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## FIVE-YEAR PLAN: 2018 - 2023

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1. INTRODUCTION

This document presents Simon Fraser University’s Five-Year Capital Plan for the construction of new facilities and the renewal of existing facilities and aging infrastructure.

The Ministry of Advanced Education (AVED/the Ministry) requests annual capital plan submissions from all public post-secondary institutions to provide a high-level understanding of public post-secondary institutional capital requirements and to develop priorities for future consideration. This Five-Year Capital Plan therefore outlines SFU’s capital requirements for new priority expansion projects, replacement/renewal projects and capital innovation projects.

The plan includes new projects totalling $591,000,000 aimed mainly at expanding the SFU Surrey Campus and enhancing accessibility to Aboriginal and First Nations communities. It also details investments in a portfolio of renewal projects that will significantly address SFU’s deferred maintenance liability as well as improve the functionality, reliability, efficiency and environmental performance of institutional facilities and infrastructure.

The selection of capital projects reflect the Province’s focus on aligning education and training with the demands of the BC labour market, strengthening BC’s global competitive advantage and maximizing social and economic benefits. These investments are also in support of SFU’s vision as a leading engaged university and targeted to achieve institutional goals as they relate to improving learning conditions for students, improving research delivery areas, enhancing community social spaces and ensuring that SFU facilities are fiscally and environmentally sustainable.

The format for this Capital Plan is based on the Ministry’s standardized template. As requested, SFU’s capital projects have been categorized and grouped into two lists.

The first list (Attachment 3) is the prioritized list of projects that AVED is expected to contribute funds to and which fall into any one of the following three categories:

1. New Priority Projects;
2. Whole Asset Replacement and Renewal Projects; or
3. Student Housing Projects.
A second list (Attachment 4) outlines Major On-going and Planned Self-Funded Projects.

Overviews of each new, replacement/renewal capital project are listed in order of their priority. Additional financial and cash flow information, as well as a list of ongoing/self-funded projects are provided in appendices.

SFU looks forward to working with the Ministry to achieve our shared mandate of providing the highest quality teaching, research and community service to the citizens and communities of British Columbia.
SFU’S PLANNING FRAMEWORK

SFU has a vision to be the leading engaged university, as defined by its dynamic integration of innovative education, cutting-edge research, and far-reaching community engagement.

This vision has three components:

- **Engaging Students** - To equip SFU students with the knowledge, skills, and experiences that prepares them for life in an ever-changing and challenging world.

- **Engaging Research** - To be a world leader in knowledge mobilization building on a strong foundation of fundamental research.

- **Engaging Communities** - To be Canada’s most community-engaged research university.

As part of this vision, SFU has committed to the following set of principles. These guide the work and planning of the institution and have therefore guided the selection of projects for the Capital Plan.

- **Academic and Intellectual Freedom**: SFU will be an open and inclusive university whose foundation is intellectual and academic freedom.

- **Diversity**: SFU will foster a culture of inclusion and mutual respect, celebrating the diversity and multi-ethnic character reflected amongst its students, staff, faculty, and our society.

- **Internationalization**: SFU will value international knowledge, understanding and engagement, and will seek to engender an active global citizenship among its students, faculty and staff, and to ensure that SFU is an engaged partner and contributor on the international stage.

- **Respect for Aboriginal Peoples and Cultures**: SFU will honour the history, culture and presence of Aboriginal peoples. The university will welcome and nurture Aboriginal students and seek opportunities for greater representation of Aboriginal peoples amongst its faculty and staff.

- **Supportive and Healthy Work Environment**: SFU will recognize, respect and value the essential contribution made by staff and faculty, and will seek to
build and sustain a work environment that is equitable, supportive, rewarding and enjoyable.

- **Sustainability**: SFU will pursue ecological, social and economic sustainability through its programs and operations. Through teaching and learning, research and community engagement, SFU will seek and share solutions. In its own operations, it will develop and model best practices, from minimizing its ecological footprint, to maximizing its social health and economic strength.

SFU has developed an Integrated Planning Framework to help ensure that planning and resource utilization for the institution, including capital projects, remain focused and aligned with SFU’s vision, priorities and the strategic direction for the university as provided by the Academic Plan and Strategic Research Plan.
SFU has experienced exceptional growth over the past decade in support of the accessibility agenda of the Province of British Columbia. Total enrollment of Full Time Equivalent (FTE) students grew by 51% between 2005/06 and 2015/16. Enrollment at SFU’s Surrey Campus is now more than three times what it was ten years ago. The university’s inventory of spaces and facilities has meanwhile not kept pace. Original buildings have also aged significantly and many are in need of replacement or renewal.

SFU’s Five Year Capital Plan has been developed to address the current capacity pressures, respond to the growing demand and achieve SFU’s vision as the leading engaged university. The Plan is structured around four strategic initiatives:

1) Surrey Campus Expansion
2) Burnaby Campus Renewal
3) Community Engagement
4) Sustainability and Climate Action

Each of these initiatives, and the capital projects being pursued in relation to the initiatives are described below.

1) Surrey Campus Expansion

An expansion of the SFU Surrey Campus is necessary to meet the increasing enrollment demand from the fast growing university student aged population in the south Fraser Valley.

Since opening its doors in 2002, student numbers at SFU’s Surrey Campus have far exceeded the 2,500 FTE population that this campus was designed to accommodate. While total enrollments for the university grew by 3% between 2010/11 and 2015/16, those at SFU Surrey increased by 36%. Course offerings in the sciences and in areas of technology such as mechatronics have proven to be very attractive at this location. However, without expansion of the Surrey campus, qualified students from the immediate area who intend on enrolling at SFU Surrey cannot be accommodated.
The goal for this location is to carry out the mandate to become a fully comprehensive campus, with capacity for an additional 2,500 FTEs. Expansion projects for this campus also align with the priority program areas and labour market demands as identified in the BC Skills for Jobs Blueprint, with a focus on clean energy engineering, health and creative technologies.

The Surrey Campus Expansion consists of four main capital projects. Work on the first project, the Sustainable Energy and Environmental Engineering (SE³P) Building is already underway. Featured as a priority initiative in the previous Capital Plan, this state-of-the-art new building has been designed an integrated academic precinct within the Surrey City Centre. Upon completion in 2020, the SE³P Building will provide space for 320 undergraduate, 195 new graduate students in a living showcase of sustainable building standards.

The SE³P Building will host the first dedicated undergraduate energy engineering program in Western Canada accredited by the Canadian Engineering Accreditation Board. The new program and associated research will be based on an integrated approach to sustainable energy engineering education combining essential elements of policy, economics, management, entrepreneurship and leadership with a strong base of energy related engineering sciences and design.

The next three projects in the Surrey Campus enhancement are proposed to be carried out over the next 2 to 10 years. All three projects are prioritized within this Capital Plan, They are:

- **Health Systems Innovation and Sustainability Building** - a new 13,600 m² building at SFU Surrey will become home to five different programs associated with the Faculty of Health Science and the Faculty of Applied Science, providing opportunities for up to 660 undergraduate and 185 graduate students in programs including Health Systems Innovation, Population Health Promotion, Indigenous Health Development, eHealth Innovation and Informatics, Health Technology Development and Assessment.

- **Business and Creative Technologies Building** - a new 13,000 m² facility will provide space and specialized facilities to support the needs of up to 420 undergraduate FTEs and 202 graduate FTEs in business innovation, entrepreneurship and creative technologies.

- **Innovative Teaching and Other Facilities** - a new 5,500 m² building will provide space and facilities for students in the faculties of environment, education and science. The programs will be intertwined and SFU will seek to develop community partnerships and integrated educational pathways that improve employment prospects for graduates.
2) Burnaby Campus Renewal

The SFU Burnaby campus suffers from an on-going and increasingly serious deferred maintenance problem. The average Facilities Condition Index (FCI) of buildings on the Burnaby campus is 0.52, and is a measure of their overall poor condition. Eighteen core academic buildings have an FCI of 0.5 or greater.

