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**Final Report**  
High-Technology Industry Advisory Committee  
BC Competition Council

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**March 23, 2006**



## Message from the Chair

March 16, 2006

Please accept this report detailing the recommendations of the High-Technology Industry Advisory Committee (the Committee) for enhancing the competitive strength of British Columbia's technology industry, a vibrant and rapidly growing sector with world-class potential. Despite its small size compared to other jurisdictions around the world, our outstanding technology sector has the capacity to flourish, putting British Columbia on the map as a centre for innovation.

While still dominated by relatively small companies, the technology sector comprises a large and diverse group of industries, a fact reflected by the Competition Council itself. The issues affecting the innovation economy are represented in at least 4 of the 12 industry advisory committees, including:

- Biotechnology
- High Technology
- Film and New Media
- Scientific and Engineering Services

Furthermore, the importance of encouraging innovation is reflected in all reporting sectors, where the development of innovative products and services and new production and delivery efficiencies relies consistently on the development and utilization of new technologies.

This report has been generated through the support of a group of high-tech CEOs, representing companies of varying sizes and core technologies, and representatives from two burgeoning technology clusters – wireless and alternative energy – to ensure diverse input that complements the reports from the other technology cluster committees.

The recommendations provided herein represent the culmination of many recent studies, most notably, the Integrated Technology Initiative (ITI), a cross-industry initiative that encompassed all of the technology sectors and included nearly 200 participants.

Committee members were very excited to hear about the government's commitment to create a strategy for the technology sector in collaboration with industry representatives, as expressed in the recent Throne Speech. As an industry, we look forward to working with the government to further examine these issues and to incorporate the recommendations of the Competition Council into that strategy.

Sincerely,



Rob Cruickshank  
President,  
British Columbia Technology Industries Association

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## Executive Summary

The technology industry in BC, while relatively small compared to other jurisdictions, offers a strong foundation for future growth and prosperity in the province. British Columbia has many of the seeds of success that, if properly nurtured, will grow into a prosperous and dynamic innovation-based economy. The province's leading technology sectors are characterized by rising employment and concentration, and new supportive government policies and investments are giving BC a leading edge in innovation.

Over the past decade, the innovation-driven industries – life sciences, information and communications technology, wireless, new media, alternative energy, and sustainability technologies – have dramatically outpaced the rest of the province's economy. Total employment in these clusters now exceeds 45,000 technology workers and over 78,000 employees of all job descriptions.

While British Columbia is rich in natural resources, it is also blessed with many factors that can enable the growth of an enviable technology industry. The importance of BC's proximity to the enormous U.S. market, and the large West Coast market in particular, should not be underestimated. In addition, with our large immigrant populations that understand the culture and have market connections, BC has a natural affinity with the rising markets of India and China.

BC is widely recognized as an emerging global player in high technology, with an impressive record for creating new start-ups over the past 10 years. Unfortunately, many of these new start-up companies are acquired by larger players. While acquisition events can create wealth for a company's founders and investors, the company's intellectual property, research and development activities, and the jobs associated with it often leave BC in the months following an acquisition.

As its technology clusters begin to mature, BC's technology reputation is growing. Delivering a comprehensive strategy will positively influence the marketplace as BC's technology community moves beyond entrepreneurship to tackle the challenges of competing in global markets.

Despite the advancements made to date, a number of other North American jurisdictions are outpacing BC. For this reason, it is imperative that industry and all levels of government work collaboratively to address the issues identified as critical barriers to the future advancement and success of BC's technology industry.

The Integrated Technology Initiative (ITI), a recent collaborative study undertaken by the technology community, found that the following critical barriers to success need to be addressed:

- While overall growth in R&D expenditures is strong and suggests a more progressive outlook, on a per-capita basis, funding for academic and industrial R&D is lower than in other North American jurisdictions. Our relative lack of R&D spending limits the development and commercialization of new technologies.
- The level of investment from both public and private sources remains low compared to other jurisdictions with which BC is competing. Because our start-up companies are undercapitalized, in most cases significantly, many are doomed to mediocrity. As a result, many of our innovative companies are acquired by larger firms, and their intellectual property is lost to other jurisdictions. To end this cycle, BC needs to escalate its level of investment from both public and private sources.
- To produce world-class innovations requires the attraction and retention of world-class human capital. BC currently lacks key talent in several areas, particularly graduate-level researchers and senior business talent, which is hurting our ability to compete with other jurisdictions. An

initiative focused on attracting and retaining the skilled professionals required to meet the needs of our technology companies is paramount.

As with virtually all business sectors, the technology industry needs the following ingredients to grow, attract, and retain businesses in BC:

### ***An Investment-Friendly Climate***

- solid governance that provides the stability of economy necessary to attract long-term investment
- a balanced tax structure between corporate and personal tax rates to attract and retain companies, as well as the individual talent required to ensure their success

### ***Market Access***

- strong vibrant ports and efficient transportation systems to reliably convey goods and services between markets
- convenient air transportation between BC and the major U.S. and Asian markets

### ***Strong Infrastructure***

- an adequate supply of affordable commercial real estate
- a dependable supply of affordable power and telecommunications
- a strong education system to develop tomorrow's leaders

### ***A Healthy Community***

- a solid health care system to look after our employees, families, and friends
- a clean environment in which to live
- safe neighbourhoods

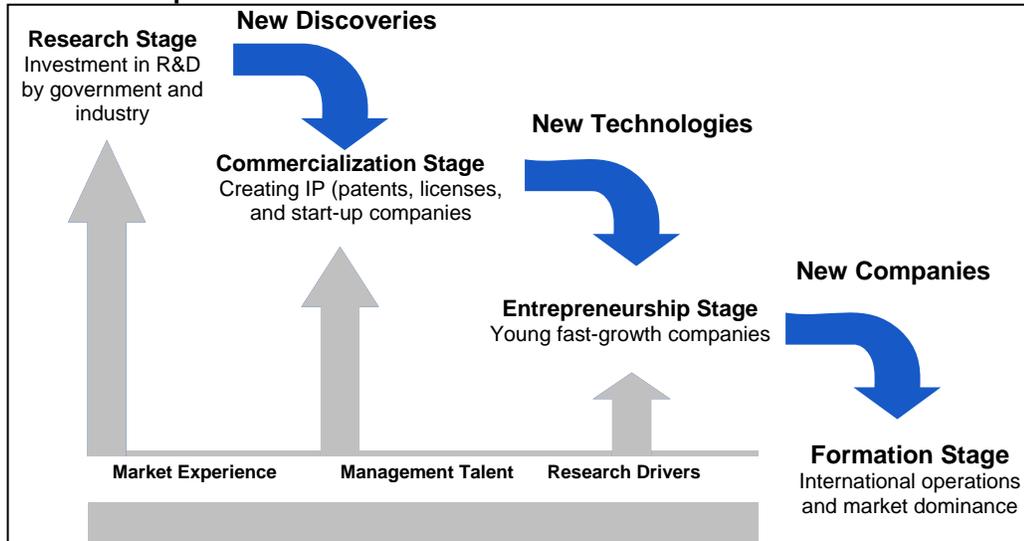
However, in addition to these overarching requirements, to develop a healthy and vibrant technology community will require a number of multifaceted policies and initiatives. To determine an optimal strategy for policy formation, the government must balance several important considerations, including:

- **The innovation pipeline** – the various unique life stages of technologies and the companies that commercialize them
- **The innovation ecosystem** – the availability of partners and resources within each life stage, including key participants such as academia, venture capitalists, industry anchor companies, the overall labour talent pool, support companies, support associations, and even government itself

The continuous process of producing mature technology companies is often referred to as the innovation pipeline. Depending on the technology and the company involved, this process can take anywhere from a few years from start to finish (in the case of software solutions) to over a decade (in the case of technologies such as fuel cells).

The innovation pipeline consists of 4 closely linked stages of development – research, commercialization, entrepreneurship, and global company formation. These 4 stages form a pipeline that channels the flow of inputs from each stage into the next, having a significant impact on the overall efficiency of technology development.

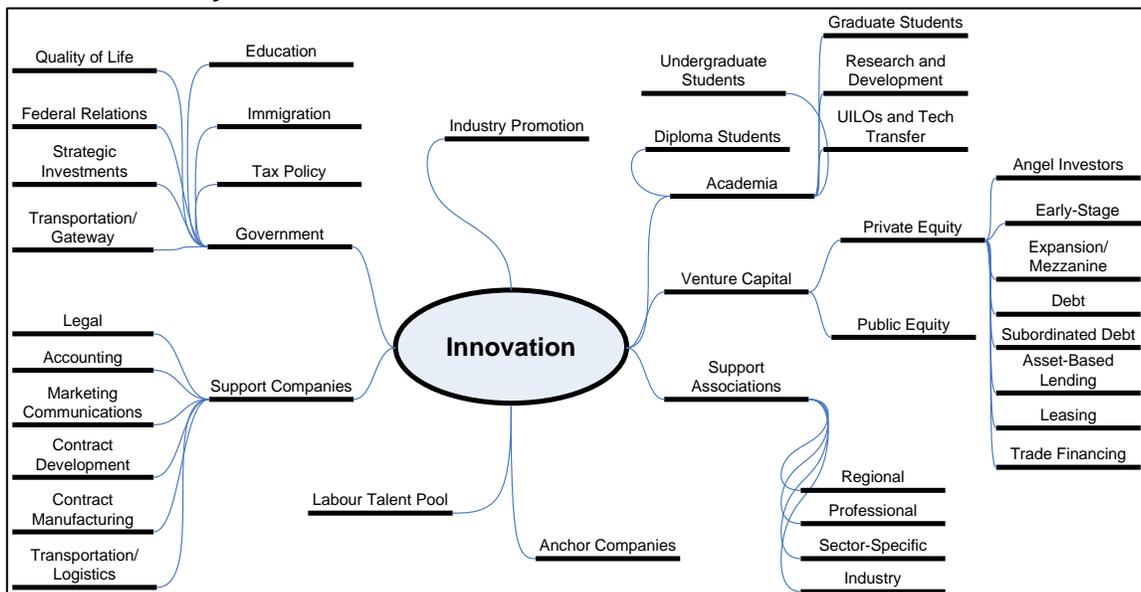
### Innovation Pipeline



Without a proper balance of inputs at each stage of the innovation pipeline, the industry will begin to wane over time, or will fail to reach sustainable critical mass.

To be effective and sustainable, the innovation industry also needs to have the proper ecosystem of partners with all resources working collaboratively to ensure the essential synergies necessary to support companies through all stages of the innovation pipeline.

### Innovation Ecosystem



With such a large number of players and variables, it is imperative to have a proper game plan for success. For that reason, the High-Technology Advisory Committee's **number one recommendation is that industry and government work together to create a strategy for the technology sector.**

In the recent Throne Speech to Open the Second Session of the 38<sup>th</sup> Parliament, the government recognized the need for a comprehensive strategy to support the growth of the technology industry in BC and made a high-level commitment to deliver that goal.

With the encouragement of the Competition Council, we recommend that the government begin creating a strategy for the technology industry immediately and that the recommendations within this report be given due consideration in the development of that strategy, particularly where such recommendations dovetail with broader competitive issues identified in the Competition Council's final report.

