



Information & Communications Technology

The Government of Alberta is committed to encouraging a more diverse base of economic activity and to boosting trade and investment within Alberta's knowledge-based industries. Alberta's information and communication technologies (ICT) sector, with its origins in oil and gas related applications, now consists of world-class companies with expertise in diverse business areas, including:

- bioinformatics
- digital content
- e-learning
- global positioning systems
- health management systems
- nanotechnology
- software development
- systems integration
- telecommunications
- wireless communications

Reasons to Invest in Alberta's ICT sector

Alberta has a large, sophisticated and growing ICT industry with an international reputation for innovation. The highly skilled workforce, advanced infrastructure, and exceptional centres of research create a rich environment for investors.

Alberta's third largest value-added sector

Alberta's robust ICT sector has enabled growth across all sectors of Alberta's economy. The solid company base of Alberta's ICT industry includes more than 4,300 companies and 54,500 employees generating over \$10.2 billion in annual revenues, making ICT Alberta's third largest value-added sector.

Areas of Expertise

There are many partnership and investment prospects in technologies that support Alberta's priority sectors of energy, environment, health and education. ICT is an enabling technology that supports other economic sectors. The industry enables superior economic outcomes in all industries as a result of its use. Some areas of opportunity include:

Digital Media

Alberta is home to a vibrant digital media industry supported by leading edge research at Alberta's academic institutions and the Banff New Media Institute. Areas of key growth and opportunity in Alberta's digital media industry include:

- content and applications for mobile devices
- e-Learning and games for training and education
- interactive entertainment
- interactive marketing
- social media content and applications
- standards-based web design and development

Banff New Media Institute (BNMI) digital media research www.banffcentre.ca/bnmi/research

The Banff New Media Institute (BNMI) has become a centre for digital media research and development in Alberta, across Canada, and around the world. BNMI has created a dynamic, collaborative environment for such research by fostering partnerships between:

- academic research institutes
- educators
- industry and government stakeholders
- members of the arts community

Digital media research and new media projects at BNMI are carried out in the following three Advanced Research Technology (ART) labs:

- collaborative systems
- mobile media
- visualization

Aside from providing venues and resources for digital media research and development, the ART labs also facilitate post-doctoral training opportunities, applied research, and new media co-productions.

University of Alberta research – ICT and education www.cs.ualberta.ca/~lin/MRC/multimedia.html

The University of Alberta in Edmonton is home to the iCORE-NSERC Multimedia Research Centre. One notable research project at the Centre involves the development of web-based educational support tools and products that can function over wireless networks. This research has stimulated an exciting collaboration between Alberta educators and ICT specialists, and has opened up unique business and investment opportunities in the Alberta economy.

Nanotechnology and Microsystems

Alberta is the centre of nanotechnology and microsystems development in Canada. The flagship of nanotechnology research in Canada, the National Institute for Nanotechnology (NINT), is an integrated, multidisciplinary institution involving researchers in physics, chemistry, engineering, biology, informatics, pharmacy and medicine.

About National Institute for Nanotechnology - NINT www.nrc-cnrc.gc.ca/nint-innt/index.html

The NINT facility, located on the University of Alberta (U of A) campus, provides optimal conditions for nanotechnology research: it houses the 'quietest' lab space in Canada and boasts the latest in laboratories, clean rooms (Class 1,000) and the best collection of microscopy and surface science equipment in the country.

Opportunities in nanotechnology and microsystems

With the release of Alberta's Nanotechnology Strategy and associated initiatives, opportunities will expand in the development of nano-enabled products and applications specific to industries in the energy and environment, health and medical technologies, and agriculture and forestry sectors.

The University of Alberta has significant nanotechnology and microsystems research expertise with some 400 researchers active in nanotechnology and 15 Canada Research Chair positions.

