



ACCELERATING technology-based economic growth and entrepreneurship in Greater Moncton

Report A
*Executive Summary
and Recommendations*

prepared for
**MONCTON TECHNOLOGY
PLANNING GROUP**
by the
IC² Institute / UNIVERSITY OF TEXAS AT AUSTIN



JANUARY 2007

Established in 2004, **the Moncton Technology Planning Group** is comprised of community leaders representing technology-based business, institutional research, venture capital, and local government. The MTPG's purpose is to advance dialogue and action that will lead to the growth of technology-based enterprise in Moncton. Members of the group offer a wealth of innovation and technology experience, and share the common goal of building on the community's strengths and potential to accelerate the growth of Moncton's knowledge-based economy.

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The IC² Institute (The *Innovation, Creativity & Capital* Institute www.icc.utexas.edu) is an organized research unit of The University of Texas at Austin with the vision that science and technology are resources for economic development and enterprise growth; and the mission to enhance research and education on the enterprise system in order to promote widespread wealth creation and shared prosperity. Established in 1977, the IC² Institute founded the Austin Technology Incubator (ATI) in 1984; and in 1997 established the Master of Science Degree in Science and Technology Commercialization (MSSTC). Recently, ATI expanded to include the Austin Wireless Incubator, the Clean Energy Incubator, Digital Media incubation, as well as an active Global Commercialization group. The institute has over 235 international fellows in business, academia and government – peers of excellence who actively support the vision and mission of the Institute worldwide.

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Accelerating Technology-Based Economic Growth & Entrepreneurship in **GREATER MONCTON**

REPORT A: EXECUTIVE SUMMARY & RECOMMENDATIONS

Prepared for the MONCTON TECHNOLOGY PLANNING GROUP
by the IC² Institute at
THE UNIVERSITY OF TEXAS AT AUSTIN

With the cooperation of the government, universities, & businesses of Greater Moncton

The IC² team gratefully acknowledges the support and encouragement of the Moncton Technology Planning Group and its chair, Douglas Robertson. Group members not only opened their businesses, offices, and research programs to team members during the study but also facilitated interviews and data collection across Moncton and throughout New Brunswick. For their invaluable counsel in helping the research team to understand New Brunswick's educational system, we thank Réjean Hall at the Université de Moncton; Andrew Paskauskas at Mount Allison University; Virendra Bhavsar, David Foord, and Gregory Kealey at UNB; Michel Thériault at NBCC/CCNB; Richard Corey at NBCC; Graham Sheppard at NBCC-Moncton; and Claude Allard at CCNB-Dieppe. Finally, we would also like to recognize Mathieu Brideau of Business New Brunswick, and Ben Champoux with the City of Moncton for research assistance and expert advice.

The Moncton Technology Planning Group and the IC² Institute project team dedicate this report to the memory of Len Weeks, a true champion of innovation and a mentor and friend to entrepreneurs in the Province of New Brunswick.

Accelerating Technology-Based Economic Growth & Entrepreneurship in GREATER MONCTON

REPORT A: EXECUTIVE SUMMARY & RECOMMENDATIONS

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INTRODUCTION

Accelerating Technology-Based Economic Growth and Entrepreneurship in Greater Moncton provides select strategies for Moncton, New Brunswick, to take control of its economic destiny. The report emphasizes the importance of having common visions and action plans to mobilize key local partnerships. A main theme is the importance of collaboration and cooperation among Greater Moncton business, academic, and government sectors. The effectiveness of these partnering activities will largely determine the region's ability to create high-value jobs; educate, attract, and retain talent; and to accelerate economic growth while sustaining a high quality-of-life for all citizens.

The overall vision is for Greater Moncton to be nationally and internationally recognized as a region that is known for education and research excellence, creativity and entrepreneurial success, and globally competitive business development in targeted technology sectors.

The report is organized in two parts. *Report A* (this document) contains key findings and action items. *Report B* contains the body of the report and supporting research data collected by the IC² team during the study.

Greater Moncton has been a regional leader in the use of strategic planning to guide economic development, as evidenced by at least three community-wide strategic planning efforts undertaken in 1989, 1994, and 1998. In 2004, the Moncton business community perceived that its unity of purpose and direction that had been so successful in the 1990s were being challenged. It found itself at a crossroads, partly due to the decreasing frequency of new business investments and the increasing frequency of call center jobs moving overseas. Consequently, Moncton stakeholders set as their mission to increase the quality of jobs in the economy and to increase the level of educational attainment in the workforce.

This report emphasizes the key role of significant but limited assets, and both real and perceived challenges, for accelerating technology-based growth and entrepreneurship in Greater Moncton. Challenges include: ¹

- Successfully recruiting established firms
- Launching and growing business start-ups
- Growing centers of R&D excellence
- Post-secondary education opportunities
- Expansion of career employment opportunities in knowledge-based industries
- The emigration of Moncton's young, educated talent
- Limited national and international visibility
- The lack of a common vision, brand, and strategic plan

¹ Building on Our Success: A Strategic Plan for Greater Moncton, Enterprise Greater Moncton, April, 2004; New Brunswick Capacity Study: Gaming, Simulation and Animation Industry Report, Red Hot Learning, Inc., October, 2004; City of Moncton Economic Development Strategy, City of Moncton, November, 2005; Research & Discovery, Vol. 1, No. 2 (2005).

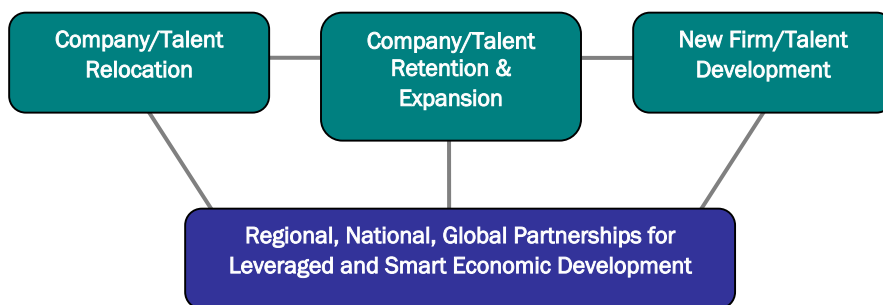
In recognition of regional challenges, The Moncton Technology Planning Group (MTPG)² and other community leaders came together to commission the IC² Institute at The University of Texas at Austin to do an action-oriented study for accelerating technology-based entrepreneurship and economic development in Greater Moncton. The underpinning belief is that:

- Technology-based growth is key to the creation of wealth and career oriented jobs.
- Rapidly changing national and global realities require change in regional economic development strategies and policies.
- Moncton needs to be pro-active in determining its own destiny, rather than reacting after the fact.

Working closely with the Moncton Technology Planning Group (MTPG), the IC² Institute at The University of Texas at Austin, conducted an assessment of Moncton’s business, academic, and government assets, challenges, and opportunities. A main objective was to identify specific near- and longer-term action initiatives for accelerated technology-based entrepreneurship and economic growth in Greater Moncton to:

- Facilitate successful recruitment of companies and talent (e.g., professional, entrepreneurial) in targeted industry sectors.
- Assist the growth of existing local technology-based organizations.
- Assist in the incubation and accelerated-growth, of regionally based, globally competitive companies.
- Leverage regional public and private assets more effectively, as well as national and international partnerships, see Figure 1.

Figure 1. Four Strategies for Regional Economic Development



Source: IC² Institute, The University of Texas at Austin

² The Moncton Technology Planning Group (MTPG) is comprised of community leaders representing business, institutional research, venture capital, municipal government and community economic development.

Research Methods

The IC² Institute research team collected and analyzed data from January to September 2006, including:

- Four team and individual visits to Moncton
- Interviews with over 100 local and provincial leaders in academia, business, and government (See Report B, Appendix G for the complete list of interviewees)
- Reviews of 45 published economic development reports on Moncton, NB, and Atlantic Canada (See Report B, Appendix H for bibliography)
- A survey of 2006 college and university graduates from Moncton's post-secondary educational institutions to gauge their future employment plans and impressions of Moncton's economy (see Report B, Appendices A, B, C for the complete survey and analysis)

The scope of work included:

- Developing a benchmark of existing Information and Computer Technology (ICT) companies within Greater Moncton
- Documentation of Moncton's research and development assets including governmental programs and educational resources, and existing private companies
- Developing case profiles of local technology-based businesses and entrepreneurial successes
- Identifying specific assets and challenges for technology-based innovation and company growth, including assessing available and potential sources of capital

STRATEGIES FOR SUCCESS

To better focus Moncton's priorities and objectives with regard to accelerated technology-based growth and entrepreneurship, "strategies for success" were defined in terms of five key objectives:

- 1. Accelerate technology-based business development in established and emerging industry clusters with the greatest growth potential.**
- 2. Develop Greater Moncton as an emerging center of technology-based entrepreneurship.**
- 3. Foster academic and research excellence that is specifically linked to regional economic development.**
- 4. Foster and leverage regional, national, and global value-added partnerships and alliances.**
- 5. Promote a common vision and coordinated action initiatives targeted to brand Greater Moncton as an important emerging center of technology-based entrepreneurship and business development.**

KEY OBJECTIVE 1 ACCELERATE TARGETED INDUSTRY CLUSTERS

Accelerate technology-based business development in established and emerging industry clusters with the greatest growth potential.