As with any solid corporate strategy, the High-Technology Advisory Committee recommends that the provincial technology strategy have:

1. a clearly articulated vision for the technology industry for the next 5 years, such as:
  - a. doubling industry revenue from 2005 levels by 2010 and/or
  - b. doubling industry headcount from 2005 levels by 2010
2. a set of objectives to leverage the strengths of the industry that are unique to British Columbia
3. a set of objectives that address a prioritized list of weaknesses, opportunities, and threats
4. a set of strategies that commit time, resources, and money to ensure success

Specifically, the provincial technology strategy needs to be centred on attracting, developing, and retaining outstanding people. More generally, the key elements that should be incorporated into the strategy to create a world-class technology centre in BC are:

- access to capital
- adequate research and development (both private and public)
- efficient technology transfer and commercialization processes
- competitive personal and corporate taxation rates
- adequate industry promotion to attract talented people and investment capital

We recognize that the strategy needs to have considerable buy-in from both industry and government, and must encompass, as a minimum, the 6 major technology clusters: information and communications technology, wireless, new media, life sciences, sustainability technologies, and alternative energy technology while still providing for other new clusters to emerge and grow within the province.

The strategy also needs to address the various stages of the innovation pipeline, as well as the key parties and resources within the innovation ecosystem, particularly the innovation economy triumvirate of academia, industry, and government.

With respect to specific recommendations in this submission, the High-Technology Industry Advisory Committee is making a number of recommendations that address the following areas:

#### **Access to Capital**

- **Strategic Investment** by the government to increase the size of the venture capital industry to meet and ideally exceed the targets set within the 2006 service plan for the Ministry of Economic Development: this strategic \$150 million investment in a fund of funds would be used to attract matching funds, particularly foreign venture capital, in a fashion similar to that which has been successful in jurisdictions such as Israel and New Zealand.

- **Addressing the short-term lending needs** of companies in transitional periods of their lifecycles when they do not clearly fall into solutions offered by financing providers: such transitional situations include organizations engaged in the development of prototypes and business plans in order to become investment-ready and companies on the cusp of first revenue that require short-term capital infusions for activities that will quickly generate sustaining revenue, such as sales and marketing activities.

### Brain Gain, Train, and Retain

- **People are the most important resource** for an innovation economy. As such, the Committee has made a number of recommendations to help the Province of BC develop, attract, and retain talented individuals whose participation will ensure the energetic growth of the technology sector.

### Taxation

- **Taxation programs should be harmonized** to ensure that all companies undertaking private research and development within BC are equally rewarded for their efforts, particularly where such activities lead to revenue generation through exports. The Committee recognizes that organizations undertaking research and development activities should not be penalized or rewarded based on their ownership structures.

### Procurement

- **The government is a large consumer of technology-oriented goods and services.** As such, the Committee recommends that the government use its buying power to assist fledgling technology organizations by encouraging partnerships between smaller organizations and the larger organizations that typically service the government.

### Technology Transfer

- **Technology transfer processes at provincial post-secondary institutions need to be streamlined** to improve time to market for commercialized technologies **and promoted** to assist smaller organizations to better engage academia with privately-funded research initiatives.

### Infrastructure, Demographics, and Environment

- **The various sectors of the technology industry, government, and academia need to come together** to create a natural hub for technology to facilitate cross-pollination of technologies and ideas and to grow new initiatives. Specifically, the Committee recommends that the government work with industry to review recommendations such as the BC Hub proposal from Discovery Parks, Genome BC, and Merck Frosst Canada Ltd. to develop joint facilities.

### Final Note

**The government needs to stay the course** of developing and promoting British Columbia as a desirable place to live, work, and invest. A business-friendly environment, coupled with the natural innovativeness and problem-solving capacities of the technology sector, will ensure that the Province of British Columbia always has a strong foundation from which to accelerate the growth and development of the technology industry.

## Overview of the Technology Sector in British Columbia

Over the past 10 years, BC's technology industry has established its reputation as a burgeoning sector and significant contributor to BC's economy. This emerging technology sector is characterized by rising employment and a continued concentration of unique clusters.

The chart below provides a snapshot of BC's emerging technology clusters today, summarizing areas of expertise, numbers of companies, employees, and annual revenue. This chart reflects only companies reporting full-time employees and does not include the approximate 13,522 solely owned companies or self-employed contractors that contribute significantly to BC's technology industry. Additionally, it is important to note that many technology companies operate within multiple clusters and therefore run the risk of being included in multiple-cluster-association stats.

Cluster	Sub-clusters	Companies (#)	Employees (#)	Annual Revenue (\$M)
Biotech/Life Sciences	<ul style="list-style-type: none"> <li>• Therapeutics and diagnostics</li> <li>• Pharmaceuticals</li> <li>• Medical devices</li> <li>• Agriculture, marine, &amp; forestry</li> <li>• Environmental</li> </ul>	91	2,173	779
Energy Technologies	<ul style="list-style-type: none"> <li>• Alternative engine fuels</li> <li>• Biofuels, biomass, &amp; waste-to-energy</li> <li>• Earth &amp; geothermal energy</li> <li>• Fuel cell producers/others</li> <li>• Hydroelectric energy</li> <li>• Power electronics &amp; smart energy</li> <li>• Solar, wind, &amp; ocean energy</li> </ul>	60	3,000	600
Information & Communications Technology (ICT)	<ul style="list-style-type: none"> <li>• ICT services</li> <li>• ICT manufacturing</li> <li>• Telecommunications services</li> </ul>	6,000	46,000	9,000
New Media	<ul style="list-style-type: none"> <li>• Games</li> <li>• Animation</li> <li>• E-learning</li> <li>• Web services</li> </ul>	700	14,000	1,000
Sustainability Technologies	<ul style="list-style-type: none"> <li>• Wastewater treatment</li> <li>• Power technologies (including fuel cells and smart energy applications)</li> <li>• Geographic information systems for forestry &amp; mining</li> <li>• Site remediation</li> <li>• Environmental instrumentation</li> </ul>	1,300	18,000	1,900

BC's high-tech industry has dramatically outpaced the overall economy in terms of GDP growth over the past several years. In 2004, high-tech activity accounted for approximately 5.3% of BC's GDP – comparable to the education and construction industries in the province.

Overall growth in R&D expenditures has been strong, although R&D per capita in BC lags most of the jurisdictions with which we compete. This lack of expenditure directly affects our ability to attract companies, investment, and knowledge workers to the province.

Compared to other Canadian jurisdictions, BC does have a reputation for doing very well with the limited resources that it has. For instance, UBC holds an impressive record for leading all other Canadian G-10 universities in terms of gross income from technology licences and in the number of U.S. patents awarded.

The increasing penetration of high technology into all facets of life and business, including many traditional industries such as forestry, mining, and agriculture, will profoundly affect BC's technology industry. To succeed, BC's technology industry must have the infrastructure, resources, and support required to aggressively compete in the global marketplace. To achieve this aggressive competitive position, government and industry must work collaboratively to develop a comprehensive strategy, broaden our level of competitive intelligence, and execute a coordinated and focused marketing plan.

There is no one solution; it is the synthesis of many elements within a multifaceted strategy that will enable BC's technology industry to move beyond emerging entrepreneurship to become a serious competitor in the ever-changing global marketplace.

## Committee Recommendations

## Provincial Strategy for Technology

### 1.1 The Need for a Provincial Strategy

While the government has made a number of intelligent short-to-medium-term investments in a few of the clusters within the technology sector, these have been made independent of an over-arching strategy for the technology industry as a whole. Without a holistic view of the technology industry and a clear articulation of its direction, it will be difficult to convince people to make the necessary long-term investments in both capital and talent that are necessary to grow the industry.

Further, successes in a couple of clusters will not enable the achievement of the Premier's stated objective of making British Columbia one of the top ten technology centres globally.. In the recent Throne Speech to Open the Second Session of the 38<sup>th</sup> Parliament, the government acknowledged this need for a strategy and has made a high-level commitment to work with technology industry leaders in building this strategy, although details still need to be worked out.

With the encouragement of the Competition Council, the Committee recommends that the government craft a strategy for the technology industry immediately and that the recommendations within this report be given due consideration in the development of that strategy, particularly where such recommendations dovetail with larger competitive issues that will be identified in the Competition Council's final report.

As with any solid corporate strategy, the High-Technology Industry Advisory Committee recommends that the provincial technology strategy have:

- a clearly articulated vision for the technology industry for the next 5 years, such as:
  - doubling industry revenue from 2005 levels by 2010 and/or
  - doubling industry headcount from 2005 levels by 2010
- a set of objectives to leverage the strengths of the industry that are unique to British Columbia
- a set of objectives that address a prioritized list of weaknesses, opportunities, and threats
- a set of strategies that commit time, resources, and money to ensure success

Specifically, the provincial strategy needs to be centred on attracting, developing, and retaining outstanding people and needs to recognize the key elements that create a world-class technology centre, such as:

- access to capital
- adequate research and development (both private and public)
- efficient technology transfer and commercialization processes
- competitive personal and corporate taxation rates
- adequate industry promotion to attract talented people and investment capital

We recognize that the strategy needs to have considerable buy-in from both industry and government, and needs to encompass, as a minimum, the 6 major technology clusters: information and communications technology, wireless, new media, life sciences, sustainability technologies, and alternative energy technology while still providing for other new clusters to emerge and grow within the province.

The strategy also needs to address the various stages of the innovation pipeline, as well as the key parties and resources within the innovation ecosystem, particularly the innovation economy triumvirate of academia, industry, and government.

We further recommend that this strategy be jointly reviewed on an annual basis to continually provide a 5-year view of where the industry needs to go and how it will get there. The strategy for the technology

industry should include a plan for developing consistency in the marketing and branding of BC. The Committee recommends that the province build from its common overarching brand.

## 1.2 The Need to Establish Industry and Government Champions

In order for any joint industry-government strategy for the technology sector to be successfully implemented, champions need to be established on both sides to effectively direct the strategy. Currently, the technology industry interfaces with several government ministries including, but not limited to, the Ministries of Advanced Education, Economic Development, Finance, and Small Business.

### Specific Recommendations

- **For the technology industry** – the disparate sectors should unite with a single community voice to represent issues common to the industry as a whole and to drive the strategy forward.
- **For the government** – a single minister should be responsible for science and technology issues, and that minister should be provided with the budget, mandate, and resources necessary to deliver on the strategy.

While it is unlikely that a single champion will emerge in the short term for either the technology industry or the government, establishing champions should be a priority for both sides while building the provincial strategy.

## 1.3 The Need for More Anchor Companies

British Columbia has a comparative deficit of large technology companies. As a result, while the industry as a whole is fairly large, it lacks the stability, international visibility, and training ground often provided by larger organizations. Unlike the primary resource industries where BC is home to some of the largest companies in the world, most technology companies in BC are relatively small.

While BC has a history of developing innovative companies, many of these start-ups are acquired once they achieve an evaluation of \$20 to \$30 million dollars. Many of the recent technology acquisitions have resulted in intellectual property being absorbed into larger organizations and the BC-based workforce being slowly reduced to zero.

If the goal of the technology industry is to double its headcount in the next 5 years, then a key objective of the provincial technology strategy needs to be the attraction of several new anchor companies to BC (likely 4 to 5) within that timeframe.

**On the part of the government**, this action will likely necessitate tax incentives or other perquisites to attract companies to the province. We recognize that the government is the best party to lead the recruitment of new anchor companies to BC, albeit under guidance and with assistance from industry.

**On the part of the technology industry**, there needs to be recognition and support of this attraction initiative by technology companies, even though it may mean introducing competitors into the local marketplace.

The key to growth through the attraction of new anchor companies is to identify the right kinds of companies, or the optimal parts of companies, to create meaningful jobs. Significant attributes of target organizations should include:

- undertaking substantial R&D

- being willing to register intellectual property in BC
  - having histories of creating spin-off companies
- having reputations as a good corporate citizens

## Access to Capital

### 2.1 The Need for More Seasoned Venture Capital

Another symptom of the relative immaturity of BC's technology market is modest venture capital investments. This detrimental lack of capital investments is most significant during the earliest stage of development and then again at the expansion stage.

