



SUBJECT	UBC FIVE-YEAR CAPITAL PLAN
MEETING DATE	JUNE 14, 2017

Forwarded to the Board of Governors on the Recommendation of the President

APPROVED FOR SUBMISSION

Santa J. Ono, President and Vice-Chancellor

DECISION REQUESTED	IT IS HEREBY REQUESTED that <i>the UBC Board of Governors grant approval for the submission of the UBC Five-Year Capital Plan (2018-2019 to 2022-2023) to the Ministry of Advanced Education.</i>
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Report Date	May 26, 2017
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- Presented By**
- Andrew Simpson, Vice-President Finance & Operations
 - Angela Redish, Provost & Vice-President Academic *pro tem*
 - Helen Burt, Vice-President Research *pro tem*
 - Deborah Buszard, Deputy Vice-Chancellor & Principal, Okanagan
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 - Pam Ratner, Vice-Provost & AVP Enrolment & Academic Facilities
 - John Metras, Managing Director, Infrastructure Development
 - Peter Smailes, Treasurer
 - Michael White, Associate Vice-President, Campus & Community Planning

EXECUTIVE SUMMARY

Five-Year Capital Plan

To develop capital priorities for future consideration, the Ministry of Advanced Education (AVED) requests five-year capital plan submissions from all public post-secondary institutions in June of each year. A draft UBC Five-Year Capital Plan has been developed in accordance with the University’s established Capital Planning Principles and in alignment with Provincial priorities. The proposed projects, which are outlined in this report, were selected by the UBC Executive based on their potential to contribute to academic excellence.

The Five-Year Capital Plan submission provides an opportunity to highlight UBC’s capital priorities to government for potential funding. Board approval of the Plan does not commit the University to undertake any specific project(s) nor does it commit any UBC resources. Any project that the government may choose to support would be subject to the standard UBC capital approval process.

The Board is asked to consider the proposed Five-Year Capital Plan projects within the context of the University’s long range priorities and current goals and to approve the Five-Year Capital Plan for submission to AVED.

INSTITUTIONAL STRATEGIC PRIORITIES SUPPORTED

- ✓ Learning
 - ✓ Research
 - ✓ Innovation
 - ✓ Engagement
(Internal / External)
 - ✓ International
- or ✓ Operational

DESCRIPTION & RATIONALE **Five-Year Capital Plan**

To develop capital priorities for future consideration, the Ministry of Advanced Education (AVED) requests five-year capital plan submissions from all public post-secondary institutions in June of each year. Board of Governors' approval is required for the submission. The Five-Year Capital Plan will provide AVED with a high-level understanding of UBC's capital requirements for new priority expansion projects, replacement/renewal projects and capital innovation projects.

UBC has developed a jointly funded Capital Plan which reflects the Provincial focus on technology innovation expansion, international education, economic development, jobs, and facility asset renewal. These capital investments are specifically targeted to support academic excellence in teaching and research. The proposed projects were identified from the UBC capital priorities list through an extensive assessment process with UBC's Executive.

The proposed UBC Five-Year Capital Plan includes priority academic projects totalling \$616 million with a request to the Provincial Government for \$357 million. Demolitions or renovations associated with the new construction would reduce UBC's deferred maintenance by \$153.9 million and improve seismic ratings on specific buildings.

Approval of this plan does not commit the University to undertake any specific project(s) nor does it commit any UBC resources. Any project that the government may fund would be subject to the standard UBC capital approval process.

UBC Five-Year Capital Plan: Priority Academic Projects

The UBC Five-Year Capital Plan includes strategic academic projects which support UBC priorities and focus on teaching and research excellence. The proposed projects are intended to align with Provincial government priorities, in particular economic development and facility asset renewal. These projects are shown in the context of UBC's current list of planned priorities which is presented at each Board meeting in the Capital Projects Update report.

As careful prioritization of proposed capital projects is critical to ensure that limited capital is directed to help UBC achieve its goals, these projects have been ranked to align with UBC's strategic objectives. The proposed projects support a vision for the transformative enhancement to student learning and research infrastructure. The projects proposed are shown in Table 1: UBC Five Year Capital Plan: Academic Priorities and are described in more detail in Attachment 1: UBC Five Year Capital Plan Academic Priorities Project Descriptions.

The academic projects proposed to be submitted as UBC's Five-Year Capital Plan are contained in the following table.