Vision:

Greater Moncton experiences accelerated technology-based company growth for enhanced wealth and job creation.

Challenges:

- Limited density/size of R&D centers and industry sectors
- Inventor-owned intellectual property regime
- Limited sources of financing for start-ups
- Limited talent at senior management levels

Strategies:

- Establish an inventory of established academic assets.
- Establish an inventory of regional industry.
- Link R&D centers to local business and start-ups *more effectively* through such activities as a Moncton Technology Commercialization Center (MTCC), a Creative Learning Institute in Digital Media, and a Bioscience Consortia.
- Better identify and coordinate sources of financial support for R&D through commercialization and business start-ups.

Specific Actions:

- Provide a strategy for establishing a Moncton Technology Commercialization Center (MTCC) – Incubator.
- Focus on dual, simultaneous economic development strategies for:
 - Near-Term Innovation-Based Growth (e.g., ICT, Gaming)
 - Longer-Term R&D-Based Growth (e.g., Biosciences, Informatics, Thin Films).
Initial tenants in the incubator could include:
 - *Dr. Yves Gagnon, K.C. Irving Chair in Sustainable Development at the Université de Moncton*, has a technology commercialization proposal to develop a new company to build a small wind turbine for residential and small business applications; also Dr. Gagnon’s proposed Eco-Efficiency Center would promote reduced industrial energy use through better energy management, efficient waste processes, and outreach efforts (see the Wind Energy case study in Report B for a complete description).
 - *Dr. Rodney Ouellette, Scientific Director and CEO, Atlantic Cancer Research Institute*, has research that is viable for commercialization (see Report B for complete case study).
 - *Both IT departments at the two Moncton hospitals* have expressed interest in developing closer contacts with local IT companies and commercializing research from their hospitals by opening an office in a new incubator.

- Enhance existing assets and knowledge, which are closer to the market place; success with near-term objectives will provide momentum and resources to support more long-term research and development.
- Strengthen outreach to regional business know-how.
- Involve faculty and students from the Université de Moncton, Mount Allison University, New Brunswick Community Colleges in Moncton and Dieppe and others.
- Develop links with the Austin Technology Incubator (www.ati.utexas.edu).
- Develop national and international partnerships and alliances focused on targeted industry sectors through, in part, strategic alliance with IC² Institute (www.icc.utexas.edu).

Finance:

- Provide subsidized office space at the proposed MTCC for VC and angel investors.
 - Invite VC and angels from outside region.
- Promote “Bootstrapping” as a viable form of venture funding.
 - Develop a regional bootstrapping organization.
- Develop and organize a local business angel network.
- Identify and coordinate VC, angel, and governmental financial support for business development (downstream activities) as well as R&D development (upstream activities).

Education/Training:

- Improve workforce education and training program mechanisms within specific technology sectors in the Greater Moncton Region (see Key Objective 3).

KEY OBJECTIVE 2 FOCUS ON ENTREPRENEURSHIP

Develop Greater Moncton as an emerging center of technology-based entrepreneurship.

Vision:

Greater Moncton is a national and international center for educating, recruiting, and retaining entrepreneurial talent.

Challenges:

- Greater Moncton is currently losing some of its best entrepreneurial talent to higher-paying jobs and more exciting career opportunities in Toronto, Quebec, Montreal, Ottawa, Halifax, and elsewhere (See Student Survey, Report B, Appendices A, B, C).
- Existing entrepreneurial support mechanisms are fragmented.

Strategies:

- Celebrate Moncton’s entrepreneurial successes that have overcome regional challenges (see Case Studies for Spielo/GTECH, Whitehill Technologies, Ardent Development Solutions, BMG, Dovico Software, Mindsweep, VE Networks, and Vimsoft in Report B).

- Recognize the importance of – and actively support – grassroots development of entrepreneurial initiatives in helping educate, retain, and recruit talent.

Specific Actions:

- Organize a Greater Moncton Entrepreneurial Council:
 - Facilitate monthly meetings with small dues for refreshments, promotion, speaker fees, etc.
 - Provide a forum for regional, national, and international speakers.
- Use Internet and web infrastructure for virtual community-building among Moncton entrepreneurs.
- Foster entrepreneurship of younger individuals in the region:
 - Create a regional business plan competition for university and college students and an associated competition for regional high schools.
 - Offer entrepreneurial training for key personnel in start-ups and in established firms.
 - Take advantage of the talent of local residents who are retired or semi-retired, who would be outstanding mentors for younger entrepreneurs.
- Provide small grants which may lead to larger funds from outside sponsors:
 - Create a venture research fund for faculty and students supporting new research leading to commercialization that is unlikely to be supported by traditional sponsors without further development.
 - Limit most grants to around \$20,000 or less.
 - Focus funds to encourage research and innovation in targeted technology areas.
 - Make a concerted effort to bring back entrepreneurial talent that traditionally has left the community for post-secondary education and for better paying jobs and career development elsewhere.

AN INNOVATION PATH FOR MONCTON

Moncton has two clear asset classes for growing a knowledge-based economy. One is represented by Moncton's Information and Communication Technology (ICT) sector with over 400 companies (see Timeline Companies in Report B, Appendix D).³ Within ICT, Moncton's strengths exist in the area of interactive software (including game design, IT education, and software design), digital media, and informatics (manipulating, storing, and classifying recorded information, especially in the health sciences). The other technology-based asset class is represented by Moncton's existing R&D centers, like the Atlantic Cancer Research Institute, the science research being conducted at the Université de Moncton, and the bioscience commercialization initiatives at Mount Allison University. Technology transfer and commercialization from these R&D centers, to a large degree, is in its infancy. Large-scale commercial development in this area, with significant local job growth, while encouraged, is a longer-term proposition.

³ We use the definition of ICT companies supplied by Statistics Canada: "Industries primarily engaged in producing goods or services, or supplying technologies, used to process, transmit or receive information." It is based on the North American Industry Classification System (NAICS). Statistics Canada website, "Special Aggregation: Information and Communication Technology (ICT)," accessed November 16, 2006.

Simultaneous investment in ICT and targeted R&D activity along both paths is recommended. Investment of resources in ICT should be distributed across more companies and more entrepreneurs, creating greater potential for spectacular success in job creation and economic growth. With the array of ICT assets that currently exist in Moncton, it is recommended to focus finances (and other resources for near-term wealth and job creation) toward the single asset that offers the greatest and quickest return on investment: *innovation and entrepreneurship in digital content including services and product development*. This report's recommendations specifically embrace five of the eight focused sectors from Moncton's 2005 Strategy Report:

- Gaming technologies
- Animation sector
- Information and communications technologies
- Software development
- E-learning

Current recommendations (see below) specifically answer five key threats and challenges to the ICT growth that the City of Moncton identified in its 2005 strategy report:

1. Demographics The niches in the ICT sector that are recommended directly appeal to more youthful age brackets to address Moncton and New Brunswick's aging demographics.
2. Limited post-secondary education opportunities for Anglophones Establishment of new articulation agreements and computer science and applied IT programs in Moncton to raise the number of post-secondary educational offerings for Anglophone students (See Key Objective 3).⁴
3. Lack of challenging employment opportunities in knowledge-based industries and the creative economy Employment data suggest demand for ICT jobs is up, even while enrollment in IT programs at NBCC and CCNB is at capacity.
4. Weak attractiveness factors that are crucial to making the city more appealing to younger people It is recommended, for example, that an annual gaming conference be staged in Moncton and that digital content niches be promoted in primary and secondary educational programs.
5. Weak national and international visibility Moncton's ICT entrepreneurship could be accelerated with the support of a specialized incubator. While the Moncton Technology Commercialization Center (MTCC) can be branded provincially, international entrepreneurship can also be promoted through competitions promoting international student exchange similar to the USA/Canada/Mexico program in place at the Université de Moncton's Faculty of Business.

⁴ The City of Moncton's "Downtown Moncton Development Vision" supports the idea of locating a university presence in the downtown area. See p. 5, <http://www.moncton.ca/search/english/cityhall/downtown/strategy-draft.pdf>

FINANCING

“A second strategy that helped Whitehill grow successfully is that its early operations were financed not with venture capital but from ongoing revenues. The firm is a good case of a company that started with a modest amount of initial capital but was able to grow quickly, financing itself organically from sales rather than from an extensive amount of external capital. This forced Whitehill to pursue a number of revenue-generating services that, while not necessarily in its niche, could add value for its clients.”

– Excerpt from Whitehill Technologies Case Study, Report B

“In all, Micro-Optics absorbed more than \$34 million in venture capital investment and received \$6 million in loans and grants from ACOA. It is estimated that in total, Micro-Optics raised more \$50 million in financing during its 9-year lifespan.”

– Excerpt from the Micro-Optics Case Study, Report B

Financial capital plays a crucial role in the process of entrepreneurial business development. Not only the quality of internal management but the coordination of investment programs across the spectrum of company business cycle development is critical in order to maximize a region’s financial resources. Sources of capital that are not mutually exclusive can be coordinated as a matter of policy, in a way that enables new high tech companies to transition through consecutive stages of their business development.