Undercapitalized venture funds generally result in undercapitalized investments and difficulty competing globally. Unable to raise the necessary follow-on capital to expand and acquire, many BC companies find their growth hampered and seek to be acquired instead.

While BC is home to some relatively large venture funds and institutional investors, in 2005 only \$226 million USD of private equity was invested in the BC sector by the venture community. In comparison, \$727 million was invested in Seattle and \$1.2 billion in San Diego. Ontario and Quebec also surpassed BC with \$674 million and \$524 million respectively.

The result is that many start-ups in BC operate with less than \$2 million in equity funding, significantly less than is received by similar start-ups in other jurisdictions. Unable to attract top talent or adequately market their products and services globally, many BC firms have difficulty growing, regardless of how innovative their technology is.

The most significant constraint on the growth of BC's technology sector is a lack of funds. Therefore, we recommend that the provincial government make a one-time strategic investment to grow the local venture community.

Specifically, we recommend that the government make a strategic investment through the development of a fund-of-funds approach similar to that which has been successfully used to grow the venture capital markets in both Israel and New Zealand – two economies with similar populations to British Columbia.

We envision a strategic investment of \$150 million that would be matched 2 to 1 by industry for a total commitment of \$450 million in new investment – approximately doubling the available venture capital market in BC. Similar to the programs in New Zealand and Israel, the industry would have an option of buying out the government's investment with interest calculated based on the government's cost of capital.

We further recommend that the program contain a mechanism that increases the attractiveness of the fund for foreign investors, particularly those from important markets such as Seattle, Silicon Valley, and San Diego. This mechanism would be designed to capture foreign investment while also attracting the capital, expertise, and connections that come with it.

U.S.-based investors, while comparatively larger and able to invest greater amounts, also take a more proactive role in their investments – providing the experience and connections to improve market access as well as capital.

We recommend that while this additional investment would likely be attractive to larger institutional investors, it would not replace the existing incentives that the government is using to build the retail

investor market. Rather, we encourage a balance in the market between retail-led and institution-led venture funds, which often have different approaches to investing.

By developing a complementary solution for attracting foreign and institutional investments, the Government of BC can add one more tool to its economic toolkit while building on the success of the retail-based venture community.

## 2.2 The Need for Earliest-Stage Investment Loans

There exists a perceived gap in the BC market for funding 2 key stages of commercialization:

1. the earliest stages of development activities in which ideas are being taken from concepts to working prototypes or models that can be tested and refined within the marketplace
2. the first-revenue stage in which a company may have its first referential customers but requires a short-term cash infusion for final development or sales and marketing activities

For further growth in the earliest stages of development, during which companies are often taking ideas from concepts to prototypes, we recommend that the government work with industry to create a Small Investment Loan Program. Ideally, this fund would consist of \$10 to \$15 million in contributed capital and make loan investments of up to \$1 million and 5 years in duration.

## Brain Gain, Train, and Retain

### 3.1 The Need to Develop Better Talent

Several studies have indicated that BC has a significant talent shortfall in product sales and marketing. BC's colleges and universities can provide the necessary talent and resources for addressing such technology industry recruiting and retention issues. Furthermore, training enables personnel to adapt to changing employment circumstances.

All technology clusters have significant interaction between local industry and local academia, a successful recipe for regional growth. This interaction consists of academia providing needed education in key industry areas. Additionally, academia can be a source of recruiting talent, particularly at the Master's and PhD levels.

To build better talent in BC, we also recommend that industry and government work together to make more cooperative education positions available for students at post-secondary institutions.

- **For government**, this means working with academia to make more cooperative spaces available at post-secondary institutions.
- **For industry**, it means making more placements available for students and providing them with meaningful work while there.

The Committee also recommends:

- increasing scholarships specifically targeted at technology students, including Master's and PhD students, technical specialties, and key non-technical specialties such as general management, marketing, and sales
- providing tax incentives to encourage industry to increase the availability of internship programs
- providing tax incentives to industry with respect to retraining existing employees in technology, which could even be tied to the requirement to replace retraining workers with interns

- adding a technology stream to the sales and marketing program at BCIT

### 3.2 The Need to Improve Talent Recruitment Strategies

Currently, there is no single Internet site offering critical information about BC to potential recruits.

Tremendous pressure is placed on BC companies to provide information for potential recruits to assist them in making geographic relocation decisions. Although information is available on the Internet, it is difficult to find and interpret. Furthermore, many of the websites contain conflicting information.

To attract talented employees to BC, we recommend that the province create a recruitment portal that includes:

- an overview of the technology clusters and future career opportunities
- job offers and opportunities
- lifestyle information
- “ask an expert” questions and answers

### 3.3 The Need for More Graduate Programs, Scholarships, and Facilities

While BC is taking measures to expand its undergraduate program capacity, including creating an additional 25,000 post-secondary spaces by 2010, there is still a relative lack of graduate students in the technology sector, particularly the business graduates needed to lead teams and companies.

Graduate students are the future leaders in an innovation economy. They put advanced learning to work, using the knowledge and skills they've gained in the classroom to make businesses and industries more innovative and competitive. Arguably, graduate students represent the most significant technology transfer opportunity by translating leading-edge knowledge into practice.

PhDs from BC universities were instrumental in the founding, resourcing, and growth of numerous successful companies in the province, including QLT Inc., MacDonald-Dettwiler, PRA International (formerly CroMedica Global), Creo Products, Tactex Controls, BC Pacific Capital Corporation, Mackenzie Financial Corp., Ventures West Management Inc., Philips, Hager & North, and other multimillion-dollar, globally competitive, knowledge-intensive companies that collectively employ thousands of people in our province.

**Graduate-level R&D talent** – The Committee recommends that graduate program expansion parallel the current expansion of undergraduate capacity. By 2010, the Province of BC should aim to have a minimum of 2,500 additional graduate students enrolled in our universities. Graduate students in research-intensive programs will be the key to enhancing BC's strengths in emerging sectors such as fuel cell technologies, life sciences, and nanotechnology, and ensuring that innovation continues to keep all sectors of the BC economy performing at peak efficiency.

**Graduate-level business talent** – The Committee wishes to congratulate the government on its commitment to working with industry and academia to build the New Media World Centre to help develop graduate-level knowledge and senior business talent within the new media and digital entertainment industry.

The committee recommends that other sectors work with government to help define and introduce similar programs to develop senior business talent within the technology industry – particularly in sales and marketing.

## Taxation

### 4.1 The Need to Extend the Intellectual Property Tax Credit

There is currently disparity between the taxation of life sciences companies and other companies within the technology sector.

In the 2004 budget, the provincial government extended the International Finance Business Program into the area of international film and television licensing and distribution. Recently, the provincial government further expanded the International Financing Activities Act to create what is now commonly referred to as the intellectual property (IP) tax credit for life sciences.

Effective January 1, 2006, and enabled through Bill 2, Revenue Statutes Amendment Act, 2005, international financing activities under the International Financing Activity Act (IFA Act) were expanded to cover certain patent activities.

The relevant activities are as follows:

- selling, assigning, or licensing to a non-resident a patent within a prescribed class of patents
- selling, assigning, or licensing to a non-resident a good or service whose sale revenue is principally derived from an invention for which, within a prescribed class of patents, is owned by the corporation

The prescribed classes of patents will incorporate certain inventions related to **life sciences** as determined by references to the primary classification of the patent under the International Patent Classification System. The tax refund for patent activities is limited to the lesser of \$8 million and 75% of British Columbia corporate income tax paid.

When announcing what is now often referred to as the intellectual property (IP) tax credit for life sciences, the government suggested that the credit was being tested as a pilot with the life sciences sector and if successful at generating business would be extended to other sectors.

We recommend that the government extend the intellectual property (IP) tax credit currently provided to life sciences to cover the entire technology industry. We also recommend that the tax credit extension contain some form of clawback mechanism to repatriate the monies invested in the credit should the organization or IP leave the Province of British Columbia.

By extending the tax credit to all technology sectors, the Province of British Columbia will deliver a clear message of its support for developing intellectual property in BC, regardless of sector, particularly where such intellectual property is driving export revenue.

### 4.2 The Need to Extend and Harmonize the SR&ED Tax Credit

There are currently 2 key issues involving the Scientific Research and Experimental Development program, which involves both a federal and a provincial component.

1. The provincial SR&ED credit is only viewed as a temporary measure and is due to expire in 2008.
2. The federal SR&ED tax credit creates a disparity between Canadian-controlled and non-Canadian-controlled private companies and public companies with respect to rates and refundability.

The combination of the provincial and federal SR&ED tax credit programs is a very important mechanism for encouraging research and development in new technologies and innovation. It has been identified as an important tool in encouraging the introduction and development of technology companies.

The SR&ED program aims to reduce some of the risks attributed to the development of new technologies or innovations, in addition to serving as an important incentive to attract private research and development efforts. However, the current provincial and federal SR&ED rules are such that the opportunity to stimulate private-sector R&D spending cannot be fully realized.

Specifically, the current rules state that:

- SR&ED credits are provided on a refundable tax credit (or cash) basis for “Canadian-controlled private corporations” (CCPCs) and are not extended to publicly-controlled Canadian corporations.
- For non-Canadian-controlled private or public companies, nonrefundable tax credits are extended and applied as a deduction against income. In the case that a company is not profitable, the nonrefundable credits become useless. Additionally, the tax credit rate is lower for non-Canadian-controlled companies.

These current rules create odd incentives with respect to the location that financing may come from as well as the choice of financing vehicles (private versus public).

With respect to the SR&ED tax credit, the Committee believes that the most important aspect of the credit is that it encourages research and development in the province; the ownership structure of the organization undertaking the scientific research and experimental development should be irrelevant.

Therefore, we recommend that the provincial government work with the federal government to extend the SR&ED refundable tax credit to make it available to all companies conducting significant R&D activities in BC and Canada regardless of their control status – public, private, foreign-owned, or other.

We further recommend that the provincial SR&ED tax credit be made a permanent program to signal the government’s continued commitment to attracting private research and development to BC. Investors risking their capital in the development of new ventures need to feel that the general economic climate is business-friendly and will continue to be so in the years to come, particularly as the founding investors seek exits for their investments.

Similar to the IP tax credit, we recommend that the SR&ED tax credit have a clawback mechanism for organizations that withdraw their companies and their intellectual property from the province.

## Procurement

### 5.1 The Need to Encourage BC Content in Government Procurement

Many smaller BC technology companies do not feel that they get a fair opportunity to partake in the business opportunities created through government procurement.

As the vast majority of technology companies in BC are smaller organizations, they often need to partner with larger organizations to generate the experience and references required to kick start other opportunities. One area in which small companies struggle is creating the capacity to bid on

government procurement opportunities. Many BC organizations do not have the size, reputation, or where-with-all to do so.

That said, the provincial government is a large consumer of goods and services in its role of serving the people of British Columbia. Similarly, through transfers to regions and municipalities, the government also has a tremendous opportunity to direct investment into products and services.

To ensure that small and medium-sized businesses receive an adequate share of government procurement in the area of technology sales and services, the Committee recommends that the **government develop a procurement policy** that provides for the following:

- Where unsolicited proposals are received by the Province of BC, they must comprise a minimum of 10% BC private sector technology company content (in the form of products or services) by dollar volume.
- Where proposals are submitted through a formal RFP process, they must comprise a minimum of 5% BC private sector company content (in the form of products or services) by dollar volume.

**In return, industry should** encourage partnerships between smaller fledgling companies and more prosperous and stable larger companies that have clearly-defined partner ecosystems.