The rehabilitation and renewal of compromised and aging facilities and infrastructure at the Burnaby campus is required to extend the useful life as well as improve the functionality, safety and sustainability of these facilities.

Addressing these critical deferred maintenance and capital renewal requirements is key to supporting students to achieve their education, employment and training goals. Campus renewal also directly supports SFU’s vision, mission and values related to improving learning conditions for students, improving research delivery areas, improving community social spaces, mitigating the cost of deferred maintenance and ensuring that SFU facilities are fiscally and environmentally sustainable.

In line with this strategic priority, SFU is planning a sequence of strategic building development, renewal and reuse projects, which, once completed, will address the most critical academic building renewal needs to the Burnaby campus.

The strategic multi-year integrated development plan will involve three steps and three large-scale projects specifically for the sciences precinct and the library on the Burnaby campus. The projects will be carried out sequentially, creating on-campus swing space for those buildings undergoing major overhauls and avoid the closure of programs and functions and maintain a positive student experience. The projects and main steps in the strategy are all contained in this Capital Plan. Brief summaries of these projects are as follows:

- **Life Sciences Research and Innovation Building Replacement** - the first project in the development plan will involve the creation of a new, state-of-the-art Life Sciences Building on a greenfield site connected to the Technology and Applied Sciences (TASC) buildings on the south side of campus. This 9,300 m² facility will be a centre for discovery and innovation in life sciences research. The new building will facilitate increasing research needs. It will also create space to allow the Shrum Biology Building to be renewed for use as swing space for subsequent major building renewal projects.
Library and Student Learning Commons Renewal – the second step in the development plan and a project which will see the renewal of the entire library building, a key community hub on campus and a centrepiece of scholarly activity which is now 50 years old. The current 23,000 m² Library building has a Facility Condition Index (FCI) rating of 0.84, which is among the highest of all SFU facilities. The project is therefore key to reducing the institution’s deferred maintenance liability. Renovations to be made will also reflect changes and growth in demand including an expanded student learning centre and improved study spaces with power and wireless Internet services.

The W.A.C. Bennett Library Building will need to be vacated completely to allow for the extensive upgrades required. Therefore, for the course of the project, all library programs and functions will move temporarily into the vacated Shrum building.

Shrum Sciences Renewal – the third and final step in the plan will involve the redesign and renewal of the Shrum Science Complex (both the Biology wing and adjacent Physics building). Originally constructed in 1965 with additions in the 1970’s and 1980’s, the 10,305 m² Biology wing is in very poor condition with a current FCI of 0.84 and a VFA estimate of $53M in deferred maintenance and capital renewal needs. Constructed in 1970, the adjacent 10,305 m² Physics building is in a similar state with an FCI of 0.77 and a VFA estimate of $38M in deferred maintenance and capital renewal needs.

The Shrum Science Project will see a complete renewal of the systems and infrastructure elements in both buildings, including a redesign of laboratory areas to support contemporary academic research, graduate students and faculty offices.

The Burnaby Campus Renewal also entails the renewal of two other central public space precincts of campus.

Convocation Mall Renewal Project – an initiative to completely rebuild this pivotal space on campus, which is part of the iconic architecture of the SFU Burnaby campus and the primary celebration space for major University events and official gatherings such as convocation. The project will include a seismic upgrade and renewal of the supporting structure, staircases. Lighting, and mechanical systems.

Multi-Purpose Complex Renewal Project (RC Brown) – a project that will address subsurface moisture penetration, above-grade envelope replacement, and replacement of hot water heating system in this complex. The 13,000 m² building, which was built in 1970, is in poor
condition with a current FCI rating of 0.77 and a VFA estimate of $34M in deferred maintenance and capital renewal needs. It is comprised primarily of classrooms, computer laboratories, a lecture theatre and offices.

- **Academic Quadrangle, Renewal Phase 1** - a project to undertake the initial phase of upgrades to restore the oldest, largest, most iconic and most heavily utilized building on the SFU Burnaby Campus. This first phase will address envelop, HVAC, lighting, finishes and functional upgrades and improvements in select areas of this 27,420 m² building.

3) **Community Engagement**

The strategic initiative of community engagement is a key element of SFU’s vision as a leading engaged university. Being an engaged university means having facilities that attract students, enhance the student experience as well as support, contribute to and enhance the local community. In line with this initiative, work is underway on several self-funded projects including a new art gallery and improvements to the student residences, campus recreation and athletics facilities. In addition, this Capital Plan includes a new Aboriginal Peoples’ Gathering Space on the SFU Burnaby Campus.

- **Aboriginal Peoples’ Gathering House** - This unique project will see the development of a new facility dedicated to providing a Gathering House. This will be a space to host cultural events, celebrations, and workshops for the Aboriginal and campus-wide community.
4) Sustainability and Climate Action

Sustainability and Climate Action is a crosscutting strategic initiative that influences the planning and implementation of all of the projects in the Capital Plan: both the new projects and the renewal and replacement projects.

This initiative aligns with Provincial government mandates and objectives around carbon neutrality, public sector greenhouse gas emissions reductions, and infrastructure renewal. It also supports the 20-year goals and a series of policies that the University has established around sustainability, including targets for displacing the use of fossil fuels to reduce GHG emissions as follows:

- 33% by 2020 (using a 2007 baseline);
- 80% by 2050 (using a 2007 baseline).

Directly in line with SFU’s Sustainability and Climate Action initiative, is the new biomass heating plant, which is among the self-funded project listed in this Capital Plan. This heating plant will burn organic material to service SFU’s Burnaby Campus and the UniverCity community on Burnaby Mountain. At build-out, the plant is expected to reduce campus greenhouse gas (GHG) emissions from all sources by approximately 70 percent.

Both new and renewal projects in this Capital Plan have adopted a holistic view which considers the University’s environmental footprint. New buildings are designed to meet high performance energy standards and LEED Gold Standard. Projects seek to enhance the operational efficiency of existing buildings and avoid unnecessary waste. Similarly, infrastructure improvements aim to achieve reductions in energy use and greenhouse gas emissions, while conserving water.

Where possible, the re-use of existing structures is the decision of choice. In addition to physical upgrades, emphasis is also placed on "soft tissue" changes such as behavioral change programs and improved communications to engage the community in support of energy conservation and sustainability programming.
PLANNING ASSUMPTIONS

It is assumed that the facilities and infrastructure necessary to accommodate normal and/or targeted enrolment growth will be funded by AVED in accordance with the BC Space Standards - and using an appropriate Unit Rate Budgeting methodology that recognizes elemental unit costs and reasonable projections of cost escalation.

Estimated construction costs are indicative cost estimates produced with the most current information available and with the assistance and validation of credible and qualified quantity surveyors. At the time of project approval, funding an appropriate adjustment for change of scope and escalation may be required.

All future projects will be executed in accordance with campus planning principles, design standards and functional requirements, and the government mandate to achieve LEED Gold, or equivalent, for new construction and LEED Silver for major renovation and renewal projects. As well, the University will honour the Wood First Initiative and will comply with The Capital Asset Management Framework, the Greenhouse Gas Reductions Target Act, and the Capital Asset Reference Guide.

The projects described in the balance of this plan use reasonable parametric assumptions. The plan attempts to address those areas that are currently in a deficit position or where the condition of a building or infrastructure asset is compromised to the point of requiring renewal, rehabilitation or replacement.
5 PROJECT OVERVIEWS

NEW PRIORITY PROJECTS & WHOLE ASSET AND RENEWAL PROJECTS (CATEGORY 1 & 2)
1.0 Current Situation

- The existing Shrum Biology Building does not adequately provide for today’s biology teaching and research programs.
- The Life Sciences Research and Innovation Building would be the first step of a multiyear, integrated development plan that would create new space to replace the derelict Shrum Biology building as well as establish a swing space for the university Library and Student Commons to allow for a full renewal of the W.A.C. Bennett Library Building.

2.0 Project Description

- The Life Sciences Research and Innovation Building will be a centre for discovery and innovation.
- Interdisciplinary teams of scientists will solve problems ranging from agricultural challenges to human disease to species preservation.
- Housing 1000 faculty, staff and students, the 9,300 m² replacement facility will strengthen partnerships between researchers and organizations to support resource and industry sectors as well as BC and SFU’s goals for sustainability.

