

**Submission to the Legislative Assembly of British Columbia  
Select Standing Committee on Finance and Government Services**

October 10, 2017

## INTRODUCTION

British Columbia's research universities' commitment to post-secondary education centres on students, supporting them to become active participants in their own discovery process. Over the past two decades dramatic shifts in learning have occurred with new technologies transforming the learning paradigm. There is also a better understanding of the learning process and recognition of the needs of students as they enter and re-enter post-secondary education, as well as of the diversity of students across age, gender, ethnicity and economic means.

The importance of post-secondary education to student success is widely recognized and has been supported by extensive research. At the same time, there is increasing recognition that post-secondary education is a significant driver that is not only a response to labour market demand, but also key to an economic strategy for sustainable growth and new economic opportunities. Today, an economy's greatest asset is the skills and talent of its people.

The purpose of the submission to the Select Standing Committee on Finance and Government Services by The Research Universities' Council of British Columbia (RUCBC) is to outline how BC's research universities are taking action to meet students' needs and the ways in which universities both support and strengthen the BC economy. The submission will speak to how targeted investments in young people will allow them to gain the knowledge and skills to pursue their personal goals, to move into new knowledge-based jobs and services and contribute to building a strong, resilient economy.

This year, the research universities are also joining with all twenty-five post-secondary institutions from across BC to bring to the Committee's attention through a joint written submission the complex issues that students face and the pressures on institutions in providing new responsive services in the areas of mental health and sexual violence, and in transition to employment through work-integrated learning. Consistent with the Truth and Reconciliation Commission of Canada's Calls to Action, BC's post-secondary institutions are committed to improving the levels of participation and success for Indigenous Learners.



## SUPPORTS FOR STUDENT SUCCESS

Post-secondary education has become significantly more complex than twenty years ago. Issues facing students in areas such as mental health and sexual violence are more predominant, requiring substantive new services. Other supports such as work-integrated learning are key to students and to prospective employers as relevant experience for transition into employment.

A recent study of Canadian post-secondary students found that approximately 25 percent of students reported a mental health issue such as depression, anxiety, schizophrenia, post-traumatic stress disorder or other related disorders. Institutions have responded with additional counsellors, peer mentorship programs and new integrated health teams to better identify students in distress and offer the assistance they require. However, with an increasingly diverse student population, more tailored and supportive health and wellness services are required.

Safety is also a critical issue for students and, in accordance with BC's *Sexual Violence and Misconduct Policy Act*, institutions are committed to making campuses safe, respectful environments and are developing or updating policies and practices to address sexual assault and harassment. Initiatives that require additional support include education, prevention strategies and enhanced training for counsellors and residence staff to address sexual misconduct.

A positive and growing trend at post-secondary institutions is that education and employment outcomes have improved for Indigenous learners. However, more must be done to ensure programs are relevant, effective and provide pathways to success. Post-secondary institutions welcome the Government of BC's recent adoption of the UN Declaration on the Rights of Indigenous Peoples. Consistent with the Truth and Reconciliation Commission recommendations, the institutions are committed to working with Indigenous partners to increase the number of Indigenous learners accessing and completing post-secondary education.

Another rapidly growing trend within institutions is work-integrated learning, such as co-op, internships or mentorships. For students and employers, real-world work experience is a valuable learning tool where skills are developed and relationships are strengthened. However, many employers, particularly small businesses, require assistance in order to offer work placements as more and more students seek to enroll in these programs. Institutions need to provide more integrated learning services for students as well as to facilitate new approaches for employers to quickly integrate students into the workplace.