Moncton technology companies have a full range of sources of capital from which to draw, including venture capital, angel investment, government programs like ACOA and NRC-IRAP, bank loans, and self-funding (“bootstrapping”).

Self-funded Ventures

Support for self-funded ventures should be a priority. Moncton companies including Ardent Development Solutions, BMG Consultants, Vimsoft, Whitehill and others are successful stories of self-funded ventures. Institutional steps should be taken to facilitate the stream of initial capital and credit needed by self-funded ventures. Support should specifically be provided to advance formation of *fast organic* (Gazelle) ventures.⁵

To support and sustain self-funded Fast Organic ICT ventures, a self-organized and grassroots group tentatively called Moncton Gazelle Group (MGG) is proposed. Such a group could be organized by a founding team of core entrepreneurs. In addition to monthly or weekly meetings (happy hours), the MGG should communicate actively through electronic bulletin boards, etc., in order to share and exchange information in real time. An effort should also be made to link the MGG to existing activities such as Cyber Social. The following steps are suggested to implement the MGG:

- Establish an executive committee to overview the development of the Moncton Gazelle Group, including:
 - Invite select self-funded entrepreneurs and expand this group through their referrals and invitations.

⁵ Report B describes three basic venture development paths: *fast organic* (Gazelle), *express* (Rocket), and *slow lifestyle* (Turtle). The *fast organic* or Gazelle model provides higher growth with less investment compared to the other models. The *express* or Rocket development model requires high investment over a long period of time with little return until an eventual “fast takeoff” is achieved; while the *slow lifestyle* or Turtle development model provides moderate returns with a sustained investment pattern.

- Establish monthly meetings and online communications procedures and policies
 - members will be encouraged to share information and experiences in locating and utilizing entrepreneurial resources.
- Network with other organizations in Moncton i.e. the City of Moncton, Enterprise Greater Moncton Inc., and the Chamber of Commerce.
- Establish an advisory committee to provide advice on the conceptual topics related to the Fast Organic (Gazelle) path of venture development including connecting MGG executive committee and members to relevant academic centers in Moncton.

Loans

The Canada Small Business Financing (CSBF) Program should be adjusted to provide support for knowledge-intensive new businesses that rely less on hard assets and more on information technology and knowledge-based industries. In this respect, elements of the U.S. Small Business Development program, which provides business advice and business consulting services, should also be considered.

Provincial government programs that provide start-up capital for new businesses and for business expansion and diversification should be used to support new technology-based organic growth ventures in Moncton.

Individual (Angel) Investment Network

Organizational structures for angel networks in other locations including Silicon Valley, Boston, and Austin are often promoted by individual investors who actively participate in these networks and play mentorship roles. Moncton is home to many wealthy individuals and families, some of whom could act as the core for an angel investor network. Moncton angels should be encouraged to organize into a network. Training workshops should be formed to help entrepreneurs better communicate their business ideas and plans in front of angels. The network should support the type of technologies that are consistent with the regional development of Moncton.

STRATEGIES FOR A MONCTON TECHNOLOGY COMMERCIALIZATION CENTER (MTCC)⁶

The recommendation for Moncton in terms of a regional technology commercialization center (incubator) and larger innovation center (science park) is to start small, leverage available resources to the benefit of the tenant companies, and build a track record of success. We offer the development history of the Austin Technology Incubator (ATI) to provide a plan for founding the MTCC.

ATI was launched in 1989 in 4,000 sq. ft. of donated office space. The City, the County, and The Greater Austin Chamber of Commerce seed-funded the three-year experiment – about \$30,000 each for three years – to create wealth, generate jobs, diversify Austin’s struggling economy, fill office space, and help catalyze and build an entrepreneurial infrastructure for the City. The main expenses were salary for the incubator director and her assistant and to pay for office supplies and building taxes. Office furnishing and equipment were largely

⁶ “Overview of U.S. Incubators and the Case of the Austin Technology Incubator,” by J. Wiggins and D. Gibson, in *International Journal of Entrepreneurship and Innovation Management*, Vol. 3, Nos. 1 and 2 (2003).

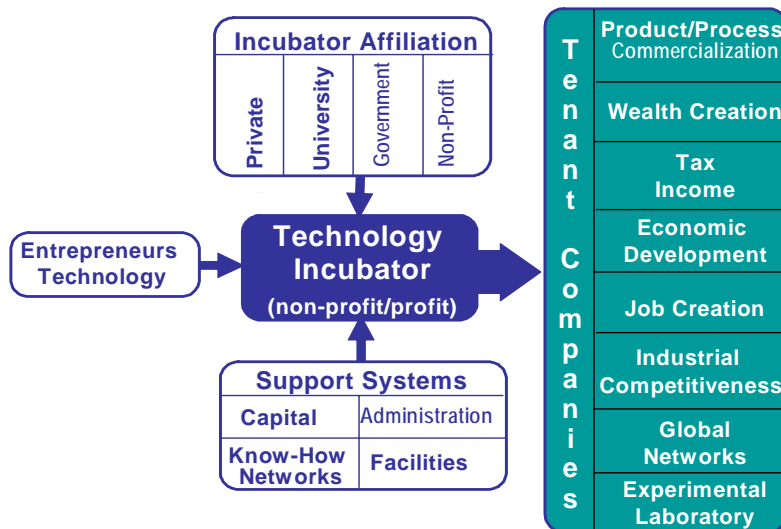
donated from university surplus and by local office/furniture supply stores in hopes of developing a new customer base. Professional legal, accounting, management, and marketing talent from the region also donated their time to assist the companies in order to help grow future paying clients. In addition to office space rent from the tenant companies, a private financial donor contributed additional needed funds. The strategy was to select the best candidates for near-term success to establish a positive track record. Of the first three tenant companies: One was recruited from California, one from a local research consortium, and one from The University of Texas at Austin. This report identifies several potential candidates to be founding tenants of the MTCC.

Phase I Suggestions for the Moncton Technology Commercialization Center (MTCC)

The delivery of value-added services becomes a vital differentiator between successful and unsuccessful incubators.⁷ The National Business Incubator Association (NBIA) published a report of the incubation industry and identified typical services (by more than 75% of the respondents) offered by technology incubators:

- assistance with business basics
- marketing assistance
- accounting/financial management
- investor and strategic partner linkages
- networking activities
- links to higher educational institution
- conference rooms and other shared facilities
- shared administrative services

Figure 2. Important Basic Components of Technology/Business Incubators



Source: IC² Institute, The University of Texas at Austin

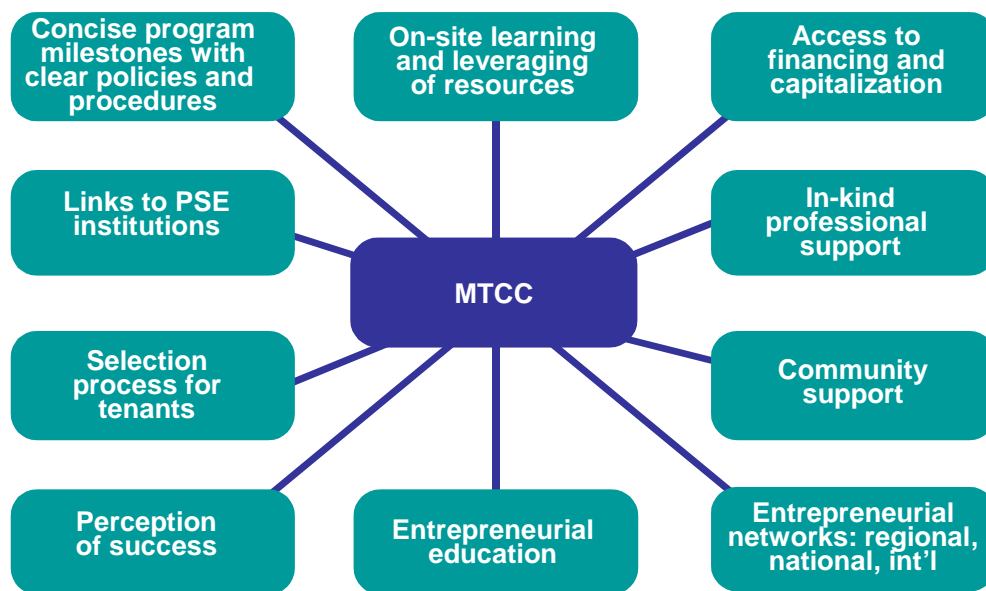
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⁷ Ibid, 58.

Based on the ATI model, initial crucial MTCC criteria for success include:

- *Deal Flow* – promote sufficient numbers of technology and business applicants so the incubator has the ability to select the most promising business ideas.
- *Community support and involvement* –local business and government officials support the incubator and provide free or discounted professional advice to tenant companies.
- *University support and involvement* –faculty and students teach and work at the incubator helping the companies with technology and business assessments, marketing plans, financial plans, etc. while the companies provide experiential learning opportunities.