Alberta has had significant success in the commercialization of microsystems and nanotechnology with leading companies in the design and manufacture of the following:

- micro-electro-mechanical systems (MEMS)
- micro-optical devices
- nano-biotechnology
- nano-engineered thin film structures
- nano-materials

Related Information

For more about opportunities in Alberta's nanotechnology and Microsystems industry, visit:

- **nanoAlberta** www.advancededucation.gov.ab.ca/technology/industry/nano.aspx

Software and Information Technology (IT)

Alberta's software industry has highly specialized and widely recognized expertise in a wide variety of business areas, including:

- custom programming
- digital content creation
- e-learning
- energy and resource industry software
- financial and process management software
- gaming
- geospatial and remote sensing systems and related software
- image processing and analysis
- industrial process control automation
- scientific and engineering software
- systems integration and consulting
- telecommunications

Business opportunities

Specific opportunities in Alberta's software industry exist in the following areas:

- Broadband network applications on Alberta's province-wide SuperNet fiber network. Opportunities exist in wireless last mile applications for industry, citizens and government.
- Geospatial and remote sensing systems and software including the areas of geospatial visualization and modeling (resource management and environmental), earth observation, and sensor systems (GPS, environmental, space-based).
- Health systems, specifically health industry initiatives focused on expanding Alberta's leadership in health information and record systems.
- Technology fusion. Significant opportunities exist at the intersection of biotech/health, nanotechnology and information technology, especially in areas in which the province has significant capabilities, such as:
 - bioinformatics
 - diagnostics
 - enhanced wireless medical systems
 - health portals and analytic engines to simplify and organize electronic health information and processes
 - ultra sensitive hyperspectral sensors/instruments and data cube analysis systems

Education and research opportunities

Alberta's software and IT sector enjoys access to an outstanding research community and excellent education system - including 26 world-class post-secondary institutions of higher learning - providing one of the most highly educated technologically advanced work forces in North America.

These colleges and universities offer the full range of software-related training programs and courses.

Academic and industry research strengths include:

- algorithmic number theory and cryptography
- artificial intelligence (AI) / machine learning
- bioinformatics
- computer graphics, visualization, image analysis, robotics
- data mining and database management
- e-learning
- geomatics
- high performance computing
- software engineering

Related Information

Alberta's academic institutions are home to numerous world-class research groups in the area of software and IT. Some of these include:

- Athabasca University
 - AU Research Centre
- University of Alberta
 - Alberta Ingenuity Centre for Machine Learning
 - Centre for Intelligent Mining Systems
 - Multimedia Advanced Computational Infrastructure
- University of Calgary
 - Advanced Database Systems and Applications
 - Centre for Information Security and Cryptography
 - Software Engineering Research Network (SERN)
SERN is a joint venture of the Departments of Computer Science and Electrical & Computer Engineering
 - Centre of Excellence for Integrated Resource Management

Wireless

Alberta is home to leading companies in areas such as wireless broadband technology, and wireless applications and services. Alberta technologies are the base for international standards and applications range across the following areas:

- contract design
- geomatics and GPS
- location and mapping technology
- physiological monitors and sensors
- telematics
- WiMAX
- wireless content and services

Areas of expertise in wireless

- fixed wireless
- geomatics
- remote sensing
- telematics
- wireless broadband
- wireless design

There is growing capacity in security applications, machine learning and other advanced communications and computing, including emerging areas such as quantum cryptography.

Wireless research and development

Alberta has a range of institutions that provide exceptional support for research and development in wireless technology:

- [Athabasca University](#)
Athabasca University is a leader in distance education.
- [Banff New Media Institute](#) (BNMI)
BNMI is a world-class research and content innovation centre in developing new technologies and content.
- [TRTech](#)
TRTech is Canada's largest not-for-profit information and communications technology research consortium, internationally recognized as a leading model for industry-university-government collaboration. TRTech verses TR-Labs also offers technology development services, including pre-certification testing and validation, and access to demonstration environment. <http://www.trtech.ca/trlabs/>

[University of Alberta](#)
The University of Alberta is one of the top five wireless research groups within North America.

[University of Calgary](#)
The University of Calgary is recognized for its strengths in geomatics and remote sensing technologies.

Associations

The information and communications technologies (ICT) sector in the Province of Alberta is supported by a number of industry associations. These associations act as advocates for and promoters of the ICT sector. They also provide venues for ICT businesses to network and share resources and expertise.