## Proposal

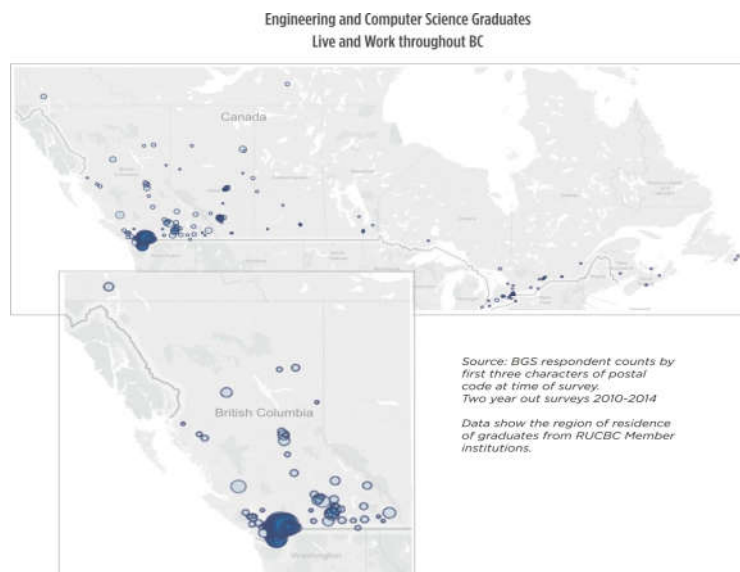
Investing in services and supports that are responsive to students' needs is essential in providing high quality post-secondary education which will allow students to successfully pursue personal and career goals and in turn provide the resource of talent vital for the prosperity of the province. Last year, post-secondary institutions proposed that the \$50 million reduction in funding to the system that occurred over the fiscal years 2013/14 to 2015/16 be re-invested in areas of greatest student need. This year, the institutions have come together again to ask the Committee to recommend this investment in students in its report to the Legislative Assembly.

## TALENT

### Engineering and Technology

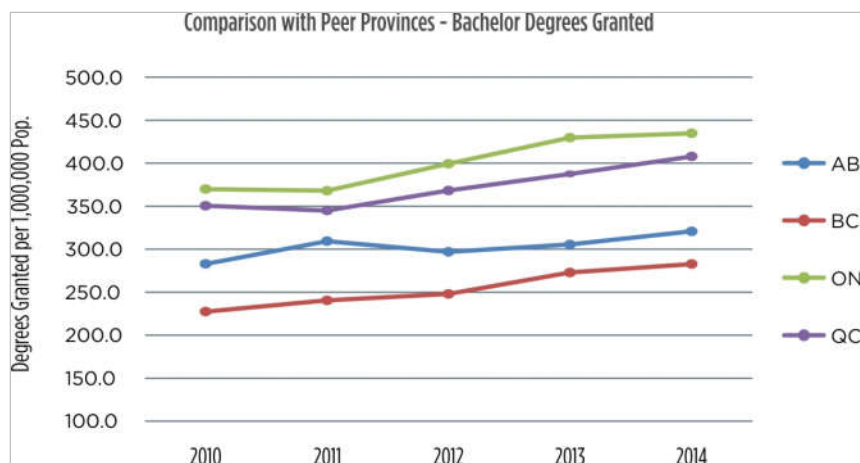
Today's global economy is rapidly changing, due not only to demographic shifts but also to the accelerating rise of the digital economy. Jurisdictions are competing for capital, high-value business activity and talent. Innovation and new technology developments are key to growth in all sectors of BC's economy, from forestry, mining and agri-foods, to information and communications technology, clean technology and creative industries. This growth is highly dependent on the skills and knowledge of engineering graduates and computer science graduates who take new ideas, methods and technologies into these sectors.

Engineering alumni from BC's universities hold key positions in every sector of the province's globally connected and rapidly changing economy. The following map, based on surveys conducted by BC Stats, shows that students graduating with engineering degrees from BC's research universities remain in BC and work in regions across the province.

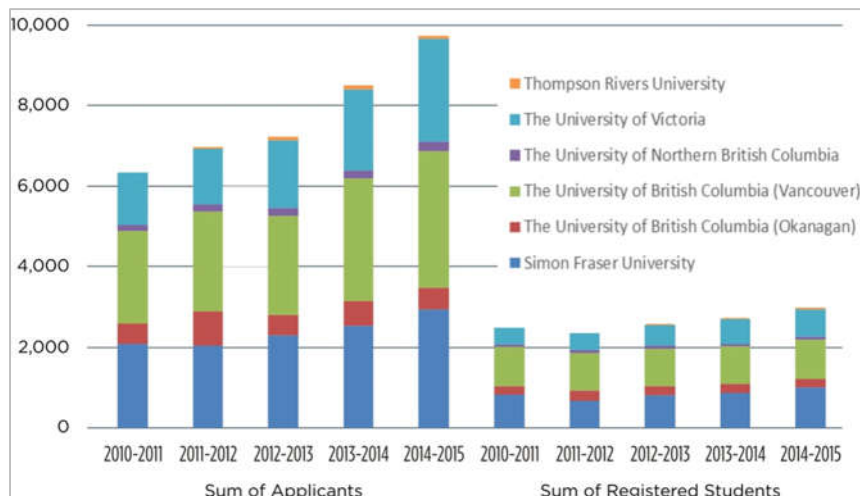


British Columbians expect high quality services in construction, electricity production, water and sanitation, transportation, and other services which also depend on engineering knowledge and skills being available across BC. However, there is increasing concern that the province's economic growth will be limited by a shortage of engineering and computer science graduates, and that this situation will worsen unless urgent action is taken.