## Technology Transfer

### 6.1 The Need to Rationalize Technology Transfer Processes

There are 2 consistent issues with respect to research and development and the commercialization of new technologies:

1. For government and academia, there is a desire for private companies to increase their investment in research and development.
2. For industry, there is a desire to have simplified and harmonized processes at the academic institutions in order to expedite the time to market and, to encourage more participation and private investment there needs to be more communication and promotion of the opportunities to engage with academic institutions for cooperative R&D.

The amount of private research and development being funded by industry at academic institutions in BC is low compared to other jurisdictions. The result is that the post-secondary institutions are underutilized and are very reliant on public sources of funding for research and development.

Many industry proponents argue that private research and development is being stifled due to:

- onerous intellectual property requirements at the various post-secondary institutions
- unwieldy procedures for engaging academia in private research initiatives
- disparate policies at each institution being engaged

Therefore, the Committee recommends that industry work with government and academia to design a technology transfer process that makes it easier for companies to understand and engage with academia. Ideally, this streamlined technology transfer process would be harmonized across a large number of post-secondary institutions (ideally all) to improve interaction with multiple organizations.

Aside from the engagement synergies afforded by a single streamlined policy and process, it would also make it easier for industry to communicate the benefits of engaging in private research and development efforts to its member companies.

In return for streamlining processes, industry must commit to:

- better utilization of academia for private research and development efforts
- promoting private research and development
- assisting academia with the commercialization of new products that arise from research efforts

## Infrastructure, Demographics, and Environment

### 7.1 The Need for Strategic Infrastructure

At the essence of the following recommendations is a recognition of the need for industry, government and academia to work more closely and cohesively together to put the strategic infrastructure in place necessary to achieve a breakthrough objective such as doubling the size of the technology industry by 2010.

As the intent of this partnership is provincial in nature the infrastructure needs to connect as well as to house.

On a more practical side there is a dearth of affordable commercial space available for technology start-ups, particularly for life sciences companies and other technology companies that require elaborate laboratory space. Concurrently, there is no geographical focal point for the technology industry in the Lower Mainland. Instead, there are small pockets of activity spread across a number of cities.

Experience in other jurisdictions, most notably Silicon Valley, has proven that technology clusters grow and develop better when the people within them interact on daily basis. Cross-pollination of ideas and projects provides synergies and encourages serendipitous innovation. Yaletown in Vancouver was a good example of the type of cross-pollination encouraged by proximity before the escalation of the area's real estate prices put it out of reach for many small companies.

With real estate prices in Vancouver showing no signs of easing and commercial space being continuously converted to condos, the technology industry is likely to separate further as companies disperse in a quest to find more affordable real estate.

In the past, organizations like Discovery Parks Trust, in working with BCIT, UBC and SFU, as well organizations like the University of Victoria with its technology park, have been successful at creating small technology centres across the Lower Mainland, but these facilities are also at capacity.

At the same time the BC TIA, in partnership with Leading Edge BC, has been successful in co-location with several technology-focused organizations, leading to better dialogue and synergies among a number of associations and quasi-government organizations.

Prior to the technology bubble exploding at the turn of the millennium, the City of Vancouver was seriously considering creating a technology park on what is known as the False Creek Flats. This area is home to a few technology companies, as is the Great Northern Way Campus, a joint campus of SFU, UBC, the Emily Carr Institute, and BCIT. The False Creek Flats is located on the existing SkyTrain line, and is relatively close to the new Millennium Line.

The Committee recommends that the industry work with academia and government to establish collaborative facilities of industry-industry and industry-academia for co-location and joint research and development.

Such collaborative facilities would provide for cost sharing of services, space, and equipment and provide experience-based learning and training for students. For its part, industry needs to commit to use and promote the joint facilities that are developed.

One solution that has been raised in response to this need for strategic infrastructure supporting R&D is the BC Hub proposal led by Discovery Parks, Genome BC, and Merck Frosst Canada Ltd. The Committee recommends that the Government of BC work with industry and the proposal consortium to validate the merits of the BC Hub proposal, particularly as the proposal may play a role in:

- tying together the various technology centres across the province and the Lower Mainland, including the other Discovery Park facilities, and
- acting as a flagship anchor for a revitalization of the False Creek Flats as a new geographic focus for the technology community.

## 7.2 The Need for a Strong Place to Work and Live

The Province of BC needs to stay the course that it has set for the past 5 years – advancing British Columbia as a great place to live and work. British Columbia has many natural attributes that make it a desirable place to do business and raise families. By providing a stable and predictable economy, the Province of BC will enable growth simply by allowing the people of British Columbia to do their jobs.

By nature, technology companies are innovative and resourceful. Given a stable and vibrant environment that attracts talent, people, and investment, particularly one with the natural geographic strengths of British Columbia, a technology community will always provide a solid base of economic activity.

Over the past 5 years, the Government of BC has made considerable strides to improve the business climate of BC and make it a better place to work and live. These benefits are not unique to the technology community, but are important to all sectors of the economy. We applaud the government of BC for its efforts to date, and support its drive to continue.

Like all sectors, the technology industry needs the following ingredients to grow, attract, and retain businesses in BC:

- an investment-friendly climate
- efficient market access
- strong infrastructure
- a healthy community

One of the most important things that the provincial government can do is to continue its focus on making BC a desirable place to live and work. Failing all else, the natural attractiveness of the province, coupled with the innovativeness of our technology professionals, will ensure that BC has a strong platform on which to work to accelerate the growth and development of the technology industry.

That said, the government must not rest on its laurels and destine BC's technology industry to mediocrity when it has world-class potential.

## Detailed Recommendations

## 1.1 Provincial Strategy for Technology

### The Need for a Strategy

#### Issue

While there have been substantial investments made on behalf of strategic initiatives to date, there is not a clearly developed and articulated strategy to grow the BC technology sector.

#### Context

The technology sector provides an excellent opportunity for the Province of British Columbia to diversify beyond its traditional roots in the primary resource sector. While the government has made a number of intelligent short-to-medium-term investments in the technology sector, there is no clearly defined longer-term strategy to grow the industry. Without a holistic view of the technology industry and a clear articulation of its direction, both government and industry will have difficulty convincing people to make the necessary long-term investments (both capital and talent) that are necessary to grow the industry.

In the recent Throne Speech to Open the Second Session of the 38<sup>th</sup> Parliament, the government acknowledged this need for a strategy and has made a high-level commitment to work with industry to build a strategy, although details still need to be worked out.

#### Recommendation

To fulfill the commitment made in the Throne Speech, we recommend that industry leaders work with government to create an effective strategy for the technology sector.

As with any solid corporate strategy, the High-Technology Industry Advisory Committee recommends that the provincial technology strategy have:

- a clearly articulated vision for the technology industry for the next 5 years, such as:
  - doubling industry revenue from 2005 levels by 2010 and/or
  - doubling industry headcount from 2005 levels by 2010
- a set of objectives to leverage the strengths of the industry that are unique to British Columbia
- a set of objectives to address a prioritized list of weaknesses, opportunities, and threats
- a set of strategies that commit time, resources, and money to ensure success

Specifically, the provincial strategy needs to be centred on attracting, developing, and retaining outstanding people and needs to recognize the key elements that create a world-class technology centre, such as:

- access to capital
- adequate research and development (both private and public)
- efficient technology transfer and commercialization processes
- competitive personal and corporate taxation rates
- adequate industry promotion to attract talented people and investment capital

We recognize that the strategy needs to have considerable buy-in from both industry and government, and needs to encompass, as a minimum, the 6 major technology clusters: information and communications technology, wireless, new media, life sciences, sustainability technologies, and alternative energy technology while still providing for other new clusters to emerge and grow within the province.

The strategy also needs to address the various stages of the innovation pipeline, as well as the key parties and resources within the innovation ecosystem, particularly the innovation economy triumvirate of academia, industry, and government.

We recommend that this strategy be jointly reviewed on an annual basis to continually provide a 5-year view of where the industry needs to go and how it will get there. We also recommend that the strategy for the technology industry include a plan for developing consistency in the marketing and branding of BC. It is the recommendation of the Committee that the province build from its common overarching brand.

### **Background**

While considerable efforts have been made in recent years to examine the diverse technology sector, a clear strategy combining government and industry has not been formally developed and articulated. Without a strategy, the government has no clear metrics with which to prioritize projects put forward by various groups.

Similarly, without a clearly articulated strategy and commitment to technology, it is difficult to promote BC as a hospitable place in which to do business. The State of Oregon, with which the Province of BC competes for human capital as well as venture capital, is an example of a jurisdiction that has a clear vision to grow its technology sector. The result is that Oregon, which has 700,000 fewer constituents than British Columbia, is generating a greater per-capita GNP than BC. Oregon has also created sufficient internal venture capital funds to reduce the dependence on external capital.

## 1.2 Provincial Strategy for Technology

### The Need to Establish Industry and Government Champions

#### Issue

In order for any joint industry-government strategy for the technology sector to be successfully implemented, champions need to be established on both sides to effectively direct the strategy.

#### Context

Currently, the technology industry interfaces with several ministries of the government including, but not limited to, the Ministries of Advanced Education, Economic Development, Finance, and Small Business.

#### Recommendation

It is vital to establish champions in both industry and government who will execute and deliver the strategy.

#### Specific Recommendations

- **For the technology industry** – the disparate sectors should come together with a single community voice to represent issues common to the industry as a whole, and to drive the strategy forward.
- **For the government** – a single minister should be responsible for science and technology issues, and that minister should be provided with the budget, mandate, and resources necessary to deliver on the strategy.

While we recognize that it is unlikely that a single champion will naturally emerge in the short term for either the technology industry or the government, establishing champions should be a priority for both sides while building the provincial strategy.

#### Background

In BC, the provincial Ministry of Advanced Education is responsible for technology and innovation. Although education, and technology transfer and commercialization in particular, are important to the technology sector, technology sector issues can easily be dwarfed by factors affecting post-secondary institutions.

In comparison, technology sectors in Alberta, Ontario, and Quebec, which all lead BC, each have a dedicated Ministry of Technology or Science and Technology. Similarly, Alberta, Ontario, and Quebec place the responsibility for technology transfer and commercialization activities with the Ministry of Technology rather than their post-secondary education institutions.

Technology industry responsibilities in BC are also spread over 3 other governmental organizations, the BC Innovation Council, the Premier's Technology Council, and Leading Edge BC. The BC Innovation Council's mandate is to accelerate and expand science and technology-based economic development while the Premier's Technology Council is comprised of industry representatives who guide the province in its use of technology to improve services for the public good. Leading Edge BC is a marketing organization dedicated to ensuring that BC is a globally recognized destination for technology enterprise by investors, entrepreneurs, site selectors, and potential technology recruits.

There are also 3 additional government ministries associated with BC's technology sector. The Ministry of Finance and the Ministry of Economic Development are both involved due to prevailing issues in the industry surrounding the attraction of venture capital investment – both retail and institutional – as well

as policies surrounding corporate and personal taxation to attract businesses and talent. The Ministry of Small Business is involved in the technology sector because more than 70% of the technology-oriented businesses in BC employ less than 5 people.

BC's technology industry is represented by several associations across the province, including regional, sector-specific, and larger umbrella organizations such as the BC Technology Industries Association. Industry members recently came together through the Integrated Technology Initiative (ITI) to review and address flagship issues that cut across all technology sectors. ITI participants included over 400 industry leaders from the majority of technology-oriented associations and organizations across BC, as well as from many technology companies.

The ITI delivered a list of 27 flagship issue recommendations, many of which are included in this submission to the Competition Council. Subsequent to the release of its report, ITI participants created a leadership group and are working on industry initiatives to start addressing the issues and concerns of the industry.