Alberta ICT Council

The Alberta ICT Council is a dedicated partnership of equals consisting of local industry associations of companies operating in the ICT sector in Alberta. The Council's mission includes the following:

- to focus the communications and relationships between the ICT sub-sectors and government
- to lead collaboration across sub-sectors on areas of common advantage

Other Sources

Learn more about Alberta's ICT industry associations. Visit:

- Alberta Geomatics Group (AGG)
- Calgary Council for Advanced Technology (CCAT)
- Calgary Geomatics Cluster (CGC)
- Canadian Information Processing Society (CIPS)
- Digital Media Association of Alberta (DMAA)
- Digital Solutions Alliance
- INFOTECH Alberta
- NanoMEMS
- WiTec Alberta

Additional organizations that support the ICT industry through programs and services include:

- Calgary Economic Development – ICT
- Calgary Technologies Inc.
- Edmonton Economic Development Corporation – Information and Communications Technology
- INFOPORT.ca
- TEC Edmonton
- University Technologies International Inc.

Government Initiatives

The Alberta government has established a number of development initiatives in partnership with the information and communications technologies (ICT) sector. The aim of these initiatives is to stimulate investment and entrepreneurship in ICT businesses.

Access to Capital Programs

The Government of Alberta supports several programs that improve access to capital for ICT companies. These programs often involve networking between ICT companies and potential business investors to help secure capital for future growth.

- [Alberta California Venture Channel](#) (ACVC)
The ACVC is a non-profit organization that matches Alberta technology investors and entrepreneurs with business markets, expertise and capital raising opportunities in California.
- [Alberta Deal Generator](#) (ADG)
The Alberta Deal Generator is a non-profit venture that screens and links Alberta's high growth technology companies with potential investors.
- [AVAC](#)
AVAC is a non-profit organization specializing in investments towards Alberta's value-added industry sectors, including the ICT sector.
 - [IVAC Initiative](#)
A new investment initiative from AVAC Ltd. which provides investment and other assistance to Alberta businesses in the ICT, life sciences and other industrial technology sectors to help them get to the investor-ready stage.
- [Banff Venture Forum](#)
The Banff Venture Forum is one of the premier company financing events in the West. It is designed to showcase the hottest hi-tech companies, provide insights into key issues in the industry, provide a premium networking opportunity and a chance to learn from world-class professionals in the investment community.
- [VenturePrize Program](#)
VenturePrize is a program established by the non-profit group, TEC Edmonton. The Venture Prize Program assists aspiring entrepreneurs to transform high-growth ideas into solid business plans.
 - [VenturePrize Business Plan Competition](#)
The VenturePrize Business Plan Competition awards \$150,000 in prizes to the top three VenturePrize Program business plans in the Fast Growth and post-secondary student categories.

Endowment Funds

The province has established a number of endowment funds and programs as primary mechanisms to fuel innovation and diversify the provincial economy. Endowment funds provide capital for a number of industry funding support programs.

- [Access to the Future Fund](#)
The Access to the Future Fund is a \$3 billion endowment established by the Government of Alberta to support innovative post-secondary initiatives.
- [Alberta Heritage Foundation for Medical Research \(AHFMR\)](#)
The AHFMR, part of Alberta Innovates – Health Solutions, was established by the Alberta Government to provide a \$1.5 billion endowment fund for medical research.
- [Alberta Ingenuity Fund](#)
The Alberta Ingenuity fund, under Alberta Innovates – Technology Futures, is a \$1 billion science and technology endowment fund created by the Government of Alberta to encourage innovation.

Ongoing Support Programs

The Alberta government provides ongoing funding and support to help ICT companies build the infrastructure and recruit the personnel necessary to stimulate growth and development.

