Preface

ASTTBC has produced *A Strategic Direction for Technology Education and Skills in British Columbia* to inform and influence public policy initiatives, including the BC Jobs Plan, British Columbia’s Technology Strategy, and other major economic and human capital priorities. We want to work with educators, industries and others to make a difference.

Now is the time to take action in order to avert major shortages and impacts in technology occupations in BC. This report offers a strategic direction and set of recommendations that ASTTBC together with others need to discuss and take action on over the next eighteen months.

In 2007, ASTTBC released *Technology Skills 2020: A Technology Human Resources Strategy for British Columbia*. This was in response to a growing concern about the impact of skill shortages on our province’s economy and many sectors and communities. The Strategy also demonstrated the strategic importance of technologists, technicians and technical specialists, particularly for resource, construction and technology industries. It also called for the development of a strategic direction for technology education and training in BC.

Five years later...perhaps the impacts were blunted by the global recession, but now we are starting to see growing skill gaps and ASTTBC is concerned about shortages of spaces in various technology education programs. Much headway has been made on technology education in the last five years by ASTTBC, the Government of BC and others. The Technology Education and Careers Council, support for various K-12 initiatives, the First Nations Career Council, internationally trained professionals (ITPs) forums and a new mentoring program for ITPs are just some of the ASTTBC initiatives in partnership with others to address *Technology Skills 2020* issues.

I acknowledge the work of Kerry Jothen, Chief Executive Officer, Human Capital Strategies, for drafting this report and advising ASTTBC on it. Many readers will know Kerry and the quality of his work, and will have additional confidence in this report from his involvement.

I also thank ASTTBC staff and volunteers who contributed information, data and feedback for this report.

John Leech, AScT, CAE
Executive Director
Applied Science Technologists and Technicians of BC
Statement of Endorsement

The Technology Education and Careers Council (TECC), a group of industry and education leaders brought together by ASTTBC, has a mandate to advocate for technology education and careers.

TECC lends its general support to the direction enunciated in this ASTTBC report, *A Strategic Direction for Technology Education and Skills for BC*, and encourages decision-makers and those who influence young minds to embrace and act on this Report’s recommendations.

This endorsement is offered by the individuals serving on the TECC and does not necessarily represent the views of the organizations with which TECC members are employed.

Technology Education and Careers Council Membership

- Sid Siddiqui (Chair) – Vice President, Stantec
- Sandy Innes (Vice Chair) – Vice President, Human Resources, TELUS
- Josh Blair (Executive Advisor) – Executive Vice President, TELUS
- Steve Cardwell – Superintending of Schools and CEO, Vancouver School District
- Harry Diemer, Honourary Member, ASTTBC – Former CEO, BC Safety Authority
- Oksana Exell – Executive Director, Asia Pacific Gateway Skills Table
- Andrew Hay – Vice President, Okanagan College
- Candy Hodson – Sr VP, National Sales and Marketing, Black Press Media
- Reid Johnson – President, Health Sciences Association
- John Leech – Executive Director, ASTTBC
- Jan Marston – VP, Human Resources and Corporate, TimberWest Forest Corp
- Debbie Nagle – Sr VP and Chief Human Resources Officer, BC Hydro
- Janine North – CEO, Northern Trust
- Catherine Roome – CEO, BC Safety Authority
- Bryan Tisdall – President and CEO, Science World
- MJ Whitemarsh – CEO, Canadian Home Builders’ Association of BC
- Lesley Wilson – Principal, Concost Consultants Inc.
- Glen Wonders – Division Manager, Prince George, Allnorth Consultants Limited
- Don Wright, President, BCIT
Executive Summary

The Applied Science Technologists and Technicians of British Columbia (ASTTBC) is concerned about the need to take pre-emptive action on addressing a technology skills gap in partnership with educators, business and industry, associations and others.

This document presents a strategic direction for technology education and skills and career development in British Columbia (BC) and is designed to support the BC Jobs Plan, British Columbia’s Technology Strategy and other major economic and human capital initiatives in our province.

This report focuses on technology and technical occupations as defined in the National Occupational Classification codes 021, 022 and 321; these are defined as “high technology” occupations by BC Stats in its 2010 measurement of employment in such job categories.

Almost 150,000 British Columbians are employed in these occupations in BC in 2012, one-third of these being technologists and technicians. 25,000 new job openings are expected by 2020, although there are growing concerns about technology education keeping up with this growth.

After demonstrating the importance of technology occupations to the BC economy and showing issues and trends in K-12 and post-secondary technology education, this report provides a strategic direction (vision, values and long-term goals). This is followed by a set of ten strategic challenge and strategy areas, each containing ASTTBC recommendations, forty-four in total.

ASTTBC Recommendations

1. Develop a clear, strategic direction for technology education and skills in BC, including clear, high-level leadership and championing.

   1.1 ASTTBC with governments and others, develop a provincial strategic direction (vision, principles, goals) for technology education in BC.

   1.2 The Ministers responsible for Advanced Education, Innovation and Technology and Jobs, Tourism and Skills Training create a high-level advisory task force to recommend a Science, Technology, Engineering and Mathematics Education and Training Strategy.

2. Develop a clear technology education and training plan and capacity for BC – annual and multi-year – that is tied to labour market demand.

   2.1 Conduct a detailed gap analysis between BC’s labour market demand forecast and programs for technicians, technologists and other technology workers.

   2.2 Link technology jobs in the BC Jobs Plan with education planning, programming and funding.

   2.3 Based on the gap analysis and linking jobs and education and training, set targets and performance measures across BC for the development and training of technology workers. Provide defined/targeted funding and offer incentive funding for such development and training.

   2.4 Focus in particular, on access to such programs in the Northern, Interior and Kootenay regions. Consider technician/certificate programs in the regions leading to a second year/diploma of technology at one of the larger institutions offering technology education, e.g. BCIT, Okanagan College and Camosun College. This is a critical priority given the extent of job creation and huge capital projects expected in Northern regions over the next decade.

   2.5 ASTTBC and the ITA, in consultation with the Ministries, work together to define and pilot training and certification for a trades-technology-degree pathway.
2.6 ASTTBC to work with the Ministry of Advanced Education, Innovation and Technology and post-secondary education institutions to act on the following technology program initiatives to increase the supply of technology workers:

- The College of New Caledonia’s proposals for Civil and Mechanical Engineering Technology programs;
- Okanagan College’s proposal for a Sustainable Construction Management technology program;
- Introduce technician programs that could lead to a certificate and also ladder into second year Diploma Program (e.g. in mining and Geomatics at Northwest Community College and Northern Lights Community College);
- Offer some technician/technologist programs in the North as there is only one 2-year applied science/engineering technology program north of Kamloops;
- Rationalize technology programs in BC, particularly at the first year level, and by more effectively using distance learning models of delivery;
- Dedicated technology program FTE funding is needed by the Ministry of Advanced Education, Innovation and Technology to target key technology areas, including the earlier-referenced incentive funding.

3. Develop a comprehensive program to promote technology careers, skills and education in BC.

3.1 Science World assumes the lead in promoting technology education and careers.

3.2 Science World takes the lead in creating a Science and Technology Leadership Board to enhance coordination of efforts on technology career promotion.

3.3 Create a $50 million Science and Technology Futures Fund to advance a science and technology culture.

3.4 Use technology to promote technology careers among K-12 students – for example in 2011, ASTTBC’s development of a “technology” music video recorded by the Kerplunks. ASTTBC recently released a new music video entitled “Everyday Science.”

3.5 Ensure that a major initiative of BC Jobs Plan includes comprehensive marketing of technology careers to parents, young people and children, educators, the media and others.

3.6 Involve technology employers directly in the promotion of technology careers to schools, by having ASTTBC, the BC Technology Industries Association (BCTIA) and others create a Technology Employers Speakers Bureau.

3.7 Promote technology entrepreneurship to young people and adults.

4. Increase high school technology career preparation programs and teaching, and emphasis on STEM within curriculum.

4.1 ASTTBC and its partners build on the work of the Ministry of Education to support the development and expansion of high school technology career preparation programs as preparation for post-secondary education programs and technology careers.

4.2 Building on ASTTBC’s success with TechWorks!, create an ACE-iT-like program for technology programs. Perhaps this could be done in conjunction with the Industry Training Authority as it pursues fields other than traditional trades training models.

4.3 The Ministry of Education and school boards to encourage and support math and science teachers to ensure continuing positive exposure to these subjects among all students in all elementary years.
4.4 Continue to emphasize the STEM theme. The Ministry of Education and K-12 system develop incentives and support to help develop and retain high school technology, math and science teachers and promote and update math, science and technology programs.

5. Support small business HR innovation capacity and provide incentives for employers to hire, retain and train technical graduates and workers.

5.1 Form a strategic partnership between ASTTBC, Small Business BC and BCTIA to promote small business hiring and retention of technology graduates and workers.

5.2 Support SMEs in adopting and hiring technology workers to improve productivity, and encourage governments to offer some form of refundable tax credit tied to training and internships that aim to improve workplace productivity.

5.3 Pursue a partnership between ASTTBC, the BC Chamber of Commerce, the Small Business Roundtable, the Ministry of Jobs, Tourism and Skills Training, and the BC Human Resources Management Association to develop tools and capacity for small businesses that employ technology workers to enable them to recruit, retain and develop technical employees through innovative HR practices. This would include retaining mid-career and older workers, and include targeting managers and supervisors.

5.4 Expand the BC Training Tax Credit Program for employers of certified technologists and technicians (and technical specialists) to provide eligible for tax credits for training.

