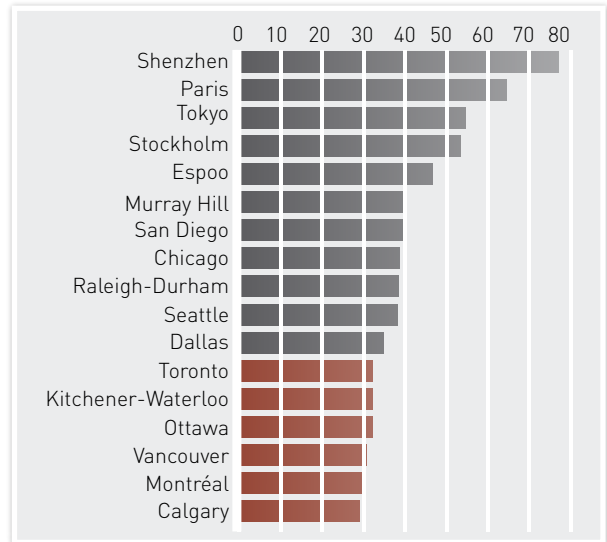
## Advantage:

### Favourable corporate income tax rates

Canadian corporate income tax rates compare very favourably with those of other countries.

- This chart looks at the total income tax payable by corporations in selected cities. Figures express tax payable as a percentage of companies' gross profit, in 2009-2010.

Total tax payable by businesses



Sources: fDi Benchmark; World Bank, *Doing Business 2010*; The Tax Foundation, *National and State Corporate Income Tax Rates, U.S. States and OECD Countries, 2009*; KPMG: *Income Tax Rates for General Corporations (2008/2009)*.

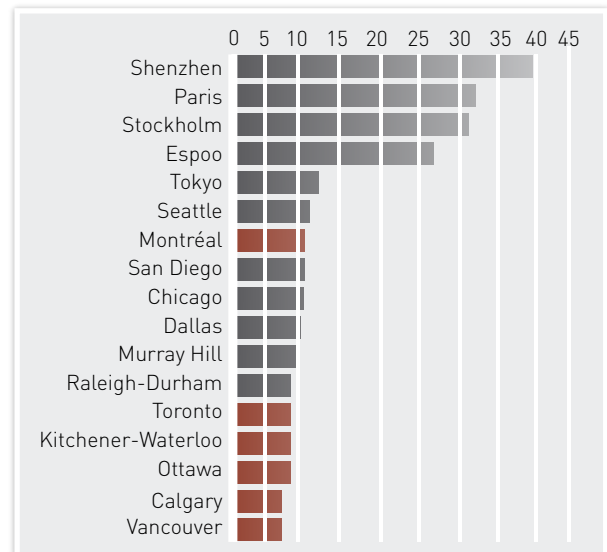
## Advantage:

### Low social security contributions

Canadian workers have very good social security coverage, but this does not translate into excessive costs to employers. In Canada, social security costs to employers are lower than in some states in the U.S., as well as some countries in Europe and in Asia.

- This chart looks at employers' contributions to employee social benefits, expressed as a percentage of employee salaries.

Social security paid by businesses



Sources: fDi Benchmark; Deloitte International, *International Tax and Business Guide* (Oct. 2009); Towers Watson, *2009/2010 Global 50 Remuneration Planning Report*; fDi intelligence based on Towers Watson data (Aug. 2010); fDi intelligence based on data from the International Social Security Association (ISSA).



