

**SAINT JOHN POST SECONDARY:
A STRATEGIC FRAMEWORK**

BACKGROUND AND DISCUSSION PAPER

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SAINT JOHN POST SECONDARY STRATEGY BACKGROUND AND DISCUSSION PAPER

As Canada and the rest of the world race to secure a solid foot-hold in a radically new, technology-driven global economy that has shifted from material and labour-intensive products and processes to knowledge-intensive products and services¹, New Brunswick, and by extension Saint John, must focus and develop its economy, industries, companies, labour force and education systems for the highly competitive global marketplace.

Saint John has undergone a significant industrial to post-industrial transformation in the past 50 years². As it transforms itself yet again to a knowledge and technology economy it has defined four priority economic sectors as the foundation for *True Growth*: Energy and Advanced Manufacturing, Health Sciences, Information and Communication Technologies (ICT) and Tourism, The Arts/Culture and Heritage sector has also been prioritized as complementary to the Region's quality of life.

With the continuously rapid evolution of powerful new information and communication technologies and their impact on every economic sector, human capital – knowledge, skills and talent – is and will continue to be a critical, competitive asset for Saint John success. Fifty years ago, a high school diploma earned a well-paying job: today, higher education is an absolute necessity.

If Saint John is to achieve *True Growth*, it must stoke education as an economic engine to power its priority economic sectors. The project team of Amulet Consulting Ltd., Growth Strategies and Accent Incorporated, has been tasked to develop a twenty-year Saint John Region post secondary vision and strategy as a world class center of excellence.

Beginning in December 2006, the project team has conducted broad research and personal interviews with 60+ Regional, provincial and national key informants (Appendix I) to understand Saint John post secondary potential and challenges. Supporting the project team are international sector experts who will contribute their knowledge and expertise to defining the strategy (Appendix II).

New Brunswick and Saint John growth, and the role of post secondary in shaping that growth, is of interest to industry, business, labour, economic agencies, governments and residents. As such, community consultations will be conducted to solicit input into the Saint John post secondary strategy. This Discussion Paper is provided as background and challenge to post secondary change.

The Saint John post secondary strategy will be completed by April 30, 2007 and be the basis for the Saint John presentation to the New Brunswick Commission on Post- Secondary Education that has the mandate to make broad recommendations from a student-focused perspective with particular attention to accessibility, relevancy and responsiveness, quality and accountability, as well as sector structural elements in terms of efficiency, collaboration, differentiation and affordability.

WHAT MAKES A COMMUNITY WORLD CLASS?

If the Saint John vision is to be a world-class center of educational excellence, then the first challenge is defining *world class* and the second challenge is understanding the inter-connectedness of community success and education success.

By its very nature, *world class* suggests capacity to meet highest standards and ability to command resources to operate beyond borders and across wide territories. Modern communities require three “C’s” to be world class³:

- Concepts: the best and latest knowledge and ideas, thereby inferring the imperative of innovation.
- Competence: the ability to operate at highest standards, thereby requiring raw skills and organizational routines that permit people to use their skills to the highest operational standards.
- Connections: the ability to form good and fruitful relationships and gain access to resources of other people and organizations around the world.

Today’s social, economic, technological and market forces interfuse community and education. Communities that successfully connect to the world through concepts, competence and connections continuously integrate and resource four equally critical elements:

1. Post secondary institutions that attract and support people with the talent and foresight to create new ideas:
 - Post secondary institutions are magnets for bright people who attend school and then stay to start/lead/innovate businesses.

- This brainpower hub, in turn, is a magnet for research and knowledge discovery to generate ideas that have commercial potential and/or drive social, cultural, economic and environmental change.
2. An entrepreneurial culture to commercialize concepts through technology and knowledge transfer into viable products/services and support businesses based on them to grow in the community: For example: 72% of new technology businesses established in the Metropolitan Boston Area since 1975 trace their origins to MIT and the University of Waterloo has contributed to similar technology business growth, notable Research in Motion.
 3. Integrated post secondary, industry and business centers of excellence that enhance post secondary education/training efforts, stimulate research, innovation and commercialization, support entrepreneurial companies and build a critical mass of competence that attracts capital investment.
 4. Cultural, social and environmental amenities that motivate knowledge workers and concept-based companies to come and stay in a community, thereby avoiding the economic misfortune of competence and concepts lost to other communities.

To achieve post secondary excellence, Saint John must be a world class community that respects the dynamics of global opportunities and challenges and the strategic, but often tough, decisions necessary to establish and maintain a national and international presence.

BUILDING NEW BRUNSWICK AND SAINT JOHN FOR THE GLOBAL ECONOMY

New Brunswick and, by extension every rural and urban community throughout the province including Saint John, is challenged in broad ways to achieve success in the global economy. Widely documented and acknowledged as the most evident, inter-related socio-economic challenges for New Brunswick's future are:

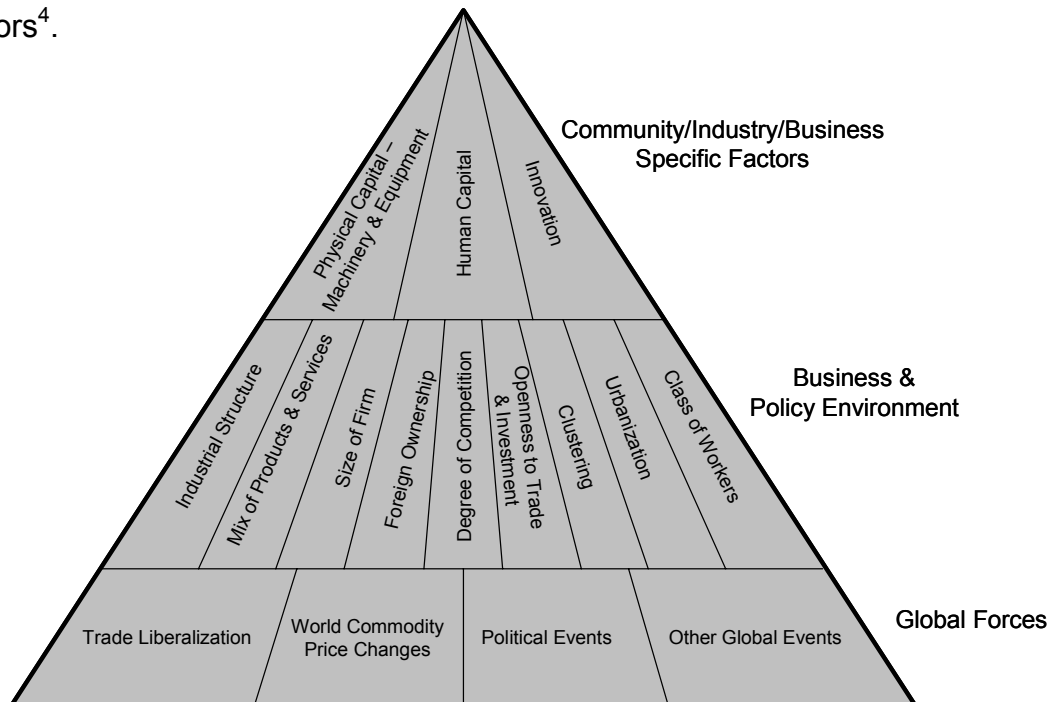
1. **Demographics:** declining and aging, out-migration rates that exceed in-migration and low immigration attraction and retention rates.
2. **Educational Readiness:** 56% of residents age 16+ are functionally illiterate, 65% have low numeracy skills, too few residents who proceed to post secondary and even fewer who complete.
3. **Workforce Transformation:** workforce retirement rate that will exceed working age cohort (15-64) in the next decade.
4. **Economic Performance:** below Canadian average economic growth (New Brunswick GDP's +6% of national average), lower than Canadian average productivity and median total income \$21,000 is one of the lowest in Canada.
5. **Entrepreneurial Culture:** dominantly SME-based economy often siloed with weak horizontal and vertical networks within/amongst government, industry, business, entrepreneurs, academia and research institutions and inadequate and/or siloed incentives to nurture entrepreneurship.
6. **Poverty Rates:** a provincial poverty rate (15.7%) comparable with national rate (16.5%), high levels of child poverty particularly in female, one parent families and widening gap of inequality between rich and poor