5.5 Explore the potential of utilizing retiring workers in a mentoring role and extending the working time for mature workers by reducing their stress, providing flexible work arrangements and decreasing the level of responsibility.

6. Support the recognition of skills and employment of internationally trained professionals and mature workers

6.1 ASTTBC and its partners to use the Philippines experience to expand recruitment of internationally trained professionals from other countries.

6.2 ASTTBC to further develop and expand outreach services for internationally trained professionals who are now resident in BC.

6.3 ASTTBC to publish a listing of foreign credentials already assessed by ASTTBC to inform internationally trained professionals prior to coming to Canada.

6.4 ASTTBC to partner with industry groups and the IEC-BC to work with immigrant service agencies and government to ensure a more streamlined, relevant response from service agencies to help match employers and internationally trained professionals.


7.1 ASTTBC to work with the Ministries of Advanced Education, Innovation and Technology and of Education to promote technology careers to K-12 Aboriginal students, Aboriginal communities and Aboriginal post-secondary institutions.

7.2 ASTTBC to seek targeted funding for Aboriginal technologist and technician bridging and certificate and diploma programs and other opportunities for partnership within the Ministry of Advanced Education, Innovation and Technology’s Aboriginal Post-Secondary Education and Training Policy Framework and Action Plan.

7.3 ASTTBC to continue to engage First Nations and Aboriginal organizations and post-secondary institutions to pursue partnerships on technology education and career promotion.

8. Increase the participation and career advancement for women in selected technology education and careers
8.1 Science World to help lead and coordinate efforts to promote careers in technology for women.

8.2 ASTTBC to continue to partner with groups such as the Minerva Foundation, the Society for Canadian Women in Science and Technology and the Westcoast Women in Engineering, Science and Technology to advance this goal.

8.3 Post-secondary institutions to adopt recruitment and retention strategies to increase female enrolment and graduation in non-traditional technology occupations.

8.4 Include in K-12 career promotion, initiatives to encourage girls and young women to enter technology education and careers.

8.5 ASTTBC to work with industry groups and large and small businesses to recognize employers of women in technology and to recognize women in technology.

9. Increase the utilization and recognition of the talents of technology professionals

9.1 ASTTBC and the Association of Professional Engineers and Geoscientists of BC (APEGBC) to jointly define areas in which ASTTBC members might be appropriately recognized to work.

9.2 ASTTBC to work with employers and regulatory bodies to secure appropriate inclusion and recognition of ASTTBC members as “qualified persons” based on competency.

9.3 ASTTBC to continue to advance the Bachelor of Technology within its regulatory role and encourage educational organizations to promote the BTech as a natural career pathway for the Technologist.

9.4 The Ministry of Advanced Education, Innovation and Technology encourage and provide incentive to post-secondary institutions to expand flexible lifelong learning for technology professionals, including part-time seminars, workshops, and on-line formats to help ensure sustained competency. ASTTBC and other professional bodies to facilitate this by promoting and requiring continuing professional education. Also, support institutions to develop fast-track programs for 20-30 year olds and mature workers looking to change careers.

10. Increase access to useful technology occupation labour market information.

10.1 ASTTBC to partner with industry groups and the Ministry of Jobs, Tourism and Skills Training to refine the BC Labour Market Outlook to better measure technology labour demand and supply. In the longer term, this may include working with BC Stats and Statistics Canada on occupational classifications.

10.2 ASTTBC to work with the Deans of Technology in post-secondary institutions to make recommendations to the Ministry of Advanced Education, Innovation and Technology on regularly collecting and publishing technology education data.

10.3 ASTTBC to work with industry groups, the Ministry of Education and others to ensure technology LMI is included in K-12 technology career information.

Conclusion and Next Steps

As shown in this report, technology occupations in and outside of the technology sector reflect a growing portion of jobs and wealth creation in British Columbia. Technologists, technicians and technical specialists are in demand today, and future skills shortages are assured.

Major projects throughout the province and particularly in the north will produce thousands of jobs and require many new technology workers over the next decade. Liquefied natural gas (LNG) alone will represent $48 billion in investment and 1,400 long-term jobs. The Northeast region of BC is expected to lead the province in the annual employment growth rate; and the North Coast & Nechako region will have the third highest rate.
Forestry, mining, natural gas, technology and transportation – five of the BC Jobs Plan’s priority sectors – will depend heavily on the talent and productivity of technology professionals. ASTTBC wants to position technologists, technicians and technical specialists to support the growth of these and other sectors in BC and to ensure sufficient numbers of young people, new Canadians, Aboriginal people, women and others enter these careers.

Job creation, wealth creation, productivity and innovation will be key to our province’s prosperity. ASTTBC looks forward to working with the Government of British Columbia and others to “ensure the province has enough workers who have the skills necessary to meet the demands of our evolving economy, and that British Columbians are able to take advantage of the jobs available.”

ASTTBC and key provincial ministries will need to work collectively and strategically with those in the school system, post-secondary education institutions, industry groups and employers, professional associations and others.

ASTTBC will use *A Strategic Direction for Technology Education and Careers in BC* as a point of discussion with its partners and with participants at its events to engage them on adding value to the Strategy and on obtaining their commitment to joint action on its implementation.

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The Imperative for Addressing the Technology Skills Gap: A Strategic Direction for Technology Education and Skills in British Columbia

1. Impetus

"By taking action now, government can ensure that B.C.’s skills and training programs lead the way to the jobs of tomorrow."\(^2\)

In its recent report on *Competing in the 21st Century Skills Race*, the Canadian Council of Chief Executives (CCCE), included as priority policy questions the following:

“What are the skills that will enable Canada to compete successfully in the 21st Century and what institutional arrangement will ensure that Canadians are equipped with those skills?”

“How will we meet the need for more scientists, engineers, technologists and skilled tradespeople when our postsecondary system is largely driven by student choice, and when insufficient numbers of students seem inclined to pursue such careers?”\(^3\)

The Applied Science Technologists and Technicians of British Columbia (ASTTBC) and its 10,000 members share this concern and feel compelled to take pre-emptive action on addressing a technology education and skills gap.

A key theme of the CCCE’s report was that, “knowledge and proficiency in the areas of science, technology, engineering and mathematics (so-called STEM skills) are closely related to a country’s capacity to compete in those sectors of the economy in which technological innovation is most important” (p. 8). The CCCE report also concluded, “STEM skills have become the means by which countries such as Japan, Korea, Singapore, Taiwan, and Finland have established leadership positions in key industries, leaving Canada struggling to maintain its place among the advanced industrialized economies” (p. 16).

STEM skills and knowledge and education will be important in sectors with significant amounts of job openings in BC over the coming decade such as mining, technology,
transportation equipment, oil and gas, health care, etc. Global competition for engineers, technologists, technicians and tradespeople has become extremely strong. Figure 1 shows that globally, these types of jobs are the most difficult to fill.

Figure 1: Top 10 Jobs Employers are Having Difficulty Filling Worldwide, 2012

<table>
<thead>
<tr>
<th>Rank</th>
<th>Job Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Skilled Trades Workers</td>
</tr>
<tr>
<td>2</td>
<td>Engineers</td>
</tr>
<tr>
<td>3</td>
<td>Sales Representatives</td>
</tr>
<tr>
<td>4</td>
<td>Technicians</td>
</tr>
<tr>
<td>5</td>
<td>IT Staff</td>
</tr>
<tr>
<td>6</td>
<td>Accounting &amp; Finance Staff</td>
</tr>
<tr>
<td>7</td>
<td>Drivers</td>
</tr>
<tr>
<td>8</td>
<td>Management/Executives</td>
</tr>
<tr>
<td>9</td>
<td>Laborers</td>
</tr>
<tr>
<td>10</td>
<td>Secretaries, PAs, Administrative Assistants &amp; Office Support Staff</td>
</tr>
</tbody>
</table>


The purpose of this document is to present a strategic direction for technology education and skills and career development in British Columbia (BC). This in turn is designed to support the BC Jobs Plan, British Columbia’s Technology Strategy and other major economic and human capital initiatives in our province. This strategic direction will be guided by ASTTBC and its partners, in order to support, influence and inform and support existing government initiatives.

2. Background and Scope

“Success in technology is no longer an option. It’s a prerequisite for economic success. Consider how innovative technology fields influence traditional sectors: biotechnology in healthcare and life sciences; clean technology in energy and water; information technology in mining and oil and gas; communications technology in retail and consumer. Technology is the backbone of every industry, impacting virtually every aspect of the economy as competitive forces propel us to become more flexible and more efficient.”

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4 When used in a global context, “Technicians” and “IT Staff” include technicians and technologists as defined by ASTTBC.
BC’s technology sector is our province’s second fastest growing sector (see Figure 2), with current employment of 84,000, more than forestry, mining, and oil and gas combined. Since the dot.com bust over 10 years ago, this BC sector has recovered to increase by 40% over the last decade. Total revenue from the sector has increased 56% and its exports have ramped up by 86% over the same period.7 Upon the release of BC’s Technology Strategy recently, the announcement quoted Minister of Jobs, Tourism and Skills Training Minister Pat Bell: “B.C. is aiming to see 100,000 new jobs…in the province’s technology sector over the next couple of years.” The Minister added, “We think that is very achievable.”8

![Figure 2: BC Employment Growth by Sector, 1999-2009](image)

For purposes of this plan, “technology” occupations refer to professional occupations in natural and applied sciences (National Occupational Code 21), technical occupations in natural and applied sciences (NOC 22), and medical technologists and technicians (except dental health (NOC 321)).9 This plan refers to such occupations across the whole BC economy and not simply in the high technology sector.