3.0 Project Objectives

- The new building will facilitate increasing research needs and vacating existing outdated teaching and research facilities to allow renovations to accommodate life sciences teaching needs in space designed for traditional and new project based teaching models.
- The project has been conceived in response to changing needs in life sciences teaching and research.
- The new building will provide state-of-the-art research facilities.
4.0 Options Considered

- After reviewing multiple options, the Life Sciences Research and Innovation Building has been conceived as the most efficient approach: providing a necessary swing space during the renewal of the Shrum Biology Wing in the short term; and extra space for the rapidly expanding life sciences research and innovative faculties in the longer term.

5.0 Project Outcomes

- **Infrastructure Improvements:**
  
  - This project will improve space efficiency through the use of larger, open research labs that allow for greater sharing of centralized supports spaces and flexibility to accommodate the expansion and contraction of research projects.

- **Cost Effectiveness:**
  
  - A new energy efficient design will reduce current energy use resulting in cost savings.
  
  - Efficient design will provide higher space utilization, hence more value for money spent.
  
  - A flexible “plug and play” infrastructure will reduce the cost of changes and time for implementation of future programs.

- **Innovation:**
  
  - The Life Sciences Research & Innovation Building will be an integrative research centre enabling research team members with diverse experience to work together on cross-disciplinary problems ranging from climate change to disease proliferation.
  
  - Such interdisciplinary collaborations are critical to innovation and have resulted in knowledge transfer with significant industrial, commercial and social impacts.
  
  - While the building will house 1,000 faculty, staff and students, many more will utilize and benefit from the building’s innovation space.
  
  - The new laboratories will improve recruitment and retention of top faculty and students. They will also help to improve translational research and commercialization success.
A large number of small, undersized, inefficient lab rooms will be opened up and replaced with larger, flexible labs to make better use of space.

- **Strategic Alignment:**
  - The Life Sciences Research and Innovation Building is directly aligned with the Ministry Service Plan objective of building on current strengths to enhance the quality of our post-secondary education.
  - The project aligns with the institutional priorities of providing a dynamic integration of innovative education, cutting-edge research and equipping SFU students with the knowledge, skills, and inter-professional learning experiences necessary to succeed in an ever-changing and challenging world.

- **Quality Education:**
  - A new leading edge research facility will provide opportunities for all students to engage in research programs that will provide project-based hands-on learning opportunities.
  - The new building will allow for larger labs (improving course capacity and student access) and incorporate flexible space that is designed for innovative experiential learning and is brighter, better organized, and more desirable for students to use.
  - The consolidation of faculty programming will free up space in other buildings and facilitate collaborative learning.
  - In incorporating more ancillary equipment space, the new design will also expand the scope of course activities that can be pursued.

- **Energy and Emission Reduction:**
  - The new building will be designed to LEED Gold standards. Through high efficiency energy performance and space design, the net improvement in energy performance is estimated to be a minimum of 15% in comparison to the 1965/70 building.
  - The vacated building will also be repurposed in the future to support other university functions.

### 6.0 Project Cost/Funding

- Total estimated capital cost of the Life Sciences Research & Innovation Building is $70 Million.
7.0 Key Risks

- Risks of cost escalation will be mitigated by confirming budget estimates and ensuring appropriate contingencies. Major equipment will also be pre-ordered in the event of market-driven escalations.
- Schedule overruns will be mitigated through the use of rigorous review and approval processes for timely approvals. Users groups will be engaged early in the design process. Equipment lists will also be established early in the process.
- Unforeseen infrastructure connection issues will be mitigated by a detailed analysis of existing infrastructure during design.
- Delays and issues associated with required Municipal approvals will be mitigated by liaising with the City early on in the design phase of the project and adjusting the project schedule as necessary.

8.0 Project Schedule

- Design of the Life Sciences Research & Innovation Replacement Project is scheduled to commence in Q1 2018/19. Construction completion and occupancy are expected in April 2022.

*Quarters relate to a fiscal year end of March 31st*
1.0 Current Situation

- There were 662 Aboriginal students attending SFU in 2015-16, including 494 undergraduate students and 168 graduate students.
- Programs and services to support Aboriginal students are presently diffused throughout various locations around the Burnaby campus and there is no gathering space to accommodate a large gathering.

2.0 Project Description

- This Project will result in the development of a dedicated facility for an Aboriginal Gathering Space for First Nations students and activities on campus.
- The new building will include a large ceremonial hall, prep kitchen and support space.
- The size of the building program is 1,200 m².

3.0 Project Objectives

- This project is needed to support the participation of First Nations peoples in post-secondary education on the SFU campus. The project will create a place for Aboriginal students, staff, and faculty who come from across British Columbia, Canada, and the world, to feel at home and make friends. It will be a place where their cultures and backgrounds are respected and supported. Such a place of pride and culture becomes a tangible recruitment tool and a place to enhance the retention of Aboriginal students, staff, and faculty.
- The Aboriginal Peoples’ Gathering House will be a place where cultural events, celebrations, and workshops can be held for the Aboriginal and campus-wide community. It will be a place to share Aboriginal culture as members of the University and off-campus community would come to the Aboriginal Peoples’ Gathering House to inquire and learn. It will also be an honoured place from which to make connections to local Aboriginal communities and a recognized symbol of the SFU commitment to these communities.
A centerpiece of the Aboriginal Peoples’ Gathering House will be a traditional-style Ceremonial Hall. This hall will be a place to hold conferences, social and cultural events, and celebrations — for example, the special Honoring Feast for SFU Aboriginal graduates. It will be a place to welcome special dignitaries to the Burnaby campus. Such a Ceremonial Hall in a beautiful Aboriginal Peoples’ Gathering House will be a signature room and building on the campus, recognized across the University, city, province, and country.

4.0 Options Considered

- All three of SFU’s campuses are on unceded First Nations territory. In 2015, a First Peoples’ Gathering Space was opened at the Vancouver campus and a space has been dedicated for this purpose at the Surrey campus. It is now necessary to provide a facility to engage the larger Aboriginal students and community in Burnaby.
- In order to fulfil its intent as a space appropriate and desirable for cultural gatherings and celebrations, the new space needs to be designed to reflect Aboriginal culture.
- Renovation of existing facilities on campus was considered, but rejected, as there was no suitable location with enough vacant space.

5.0 Project Outcomes

- The project will help to improve the engagement of Aboriginal students and the Aboriginal community, and improve participation and outcomes in post-secondary education for First Nations peoples.

**Infrastructure Improvements:**

- The Aboriginal Peoples’ Gathering House will provide a unique space for the engagement of Aboriginal students and the Aboriginal community.
- The new building will also contribute to the cultural diversity on campus and provide an added space for gatherings and celebrations.

**Strategic Alignment:**

- The project aligns with the AVED Aboriginal Service plan to “Increase access, retention, completion and transition opportunities for Aboriginal
learners, strengthen partnerships and collaboration in Aboriginal post-secondary education and increase the receptivity and relevance of post-secondary institutions and programs for Aboriginal learners.”

- It also aligns with SFU’s commitment to becoming the leading “engaged” university in Canada, defined by its dynamic integration of innovative education, cutting edge research, and far reaching community engagement. This project will assist the University in realizing this vision with respect to the underlying principle of “respect for Aboriginal peoples and culture” by:
  - Engaging Aboriginal students and equipping them with the knowledge, research skills, and experiences to prepare them for life in an ever-changing and challenging world;
  - Stimulating research in the service of Aboriginal peoples; and
  - Engaging Aboriginal communities in every way possible to contribute to their social, economic, environmental, and cultural well-being.
  - Honouring the history, culture, and presence of Aboriginal peoples. The University will welcome and nurture Aboriginal students.

6.0 Project Cost/Funding

- The estimated capital cost of the Aboriginal Peoples’ Gathering House is $15 Million.
- This project is expected to be funded partially from AVED and donations.