BC is significantly behind Alberta, Ontario and Quebec in terms of the number of engineers produced per capita. As the following graph shows, the number of BC engineering bachelor degrees per capita is half of those provinces.



There are now five qualified applicants for each engineering seat in BC, with a dramatic corresponding increase in entry level Grade Point Averages (GPAs). Engineering has the highest incoming GPA for domestic direct entry students at UBC, UVic and SFU, with the average entrance at UBC reaching 93 percent. Consequently, BC universities are having to turn away many of the best and most committed BC students.



## Proposal

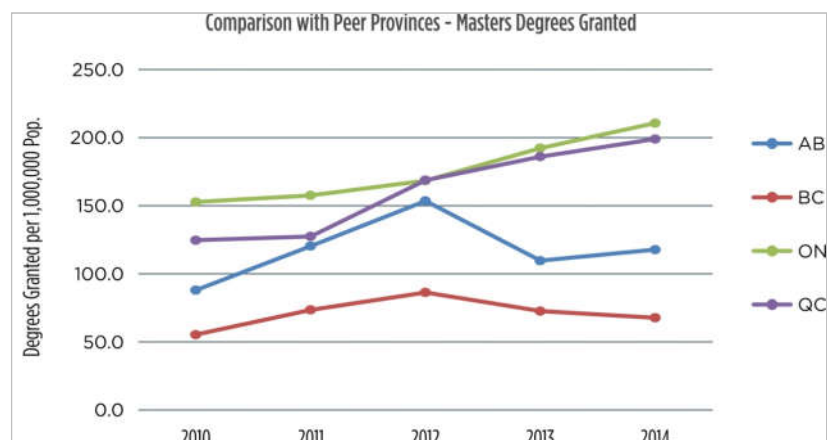
Engineering and computer science capacity in the province is at a critical point. BC requires new strategic investments in these programs in order to produce graduates with the advanced skills required for new resource sector-based growth, and for new digital, creative and technology-based industries.

The introduction of a new, phased-in strategic initiative in engineering and computer science would add 3,300 new student spaces and related infrastructure over three fiscal years beginning in 2018/19. An investment of \$58 million in operating funding, and in associated capital funding, would be part of a long term vision which would create new spaces throughout the province, placing BC in line with other jurisdictions such as Ontario and providing the engineering and computer science capacity that is vital for sustained economic growth.

## Graduate Students

RUCBC welcomes the BC government's commitment to introduce a graduate student scholarship program. The significance of graduate programs to BC's economy and to the labour market is often overlooked. These new scholarships will support graduate students in gaining the advanced skills and knowledge and transfer their ideas and knowledge into the workplace, leveraging competitiveness and productivity. Graduate degree holders are an integral part of a community or eco-system that uses ideas and technologies to produce new or improved products and services.

However, despite the internal shifts over the past decade by BC's research universities in response to student and labour market demand, as previously noted, BC lags significantly behind other provinces in graduate student numbers in engineering, mathematics and computer sciences, falling below the Canadian average in overall graduate degrees. The number of degrees awarded in the province is one measure of the technical talent available meet demand and fuel growth across all BC sectors.



## Proposal

Those jurisdictions that invest in post-secondary education will be positioned to gain the highest economic return. Developing an investment strategy to increase the number of graduate students to match market demand and generate new economic activity is essential to increasing BC's productivity and GDP. A targeted investment in graduate space expansion would help to alleviate skills shortages and support BC's economic growth and improve BC's competitive position relative to other jurisdictions.

## POST-SECONDARY INFRASTRUCTURE

One of the most important aspects of supporting students in their post-secondary studies is the learning environment of the institution, which includes the facilities, equipment and technology that comprise the physical and virtual campuses that institutions create within communities. In BC, there is now an opportunity to invest in post-secondary infrastructure that would respond to the needs of student populations, be responsive to new methods of teaching and learning, address housing affordability for students and communities, and generate new economic activity.