These occupations are pivotal to enhancing BC’s productivity, competitiveness and innovation. As an American manufacturing report concluded, “The hardest jobs to fill are those that have the biggest impact performance” – particularly skilled production jobs. In

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9 See Appendix 1 for a detailed list of NOC 21, 22 and 321 occupational categories.
this context, 14% of U.S. manufacturers recently predicted that engineering technologist skill shortages will increase over the next 3 to 5 years.\(^{10}\) The same report found that 42% of the manufacturers said that workforce shortages or skill deficiencies in engineering technologist positions have had negative impacts on companies’ ability to expand operations or improve production.

Why should we be concerned about technology skills and education? There are many reasons:

- Technology permeates every job and workplace in BC, and increasingly so;
- Technology skills are critical to the growth and prosperity of BC’s technology sector (i.e. information and communication technology, digital media, clean energy, life sciences);
- Technology and technology skills are important to most other sectors such as resource industries, construction, transportation, various service sectors (e.g. health, government, etc.), etc.;
- Part of the chronic productivity challenge in BC and Canada will be addressed through the adoption of new technologies and technology skills;
- The effective use of technology and technology skills will also enhance companies’ innovativeness and competitiveness;
- Technology is also an important means for the productive employment of persons with physical disabilities and for K-12 and adult learning.

Also see the footnoted reports for further evidence of the significance of the technology sector and technology jobs.\(^{11}\)

> “Building a knowledge-based society is key to the future of British Columbia – and British Columbians.”\(^{12}\)

### 3. Addressing the Technology Skills Gap

Why do we need a strategic direction for technology education and skills development? What is broken?

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\(^{12}\) Greg Peet, Chair, BC Premier’s Technology Council in BC Jobs Plan 1 Year Progress Report. September 2012.
In 2007, ASTTBC published *Technology Skills 2020: A Technology Human Resources Strategy for British Columbia*; and held a *Roundtable on Technology Skills Shortage II*. It did this for three reasons. First, technology employment was sizable and had grown to a significant portion of the BC workforce. Second, despite this, ASTTBC saw technology work as an “invisible” occupation, overshadowed by increasing attention being paid to trades careers and university education and the traditional professions. Third, there was no cohesive and coordinated plan among government, education, business and industry and other leaders to ensure the necessary high school, post-secondary and industry training capacity was in place to respond to the need for more technology workers in the coming years to support BC’s economic development and growth.

While many improvements have been seen over the last 5 years in technology education, training and career development initiatives, with many accomplishments by ASTTBC and its partners, BC still needs a coordinated plan of action. Progress since 2007 has been sporadic, piecemeal and mostly within silos. Many of the challenges relate to gaps in labour demand and supply and the lack of strong linkages between the two.

A technology education plan will ensure taxpayers dollars are wisely spent in programs that will lead to jobs. Such a plan will also support the BC Jobs Plan and the eight sectors identified as priorities in this plan.

While technology is one of the eight BC Jobs Plan sectors, technology occupations and skills support the growth and viability of almost all of the other sectors – especially forestry, mining, natural gas, transportation and international education. As the BC Jobs Plan *1 Year Progress Report* indicates, “…the province’s technology sector, which is growing faster than any other sector.”

This strategic plan will inform not only ASTTBC’s planning and priorities, but should also inform the post-secondary education system, government policies and programs, and industry action.

What is ASTTBC’s interest and stake in this plan? As the eighth largest self-regulating association in BC, it has 10,000 registered technology professionals – technologists, technicians, and technical specialists.

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14 This and the next three paragraphs are from the ASTTBC Website. [www.asttbc.org](http://www.asttbc.org).
Technologists, technicians and technical specialists work in applied science technology fields such as architecture, bio-medical engineering, building, civil, electrical, electronics, environmental, fire protection, house inspection, information, mechanical, onsite wastewater and other related disciplines tied to the built and natural environment.

These technology professionals design, construct, inspect, test, maintain and manage most of the world around us including buildings, computers, electrical power, all manner of equipment, roads, environment, and water and wastewater systems. They work in private enterprise, for consulting engineering and technology companies, in all levels of government and as private consultants.

Technology professionals enjoy stimulating and rewarding careers often involving a combination of inside work including design and project management as well as on-site field work. They are in high demand, even when the economy is slow. Technology professionals' compensation varies, ranging from salaries of $60,000 to $125,000 and more, plus benefits. There are great opportunities for under-represented groups including women (currently 10% of the technology work force) and Aboriginal people.

4. The Technology Labour Market

While BC’s technology sector is growing and technology jobs are becoming strategically critical to our knowledge-based economy, other industrialized nations are also in the hunt for such workers.

In the Manpower Group’s most recent Talent Shortage Survey (2012), they asked employers throughout the world about which jobs they are having the most difficulty filling. The bottom line is that there is extremely strong competition for technical talent, with “top ten” lists dominated by jobs in Science, Technology, Engineering and Mathematics, including skilled trades.

Globally, Manpower found the top five occupations most difficult to fill are: 1) Skilled Trades Workers; 2) Engineers; 3) Sales Representatives (many technical); 4) Technicians; and 5) IT Staff. In the Americas, the priorities were similar: 1) Engineers; 2) Technicians; 3) Sales Representatives; 4) Skilled Trades Workers; and 5) Production Operators – with IT Staff being 9th.

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In Canada, employers indicated the current most difficult to fill positions are: 1) Skilled Trades Workers; 2) Engineers; 3) Sales Representatives; 5) Technicians; and 9) IT Staff.

Figure 3 shows that “specialty” technicians and technologists were the single most important position for BC technology companies to fill today.

**Figure 3: BCTIA Labour Survey, 2012**

Technologists and technicians are also prevalent in non-technology industries. For example, the BC Mining HR Task Force and Mining HR Council recently released a new forecast on industry labour demands. This data shows technologists and technicians are prominent in the mining industry’s top 5 most in-demand occupations: 16

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Projected Unfilled Positions by 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geological and mineral technologists</td>
<td>375</td>
</tr>
<tr>
<td>Drafting technologists and technicians</td>
<td>315</td>
</tr>
<tr>
<td>Heavy equipment operators (except crane)</td>
<td>305</td>
</tr>
<tr>
<td>Mapping and related technologists and technicians</td>
<td>280</td>
</tr>
<tr>
<td>Geological engineers</td>
<td>245</td>
</tr>
</tbody>
</table>

Technology Occupational Employment in BC

One of the changes since the ASTTBC 2007 report is the development of a robust BC labour market forecasting model. The BC Labour Market Outlook was first published in 2011 and was updated this past year, predicting occupational employment and job openings between 2010 and 2020. For the first time, ASTTBC is able to use data from this model to forecast technology occupational employment and job openings.

As indicated earlier, for purposes of this plan, “technology” occupations refer to professional occupations in natural and applied sciences (National Occupational Code 21), technical occupations in natural and applied sciences (NOC 22), and medical technologists and technicians (except dental health (NOC 321)). This NOC definition of technology occupations is supported by BC Stats. Throughout the data in the following tables, the jobs ASTTBC technologists and technicians are employed in all the “technical” occupational categories in NOC 22 (except Transportation Officers and Controllers) and a limited amount of employment in NOC 321.

Table 1 shows that employment in technology occupations in BC in 2012 was almost 150,000. The largest sector in terms of technology employment in 2012 was the Professional, Scientific & Managements sector, at 60,217 or 41%. The rest of the top 5 employers of technology workers were: 2) Government Services; 3) Health & Social Services; 4) Manufacturing; and 5) Trade. It is interesting and important to note that more than half of technology employment in BC is outside the technology sector.

The largest occupational categories of technology workers in BC in 2012 were: 1) Computer and informational system professionals (34,830); 2) Engineers (20,343); 3) Technical occupations in electronics and electrical engineering (13,336); 4) Medical technologists and technicians (13,152); and 5) Technical occupations in computer and information systems (12,898).

ASTTBC technologist and technician jobs represent 56,698 or 38.3% of total 2012 technology occupation employment.

As per Table 2, in terms of new technology jobs during 2010-2020, the Province’s BC Labour Market Outlook projects 25,621 new jobs over this period. Just over half (13,504) of these is expected to be created in the Professional, Scientific and Management

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17 See Appendix 1 for a detailed list of NOC 21, 22 and 321 occupational categories.
### Table 1: BC Technology Occupational Employment in 2012, by Industry

<table>
<thead>
<tr>
<th>Occupational Category</th>
<th>Agriculture</th>
<th>Other Primary</th>
<th>Utilities</th>
<th>Construction</th>
<th>Manufacturing</th>
<th>Trade</th>
<th>Transportation &amp; Warehousing</th>
<th>Finance, Insurance, &amp; Real Estate</th>
<th>Professional, Scientific, &amp; Management</th>
<th>Education</th>
<th>Services</th>
<th>Health &amp; Social Sciences</th>
<th>Accommodation &amp; Food Services</th>
<th>Other Private Services</th>
<th>Government Services</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical science professionals</td>
<td>23</td>
<td>662</td>
<td>14</td>
<td>23</td>
<td>310</td>
<td>60</td>
<td>22</td>
<td>11</td>
<td>1839</td>
<td>170</td>
<td>250</td>
<td>0</td>
<td>15</td>
<td>187</td>
<td>1886</td>
<td>6360</td>
</tr>
<tr>
<td>Life science professionals</td>
<td>100</td>
<td>1236</td>
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Table 2: Technology Employment Growth, by Occupation and Industry, 2010-2020

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occupation cluster. The next highest sources of technology employment growth to 2020 are expected to be in Health & Social Services (3,943), Manufacturing (1,462), Government Services (1,219), and Transportation & Warehousing (1,073).