New Brunswick is in a vicious cycle: the combined impacts of demographics without adequate higher education and competitive workforce competence contributes to critical skilled labour shortages that affects economic stagnation that leads to further out-migration by people, industry and business that contributes to :

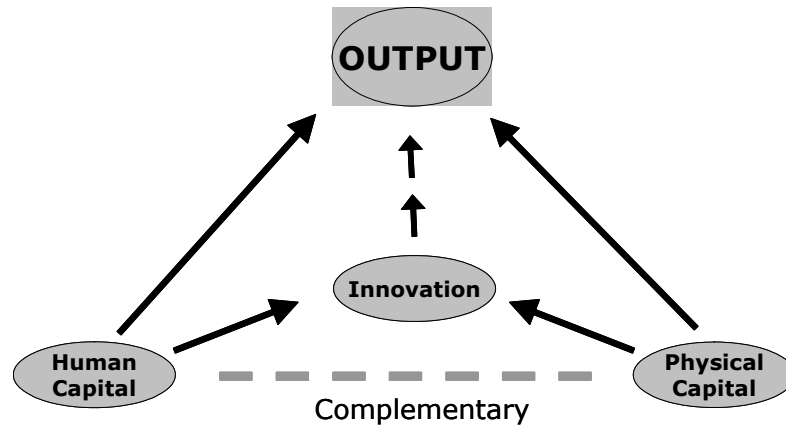
- A shrinking and changing domestic market
- Shortfalls in personal income tax base
- Health and social service demands that consume ever-increasing shares of public resources
- Workforce shortages required to support business growth and expansion
- Business downsizing or movements to workforce skills supply
- Shrinking corporate tax base
- Business/industry inability to produce innovative and globally competitive value-add products/services
- Inability to attract investors and entrepreneurs to re-energize the provincial economy.

Saint John has not been immune to these provincial realities. In fact, the Saint John population declined by 2.6% or 3,300 people between 1996 and 2006 accounting for 40% of the total provincial decline. Additionally, the City of Saint John has major poverty challenges: a poverty rate 35% higher than provincial and national averages, 27% (19,100) of citizens living in poverty with the majority (64%) not having achieved a high school certificate and the second highest rate of single parents living in poverty in Canada (88% are women), only half of whom work and most surviving on Social Assistance.

Productivity is the single most important determinant of living standard (level of real income)⁴. New Brunswick productivity was 18% lower than the Canadian average in 2005 and lags all but two provinces. Improving productivity is the only sustainable way to grow New Brunswick. Productivity, the value of output per unit of labour (measured by hours worked), is the culmination of a number of related factors⁴.



Productivity is not about working harder: it is all about working smarter. Evidence clearly indicates that to advance to a state of global competitiveness, an economy must have a highly skilled and productive workforce that complements physical capital investments in technology, machinery and equipment⁵.



The inherent challenge, however, is the willingness of jurisdictions (countries, provinces/states, communities, etc.), industry and business to invest substantially and sustainably in both state-of-the-art infrastructure and developing human capital. Throughout Atlantic Canada this challenge is heightened by current socio-economic factors that magnify reluctance to invest, particularly in human capital, only to see people take their talents West.

The reality is that physical capital investments without a highly skilled and productive workforce is all for naught. Every emerging or advancing economy must continuously source, retain and re-invest in the right mix of knowledge, skills and talent because, not only is every other economy doing so, but the labour force is shrinking, escalating competition for smart people.

There is no singular workforce solution but those that are succeeding are integrating innovative and unique solutions that include:

- Public policy changes to eliminate/reduce workforce participation barriers (e.g., mandatory retirement, immigration, foreign credentials recognition, labour codes, etc.).

- Internal jurisdictional, industry and business workforce management to align performance with strategic direction, career development, education/training and succession planning.
- Investments in public and post secondary education/training to prepare next generation workers.
- Investments in life-long learning to re-tool and refresh current workers by keeping knowledge and skills up-to-date.
- Incentives to defer planned retirements.
- Increasing the base workforce through innovative education/training and career opportunities for under-employed and under-educated segments of society who have been marginalized (aboriginals, unemployed, in poverty, etc.).
- Expedited accreditation processes and professional upgrading for immigrants.
- Career opportunities and wage parity to repatriate and/or attract in-migrants.
- International recruiting: job fairs, employment agency relationships, etc.
- Enticements for skilled workers at all levels, not just executive positions: housing perks/subsidies, golf club/ski resort memberships, etc.
- Incentives to attract “mobile” workers to relocate on a temporary basis for employment opportunities.
- Importing foreign workers on a temporary basis.

Labour shortages in every developed country are the impetus for innovative workforce solutions to continuously source ever higher levels of competence. The one workforce solution common to competitive jurisdictions is education because higher levels of education are associated with productivity, an economy’s ability to undertake innovation⁶ and improvements to citizen quality of life (employment, job security, income, etc.). To New Brunswick’s advantage

there are four public universities with seven campuses, two private universities, a network of eleven community college campuses, a forestry college and numerous private post secondary schools that combined have capacity to fulfill some of the current and future human capital needs of New Brunswick.

SAINT JOHN ECONOMIC PRIORITIES

The Greater Saint John Community Growth Strategy identifies four priority growth sectors and one complementary socio-cultural sector:

1. Priority Economic Growth Sectors

Energy and Advanced Manufacturing Sector

Rationale:

- Historic investments in New Brunswick/Saint John energy sector: electricity transmission, crude oil refining, nuclear power.
- High potential to become central energy hub for eastern North America.
- Saint John is one of Eastern Canada's largest concentrations of advanced manufacturing clusters in plastics, metal fabrication, fish and food processing and forestry, generating an estimated \$7 billion in exports representing approximately 60+% of New Brunswick total.

Competitive Advantages:

- Geographic location/proximity to large US markets with growing demand for energy that exceeds internal supply capacity.
- Ice-free, deep water protected sea-port.
- Provincial electricity grid and power transmission capacity.
- Planned/proposed energy infrastructure investments:
 - Canaport LNG terminus and Brunswick LNG Pipeline
 - Refurbishment of Point Lepreau
 - Second Irving Eider Rock crude oil refinery
 - International 145 mile 345 kilovolt Northeast Reliability Interconnect transmission line
 - Natural gas exploration in Sussex, production facility and lateral pipeline
- Long-standing advanced manufacturers such as JD Irving, Irving Oil, Moosehead Breweries, Uponor-Wirsbo, Lorneville Mechanical and Bourque Industrial.
- Significant influx of new and advanced manufacturing processes, products and associated investments in 2006 including the Floating Pipeline Ltd.'s new CNG pressure vessel manufacturing facility,

Atlantic Wallboard and New York Thermal's Entec final assembly facility.

- Growing cluster of New Brunswick companies specializing in environmental remediation create high paying engineering and science jobs.
- UNB Saint John/Canadian Rivers Institute and Centre for Coastal Studies and Aquaculture environmental research in partnership with industry.

Benefits:

- Strong spin-off business start up/expansion opportunities from the Energy sector, notably select advanced manufacturers, ICT, engineering and environmental science.
- Population drivers that will positively impact demand in every other economic sector including housing, retail/commercial, education, health, recreation, etc.
- Innovation is a pre-condition for manufacturer success in the global market: investing in the development of technology to increase productivity and LEAN processes will result in fewer but higher-paying jobs and sustainable global competitiveness and success.

Growth and Sustainability:

- Strong due to escalating global energy demand and projected global shortage of refining capacity.
- Strong potential for advanced manufacturers that are innovative and can secure a competitive edge or niche in the global marketplace.

Opportunities:

- Bridging advanced manufacturers to the Energy sector to innovate new products/services that improve overall Energy sector and advanced manufacturer value. (NOTE: One third of Canadian manufacturers reported in 2006 that 25% of total sales were derived from products introduced in the past three years⁷).
- Spin-off opportunities to assist industry/business to become more efficient: it costs less to save fuel than buy fuel.
- Managing the Energy and Advanced Manufacturing sector to eliminate/minimize impacts on air, water and land quality.
- Saint John as a community "laboratory" to balance economic growth, maximize energy efficiency and ensure adherence to environmental ethics.