7.0 Key Risks

- Risks of cost escalation will be mitigated by confirming budget estimates and ensuring appropriate contingencies. Major equipment will also be pre-ordered in the event of market-driven escalations.
- Schedule overruns will be mitigated using rigorous review and approval processes for timely approvals. Users groups will be engaged early in the design process. Equipment lists will also be established early in the process.
8.0 Project Schedule

- Planning of the Aboriginal Peoples’ Gathering House Project is scheduled to begin in April 2018. The project is slotted for completion and occupancy in April 2021.

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*Quarters relate to a fiscal year end of March 31st.
1.0 Current Situation

- Since opening its doors in 2002, SFU’s Surrey Campus has grown to more than the 2,500 FTE in 32,257 m² (347,211 sf) with no room for expansion.
- Surrey Campus was planned on 135 sf per FTE, which is significantly lower than the Ministry Space Standard that yields approximately 175 sf per FTE.
- SFU is seeing increasing enrollment demand from the fast growing university student-aged population in the south Fraser Valley.
- The next phases of development at Surrey Campus are being planned to accommodate the next forecasted enrollment growth of 2,500 FTEs and allow SFU Surrey to keep pace with growing demand. The Health Systems Innovation and Sustainability Project is a key component of that expansion.

2.0 Project Description

- This project will provide space for science, health and technology programs and will be comprised of classrooms, research and teaching laboratories, academic and support spaces, and a data centre to serve the SFU Surrey campus.
- The collection of five programs associated with the Faculty of Health Science and the Faculty of Applied Science will provide opportunities for up to 660 undergraduate FTEs and 185 graduates FTEs in programs including Mechatronics (which will share part of Phase 1 lab space), Health Systems Innovation, Population Health Promotion, Indigenous Health Development, eHealth Innovation and Informatics, Health Technology Development and Assessment. Students in all concentrations will be offered the opportunity to complete a Minor in “Innovation and Entrepreneurship” from the Beedie School of Business.
- The estimated size of this project is 13,600 m².
3.0 Project Objectives

- The project will add programs to train students for careers in health, mechatronics and applied sciences where job growth in BC is expected to grow annually by 2.4% to 2020 and where an estimated 90,000 new or replacement workers will be needed according to the BC Labour Market Outlook 2010-2020.

- Science, Health and Technology programs will be offered to support other academic initiatives to provide disciplinary breadth and academic choice for students completing programs and degrees in Surrey.

- The purpose of this program is to train the leaders of the future who will develop and translate innovative ideas into evidence-informed practices that improve the planning, delivery, and outcomes of health care. The programs will prepare students to be problem-solvers, innovators, advocates, administrators, and leaders to meet health system-related needs in Surrey, British Columbia, and beyond. The program will generate evidence and translate evidence-informed ideas into improved systems of health promotion, disease prevention, and health care delivery. No other university or college in BC has developed a multi-disciplinary program focused on innovation for the future of this breadth or depth.

4.0 Options Considered

- The nature of science teaching and research requires hands-on experience in a laboratory setting. Alternative means of teaching and research without lab experience is not practical. Specialized lab facilities are not generally available in the marketplace and those that might be typically are not designed to meet the building code requirements for assembly use as required for university teaching functions. Locations distant from the Burnaby campus are also not practical.

- Extensive investigation of partnerships with private developers and the Surrey Development Corporation have not resulted in any viable facilities alternative.

- The project supports the development a university campus as part of the new Surrey downtown civic centre precinct.
5.0 Project Outcomes

- **Infrastructure Improvements:**
  - The project will allow for expansion of new graduate and undergraduate programs in science, health and technology at the Surrey campus, and provide support space for existing programs.

- **Strategic Alignment:**
  - This project will accommodate growth and labour market demand driven capacity. The project provides the opportunity for industry-based collaborations for which SFU Surrey has a strong reputation. The programs offered in this building will provide the training and education required to meet BC’s labour market needs and maintain a competitive economy. SFU is the only BC research university with plans to significantly grow its undergraduate student population.
  - The expansion of Surrey’s campus buildings and academic programs will support the institution’s vision for the integration of innovative education, cutting edge research and far-reaching community engagements. SFU Surrey has been a living example of what it means to be an “engaged university”.
  - This project is needed to meet the increasing enrollment demand from the fast growing university student aged population in the south Fraser Valley.

- **Energy and Emission Reduction:**
  - The project will be designed to LEED Gold Standard. The building will also be connected to the City of Surrey district energy system, which will utilize various low GHG emission sources.

6.0 Project Cost/Funding

- The estimated project costs are $90 Million.
- This project is expected to be funded by AVED. There are on-going discussions with other institutional and municipal bodies regarding the possibility of making this part of a larger development on the site.
- It is assumed that operating funding would be provided by AVED based on standard funding per FTE formula.
7.0 Key Risks

- Risks of cost escalation will be mitigated by confirming budget estimates and ensuring appropriate contingencies. Major equipment will also be pre-ordered in the event of market-driven escalations.
- Schedule overruns will be mitigated using rigorous review and approval processes for timely approvals. Users groups will be engaged early in the design process. Equipment lists will also be established early in the process.

8.0 Project Schedule

- The Planning Phase of the Health Systems Innovation and Sustainability Project is scheduled to commence in April 2019. The project will be completed by the end of 2022.

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*Quarters relate to a fiscal year end of March 31<sup>*</sup>.
1.0 Current Situation

- The W.A.C. Bennett Library facility is a key public building on the Burnaby campus that is now over 48 years old. The building is 23,000 m² and is comprised primarily of study areas, book storage and some administrative offices on the top floor.

- This building is in poor condition with a current FCI assessment of 0.84. Renewal of the building’s HVAC system make up 38% of the total $78.2M in renewal requirements. Electrical distribution equipment and fire protection systems also require updating. The exterior building enclosure such as windows and roofing, as well as interior construction systems are beyond useful life. Despite recent washroom interior upgrades, the overall plumbing system still requires renewal. To carry out this major renewal work, building seismic upgrades will also be required. Extensive consultant investigation of seismic upgrades have recommended that new shear walls and footings are required, and the building is considered a high priority for upgrades to bring it up to current building codes.

- The building requires a major infrastructure upgrade to extend the life of the building and to address life safety, seismic, and accessibility issues.

- Renewal of the W.A.C. Bennett Library building will be conducted as part of a multi-phased, integrated development plan. Work on the project will commence once the Life Sciences Building is constructed and the Shrum Biology Building is vacated. Library programs and functions will temporarily move into the Shrum swing space during construction so as minimize disruptions to students, faculty and staff.

2.0 Project Description

- Reorganization and renewal of the entire building is required to accommodate changes and growth in demand including expanded student learning centre and improved study spaces with power and wireless Internet services.

- Material storage areas will be consolidated into more efficient storage and retrieval systems to free up space.
• Spaces to support student study and learning will be created including tutorial
  rooms, private and group work areas.
• Basic infrastructure and code improvements are also needed including seismic
  upgrades, washroom improvements, additional electrical and data services
  and accessibility improvements.

3.0 Project Objectives
• This project aims to address deferred maintenance backlog, code and life
  safety systems deficiencies and improve accessibility.
• It will also modernize the functionality of library facilities to suit current practices
  and to support the student academic experience. Demand for library services
  has changed with less space needed for storage of hard copy materials. This
  project will involve a redesign to provide a diversity of spaces to support
  learning and collaboration.

4.0 Options Considered
• The most cost effective and practical option is to re-use the existing building.
• There are no other buildings on campus that have space and would be
  suitable to host the library function. Locating off campus would be impractical
  given the need for students and faculty to access other resources available
  only on campus. The cost of acquiring and renovating an off-site building
  would far exceed the cost of renewing the existing Library Building.

5.0 Project Outcomes
• Infrastructure Improvements:
  o The project will provide an improved environment to support teaching for
    undergraduate and graduate academic programs. The renewed facilities
    will also support enhanced research activities.
  o The project is expected to reduce the FCI to below 0.1 and will resolve all
    life-safety and building code deficiencies.
  o Renovating the space in line with how libraries have come to be used will
    also enhance space utilization.
• Cost Effectiveness:
  o The project will resolve significant deferred maintenance requirements.
Cost savings will be accrued through more modern and efficient building systems.