# CANADA'S WIRELESS COMMUNICATIONS INDUSTRY: AN OVERVIEW

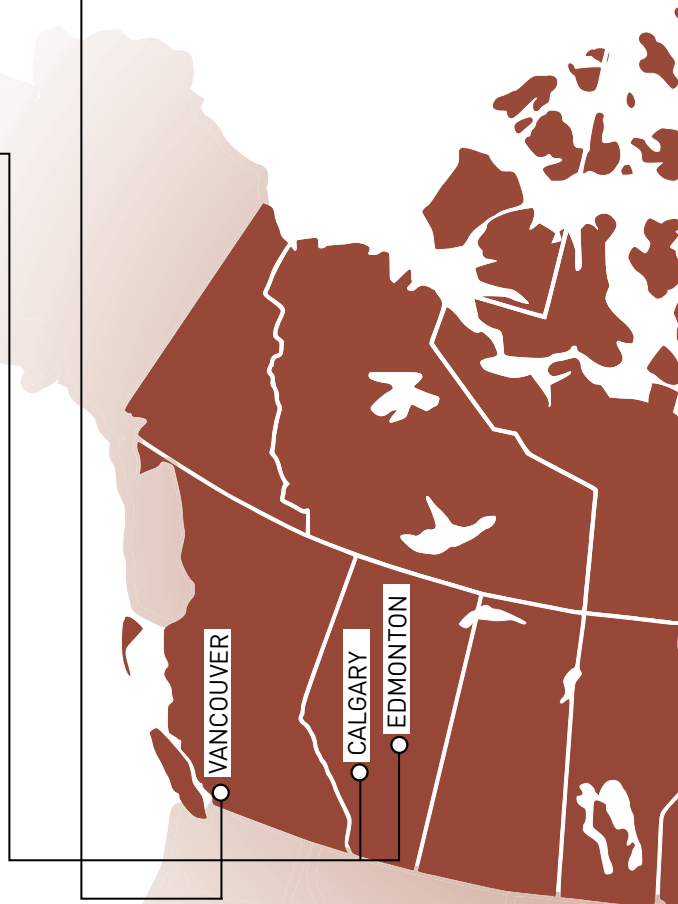
## BRITISH COLUMBIA ○

**Vancouver** is a global leader in the convergence of digital media, wireless and mobile, generating over \$3 billion in revenue from 1,150 companies, which include Wavefront, GLENTEL, Star Solutions and Vecima Networks. Vancouver is also a leading wireless R & D hub, with Nokia's R & D facility anchored by large tenants such as Sierra Wireless and PMC-Sierra. In addition, Tellabs recently opened an R & D office in the city. Vancouver has a large pool of talent supported by such institutions as the University of British Columbia, Simon Fraser University, and the National Research Council of Canada Herzberg Institute of Astrophysics.

## ALBERTA ○

**Calgary** is the centre for leading multinationals such as Sanmina-SCI, Hemisphere GPS, Wedge Networks and Novatel Wireless. A growing number of other firms are located in the city, including Techforce Telecom, which opened an office in June 2009. Key Canadian companies leading the wireless and telecom sector in Calgary are Widelity, Meta4hand, Blackline GPS and Baseband Technologies. Research in this industry sector is fuelled by the University of Calgary, TRILabs and the Network for Emerging Wireless Technology (NEWT) test centre.

**Edmonton's** growing microelectronics cluster is anchored by Micralyne, one of the largest independent microelectromechanical systems (MEMS) foundries in the world. Leading research facilities supporting this cluster are the University of Alberta, the National Research Council's National Institute for Nanotechnology, the NanoFab research facility, nanoAlberta, and the Alberta Centre for Advanced MNT Products (ACAMP). Companies involved in micro and nanotechnology MEMS activities include Norcada, Harding Instruments and BigBangwidth.







## ○ ONTARIO

Huawei, Oracle and ZTE Corporation are three of the more than 3,300 high-tech companies present in the **Greater Toronto Area**, with Oracle ranked among the top-25-performing IT multinationals operating in Canada (Branham Group report for 2010). The University of Toronto's communications research institute, NANOnetwork, York University, and the University of Ontario Institute of Technology all have a strong track record of producing highly skilled employees and outstanding research.