Figure 3. Ten success factors for the Moncton Technology Commercialization Center (MTCC)

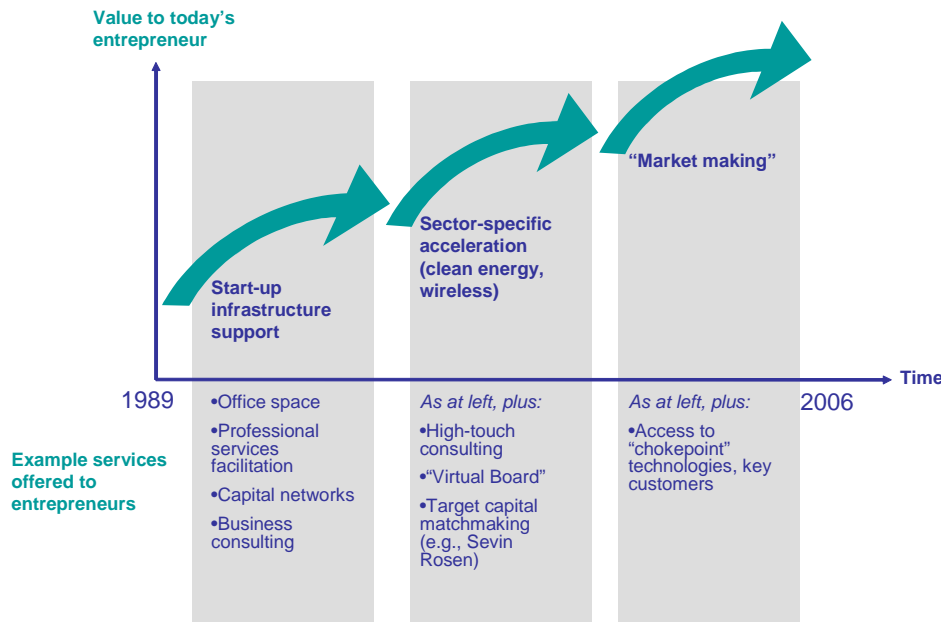


Source: IC² Institute, The University of Texas at Austin

Phase II Suggestions for the Moncton Technology Commercialization Center (MTCC)

As a Phase II model for MTCC we again look to the Austin Technology Incubator. When ATI's initial success warranted larger facilities, the incubator moved to its present location where it occupies about 40,000 sq. ft. in a university-owned building. Financial support is provided by tenant company office rent, research projects, occasional contributions from the city, and private sector partnerships. Over the years, as a result of changing local and global conditions, ATI has transitioned from providing a location for subsidized rent, business plan support, and business know-how support, to providing enhanced value-added support and market making activities (see Figure 4).

Figure 4. Potential Moncton Model: ATI's Transition in Value-Added Activities for Tenant Companies



Source: Isaac Barchas, Director, ATI (2006)

Initially ATI welcomed a broad range of technology-based companies but has increasingly focused on industry sectors that are most linked to regional emerging business sectors and related UT-Austin academic excellence. These sectors are IT, wireless, Clean Energy, and Digital Media.

An additional current focus of ATI is on facilitating global incubation where international companies are incubated at ATI with an emphasis on "market making" support. For example, ATI is currently mentoring 12 select companies from Mexico. The TechBA program is funded by the Mexican government with the goal to accelerate growth through increased access to U.S. markets and business alliances. ATI has also launched cooperative programs with Poland and Portugal and has had tenant companies from Brazil, Japan, and Canada.

ATI served as a catalyst for Austin's economic recovery in the 1990s by developing an entrepreneurial support infrastructure, expanding the region's tax revenues, and increasing demand for commercial office space. Over the years ATI has measured itself according to four basic criteria: Business creation, wealth generation, innovation, and value to the university (student internships and entrepreneurship research). As of 2006 ATI has graduated 150+ companies, raised \$720 million (USD) in capital, had four companies IPO and 20 companies acquired, launched 30 independent profitable companies, and created 3,000 direct and 7,000 indirect jobs. Important lessons have been learned about successful business incubation.⁸

- Plan for financial sustainability.*
- Develop a workable company selection process.*
- Develop service system that delivers on behalf of client companies.*

⁸ Ibid. p. 57

- *Provide entrepreneurial leadership.*
- *Establish clear metrics of success.*

ATI's growth has taken a natural and logical course: growing in size as it takes on more companies; growing in services as "best practices" are honed and developed; enlarging its networks as a natural result of pairing hi-potential companies with venture capitalists and other professionals in the community; expanding to strategic new industry sectors as the region's economy diversifies. Most importantly, the Austin Technology Incubator is an interactive component in Austin's economy as a whole – and it is supported by broad-based interests and financial investments. It is believed that with similar community focus and support, the MTCC could serve as a similar catalyst to accelerate technology development in Moncton.

KEY OBJECTIVE 3 FOSTER ACADEMIC & RESEARCH EXCELLENCE

Academic and research excellence is fostered that is specifically linked to regional economic development.

The long-term foundation for accelerated regional economic development is regionally based research and education excellence. This has proven to be a viable strategy for enhancing university education and research excellence and for accelerating economic development at Stanford University and Palo Alto, CA; MIT and Boston, MA; and the University of Texas at Austin, as well as less famous universities and regions. Recruiting world-class faculty in targeted areas leads to greater funding from industry and government, recruitment of higher-quality students, and increases the possibility of company spinout activity from educational institutions as well as enhanced research and education excellence.

Vision:

To fully leverage and develop existing and emerging academic assets (research, education, and training) that are key to accelerating the growth of established and emerging technology-based industries in targeted, niche sectors.

Assets:

- Area R&D activities in the biosciences are a long-term asset and growing stronger every year. In 2005 and 2006, over \$750,000 in CIHR research funds was awarded to Université de Moncton scholars; in addition, the Centre de Formation Médicale du N.-B. started its four-year MD degree program in 2006 in Moncton, which increases research capacity in the city and may pave the way for an eventual medical school associated with Université de Moncton.
- The Atlantic Cancer Research Center, research underway at both local hospitals, and R&D groups at the Université de Moncton like the Thin Films and Photonics program have untapped commercialization potential.
- Moncton has a large endowment of community and private colleges.

- Moncton has a sufficiently large local supply of bilingual engineers and scientists, thanks to the presence of the Université de Moncton, the largest Francophone university in Atlantic Canada. Indeed, the Université de Moncton reports that 89 percent of its full-time students are originally from New Brunswick, 70 percent of its graduates reside in New Brunswick, and 80 percent work in the province.⁹
- Moncton has a number of nearby universities, such as UNB-Fredericton, that provide excellent masters and doctoral programs in science and engineering fields.

Challenges:

- There is no major Anglophone university in Moncton.
- There is a need to foster shared vision and effort on targeted activities across businesses, academic institutions, and local and provincial government leaders.
- The entire Atlantic Region faces population decline. Numbers show that by the end of the next decade, there will have been, spread over two decades, a 33 percent decline in the number of high school graduates in New Brunswick alone.¹⁰ In the long run, unless there is more immigration, this situation is likely to continue.¹¹
- Disparity exists between the percentage of Anglophone and Francophone workers with post-secondary education.
- Universities in the province—with a few exceptions (e.g. University of New Brunswick at Saint John)—are not attracting sufficient numbers of science and engineering students from outside the NB province or from other countries.

Strategies:

- Support existing and emerging research and development centers as valuable resources that create the “seed corn” for future economic development.
- Establish academic-business “Partnerships for Research Excellence” that will benefit the larger community in terms of regional, national, and global perceptions that Greater Moncton is serious and action-oriented and that regional leaders work cooperatively.
 - Raise funds to endow faculty chairs, at regional universities, in targeted industry sector areas such as ICT, Gaming, Bioengineering, Computer Science, Entrepreneurship and Commercialization.
 - Recruit outstanding faculty that are likely to win competitive grants and recruit outstanding students, especially in these targeted areas.
 - Concentrate on building upon existing and emerging regional strengths, e.g., the Thin Films and Photonics Research Group (GCMP) at the Université de Moncton.
- Develop a regional approach in Greater Moncton for specific clusters that links academic and industry leaders and fosters targeted growth through effective recruitment.
 - Greater Moncton has an emerging model in regional cooperation in biosciences including Mount Allison, UNB, Université de Moncton, and the two Moncton Hospitals and includes public-private sector support and leading-edge research, i.e. the Atlantic Cancer Research Institute.

⁹ Data taken from interview with Daniel Grant, Université de Moncton Placement Officer.

¹⁰ This trend is explained, in part, by an aging population—the median age of the population in Moncton is 38 years old—and by the decline in the rates of growth of the young cohorts (ages 5-14 and 15-19).

¹¹ Data provided by Dr. Richard Wiggers, Senior Policy Analyst, Post-Secondary Affairs, New Brunswick Department of Education during interview on August 3, 2006.

- Focus both on near-term objectives, which concentrate on the use of existing knowledge and strength of existing assets; and longer-term objectives, which include the creation of new, cutting-edge research and development that is a desirable longer-term objective for the educational institutions.