Re-use of the existing structure will also be more cost effective than demolition and rebuilding.

**Innovation:**

- The renewal project contemplates several innovative program changes to enhance the library’s role and significance as a center of learning and collaboration of the university. These include a new Digitization Lab, up to 50 team rooms, a new Data Visualization Studio, and an expansion of the Research Commons.

**Strategic Alignment:**

- The improved Library Building supports the Ministry Service Plan objective of building on current strengths to enhance the quality of our post-secondary education.

- The project aligns with the institutional priorities of providing a dynamic integration of innovative education, cutting-edge research and equipping SFU students with the knowledge, skills, and inter-professional learning experiences necessary to succeed in an ever-changing and challenging world.

**Quality Education:**

- The Library provides essential services to support learning activities including access to literature, study space and learning support.

**Energy and Emission Reduction:**

- The project will include the renewal of several building enclosure components that affect the performance of the building, including resistance to water ingress and associated deterioration of components, as well as occupant comfort and heat transfer.

- Resealing activities and the renewal of roof membranes, as well as the additional of increased insulation at the roof and decks, the use of better performing glazing systems (for example, the use of thermally improved frames, and double or triple glazing), the over-cladding exposed concrete with exterior insulated assemblies and improvements to the air barrier system to reduce air leakage will have a significant affect in improving the energy efficiency of the facility and reducing greenhouse gas emissions.

6.0 Project Cost/Funding
The total estimated capital cost is $80 Million.

This project will be funded by AVED.

There is little expected cost impact on operating or program costs as there is no expansion of program delivery anticipated.

7.0 Key Risks

- There is a risk that instructional activity will be disrupted if the Library and Student Commons renewal project is not completed on time. Such disruptions will be mitigated through comprehensive, realistic and well-communicated scheduling of activities. Clear requirements, roles and responsibilities and work completion milestones will be established with the City and project team. “Safe to occupy” and phased occupancy back-up plans. A comprehensive communication strategy will also be put in place to ensure campus community informed of work in progress.

- Risks of cost escalation will be mitigated by confirming budget estimates and ensuring appropriate contingencies. Major equipment will also be pre-ordered in the event of market-driven escalations.

- Schedule overruns will be mitigated using rigorous review and approval processes for timely approvals. Users groups will be engaged early in the design process. Equipment lists will also be established early in the process.

8.0 Project Schedule

- Planning of the Library and Student Commons Renewal Project is scheduled to commence in April 2019. The project is slotted for completion in December 2023.

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*Quarters relate to a fiscal year end of March
# 1.0 Current Situation

- Since opening its doors in 2002, SFU’s Surrey Campus has grown to more than the 2,500 FTEs in 32,257 m² (347,211 sf) with no room for expansion. Surrey Campus was planned on 135 sf per FTE, which is significantly lower than the Ministry Space Standard that yields approximately 175 sf per FTE.
- SFU Surrey is seeing increasing enrollment demand from the fast growing university student-aged population in the south Fraser Valley.
- The next phases of development at Surrey Campus are being planned to accommodate the next forecasted enrollment growth of 2,500 FTEs and allow SFU Surrey to keep pace with growing demand. The Business and Creative Technologies Project is a key component of that expansion.

# 2.0 Project Description

- This new building will be the third of a four phase expansion of Surrey Campus that will provide space required to serve the needs of 2,500 additional FTEs within a comprehensive and full service campus of 5,000 FTEs.
- This phase will provide for creative technologies studies and will have specialized facilities such as a games studies laboratory for students, large screen and mobile screen interfaces, a 3-D printing laboratory with industrial strength flooring, an innovation laboratory for student teams, and an innovative consultation space with video conference capability to link student teams to industry mentors.
- The project will provide classrooms, research and teaching laboratories, and academic and staff support spaces.
- This project will provide space required to serve the needs of up to 420 undergraduate FTEs and 202 graduate FTEs in Business Innovation and Entrepreneurship and Creative Technologies.
- The estimated size of this project is 13,000 m².

# 3.0 Project Objectives
Entrepreneurship and innovation are fundamental to economic growth and prosperity in Canada. Students at SFU with undergraduate degrees outside of Business would benefit from an accessible Minor in Business offered at the Surrey campus focused on venture development (entrepreneurship) and innovation within organizations (intrapreneurship).

Business majors in this concentration will select into one of two broad themes of Science and Technology Entrepreneurship or Social Entrepreneurship. Students in the Business major concentrating in entrepreneurship and Innovation could work to earn space in Surrey Incubator through competition. Limited spaces would be provided for both Technology as well as Social Entrepreneurship.

Creative technologies will reshape the way we experience the world in the 21st Century. The convergence of media, entertainment and communication will bring together historically separate industries, revolutionizing usual business methods. Development in social media, big data, gamification (i.e. the application of typical elements of game playing to other areas of activity) and the creative economy will transform the way businesses reach, engage, and manage their employees and customers.

The projected annual growth in employment in the tech sector is 3,000 to 4,000 new jobs, many with requirements for new skill sets. Unfortunately, according to a 2012 analysis from BCTIA, BC is well behind the Canadian average in producing graduates in this area. SFU programs will answer the need for creative technologies workers across the economy.

182,000 job openings in BC are expected by 2020 in the Business, Finance and Administration occupations according to the BC Labour Market Outlook 2010-2020.

4.0 Options Considered

- Extensive investigation of partnerships with private developers and the Surrey Development Corporation have not resulted in any viable facilities alternative.
- The project supports development a university campus as part of the new Surrey downtown civic centre precinct.

5.0 Project Outcomes

- Infrastructure Improvements:
The project will allow for expansion of new graduate and undergraduate business and other programs at the Surrey campus, and provide support space for existing programs. The project will help to enhance the development of the Surrey Central City community.

**Strategic Alignment:**

- This project will accommodate growth and labour market demand driven capacity. The project provides the opportunity for industry-based collaborations for which SFU Surrey has a strong reputation. The programs offered in this building will provide the training and education required to meet BC’s labour market needs and maintain a competitive economy. SFU is the only BC research university with plans to significantly grow its undergraduate student population.

- The expansion of Surrey’s campus buildings and academic programs will support the institution’s vision for the integration of innovative education, cutting edge research and far-reaching community engagements. SFU Surrey has been a living example of what it means to be an “engaged university”.

- This project is needed to meet the increasing enrollment demand from the fast growing university student aged population in the south Fraser Valley.

**Energy and Emission Reduction:**

- The project will be designed to a LEED Gold Standard. The building will also be connected to the City of Surrey district energy system, which will utilize various low GHG emission sources.

### 6.0 Project Cost/Funding

- The estimated project costs are $90 Million.

- There are on-going discussions with other institutional and municipal bodies regarding the possibility of making this part of a larger development on the site.

- It is assumed that operating funding would be provided by AVED based on standard funding per FTE formula.
7.0 Key Risks

- Risks of cost escalation will be mitigated by confirming budget estimates and ensuring appropriate contingencies. Major equipment will also be pre-ordered in the event of market-driven escalations.
- Schedule overruns will be mitigated using rigorous review and approval processes for timely approvals. Users groups will be engaged early in the design process. Equipment lists will also be established early in the process.

8.0 Project Schedule

- Planning of the Business and Creative Technologies Building is scheduled to commence in Q1 of 2020 for completion in December 2023.

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*Quarters relate to a fiscal year end of March 31st.*
1.0 **Current Situation**

- Convocation Mall was built in 1965 as part of the initial phase of building the SFU Burnaby campus. It is the primary celebration space for major University events and official gatherings such as convocation.

- Convocation Mall is a large outdoor mall built as the ‘roof’ of a large multi-storey parkade. It is covered by a large glass panel roof that sits atop concrete columns and a wood and steel frame. Concrete walkways run along both sides of the mall.