Table 1: UBC Five Year Capital Plan: Academic Priorities (in order of priority)

UBC Campus	Project	Delivery	Cost in \$Ms	Funding	Request to AVED in \$Ms	Reduced Deferred Maintenance in \$Ms
Vancouver	Biological, Environmental, and Biomedical Engineering Building	Jun-21	\$90	Government \$45M UBC \$45M	\$45	\$10.4
Vancouver	Chemistry Laboratory Complex (Undergraduate Chemistry Teaching Labs + Chemistry Physics Research Labs)	Sep-21	\$140	Government \$85M UBC \$55M	\$85	\$39.0
Okanagan	UBCO Industrial Scale Engineering Lab	Jun-20	\$10	Government \$5M UBC \$5M	\$5	\$0
Vancouver	Community Health Sciences + Recreation Facility + War Memorial Gym Renewal	Sep-21	\$190	Government \$80M Fundraising \$20M UBC \$90M	\$80	\$45.8
Vancouver	Math Building Renewal/Replacement (including Klinck Building)	Sep-21	\$100	Government \$80M Fundraising \$15M UBC \$5M	\$80	\$37.7
Vancouver	Geography Building	Sep-21	\$50	Government \$45M Fundraising \$2M UBC \$3M	\$45	\$10.3
Vancouver	Asian Centre Renovation & Library Addition	Mar-21	\$16	Government \$8M Fundraising \$8M	\$8	\$9.47
Vancouver	UBC Farm Centre	Dec-20	\$20	Government \$9M Fundraising \$11M	\$9	\$1.2
	Total		\$616		\$357	\$153.9

BENEFITS See Attachment 1: UBC Five Year Capital Plan Academic Priorities Project Descriptions
 Learning, Research,
 Financial,
 Sustainability &
 Reputational

RISKS See Financial section
 Financial,
 Operational &
 Reputational

COSTS See table above.
 Capital &
 Lifecycle Operating

FINANCIAL Funding Sources, Impact on Liquidity The University currently has sufficient working capital liquidity to provide internal financing for several of the projects. In the event the University is successful in obtaining government funding for one or more of the proposed Five-Year Capital Plan projects, the timing of existing priorities may require revision.

SCHEDULE Implementation Timeline The proposed dates of project delivery are shown for each project in Table 1: UBC Five Year Capital Plan: Academic Priorities. These dates assume project funding approval by March 31, 2018.

CONSULTATION Relevant Units, Internal & External Constituencies Input on the capital priorities and prioritization process was sought and received from a range of different groups including:

- Committee of Deans
- Property & Planning Advisory Committee
- Senate Academic Building Needs Committee
- Senate Budget Committee
- Alma Mater Society
- Graduate Student Society
- UBC Properties Trust

The UBC Executive undertook a capital planning workshops on March 13 and 21, 2017 to identify capital investment priorities to most effectively support academic excellence. The Executive approved the final submission on May 23, 2017.

UBC Capital Priorities are developed in accordance with the University’s established Capital Planning Principles, and these principles along with the prioritization process will be presented at the September 2017 Board of Governors meeting.

UBCPT COMMENTS Complete for all reports that include a property component	Date of Review: <input type="text"/>	Signed off by: <input type="text"/>
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Previous Report Date	June 14, 2016
Decision	The UBC Board of Governors approved the UBC Five-Year Capital Plan (2017/18 – 2021/22) for submission to the Ministry of Advanced Education.
Action / Follow Up	

Attachments:

1. UBC Five Year Capital Plan Academic Priorities Project Descriptions
2. Seismic Impact of Five Year Capital Plan

Attachment 1: UBC Five Year Capital Plan Academic Priorities Project Descriptions

Note that some minor edits may be made to these project descriptions prior to final submission to AVED.

Institution/ Campus	Project Title:	Category	Estimate	Priority
UBC Vancouver	Biological, Environmental and Biomedical Engineering Building	1	\$90 m	1 of 8

1.0 Current Situation

The Faculty of Applied Science proposes a significant expansion of applied science education to allow the Faculty and its graduates to respond to emerging local, national and global issues in environment, urbanism and biology. The key element of the planned expansion is an increase in undergraduate engineering education, including a major increase in the number of international students.