ASTTBC technologists and technicians could represent as many as 8,647 or one-third (33.7%) of this total growth.

By virtue of their base of employment in 2012, the five largest occupational categories in terms of absolute employment growth areas: Computer and informational systems professionals; medical technologists and technicians; engineers; technical occupations in computer and information systems; and technical occupations in electronics and electrical engineering. These 5 categories combined are projected to contribute 65% of the new employment growth in BC to 2020.

As per Table 3, in terms of percentage growth, overall technology occupational employment is projected to grow by 18% between 2010 and 2020, or approximately 1.8% per year. This is significantly higher than the 1.4% for all occupations during the same period. The fastest growing technology occupational categories during this period are expected to be: Medical technologists and technicians (27%); computer and information systems professionals (20%); and “other” engineers and architects urban planners and land surveyors (19%). Computer and information system technical occupations (18%), technical occupations in architecture, drafting, surveying and mapping (18%) and technical occupations in physical sciences (17%) also are predicted to experience significant growth to 2020.

The slowest growing occupations are technical occupations in life sciences (12%), transportation officers and controllers (13%), and life science professionals (13%). The Professional, Scientific & Management and Health & Social Sciences sectors employed technology occupations with the highest growth rates, with many occupational categories in the 20%-30% growth rate range.

Table 4 is a summary chart of projected employment growth in technology occupations in BC to 2020. As previously indicated, the BC Labour Market Outlook projects a growth of 25,612 job openings from new employment in BC during this period. This does not include replacement jobs or job openings from attrition (retirements and deaths). The overall BC economy is expected to produce 1,027,400 new openings including 351,000 new jobs and openings of 676,400 from attrition.
Table 3: Technology Employment Percentage Growth, by Occupation and Industry, 2010-2020

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<td>Technical occupations in computer and information systems</td>
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<td>30</td>
<td>18</td>
<td>16</td>
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<td>Medical technologists and technicians (except dental health)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>13</td>
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<td>0</td>
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Table 4: Technology Occupation Employment in British Columbia, 2010-2020, NOC 21, 22 and 321

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<tr>
<td><strong>Professional occupations in natural and applied sciences</strong></td>
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<tr>
<td>021 Total</td>
<td>68,584</td>
<td>81,288</td>
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<tr>
<td>0211 Physical science professionals</td>
<td>3751</td>
<td>4441</td>
<td>690</td>
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<tr>
<td>0212 Life science professionals</td>
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<td>6960</td>
<td>807</td>
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<tr>
<td>0213 Civil, mechanical, electrical, and chemical engineers</td>
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<td>16023</td>
<td>2418</td>
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<td></td>
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<td>0214 Other engineers</td>
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<td>7224</td>
<td>1167</td>
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<tr>
<td>0215 Architects, urban planners, and land surveyors</td>
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<td>5987</td>
<td>949</td>
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<td></td>
</tr>
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<td>0216 Mathematicians, statisticians, and actuaries</td>
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<td>539</td>
<td>81</td>
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<td>0217 Computer and information systems professionals</td>
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<td>40113</td>
<td>6591</td>
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<td><strong>Technical occupations in natural and applied sciences</strong></td>
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<td>4415</td>
<td>639</td>
<td>16.9</td>
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<td>0222 Technical occupations in life sciences</td>
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<td>961</td>
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<td>0225 Technical occupations in architecture, drafting, surveying, and mapping</td>
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<td>8837</td>
<td>1377</td>
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<td>0226 Other technical inspectors and regulatory officers</td>
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<td>5759</td>
<td>743</td>
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<td>0227 Transportation officers and controllers</td>
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<td>0228 Technical occupations in computer and information systems</td>
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<tr>
<td><strong>0321 Medical technologists and technicians (except dental health)</strong></td>
<td>12,612</td>
<td>16,011</td>
<td>3399</td>
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<td><strong>Total All Technology (NOC 021, 022 and 0321)</strong></td>
<td>142,637</td>
<td>168,249</td>
<td>25,612</td>
<td>18.0</td>
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Table 5: 2012 ASTTBC Membership Credential and Discipline (excluding Technical Specialists)

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<tr>
<th>Discipline</th>
<th>AScT</th>
<th>AScT(P)</th>
<th>CTech</th>
<th>CTech(P)</th>
<th>Associate</th>
<th>GradTech GL</th>
<th>GradTech GN</th>
<th>Total</th>
<th>% of Total</th>
</tr>
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<td>3</td>
<td>0</td>
<td>3</td>
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<td>3</td>
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<td>Building</td>
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<td>136</td>
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<td>Chemical</td>
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<td>5</td>
<td>73</td>
<td>0</td>
<td>169</td>
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<td>Civil</td>
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<td>367</td>
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<td>80</td>
<td>538</td>
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<td>2297</td>
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<td>Electrical</td>
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<td>148</td>
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<td>50</td>
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<td>Environmental</td>
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<td>201</td>
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<td>Forest Engineering</td>
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<td>0</td>
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<td>Gas &amp; Petroleum</td>
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<td>0</td>
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<td>Industrial</td>
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<td>6</td>
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<td>0</td>
<td>82</td>
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<td>Information</td>
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<td>1</td>
<td>6</td>
<td>1</td>
<td>41</td>
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<td>0</td>
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<tr>
<td>Instrumentation</td>
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<td>0</td>
<td>2</td>
<td>6</td>
<td>0</td>
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<td>Mechanical</td>
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<td>25</td>
<td>425</td>
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<td>Metallurgical</td>
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<td>413</td>
<td>1783</td>
<td>31</td>
<td>7709</td>
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</tbody>
</table>

Source: ASTTBC Registration Data

Credential/Membership Classifications:

AScT – Applied Science Technologist; will hold a minimum of a Diploma of Technology or its equivalent.

AScT(P) – Provisional AScT is an “internationally trained professional”; one who has completed academics in a country other than Canada; will have 3 years to achieve required minimum of 1 year of Canadian experience in the applicable discipline at the appropriate level of membership (Technologists or Certified Technician).

CTech – A Certified Technician; will hold a minimum of a Certificate of Technology or its equivalent.

CTech(P) – Provisional CTech is an “internationally trained professional”; one who has completed academics in a country other than Canada; will have 3 years to achieve required minimum of 1 year of Canadian experience in the applicable discipline at the appropriate level of membership (Technologists or Certified Technician).

Associate – A temporary membership category granted to a person approved by the Board of Examiners; meets the general standards of Registration and indicates their intent to actively seek certified membership.

GradTech GL (Technologist) – Person approved by the Board of Examiners, who has successfully graduated from an ASTTBC or National Accredited program of studies lead to registration as an Applied Science Technologist.

GradTech GN (Technician) – Person approved by the Board of Examiners, who has successfully graduated from an ASTTBC or National Accredited program of studies lead to registration as a Certified Technician.
Estimated attrition equals 1.9 times estimated openings from new jobs. Applying this attrition formula to technology job openings (1.9 X 25,612) means a rough estimate of attrition would be 49,431 (assuming the technology occupation attrition rate is roughly the same as all occupations). We estimate total technology occupation openings to 2020 to be 75,043 or 52.6% of 2010 employment in such occupations. For the whole BC economy, total job openings only equal 42.8%. Therefore job openings in technology occupations appear more significant relative to 2010 employment.

Table 5 above shows 2012 ASTTBC membership by type of credential and discipline. Of the 7,709 members (excluding technical specialists), according to discipline, the top four among ASTTBC members are: Civil (29.8%); Electronics (16.7%); Mechanical (16%); and Building (11.4%). By type of credential, more than half are AScT (Applied Science Technologists) at 53.9%. GradTech technologists represented 23.1% of ASTTBC members; and 16.1% are Certified Technicians (CTechs).

It is important to note that there is no legal requirement for membership in (registration with) ASTTBC – its designations are not mandatory licenses required to train or work in technologist and technician occupations. As a result, ASTTBC membership numbers only represent approximately 20% of the total population of technologists and technicians in BC (estimated by ASTTBC). There could be as many as 40,000 or more people functioning as technologists and technicians in the province.

As per Table 6, in addition to technologists and technicians, ASTTBC has a growing number of technical specialists, totaling 2,007 in July 2012, up 5.4% from the beginning of 2012. The largest technical specialist categories are Fire Protection (39.5%), Onsite Wastewater (29.0%), and Construction Safety (10.9%) and Home & Property Inspection (10.0%).

<table>
<thead>
<tr>
<th>Name of Group</th>
<th>January 2012</th>
<th>July 2012</th>
<th>% of Total</th>
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<td><strong>Building Design</strong></td>
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<td>RBD</td>
<td>25</td>
<td>25</td>
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<td>CRD</td>
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<td>43</td>
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<tr>
<td>Assoc. Des.</td>
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<tr>
<td>Total</td>
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<td>75</td>
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</tr>
<tr>
<td><strong>Construction Safety</strong></td>
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<tr>
<td>CSO</td>
<td>181</td>
<td>209</td>
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<tr>
<td>TSC</td>
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</tr>
<tr>
<td>Total</td>
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<td>218</td>
<td>10.9</td>
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<tr>
<td>Name of Group</td>
<td>January 2012</td>
<td>July 2012</td>
<td>% of Total</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>--------------</td>
<td>-----------</td>
<td>------------</td>
</tr>
<tr>
<td><strong>Fire Protection</strong></td>
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<td></td>
<td></td>
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<tr>
<td>Full</td>
<td>722</td>
<td>756</td>
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<tr>
<td>Interim</td>
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<tr>
<td>Trainee</td>
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<tr>
<td><strong>Total</strong></td>
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<td><strong>Onsite Wastewater</strong></td>
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<td>ROWP</td>
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<td>561</td>
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<td>OWT</td>
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<td><strong>Total</strong></td>
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<td><strong>House &amp; Property Inspection</strong></td>
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<td>CHI</td>
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<td>CHI(P)</td>
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<tr>
<td>Insp.-in-Training</td>
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<td>42</td>
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<td><strong>Total</strong></td>
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<td>CPWI 2</td>
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<tr>
<td><strong>Total</strong></td>
<td>80</td>
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<td><strong>Steel Detailers</strong></td>
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</tr>
<tr>
<td>ASD</td>
<td>5</td>
<td>4</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td>29</td>
<td>29</td>
<td>1.3</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td>1904</td>
<td>2007</td>
<td>100.0</td>
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</table>

Source: ASTTBC Registration Data.