- [Alberta Heritage Foundation for Medical Research \(AHFMR\) Forefront Program](#)
The AHFMR Forefront Program, through Alberta Innovates – Health Solutions, supports Alberta innovators and tomorrow's industry leaders through an Internship Program and four new people-focused awards which are in development including the Industrial Research Program.
- [Alberta Ingenuity Industry Programs](#)
Established by the Alberta government, the Alberta Ingenuity endowment fund, through Alberta Innovates – Technology Futures, supports a number of funding programs for basic and applied science and engineering research projects.
- [Commercialization Associates Program](#)
The Commercialization Associates Program, under Alberta Innovates – Technology Futures, enables Alberta companies to recruit highly trained business and management personnel to advance the commercialization of industrial applied research that benefits the company (each award \$55,000 annual stipend and a commercialization allowance of up to \$7,000).
- [Research and Development Associates Program](#)
The Research and Development Associates Program, under Alberta Innovates – Technology Futures, addresses the growing need of Alberta industry for research personnel. Companies receive two years of support for recent Master's and Doctoral graduates hired to conduct research in the company (each award \$55,000 annual stipend and a research allowance of up to \$7,000).
- [Alberta Science and Research Investments Program \(ASRIP\)](#)
ASRIP supports science and research initiatives of strategic importance to Alberta by investing in research infrastructure that will put Alberta research teams at the forefront of their fields.
- [iCORE Industrial Chair Program](#)
The iCORE Industrial Chair Program, through Alberta Innovates – Technology Futures, provides financial support for university chairs to attract world-class researchers in the areas of computer science, electrical and computer engineering, physics, mathematics, and other disciplines related to information and communications technology.

Infrastructure

To foster a culture of innovation and to support Alberta's research and development infrastructure, the Government of Alberta has provided extensive financial support to assist in the creation of research facilities and has focused on lowering taxes. The research and development infrastructure in Alberta offers excellent opportunities to test, pilot, and commercialize new applications.

Related Information

Here are some examples of key Alberta research and development infrastructure and facilities:

[Alberta SuperNet](#)

An ideal environment for the development of new broadband applications, the Alberta SuperNet connects over 4700 hospitals, schools, libraries and government facilities in over 429 provincial communities through a fibre optic high-speed broadband network. Recognized by the Institute of Electrical and Electronics Engineers (IEEE) as the most innovative global project of its kind, SuperNet provides the foundation for improved services in distance learning, telehealth, and e-commerce.

[Cybera](#)

A new provincial organization, Cybera Inc., will facilitate access to Information and Communications Technology (ICT) resources, often referred to as cyberinfrastructure (CI). This includes existing ICT tools around the province as well as new resources acquired through partnerships with Alberta's four universities, other public and private sector partners, and Netera Alliance – which maintains Alberta's high-speed, high-bandwidth research network.

[Integrated Nanosystems Research Facility](#) (INRF)

A one-stop-shop at the University of Alberta for the design, construction and understanding of nanosystems, with a focus in four areas: nanofabrication; biomolecular synthesis for self-assembled nanosystems; nanoscale characterization-probes and microscopy; computational lab-design and modeling.

[National Institute for Nanotechnology](#) (NINT)

Canada's premier nanotechnology research institute, a provincial-federal initiative, is an integrated, multi-disciplinary institution involving several hundred researchers in physics, chemistry, engineering, biology, informatics, pharmacy and medicine.

[TRnet](#)

TRnet is an experimental high-speed wide area network traversing three western Canadian provinces - the largest such network - to develop and test extremely high performance networks of the future. At 10 Gigabits per second, TRnet is one of the fastest test networks in Canada, offering a window to the future with exponentially faster networks and a new paradigm of networking, content and applications.

[WestGrid](#)

WestGrid, Canada's largest high performance computing grid, provides high performance computing, networking, and collaboration tools for researchers in seven participating institutions in Western Canada. The distributed resources are connected by the research networks in British Columbia (BCNet), Alberta (NeteraNet) and across Canada (CA*net).

Research and Development Institutions and Funding/Advisory Programs

To ensure the adequate sustainable development of Alberta's ICT sector, the appropriate programs must be put in place that will foster continued research. Below are key institutions that ensure the growth and sustainability of this vital sector.