Canada's "Technology Triangle" in Ontario's **Kitchener-Waterloo** area is the headquarters of world-renowned Research In Motion and Teledyne DALSA. Multinational enterprises Icera (Sirific Wireless), LSI and Sandvine also have a strong R & D presence in the region. Kitchener-Waterloo's top-ranking universities, Waterloo and Wilfrid Laurier, develop talent that can pursue careers in the 700 high-tech companies in the area. Research facilities that support this hub include Communitel, the Accelerator Centre, the Waterloo Institute for Nanotechnology, the Centre for Wireless Communication and the Centre for Automotive Research (WATcar).

Canada's national capital, **Ottawa**, is home to more than 1,600 high-tech companies. Avaya, Alcatel-Lucent, Bridgewater Systems, Ciena, Cisco, CMC Electronics, DragonWave, Ericsson, Mitel, QNX Software Systems and SiGe Semiconductor all have a strong R & D presence in the city. Huawei joined these leading Canadian and multinational companies in April 2010 when it officially opened an R & D facility. The sector is supported by the Ottawa Centre for Research and Innovation (OCRI), Canadian Advanced Technology Alliance, Information Technology Association of Canada, and the National Research Council's Institute for Information Technology and Canadian Photonics Fabrication Centre. Talent is drawn from the University of Ottawa, Carleton University and Algonquin College.

## ○ QUÉBEC

**Montréal** is home to Ericsson's largest R & D and services centre outside of Sweden. Leading companies specializing in telecom equipment, microelectronics and photonics in the city include Wavesat, EXFO, Miranda Technologies and Ultra Electronics. Montréal's cutting-edge digital-media hub represents a large percentage of the city's 5,000 ICT companies, which generate a combined \$9 billion in annual revenue. The greater Montréal area's four comprehensive universities and seven other institutes of higher learning provide companies in this cluster with the skilled workforce they need to meet their high labour requirements.

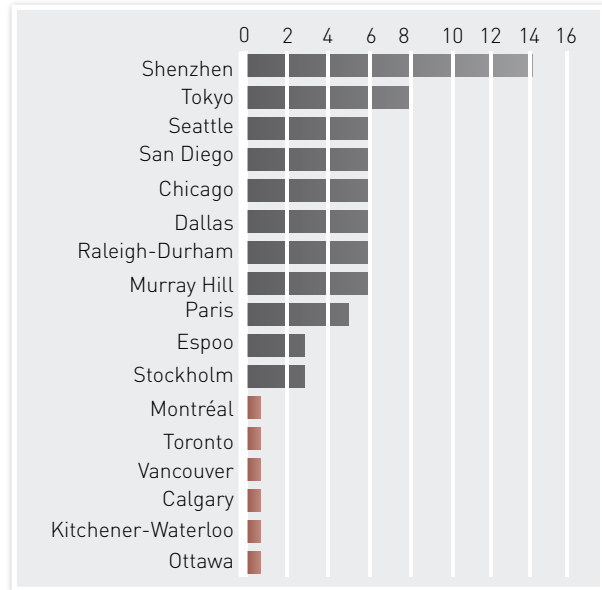
The Microelectronics Innovation Centre in **Bromont** is a global centre of excellence in microchip packaging technologies and MEMS. The \$218 million facility is a partnership of DALSA Corporation, IBM Canada, the Université de Sherbrooke and the governments of Québec and Canada.

# CANADA'S COMPETITIVE ADVANTAGES

## Advantage: Simplified, one-step business registration

In Canada, investors need follow only one procedure to register a business: they simply select the appropriate federal or provincial authority and register their business name by filling out the appropriate forms and paying the required fees. Once a company has obtained its legal status, it can register with the various regulatory agencies that govern its area of activity and that are responsible for applying relevant taxation statutes and labour codes.