## 1.3 Provincial Strategy for Technology

### The Need for More Anchor Companies

#### Issue

Unlike the primary resource industries where BC is home to some of the largest companies in the world, most technology companies in BC are relatively small. Therefore, while the industry as a whole is fairly large, it lacks the stability, international visibility, and training ground often provided by larger organizations.

#### Context

While BC has a history of developing innovative companies, these start-ups are often acquired once they achieve evaluations of \$20 to \$30 million dollars. The result of many of the recent technology acquisitions is that intellectual property has been absorbed into the larger organizations and the BC-based workforce has been slowly reduced to zero.

#### Recommendation

If the goal of the technology industry is to double its headcount in the next 5 years, then a key objective of the provincial technology strategy should be attracting several new anchor companies to BC (ideally 4 or 5) within that timeframe.

**On the part of the government**, this action will likely necessitate tax incentives or other perquisites to attract companies to the province. We recognize that the government is the best party to lead the recruitment of new anchor companies to BC, albeit under guidance and with assistance from the industry.

**On the part of the technology industry**, there needs to be recognition and support of this attraction initiative by the technology companies, even though it may mean introducing competitors into the local marketplace.

The key to growth through the attraction of new anchor companies is to identify the right kinds of companies, or the optimal parts of companies, to create meaningful jobs. Significant attributes of target organizations should include:

- undertaking substantial R&D
- being willing to register intellectual property in BC
- having histories of creating spin-off companies
- having reputations as a good corporate citizens

Depending on the organization and its corporate structure, it may not be the head office function that is desired in BC, but rather a significant function such as R&D. Similarly, companies with intense manufacturing functions may not be the best fit due to environmental and land use issues, particularly within the Lower Mainland.

The Lower Mainland is already home to a number of firms that undertake their R&D here, while using our proximity to the U.S. and our port infrastructure to market and ship the products they manufacture in low-cost jurisdictions such as China.

**Background** With the average technology company having fewer than 12 employees and generating about \$1.7 million in annual revenues, to achieve the goal of doubling headcount from 65,000 to 130,000 employees in the next 5 years will require the creation of about 5,400 new technology companies, or almost 1,100 per year.

Alternatively, and the more plausible scenario, is that BC needs to focus on growing its existing companies while attracting new anchor companies. Larger companies tend to provide stability to technology markets owing to their large workforces, steadier revenue streams, mature work processes, and better internal human resource capabilities. Moreover, larger companies often create their own ecosystems of channel partners, IT support vendors, and services vendors including recruiting, accounting, legal, and marketing firms.

Larger companies often provide better on-the-job training and education allowances for employees. They are also better equipped to hire nationally and internationally, and to pay to introduce top talent to the BC industry.

In addition, the larger companies in BC tend to pay their employees better, and to reward with salary and performance benefits rather than the all-or-nothing cyclicalities that comes with sweat equity and stock options, thereby evening out the economy.

Undoubtedly, some of the most attractive organizations are companies like the Oregon-based Tektronix, which has a history of actively encouraging the spin-out of new companies. Tektronix typically takes a small equity position in the new company while allowing it autonomy and the opportunity to innovate and grow. In contrast to Tektronix are companies like Intel, which have a history of retaining their intellectual property internally, creating very little spin-out effect for jurisdictions where they have facilities.

In the software arena, the ideal companies also include those that develop software platforms upon which other independent software vendor (ISV) solutions can be built – encouraging natural spin-offs and extending the deployment base for all.

Due to its proximity to Seattle, Vancouver is a natural home for ISV solutions based on Microsoft technologies. Many successful companies have already been developed to take advantage of the technology, delivery channels, and ready-made markets provided through what is undeniably the premiere anchor company.

Anchor companies also tend to attract or spin-off industry competitors, as we can see by the success of Electronic Arts in BC, whose alumni have started many of the other larger entertainment and gaming companies in the Lower Mainland. Because of Electronic Arts and its spin-offs, BC is now home to a world-class gaming and entertainment media cluster.

## 2.1 Access to Capital

### The Need for More Seasoned Venture Capital

#### Issue

Another symptom of the relative immaturity of the BC technology market is the modest venture capital investments that exist here. The lack of capital investments appears to be occurring in 2 significant stages, at the earliest stages of development and then again in the expansion stage.

When venture funds are undercapitalized, the result is often undercapitalized investments and difficulty competing globally. Unable to raise the necessary follow-on capital to expand and acquire, many BC companies find their growth hampered and seek to be acquired instead.

#### Context

While BC is home to some relatively large venture funds and institutional investors, in 2005 only \$226 million USD of private equity was invested in the BC sector by the venture community. In comparison, \$727 million was invested in Seattle and \$1.2 billion in San Diego. Ontario and Quebec also led BC with \$674 million and \$524 million respectively.

The result is that many start-ups in BC operate with less than \$2 million in equity funding, often substantially less than is received by similar start-ups in other jurisdictions. Unable to attract top talent or adequately market their products and services globally, many BC firms have difficulty growing, regardless of how innovative their technology is.

U.S.-based investors, while comparatively larger and able to invest greater amounts, also take a more proactive role in their investments – providing the experience and connections to improve market access as well as the capital itself.

The Province of BC has been successful at building a small but significant retail investment community through the Venture Capital Corporation (VCC) and Eligible Business Corporation (EBC) programs, thanks to a strong historical partnership between industry and government. Of the \$226 million USD of venture capital invested in BC in 2005, just under \$60 million (\$67 million USD) came from retail investors, funds not typically sourced by traditional venture capital companies.

#### Recommendation

The primary constraint on the growth and competitiveness of BC's technology sector is lack of capital. Therefore, we recommend that the provincial government make a one-time strategic investment to grow the local venture community.

Specifically, we recommend that the government make a strategic investment through the development of a fund-of-funds approach similar to that which has been successfully used to grow the venture capital markets in both Israel and New Zealand – two economies with similar populations to British Columbia.

Such an investment commitment would also be in line with the Ministry of Economic Development's goal (as mentioned in its 2006 service plan) of increasing the amount of venture capital in BC by \$800 million between 2005 and 2010.

We envision that this strategic investment would involve an investment of \$150 million that would be matched 2 to 1 by industry for a total commitment of \$450 million in new investment – adding another \$225 million in investable capital. These funds would be required to be invested in a BC-based company. Similar to the programs in New Zealand and Israel, the industry would have the option of

buying out the government's investment with interest calculated based on the government's cost of capital.

We further recommend that the program contain a mechanism that increases the attractiveness of the fund to foreign investors, particularly those from important markets such as Seattle, Silicon Valley, and San Diego. The goal of this mechanism would be to capture foreign investment while also attracting the capital, expertise, and connections that come with it. One potential strategy would be to match foreign funds at a better rate than matching funds from BC – such as a ratio of 1.5 to 1 instead of 2 to 1.

By growing the venture capital in BC, the government will not only assist the technology industry but will also assist other innovative industries that are making riskier investments in new ventures, such as the forestry and mining industries.

A doubling of the available venture capital in BC would increase:

- competition for deals among earlier-stage companies
- the availability of funds for latter-stage, often considerably larger deals
- the experience and connections provided by foreign investors

We recommend that while this additional investment would likely be attractive to larger institutional investors, it would not replace the existing incentives that the government is using to build the retail investor market. Rather, we encourage a balance in the market between retail-led and institution-led venture funds, which often have different approaches to investing.

By developing a complementary solution for attracting foreign and institutional investments, the Government of BC can add one more tool to its economic toolkit while building on the success of the retail-based venture community.

## **Background**

The relatively small venture funds in BC, particularly the retail funds, often do not possess the experience and corporate connections necessary to assist their portfolio companies in comparison to the large U.S. and international funds. Because the venture funds do not have sufficient capacity to provide follow-on investment, it is often difficult for them to partner with larger firms that fear being held back during follow-on investment rounds.

Similarly, larger, experienced, and specialized firms often have greater expertise within a given investment sector, as many have done a number of similar deals, providing a wealth of corporate knowledge of the sector as well as connections and experience.

The Yozma investment model, created by Israel and later copied by other jurisdictions including New Zealand, is the ideal model on which to build the BC-based solution. In the early 1990s, Israel found itself in a similar position to BC, with a small but burgeoning technology and venture community. The Israeli government created a \$100 million USD fund of funds that provided co-investment alongside private investors.

Similar to BC, the goal of the Israeli government was to attract foreign investment and expertise and to grow the venture capital market without displacing current and potential players. In all, 10 funds were created by the government. In the fund-of-funds model, the fund managers were responsible for making and managing the investments. Standard VC structures and commercial terms were used, namely fixed-life funds with profit-sharing mechanisms to align investor and manager interests.

The government matched \$1 USD for each \$1.50 provided by the industry players. Uniquely though, the government structured a buyout arrangement that allowed the industry participants to buy the

government's share within the first 5 years of the fund's life. The government's share could be purchased at a cost of principal plus interest based on 5-year government bond rates.

The buyout arrangement ensured that the funds were invested prudently, and provided the government with an exit strategy. In all, the government was bought out by industry in 9 of the 10 funds, resulting in reinvestment in further funds.

The end result was that the Israeli venture capital market grew from approximately \$45 million in annual investments in 1990 to over \$1.3 billion invested in 2005, making it the third-largest jurisdiction for venture capital, behind Silicon Valley and Boston.

The Yozma model was subsequently adopted by New Zealand in its efforts to jump-start its venture community. The New Zealand government made its formal commitment of \$100 million USD in June 2001 and its first investment in June 2003.

The New Zealand government created 6 funds in total, and developed a competitive RFP process for selecting fund managers. The government created a standard methodology to identify investment-grade managers, including criteria to evaluate:

- people and skills
- potential to become world-class VC fund managers
- alignment with purpose and intent of the fund program
- convincing investment strategies
- ability to engage long-term investors and succeed in raising the required private investment
- ability to deliver the superior returns expected from an experienced and successful VC fund manager

The result of the New Zealand experience is that in 2002, \$14 million NZD was invested in 10 deals while in 2004, \$96 million was invested in 32 deals. The government has already been bought out of one of the funds, availing \$20 million for further reinvestment.

Aside from simply injecting capital into the economy, the investments by both the Israeli and New Zealand governments helped to attract global attention and represented a tangible commitment that promoted the jurisdictions as forward-thinking places that are friendly toward investment and growth.

## 2.2 Access to Capital

### The Need for Earliest-Stage Investment Loans

#### Issue

There exists a perceived gap in the BC market for funding 2 key stages of commercialization:

1. the earliest stage of development activities where ideas are being taken from concepts to working prototypes or models that can be tested and refined within the marketplace
2. the first-revenue stage where a company may have its first referential customers but requires a short-term cash infusion for final development or sales and marketing activities

#### Context

Because of the chronic undercapitalization of the BC technology market, many organizations find themselves bootstrapped, or at least scrimping every dime as they go to market. As such, organizations often find themselves at a point where they are required to give up too much equity for what is expected to be a shorter-term requirement.

#### Recommendation

To further growth in the earliest stages of development, during which companies are often taking an idea from concept to prototype, we recommend that the government work with industry to create a Small Investment Loan Program. We envision that such a fund would consist of \$10 to \$15 million in contributed capital and would make loan investments of up to \$1 million and 5 years in duration.

The fund would be delivered through an independent foundation and would involve a peer review of investment decisions by individuals who are knowledgeable of the applicant's industry and business model (i.e., financial services, broadband wireless, or software-as-a-service). As a loan, it would be expected that the investment be paid back as the company achieves sustainable revenues, or upon its sale or other follow-on investment activities. We also recommend that such a fund consist of 50% government investment and 50% private investment.

We recognize that a program that targets the earliest stages of development may have difficulty raising private investment funding due to the high-risk nature of this initiative. That said, it should still be a goal when developing the specific business case and plan for this program.