2.0 Project Description

The planned Biological, Environmental & Biomedical Engineering Building, a 15,000 GSM new building, will support expansion in undergraduate engineering education and relocate the functions housed in the aging “Rusty Hut” (Civil and Mechanical Engineering Laboratories Building). Planned area includes classrooms, teaching laboratories, research laboratories, office space, meeting space and allowance for informal learning in the fields of Biomedical Engineering, Clean Technology Environmental Engineering, Math and Computational Engineering and Software Engineering, and Manufacturing Engineering.

The Faculty proposes to locate the new building on the Main Mall site of the Old Barn which currently houses a daycare. The Old Barn site on Main Mall is ideally situated in the Applied Science precinct, adjacent to Frank Forward and opposite the Kaiser/CEME/McLeod/Engineering Student Centre complex. Location of the expanded undergraduate teaching program on this site reinforces the Applied Science undergraduate hub and co-locates associated faculty in close proximity to their colleagues in other Applied Science programs.

3.0 Project Objectives

- The key element of the planned expansion is an increase in undergraduate engineering education. Enrolment increases will comprise a major increase in international student enrolment and a distributed undergraduate engineering.
- Provide higher capacity, more flexible and efficient facilities for research component fabrication and teaching and learning activities.
- Rationalize and consolidate Faculty operations to free up existing space for other teaching and/or research purposes.

4.0 Options considered

Applied Science fully occupies 14 buildings on the Point Grey campus, with a significant presence in 4 additional buildings, and specific functions in another 6 buildings. Several of these facilities are small or special purpose, designed to accommodate one or more of the specialized processes critical to engineering research or the hands-on learning experience.

Although a few of these facilities fall outside the primary Applied Science precinct, the Faculty has most programs concentrated in a central zone that contributes to the building of community. Facilities Planning confirms that all of these core facilities are fully functional and that there is no space available to accommodate the Faculty’s planned undergraduate teaching expansion. New expansion is required and detailed planning is underway to determine project scope costing, site analysis, funding/financing strategy.

5.0 Project Outcomes

- Infrastructure Improvements**

Rusty Hut (built 1971) FCI: 0.84 Reduction in Deferred Maintenance: \$10.4M

The existing Rusty Hut cannot support the proposed teaching and research operations. It is an aging single-storey building located on a site which could support a much higher density. Existing functions in the Rusty Hut will be relocated, the building demolished, and the site eventually redeveloped to support future academic initiatives. While unranked by previous seismic assessments, recent site investigations and analysis indicate the removal or renewal of the Rusty Hut should result in a reduced life safety risk.

- Cost Effectiveness**

The Biological, Environmental & Biomedical Engineering Building will facilitate the decanting of existing Rusty Hut functions and will rationalize and consolidate Applied Sciences' distributed operations (e.g. Consolidating existing machine shops into one location frees up space for other teaching and/or research purposes).

- Quality Education/ Innovation/ Strategic Alignment**

The undergraduate enrolment increases are planned to comprise a major increase in international student enrolment and a distributed undergraduate engineering program. The proposed expansion of applied science education will allow Faculty and graduates to respond to emerging issues in environment, urbanism and biology thus aligning with provincial goals as responsible and sustainable stewardship of BC's and Canada's natural resources - a growing imperative, in particular areas of hydrocarbons, fibre and water. Realization of the significant benefits of natural resources requires engineering expertise in many fields, including chemical engineering, transportation engineering, mechanical engineering, civil engineering and others.

- Energy & Emission Reduction** This project will target LEED Gold certification.

6.0 Project Cost/ Funding for the Biological, Environmental and Biomedical Engineering Building

Anticipated budget is \$90 million. UBC's contribution would be financed primarily by increased international enrolments.

Estimate	Total
Planning and Design	\$8,100,000
Construction	\$63,000,000
Contingencies	\$4,630,000
Completion Costs	\$12,850,000
Taxes	\$1,420,000
Total	\$90,000,000

Proposed Funding	Amount
UBC	\$45,000,000
AVED	\$45,000,000
Total	\$90,000,000

Annual Operating + Maintenance	Amount
New Space @ \$92/GSM	\$1,388,544
Less Existing Space	\$ 499,366
Total	\$ 889,178

Recapitalization	Amount
Cyclical Maintenance	566,721
Modernization/ Upgrade	150,157
Total	\$716,878

7.0 Key Risks

- Project costs and schedule overruns are mitigated by UBC’s retained risk contingency policy, project risk management practices (e.g. risk registry).
- UBC will apply the experience gained from recently completed capital projects.