A new post-secondary infrastructure program would have four components:

### **Self-financed student residence construction to help alleviate local housing affordability challenges.**

The Province's restriction on the ability of post-secondary institutions to self-finance capital projects has meant that many capital projects with fully supporting revenue streams are not being developed, and the shortage of student residences are an example of this. With the high unmet demand for residence spaces, students are turning to private accommodation, driving up rental costs and housing scarcity across the province. Not only will new residences help university students, they will also provide well paid construction jobs in communities across the province. Additional residences will alleviate housing pressures in local communities, including those pressures facing low and single income families, and low income seniors.

### **New priority investment projects to meet student and labour market demand for programs**

New capital investments in infrastructure will be necessary to meet the access needs of growing student populations and new programs associated with this growth, as well as to accommodate the shifts in new technologies for creating, displaying and assessing information that is transforming the learning paradigm. An immediate example is the requirement for new capital infrastructure for engineering, STEM and computer science programs as existing space is fully utilized.

### **Enhanced routine minor capital to improve building efficiency and safety**

BC institutions are facing a significant backlog of routine capital funding necessary to maintain physical assets and to reduce high levels of deferred maintenance across the system. For example, a 2011 report found that 53 percent of one institution's buildings were in poor condition, while another 27 percent were in fair condition. The increase in routine capital over the past few years has been of assistance but it is critical that funding for routine capital continue to grow.

### **Seismic upgrades to address aging and unstable facilities**

A comprehensive post-secondary seismic upgrading program is needed to make institutions safer in the event of an earthquake by minimizing the possibility of structural collapse. Such a program could mirror the approach the Province has taken to provide seismic upgrades to K-12 schools across BC. Since launching the Seismic Mitigation Program, the Ministry of Education has spent over \$1.5 billion to complete 165 high-risk seismic projects throughout the province. The Ministry has another \$560 million allocated for high-risk seismic projects in its three year capital plan.

### **Proposal**

The infrastructure needs of BC's post-secondary institutions are differentiated and a flexible infrastructure program would be most effective. Institutions, together with government, would determine priority spending among facility upgrades, deferred maintenance, new construction or re-purposing existing facilities. Eligible self-financed projects would be approved by government based on the business case demonstrating that a project is self-supporting.

A new dedicated post-secondary infrastructure program would alleviate pressure on private rental accommodations; improve the learning and research environment for students and faculty; create leading edge facilities current with the technology needs of programs; reduce the backlog of deferred maintenance projects; provide opportunities to partner with local communities; create well-paying construction jobs across the province; and, create spin-off benefits to the local communities.

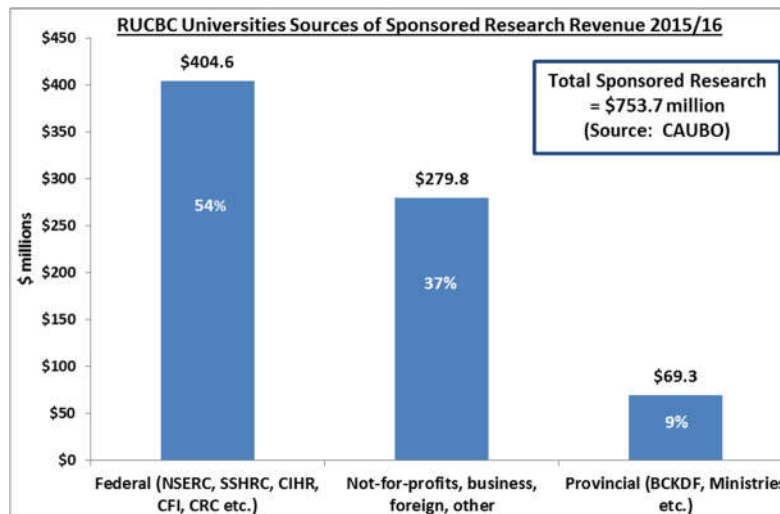
## RESEARCH AND INNOVATION

Innovation is widely recognized as the driver of long-term economic growth by creating new or improved technologies, processes, goods, and services that enhance the lives of British Columbians. These benefits of innovation grow out of the wellspring of knowledge, ideas, and insights that originate largely from discovery research that is primarily conducted at research universities.

A vibrant discovery research base is also a significant contributor to: living longer and healthier lives in a cleaner and safer environment; fostering a creative, vibrant and inclusive society; stimulating informed public debate; and supporting evidence-based policy-making in a period of accelerating change and complex provincial, national and global challenges.