Specific Actions:

- Pursue opportunities for greater alignment of post-secondary capacity in ICT with regional industry needs, and challenge Université de Moncton, NBCC-CCNB, and other post-secondary educational institutions to meet this objective through collaboration and other arrangements.
- Expand and clarify articulation agreements (community college-to-university, and across universities) to encourage post-secondary educational enrollment, especially among Anglophone students.
- Develop reliable math testing protocols at the school district level that fulfill two characteristics: (1) they allow comparisons of math scores for both the Anglophone and the Francophone population and (2) they can be compared with scores of students in other cities in Canada and other industrialized countries.¹² Increasing Moncton's sample size in the PISA test could be an easy way to address this issue.
- Explore development of K-12 curriculum initiatives and youth training programs with the participation of the ICT business community.
- Encourage more active participation of entrepreneurs on the Board of Directors for the Maritime Provinces Higher Education Commission (MPHEC) in the determination of new programs to be initiated at universities in Atlantic Canada.
- Increase distance education opportunities, especially at the post-graduate level. The continuing education of engineers and scientists is a necessary condition for the growth of a knowledge-based industry in Moncton.
- Promote a campaign to matriculate more students into Moncton's ICT and other technology-based education/training programs.

The importance of having a college-educated workforce in a local economy cannot be overemphasized. Worldwide, the most successful technology regions have regional universities that graduate talent into the local economy. For Greater Moncton, the Université de Moncton and CCNB-Dieppe are huge assets for the city but especially so for Moncton's minority Francophone community. For Anglophone students, NBCC-Moncton, Mount Allison University, and Atlantic Baptist University enjoy well-deserved reputations for excellence among both students and employers. But the province's post-secondary educational institutions need to do more to raise the percentage of Greater Moncton workers with degrees in the sciences and engineering, especially in the Anglophone community.

Develop Student Internships and Job Placement Opportunities

- Pilot test a variety of innovative ideas and approaches for improving student placement with local employers. Better employer and student placement service relationships and interactions are needed to achieve higher retention levels of graduates and to facilitate co-op programs, between local employers and

¹² Moncton needs to sell an image to the international high-tech community that its educational system is among the best in the world. In Austin, for instance, the Chamber of Commerce website advertises that Eanes and Round Rock School Districts (where Dell Computer is located) in the Austin metropolitan area are rated "gold medal," the highest of *Expansion Magazine's* cost-performance category.

undergraduates, that will build important ties between “town and gown” before students graduate.

- Develop technology-based education and training programs at the high-school level to get students interested at an early age in ICT and engineering fields. Many of the interviewees from the NB Department of Education noted that student interest in trade skills was much higher than in ICT skills.
- Support college and university internships with companies in targeted industry sectors to build ties with Moncton businesses early in students’ educational programs.
- Develop an internship program for high school students with local employers.
- Host job fairs for targeted industry sectors and regional universities.
- Develop and fund research and education workforce projects.
- Provide a brokering service to match employers seeking information on technology available talent in targeted industry sectors.
- Recruit those who have moved away after graduation—the goal is to identify and attract those individuals who moved away from Moncton for whatever reason.
- Develop campaigns to attract to the region the best students in science and engineering from other provinces in Canada and from other countries.
- Increase international connections and exposure through student exchange in digital media entrepreneurship. For example, an international exchange program is being considered between Université de Moncton and France, IC² Institute and partners in Poland and Portugal.

RESEARCH & DEVELOPMENT BASE

“Renewable energy and energy efficiency are crucially important long-term issues for a region like New Brunswick, where wind energy is so abundant... The prospect of locating the company in an incubator, where we could access commercialization resources, is attractive.”

– Excerpt from the Wind Energy Research & Development Case Study, Report B

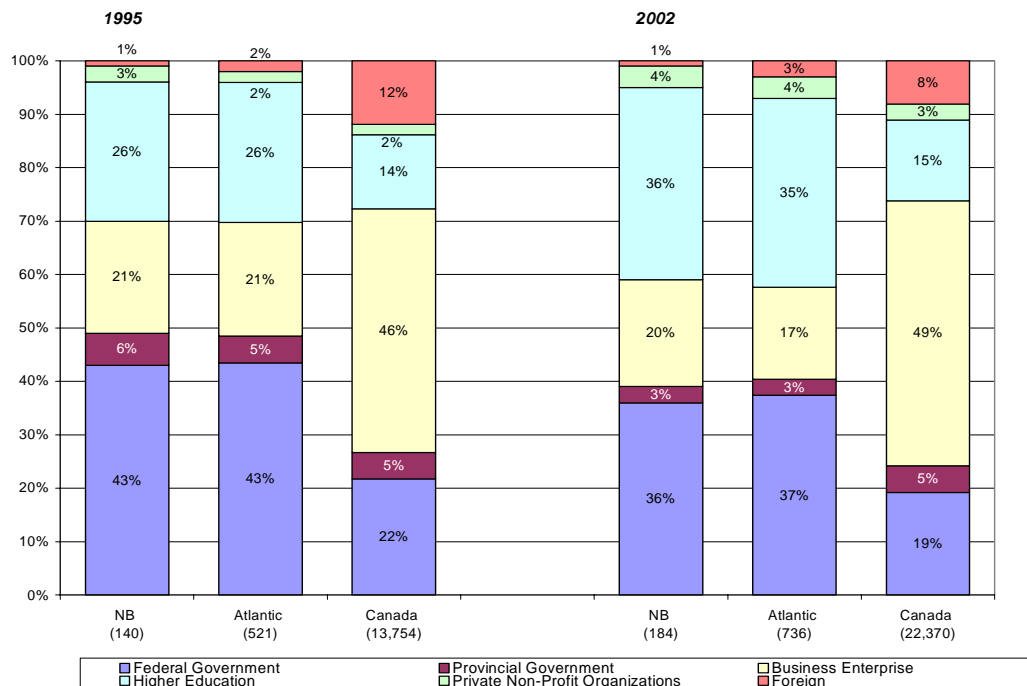
Doucet believes that a number of synergies could be created if Moncton created an innovation center. “Synergies don’t occur if people don’t talk, and they don’t talk without proximity,” he says. An ICT innovation center could provide the region with a usability lab where software product development can be undertaken. Alpha and beta testing can be done at such a center, which would function in a similar role to that played by CADMI in the 1990s. NRC could be an important initial tenant. Rather than locating on an academic campus, as CADMI did, an innovation center sited in a commercial area close to downtown would attract businesses eager to be closer to other ICT companies and those doing applied research. Doucet, having lived through the creation of CADMI and Spielo’s success, believes that “an incubator in an industrial or research park with supportive zoning could lead to an ICT cluster. The bottom line is the City has to make it easy to do business in the ICT sector.”

– Excerpt from the Dovico Case Study, Report B

Research and development (R&D) is the basis for innovations and therefore economic growth. Research centers at universities and research labs at private companies need research funds to create new products and processes. The commercialization of these new inventions is an important component of the knowledge-based entrepreneurial process.

Moncton has a number of important R&D centers, including the Atlantic Cancer Research Institute, and the Thin Films and Photonics Research Group at the Université de Moncton, among others. But there are significant barriers to commercializing R&D activity in the region, including the one hundred-percent inventor-owned intellectual property regime at regional universities, and the relative lack of commercialization assistance available to researchers.

Figure 5. R&D Expenditure by Funding Sectors—Atlantic Canada & NB Province 1995, 2002



Moncton is typical in the Atlantic Canada region as an economy dominated by small and-medium size enterprises that allocate very few resources to R&D. The low participation of the private sector in R&D means that Atlantic Canada relies more heavily for research funding on the federal government than Canada as a whole. Indeed, as Figure 5 shows, in 2002, the private sector accounted for 49 percent of R&D funding in Canada, while it accounted for only 20 percent in New Brunswick and 17 percent in Atlantic Canada.¹³

INTELLECTUAL PROPERTY & TECHNOLOGY TRANSFER

New Brunswick universities have inventor-owned IP policies. The most comprehensive of these can be found in the collective bargaining agreement at the University of New Brunswick.¹⁴ The regional university-based R&D path for commercializing technologies could be accelerated and optimized if the IP ownership policy were changed to an institution-owned policy in conformance with the trend at modern research institutions throughout the world.

¹³ Data for figures 3.1 to 3.4 comes from: MPHEC (Maritime Provinces Higher Education Commission), *R&D Funding in Atlantic Universities* (Fredericton, NB: MPHEC, 2005).

¹⁴ <http://www.unb.ca/hr/aunbt/art38.html>

IP Ownership: The Oxford and Cambridge Model

The IP policy of the premier British research institutions may provide a lesson for New Brunswick. Both Oxford and Cambridge Universities have struggled with IP ownership institutional policy. Cambridge recognized that with an inventor-owned IP policy, a supportive infrastructure was needed to ensure that opportunities for the application of new knowledge that arose would not be lost. The three most reasonable implementation options for the institution taking ownership included:

- i. of all intellectual property generated past, present, and future by all employees where it has not been licensed, assigned, or is in any other way subject to third-party obligations*
- ii. of all intellectual property created after an agreed date by all employees*
- iii. of all intellectual property created by new employees who join after an agreed date*

The Cambridge Joint Report recognized that Oxford had chosen (ii) in 1995. Cambridge, with this pronouncement, chose (ii) on July 22, 2002. These same three options could be recommended for consideration by New Brunswick's research institutions. The trade to the inventors in the case of Cambridge took the form of a generous royalty schedule: 90% of the first £20,000, then 70% of the next £40,000 and then 50% of the next £40,000, far more generous than the normal U.S. university royalty-sharing schedule. Notwithstanding the minority views of Canadian proponents for inventor-owned IP policies,¹⁵ from a Canadian national perspective, the Prime Minister's Advisory Council on Science and Technology panel of experts on the commercialization of university research "strongly believes that university ownership of IP (either in the first instance or through assignment) would greatly increase the number of commercialization opportunities emanating from university-based research. University researchers do not need to own IP in order to benefit from successful commercialization undertakings..."