8.0 Project Schedule

Biological, Environmental and Biomedical Engineering Building

	`2018				`2019				`2020				`2021				`2022			
	Q1	Q2	Q3	Q4																
Planning																				
Design																				
Tender																				
Construction																				
Occupancy																				

Institution/ Campus	Project Title:	Category	Estimate	Priority
UBC Vancouver	Chemistry Laboratory Complex (Undergraduate Chemistry Teaching Labs + Chemistry Physics Research Labs)	1 + 2	\$140 m	2 of 8

1.0 Current Situation

Undergraduate demand for Chemistry courses has grown significantly over the years and will continue to grow. Every UBC science student’s education includes chemistry courses and this requirement has increased with the introduction of UBC’s Vantage College program. However, the layout, age, condition, and inadequate infrastructure of the existing teaching laboratory facilities restrict pedagogical development and growth in student numbers, and will not support the planned international student program. The next generations of scientists, engineers and medical personnel must be trained in sophisticated, state of the art techniques that relate to analytical chemistry, nanomaterials, new drug discovery, and industrial catalysis. New undergraduate chemistry teaching laboratories are urgently required to deliver these programs and satisfy critical future demands for young people in British Columbia’s medical, biotech, mining, environmental chemistry, materials science, quantum materials, forestry and wood processing industry sectors.

2.0 Project Description

UBC proposes to build a 19,300 GSM expanded replacement facility for undergraduate Chemistry teaching which will fulfill capacity requirements and provide up to date, flexible space with full infrastructure capability. The project will include replacement of the Chemistry complex Stores and NMR Service functions located in Chemistry South.

3.0 Project Objectives

This replacement facility will:

- Provide the opportunity for transformative student learning through enhanced laboratory experiences in a facility with appropriate infrastructure
- Create flexible learning facilities that can adapt to evolving pedagogies
- Provide capacity for increased domestic and international demand for Chemistry teaching
- Provide opportunities for group work and collaboration through informal learning spaces and innovative classrooms
- Aid in the recruitment and retention of exceptional students and faculty.

4.0 Options considered

Renewal of the Chemistry teaching buildings was considered, however, the existing buildings are insufficient in area and deficient in seismic capacity. The existing buildings total 16,430 GSM. The planned expansion brings the area to 19,300 GSM. The existing site will not accommodate additional built area. Therefore, the proposal is to build on the Wesbrook /Cunningham site.

	GSM	Date Built
Chemistry A Chemistry Physics (Bldg 447)	7,630	1989
Chemistry B Chemistry South(Bldg 148)	5,240	1959
Chemistry C Chemistry East (Bldg 144)	3,560	1963
Expansion to meet academic program	2,870	
Total Replacement Area	19,300	

5.0 Project Outcomes

- **Infrastructure Improvements**

A replacement facility will correct the problem of limited servicing in the Chemistry research buildings which is caused by the current location and configuration of Chemistry Stores. It will eliminate the outdated buildings’ deferred maintenance issues which include envelope, electrical and mechanical systems and seismic upgrades, sprinklers and Code upgrades.

This 19,300 GSM project will demolish and replace Chemistry East (built in 1963), Chemistry South (1959) and Chemistry Physics (1989). These deteriorating buildings have reached the end of their service life and have been previously classified as high or very high risk buildings. Site investigation and analysis to date support these classifications. Demolition or retrofit of these buildings should result and reduced life safety risk on campus. If the Wesbrook/Cunningham site is selected for the Chemistry Laboratory Complex, 4 additional buildings would be removed from the very high seismic risk category and deferred maintenance would be reduced by an additional \$51.94 m.

Associated Deferred Maintenance	Deferred Maintenance in \$Ms	FCI	Built
Chemistry A Chemistry Physics (Bldg 447)	18.58	0.57	1989
Chemistry B Chemistry South(Bldg 148)	13.02	0.57	1959
Chemistry C Chemistry East (Bldg 144)	7.41	0.54	1963
Subtotal	\$ 39.01		
If Wesbrook site selected:			
Wesbrook (Bldg 864)	31.06	0.79	1949
Wesbrook Addition (Bldg 867)	2.5	0.57	198
Cunningham (Bldg 625)	10.12	0.74	1960
Cunningham Addition (Bldg 624)	8.26	0.75	1971
Subtotal	\$ 51.94		
Total	\$ 90.95		

- **Cost Effectiveness**

With the noted FCIs, the Chem B and C buildings are marginal but could be considered as candidates for building renewal. Their size, however is insufficient and renewal would perpetuate the inefficiency of a

teaching program split between two buildings. Chemistry A, however, is suffering from failed envelope and roofing and projected costs to repair are beyond consideration. Consolidation will encourage operational efficiencies, e.g. equipment and space sharing. A larger replacement building on the proposed site of Wesbrook /Cunningham site will intensify land use on a prominent central campus site.