### 5. A Strategic Direction

ASTTBC offers the following vision, principles and strategic goals to guide the development of a Technology Education and Careers Strategic Plan and specific strategies.

**Vision**

A growing, diverse and sustainable British Columbia knowledge-based economy supported by state-of-the-art technology, well-trained, qualified and fully-engaged technology workers and a responsive, flexible education and training system.
Principles

This technology education and careers strategic statement will be implemented in a way that emphasizes and reflects the following principles and values:

- Focus on both short and long term strategies;
- Leadership by industry, professionals, governments and educators;
- Partnerships among stakeholders;
- Connect labour market demand and supply for technology workers and skills;
- Flexible design and delivery of education and training programs;
- Sectorally and regionally sensitive strategies; and,
- Clear roles and responsibilities among stakeholders.

Strategic Goals

The Technology Education Strategy will achieve the following strategic (long-term) goals over the next three to five years:

1. Technology careers are 'top of mind' among British Columbian youth and their influencers (i.e., parents, educators, peers and the media).
2. BC’s post-secondary education system provides a balance of programming throughout BC, graduating an optimal supply of technology workers and providing lifelong learning opportunities for technology professionals.
3. Unemployed persons and members of underemployed labour force groups are full participants in technology careers and education and training.
4. Technology labour market information and intelligence guides strategic decision-making for technology education and careers and for technology employers and workers.
5. Technology professionals in BC are qualified, registered and accountable through professional registration, and fully recognized by government and other regulatory bodies.
6. Internationally trained professionals are fully integrated into careers and within BC through an effective technology professional foreign credential recognition process.
7. Small and medium-sized businesses in BC are supported and have the capacity to hire, mentor and retain technology workers.
6. Strategic Challenges, Strategies and Recommendations

1. Develop a clear, agreed upon strategic direction for technology education and skills in BC, including clear, high-level leadership and championing.

The BC Jobs Plan and industry organizations like the BC Technology Industries Association have recently profiled the importance of the technology sector and jobs to the BC economy.

ASTTBC has provided leadership in technology education and career promotion for several years. In 2008, ASTTBC created the Technology Education & Careers Council (TECC). The mandate of the Council is to provide strategic leadership and an advocacy role in advancing the importance of technology careers and education in British Columbia by being a catalyst for action and an industry voice to governments and educational systems on policy issues. It is comprised of senior business leaders and employers of technology professionals in British Columbia, as well as a small number of other stakeholder leaders.

Despite efforts from the BC Government, industry and ASTTBC and TECC, there still remains a technology education policy vacuum in terms of technology education programs. "Technology" occupations and programs are still the invisible "middle" category in the workforce, with most attention placed on university level education and skilled trades. There is currently little apparent cohesive strategic direction for technology education in BC. While there is some linkage between some institutions, it is far from the ideal needed to ensure maximum potential for our post-secondary education system. In spite of positive work by the BC Government and the technology industry on marketing our province and stimulating technology investment and research, there has been limited focus and resources applied to linking technology education and human resources priorities.

While there are several industry and professional associations involved in technology development, and leadership groups such as the Premier’s Technology Council and BCTIA, no high-level panel of leaders is bringing these groups together around a long-term comprehensive technology education and skills strategy. The TECC has added value in bringing attention to technology careers, but more is needed.
ASTTBC Recommendations:

1.1 Develop a strategic direction (vision, principles, goals) for BC technology education.

1.2 The Ministers of Advanced Education, Innovation and Technology and of Jobs, Tourism and Skills Training create a high-level advisory task force to recommend a STEM Education and Training Strategy.

2. Develop a clear technology education and training plan and capacity for BC – annual and multi-year – that is tied to labour market demand

BC needs a plan for the funding and delivery of science, technology, engineering and mathematics (STEM) programming in high school and post-secondary education and training.

As indicated earlier, credentials obtained in accredited technology programs at BC colleges and institutes have not declined in recent years, however, there is no evidence that institutions and government are well-positioned to ensure that technology education programs will keep up with the potential 75,000 new job openings between 2010 and 2020.

Table 7 shows the number of graduates of nationally-accredited technology programs at BC colleges and institutes between 2002 and 2011. During this period, the number of such graduates increased by 299 or 77.9%. The average annual change was 33.2 graduates or 8.4% per year. There is a pattern of alternating years of growth and decline. The highest year of graduates in technology programs in BC was 752 in 2010, however, this dropped off by over 9% in 2011.

While at the aggregate level, technology program credentials may have kept stable since the recession, this masks significant declines in certain program areas and institutions. For example:

- Water Engineering credentials have dropped from 78 in 2002 to 18 in 2011
- Plastics has had no credentials in the last two years;
- Computer Systems credentials has declined from 53 in 2005 to 30 in 2011;
- Renewable Resources – Forest Ecology has declined from 22 in 2005 to zero in 2011;
- Natural Resources credentials have decreased from 21 in 2002 to 7 in 2011;
Table 7: Graduates in Nationally-Accredited Programs, BC Colleges & Institutes, 2002-2011

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>Change</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduates</td>
<td>384</td>
<td>426</td>
<td>696</td>
<td>625</td>
<td>728</td>
<td>661</td>
<td>704</td>
<td>690</td>
<td>752</td>
<td>683</td>
<td>299</td>
<td>77.9%</td>
</tr>
<tr>
<td>Change From Previous Year</td>
<td>N/A</td>
<td>42</td>
<td>270</td>
<td>-71</td>
<td>103</td>
<td>-67</td>
<td>43</td>
<td>-14</td>
<td>62</td>
<td>-69</td>
<td>Avg.</td>
<td>33.2</td>
</tr>
<tr>
<td>Percent Change</td>
<td>N/A</td>
<td>10.94%</td>
<td>63.38%</td>
<td>-10.20%</td>
<td>16.48%</td>
<td>-9.20%</td>
<td>6.51%</td>
<td>-1.99%</td>
<td>8.99%</td>
<td>-9.18%</td>
<td>Avg.</td>
<td>8.41%</td>
</tr>
</tbody>
</table>

20
• BCIT technology program credentials dropped over 10% from 1,244 in 2001/02 to 1,118 in 2010/11;
• College of New Caledonia’s technology program credentials decreased from 145 in 2000/01 to 32 in 2010/11.¹⁹

In terms of seat/enrolment reductions, over the past decade, there have been a number of technology programs cancelled throughout BC. The programs include architectural and engineering, civil, electronics and robotics. It is estimated by ASTTBC that had these programs continued, there would have been an estimated 750 additional graduates of technologist and technician programs. Using this figure, it would more than nullify the growth of 299 in graduates in nationally accredited technology programs in Table 7.

Since the 2008/09 recession, BC’s technology sector has bounced back with a reported 12.5% growth in headcounts between September 2010 and September 2011; and a predicted growth of 5.5% to September 2012.²⁰ These are huge annual employment growth rates that will produce another 3,000 to 4,000 jobs in this sector this year. Is our system and programs positioned to respond to this and other trends later in the decade? And is there a coordinated (cross-BC) plan developed or being completed among institutions and government and industry

**ASTTBC Recommendations:**

2.1 Conduct a detailed gap analysis between BC’s labour market demand forecast and programs for technicians, technologists and other technology workers.

2.2 Link technology jobs in the BC Jobs Plan with education planning, programming and funding.

2.3 Based on the gap analysis and linking jobs and education and training, set targets and performance measures across BC for the development and delivery of technology program priorities.

2.4 Provide defined/targeted funding and offer incentive funding for existing and new programs.

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¹⁹ Source: ASTTBC (collected from institutional sources). 2012.
2.5 Focus in particular on access to such programs in the Northern, Interior and Kootenay regions. Possibly consider technician/certificate programs in the regions leading to a second year/diploma of technology at one of the larger institutions offering technology education, e.g. BCIT, Okanagan College and Camosun College. This is a critical priority given the extent of job creation and huge capital projects expected in Northern regions over the next decade.

Also, there continues to be inadequate bridging and laddering among trades, technical and university level education programs. Some ITA industry training programs (i.e., trades) could be entry points to the skills, knowledge and qualifications of technician and technologist standards. To date, only sporadic and piece-meal efforts have been undertaken to create linkages. ASTTBC is involved in dialogue with the ITA to explore possible opportunities in creating formal linkages in training, certification and accreditation between trades and technology occupations.

Bridging and laddering among trades and technology jobs through a partnership of ASTTBC, ITA and the Ministries of Advanced Education, Innovation and Technology and of Jobs, Training and Skills Training could increase the value of training, certification and the full development and utilization of technology talent in BC.

**ASTTBC Recommendations:**

2.6 ASTTBC and the ITA, in consultation with the Ministries, work together to define and pilot training and certification for a trades-technology-degree pathway.