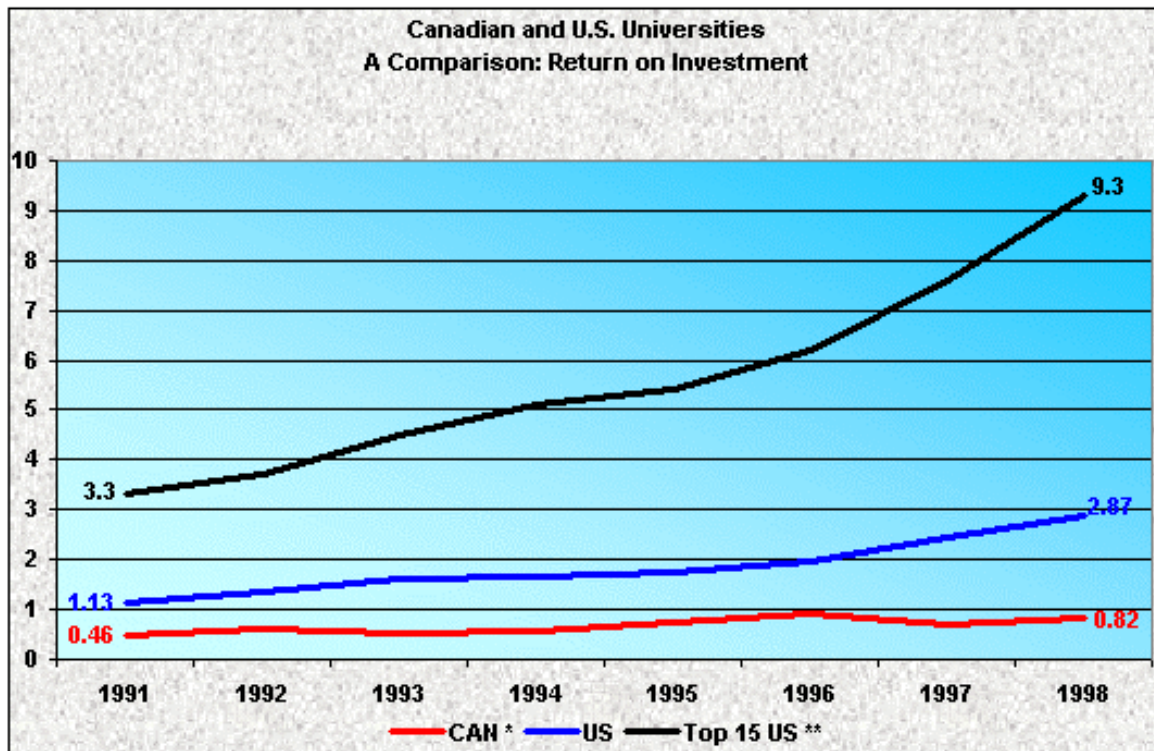
Persuasive arguments are made that IP ownership policies are directly related to return on investment (ROI) made in research and enjoyed by Canadian compared to U.S. universities. The Prime Minister's expert panel on the commercialization of university research believes "the best way to measure Canada's commercialization performance is to examine rates of ROI. The ideal benchmark would be return on investment measures for American universities which are considered to be world leaders in this area."¹⁶ The favorable U.S. position relative to Canada for ROI is reflected in the data depicted in Figure 6.¹⁷

¹⁵ "Commercialization Productivity of Canadian Universities" Bruce P. Clayman, Simon Fraser University, AUTM presentation www.sfu.ca/vpresearch/vp-research/ICUR.ppt Slide 21. accessed online June 5, 2006

¹⁶ Ibid page 16.

¹⁷ See "MATC: Medical and Assistive Technologies Consortium SWOT Analysis for the Medical and Assistive Technologies Sector in Ontario and Western New York," Soloninka and Associates, May 2002. <http://www.htx.ca/HTX/DesktopModules/Links/..%5C.%5CFiles%5ClocalDocuments%5CSWOT%20Report.pdf>

Figure 6. Canadian and U.S. Universities: A Comparison of ROI for R&D



Source: Pierre Fortier, Commercialization of University Research, 2001.

The graph demonstrates that colleges and universities in the U.S. enjoy ROI approximately three times greater than that of Canadian universities. In the context of ROI with the United States as an example, it is suggested by the Standing Committee that "...one of the key (U.S.) policies which was made in 1980 was to pass legislation to say from now on when researchers develop intellectual property it won't belong to the government, it will belong to the university where the research is performed with the obligation for that university to organize a commercialization office and to commercialize and to do it in such a way that it favors the American enterprises and preferably the SMEs."¹⁸ Research performed at New Brunswick universities, at present, is conducted, for the most part, under an IP policy that runs contrary to a preferred model arguably superior in the rest of the world where IP ownership devolves upon the institution rather than to the inventor or is substantially shared between the two.

¹⁸ "A Canadian Innovation Agenda For The Twenty-First Century, Fifth Report of the Standing Committee on Industry, Science and Technology," Susan Whelan, M.P. Chair, June 2001.
<http://www.parl.gc.ca/infocomdoc/37/1/INST/studies/reports/indu04/22-ch10-e.htm>

KEY OBJECTIVE 4 PARTNERSHIPS & ALLIANCES

Foster and leverage national and international value-added partnerships and alliances.

Vision:

Greater Moncton's existing resources and assets will realize larger markets due to enhanced national and global alliances and partnerships.

Challenge:

Building regional agreement and support for the value of national and international networks and partnerships for quality research and education and targeted economic development

Strategies:

- Build on the region's existing international programs and activities and characteristics of openness, tolerance, and friendliness to develop national and global partnerships.
- Promote programs that recruit talented, entrepreneurial immigrants.

Specific Actions:

- Target several carefully chosen partnerships, alliances, and opportunities for collaboration that would benefit Greater Moncton's academic and business sectors such as: Creative Learning Institute in Digital Media, Bioscience.
- Leverage IC² Institute's existing regional economic development programs with Mexico, Portugal, and Poland as well as IC² Institute's international networks and international conferences.
- Promote a strategic alliance with Austin Technology Incubator and incubators worldwide in target industry sectors.
- Foster "Immigrant Entrepreneurship." Organize international student exchange focused on entrepreneurship and business venturing such as Université de Moncton student exchange and entrepreneurship competition with students from France, Poland, Portugal, and Austin increasing international connections and exposure.
- Explore links to IC² Institute's Master of Science in Science and Technology Commercialization (<http://msstc.ic2.org/>). Work to collaborate on research and development and innovation with other regions and countries such as Russia, Portugal, and Poland using Canada as a gateway to the Americas.

MODEL FOR SUCCESS: OULU

Oulu, Finland, was selected as Moncton's Benchmark City as a model for success. Oulu is located close to the Arctic Circle about 400 miles north of Helsinki, is the sixth largest city in Finland with a population of 129,000, and promotes itself with the slogan "Small in Size, Big in Technology." Oulu has experienced exceptionally strong technological transformation over the past thirty years from large-scale industries that use natural resources to knowledge-based industries. How did this small city manage to become an important knowledge city? A short account of the path that the city followed to success in this effort is outlined in Table 1 (also see Report B). Moncton can learn from Oulu's success story. Many of the actions

taken by Oulu's network of government, university, and private sector initiatives have already been suggested for Moncton in this report.

Table 1. Reasons why Oulu, Finland, was chosen as Moncton's Benchmark City

General: Oulu is one of Finland's most successful regions

Sixth largest city in Finland
First in international competitiveness¹
First on the European Innovation Scoreboard²
Well-connected by air, water, and train
Population: 129,000

Universities: educational opportunities

University of Oulu has 3,100 staff and 15,800 students
Oulu Polytechnic has 7,700 students

Research institutions: information technology is growing

VTT Electronics
Centre for Wireless Communications
Infotech Oulu within U. of Oulu has 500 staff
Medialab Oulu

Private sector: information technology is growing

Biocenter Oulu within U. of Oulu has 270 staff
Technopolis science park has 700 companies with 9,000 personnel (est. 1982)
Nokia has 8 divisions located in Oulu with 4,600 employees
Polar Electro (measuring & controlling devices manufacturer)

High-technology clusters: industrial clusters with employment in 2002

High-tech cluster: 800 enterprises with 15,000 employees³
Information technology cluster: 260 companies with 8,467 employees
Content and media cluster: 1,289 employees
Medical cluster: 3,718 employees
Biocluster: 257 employees
Environmental cluster: 997 employees

Sources: ¹The Lisbon Review, World Economic Forum, 2004 ²European Commission, 2004 ³Statistics Finland, 2002.