- **Quality Education/ Innovation/ Strategic Alignment**

Laboratory experiences enhance learning by providing the opportunity to explore practical problems and research questions. Faculty have been exemplary in adapting desired lab experiences to suit existing conditions, but the physical space and infrastructure hamper their efforts to be innovative. New, flexible, up-to-date facilities to support today’s trends in collaborative learning will lead to transformative student learning.

- **Energy & Emission Reduction:** This project will target LEED Gold certification.

6.0 Project Cost/Funding for Chemistry Laboratory Complex (Undergraduate Chemistry Teaching Labs + Chemistry Physics Research Labs)

Estimate	Total
Planning and Design	\$12,600,000
Construction	\$98,000,000
Contingencies	\$7,200,000
Completion Costs	\$20,000,000
Taxes	\$2,200,000
Total	\$140,000,000

Proposed Funding	Amount
UBC	\$55,000,000
Government	\$85,000,000
Total	\$140,000,000

Annual Operating + Maintenance	Amount
New Space @ \$92/GSM	\$ 1,775,600
Less Existing Space \$57.60/GSM	\$ 946,368
Total	\$ 829,232

Recapitalization Costs	Amount
Cyclical Maintenance	\$ 729,178
Modernization/ Upgrade	\$ 193,201
Total	\$922,379

7.0 Key Risks

- Project costs and schedule overruns are mitigated by UBC’s retained risk contingency policy, project risk management practices (e.g. risk registry).
- UBC will apply the experience gained from recently completed capital projects.

8.0 Project Schedule

Chemistry Laboratory Complex

	'2018				'2019				'2020				'2021				'2022			
	Q1	Q2	Q3	Q4																
Planning																				
Design																				
Tender									T											
Construction																				
Occupancy																				

Institution/ Campus	Project Title:	Category	Estimate	Priority
UBC Okanagan	Industrial Scale Engineering Laboratory	1	\$10 m	3 of 8

1.0 Current Situation

At UBC Okanagan, existing high head laboratory space is at capacity and the UBC Okanagan School of Engineering is unable to expand.

2.0 Project Description

A 604 GSM expansion of industrial scale laboratory space to enable the UBC Okanagan School of Engineering to grow teaching, research, and development of advanced technologies, such as seismic enhancement tools for large-scale infrastructure.

3.0 Project Objectives

Industrial Scale Engineering Laboratory expansion is proposed to grow teaching, research and development of advanced technologies, such as seismic enhancement tools for large-scale infrastructure. Once complete, and, over the medium and long term, the Industrial Scale Engineering Laboratory will enable UBC Okanagan to grow efforts to drive economic development and diversification in the BC Interior through the training of engineers and innovative research partnerships with industry, clearly supporting the Provincial Government’s strategy of expansion for technological innovation.

4.0 Options considered

Existing high head laboratory space is at capacity so an expansion is the most viable option.

5.0 Project Outcomes

- **Infrastructure Improvements**

Quality of life and major economic development largely depend on reliable and efficient infrastructure. The Industrial Scale Engineering Laboratory will enable new developments in advanced technologies, such as seismic enhancements, and is a necessary precursor to a proposed development at the UBC Okanagan Innovation Precinct that will bring together the University and a large advanced manufacturing firm working in advanced composite materials.

- **Cost Effectiveness**

Once complete and over the medium and long term, the Industrial Scale Engineering Laboratory will enable UBC Okanagan to grow efforts to drive economic development and diversification in the BC Interior through the training of engineers and innovative research partnerships with industry.

- **Quality Education/ Innovation/ Strategic Alignment**

Given existing high head lab space is at capacity, this expansion will enable new industry partnerships and projects which further campus efforts to transform and diversify the regional resource economy to one driven by high technology and advanced manufacturing.

- **Energy & Emission Reduction**

This project will target LEED Gold certification.