- Saint John environmental impacts analysis to measure industry/business broad-based performance and develop new industry-community relationships.
- Environmental technology research including alternative/green energy technologies.
- Commercialization of innovative environmental products/services, including education, and expansion/spin-off entrepreneurial ventures.

Issues:

- Energy industry consolidation that led to job losses, lay offs, etc. and subsequent declines in relevant engineering and trades education/training enrollments in the 80's and 90's have caught the Canadian energy industry with a skills shortage at the very point of massive growth and workforce attrition.
- Energy sector workforce needs are changing: specialized skills, use and understanding of technology and worker flexibility to operate in a complex workplace.
- Energy sector research investment to stimulate innovation and spin-off commercialization opportunities is excessively low: sector average is 0.75% of corporate revenues and oil and gas segment average is 0.36% compared to Canadian industrial average of 3.5% which itself lags well behind that of other countries.
- Technical skills with technology expertise labour shortage nationwide in both Energy and Advanced Manufacturing for similar skilled workforce, both professional and technical, with state-of-the-art technology and systems analytical/engineering skills.
- Supply of environmental workers is decreasing rapidly while demand intensifies as the sector experiences sustained boom in activity
- Saint John branding as a *brown* community.

Health Sciences Sector

Rationale:

- Health care demand is and will continue to escalate for the next 30 years requiring ongoing, innovative and integrated health and wellness solutions.
- Environmental and individual health determinants for Saint John necessitate a community-driven response.
- Atlantic Health Sciences Corporation (AHSC), New Brunswick Community College: Saint John (NBCC Saint John Campus) and University of New Brunswick: Saint John (UNB Saint John) medical education programs.

Competitive Advantages:

- Service cluster of Saint John Regional Hospital, St. Josephs Community Health Centre and AHSC.
- Nationally accredited trauma hospital with air ambulance facilities, medical specialists, injury through recovery capability.
- Physician teaching hospital affiliated with Dalhousie University.
- Collaborative Intra Professional Education research project currently underway by the AHSC, UNB Saint John and NBCC Saint John Campus.
- Internal medicine residency program to be established in 2007.

Benefits:

- Centralized health care and wellness services and programs.
- Health care workforce is populated with high-paying professionals whose education/training must be constantly refreshed to ensure skills appropriate to tasks.
- Overwhelming majority of graduates from health sciences education enter the health care industry as providers of care in professional specialties of which medicine and nursing are the obvious examples.
- Health care providers are both a benefit and a cost to economies: health care costs account for about 10% of Canada's GDP and, in most provincial jurisdictions, account for between 35-40% of budget allocations.

Growth and Sustainability:

- Strong: baby boom generation will drive health care demand for 30+ years
- Constantly improving health care management is focusing on providing the *right care* by the *right person* at the *right time* with the *right result* at the *right cost*.
- Health care industry is increasingly paying attention to the *right person* component so respects the imperative of ensuring education that is timely and appropriate.

Opportunities:

- Proposed Saint John medical education training program in partnership with Dalhousie University can fuel a collaborative, integrated health sciences business model: infrastructure, education/training, clinical, research, management and administration to build industry critical mass and capacity.
- Innovative health sciences business model that has potential to be a significant economic generator.
- Innovative community-based health and wellness focus.
- Educating a workforce to the highest level of expertise has many upsides, particularly in developing technologies that provide more rapid and accurate assessments of functioning – from x-rays, through CT scans, to MRI's in "machine" mode, to pharmaceuticals and massively improved laboratory techniques.
- Advances in human functioning have been accompanied by an accelerating relationship between practitioners of health care and a wide range of industries to develop technologies to forward the cause of better health. In many instances, these relationships are fostered and matured by investigators working in university research environments where there is an interesting symbiosis between the laboratory and the practitioner.
- Commercial e-health education applications.

Issues:

- Capital intensiveness of health sciences infrastructure, technology, workforce, education/training, research, etc.

Information and Communication Technologies Sector

Rationale:

- Rapidly growing cluster of over 50 diverse ICT companies in Saint John specializing in e-commerce, software development, remote network management, technical support, multi-media and state-of-the-art Voice Over Internet Protocol (VOIP) applications.

Competitive Advantages:

- Success of Saint John-based global companies such as CenterBeam, Exigen, Xerox, IBM, Alcatel, Aliant, Bell Canada, Cendant, Unilever, ExxonMobil, Sitel, Iron Mountain, TD Insurance and Stream.

Benefits:

- Well-educated, high paying, typically younger workforce.

Growth and Sustainability:

- Strong: continuous, robust research and development investments by ICT producer industries.
- Continuous changes in technology drive ICT spending by user industries.
- New Brunswick ICT workforce projected to grow by 20-30% (58,000-63,000 jobs) by 20206.

Opportunities:

- Integrate ICT into Energy and Advanced Manufacturing and Health Sciences sectors to innovate commercial products/services and expand/incubate entrepreneurial businesses.

Issues:

- Potential labour shortages.
- Constant workforce requirement to up-skill.
- Impact of off-shore (China, India) ICT outsourcing capacity due to large numbers of ICT post secondary graduates and low labour costs.

Tourism Sector

Rationale:

- Cruise ship visitation success to date and economic impact.
- Investments in cruise ship infrastructure including state-of-the-art gangway system and recently announced \$8M cruise terminal at Pugsley Wharf.

Competitive Advantages:

- Cruise ship stops in 2006 brought 138,450 cruise visitors plus approximately 55,000 crew members/staff.
- Bay of Fundy.
- Heritage.

Benefits:

- \$200+ million in expenditures in Saint John.

Growth and Sustainability:

- Low to medium without substantial capital intensive investments in infrastructure to support year-round, high end corporate/special events tourism.

Opportunities:

- Continued cruise ship focus to maximize economic impact.
- Heritage preservation efforts to differentiate Saint John product.

Issues:

- Absence of state-of-the-art, internationally competitive conference/meeting/special events facilities.
- New Brunswick tourism season is dominantly June-September with high reliance on student employees.
- Year-round tourism employs a significant proportion of part-time, low wage workers.
- Tourism is extensively and immediately impacted by external forces: global competition, gas prices, world issues (SARS, terrorism, passport requirements, value of Canadian currency, etc.).
- Reliance on variable government marketing programs/resources to *pull* in traveling public.
- Maximum economic impact on Uptown Saint John but minimal impact on surrounding Saint John Region.

2. Complementary Sectors

Arts, Culture and Heritage Sector

Rationale:

- Quality of life contributors to attracting and retaining people, industry and business.
- Demonstrated direct and indirect economic contributors to a community. For example, Toronto's plethora of live theatre, galleries, museums, concerts, etc., Quebec City's history, architecture and restaurants and Vancouver's green space all attract people to live there, tourists to visit and industry/business to locate or conduct business (conferences, etc.) there resulting in significant economic impacts.

Competitive Advantages:

- Small but thriving arts and culture sector with several economically viable commercial art galleries, the Imperial Theatre, the Saint John Theatre Company and an emerging film industry.
- Rich Uptown internal heritage component.
- Recent heritage property restoration efforts.

Benefits:

- Key influence in people and business decisions to locate and stay in Saint John.

Growth and Sustainability:

- Low to medium without significant investments.

Opportunities:

- Significant rich Uptown internal heritage component that can be a vibrant cultural lure for the creative class: an urban area complete with waterfront that can be transformed and filled with cultural amenities that strongly appeal to both creative professionals (e.g., scientists, engineers, architects, educators, financial planners, ICT workers, doctors, lawyers, etc.) and the super-creative (e.g., poets, musicians, actors, artists, etc.) who represent economic power and growth⁸.

Issues:

- Saint John is not internationally recognized for the arts, culture or heritage sector because of lack of resources, commitment and focus.
- Government, industry/business and public recognition and support for sector as an economic sector.
- Sector workforce is generally characterized by highly dispersed, dominantly self-employed part time/full time workers with minimal connections to other sectors.