- The Mall is aging and in need of significant upgrading. The roof structure does not have adequate load capacity for the snow load experienced on Burnaby Mountain. The columns and steel frame do not meet current seismic code requirements. It has an FCI of 0.61 and a VFA estimate of $5.4M in deferred maintenance and capital renewal needs.

2.0 **Project Description**

- The roof and supporting structure will be upgraded to meet current seismic code. The staircases to the parking level will be upgraded, as will the electrical and mechanical systems.

3.0 **Project Objectives**

- Building on the ongoing plaza renewal project, this project will reduce the deferred maintenance backlog. It will eliminate the risk of failure of the roof structure in a snow or seismic event.

- It will improve the student experience by restoring the quality of the primary gathering place on the SFU Burnaby campus.

- It will help SFU to engage the community by providing an improved gathering space for various community events.

4.0 **Options Considered**

- Convocation Mall is part of the iconic architecture of the SFU Burnaby campus and serves a vital functional purpose for the life of the campus. Restoration or re-
Evaluation of the best option will be completed during the planning stage of the project.

5.0 Project Outcomes

- **Infrastructure Improvements:**
  - The project will eliminate the deferred maintenance issues with the Mall. This asset is not included in the VFA database; therefore, no FCI measurement.

- **Strategic Alignment:**
  - The Mall is a vital component in supporting the activities of campus life at SFU Burnaby. It provides a place where numerous student functions are held each year. All convocations in the entire history of SFU have taken place in Convocation Mall. It provides a place where SFU is able to engage with the community for various public events that take place in the Mall and the facilities that align along the mall such as the University Theatre and Library.
  - Renewal of the Convocation Mall is therefore well aligned with SFU's priorities around community engagement.
  - It also supports the Ministry objective of building on current strengths to enhance the quality of our post-secondary education.

- **Energy and Emission Reduction:**
  - Convocation Mall is a large, covered open space that uses no heat or air conditioning. New lighting installed as part of the renewal will use LED fixtures to increase energy efficiency.

6.0 Project Cost/Funding

- The estimated project costs are $20 Million.
- This project is expected to be funded by AVED and private donations.

7.0 Key Risks

- There is a technical and logistical challenge with this project posed by removing and replacing the roof over an active campus space. This challenge will be mitigated through careful scheduling and a phased work plan.
- Disruptions to SFU students and staff will be mitigated through clear and realistic scheduling of activities. There will be a transfer of responsibility to the General Contractor to develop plans for safety, tie-ins, shutdowns, etc., as part of fixed price
lump sum contract. There will also be a comprehensive communications strategy developed and implemented to ensure campus community informed of work in progress.

- Risks of cost escalation will be mitigated by confirming budget estimates and ensuring appropriate contingencies. Major equipment will also be pre-ordered in the event of market-driven escalations.

- Schedule overruns will be mitigated using rigorous review and approval processes for timely approvals. Users groups will be engaged early in the design process. Equipment lists will also be established early in the process.

8.0 Project Schedule

- The Convocation Mall Renewal Project is scheduled to commence in Q1 of 2020. Construction will be completed in December 2022.

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*Quarters relate to a fiscal year end of March 31st.*
### 1.0 Current Situation

- The Multi-Purpose Complex was constructed in 1970. The building is 13,000 m² in size and comprised primarily of classrooms, computer laboratories, a lecture theatre and offices.
- This building is in poor condition with a FCI assessment of 0.69 and a VFA estimate of $34M in deferred maintenance and capital renewal needs.
- It has significant deficiencies with respect to the condition of mechanical and electrical systems. The exterior enclosure including windows and skylights are overdue for renewal. The interior construction and building finishes are worn out. Seismic assessments show this building is of moderate to high priority and requires additional seismic study.
- The intent of the project is to retain and renew the existing building.
- The current upgrade project will address subsurface moisture penetration, above-grade envelope replacement, and replacement of hot water lines that are prone to failure. The project scope also includes upgrades to seismic, fire alarm, sprinkler, plumbing, HVAC or electrical systems.

### 2.0 Project Description

- The project includes renewal of major building systems and infrastructure elements.
- Training areas will be redesigned to align to modern teaching approaches using flexible active learning classroom concepts. Improvements will be made to general circulation and emergency exit routes.
- All areas will be upgraded to current code guidelines and will provide appropriate life safety systems including the addition of fire sprinklers.
- The main electrical and mechanical systems will also be upgraded to improve indoor air quality and energy efficiency.
- All interior finishes, hardware and lighting will be replaced.
- The seismic performance will be upgraded to a minimum of 75% of current code, addressing major life safety issues.
3.0 Project Objectives

- The project will support SFU’s strategic vision of innovative education and cutting edge research by improving learning conditions for students and improving research delivery areas.
- Renewal will address the deferred maintenance backlog and mitigate the ongoing cost of short-term maintenance repairs and continued risk of systems failures and their impact on the education and research activities in the Multi-Purpose Complex.
- Design changes will improve the functionality of teaching facilities to promote contemporary learning practices and to support the student academic experience.
- Systems replacement will improve the energy efficiency of the building.

4.0 Options Considered

- The most cost effective and practical option is to re-use the existing building.
- Locating off campus would be impractical given the need for students and faculty to access other resources available only on campus.
- The cost of acquiring and renovating an off-site building would far exceed the cost of renewing the existing Multi-Purpose Complex. Full replacement of the Multi-Purpose Complex is estimated to cost $70M.

5.0 Project Outcomes

- Infrastructure Improvements:
  - The project will resolve significant deferred maintenance requirements and provide an improved environment to support teaching for undergraduate and graduate academic programs.
  - The project is expected to reduce the FCI to below 0.1 and will resolve all life-safety and building code deficiencies.
**Cost Effectiveness:**

- The project will result in a building that will meet LEED Gold standard. Energy consumption will be reduced through more efficient building systems. Re-use of the existing structure will be more cost effective than demolition and rebuilding.

**Innovation:**

- The project will result in the creation of flexible and responsive teaching and working environments including:
  - Spaces that are able to support new technologies;
  - Flexible and open space for teaching, learning and working; and
  - Increased access to natural light.

**Strategic Alignment:**

- The improved Multi-Purpose Complex supports the Ministry Service Plan objective of building on current strengths to enhance the quality of our post-secondary education.

- The project also aligns with the institutional priorities of providing a dynamic integration of innovative education, cutting-edge research and equipping SFU students with the knowledge, skills, and experiences that prepares them for life in an ever-changing and challenging world.

**Quality Education:**

- The renewed facilities will provide support for enhanced research activities.

- Redesigned training areas will enable the use of modern teaching approaches and flexible active learning classroom concepts.

**Energy and Emission Reduction:**

- The building will contribute to sustainability by re-using an existing building, improving energy efficiency and reducing greenhouse gases.

### 6.0 Project Cost/Funding

- The estimated project budget is $40 Million.

- This project is to be funded by AVED.

- There is little expected cost impact on operating or program costs as there is no expansion of program delivery anticipated.
7.0 Key Risks

- There is a risk that instructional activity will be disrupted should the work on this project not be completed on time. Such disruptions will be mitigated through comprehensive, realistic and well-communicated scheduling of activities. Clear requirements, roles and responsibilities and work completion milestones will be established with the City and project team. “Safe to occupy” and phased occupancy back-up plans will be developed and a comprehensive communication strategy will be put in place to ensure campus community informed of work in progress.

- Risks of cost escalation will be mitigated by confirming budget estimates and ensuring appropriate contingencies. Major equipment will also be pre-ordered in the event of market-driven escalations.

- Schedule overruns will be mitigated using rigorous review and approval processes for timely approvals. Users groups will be engaged early in the design process. Equipment lists will also be established early in the process.

8.0 Project Schedule

- The design phase of the Multi-Purpose Complex Renewal Project is scheduled to commence in April, 2021. The project is expected to be completed in March, 2025.