2.7 ASTTBC to work with the Ministry of Advanced Education, Innovation and Technology and post-secondary education institutions to act on the following technology program initiatives:

- The College of New Caledonia’s proposals for Civil and Mechanical Engineering Technology programs;
- Okanagan College’s proposal for a Sustainable Construction Management technology program;
- Introduce technician programs that could lead to a certificate and also ladder into second year Diploma Program (e.g. in mining and Geomatics at Northwest Community College and Northern Lights Community College;
• Offer some technician/technologist programs in the North as there is only one 2-year applied science/engineering technology program north of Kamloops;
• Rationalize technology programs in BC, particularly at the first year level, and by more effectively using distance learning models of delivery;
• Dedicated technology program FTE funding is needed by the Ministry of Advanced Education, Innovation and Technology to target key technology areas, including the earlier-referenced incentive funding.

We end this section with a quote from the recent report of the Council of Canadian Chief Executives:

“If we believe that these are the skills most needed for individuals and nations to succeed in the 21st century, we must ask ourselves whether our present educational institutions are the best vehicles for nurturing these skills, or whether new arrangements and methods are required. Can institutions built on a centuries-old model of teaching and learning be expected to produce graduates who are innovative, critical, adaptable and flexible, or do we need to develop new structures and strategies? If existing institutions are to continue as the principal means of skills development, what reforms are required to ensure that graduates are ready for the world they will enter?”

3. Develop a comprehensive program to promote technology careers, skills and education in BC.

Despite best efforts of ASTTBC, Skills Canada BC and other private and public agencies, technology careers are ‘invisible’ in BC and most of Canada. The general public and media tend to focus on the two ends of the continuum: skilled trades and university careers.

As indicated five years ago, there is a general lack of public understanding of the key role technologists and technicians play in industry today, the significance of their contribution to the BC economy, and of the diverse and exciting career opportunities and income potential these careers provide. Awareness of STEM jobs has been lost between the perceived higher status of university degrees and the increasing profile of the trades.

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21 Orpwood et al., op. cit., page 17.
The earlier-referenced Council of Canadian Chief Executives cites recent research on young people’s perceptions of STEM careers:

“Yet in spite of that, a 2010 Angus Reid survey of Canadians aged 16 to 18 revealed that only 37 per cent were interested in taking even one science course at the postsecondary level. Our research indicates that Canadian students recognize the need for more people to study science, but that a majority of them are not themselves attracted to such programs or careers… As the Amgen/Let’s Talk Science study concluded, there appears to be a serious disconnect between Canadians’ positive perceptions about the importance of science to society and young people’s desire to pursue a science-related career.”

The Council recommends:

- …governments and other stakeholders must work harder to recruit and retain young people in STEM programs and to support effective practices in these areas.
- To rethink traditional subject boundaries and develop multi-disciplinary approaches to learning that would provide students with relevant and exciting contexts for their education.
- To establish better linkages between education and career awareness. Formal and informal educational institutions, as well as corporate and voluntary organizations, all have roles to play here.

In 2007, ASTTBC indicated that youth enrolment in post-secondary technology programs was not keeping up with labour market demand, and students were not taking the required science and math prerequisites in high school. Most high school students continue to plan on attending university. ASTTBC’s 2007 report asserted, “This view is encouraged by key influencers of youth including parents and school counselors, who often encourage youth to pursue a degree versus technology training or trade apprenticeships.”

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22 Orpwood et al., op. cit., p. 11.
23 Ibid., p. 17.
One success in this challenge is ASTTBC’s charitable foundation’s – the ASTTBC Foundation – provision of $25,000 in bursaries each year for technology students. Since 2007, the Technology Legacy Fund was increased to $500,000. In addition to many other technology career promotion initiatives, over the last four years, ASTTBC contributed $25,000 for the Big Little Science Centre in Kamloops; and has sponsored several technology awards throughout the province (e.g. Mid-Island Science, Technology and Innovation Council). Further, ASTTBC supported the formation of the Bert Edwards Science and Technology Elementary School in Kamloops and supported the Trades and Technology High School in the same community.

In addition to continuing technology career promotion efforts with TECC, Skills Canada BC and others, ASTTBC offers the following recommendations.

**ASTTBC Recommendations:**

3.1 Science World assumes the lead in promoting technology education and careers.

3.2 Science World to create a Science and Technology Leadership Board and bring stakeholders together to enhance coordination of efforts on technology career promotion.

3.3 Work with public and private sectors to create a $50 million Science and Technology Futures Fund to advance a science and technology culture.

3.4 Use technology to promote technology careers among K-12 students – for example in 2011, ASTTBC’s development of a “technology” music video recorded by the Kerplunks. ASTTBC recently released a new music video entitled “Everything Science.”

3.5 Ensure that a major initiative of BC Jobs Plan “2” includes comprehensive marketing of technology careers to parents, young people and children, educators, the media and others.

3.6 Get technology employers directly involved in the promotion of technology careers to schools, including ASTTBC working with BCTIA and others to create a Technology Employers Speakers Bureau.

3.7 Promote technology entrepreneurship to young people and adults. For example, the BCTIA found in a recent study that there were 16,549 sole entrepreneurs (i.e. the vast majority were true freelancers and not simply contract employees).\(^{24}\) It also found that

\(^{24}\) BCTIA, op. cit., p. 8.
62% of these sole entrepreneurs intend to hire full-time employees within the next two years, thus converting into micro-businesses.

4. The need for more high school technology career preparation programs and teaching, and emphasis on STEM curriculum.

ASTTBC and partners delivered successful technology career prep programs in the last 10 years through programs such as TechWorks! Despite the success of such programs and the demand for technology awareness and technology workers, federal and provincial departments and the school system have not been able to allocate funds to sustain these valuable programs. Therefore, at the high school level, technology employers and technology education administrators need to strengthen the quality of math, science and technology teaching and facilities in our schools.

Some of the barriers are perceptual, capacity and policy:

- Students are not well-informed about non-university careers, particularly technology careers;
- A lack of comprehensive and consistent exposure to math and sciences among elementary students;
- Parents are more opened-minded about these options, but “not for their child”;
- Educators frequently signal a bias towards university and professional training;
- Technical training facilities and equipment are often out of date and costly to renew;
- Technology courses can mean higher operating costs and influence what districts/schools offer;
- A lack of consistent and comprehensive career counseling resources;
- A shortage of technical education teachers, particularly with technical credentials;
- The need for flexibility and multiple pathways to graduation and career preparation;
- Engagement of industry in the review and revision of curriculum and graduation program.

Since 2007, ASTTBC has been proactively promoting technology career preparation programs. It has put much effort into supporting the proposed Trades and Technology high school in Kamloops. ASTTBC has been meeting with other school boards to consider high school level technology programming similar to the Industry Training
Authority ACE-IT (dual credit) initiative. Also, ASTTBC has undertaken discussions with BCIT, Okanagan College, Thompson Rivers University and Camosun College on the development of ACE-IT technology programs.

**ASTTBC Recommendations:**

4.1 ASTTBC and its partners build on the above momentum and work with the Ministry of Education to support the development and expansion of high school technology career preparation programs as preparation for post-secondary education programs and technology careers.

4.2 Building on ASTTBC’s earlier successes with *TechWorks!*, create an ACE-IT-like program for technology programs. Perhaps this could be done in conjunction with the Industry Training Authority as it pursues traditional fields other than trades training models.

4.3 The Ministry of Education and school boards to encourage and support math and science teachers to ensure continuing positive exposure to these subjects among all students in all elementary years.

4.4 Continue to emphasize the STEM theme. The Ministry of Education and K-12 system develop incentives and support to help develop and retain high school technology, math and science teachers and promote and update math, science and technology programs.

5. Support small business HR innovation capacity and incentives for employers to hire, retain and train technical graduates and workers.

As ASTTBC indicated in its 2007 report, “Many recent studies have demonstrated significant skills gaps in small and medium sized businesses in BC and weak capacity and/or cultures among such employers to invest in employee training and innovative human resource practices.”

More recent research shows small businesses that employ technology workers need supports including information, practical tools and financial incentives to help build this capacity for attracting and recruiting, developing and retaining such workers.

In the earlier mentioned BCTIA study, based on its survey, it found that “retention is the new recruitment”: “More progressive companies appear to be transitioning their
recruitment and retention efforts, often with a focus on minimizing turnover so that they won’t need to recruit.”25 The study also cites trends: of cultural changes occurring to facilitate “meaningful work” for employees; use of brand-building efforts to attract jobseekers; more recruiting via social networks; recognition of further on-the-job training to “compensate for new graduates’ lack of work experience, and assert that more work could be done with co-operative education and internships to increase the job-readiness of new grads.”26

BCTIA’s report goes on to recommend:

- Employee retention strategies;
- Building local talent brands;
- Undertake supply-side research;
- National and international recruitment programs; and,
- Continue to focus on talent and capital.

The supply-side research would include developing a better understanding of: under-employment issues; prospects for internal advancement; retirement and succession plans; awareness and desirability of BC as a destination for talent; and understanding career paths to improve the quantity and quality of management talent.

ASTTBC signed a Memorandum of Understanding with Small Business BC in 2011 and has started linking ASTTBC members to SBBC programs and service.

**ASTTBC Recommendations:**

5.1 Form a strategic partnership between ASTTBC, SBBC and BCTIA to promote small business hiring and retention of technology graduates and workers.