SAINT JOHN SECTOR WORKFORCE CHALLENGES

New Brunswick is already experiencing a labour shortage fuelled by out-migration, natural population declines and an aging workforce. Virtually all industry sectors in the province are struggling to attract and retain skilled employees. And it is only going to get worse: according to the University of New Brunswick's Policy Studies Centre, New Brunswick's working age population (20 to 69 years of age) will decline by 21,000 people by 2026.

Greater Saint John is facing such a significant shortage of skilled labour that it will compromise planned and potential investment in priority growth sectors and existing employers will be challenged to sustain current operations. Within 5 years, more than 10,000 workers will be required to fill permanent **full-time** jobs in key occupations in Saint John including:

Skilled Trades (Base)	1,669
Information & Communications Technology	1,411
Energy Sector Projects (Committed & Potential) ¹	1,370
Management and Administration	1,348
Health Sciences	1,240
Natural/Applied Sciences	553
Tourism	476
Engineering	227
Arts, Culture & Heritage	152
Other ²	<u>2112</u>
TOTAL	10,558

¹ 75 to 80% of jobs expected to be in the skilled trades sector.

² Based on anticipated spin-off opportunities in a variety of sectors.

More than 55% of the anticipated employment gap is based on the creation of new permanent full-time jobs, with the balance due to employment attrition (retirements, relocations, career changes, etc.). To put these figures in

perspective, the employment gap will be equivalent to almost 20% of the current workforce in Saint John.

In addition, over the next five years, committed and potential energy sector projects are expected to generate peak demand during construction of almost 7,000 additional workers, widening the anticipated employment gap to as much as 17,500 workers at various times throughout the five year period.

SECTORAL CHALLENGES:

Energy, Advanced Manufacturing and Environment: require similar workforce skills.

Current & Projected Workforce:

	New Brunswick				Saint John (Estimated)			
	<u>2006</u>	<u>2011</u>	<u>Attrition</u>	<u>Gap</u>	<u>2006</u>	<u>2011</u>	<u>Attrition</u>	<u>Gap</u>
Trades: ¹								
Industrial	6,343	6,819	1,586	2,061	2,537	2,727	634	825
Residential	5,538	5,953	1,385	1,800	1,661	1,786	415	540
Supervisory	2,680	2,881	670	871	938	1,008	235	305
Total Trades	<u>14,561</u>	<u>15,653</u>	<u>3,640</u>	<u>4,732</u>	<u>5,137</u>	<u>5,522</u>	<u>1,284</u>	<u>1,669</u>
Engineers ²	3,102	3,223	336	457	831	864	90	122
Engineering Technicians ³	3,667	3,691	365	389	983	989	98	104
Natural & Applied Sciences ⁴	17,700	18,143	1,770	2,213	4,425	4,536	443	553
Management & Administration ³	30,834	31,446	4,780	5,392	7,709	7,862	1,195	1,348
	<u>69,864</u>	<u>72,156</u>	<u>10,891</u>	<u>13,183</u>	<u>13,948</u>	<u>14,250</u>	<u>1,825</u>	<u>2,128</u>

¹ Source: Construction Sector Council

² Source: New Brunswick Association of Professional Engineers

³ Source: Occupational Outlook, NB Department of Post Secondary Education, Training & Labour

⁴ Source: 2001 Census

Projected Additional Workforce Demand:

- a. **Energy:** Based on four proposed energy sector projects alone it is estimated that there will be a need for an **additional** workforce of 6920 at peak between 2007 and 2012 and 1370 permanent.

	<u>At Peak</u> ¹	<u>Permanent</u> ²
Eider Rock	5,000	1,000
Canaport LNG	700	40
Point Lepreau	220	50
Brunswick Pipeline	1,000	280
	6,920	1,370

¹ Project construction phases which are variable but anticipated to extend from 2007 to 2012

² Excludes periodic spikes for maintenance, upgrades, shut downs, expansions etc. that can increase workforce demand by 10% to 50%.

Energy sector workforce skills requirements estimated to be 75% Trades, 15% Engineers and 10% Management & Administration.

- b. *Advanced Manufacturing*: estimated **additional** workforce demand of 1,500 workers in Saint John based on: 75% Trades, 15% Engineers and 10% Professional Managers.
- c. *Environment*: estimated **additional** workforce demand of 550 workers based on: 10% Trades, 15% Engineers, 60% Natural and Applied Science and 15% Professional Managers.

Workforce Challenges:

- Canadian, North American and global competition for skilled trades, engineers, natural and applied science and professional managers is already high and expected to dramatically increase. Alberta alone will face a shortage of 332,000 workers by 2025 despite annual net migration rates of 30,000+, dominantly to the energy sector.
- Net migration of skilled trades workers to Western Canada where wages are significantly greater.
- General interest in the skilled and industrial trades has declined resulting in chronic shortage of workers across Canada.

- Low awareness by secondary school students of opportunities in the Energy and Advanced Manufacturing sectors.
- Post secondary infrastructure, programming and teaching capacity to meet projected Saint John Energy and Advanced Manufacturing workforce demands.
- Adequate apprenticeships for the trades to achieve certification.

Health Sciences Sector

Current and Projected Workforce:

	New Brunswick ¹				Saint John (Estimated) ²			
	2006	2011	Attrition	Gap	2006	2011	Attrition	Gap
Registered Nurses	7,533	8,086	1,388	1,941	1,753	1,882	323	452
Nurse Aides and Orderlies	5,094	5,392	591	889	1,185	1,255	138	207
Registered Nursing Assistants	2,114	2,134	268	288	492	497	62	67
Other Aides and Asstnts in Support of Health Services	1,902	2,032	222	352	443	473	52	82
General Practitioners/Family Physicians	1,166	1,286	133	253	271	299	31	59
Managers in Health Care	923	948	255	280	215	221	59	65
Specialists Physicians	863	951	98	186	201	221	23	43
Medical Laboratory Techs & Pathologists Asstnt.	680	737	84	141	158	172	20	33
Ambulance Attendants and Other Paramedical Occs.	652	658	83	89	152	153	19	21
Pharmacists	591	627	66	102	138	146	15	24
Physiotherapists	591	656	51	116	138	153	12	27
Medical Radiation Technologists	534	581	66	113	124	135	15	26
Psychologists	473	485	90	102	110	113	21	24
Occupational Therapists	343	382	30	69	80	89	7	16
Medical Laboratory Technicians	325	353	40	68	76	82	9	16
Respiratory Therapists and Clinical Perfusionists	290	313	36	59	67	73	8	14
Head Nurses and Supervisors	282	299	52	69	66	70	12	16
Dietitians and Nutritionists	250	293	29	72	58	68	7	17
Audiologists and Speech-Language Pathologists	224	249	19	44	52	58	4	10
Other Technical Occupations in Therapy and Assmnt.	154	156	20	22	36	36	5	5
Cardiology Technologists	97	105	12	20	23	24	3	5
Chiropractors	83	87	12	16	19	20	3	4
Other Prof. Occs. in Health Diagnosing & Treating	72	75	10	13	17	17	2	3
Medical Sonographers	48	52	6	10	11	12	1	2
Other Professional Occupations in Therapy & Assmnt.	39	44	3	8	9	10	1	2
Electroencephalographic & Other Diag. Techs, nec	28	30	3	5	7	7	1	1
	<u>25,351</u>	<u>27,011</u>	<u>3,667</u>	<u>5,327</u>	<u>5,900</u>	<u>6,286</u>	<u>853</u>	<u>1,240</u>

¹ Source: Occupational Outlook, NB Department of Post Secondary Education, Training & Labour

² Estimated based on % of Provincial Population

Projected Additional Workforce Demand: Factors that will influence additional growth in Saint John demand for health sciences workers include:

- The Region's environmental and individual health determinants that clearly point to escalating health service demands requiring additional workforce capacity across all occupations.
- Growth in priority growth sectors will further increase health service demands and subsequent need for enhanced workforce capacity.