Owing to its focus on the earliest stages of investment, it is fair to say that such a loan fund would not compete with any pre-existing lenders or venture capital companies. The goal of the fund would be to become self-sustaining through its lending and investment activities.

**Background**

BC used to have a group of funds that provided loans to start-up companies for product development activities through the Advanced Systems Institute of BC (ASI). The loss of the ASI funds has been particularly lamented by many industry leaders who either benefited from the fund or who were involved in the peer-review process that helped to ensure that quality loans were being made while bringing the community together through collaborative interaction.

The ASI investment funds were created in 1990, with \$7.9 million in investment by the provincial and federal governments. By the end of 2003, they generated a modest return of \$5.2 million that was re-invested into further loans. The investment mechanisms utilized by the ASI investment funds included loans and convertible debt instruments.

In total, the ASI investment funds assisted 83 companies in industries such as ICT, New Media, Wireless, Life Sciences, Alternative Energy, and Forestry.

## 3.1 Brain Gain, Train, and Retain The Need to Develop Better Talent

### Issue

BC's colleges and universities can provide the vital talent and resources to address technology industry recruiting and retention issues. Furthermore, training provides the ability for personnel to adapt to changing employment circumstances. Several studies have also indicated that BC has a significant talent shortfall in product sales and marketing.

### Context

All technology clusters have significant interaction between local industry and academia, which has been a successful recipe for regional growth. This interaction consists of academia providing needed education in key industry areas. Additionally, academia can be a source of recruiting talent for a region, particularly at the Master's and PhD levels.

### Recommendation

To build better talent in BC, we recommend that industry and government work together to make more cooperative education positions available for students at post-secondary institutions.

- **For government**, this means working with academia to make more cooperative spaces available at post-secondary institutions.
- **For industry**, it means making more placements available for students and providing them with meaningful work.

The Committee further recommends:

- increasing scholarships specifically targeted at technology students, including Master's and PhD students and key non-technical specialties such as general management, marketing, and sales
- providing tax incentives to encourage industry to increase the availability of internship programs
- providing tax incentives to industry for retraining existing technology employees, which could even be tied to the requirement to replace retraining workers with interns
- adding a technology stream to the sales and marketing program at BCIT

### Background

Regions recognize that universities are resources for attracting and creating talent. Ontario and Alberta have announced plans to expand graduate education as part of their 2005 budget submissions. This may widen the existing gap between BC's graduate enrolment per capita and the national average quoted by Statistics Canada.

Many U.S. geographical regions utilize research chairs as a major strength. In Canada's business schools, the number of fully funded research chairs with an endowment of \$2.5 million or more is lower than that of some single U.S. institutions. These chairs are critical for driving research performance, according to the Canadian Council of CEOs. The University of Texas at Austin has effectively used research chairs for attracting new business, including endowed chairs in engineering and science. Austin has also offered fellowships and teaching positions to recruits. The University President's Council has indicated a widening gap between BC universities and other Canadian universities in the funding of R&D, particularly research chairs.

Internships have been effective in geographic areas such as Portland and Austin and recruits to BC have expressed surprise over the lack of industry internship programs in the province. Although BC

institutions may represent an effective means of attracting talent to BC, the lack of internships creates a barrier to incorporating this talent into the BC workforce.

A lack of sales and marketing experience has been noted in several BC studies. This becomes particularly problematic as BC companies move into the product sales phase, where the benefits of previous investments can be realized.

## 3.2 Brain Gain, Train, and Retain The Need to Attract Talent

### Issue

Currently, there is no single Internet site offering critical information about BC for potential recruits.

### Context

Tremendous pressure is placed on BC companies to provide information to potential recruits for making geographic relocation decisions. Although information is available on the Internet, it is difficult to find and interpret. Furthermore, there is much conflicting information.

### Recommendation

To attract talented employees to BC, we recommend that the province create a recruitment portal with information including:

- an overview of the technology clusters and future career opportunities
- job offers and opportunities
- lifestyle information
- "ask an expert" questions and answers

### Background

Due to the lack of easily accessible information, making decisions about relocating to BC can be extremely difficult. Recruits consider a great deal of information in a number of areas before making a decision. Their evaluation of job offers includes net disposable income, benefits, availability of exciting work in the region, and the overall management of companies. It can also include examining regional employment, R&D spending, entrepreneurship, industry support, government plans, and post-secondary education. Lifestyle considerations can include overall living conditions, post-secondary education, public safety, and tolerance. The scope of the information needed to make a decision to relocate a career to another geographic area is extensive. This is particularly important for areas like BC that have a relatively small technology employment base.

BC recruiters have expressed frustration in trying to provide recruits with information that addresses misperceptions about BC and Canada. This is particularly true in recruiting from the United States. There are strong misperceptions about health care, the quality of schools, and the strength of BC entrepreneurship. There are also a number of publications that compare other Canadian provinces to BC but there is currently no easily identifiable BC forum for response. In addition, there is no place for recruits to ask an expert about topics of interest.

A Web portal provides a solution to all of problems described above. It also has the advantage of being available to almost anyone looking to relocate to Canada. In addition, the interaction between different organizations will facilitate the coordination and communication of information.

### 3.3 Brain Gain, Train, and Retain

#### The Need for More Graduate Programs, Scholarships, and Facilities

##### Issue

While BC is taking action to expand its undergraduate programs, including creating an additional 25,000 post-secondary spaces by 2010, there is still a relative lack of graduate students in the technology sector, particularly the business graduates needed to lead teams and companies.

##### Context

Graduate students are the future leaders in an innovation economy. They put advanced learning to work, using the knowledge and skills they've gained in the classroom to make businesses and industries more innovative and competitive. Arguably, graduate students represent the most significant technology transfer opportunity by translating leading-edge knowledge into practice.

PhDs from BC universities were instrumental in the founding, resourcing, and growth of numerous successful companies in the province, including QLT Inc., MacDonald-Dettwiler, PRA International (formerly CroMedica Global), Creo Products, Tactex Controls, BC Pacific Capital Corporation, Mackenzie Financial Corp., Ventures West Management Inc., Philips, Hager & North, and other multimillion-dollar, globally competitive, knowledge-intensive companies that collectively employ thousands of people in our province.

##### Recommendations

**Graduate-level R&D talent** – Expansion of graduate student programs need to parallel the expansion of undergraduate capacity. By 2010, the Province of BC should aim to have a minimum of 2,500 additional graduate students enrolled in our universities. Graduate students in research-intensive programs will be the key to ensuring BC's strength in emerging sectors such as fuel cell technologies, life sciences, and nanotechnology, and in ensuring that innovation continues to keep all sectors of the BC economy performing at peak efficiency.

**Graduate-level business talent** – The High-Technology Industry Advisory Committee wishes to congratulate the government on its commitment to working with industry and academia to build the New Media World Centre to help develop graduate-level knowledge and senior business talent within the new media and digital entertainment industry.

The committee recommends that other sectors work with government to help define and introduce similar programs to develop senior business talent within the technology industry – particularly in sales and marketing.

##### Background

Employment for those with graduate degrees increased by 65% between 1990 and 2002 – 4 times faster than the overall rate of growth in the Canadian labour market. More than two-thirds of doctoral degree holders are using their knowledge outside academe in government, the private sector, and nonprofit organizations

Graduate students are also our future post-secondary educators. With 200,000 more students expected to graduate in the coming decade, Canadian universities are facing a growing demand for highly qualified new faculty. Research from the Association of Universities and Colleges of Canada suggests that universities across Canada will need to hire 40,000 new faculty members by 2011.

## The Situation in BC

For a period of about 15 years, BC has not funded graduate student spaces. The only major exception has been the Double the Opportunity (DTO) initiative to expand enrolments in computer science, electrical, and computer engineering programs. This initiative included funding for graduate student spaces.

In 1990, funding letters from the Ministry of Advanced Education showed that new graduate student spaces were allotted \$17,000 each. This funding remained in the base operating grants for universities and was expected to cover increasing graduate student enrolments.

In 2004/2005, the Ministry of Advanced Education provided funding for a total of 7,593 graduate student spaces (full-time equivalents) at the 4 largest universities in BC, although the actual level of funding provided for these seats is disputed. These 4 universities exceeded the target by 46%, producing a total of 11,064 graduate student seats.

Universities have had to expand graduate student enrolments as much as possible with their own resources in order to support the new faculty and infrastructure associated with BC's high degree of success in key national research competitions (such as the Canada Foundation for Innovation, Genome Canada, and The Canada Research Chairs Program). However, this has not been enough, particularly as other jurisdictions are moving aggressively to increase their graduate student enrolments.

As the complexity of science increases, the cost of quality graduate student training also mounts. Universities must maintain high standards of instruction to remain internationally competitive in growing fields such as life sciences and information technology. Without adequate provincial funding for graduate students, universities are forced to draw resources from other areas of their budgets that are already under considerable pressure.

Over the past several months, the Ministry has been publicly promoting a plan to add 2,500 new research-focused graduate student spaces over 5 years, to be funded at \$20,000 each (this amount is based on the benchmark established for the DTO initiative). However, the Ministry has not yet been successful in gaining the financial resources to support this plan.

In addition to having operating resources that are insufficient to sustain and grow quality graduate programs, BC also lacks programs to recruit and retain leading graduate students. This is a significant deficit, as the competition for graduate students is strong, both within Canada and internationally.

## What Other Jurisdictions Are Doing

Other provinces have recognized the critical role that graduate students play in their economies and have created provincial scholarship programs to ensure that they continue to attract and retain leading graduate students.

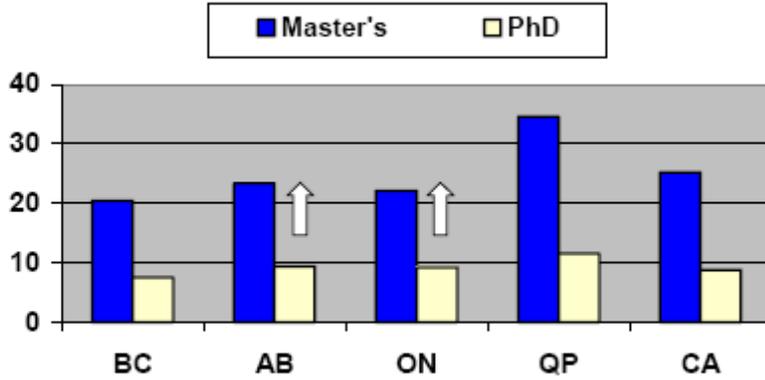
**Ontario:** The most recent Ontario provincial budget includes an expansion of 14,000 graduate spaces 2009/2010. Moreover, a budget increase of \$100 million will create endowments at universities to provide fellowships for outstanding graduate students. This program will be in addition to the existing Ontario Graduate Scholarship Program, which provides 2,000 scholarships annually of \$10,000 (for 2 consecutive terms of study) to \$15,000 (for 3 consecutive terms of study).

**Alberta:** Alberta's planned post-secondary expansion of 15,000 spaces over 3 years will include graduate as well as undergraduate seats. The Province of Alberta Graduate Scholarships and Fellowships offer 150 fellowships per year of \$10,500 for PhD students and another 150 fellowships of \$9,300 for Master's students.

**Quebec:** Quebec offers awards through its 3 provincial research funding agencies. Master’s awards are \$15,000 per year and can be held for a maximum of 2 years. PhD awards are valued at \$20,000 and can be held for a maximum of 3 years.

The following chart reflects BC’s graduate student enrolments relative to other key provinces but does not reflect the impact of recent announcements in Ontario and Alberta.