5.2 Support SMEs in adopting and hiring technology workers to improve productivity, and encourage governments to offer some form of refundable tax credit tied to training and internships that aim to improve workplace productivity.27

5.3 Pursue a partnership between ASTTBC, the BC Chamber of Commerce, the Small Business Roundtable, the Ministry of Jobs, Tourism and Skills Training, and the BC

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25 BCTIA, op. cit., p. 10.
26 BCITA, op. cit., p. 11.
27 Note that training tax/employment tax credits already exist in BC for apprenticeships, Film/TV/Digital Media, and Shipbuilding and Repair sectors.
Human Resources Management Association to develop tools and capacity for small businesses that employ technology workers to enable them to recruit, retain and develop technical employees through innovative HR practices. This should include retaining mid-career and older workers, and include targeting managers and supervisors.

5.4 Expand the BC Training Tax Credit Program for employers of certified technologists and technicians (and technical specialists) to be eligible for tax credits for training.

5.5 Explore the potential of blending retiring workers with new recruits in a mentoring role; and extending the working time for mature workers by reducing their stress and level of responsibility.

6. The need to support the recognition of skills and employment of internationally trained professionals and mature workers

Immigration represents a large source of potential labour and skills. New immigrants will account for an increasing proportion of net new labour force growth in the coming years and decades. However, as ASTTBC flagged five years ago, new immigrants are often “not integrated into the workforce quickly or efficiently, resulting in extended unemployment or under-employment.”

ASTTBC held a series of Internationally Trained Professionals forums in several BC locations earlier this year. These well-attended forums uncovered the following challenges.28

- Language and cultural adaptation;
- Settlement location choices and available support;
- Credential recognition (both educational and experiential);
- Job finding and career paths;
- Education upgrading resources; and,
- Access to mentoring.

ASTTBC currently uses the following international categories in their database:

- Africa
- Asia (excluding China, India and the Philippines)
- China

Table 8 the trend in ASTTBC registrations among internationally training professionals. The percent of ASTTBC membership educated outside Canada has remained fairly steady at approximately 7% during the 2005-2011 period.

### Table 8: Internationally Trained ASTTBC Members by Source Country, 2005-2011

<table>
<thead>
<tr>
<th>Source Country</th>
<th>ITP Registration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2005</td>
</tr>
<tr>
<td>Total</td>
<td>465</td>
</tr>
<tr>
<td>Change from previous year</td>
<td>n/a</td>
</tr>
</tbody>
</table>

As per Table 9, of the 75 internationally trained applicants in 2011, 11% were still pending decisions (8 applicants), as of June 2012. Over half had been granted full registration as either a technologist or technician (56%, or 42 applicants), and one third had provisional technologist or technician registrations (31%, 23 applicants). Only two international applicants (3%) had been given associate member status. These outcomes were then reviewed by source country.

There may be patterns by source country, however, with such small numbers these should be interpreted with caution. Of 2011 applicants from India, most were granted provisional or associate member status. It may be that applicants from India are having more trouble finding Canadian work experience. This could be further explored, perhaps examining historical data only for applicants from India from 2008 onwards, since the category was added. ASTTBC recognizes it needs to do further work in documenting, tracking and analysis of the ASTTBC registration of internationally trained professionals.
Table 9: Internationally Trained ASTTBC Applicants by Credential, 2011

<table>
<thead>
<tr>
<th>Region</th>
<th>Technologist (Provisional)</th>
<th>Technician (Provisional)</th>
<th>Technologist (Provisional)</th>
<th>Technician (Provisional)</th>
<th>Associate Member</th>
<th>Decision pending</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>100% (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>China</td>
<td>57% (4)</td>
<td>43% (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>Europe</td>
<td>33% (1)</td>
<td>33% (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>India</td>
<td>14% (1)</td>
<td>43% (3)</td>
<td>29% (2)</td>
<td>14% (1)</td>
<td></td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>Philippines</td>
<td>41% (11)</td>
<td>7% (2)</td>
<td>37% (10)</td>
<td>4% (1)</td>
<td>11% (3)</td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>UK</td>
<td>33% (1)</td>
<td>33% (1)</td>
<td>33% (1)</td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>Other</td>
<td>42% (11)</td>
<td>23% (6)</td>
<td>19% (5)</td>
<td>4% (1)</td>
<td>15% (4)</td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
<td>37% (28)</td>
<td>20% (14)</td>
<td>27% (20)</td>
<td>4% (3)</td>
<td>3% (2)</td>
<td>11% (8)</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: ASTTBC Registration Data.

A couple of areas in which ASTTBC has made progress with partners on the above challenges are foreign credential recognition and mentorship.

Technology Registrations Canada was established through funding from Human Resources and Skills Development Canada (HRSDC). It is an online software package that allows anyone from anywhere to go online at no cost to conduct a self-assessment against “National Technology Benchmarks.”

ASTTBC has created a “provisional” registration – “AScT (P)” – for international trained professionals when all qualifications have been satisfied with the exception of the one-year North American/Canadian experience.

With BC Government funding, ASTTBC is expanding its programming of international trained professionals (ITP) in other ways:

- An ITP Web Site has been developed: [http://www.itpbc.com/](http://www.itpbc.com/);
- Information and sources have been available in the web site to assist ITP’s engage and build careers and new lives in BC;
- Alternate-to-formal-education program is being investigated and could help ITP’s and indigenous technology practitioners meet ASTTBC’s professional certification standards
• A Philippine - BC Partnership is being developed. ASTTBC's Executive Director and Member Ron Alvaro AScT were part of BC Premier Clark's mission to SE Asia to start work on the initiative;
• A Philippine Education Assessment and Agreement is planned with ASTTBC taking a team to the Philippines in the fall to reach an agreement / understanding on equivalency;
• An ITP Leadership Forum was recently launched for the purpose of advising ASTTBC on the management of the ITP Program.

Most recently, ASTTBC and the Immigrant Employment Council of BC announced a joint mentoring program for internationally trained professionals (specifically technology professionals) “who need guidance and advice in finding employment in their own disciplines of engineering and applied science.”

Notwithstanding the progress to date, ASTTBC recommends the following.

**ASTTBC Recommendations:**

6.1 ASTTBC and its partners use the Philippines experience to expand to internationally trained professionals from other countries.

6.2 ASTTBC further develop and expand outreach services for internationally trained professionals who are now resident in BC.

6.3 ASTTBC publish a listing of foreign credentials already assessed by ASTTBC to further inform internationally trained professionals to help them make decisions prior to coming to Canada.

6.4 ASTTBC to partner with industry groups and the IEC-BC to work with immigrant service agencies and government to ensure a more streamlined, relevant response from such agencies to help match employers and internationally trained professionals.

7. The need to increase Aboriginal participation and success in technology education and careers.

Aboriginal communities, Aboriginal people and First Nations have lower rates of technology adoption and lower rates of participation in technology education and

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employment. Yet Aboriginal youth represent a fast-growing pool of available skilled labour. While encouraging Aboriginal youth to pursue trades careers and business opportunities, technology careers should be promoted to Aboriginal students, teachers and parents.

In recognition of this challenge and opportunity, the First Nations Career Council (FNCC) was formed in May 2008 by ASTTBC for the purpose of assisting Aboriginal technologists and technicians promote technology careers and the application of technology in Aboriginal communities. The FNCC Board is made up of Aboriginal technologists and technicians, and will be augmented by other interested persons willing to assist with our work. FNCC’s strategic direction is as follows:

Vision
First Nations, Metis, and Inuit people confidently navigate their way through the education system both scholastically and financially leading to rewarding careers in applied science technology.

Mission
To empower First Nations, Metis, and Inuit people to achieve rewarding careers in applied science technology.

Goals
1. Technology education and career information is available to support education and career decisions.
2. Career awareness programs are in place to help students make informed career choices.
3. Partnerships are in place to enhance outreach, career awareness and program delivery.
4. Funding is in place to assist students to meet their financial needs.

ASTTBC is working with First Nations, educators and industry associations to create technical certification for First Nations in designated areas such as public works.

ASTTBC has also launched an FNCC website, participated in career fairs and offered bursaries and career advice.
ASTTBC Recommendations:

7.1 ASTTBC to work with the Ministry of Advanced Education, Innovation and Technology and of Education to promote technology careers to K-12 Aboriginal students, Aboriginal communities and Aboriginal post-secondary institutions.

7.2 ASTTBC to seek targeted funding for Aboriginal technologist and technician bridging and certificate and diploma programs and other opportunities for partnership within the Ministry of Advanced Education, Innovation and Technology’s Aboriginal Post-Secondary Education and Training Policy Framework and Action Plan.

7.3 ASTTBC to continue to engage First Nations and Aboriginal organizations and post-secondary institutions to pursue partnerships on technology education and career promotion.

8. The need to increase the participation and career advancement for women in selected technology education and careers

As Table 10 shows, 10.3% of ASTTBC members are women, and while this has increased from 9% in 2009, there is still much room for improvement.

Women who enter technology education and employment have higher success rates than men. Young women in school and unemployed and under-employed women are an important talent pool to tap for technology jobs and careers.

<table>
<thead>
<tr>
<th>Membership Category</th>
<th>Women Members</th>
<th>Total Members</th>
<th>Women as % of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>AScT</td>
<td>308</td>
<td>4,158</td>
<td>7.4</td>
</tr>
<tr>
<td>CTech</td>
<td>148</td>
<td>1,244</td>
<td>11.9</td>
</tr>
<tr>
<td>GradTech</td>
<td>278</td>
<td>1,814</td>
<td>15.3</td>
</tr>
<tr>
<td>Associate</td>
<td>51</td>
<td>413</td>
<td>12.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>785</strong></td>
<td><strong>7,629</strong></td>
<td><strong>10.3</strong></td>
</tr>
</tbody>
</table>

Women are extremely under-represented in technology occupations. The Vice-President of Human Resources of Microsoft Canada recently stated that women are a serious untapped resource, representing only 30 percent of the IT workforce in Canada.30

Since its 2007 report, ASTTBC has initiated a number of women in technology initiatives.