Workforce Challenges:

- Accurate workforce demand-supply forecasting based on sound data and quantitative analysis, future design of New Brunswick health care system, health technologies, clinical practice, variations in staff mix ratios and how staff is deployed across continuum of services⁹.
- International competition for health care workers.
- Greying and increasingly fatigued health care workforce and escalating rates of attrition at very time aging demographic health care needs are escalating.
- *Creeping credentialism* by professional associations.
- Workforce capacity to meet New Brunswick language requirements in delivery of health services.
- Capital intensiveness of health care education/training and continuous professional development.
- Intra professional collaboration to maximize resource allocations and holistic client response.

Information and Communications Technology Sector

Current and Projected Workforce:

	New Brunswick ¹				Saint John (Estimated) ²			
	2006	2011	Attrition	Gap	2006	2011	Attrition	Gap
Computer and Information Systems Managers	684	756	89	118	159	214	176	231
Information Systems Analysts and Consultants	2,026	2,364	103	240	471	730	550	809
Database Analysts and Data Administrators	409	471	21	46	95	142	110	157
Software Engineers	255	304	13	33	59	97	71	109
Computer Programmers and Interactive Media Developers	2,153	2,602	110	292	501	844	606	949
Developers	566	672	29	72	132	213	156	238
Operators and Web Technicians	927	1,107	48	121	216	353	258	395
User Support Technicians	1,134	1,573	61	239	264	600	366	702
Systems Testing Technicians	25	30	1	3	6	10	7	11
	<u>8,179</u>	<u>9,879</u>	<u>475</u>	<u>1,164</u>	<u>1,903</u>	<u>3,203</u>	<u>2,299</u>	<u>3,599</u>

¹ Source: Occupational Outlook, NB Department of Post Secondary Education, Training & Labour

² Estimated based on % of Provincial Population

Priority Workforce Occupation Needs:

- Software Engineers
- Network Operators and User Support Technicians
- Computer Programmers
- Graphic Designers
- Business and Information Systems Analysts

Workforce Education Requirements:

- 50% of occupations will require undergraduate degree, particularly in engineering and 50% will require community college diploma

Workforce Challenges:

- Declining post secondary enrollment in ICT education/training.
- Labour force management capability: ICT employees and managers often lack adequate business, leadership, interpersonal, etc. skills.

Tourism Sector

Current and Projected Workforce:

	New Brunswick ¹				Saint John (Estimated) ²			
	2,006	2,011	Attrition	Gap	2,006	2,011	Attrition	Gap
Restaurant and Food Service Managers	2,889	3,105	388	604	672	723	90	141
Accommodation Service Managers	935	975	124	164	218	227	29	38
Food Service Supervisors	855	802	73	20	199	187	17	5
Chefs	238	251	11	24	55	58	3	6
Cooks	4,838	5,053	228	443	1,126	1,176	53	103
Hotel Front Desk Clerks	540	578	59	97	126	135	14	23
Tour and Travel Guides	135	141	14	20	31	33	3	5
Outdoor Sport and Recreational Guides	141	155	15	29	33	36	3	7
Maitres D'Hôtel and Hosts	334	357	19	42	78	83	4	10
Bartenders	998	1,040	55	97	232	242	13	23
Food and Beverage Servers	4,337	4,601	243	507	1,009	1,071	57	118
	16,240	17,058	1,229	2,047	3,779	3,970	286	476

¹ Source: Occupational Outlook, NB Department of Post Secondary Education, Training & Labour

² Estimated based on % of Provincial Population

Priority Workforce Occupation Needs:

- Continuous supply of front line workers.

Workforce Issues:

- Front line employees are drawn to higher wage full time job opportunities.
- Reluctance of tourism businesses, particularly SME's, to invest in training due to seasonal nature of industry, cost and return on investment if employee leaves.
- SME management, marketing and sales capacity.
- Constant front line service and interpersonal skills needs.

Arts, Culture and Heritage Sector

Current and Projected Workforce:

	New Brunswick ¹				Saint John (Estimated) ²			
	2006	2011	Attrition	Gap	2006	2011	Attrition	Gap
Producers, Directors, Choreographers & Related Occs.	295	310	35	50	69	72	8	12
Conductors, Composers and Arrangers	4	4	1	1	1	1	0	0
Musicians and Singers	922	951	107	136	215	221	25	32
Dancers	128	131	15	18	30	30	3	4
Actors	97	102	11	16	23	24	3	4
Painters, Sculptors and Other Visual Artists	487	511	57	81	113	119	13	19
Technical Occs Related to Museums and Galleries	63	63	9	9	15	15	2	2
Photographers	163	161	12	10	38	37	3	2
Film and Video Camera Operators	82	83	6	7	19	19	1	2
Graphic Arts Technicians	152	156	12	16	35	36	3	4
Broadcast Technicians	73	74	6	7	17	17	1	2
Audio and Video Recording Technicians	125	127	10	12	29	30	2	3
Other Tech. Occs in Mtn Pics, Bdcstng & Perf. Arts	105	107	8	10	24	25	2	2
Sprt & Ass. Occs in Mtn Pics, Bdcstng & Perf. Arts	37	37	3	3	9	9	1	1
Announcers and Other Broadcasters	195	201	12	18	45	47	3	4
Other Performers	26	26	2	2	6	6	0	0
Graphic Designers and Illustrating Artists	961	1,047	97	183	224	244	23	43
Theatre, Fashion, Exhbt & Other Creative Designers	59	63	6	10	14	15	1	2
Artisans and Craftspersons	329	362	33	66	77	84	8	15
	4,303	4,516	442	655	1,001	1,051	103	152

¹ Source: Occupational Outlook, NB Department of Post Secondary Education, Training & Labour

² Estimated based on % of Provincial Population

Workforce Profile: typically characterized as highly dispersed, dominantly SME/self-employed, a mix of part time, full time, confused by professional vs hobbyist and cross-over skills (i.e., artist, new media and gallery owner, customized and/or mass crafts production, etc.).

Workforce Gap:

- Subject to Saint John socio-economic-environmental attractiveness to this sector and individual/SME response.
- Subject to Saint John investments in Uptown heritage, specialized trades (carpenters, masons, metal smiths, etc.) with skills in heritage preservation may be in shortage.

Workforce Issues:

- Infrastructure investments (i.e., studios, specialized equipment, etc.) to support sector.
- Entrepreneurship and business management skills including product research development and commercialization required to enable largely self-employed workforce sustainable success.

SAINT JOHN POST SECONDARY: A STRATEGIC FRAMEWORK

World Class Benchmarks

Jurisdictions committed to growth and global competitiveness invest in post secondary education because of well-documented returns on investments:

- Developers of talent that is educated, creative and entrepreneurial.
- Producers of knowledgeable and skilled workers.
- Centers for research and development that contribute to industry innovation, entrepreneurial opportunities and influence economic and social policies.
- Economic magnets that attract industry/business.
- Contributors to vibrant communities that talented employees want to live in.
- Major employers providing a large number of well-paying jobs and purchaser of goods and services.

Achieving excellence, however, requires **unprecedented** collaborations, partnerships and investments. *World class* post secondary institutions/schools that **pull** first class, competitive and diverse students from around the world succeed because of eight integrated critical success factors:

- A global orientation, not limited to a community, a region, a province/state or country.
- Niche focus because limited resources demand specialization.
- Transformational learning experiences:
 - Innovative cutting edge education/training and research.
 - External accreditation of education/training programs.
 - Integrated student and industry/business learning opportunities.

- Recruitment of superlative teaching and research faculty with global knowledge, experience and connections.
- State-of-the-art infrastructure that is a competitive edge for students, faculty, research/development, corporate partners, etc.
- Strong local, national and international connections into/across educational, research/development and innovation spheres.
- Scholarship funding to recruit top students.
- Aggressive leadership to drive excellence.