**2001 Graduate Student Enrolments per 10,000 Population**



Source: Statistics Canada, University Enrolments, 2001/02 headcount data

## 4.1 Taxation

### The Need to Extend the Intellectual Property Tax Credit

#### Issue

There is currently a great disparity between the taxation of life sciences companies and other companies within the technology sector.

#### Context

In the 2004 budget, the provincial government extended the International Finance Business Program into the area of international film and television licensing and distribution. Recently, the provincial government further expanded the International Financing Activities Act to create what is now commonly referred to as the Intellectual Property (IP) tax credit for life sciences.

Effective January 1, 2006, and enabled through Bill 2, Revenue Statutes Amendment Act, 2005, international financing activities under the International Financing Activity Act (IFA Act) were expanded to cover certain patent activities.

Relevant activities are described as follows:

- selling, assigning, or licensing to a non-resident a patent within a prescribed class of patents
- selling, assigning, or licensing to a non-resident a good or service whose sale revenue is principally derived from an invention for which, within a prescribed class of patents, is owned by the corporation.

The prescribed classes of patents will incorporate certain inventions related to **life sciences** as determined by references to the primary classification of the patent under the International Patent Classification System. The non-resident may be at arms length or non-arm's length with the corporation, as those terms are defined within the Income Tax Act (Canada). The tax refund for patent activities is limited to the lesser of \$8 million and 75% of British Columbia corporate income tax paid.

#### Recommendation

We recommend that the government extend the intellectual property (IP) tax credit currently provided to the life sciences industry to patented technologies throughout the entire technology industry.

We also recommend that the tax credit extension provide some form of clawback mechanism to repatriate the monies invested in the credit should an organization leave the province of BC or move its intellectual property elsewhere.

By extending the tax credit to all technology sectors, the Province of British Columbia will deliver a clear message to the BC technology community, and to the global community, of its support for developing intellectual property in the Province of BC, particularly where such intellectual property is driving export revenue.

## Background

BC has an excellent reputation for creating intellectual property and our location between the U.S. and Asia-Pacific markets makes the province an excellent hub for generating technology-based exports. A quick preliminary search of the U.S. Patent and Trademark Office suggests that since 1976, over 2,500 U.S. patents have been granted to BC-based assignees in all sectors of the economy.

By extending the IP tax credit to all patented intellectual property produced in British Columbia, the government will minimize the perception of “favoured-child status” and recognize that all innovation and intellectual property development is important, particularly in a diversified technology community such as the one that we have in British Columbia.

The most obvious benefits within the high-tech sector would accrue to those firms that manufacture hardware and devices for export, including our wireless cluster in BC that is producing globally-exportable intellectual property in the areas of both hardware and software.

Similarly, with film and television production already sharing a number of common technology elements with BC’s burgeoning new media and gaming/entertainment sector, this sector is also a natural place for extension of the international financing activities that were granted to the production industry.

Comparatively, within the rest of the software market, while patented technology is less prevalent, it does exist. The reality is that in the past, many small software companies have been discouraged from patenting their developments as there is a substantial cost to do so, with little benefit accruing to the exercise. Such an incentive as the IP tax credit would encourage software companies to patent their technologies as it changes the financial incentives for doing so.

Similarly, such an incentive would also drive initiatives to license existing patents to users outside of BC, and to push export revenues from patented products. This drive is as likely to occur with technologies that have been previously patented in the traditional resource economies as with technologies developed within the technology industry.

When announcing the IP tax credit extension, the government suggested that the credit was being tested as a pilot with the life sciences sector and if successful at generating business would be extended to other sectors. Unfortunately, the government was unclear as to what the metrics for success would be, or how it would determine whether or not the life sciences sector had met them.

While the government has a number of programs aimed at encouraging companies to develop their intellectual property in BC, there are few incentives for keeping the intellectual property here, a fact that has been witnessed through many mergers and acquisitions of BC-based technology companies.

For the government to create truly sustainable technology employment, with all of its benefits surrounding relatively high-paying jobs and minimal environmental impact, the government needs to create incentives to keep IP in the province, and more importantly, to encourage companies to bring their R&D and IP to BC, regardless of the jurisdiction in which they produce or sell their products.

Of likely concern to the government in calculating its return on investment for such an initiative is the short-term concern of tax leakage. Currently, the government has allocated \$20 million to the tax credit to cover companies within the life sciences industry. Preliminary calculations for extending the tax credit to all high-technology exports amounts to a marginal leakage of between \$2 and \$26 million.

The above figure was derived by taking the current total of all exports from the technology sector (\$673 million in 2004 according to BC Stats) and assuming that all of these exports contributed 100% to the bottom lines of BC-based companies. By applying the tax rates to this calculation, the maximum

leakage amount was found to be \$68 million, including the life sciences sector. This maximum is wildly overoptimistic as it assumes that:

1. All exporting technology companies are profitable;
2. There is a 100% contribution from exports to the bottom lines of the companies (even in best-case scenarios this might be 50% to 70%); and
3. All exports are derived from patented technologies.

Therefore, a more reasonable amount of leakage can be derived by discounting the \$68 million figure by some amount (likely 33% to 67%), creating a realistic maximum leakage of between \$22 and \$46 million, or between \$2 and \$26 million more than the amount currently budgeted.

## Maximum Tax Leakage for the Intellectual Property Tax Credit

		(\$000s)
<b>Exports from the High-Tech Sector (2005)</b>	<b>a</b>	<b>\$673,000</b>
Provincial Tax Estimate (13.5% of a)	<b>b</b>	<u>\$90,855</u>
<b>Estimated Maximum Tax Leakage (75% of b)</b>	<b>c</b>	<b>\$68,141</b>

**NOTE:** The above maximum amount assumes that all 2005 industry exports were from profit-generating companies, and that all activities were from patented technologies.

Realistically, the maximum tax leakage is probably less than 50% of the above figure.

Therefore, recalculated, based on % of exports that would be eligible for the credits, the maximum tax leakage is likely to be:

*% of maximum tax leakage (c), from exports, derived from companies with taxable income:*

33%	\$22,487
50%	\$34,071
67%	\$45,655

*With the provincial government having already set aside \$20 million to cover the IP tax credit for life sciences, the **marginal cost of extending the credit** to all sectors would likely be between \$2 and \$26 million.*

**Source: BC Stats**

## 4.2 Taxation

### The Need to Extend and Harmonize the SR&ED Tax Credit

#### Issue

There are currently 2 key issues involving the Scientific Research and Experimental Development program, which involves both a federal and a provincial component.

1. The provincial SR&ED credit is only viewed as a temporary measure and is due to expire in 2008.
2. The federal SR&ED tax credit creates a disparity between Canadian-controlled and non-Canadian-controlled private and public companies with respect to rates and refundability.

#### Context

The combination of the provincial and federal SR&ED tax credit programs is a very important mechanism for encouraging research and development in new technologies and innovation. It has been identified as an important tool in encouraging the introduction and development of technology companies.

The SR&ED program aims to reduce some of the risks attributed to the development of new technologies or innovations, in addition to serving as an important incentive to attract private research and development efforts. However, the current provincial and federal SR&ED rules are such that the opportunity to stimulate private-sector R&D spending cannot be fully realized.

Specifically, the current rules state that:

- SR&ED credits are provided on a refundable tax credit (or cash) basis for “Canadian-controlled private corporations” (CCPCs) and are not extended to publicly-controlled Canadian corporations.
- For non-Canadian-controlled private or public companies, nonrefundable tax credits are extended and applied as a deduction against income. In the case that a company is not profitable, the nonrefundable credits become useless. Additionally, the tax credit rate is lower for non-Canadian-controlled companies.

*NOTE: The definition of qualified Canadian investors (which also drives the definition of Canadian-controlled) excludes Canadian public companies. This would mean that an investment in a smaller private technology company by Ballard or TELUS would work against the company when determining its status as public or private.*

These current rules create odd incentives with respect to the location that financing may come from as well as the choice of financing vehicles (private versus public).

#### Recommendation

Given that the purpose of SR&ED is to encourage research and development spending and activities in Canada and BC, the extension of nonrefundable tax credits to non-Canadian-controlled private and public companies lacks rationale and creates unnecessary barriers to the development of new innovation and technologies.

Therefore, we recommend that that the provincial government work with the federal government to harmonize the SR&ED tax credits, eliminating the nonrefundable tax credit and extending the refundable tax credit to all companies conducting significant R&D activities in BC and Canada regardless of their control status – public, private, foreign-owned, or other.

Additionally, we recommend that a claw back clause be included should a company or intellectual property on which the SR&ED credit was based be moved from the province or country.

We further recommend that the provincial SR&ED tax credit be made a permanent program. We believe this would send a strong message about the province's continued commitment to attracting private research and development in BC. Investors risking their capital in the development of new ventures need to feel that the general economic climate is business-friendly and will continue to be so in the years to come.

### Background

The following table outlines how the provincial and federal SR&ED credits are applied to private and public Canadian- and non-Canadian-controlled companies.

	Private Companies		Public Companies
	Canadian-Controlled	Non-Canadian-Controlled	CDN or Non-CDN Controlled
<b>Federal Rate</b>	35%	20%	20%
<b>Provincial Rate</b>	10%	10%	10%
<b>Net Credit</b>	41.50%	28%	28%
<b>NOTE:</b>			
1. The provincial credit is applied as a reduction of the development expense causing the net.			
2. CDN Controlled rates only apply for the first \$2m of expense than everybody gets the non CND Controlled rates.			

## 5.1 Procurement

### The Need to Encourage BC Content in Government Procurement

#### Issue

Many smaller BC technology companies do not feel that they get a fair opportunity to partake in the business opportunities created through government procurement.

#### Context

As the vast majority of technology companies in BC are smaller organizations, they often need to partner with larger organizations in order to generate the experience and references required to kick start other opportunities. One area in which small companies struggle is creating the capacity to bid on government procurement opportunities. Many BC organizations do not have the size, reputation, or where-with-all to do so.

That said, the provincial government is a large consumer of goods and services in its role of serving the people of British Columbia. Similarly, through transfers to regions and municipalities, the government also has a tremendous opportunity with which to direct investment into products and services.

#### Recommendation

To ensure that small and medium-sized businesses receive an adequate share of government procurement in the area of technology sales and services, the Committee recommends **that the government develop a procurement policy** that provides for the following:

- Where unsolicited proposals are received by the Province of BC, they must consist of a minimum of 10% BC private technology company content (in the form of products or services) by dollar volume.
- Where proposals are submitted through a formal RFP process, they must consist of a minimum of 5% BC private company content (in the form of products or services) by dollar volume.

**In return, industry should** encourage partnerships between smaller fledgling companies and more prosperous and stable larger companies that have clearly defined partner ecosystems.

## 6.1 Technology Transfer

### The Need to Rationalize Technology Transfer Processes

#### Issue

There are 2 consistent issues with respect to research and development and the commercialization of new technologies:

- For government and academia, there is a desire for private companies to increase their investment in research and development.
- For industry, there is a desire to have simplified and harmonized processes at the academic institutions in order to expedite the time to market and encourage private investment.

#### Context

Compared to other jurisdictions, the amount of private research and development in BC being funded by industry at academic institutions is relatively low. The result is that the post-secondary institutions are underutilized and are very reliant on public sources of funding for research and development.

Many industry proponents argue that private research and development are being stifled due to:

- onerous intellectual property requirements at the various post-secondary institutions
- unwieldy procedures for engaging academia in private research initiatives
- disparate policies at each institution being engaged

#### Recommendation

Therefore, the Committee recommends that industry work with government and academia to design a technology transfer process that makes it easier for companies to understand and engage with academia. Ideally, this streamlined technology transfer process would be harmonized across a large number of post-secondary institutions (ideally all) to improve interaction with multiple organizations.