6.0 Project Cost/Funding for UBCO Industrial Scale Engineering Laboratory

Estimate	Total
Planning and Design	\$870,000
Construction	\$6,500,000
Contingencies	\$590,000
Completion Costs	\$1,900,000
Taxes	\$140,000
Total	\$10,000,000

Proposed Funding	Amount
UBC	5,000,000
AVED	5,000,000
Total	\$10,000,000

Annual Operating + Maintenance	Amount
New Space @ \$70/GSM	55,900
Total	\$55,900

Recapitalization	Amount
Cyclical Maintenance	22,815
Modernization/ Upgrade	6,045
Total	\$28,860

7.0 Key Risks

Project costs and schedule overruns are mitigated by UBC’s retained risk contingency policy, project risk management practices (e.g. risk registry).

UBC will apply the experience gained from recently completed capital projects.

8.0 Project Schedule

UBCO Industrial Scale Engineering Laboratory																				
	`2018			`2019			`2020			`2021			`2022							
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Planning	█	█																		
Design			█	█	█	█														
Tender						T														
Construction						█	█	█	█	█										
Occupancy												█								

Institution/ Campus	Project Title:	Category	Estimate	Priority
UBC Vancouver	Community Health Sciences & Recreation Facility & War Memorial Gym Renewal	1	\$190m	4 of 8

1.0 Current Situation

The academic units intended to occupy this space are currently housed in 11 different UBC facilities. The current space is dispersed, outmoded and inadequate and all the units have well-identified facilities needs including outdated laboratories and teaching facilities, deficiencies in accessibility, aging and unreliable infrastructure and current space targeted for demolition or alternate use. Consolidation will improve program delivery, operations and provide opportunities for synergistic inter-professional education.

The Community Health Sciences (CHS) is envisioned as a leading knowledge centre in the field of sustainable community health. A model of cross-professional collaboration, the planning for the CHS is being undertaken by the School of Kinesiology (Faculty of Education), the School of Nursing (Faculty of Applied Sciences) and UBC Health, well known for their innovative work in community based health programs.

Through innovative approaches to sustainable community health, UBC will contribute directly to improved health and wellness in British Columbia, Canada and the world. CHS will emphasize disease prevention and community-based approaches to health by promoting healthy living and healthful environments, undertaking research into the prevention and management of chronic illnesses, and reducing inequities and risks for marginalized populations. Co-location with recreation and sport facilities will allow for development of health-related research and learning opportunities and for efficient space utilization.

2.0 Project Description

Community Health Sciences (CHS) is proposed to be co-located with a new Recreation Facility and redeveloped War Memorial within a new and distinct campus precinct, University Boulevard Neighbourhood, a key gateway and symbolic entrance to the campus which will play a significant role in expressing the academic identity and values of the university. CHS will be a key academic component and it is for this \$90 million part of the project that UBC will seek Provincial funding of \$80 million. The balance of the overall project will be funded by UBC (\$90m), including a student funding contribution for the Recreation Facility, and through donor fundraising (\$20m).

This new integrated, state-of-the-art 18,900 GSM CHS building will address individual and collective teaching, learning, community engagement and research mandates in the fields of community health, healthcare and science. CHS will accommodate the School of Kinesiology (Faculty of Education) and School of Nursing (Faculty of Applied Sciences) and UBC Health which are currently housed in dispersed, outmoded and inadequate space. These groups are committed to inter-professional interaction and will contribute to each School's continued leadership nationally and globally. Using highly connected teaching with virtual and simulation models, they will focus on flexible learning delivered through inter-professional education and practice and play an important provincial role in health policy development, health service delivery planning, education of health service providers and knowledge translation in health care.

This project proposes a new world class facility which will provide a unique integration of research, teaching, clinical training and community outreach focusing on healthy living and aging, chronic illness prevention and management, and risk reduction for vulnerable populations.

Key concepts for CHS are:

- Community contexts and social determinants of health
- Design of healthful, sustainable living environments
- Role of active, healthy living in disease prevention and recovery
- Health behaviour change
- Home, community, and healthcare systems
- Vulnerable populations and health across lifespan
- Knowledge capture, translation, and implementation.

The three academic units will be co-located to facilitate inter-program interaction and contribute to each units continued leadership nationally and globally. Using highly connected teaching with virtual and simulation models, they will focus on flexible learning delivered through interprofessional education and practice.