Current Saint John Capacity

Education/Training (certificate, diploma, degree, corporate, professional development, etc.): for its size, the Saint John Region is well provided with numerous public and private post secondary education/training options:

1. University of New Brunswick: Saint John has three faculties that service approximately 2,000 students with multiple discipline options:

- Arts Faculty: History and Politics, Humanities and Languages, Psychology, Social Sciences and Interdisciplinary Studies.
- Business Faculty: Business Administration (graduate and undergraduate), Electronic Commerce, Applied Management.
- Science, Applied Science and Engineering Faculty: Biology, Environmental Biology, Computer Science and Applied Statistics, Economics, Information Services, Engineering, Health Sciences, Mathematical Science, Nursing, Physical Sciences, Financial Mathematics.

In addition, UNB Saint John has a variety of partnerships with other faculties to support undergraduate degrees (BASc, BA/BSc, BBA, BSc (Psychology), Biology, Math and certificates in French Communication and Culture, Business French.

2. Saint John College, affiliated with UNB Saint John, is an academic preparatory college to facilitate international student transition with ESL, FLS, diversity programs, etc.

3. NBCC: Saint John Campus provides certificate, diploma, contractual and professional development programming in:
 - Academic Studies
 - Automotive Marketing and Business Studies
 - Business Administration
 - Computer Programming Technology
 - Early Childhood Education
 - General Studies
 - Human Services
 - Office Administration
 - Health Sciences
 - Pharmacy Technician
 - Licensed Practical Nurse
 - Respiratory Therapy
 - Professional Trades
 - Automotive Service Technician
 - Chemical Technology*
 - Electrical
 - Electrical Engineering Technology (computer systems and electronic communication systems*)
 - Industrial Control Technology*
 - Industrial Mechanics
 - Machinist
 - Mechanical Engineering Technology (buildings – energy, environment, CAD/CAM*, production management)
 - Mechanical Technician
 - Plumbing
 - Power Engineering Technology*
 - Pulp and Paper Process Technician

*co-op programs

4. Apprenticeship programs that are closely connected with NBCC Saint John Campus.

5. Private education/training schools in the Region that provide a variety of post secondary options:
 - Academy of Hair Design
 - Academy of Learning
 - Compu College
 - Dental Assistant Academy
 - Majesteny Institute
 - School of Rock and Film

6. Professional and technical development by industry associations, industry, business, government, etc

Research, Development and Innovation: UNB (Fredericton and Saint John) is New Brunswick's pre-eminent research institution with a strong record of technology and knowledge transfer. Since 2001, \$50 million of venture capital has been invested in companies commercializing technology¹⁰. The lion's share of UNB research is conducted on the Fredericton campus but UNB Saint John has demonstrated significant multi-partner collaborative research success including the Canadian Rivers Institute, the Centre for Coastal Studies and Aquaculture, the Industrial City in Transition CURA project, the Atlantic Regional Health Training Center in Applied Health Science Research and the Health Sciences Intra Professional Education project.

Research by the NBCC network, including NBCC Saint John Campus, is negligible, although there is certainly an abundance of applied research opportunities with industry and business.

Saint John Capacity to World Class Benchmarks

A broad analysis of current Saint John capacity to world class benchmarks clearly shows significant gaps:

Global Orientation: The Saint John post secondary sector is dominantly driven by local demand. Although the sector has had some success in attracting international students, it lacks the "pedigree" and financial clout of better established and recognized Canadian and international institutions/schools will

demand a long term strategy and resource commitments to achieve national/global positioning.

Niche Focus: The Saint John post secondary sector provides a plethora of programs that are readily duplicated by competing provincial, national and international institutions/schools. The sector is not market driven, lacks fundamental marketing clarity (Who is the customer? What are the customer(s) needs?), is not market differentiated in terms of product, price, place, packaging and promotion and does not offer a Unique Selling Proposition (USP) to customers.

Transformational Learning Experiences: Restricted by provincial and institutional barriers – governance, structures, resources, competing agendas, bureaucracy, etc., – the sector is driven by out-of-date, inflexible, institutionally-focused delivery models that target a declining 18-24 age cohort.

Superlative Teaching and Research Faculty: On an individual faculty basis, Saint John has some notable expertise in select areas and/or access to expertise through post secondary partner institutions, industry and business. Collectively, the Saint John sector is not recognized for world class teaching and research and attracting such talent will be increasingly difficult as post secondary sector aging/attrition escalates jurisdictional and institutional competition for the best.

State-of-the-Art Infrastructure: The Saint John post secondary sector is highly under-resourced to be infrastructure competitive. Without substantial and continuous investments, dated facilities, laboratories, equipment, etc. will continue to have a significant negative impact on every other element of post secondary excellence.

Connections: On a very small scale, Saint John has provincial, national and international academic connections. **Meaningful** relationships with industry and business needs to be forged and leveraged into relationships nationally and internationally.

Scholarship Funding: Current scholarship funding is largely targeted to local/provincial students and, while worthwhile, does not serve to attract national or international first class students.

Leadership to Drive Excellence: Notwithstanding the critical institutional president/CEO role as leader, educator and evangelist¹¹, the post secondary sector needs broader leadership by government, industry, business and community to drive post secondary quality, relevance and accountability.

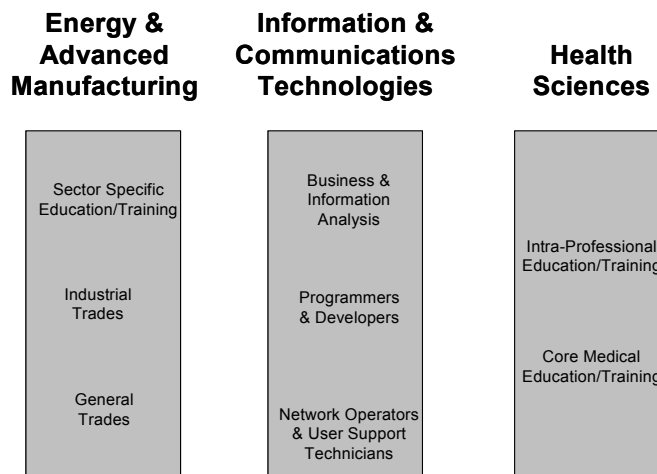
Post Secondary Implications

The provincial post secondary status quo is neither sustainable nor capable of supporting New Brunswick's self sufficiency and economic growth objectives. Major change in higher education is being driven by external socio-economic pressures at the same time as the provincial post secondary sector, and the Saint John segment, are struggling to define their respective, intertwined roles, values, identities and operational models. The paradigm shifts required of higher education in the next decade will demand a strategic approach to sectoral and institutional transformation¹¹. The complexity and barriers within the sector and individual institutions/schools, the multitude of players/ stakeholders, external and internal governance issues, bureaucracy, resistance to change and the pace of change are huge, complex challenges that require:

- The elimination of sectoral competition and barriers prohibiting market responsiveness.
- The elimination of institutional barriers that preclude flexible, innovative operational models in tune and in time with market needs.

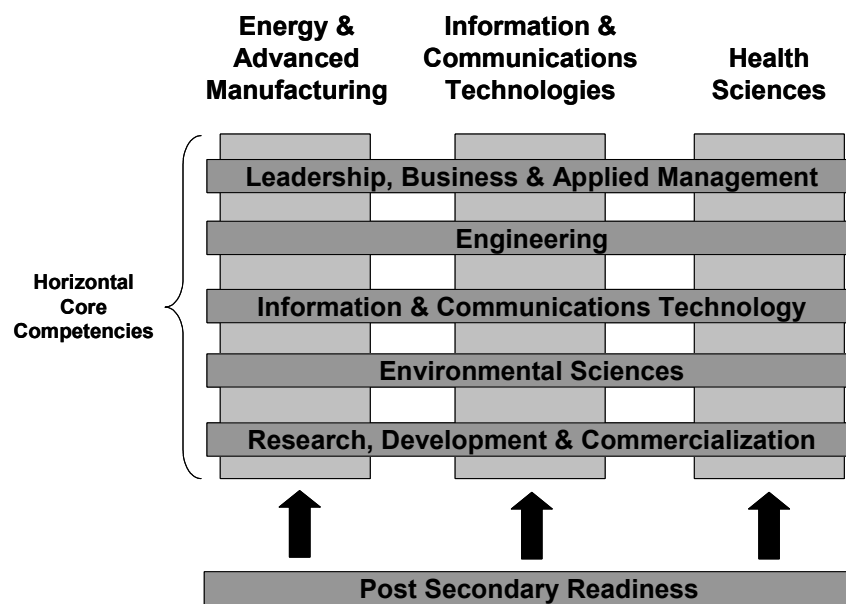
Likewise, the Saint John status quo is neither sustainable nor acceptable because economic growth demands a skilled workforce to fuel industry and business and current capacity is inadequate. Radical and abrupt transformation of the sector is a necessity and will require:

Specialization not Generalization: Saint John post secondary must specialize not only to maximize resources but focus enables market differentiation, core to excellence and recognition. Saint John post secondary must leverage immediate opportunities associated with the three Saint John priority vertical sectors – Energy and Advanced Manufacturing, ICT and Health Sciences – because these three sectors have strong growth and sustainability potential and require significant, long term workforce education/training solutions for next generation workers and continuous education/training for existing workforce.