KEY OBJECTIVE 5 PROMOTE A COMMON VISION FOR DEVELOPMENT

Promote a common vision and coordinated action initiatives targeted to brand Greater Moncton as an important emerging center of technology-based entrepreneurship and business development.

Vision:

The community will share a positive image of Greater Moncton that reflects the current realities as well as the vision of tomorrow.

Overall

- Importance of Civic Leaders — business, academic, and government — having unified regional visions and actions – use this report and the targeted action initiatives as a

means to work toward increased regional cooperation to build a regional view of how best to:

- Accelerate technology-based business development in established and emerging industry clusters with the greatest growth potential.
- Develop Greater Moncton as an emerging center of technology-based entrepreneurship.
- Foster academic and research excellence that is specifically linked to regional economic development.
- Foster and leverage regional, national, and global value-added partnerships and alliances.

Challenges:

- Existing regionalism
- Bilingual requirements

Strategies:

- Develop a coordinated media program: Newspapers, magazines, TV.
- From 1985 to 1995, Austin, Texas successfully changed its brand or image from that of a university and government town in ranch and cowboy country to a technology growth and entrepreneurial region that attracted talent and VC funds from Silicon Valley and Boston and to a global image as an international “Technopolis.”
- A land development initiative, as part of the Moncton Technology and Commercialization Center (MTCC), could be a viable long-term strategy for anchoring Moncton’s ICT and R&D activities for years to come and branding Moncton as a leading center of innovation and entrepreneurship in Canada (details of the initiative are outlined in Report B). In the near term, “bioinformatics” is seen as a bridge between on-going R&D activity and ICT companies in the area, especially if MTCC provides both commercialization services for Moncton’s R&D centers and incubation services for ICT companies.

Specific Actions:

- Work to transform how regional, national, and global media write, talk, and show the region by publicizing the region’s significant entrepreneurial heritage and celebrating Greater Moncton’s leaders and entrepreneurs.
- Engage local newspaper and other press and media to:
 - Profile Business and Civic (public) entrepreneurs and leaders.
 - Celebrate Entrepreneurial business successes and examining failures.
 - Recognize entrepreneurs and public-private leaders who have returned to Moncton.
- Fund college and university faculty and students to research and write well-written reports on Greater Moncton’s programs that illustrate and exemplify the region’s creative and innovative activities.
- Promote international workshops and events such as an international gaming competition.
- Market regional educational and business development assets as a package of resources for fostering successful entrepreneurship.

Bioinformatics: The Bridge Between ICT and Research & Development (R&D) Centers

This report has emphasized the assets and challenges facing Greater Moncton's two primary areas of technology excellence in ICT and its centers of research and development in the sciences and biosciences. For ICT, the strength of the sector in Moncton resides in the organic development of commercial firms in the private sector, many of which have bootstrapped their way to profitability without the help, in large measure, of much venture capital or governmental support. The R&D centers, on the other hand, have attracted grant money to build research capacity at the Université de Moncton and the two hospitals in the city, but they have been less successful at commercializing technology emerging from their labs (see Report B).

A bridge between the two areas of excellence in Moncton could be created by encouraging development of the pre-existing niche of "bioinformatics" in Moncton. There is a clear opportunity to brand Moncton as a center of excellence in this area by linking ICT and R&D to develop and attract business and research in the growing areas of medical informatics, bio-markers, bio-statistics, health informatics, and bioinformatics in general. A good way to do this would be to house representatives from the IT departments in Moncton's two hospitals in the MTCC proposed in this report, raising the profile of these operations and encouraging business development in the bioinformatics area.

"None of us at the Institute really understands the intricacies of negotiating with private investors, nor should we. That's not our core competency," said Dr. Ouellette. "But if we could find help locally with licensing, patent development and defense, technology transfer, and commercialization, we could take much better advantage of our research results." If incubator space were available to ACRI, the Institute would be very willing to be an initial tenant, take advantage of business management expertise made available through the incubator, and work with other R&D tenants to pursue more opportunities."

Excerpt from Atlantic Cancer Research Institute Case Study, Report B

"Moncton would also benefit from a start-up incubation center that could help launch young companies by providing inexpensive office space and technical resources. 'What is important is to have access to engineering staff and the best equipment at cost,' said Jon Manship, founder of Spielo. It is also key to have access to university professors' expertise when it is needed. An incubation center that centralized these resources, along with administrative staff and common business equipment, would help launch entrepreneurship in the region."

"Spielo/GTECH developers have a catalog of 450 discrete 'pure research' ideas with the goal of finding disruptive technologies, patentable concepts, and other breakthroughs not specifically related to new product development but that will provide the firms with a competitive advantage. It would be advantageous for Moncton to establish a subsidized research center, like a 'Skunkworks,' that helps fund some of this work. "One way to approach this would be to bring all of the institutional sources of funding and support together at the table at one time, and all of the companies that might benefit from this, into a consortium," says Rybak. Rather than companies individually seeking government funding for suitable projects, a technology center could be established with government funds. Companies could contribute financially and with in-kind contributions. This would promote research cooperation between institutions and industry and could lead to a number of spin-off technologies and start ups, Rybak believes."

– Excerpts from the Spielo/GTECH Case Study, Report

The following cases support the potential benefit of the proposed Moncton Technology Commercialization Center (MTCC) – and regional and international partnerships – for development in the two industry clusters recommended: **Informatics and ICT/Gaming**.

MTCC INDUSTRY SUPPORT CASE #1: INFORMATICS

Beauséjour Regional Health Authority, Dr. Georges-L. Dumont Regional Hospital

Robert Goguen, Manager of Development and Programmer Analyst for the Beauséjour Regional Health Authority in Moncton, has kept his hospital on the edge of technological innovation. His team of eight IT specialists is completely funded by the Regional Health Authority (not every New Brunswick health authority funds an IT team at every hospital).

Custom Software: It is not unusual for most modern hospitals to have made the transition from paper to digital intranets to track patients and their treatment. But at Beauséjour, Goguen has developed custom software applications not only to manage patient records but to track results in clinical trials and projects in specific areas like tele-nephrology and tele-oncology. Goguen's IT team developed these project-tracking applications in-house and is very willing to share them with the other regional health authorities in the province or elsewhere, but licensing them on a wider basis is not out of the question, either. And when software development projects arise, which they do continuously, Goguen sees a large potential for partnering with local software companies. "Especially when we have a big application to develop, it would be great to partner with a software firm. Locating in an incubator would raise our exposure and help us find the right partners," he says.

Bio-Statistics: An emerging asset at Beauséjour is the proliferation of bio-statistics generated from the projects, research, and trials underway at the hospital, quite apart from the routine patient record management functions of most hospitals. Goguen says that he envisions a huge amount of research that could be done on the data that he collects and stores, and that data mining with .SQL Server from Microsoft will be an important new direction for his team in coming years. "There is not much research being done on this at my hospital now, but the potential is there," says Goguen, who has spoken with NRC representatives about the potential to fund expansion in this area.

The Atlantic Cancer Research Institute is one of Moncton's leading R&D centers of excellence and is physically located in the Dr. Georges-L. Dumont Regional Hospital. Its scientists have extensive experience in bioinformatics tools and methods. It should be a partner in the bioinformatics bridge.

South-East Regional Health Authority, Moncton Hospital

The hospital itself is Moncton's largest employer, with 2,700 employees and an annual budget of \$180 million. Like the Dr. Georges-L. Dumont Regional Hospital, the Moncton Hospital has an undervalued asset in its IT department. Jacques Lirette, CIO, oversees an IT staff of 44. "For us, IT in the hospital setting is about shaking up the status quo, showing how we can improve workflow to improve patient care, always with a focus on our patients."

Medical and Health Informatics: Lirette sees huge potential growth for the hospital in IT-driven medical and health informatics, or the storage, retrieval, and analysis of health-specific data. For Lirette, the biggest issue on his department's near-term horizon is

improving the use of data that is collected to improve patient safety and reduce errors. “There is a huge amount of data flowing around our hospital. The problem is overcoming clinical specialties within the hospital to better communicate patient treatment histories. So much data exist in isolated silos and are not well integrated,” he says. Lirette’s team has developed a reputation among OEM’s across Canada for being a test bed for evaluating new technology, like mobile communications, for doctors and hospital staff to use. “We have been testing prototypes for RIM, for instance, for completely novel medical applications,” Lirette says. “We don’t publish our own results, but findings from OEM testing have appeared in industry journals, which is extremely gratifying to us.”

Incubation: Lirette’s IT department is a big consumer of software, much of it custom made for his hospital, and he would like to see more local software vendors compete for contracts at Moncton Hospital. “In many cases,” he believes, “local companies just are not aware of us and what we need, nor are they experienced enough in the bidding process to win our contracts. But if my IT department had a presence in a local incubator, we could be meeting much more regularly with local and regional software developers, discussing our needs with them, and keep more of our purchasing local. Revenue generation is not a big priority for the IT department, but licensing and partnering with local companies through the incubator could be a big win for us and for the Moncton IT community.” He envisions the hospital being a testing facility not just for the RIMs of the technology world, but also for small local and regional companies to test their technology products at the hospital, through the IT department.