- **Alberta Innovates** Agencies, established by the Government of Alberta, have been created to foster a culture of innovation that will create and support innovators, entrepreneurs and technology based industries as well as motivate, educate and train a 21st Century workforce to meet Alberta's needs. Under the banners of Alberta Innovates, there are five board-governed provincial corporations:
 - [Alberta Innovates – Bio Solutions](#)
 - [Alberta Innovates – Energy and Environment Solutions](#)
 - [Alberta Innovates – Health Solutions](#)
 - [Alberta Innovates – Technology Futures](#)
 - [Alberta Innovates – Research and Innovation Authority](#)
- [Alberta Ingenuity](#) (part of Alberta Innovates – Technology Futures)
The Alberta Ingenuity Fund, through Alberta Innovates – Technology Futures, supports science and engineering research of the highest calibre, to create a prosperous future for the province. It draws funding from a \$1 billion endowment established and managed by the Government of Alberta to build the capacity for innovation, especially in areas with long lasting social and economic impact.
- [Alberta Heritage Foundation for Medical Research](#) (AHFMR; part of Alberta Innovates – Health Solutions)
Through a \$1.5 billion endowment fund, AHFMR supports both biomedical and health research at Alberta universities, affiliated institutions, and other medical and technology related institutions. Since 1980, the foundation has directly contributed more than \$850 million to the scientific community. In 2004, an International Board of Review lauded AHFMR on its record of programs and achievements.
- [Alberta Science and Research Authority](#) (ASRA; part of Alberta Innovates - Research and Innovation Authority)
ASRA is an independent board of members from Alberta's academic, business and research communities. ASRA functions as the senior science and research advisory body to the Government of Alberta and works collaboratively with government departments and agencies and other stakeholders.
 - [Alberta Information and Communications Technology Institute](#) (AICTI)
Operating under ASRA the AICTI supports the development and growth of the ICT sector in Alberta by providing strategic advice and policy guidance to government.

- [Alberta Research Council Inc.](#) (ARC; part of Alberta Innovates – Technology Futures)
ARC, with more than 500 scientists, engineers, business managers, and support staff, partners in strategic ventures to help companies develop early stage ideas into marketable products and services. ARC is a trusted resource in the energy, life sciences, agriculture, environment, forestry, and manufacturing sectors.
- [Banff New Media Institute](#) (BNMI)
The Banff New Media Institute is an internationally respected art and digital research innovation centre. Its programs are designed to support creative pluralism, different modes of inquiry, the production of new work, and the engagement of artists, producers, technologists, and researchers with digital culture. BNMI commissions research, provides training, and offers creative production support in a multidisciplinary development environment. Practitioners are able to access a range of expertise, peers, facilities, and environments.
- [iCORE](#) (part of Alberta Innovates – Technology Futures)
iCORE was established by the Government of Alberta to foster world-class university-based research that supports the ICT industry. Funded by the Government of Alberta and supported by partners in universities and industry, iCORE's mandate is to foster an expanding community of exceptional researchers in the field of informatics, i.e. areas of computer science, electrical and computer engineering, physics, mathematics and other disciplines related to ICT.
- [Integrated Nanosystems Research Facility](#) (INRF)
A one-stop-shop at the University of Alberta for the design, construction and understanding of nanosystems with focus in four areas: nanofabrication, biomolecular synthesis for self assembled nanosystems, nanoscale characterization, and computational lab design and modeling.
- [National Institute for Nanotechnology](#) (NINT)
Canada's premier nanotechnology research institute, a provincial-federal initiative, is an integrated, multi-disciplinary institution involving several hundred researchers in physics, chemistry, engineering, biology, informatics, pharmacy and medicine.
- [TRLabs](#)
TRLabs is Canada's largest research consortium (industry, university, government) in information and communications technology. The research program is based on industry/university collaboration that produces original, industry-relevant, pre-competitive research with a time horizon of one to five years.

Contact Information:

Ms. Heli Carswell, Senior Director , Advanced Industries – Europe
12 floor, 10155 102 Street, Edmonton, Alberta, Canada
Phone: +1 780. 427-6386 Fax: +1 780.427-0699 Email: heli.carswell@gov.ab.ca

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