NOTE: The tourism sector is not recommended because there is an abundance of provincial and national education/training public and private opportunities as well as industry and government professional development programs.

Core Competencies Focus: Saint John post secondary must focus on core workforce competencies that are required across the three vertical priority growth sectors



Saint John Knowledge Hub: Saint John must develop a knowledge hub that consolidates post secondary education/training providers to maximize resources – shared infrastructure, equipment, laboratories, technology etc. – fosters teaching and research/development collaboration and centralizes administration, maintenance, etc. for greater efficiencies.

Transformational Learning: All Saint John post secondary providers must innovate current, dated education/training delivery operations to models that address just-in-time, just-for-me workforce solutions deliverable across multiple modes, multiple settings and multiple jurisdictions.

Niche Opportunities: Within the context of specialization there are potential value add opportunities that Saint John should investigate including systems engineering (currently in assessment), faculty/school of industrial design, heritage preservation trades training and cultural studies (cultural administration, heritage planning and preservation, curator studies, etc.).

Research/Development and Commercialization: Saint John must develop research/development and commercialization capacity to drive Regional innovation in the three priority growth sectors and in environmental impacts and new technologies. In addition, there is significant research potential in tracking, assessing and reporting on broad community socio-cultural, economic and environmental development for the purposes of establishing and executing best practices

Education/Training Commercialization: High caliber education/training is big business, regardless of the delivery mode. Saint John must develop capacity to market educational products/services to strengthen its specialization brand, to develop a revenue stream, to enhance innovation capacity (e.g., Saint John

College as New Brunswick/Atlantic Canada center for international credentials and competency assessments, upgrading and Canadian/New Brunswick accreditation) and to grow the sector through spin-off businesses (e.g., e-learning products, ICT applications, etc.).

Post Secondary Readiness: New Brunswick and Saint John do not have robust education cultures and readiness for post secondary is low – significant K-12 drop out rates, quality of K-12 education and environmental and individual education success determinants, etc. – resulting in too few residents moving on to higher education and even fewer completing. Regardless of provincial initiatives/not, Saint John must take ownership of the educational readiness of its citizens, and in particular its citizens living in poverty, not only because it makes good economic sense to increase the base workforce capacity but it is a barrier for people to productively participate in society. Breaking the cycle of poverty demands a holistic poverty reduction strategy and the post secondary sector should have a role to play in such a strategy

CONCLUSION

Saint John must assume leadership to build post secondary capacity to fuel *True Growth*. Unless Saint John embraces higher education as a major economic engine for the Region and continuously invests substantially in the sector as **real** partners to ensure not only its sustainability but its innovation, the Region's emergence as a modern community will be in jeopardy.

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APPENDIX I

KEY INFORMANT INTERVIEWS

KEY INFORMANT INTERVIEWS

Key Informant	Position	Company/Organization
Energy Sector		
David Scott	GM CANDU 6 Refurbishments	AECL
Phil Ribeeck	Director LNG North America	Repsol
Tim Curry	President	Atlantica Centre for Energy
Gord Mouland	President	Fundy Engineering
Tanya Chapman	Senior Manager Organizational Development	Irving Oil
Marcus Goddard	Business Planning	Irving Oil
Kevin Scott	Program Director Refining Growth	Irving Oil
Christina Taylor	Labour Relations	Irving Oil
Claire Lepage	Deputy Minister	NB Dept of Energy
Eric Marr	President	Saint John Energy
Advanced Manufacturing Sector		
Colleen Baxter	VP Human Resources	JD Irving
Darren Zwicker	Director of Recruitment	JD Irving
Paul Holah	Manager Project Engineering	Fluor
Environment Sector		
Ralph Dempster	Project Manager	Jacobs Engineering
ICT Sector		
Jeff Roach	Executive Director	PropelSJ
Anthony Hardt	Senior Vice President	Centerbeam
Gerry Pond	President	Mariner Partners
Paul Kent	Chief Operating Officer	Xwave
Jeff White	Vice President	Deloitte/PropelSJ
Ian Cavanaugh	President	Ambir Solutions
Kerry McLellan	President	Kinek Technologies
Labour		
Ross Galbraith	Business Manager	IBEW Local 37
Ron Oldfield	President	District Labour Council
Pat Darrah	President	Saint John Construction Association
Pat Riley	Business Manager	ILA Local 273
Health Sciences Sector		
Ken Baird	Vice President, Clinical and Facility Support Services	Atlantic Health Sciences Corporation
Sandra Irving	Vice-Chair	Atlantic Health Sciences Corporation
Barb McGill	Vice President, Community Programs and Chief Nursing Officer	Atlantic Health Sciences Corporation
Dora Nicinski	President and CEO	Atlantic Health Sciences Corporation
Dr. John Steeves	Director of Medical Education	Atlantic Health Sciences Corporation
Bill Teed	Chair	Atlantic Health Sciences Corporation
Nora Kelly	Deputy Minister	Department of Health
Lynn St. Pierre Ellis	Physician, Resource Advisor and Director	Department of Health
Ed Schollenberg	Registrar	NB College of Physicians and Surgeons
Bob Simpson	Executive Director	NB Healthcare Association

Arts, Culture & Heritage Sector		
Richard Hornsby	Director, Centre for Musical Arts	Extended Learning UNB: Fredericton
Bernie Cormier	Cultural Affairs Officer	City of Saint John
Sylvie Levesque-Finn	Deputy Minister	NB Department of Wellness, Culture and Sport
Post Secondary		
John McLaughlin	President	UNB
David Emmerson	Government Relations	UNB Saint John
Kathy Hamer	Vice President	UNB Saint John
John Johnson	Engineering Department	UNB Saint John
Peter McGill	Principal	UNB Saint John
Shelley Rhinehart	Dean, Faculty of Business	UNB Saint John
Dale Roach	Engineering Department	UNB Saint John
Barbara Kierstead-Shanks	Regional Director	New Brunswick Post Secondary Education Training and Labour
Leandre Desjardins	Executive Director	New Brunswick Post Secondary Commission
Peter Halpin	Executive Director	Atlantic Association of University Presidents
Chris Kantor	Principal/Campus Manager	CompuCollege
Graeme Scaplen	President	Academy of Learning
Tania Barter	Sales and Marketing Coordinator	Academy of Learning
Gary Foster	Owner	Academy of Hair Design
Peter McKelvey	Partner	Fundy Engineering
Research /Development		
Dwight Ball	Executive Director, Centre for Research and Development Services	UNB
Barrie Black	President and CEO	New Brunswick Innovation Foundation
Community		
Carolyn Stephenson	Board Member	Vibrant Communities
Cathy Wright	Social Planner	Vibrant Communities
Ross Jefferson	General Manager	Saint John Waterfront Development
Heather Stillwell	Coordinator - School to Work Program	School District 6
Bob Manning	President SJBOT	Owens McFadyen

APPENDIX II

LIST OF PROJECT EXPERTS

PROJECT EXPERTS

Mr. Jim Bezanson, Heritage Development Officer, City of Saint John: Jim is acknowledged as one of Canada's foremost leaders in Heritage with extensive experience in the heritage field as an architect, planner, educator, contractor and developer. Jim has served on local and national boards, most recently as New Brunswick Governor and Chair of the Heritage Canada Foundation. Jim is a member of the Architects Association of New Brunswick, the Royal Architectural Institute of Canada and numerous heritage conservation organizations. Jim established and taught the first trades program in Canada specializing in Heritage, he frequently gives/facilitates presentations/workshops, he directed the series of *Practical Preservation Guidelines* that won an award from the American Association for State and Local History, he assisted with drafting national *Standards & Guidelines for the Conservation of Historic Places in Canada*, he has taught Heritage Tourism through the Faculty of Business at UNB-SJ and is currently assisting with curriculum development for a heritage carpentry program with the NB Regional Council of Carpenters & Millwrights.