*Quarters relate to a fiscal year end of March 31.
1.0 Current Situation
- Since opening its doors in 2002, SFU’s Surrey Campus has grown to more than the 2,500 FTE in 32,257 m² (347,211 sf) with no room for expansion.
- Surrey Campus was planned on 135 sf per FTE, which is significantly lower than the Ministry Space Standard that yields approximately 175 sf per FTE.
- SFU is seeing increasing enrollment demand from the fast growing university student-aged population in the south Fraser Valley.
- The next phases of development at Surrey Campus are being planned to accommodate the next forecasted enrollment growth of 2,500 FTEs and allow SFU Surrey to keep pace with growing demand. The Innovative Teaching and Other Facilities Project is a key component of that expansion.

2.0 Project Description
- This building will be the last of a four phase expansion that will provide space required to serve the needs 2,500 additional FTE within a comprehensive and full service campus of 5,000 FTE.
- This phase will provide for innovative teaching programs and graduate and research facilities and will include classrooms, research and teaching laboratories, and academic offices.
- This project will provide space required to serve the needs of 490 undergraduate students and facilities for other graduate students in bridge programs.
- The estimated size of this project is 5,500 m².

3.0 Project Objectives
- The building will provide space for students in Faculty of Environment, Education and Science. The programs will be intertwined and SFU will seek to develop community partnerships and integrated educational
4.0 Options Considered

- The nature of integrated teaching and research requires hands-on experience in a laboratory setting. Alternative means of teaching and research without lab experience is not practical. Specialized lab facilities are not generally available in the marketplace and those that might be typically are not designed to meet the building code requirements for assembly use as required for university teaching functions. Locations distant from the Burnaby campus are also not practical.

- Extensive investigation of partnerships with private developers and the Surrey Development Corporation have not resulted in any viable facilities alternative.

- The project supports development a university campus as part of the new Surrey downtown civic centre precinct.

5.0 Project Outcomes

- **Infrastructure Improvements:**
  - The project will allow for expansion of facilities to support students at the Surrey campus and provide support space for existing programs.
  - The project will help to enhance the development of the Surrey Central City community.

- **Strategic Alignment:**
  - This project will accommodate growth and labour market demand driven capacity. The project provides the opportunity for industry-based collaborations for which SFU Surrey has a strong reputation. The programs offered in this building will provide the training and education required to meet BC’s labour market needs and maintain a competitive economy.
  - The expansion of Surrey’s campus buildings and academic programs will support the institutions vision for the integration of innovative education, cutting edge research and far-reaching community engagements. SFU Surrey has been a living example of what it means to be an “engaged university”.
  - This project is needed to meet the increasing enrollment demand from the fast growing university student aged population in the south Fraser Valley.

- **Energy and Emission Reduction:**
  - The project will be designed to LEED Gold Standard. The building will also be connected to the City of Surrey district energy system, which will utilize various low GHG emission sources.
6.0 Project Cost/Funding

- Estimated project costs are $36 Million.
- There are on-going discussions with other institutional and municipal bodies regarding the possibility of making this part of a larger development on the site.
- It is assumed that operating funding would be provided by AVED based on standard funding per FTE formula.

7.0 Key Risks

- Risks of cost escalation will be mitigated by confirming budget estimates and ensuring appropriate contingencies. Major equipment will also be pre-ordered in the event of market-driven escalations.
- Schedule overruns will be mitigated through the use of rigorous review and approval processes for timely approvals. Users groups will be engaged early in the design process. Equipment lists will also be established early in the process.

8.0 Project Schedule

- The Planning Phase of the Innovative Teaching & Other Facilities Building is scheduled to commence in April 2022 with a project completion date in Q2 of 2024/2025.

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*Quarters relate to a fiscal year end of March 31*.  

45
1.0 Current Situation

- The present Shrum Biology and adjacent Physics buildings are both in poor condition and in need of renewal.

- The 10,305 m² (110,922 sf) biology wing of the Shrum Science Centre was constructed in 1965 with additions in the 1970’s and 1980’s. The main building has an FCI assessment of 0.84 and a VFA estimate of $53M in deferred maintenance and capital renewal needs.
  - The building is comprised primarily of undergraduate laboratories, and research labs and classrooms that no longer comply with modern academic facility design standards. It has significant deficiencies with respect to current seismic and building code requirements. There is also a shortfall in space.
  - Biological Sciences is the largest Department in the Faculty of Science. The undergraduate program comprises 709 undergraduate FTEs, and 110 graduate, 10 teaching faculty and 36 research faculty.
  - The Department has a shortfall in space, based on the Council of Ontario Universities (COU) formula. According to COU, the total actual space inventory is 76% of that entitled to it. The shortfall is greatest in office space, but there are also shortages in research and teaching space, which includes common space and large holding facilities (e.g. greenhouses, insectary facilities). Were these spaces to be included in the COU formula, the percentage of entitlement would be lower.
  - As the space needs of the department exceed that available in the Biology Wing of the Shrum Science Centre, the department has spread into other buildings: Technology & Science Complex 2 and the South Science Building. This diffuse location of departmental members and operations – as well the quality of the space are a barrier to the continued growth in collaborative and interdisciplinary excellence in both teaching and research.

- The Physics Wing of the Shrum Science Centre was constructed in 1970. This building, located adjacent to the Biology wing, is 10,305 m² in size and is in poor condition with an FCI assessment of 0.77 and a VFA estimate of $38M in deferred maintenance and capital renewal needs.
The building is comprised primarily of undergraduate laboratories, and research labs and classrooms that no longer comply with modern academic facility design standards. It also has significant deficiencies with respect to current seismic and building code requirements.

2.0 Project Description

- This project involves a renewal of all major building systems and infrastructure elements of both the Shrum Biology and Physics buildings.
- The intent is to renew the buildings primarily for labs that do not require intensive infrastructure, classrooms and offices. This will include consolidating teaching labs to provide flexibility in class size and to allow sharing of support spaces.
- Laboratory areas will be redesigned following the model of the Chemistry renewal project that was completed in 2011.
- Research labs will also be consolidated into larger labs allowing flexibility for expansion and contraction of space assignments as research project needs change over time.
- Improvements will be made to general circulation and emergency exit routes. All areas will be upgraded to current code guidelines and will provide appropriate life safety systems.
- The renovation standard will be contemporary, modular and flexible to allow for easy adaptation to changing research and academic needs. Improvements will be made to general circulation and emergency exit routes. All areas will be upgraded to current code guidelines and will provide appropriate life safety systems.

3.0 Project Objectives

- A primary project objective is to continue with the phased renewal of the Shrum Science Complex begun with the Chemistry renewal project completed in 2011.
- The project will support SFU’s strategic vision of innovative education and cutting edge research by improving learning conditions for students and improving research delivery areas.
- Renewal will address the deferred maintenance backlog and mitigate the ongoing cost of short-term maintenance repairs and continued risk of systems failures and their impact on the education and research activities in the Biology building.
The science programs train students for careers in the natural and applied sciences where job growth in BC is expected be 1.6% by 2020, and where an estimated 60,000 new or replacement workers will be needed according to the BC Labour Market Outlook 2010-2020.

4.0 Options Considered

- The cost to renew to the existing building to current science standards would far exceed cost of constructing a new purpose-built facility. As well, the logistical challenges and costs of disruption and relocation of occupants would be significant.

- A retrofit of the existing space would not allow researchers with similar interests to be co-located; there simply is not enough space to do so. A new building could be purpose-built to improve the level of engagement within and across research groups in Biological Sciences.

- Locations distant from the Burnaby campus are not practical. The nature of science teaching and research requires hands on experience in a laboratory setting. In addition, alternative means of teaching and research without lab experience is not practical. Specialized lab facilities are not generally available in the marketplace and those that might be are not typically designed to meet the building code requirements for assembly use, as required for university teaching functions.

5.0 Project Outcomes

- Infrastructure Improvements:
  - Space utilization will be improved by developing larger open teaching labs and research labs that will allow greater sharing of centralized support spaces and greater flexibility in accommodating various class sizes and expansion/contraction of research projects.

- Cost Effectiveness:
  - The project will resolve significant deferred maintenance requirements and realize cost savings through energy efficiencies gained through a more modern and more efficient building systems.