## Number of procedures required to register a business



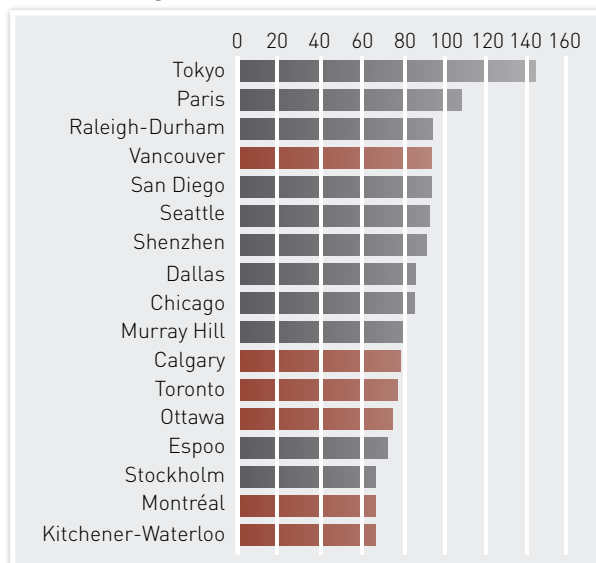
Sources: fDi Benchmark; World Bank, *Doing Business 2010*

## Advantage: Great quality of life at affordable cost

Canadian cities offer a high quality of life at an affordable cost. Compared to Asian and U.S. cities, Calgary, Toronto, Ottawa, Montréal and Kitchener-Waterloo boast a lower cost of living combined with a higher quality of life. In 2011, the Economist Intelligence Unit ranked Vancouver as the most liveable city in the world, while Toronto and Calgary also placed in the top 10.

- This chart assesses a variety of living costs, including housing.

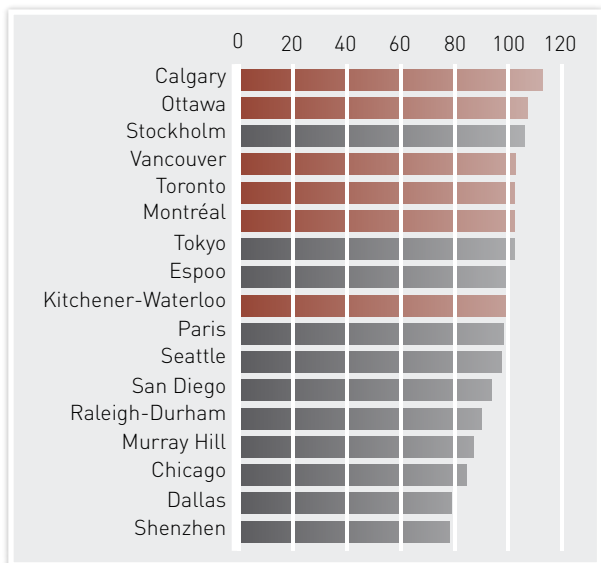
### Cost of living index



Sources: fDi Benchmark; fDi intelligence based on data from the Financial Times Ltd.

- This chart assesses quality of living factors.

### Quality of living index



Sources: fDi Benchmark; fDi intelligence based on data from the Financial Times Ltd.

## INVESTMENT LOCATION BENCHMARKING

The tables and graphs in the preceding pages were generated by fDi Benchmark, a service of the Financial Times Ltd. ([www.fdibenchmark.com](http://www.fdibenchmark.com)). This search tool relies on industry-recognized databases and location assessments to appraise the attractiveness of countries, states/provinces and cities around the world for specific sectors and investment projects.