Dr. Lon Dubinsky: Lon has worked in the areas of cultural development, history and policy as a researcher, university teacher, consultant and project manager for 20+ years. Lon initiated and was co-director of *The Cultural Future of Small Cities*, a five year project that explored how and why arts and heritage activities flourish in small cities.

Lon's expertise in the cultural dimensions of city life has engaged him in collaborations between museums and community organizations including *Reading the Museum*, the national program of the Canadian Museums Association to utilize museums as a resource for literacy for adults and families. As a program and policy development consultant for non-profit cultural organizations, government agencies and foundations, he has worked for the Canada Council of the Arts, Department of Canadian Heritage, City of Ottawa, the Samuel and Saidye Bronfman Family Foundation, Site Santa Fe and the Whyte Museum of the Canadian Rockies and is presently developing the arts and cultural master plan for the City of Vernon, British Columbia.

Dr. John H.V. Gilbert: John is presently Project Lead of the Canadian Inter-professional Health Collaborative, an initiative funded by Health Canada and Principal and Professor Emeritus, College of Health Disciplines at UBC. He was Chair of the BC Committee of Deans and Directors of Health Sciences from 2001-2003, and he currently represents the Ministry of Health Sciences on Health Canada's National Expert Committee on Inter-professional Education for Collaborative Patient Centred Care. Amongst John's many honours are Fulbright Scholarship; David Ross Research Fellowship; Canada Medical Research Council Post-Doctoral Scholarship; Outstanding Alumnus Award of the School of Liberal Arts, Purdue University; UBC Killam Outstanding Teaching Award; 50th Jubilee Medal from the Faculty of Medicine for exceptional and outstanding contributions to the Faculty, and Distinguished Service Award of the British Columbia Institute of Technology. Dr. Gilbert is a member of the Board of the Michener Institute of Toronto, the Victorian Order of Nurses in Ottawa and the BC Women's Hospital Foundation. He is the first chair of the Board of the Women's Health Research Institute and was a founding member of the BC Academic Health Council.

Geoffrey Cann: Geoffrey Cann is a Partner in the Calgary office of Deloitte where he focuses on the application of information and telecommunications technologies for energy businesses. He has seventeen years of management consulting experience gained through engagements in Canada, the United States, Hong Kong, China, Japan and the Caribbean. He has led projects in virtually all aspects of the systems development life cycle across a wide range of industries. Geoffrey holds numerous publications to his name, presents regularly on IT Strategy topics and has been a guest lecturer at the MBA program at the University of Calgary.

Mr. Cann has guided consulting services at a petroleum company engaged in an end to end business transformation. Services span full complement of advisory, technology, change management and outsourcing services offered by our firm and number over 100 different projects. In addition, he has provided IT advisory services (strategy, technology selection, outsourcing, business case, organization change, solutioning) to a broad range of energy companies.

Dr. Deborah MacLatchy: (PhD, University of Manitoba) is a Professor of Biology at the University of New Brunswick (Saint John campus), a Founding Fellow of the Canadian Rivers Institute, and Dean of Science, Applied Science and Engineering at UNB Saint John. From 2001-2003, she was Director of the International Office at UNB Saint John and the International Liaison Office for the University of New Brunswick. She coordinated a CIDA Tier 2 project in Cuba on marine ecosystem health from 1997-2003. An ecotoxicologist and endocrinologist, she is funded by the Natural Sciences and Engineering Research Council of Canada, the National Centres of Excellence (Canadian Water Network), and industry. She is a past President and Council Member of the Canadian Society of Zoologists. From 2005-2007, she has been a board member of the Saint John Board of Trade. She is a 2005 recipient, with Irving Pulp and Paper Ltd. and Environment Canada, of a NSERC Synergy award for partnerships for her collaborative work on the issue of endocrine disruption from industrial contaminants. In 2007, she will begin a new position as Dean of Science at Wilfred Laurier University in Waterloo, Ontario.

Mr. Colin MacLean: a lawyer and teacher, Colin is currently Vice President, People & Planning at Nova Scotia Community College responsible for the College's strategic planning, applied research, organizational learning, employee services and relations, student services, institutional research & analysis, international activities and legal affairs. During the past eight years at NSCC, Mr. MacLean has:

- Produced the College's Growth Study, which formed the basis of a \$123 million capital expansion project;
- Established the College's balanced scorecard Key Performance Indicator System;
- Directed 2 Strategic Planning Processes that have resulted in an 18% increase in the graduate employment rate (currently 91%), and a 40% increase in enrollment (currently 9350 students).

Mr. MacLean makes conference presentations on the subject of strategy, organizational performance, leadership and employment development, at numerous North American post secondary professional conferences and conducts workshops on planning and corporate governance for not-for-profit and private sector organizations.

Dr. Martha Piper: from 1997 to 2006, Dr. Piper served as the eleventh President and Vice Chancellor of The University of British Columbia (UBC), one of Canada's largest and most prestigious research universities. During her tenure, Dr. Piper worked with students and faculty to strengthen UBC's position as an international leader at the forefront of learning and research. Prior to UBC, Dr. Piper was Vice President of Research at the University of Alberta, after serving as Dean of the Faculty of Rehabilitation Medicine.

Dr. Piper's commitment to the advancement of research has identified her as a leader in the research community. She has served as a Board Member of the Alberta Research Council, the Canada Israel Industrial Research Foundation, the Edmonton Economic Development Board, Telecommunications Research Labs, the Centre for Frontier Engineering Research and the Interim Governing Council of the Canadian Institutes for Health Research and the Conference Board of Canada. Prime Minister Chrétien appointed Dr. Piper to the National Advisory Board on Science and Technology in 1994 and, in 1996, to the Board of the Advisory Council on Science and Technology (ACST). In 1997, Dr. Piper was appointed as a Member of the Canada Foundation for Innovation. In 1998, she was appointed to the Board of Directors of the Association of Universities and Colleges of Canada, and became a Member of the Canada Millennium Scholarship Foundation.

Dr. Colleen Taylor Sen: Dr. Sen is presently Senior Advisor, LNG and Director, LNG Training responsible to plan, initiate and direct LNG training and information programs for the Gas Technology Institute, a not-for-profit energy research and education organization that has been active in the LNG industry since its inception. She has more than two decades of experience as an LNG analyst, consultant, editor, trainer and research and development marketer.

Dr. Sen organizes and chairs professional development programs on all aspects of LNG that have been attended by thousands of oil and gas industry personnel. The current emphasis is on training LNG plant operators in classrooms, at companies' facilities, and via e-learning programs. Clients include Chevron Texaco, ConocoPhillips, Atlantic LNG, El Paso, Ecoelectrica, Dominion Cove Point and Sempra Energy.

Dr. Sen is the compiler and editor of the *World LNG Source Book*, a database of all the world's LNG facilities that is used by many LNG companies. She has published reports on LNG shipping and markets and is founder and co-editor of the quarterly *The LNG Observer* (now published by the *Oil and Gas Journal*).

Dr. Sen has been a consultant on LNG studies and reports for the US Department of Energy's Energy Information Administration. She is the author of many articles, reports and conference presentations on global LNG markets, projects and trends. Since 1989, Colleen Sen has been a member of the Steering Committee of the International Conferences on Liquefied Natural Gas.