Aside from the engagement synergies afforded by a single policy and process, having a single streamlined process would also make it easier for industry to communicate the benefits of engaging in private research and development efforts to its member companies.

In return for streamlining processes, the industry needs to commit to:

- better utilization of academia for private research and development efforts
- promoting private research and development
- assisting academia with the commercialization of new products that arise from research efforts

## 7.1 Infrastructure, Demographics, and Environment

### The Need for Strategic Infrastructure

#### Issue

There is a dearth of affordable commercial space available for technology start-ups, particularly for life sciences companies and other technology companies that require elaborate laboratory space. Concurrently, there is no geographical focal point for the technology industry in the Lower Mainland. Instead, there are small pockets of activity spread across a number of cities.

#### Context

Experience in other jurisdictions, most notably Silicon Valley, has proven that technology clusters grow and develop better when the people within them interact on daily basis. Cross-pollination of ideas and projects provides synergies and encourages serendipitous innovation. Yaletown in Vancouver was a good example of the type of cross-pollination encouraged by proximity before the escalation of the area's real estate prices put it out of reach for many small companies.

With real estate prices in Vancouver showing no signs of easing and commercial space being continuously converted to condos, the technology industry is likely to separate further as companies disperse in a quest to find more affordable real estate.

In the past, organizations like Discovery Parks Trust, in working with BCIT, UBC and SFU, as well organizations like the University of Victoria with its technology park, have been successful at creating small technology centres across the Lower Mainland, but these facilities are also at capacity.

At the same time the BC TIA, in partnership with Leading Edge BC, has been successful in co-location with several technology-focused organizations, leading to better dialogue and synergies among a number of associations and quasi-government organizations.

Prior to the technology bubble exploding at the turn of the millennium, the City of Vancouver was seriously considering creating a technology park on what is known as the False Creek Flats. This area is home to a few technology companies, as is the Great Northern Way Campus, a joint campus of SFU, UBC, the Emily Carr Institute, and BCIT. The False Creek Flats is located on the existing SkyTrain line, and is relatively close to the new Millennium Line.

#### Recommendation

The Committee recommends that the industry work with academia and government to establish collaborative facilities of industry-industry and industry-academia for co-location and joint research and development.

Such collaborative facilities would provide for cost sharing of services, space, and equipment and provide experience-based learning and training for students. For its part, industry needs to commit to use and promote the joint facilities that are developed.

One solution that has been raised in response to this need for strategic infrastructure supporting R&D is the BC Hub proposal led by Discovery Parks, Genome BC, and Merck Frosst Canada Ltd. The Committee recommends that the Government of BC work with industry and the proposal consortium to validate the merits of the BC Hub proposal, particularly as the proposal may play a role in:

- tying together the various technology centres across the province and the Lower Mainland, including the other Discovery park facilities, and
- acting as a flagship anchor for a revitalization of the False Creek Flats as a new geographic focus for the technology community.

**Background**

The vision of the BC Hub proposal is to make BC globally competitive by helping world-scale companies leverage the technological strengths identified in the Integrated Technology Initiative (information technology, communications, wireless, new media, fuel cells, and biotechnology).

**Mission**

The mission of the BC Hub is to provide both a physical centre in Vancouver's Eastside (False Creek Flats) and a province-wide network to accelerate the commercialization of technology by promoting face-to-face communication within and among the identified technological strengths of British Columbia, with an overall goal of building world-scale companies.

The BC Hub is modeled after similar facilities, BioSquare in Boston, MA, and Biomedicum in Helsinki, Finland. BioSquare is a partnership created between the university and the tenants to allow for joint research, development, and innovation. Biomedicum is a joint effort between academia and industry with ownership of the building divided between various stakeholders, including the University of Helsinki, the Joint Authority for the Hospital District of Helsinki, a state-owned property developer, several private research foundations, and the cities of Helsinki, Espoo, and Vantaa.

The BC Hub will have lab and office space for lease primarily by technology companies, but also limited space for research institutes, industry associations, service firms, angel investors, venture capitalists, and government agencies. The physical design of the centre will emphasize theme areas (defined by types of technology) to promote internal identities and force spontaneous and formal meetings among the themes. Common facilities and amenities will be located such that people will be strongly encouraged to interact, share, and develop creative relationships.

More importantly, the BC Hub will ideally serve as the new flagship building in the final realization of the development of the False Creek Flats as a new high-tech business park.

## 7.2 Infrastructure, Demographics, and Environment

### The Need for a Strong Place to Work and Live

#### Issue

The Province of BC needs to stay the course that it has set for the past 5 years – developing British Columbia as a desirable place to live and work. British Columbia has many natural attributes which make it a great place to do business and raise families. By providing a stable and predictable economy, the Province of BC will enable growth simply by allowing the people of British Columbia to do their jobs.

#### Context

By nature, technology companies are innovative and resourceful. Given a stable and vibrant environment within which to attract talented people and investment, particularly one with the natural geographic strengths of British Columbia, a technology community will always provide a solid base of economic activity.

Over the past 5 years, the Government of BC has made considerable strides to improve the business climate of BC and make it a better place to work and live, which is important for all sectors of the economy. We applaud the Government of BC for its efforts to date, and support its drive to continue.

Like all sectors, the technology industry needs the following ingredients to grow, attract, and retain businesses in BC:

#### An Investment-Friendly Climate

- solid governance that provides the stability of economy necessary to attract long-term investment
- a balanced tax structure between corporate and personal tax rates to attract and retain companies, as well as the individual talent required to make those companies successful

#### Market Access

- strong vibrant ports and efficient transportation systems to reliably move goods and services between markets
- convenient air transportation between BC and the major U.S. and Asian markets

#### Strong Infrastructure

- an adequate supply of affordable commercial real estate
- a dependable supply of affordable power and telecommunications
- a strong education system to develop tomorrow's leaders

#### A Healthy Community

- a solid health care system to look after our employees, families, and friends
- a clean environment in which to live
- safe neighbourhoods

#### Recommendation

One of the most important things that the provincial government can do is to continue to make BC a desirable place to live and work. The natural attractiveness of the province, coupled with the natural innovativeness of its technology professionals, will ensure that province has a strong platform on which to accelerate the growth and development of the technology industry.

However, it is of critical importance that the government does not rest on its laurels and destine the BC technology industry to mediocrity when it has world-class potential.

## Appendices

## Appendix 1: Fast Facts: BC Technology Sector

- British Columbia is the most connected province in Canada, with 6 out of every 10 households having Internet access.
- R&D incentives and many other available tax incentives offer businesses the chance to realize substantial savings.
- The BC population is the most educated in Canada.
- On average, BC has been the leader in small business growth in Canada for the last 10 years.
- *The Economist* ranked Vancouver #1 in its 2004 global liveability survey of 130 cities worldwide.
- BC is home to one-third of Canada's fastest-growing technology companies.
- Employment in BC's high-technology industry has increased by almost two-thirds since 1991.
- Since 1995, BC's high-technology sector has expanded at 3 times the pace of the overall economy.
- BC has a business-friendly government, which cut personal income taxes by 25% and offers a competitive tax rate of 13.5%.
- In 2004, there were 21,810 technology companies in BC (8,288 + 13,522).
  - 8,288 reporting FTEs and 13,522 independent/self-employed
  - tech workers = 64,600 plus 13,522 self-employed = a total workforce of 78,122
- Over 90 languages are spoken in Vancouver, making it one of the world's most diverse cities.
- 65% of BC's exports go to the U.S., with China being the second-largest recipient.
- 87% of BC's technology companies have fewer than 5 employees.

Factors that make BC a great place to locate technology companies:

- sophisticated telecommunications that rank among the world's best
- the Port of Vancouver, which is Canada's busiest trade intersection, facilitating trade with over 90 nations worldwide
- proximity to the Asia/Pacific region
- The Vancouver International Airport, from which domestic and international airlines serve a large continental and global network of routes, a 30-minute drive from downtown Vancouver and from the Canada/U.S. border
- well-established and regulated banking, investment, and securities institutions that have extensive international capability
- internationally recognized legal and accounting firms
- excellent medical care
- highly respected educational institutions

## Appendix 2: Comparison of British Columbia with Similar Jurisdictions

	 Province of British Columbia	 State of Israel	 Republic of Ireland	 New Zealand
<b>Population</b>	4.3 million	6.3 million	4.0 million	4.0 million
<b>Land Mass</b>	767,800 sq km	20,770 sq km	70,280 sq km	268,680 sq km
<b>Labour Force</b>	2.3 million	2.4 million	2.0 million	2.1 million
<b>Internet Users</b>	2.5 million	2.0 million (2002)	1.3 million (2003)	2.1 million (2003)
<b>Median Age</b>	38.4	30.327	33.7	33.7
<b>GDP (\$US)</b>	\$138.3 billion	\$123.7 billion	194.2 billion	100.0 billion
<b>Venture Capital</b>	\$226 million invested in 2005	\$1.34 billion raised in 2005	\$1.25 billion Euro under management	\$158 million invested in 2004

British Columbia as compared to emerging federal high-technology jurisdictions

Source: Leading Edge BC, CIA World Fact Book, Public Works and Government Services Canada

	 Province of British Columbia	 Washington State	 Oregon	 California (San Diego MSA)
<b>Population</b>	4.3 million	6.2 million	3.5 million	2.9 million
<b>Land Mass</b>	767,800 sq km	184,824 sq km	251,571 sq km	10,878 sq km
<b>Labour Force</b>	2.3 million	3.2 million	1.8 million	1.5 million
<b>Internet Users</b>	2.5 million	4.5 million	2.6 million	1.9 million
<b>Median Age</b>	38.4	36.5	36.3	33.2
<b>GDP (\$US)</b>	\$138.3 billion	\$238 billion (2004)	\$121 billion	\$100 billion
<b>Venture Capital</b>	\$226 196 million invested in 2005	\$640M	\$150M	\$1.3 billion invested in 2005

British Columbia as compared to other West Coast jurisdictions

Source: Leading Edge BC, CIA World Fact Book, Public Works and Government Services Canada, US Census Bureau, San Diego, Office of Financial Mgmt (State of Washington)

	 Province of British Columbia	 Alberta	 Ontario	 Quebec
<b>Population</b>	4.3 million	3.3 million	12.6 million	7.6 million
<b>Land Mass</b>	767,800 sq km	642,317 sq km	917,741 sq km	1,183,128 sq km
<b>Labour Force</b>	2.3 million	1.8 million	6,8 million	4.0 million
<b>Internet Users</b>	2.5 million	2.0 million	6.9 million	3.6 million
<b>Median Age</b>	38.4	35.0	37.2	38.8
<b>GDP (\$US)</b>	\$138.3 billion	\$147.0 billion	\$428.4 billion	\$221.9 billion
<b>Venture Capital (\$ CDN)</b>	\$196226 million invested in 2005	\$64M	\$751M	\$710M

British Columbia as compared to other Provinces

Source: Leading Edge BC, CIA World Fact Book, Public Works, Wikipedia, and Government Services BC Competition Council

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Canada

## Appendix 3: List of Participants

**Rob Cruickshank – Chair**

President  
British Columbia Technology Industries Association

**Sang Mah**

President  
Wireless Innovation Network of BC (WIN BC)

**Shannon Byrne**

VP, Gateway Operations  
Payment Processing Inc.

**Claudia Ng**

President & CEO  
FatPort Corporation

**Barry Jinks**

President & CEO  
Colligo Networks Inc.

**Julian Taylor**

Executive Director  
PowerTech Alliance

**Jonathan Wilkinson**

President and Chief Executive Officer  
QuestAir Technologies

**Greg Wolfe**

Greg Wolfe, SVP & GM, Americas Operations  
Business Objects