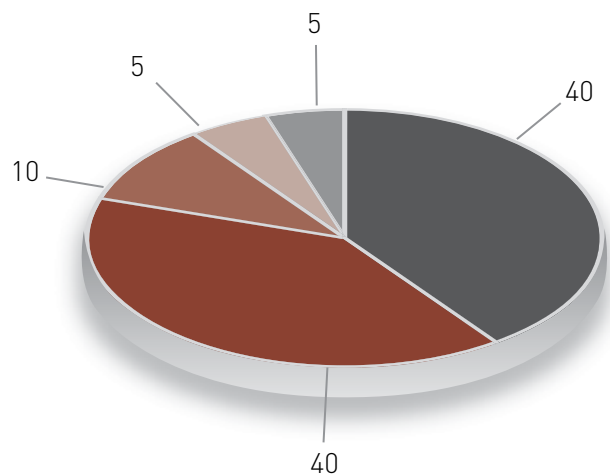
- The Canadian and foreign cities selected for benchmarking in this document are locations with a significant cluster of companies involved in the wireless industry: Calgary, Chicago, Dallas, Espoo (Finland), Kitchener-Waterloo, Montréal, Murray Hill (NJ), Ottawa, Paris, Raleigh-Durham, San Diego, Seattle, Shenzhen, Stockholm, Tokyo, Toronto and Vancouver.
- The company profile below is that of a small wireless company with a staff of 30 workers located in a downtown office.






### Wireless technology centre

COST FACTOR	USAGE AMOUNT
Property	Square metres
Total occupancy (in-town office rent)	600 m <sup>2</sup>

EMPLOYEE TYPE	PROFILE HEAD COUNT
<b>Information technology</b>	
Network analyst	1
Network engineer	1
Programmer	5
Project team leader	1
Senior designer	1
Senior manager	1
Senior programmer	1
Senior system analyst	1
Software development engineer	4
Software development manager	1
Software programmer	10
Systems analyst	2
Systems designer	1
<b>Total</b>	<b>30</b>

### Quality Model Properties / Weights Applied



WEIGHTING MODEL OVERVIEW	WEIGHT	
Labour Availability and Quality	40%	
Presence of an Industrial Cluster	40%	
General Business Environment	10%	
Infrastructure and Accessibility	5%	
Living Environment	5%	

# CANADA'S COMPETITIVE ADVANTAGES

**Canada boasts many advantages and unparalleled potential: it is a place where businesses can achieve excellence on a global scale.**

## A HIGHLY EDUCATED WORKFORCE

Canada ranks second in higher-education achievement among members of the Organisation for Economic Co-operation and Development (OECD). (Source: IMD, *World Competitiveness Yearbook 2010*)

## A WELCOMING BUSINESS ENVIRONMENT

The Economist Intelligence Unit rated Canada the number one place to do business in the G-7 for the next five years. (Source: Economist Intelligence Unit, *Business Environment Ranking*, March 2011)

## A SOUND ECONOMY

Since the third quarter of 2009, Canada's economy has grown for six consecutive quarters and has now fully recovered job and output losses that occurred during the global economic crisis. (Source: Department of Finance Canada, Budget 2011)

## FINANCIAL STABILITY

Over the past three years, Canada's banking system has repeatedly been declared the soundest in the world by the World Economic Forum.

## LOW TAX RATES

Canada's overall tax rate on new business investment is substantially lower than that of any other G-7 country, while corporate tax rates are among the lowest in the G-7. (Source: Department of Finance Canada, 2010)

## SCIENTIFIC RESEARCH AND EXPERIMENTAL DEVELOPMENT

Canada has a very generous Scientific Research and Experimental Development Program (SR & ED) and the lowest costs in R & D-driven sectors in the G-7. (Sources: KPMG, *Competitive Alternatives 2010*; OECD)

## NAFTA

Canada's NAFTA advantage (North American Free Trade Agreement) gives investors access to more than 448 million North American consumers and a combined continental GDP of more than US\$16.3 trillion. (Source: World Bank, *World Development Indicators Database*, 2010)

## A GREAT PLACE TO LIVE AND WORK

World-class universities; a universally acclaimed health-care system; clean, friendly cities; and spectacular scenery make Canada a great place to invest, work, live and raise a family. (Sources: United Nations Development Programme, *Human Development Report 2010*; Economist Intelligence Unit, *Global Liveability Report 2010*)



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We Take Care of Business.

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