BC's research universities have played a key role in positioning the province as a hub for world-leading research, producing measurable increases in GDP and employment and exerting a continuing impact on the productivity of the BC economy. Many of the province's leading biotechnology and high tech companies are direct 'spin offs' from university-based research, and BC's traditional resource industries now look to the research universities as a source of innovation and revitalization. In addition, BC's per capita share of federal government research funding rose by 148 percent from 2000 to 2013, almost double the Canadian average and placing BC as second in ranking for federal per capita research funding, ahead of Ontario and Alberta.

BC's research intensive universities attract hundreds of millions of dollars in research funding every year. In 2015/16, the research universities attracted approximately \$750 million in sponsored research funding into BC from federal, provincial, business and not-for-profit sources. This represents 99.2 percent of all the sponsored research attracted into BC by BC's research universities.





## **BC Knowledge Development Fund (BCKDF)**

Established in 1998, BCKDF has been the BC government's primary capital investment in support of research infrastructure at BC's public post-secondary institutions, research hospitals and affiliated non-profit agencies.

BCKDF is pivotal to the development of vital research infrastructure, allowing institutions to attract a critical mass of researchers, skilled technicians and research users. With state-of-the-art equipment and infrastructure, BC institutions generate favourable conditions for innovation and are well positioned to create successful collaborations with industry. The talent that BC's research universities attract and retain through BCKDF is instrumental in advancing new treatments in health and life sciences, in developing new technologies in traditional resource industries such as mining and forestry, and in supporting new innovations in clean tech and the now burgeoning high tech sectors of BC's economy.

BC's research universities leveraged their BCKDF-supported research strengths to develop contracts with industry sponsors and to support successful new companies. This, in turn, has increased tech transfer, commercialization and attracted investment from outside the province. In addition, graduate students from research universities, through their involvement in research, are a key conduit for knowledge transmission and commercialization.

The Province's support for BCKDF matches federal research infrastructure funding provided through the Canada Foundation for Innovation (CFI). Over the past four fiscal years, the Province's BCKDF investments of \$112.6 million have leveraged over \$180 million in direct matching grants from the CFI, industry and other sources.

Proposals put forward by research universities for BCKDF are judged to be of national excellence in a highly competitive Canada-wide peer reviewed process. Given the complexities for governments to adjudicate the downstream value of university-based research the federal government delegated its allocation of funds to an expert process which was also used by the BC provincial government until 2013.

A new provincial screen introduced in 2013 placed restrictions on the BCKDF program that limited funding to projects that only align to commercialization, talent development and job creation. As a result, support for a number of outstanding BCKDF research projects have been turned down, even while they received CFI approval. This approach is weakening BC's overall research capacity and is hindering recruitment of world-class talent to BC. It also means that Federal funding that would have been invested in BC are instead being invested in other provinces.

One recent example of a BCKDF rejection of a CFI-approved proposal is the Language Learning and Development Lab to conduct advanced research on effective speech learning by immigrant communities which will have 'economic and social benefits for BC, improving language learning skills...as well as better integrating our multilingual population in BC's economy and communities'. Another recent example of a BCKDF rejection was a request for equipment for a Molecular Genetics facility. Research conducted with this equipment would have increased the understanding of the occurrence, distribution and ecosystem of organisms in the context of ongoing industrialization in central and northern BC and the impacts on biodiversity.

## Proposal

BC's research universities are requesting that BCKDF returns to its original design principles to fund state-of-the-art equipment and infrastructure for research that demonstrates both economic and social benefits across all sectors and disciplines in BC and in turn, innovation and talent development. In addition, a return to BCKDF screening through the national adjudicative process is the best means of determining the quality and value of research infrastructure, as well as allowing BC to secure all Federal funding allocated through the CFI.

## BCIC Ignite

There are untapped opportunities to translate BC's research excellence into the private sector to support increased innovation, economic growth and job creation. The only provincial program that currently supports this is BC Ignite, offered through the BC Innovation Council.

BC Ignite provides funding up to \$300,000 to university/industry consortia conducting research projects to accelerate commercialization of new technologies and innovations and requires applicants to leverage existing funds from industry and academia at a matching ratio of \$2.00 to BCIC Ignite \$1.00.

BC Ignite is an effective model that has the potential to leverage more returns, but is small in scope (a total of \$1.7m funded since 2016) and constrained by its criteria. The program is limited to the natural resources and applied sciences sector, with a requirement that commercialization has to occur with a 3-year timeframe.