- Innovation:
  - The project design will provide for open labs, which will enhance space utilization, safety and equipment sharing.
Creative use of “plug and play” infrastructure concepts will provide flexibility for change and facilitate varied teaching models to enhance student learning.

Movable casework and the placement of plumbing at perimeter walls will provide maximum flexibility for space configurations and changing instructional needs.

- **Strategic Alignment:**
  - The improved Sciences complex supports the Ministry Service Plan objective of building on current strengths to enhance the quality of our post-secondary education.
  - The project aligns with the institutional priorities of providing a dynamic integration of innovative education, cutting-edge research and equipping SFU students with the knowledge, skills, and experiences that prepares them for life in an ever-changing and challenging world.

- **Quality Education:**
  - The renewal will provide an improved environment to support teaching for undergraduate and graduate academic programs. The renewed facilities will further provide support for enhanced research activities.

- **Energy and Emission Reduction:**
  - The project will result in a building that will meet LEED Gold standard. Energy consumption will be reduced through modern and more efficient building systems.

6.0 **Project Cost/Funding**

- Estimated project costs are $100 Million.
- This project is to be funded by AVED.
- There is little expected cost impact on operating or program costs as there is no expansion of program delivery anticipated.

7.0 **Key Risks**

- There are risks associated with the construction logistics of renewing a wing of a larger occupied facility mega structure. Proposed mitigation strategies focus on thorough pre-design work to identify issues, assess options and analyze existing infrastructure.
PROJECT OVERVIEW
Shrum Sciences Renewal

- The relocation of occupants for duration of project poses a risk, which will be mitigated through a detailed move strategy with phasing as required.
- Unknown existing conditions will be mitigated by detailed investigation including strategic destructive exploration during design to minimize unknowns.
- Budget overruns will be managed by way of a thorough investigation of options for renovations with cost estimates including adequate contingencies for the type of work.
- Schedule delays will be mitigated through the preparation of a detailed schedule with milestones including relocation of existing occupants.
- Risks associated with equipment coordination will be mitigated through the development of an early equipment list to establish technical requirements, inform design and construction documents and avoid coordination conflicts and unexpected costs/schedule impact.

8.0 Project Schedule

- Only the planning phase of the Shrum Biology Renewal Project will occur during the timeline of this Five-Year Capital Plan. Planning of the project is expected to commence in Q2 of 2021/2022. The project will be completed in July 2026.

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<td>Q3</td>
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<td>4. Occupancy</td>
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*Quarters relate to a fiscal year end of March 31*.
1.0 Current Situation

- The Academic Quadrangle is the largest and among the oldest and most iconic buildings on SFU Burnaby Campus. Located in the center of the SFU Burnaby Campus, this six floor, 27,420 m² building is also the most heavily utilized building on campus.

- The building currently houses Arts & Social Sciences, Canadian Studies, Chinese Studies, CUPE, Education, English, Faculty Association, Food Services, Gender Sexuality and Women’s Studies, Geography, Hellenic Studies, History, the Human Rights Office, Humanities, International Services, Mathematics, Office for Aboriginal Peoples, Political Science, Psychology, the Science Technical Centre, Sociology & Anthropology and the Terry Fox Foundation among others.

- Built in 1965/67, the building is overdue for renovation with a FCI assessment of 0.83 and a VFA estimate of $93.5M in deferred maintenance and capital renewal needs. The building’s iconic architectural heritage features must be preserved.

- Whole building system renewals are required for the exterior enclosure including windows, roof assembly, and exposed concrete walls. The building’s electrical, mechanical, and plumbing systems are all beyond useful life. Interior construction and equipment are also worn out.

2.0 Project Description

- The initial phase of upgrades will address building envelop, HVAC, lighting, seismic, finishes and functional upgrades such as fire protection and hazardous material removal and improvements in select areas of the building. Carrying out the work is also a significant challenge requiring multi-phasing to minimize disruption to occupants and building in use.

3.0 Project Objectives

- The purpose of the renewal project is to address deferred maintenance issues pertaining to this central facility of SFU Burnaby and ensure the long-
term integrity of one of the campus’ architectural centerpieces and main hubs of student activity.

4.0 Options Considered

- Given the architectural significance of the Academic Quadrangle and its central location on campus, renovation of the building is the best option for renewal.

5.0 Project Outcomes

- Infrastructure Improvements:
  - The phase 1 renewal work proposed will see the upgrading and renewal of the building envelop, HVAC, lighting and finishes in select areas of the building.

- Cost Effectiveness:
  - The project will result in a building that will meet LEED Gold standard. Energy consumption will be reduced through modern and more efficient building systems.

- Innovation:
  - The project will result in the creation of flexible and responsive teaching and working environments including:
    - Spaces that are able to support new technologies;
    - Flexible and open space for teaching, learning and working; and
    - Increased access to natural light.

- Strategic Alignment:
  - Renewal of the Academic Quadrangle will serve to enhance the learning, research and meeting space for a large and diverse number of faculties, organizations and services at SFU Burnaby - and in this way clearly supports the Ministry Service Plan objective of building on current strengths to enhance the quality of our post-secondary education.
  - The project also aligns with the institutional priorities of providing a dynamic integration of innovative education, cutting-edge research
and equipping SFU students with the knowledge, skills, and experiences that prepares them for life in an ever-changing and challenging world.

- The renewed facilities will provide support for enhanced research activities.
- Redesigned training areas will enable the use of modern teaching approaches and flexible active learning classroom concepts.

**Energy and Emission Reduction:**
- The building will contribute to sustainability by re-using an existing building, improving energy efficiency and reducing greenhouse gases.

### 6.0 Project Cost/Funding
- Estimated project costs are $50 Million.
- This project is to be funded by AVED.
- There is little expected cost impact on operating or program costs as there is no expansion of program delivery anticipated.

### 7.0 Key Risks
- The relocation of occupants for duration of project poses a risk, which will be mitigated through the preparation of a detailed move strategy with phasing if required.
- Unknown existing conditions will be mitigated by detailed investigation including strategic destructive exploration during design to minimize unknowns.
- Budget overruns will be managed by way of a thorough investigation of options for renovations with cost estimates including adequate contingencies for the type of work.
- Schedule delays will be mitigated through the preparation of a detailed schedule with milestones including relocation of existing occupants.
- Risks associated with equipment coordination will be mitigated through the development of an early equipment list to establish technical requirements, inform design and construction documents and avoid coordination conflicts and unexpected costs/schedule impact.
8.0 Project Schedule

- Only the planning phase of the Academic Quadrangle Renewal Project will fall within the scope of this Five-Year Capital Plan. This planning is scheduled to commence in Q3 of 2022/2023 with full project completion in April 2027.

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*Quarters relate to a fiscal year end of March 31st.*
PROPOSED CATEGORY 1: NEW PRIORITY PROJECTS, CATEGORY 2: WHOLE ASSET REPLACEMENT & RENEWAL PROJECTS, CATEGORY 3: STUDENT HOUSING PROJECTS

SUMMARY OF MAJOR ONGOING AND PLANNED SELF-FUNDED PROJECTS (>=$5 MILLION)
## Project Categories

- **Category 1: New Priority Projects**
- **Category 2: Whole Asset Replacement & Renewal Projects**
- **Category 3: Student Housing Projects**

### Five-Year Capital Plan Instructions (2018/19-2022/23)

#### Attachment 3

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<th>Institution</th>
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<th>Total Cashflow Forecast 2019/20</th>
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<th>Total Cashflow Forecast 2021/22</th>
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<th>Provincal Cashflow Forecast 2018/19</th>
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<td>Multi-Purpose Complex - (IRC Brown)</td>
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<td>Innovative Teaching &amp; Other Facilities</td>
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## Five-Year Capital Plan Instructions (2018/19-2022/23)
### Attachment 4 - Summary of Major Ongoing and Planned Self-Funded Projects (>=$5 million)

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<th>#</th>
<th>Institution</th>
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<th>Project Description</th>
<th>Anticipated Construction Start Date</th>
<th>Anticipated Occupancy Date</th>
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<th>Total Cashflow Forecast Outgoing Years</th>
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Total: $242,800,000

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