What is more, he says, locating an office in an incubator would give him more opportunity to recruit talent for his department. Because the government-owned hospital’s wage scale is less flexible than in the private sector, he finds it increasingly difficult to compete for employees, as Moncton’s IT industry expands. “Luckily, we can offer outstanding technology and fascinating problems on which to work. In addition, my experience has been that working for my department has the added benefit for our employees of giving them industry-specific knowledge and expertise in healthcare. So in effect, we turn IT people into healthcare specialists with IT training,” says Lirette. He also says that NBCC-Moncton is a great provider of IT workers. Lirette trains 8-10 NBCC IT students per year in an internship program run by Errol Persaud, an instructor there, and typically he’ll hire a few of those into permanent positions every year, as well as a few from UNB, Université de Moncton, and Mount Allison University.

Health Research: Michelina Mancuso, manager of research services for the hospital, believes that IT’s role in health and medical informatics is to harness health data collected in her hospital for research purposes. The recent increase in clinical trials, medical research, and contract studies at the South-East Regional Health Authority is raising the hospital’s profile as a research center and opening her eyes to the potential for better use of the vast amount of patient and clinical trial data. Mancuso recognizes that biomedical researchers in Atlantic Canada require the clinical expertise and a “real laboratory” to understand and improve devices during their research and development phases. Recently, for example, working with Paul Colosimo, Supervisor in Nuclear Medicine at the hospital, she identified an opportunity to move imaging informatics forward at the hospital and has paired diagnosticians at the hospital with nuclear engineers from UNB and industry to research the diagnostic and functional capabilities of Moncton Hospital’s SPEC-CT machine, the only such machine that has been in use for longer than a year anywhere in Canada.

Mancuso's biggest need is in the area of intellectual property and commercialization advice. She says that "the hospital doesn't have the IP specialists to manage the tools, datasets, and clinical results developed here. We need help with negotiating licenses and research contracts with large private sponsors. Having a presence at an incubator could help, if commercialization services were available." She also stresses the importance of understanding the important role that these new opportunities in hospital-based health research can play in local economic development. "The entire health field across the province should see that medical informatics has the potential to generate benefits for our hospitals and can spark entrepreneurial activity in the community, as well."

Action Plan

- Include space in the proposed Moncton Technology Commercialization Center (MTCC) for Health and Bio-informatics organizations, events, and activities.
- Encourage an initial meeting of interested parties in the Health and Bio-informatics area, including:
 - Andrew Paskauskas, Director of Research Development at Mount Allison University
 - Dr. Rodney Ouellette, Atlantic Canada Research Institute
 - Jacques Lirette, CIO; South-East Regional Health Authority
 - Michelina Mancuso, Manager of Research Services, South-East Regional Health Authority
 - Robert Goguen, Manager of Development and Programmer Analyst, Beauséjour Regional Health Authority
- Promote Health and Bio-informatics and related commercial potential.

MTCC INDUSTRY SUPPORT CASE #2: GAMING AND ICT-RELATED R&D

Creative Learning Institute in Digital Media Sponsored by Atlantic Lottery and Others¹⁹

The vision is to have an Atlantic Lottery-affiliated gaming and ICT-related R&D Creative Learning Institute in Digital Media located near the MTCC in Moncton. Initial funding could come from appropriate government programs, the Atlantic Lottery Corporation, as well as other Moncton-based interested enterprises, such as Spielo and GTECH. Should a gaming facility become a reality in the Moncton area, consideration could also be given to dedication of a portion of revenues to support the research activities at the centre. Technologies and talent could come from the funding partners and affiliates (see below) as well as New Brunswick and Atlantic Canada based universities, colleges, and even high schools. Funding, talent, and technology alliances would also be formed with national and international affiliates including The University of Texas at Austin and Austin, Texas' game, film, and arts businesses and communities, and select IC² global partners (e.g., Portugal, Poland, Korea) to launch, learn about, and test the concept (see below). An underlying premise is that:

Enhanced creativity will come from broad-based, eclectic, and creative talent from diverse backgrounds and geographic locations coming together – virtually and face-to-face - at the Moncton ICT and gaming technologies Creative Learning Institute in Digital Media.

¹⁹ It is recognized that the initial idea of the Atlantic Lottery Creative Learning Institute in Digital Media came from Bob Rybak, GTECH and was discussed with Michelle Carinci (8/1/06) at Atlantic Lottery, Moncton.

Atlantic Canada is considered to be a preferred product-and-market development location for gaming technologies for subsequent sales in the U.S. and worldwide.

Why Moncton

- Atlantic Lottery is headquartered in Moncton.
- GTECH already has major operations in Moncton as well as Austin, Texas and Poland. Moncton benefits from strong, knowledgeable executive and knowledge links to GTECH.
- Being based in Atlantic Provinces, Atlantic Lottery is free from many product development and marketing constraints that exist in such places as Texas and generally in the U.S.
- Moncton has a central location to draw on student talent from colleges and universities in Atlantic Canada.
- Moncton wants to accelerate technology based growth and has champions dedicated to this vision.

Suggested Atlantic Lottery Creative Learning Institute in Digital Media Affiliates

Austin, Texas Related Assets:

- Austin's entertainment sector (e.g., film, music) is world-recognized and growing.
- Austin is the third major gaming development location in the U.S. with such successful gaming pioneers and current leaders as Richard Garriott, NC Soft.
- Dell computers, founded and based in Austin, is moving into gaming in a big way through alliances with champions like R. Garriott and others.
- Digital Film producer Richard Linkletter, a graduate of the UT Film School, films many of his creative and innovative productions in Austin.
- The city of Austin is working to build its Digital Media economic development related activities.
- UT, Austin is building a Digital Media Center of Excellence drawing on computer sciences, engineering, and the creative arts.
- IC² Institute's Austin Technology Incubator (ATI) is looking to build a Digital Media Facility to leverage with the successful ATI Wireless Incubator.
 - IC² Institute has an on-going Visiting Scholars Program with Korea Telecom which is moving into the mobile gaming space and is sending its executives to study at UT's Film School for developing content know-how - Korea is a known leader in gaming and wireless technologies.
 - Portugal: Government of Portugal is developing a 5-Year R&D and commercialization agreement with IC² Institute and UT-Austin focused on Digital Media. Several Portuguese companies have novel technologies and content targeted for the EU market.
 - Poland: IC² has established and trusted networks based on 3-years of program development with leading Polish universities. Poland has relatively inexpensive world-class technology and software developers. UT-Austin's College of

Communication is linked to the world famous Lodz Film School in Poland. DELL is opening a plant in Lodz, Poland.

CONCLUSION

This report has presented strategies to enhance Moncton's two principle assets: the organic ICT activity represented by numerous regional-based companies, and the emerging research and development activity based in Moncton's two hospitals and at the Université de Moncton and Mount Allison University. Both represent key local strengths around which Moncton can build a national and international brand as a technology center of excellence.

Building a global brand as a technology hub is not principally about marketing the city, although marketing activities will certainly help publicize Moncton's assets, commercial opportunities, and achievements. Branding Moncton will involve forward progress with the strategic action items outlined in this report:

- Focus investment, organization, and wealth creation around Moncton's existing clusters in ICT and the bioscience and thin films sectors by launching the Moncton Technology and Commercialization Center (MTCC).
- Make Moncton a hospitable place for technology entrepreneurs by organizing angel investors, venture capitalists, and government funding agencies around the need to fund more start-up companies, preferably through the MTCC.
- Improve post-secondary educational attainment rates, particularly among Anglophones, and expand post-secondary ICT offerings through area institutions and collaboration and other arrangements.
- Actively pursue international private and municipal partnerships with other technology centers like Austin, Texas and Oulu, Finland.
- Promote a common vision for Moncton's technology development by pursuing niche opportunities like bioinformatics and a Creative Learning Institute in Digital Media through the MTCC.

Branding Moncton as a technology center of excellence and the "hub city" of Atlantic Canada for entrepreneurship and innovation also addresses larger demographic issues facing both the city and the province. Enrollment in post-secondary education institutions across New Brunswick is slipping in the face of overall population declines and the lure of jobs in rapidly growing parts of Western Canada. And even though Moncton itself is growing, data collected from the survey of graduates (see Report B) and from interviews with young local entrepreneurs indicates that Moncton must improve its "fun factor" to attract young technology workers in greater numbers than it does now. Infrastructure improvements like downtown WiFi, the Creative Learning Institute in Digital Media, and the MTCC will add to existing programs like Geeks on Ice and the Cyber Socials, to improve Moncton's atmosphere among young people in search of interesting and challenging careers in ICT. Local employment opportunities in technology fields like ICT will attract talented young people to the city in relatively high-wage jobs.

Moncton's opportunity to build on its ICT and R&D assets is real. With targeted funds, organized effort, international partnerships, and a renewed emphasis on reinforcing a culture of entrepreneurship and innovation, Moncton can enhance its already growing reputation as a bilingual technology center of excellence.