More opportunities need to be provided so that BC companies and industry sectors can access the unique knowledge, expertise and capabilities available at BC's research universities and also to support the development of new research and development partnerships aimed at addressing a company-specific problem or a 'grand challenge' faced by an industry sector or the economy more broadly. Mutually beneficial projects will result in economic benefits to BC companies and sectors and will facilitate longer term collaborations between research universities and BC industry.

## Proposal

BC's research universities are seeking an expansion of the BCIC Ignite program to address research challenges in all sectors of the economy as well as specific sector-wide challenges. This will expand the opportunities to have BC's research excellence support greater industry innovation and growth.

## GOING FORWARD

This submission proposes targeted investments in the following:

- An expansion in engineering and computer sciences spaces to prepare students with the skills required for all sectors of the economy including resource sector-based growth, and for new digital, creative and technology-based industries.
- An expansion in spaces for graduate students to support BC's economic growth and improve BC's competitive position relative to other jurisdictions, as well as alleviate skills shortages.
- A new post-secondary infrastructure program, including support for self-financed student residence construction, new priority investment projects to meet student and labour market demand, routine minor capital to improve building efficiency for students and seismic upgrades to address safety.
- A return of the BC Knowledge Development Fund to its original design principles to fund state-of-the-art equipment and infrastructure to support research that demonstrates both economic and social benefits across all sectors and disciplines in BC in support of innovation and talent development.
- An expansion of the BCIC Ignite program to address research challenges in all sectors of the economy and support greater innovation and economic growth.

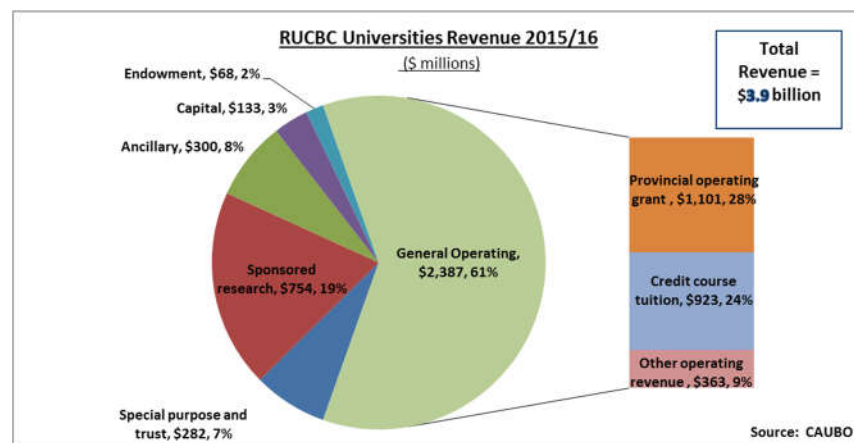
Investing in high quality post-secondary education allows students to pursue personal and career goals and prepares them to be part of a highly-skilled workforce with the ability to adapt to changing economic and social circumstances and opportunities and contribute to new economic opportunities for British Columbia.

## THE RESEARCH UNIVERSITIES' COUNCIL OF BRITISH COLUMBIA

### KEY FACTS

In 2016/17, the BC Ministry of Advanced Education provided operating funding for 91,763 full-time equivalents (FTEs) at BC's research universities. Through other revenue sources, the universities provided spaces for an additional 7,000 students for an enrollment utilization rate of 107 percent over funded FTEs.

Total revenue to the six RUCBC universities in 2015/16 was \$3.9 billion. The Province provides \$1.1 billion, or 28 percent of total revenue, to the operating fund that provides for teaching, non-sponsored research and community service roles. Credit course tuition accounts for 24 percent of total revenue. Each year, BC's research universities attract approximately \$750 million into the province from federal, business and not-for profit sources.



BC Stats' most recent *Baccalaureate Graduate Outcomes* surveyed students who graduated in 2010, five years after graduation in 2015. Despite having graduated at the end of a prolonged global recession, the survey shows graduates working in well-paying jobs in their chosen fields, applying the skills and talents they acquired at university:

- Graduates reported annual incomes averaging \$65,000.
- Graduates employed in the health sector earned the most, at \$77,805 per year, followed closely by those with engineering degrees at \$76,402 per year.
- Graduates had an unemployment rate of 5.6 percent, compared to BC's youth unemployment rate of 11.7 percent and the overall unemployment rate of 6.2 percent.
- Fewer than half (48 percent) of all graduates surveyed reported having gone into debt, and almost two-thirds (64 percent) incurred no government student loan debt.
- The median amount borrowed was \$20,000 and five years after graduating, only 20 percent of respondents still had student loan debt.