ASTTBC created in 2009 the BC Women in Technology (BCWiT) team as a core group of women, members of ASTTBC, representing various disciplines in the technology field. Its mission is to provide support, be an information resource and promote awareness to women in technology careers and to women seeking new career opportunities.

ASTTBC undertook a survey of its female members (results published in April 2009) to gather information why the numbers of women in technology careers is low. The survey focused on the challenges and issues that women in technology faced as they chose a career in technology, prepared to enter the workforce in a technology career and as they developed their technology career.

The results of the survey indicated the following:

- It is critical to capture the interest of girls at a younger age with hands on events and more focused career counseling.
- More female role models and media engagements are vital to raise awareness of the many opportunities available to women in choosing a career in technology.
- Women who are preparing to enter the workforce in a technology career are looking for co-op programs and internships to facilitate their interest in a particular field.
- Students are also asking for more tools to assist with the job search process.
- Women that are developing their careers are seeking mentoring and networking opportunities, whether it is to discuss professional development in their field, challenges working their particular field of expertise, or advancement into senior management.31

ASTTBC, in partnership with industry and other stakeholders, is embarking on the large task of promoting awareness of the technology fields to address the labour shortage of skilled technology workers. The work of the BCWiT team is to support this endeavor by promoting careers in technology to women.

In addition to the above efforts, ASTTBC recommends the following.

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ASTTBC Recommendations:

8.1 Science World to help lead and coordinate efforts to promote careers in technology for women.

8.2 ASTTBC to partner with groups such as the Minerva Foundation, the Society for Canadian Women in Science and Technology, and Westcoast Women in Engineering, Science and Technology to advance this goal.

8.3 Post-secondary institutions to adopt recruitment and retention strategies to increase female enrolment and graduation in non-traditional technology occupations.

8.4 Include in K-12 career promotion efforts targeted initiatives to encourage girls and young women to enter technology education and careers.

8.5 ASTTBC to work with industry groups and large and small businesses to recognize employers of women in technology and to recognize women in technology.

9. The need to increase the utilization and recognition of the talents of technology professionals

While well-recognized as a self-governing association of technology professionals including technologists, technicians and technical specialists, ASTTBC members are often limited in the services they can provide because of legislative and regulatory practices. The ASTT Act and Regulations established a solid foundation for the full professional regulation of technology professionals; however other legislation has not caught up with the reality of common practices in the BC work place.

ASTTBC members are highly qualified technology workers who should be enabled in what they can do based on their education, training and experience. While ASTTBC has been successful in achieving status as ‘qualified professionals’ in a few pieces of provincial legislation, there is other legislation currently limiting ASTTBC members from providing services to their fullest potential. Given the technology skills gap, only the fullest possible utilization of all professional practitioners will enhance ‘The Engineering Team’.

ASTTBC has undertaken some positive work with the Association of Professional Engineers and Geoscientists of BC (APEGBC), but more joint work is needed.
ASTTBC Recommendations:

9.1 ASTTBC and APEGBC jointly define areas in which ASTTBC members might be appropriately recognized to work.
9.2 ASTTBC to work with employers and regulatory bodies to secure appropriate inclusion and recognition of ASTTBC members as “qualified persons” based on competency.

ASTTBC has included as one of the requirements for the yet to be implemented Professional Technologist (PTech) certification, a Bachelor of Technology degree. BCIT and Thompson Rivers University both offer BTech degrees and there is growing interest in extending the BTech degree concept to further develop the technologist career pathway. The evolution to a three-year BTech degree would tie in with the progressing recognition of the Technologist as a Qualified Professional.

ASTTBC Recommendation:

9.3 ASTTBC to continue to advance the Bachelor of Technology within its regulatory role and encourage educational organizations to more fully introduce the BTech as a natural career pathway for the Technologist.

ASTTBC has seen an almost total demise of the part-time path to a Diploma of Technology. As the primary deliverer, BCIT cut much of this programming about ten years ago.

ASTTBC now finds it all but impossible to prescribe a series of available courses which would allow a certified technician to reclassify to an Applied Science Technologist, or an applicant with an otherwise excellent international education, and only requires a few top-tier technology courses to become certified and registered. The part-time route has all but disappeared.

ASTTBC needs to work with BCIT, colleges and institutes to ensure the continued competency of technologists and technicians and increase access to continuing professional development throughout the province.
9.4 The Ministry of Advanced Education, Innovation and Technology encourage and provide incentive to post-secondary institutions to expand flexible lifelong learning, for technology professionals, including part-time seminars, workshops, and on-line formats to help ensure sustained competency. ASTTBC and other professional bodies to facilitate this by promoting and requiring continuing professional education. Also, support institutions to develop fast-track programs for 20-30 year olds and mature workers looking to change careers.

10. The need to increase access to useful technology occupation labour market information.

In 2007, when ASTTBC released its report, there was very little technology-specific labour market information (LMI), particularly the forecasting of labour demand, supply and gaps. In the subsequent five years, there has been increased activity in this area of research.

In addition to BC Stats measurement of the industry, BCTIA has initiated an annual TechTalent survey of technology sector human resources in BC, and most recently published one in February 2012. Other components of the sector recently commissioned KPMG to quantify the contribution of technology to the BC economy and labour market.

Most significantly, the BC Government spent two years developing a new made-in-BC labour forecasting model, and has published two editions last year and this year as the BC Labour Market Outlook. This forecast provides labour demand, labour supply and demand/supply gaps between 2010 and 2020 for all four-digit National Occupational Classification codes. This work has been led by the Ministry of Jobs, Tourism and Skills Training and should be commended for it.

While progress on LMI has been significant, there are a few areas that need further work:

- The BC Labour Market Outlook is an occupation-based forecast with only employment and job opening forecasts being available at the highest level of industrial (NAICS) category aggregation.
- The “technology sector” does not neatly correspond to discrete occupational or NAICS categories.
• The science of forecasting labour supply is more an “art” because of many difficult to measure variables (e.g. immigration, inter-occupational mobility, skilled unemployed workers, etc.).
• There needs to be stronger linkages between LMI and educational data and planning and delivery, including determining how BC technology education supports the BC Jobs Plan.

ASTTBC Recommendations:

10.1 ASTTBC to partner with industry groups and the Ministry of Jobs, Tourism and Skills Training to refine the BC Labour Market Outlook to better measure technology labour demand and supply.

10.2 ASTTBC to work with Deans of Technology in post-secondary institutions to make recommendations to the Ministry of Advanced Education, Innovation and Technology on regularly collecting and publishing technology education data.

10.3 ASTTBC to work with industry groups, the Ministry of Education and others to ensure technology LMI is included in K-12 technology career information.

7. Conclusion and Next Steps

“Now we must gather momentum by continuing to roll out the plan, addressing the opportunities arising from our success, taking advantage of new opportunities, and bringing a renewed focus to the backbone of B.C.’s resilient economy: our skilled workforce.”

Technology occupations in and outside of the technology sector reflect a growing portion of jobs and wealth creation in British Columbia. Technologists, technicians and technical specialists are in demand today, and future skills shortages are expected.

Major projects throughout the province and particularly in the north will produce thousands of jobs and require many new technology workers over the next decade. Liquefied natural gas (LNG) alone will represent $48 billion in investment and 1,400 long-term jobs. The Northeast region of BC is expected to lead the province in the annual employment growth rate; and the North Coast & Nechako region will have the third highest rate.

Forestry, mining, natural gas, technology and transportation – five of the BC Jobs Plan’s priority sectors – will depend heavily on the talent and productivity of technology professionals. ASTTBC wants to position technologists, technicians and technical specialists to support the growth of these and other sectors in BC and to ensure sufficient numbers of young people, new Canadians, Aboriginal people, women and others enter these careers.

Job creation, wealth creation, productivity and innovation will be key to our province’s prosperity. ASTTBC looks forward to working with the Government of British Columbia and others to “ensure the province has enough workers who have the skills necessary to meet the demands of our evolving economy, and that British Columbians are able to take advantage of the jobs available.”33

ASTTBC and key provincial ministries will need to work collectively and strategically with those in the school system, post-secondary education institutions, industry groups and employers, professional associations and others.

ASTTBC will use ‘A Strategic Direction for Technology Education and Careers’ as a point of discussion with its partners and with participants at its events to engage them on adding value to the Strategy and on obtaining their commitment to joint action on its implementation.

Appendix 1

National Occupational Classification Codes 21, 22, 321

Professional occupations in natural and applied sciences

0211 Physical science professionals
0212 Life science professionals
0213 Civil, mechanical, electrical, and chemical engineers
0214 Other engineers
0215 Architects, urban planners, and land surveyors
0216 Mathematicians, statisticians, and actuaries
0217 Computer and information systems professionals

Technical occupations in natural and applied sciences

0221 Technical occupations in physical sciences
0222 Technical occupations in life sciences
0223 Technical occupations in civil, mechanical, and industrial engineering
0224 Technical occupations in electronics and electrical engineering
0225 Technical occupations in architecture, drafting, surveying, and mapping
0226 Other technical inspectors and regulatory officers
0227 Transportation officers and controllers
0228 Technical occupations in computer and information systems

0321 Medical technologists and technicians (except dental health)
VISION

ASTTBC is the model association for technology professionals.

MISSION

To serve the public by regulating and supporting technology professionals’ commitment to a safe, healthy and sustainable society and environment.

A Strategic Direction for Technology Education and Skills in British Columbia

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