3.0 Project Objectives

This new integrated, state-of-the-art building envisions these academic goals:

- Innovative knowledge centre in sustainable community health that will contribute directly to improved health and wellness in BC, Canada and the world
- Unique integration of research, teaching, clinical training and community outreach focusing on health living and aging, chronic illness prevention and management, and risk reduction for vulnerable populations.
- Emphasis on disease prevention and community-based approaches to health, and
- Inter-disciplinary, cross-professional learning, research and collaboration among complementary disciplines

4.0 Options considered

Status Quo: Given the dispersed and inadequate nature of their existing facilities, these groups can no longer be accommodated in their current facilities.

Lease, Sublease, Use/rental of vacant or underutilized public assets: No adequate space in these categories is available at UBC Vancouver campus.

Phased approach: Phasing has been reviewed and is a possibility that can also work for UBC. The logistics must be reviewed further.

Build New: The optimal solution is to build a new facility in a single phase as proposed.

Distance learning will be a component of this building as it is with the distributed medical teaching model.

5.0 Project Outcomes

- **Infrastructure Improvements**

Relocating from 11 different buildings to one will provide the most benefit for improved space utilization and opportunities for inter-professional experience. Existing space will be demolished or repurposed and reallocated. Nursing can relinquish inadequate space in UBC Hospital.

- **Cost Effectiveness**

Combining Nursing, Kinesiology and UBC Health in the CHS offers economies of scale, academic support and other opportunities for synergies and shared use of space. CHS will meet LEED Gold certification standard as per UBC and Provincial government policy. The design team will be encouraged to look for efficiencies in the shared common area spaces (washrooms, lobbies, stair systems, service areas) that would otherwise require duplication.

- **Strategic Alignment and Innovation**

CHS will contribute directly to the BC government's goals to ensure BC's position as a global destination of choice for students to learn, stay to live, work and invest. These programs support the provincial goals of improved health and wellness for British Columbians, the City of Vancouver's plans for healthy, active communities, and the Federal government's initiatives to increase health, wellness and well-being of Canadians.

AVED and UBC have a mutual goal to encourage international students to pursue further learning in BC. "International Engagement" is a commitment in *Place and Promise: The UBC Plan* in which the University strives to create rich opportunities for international engagement for students, faculty, staff, and alumni, as well as global collaboration and communication. UBC works to increase the capacity of UBC students, faculty,

staff, and alumni to engage internationally and to strengthen UBC’s presence as a globally influential university. Partnership with industry will be through fundraising.

• **Quality Education**

The UBC Schools of Nursing and Kinesiology are currently faced with space shortages and rising demands for teaching and research capacity. These units are expecting further significant enrolment increases in both undergraduate and graduate student cohorts. The new CHS facility will address these demands for quality learning and research space.

The most effective means of ensuring sustainable health care is through the promotion of healthy living and healthful environments, prevention and management of chronic illnesses, provision of accessible primary health care, and the reduction of inequities and risks for marginalized populations. CHS is committed to moving health care ‘upstream’ to support prevention and community based approaches.

CHS offers programs in community health, health care and science that can:

- Increase student participation in learning and service abroad.
- Increase the international dimension of UBC’s educational opportunities.
- Increase support for international collaborations by faculty, staff, and alumni.
- Expand recruitment of outstanding students and faculty from around the world.
- Increase the number of substantial strategic partnerships in regions of priority to UBC.
- Enhance UBC’s scholarly communications on global issues, including on the web.
- Strengthen UBC’s role in international development

• **Energy & Emission Reduction**

This project will target LEED Gold certification. Integrated programs have an opportunity to share previously duplicated core space resources

6.0 Project Cost/Funding (CHS only)

Estimate	Total
Planning and Design	8,100,000
Construction	63,000,000
Contingencies	4,630,000
Completion Costs	12,850,000
Taxes	1,420,000
Total	\$90,000,000

Proposed Funding	Amount
UBC	5,000,000
Government	80,000,000
Fundraising	5,000,000
Total	\$90,000,000

Annual Operating + Maintenance	Amount
New Space @ \$92/GSM	\$ 1,749,610
Total	\$ 1,749,610

Recapitalization	Amount
Cyclical Maintenance	\$ 714,085
Modernization/ Upgrade	\$ 185,133
Total	\$899,218

Associated Deferred Maintenance	Deferred Maintenance in \$Ms	FCI	Built
War Memorial Gym (Bldg 428)	24.8	0.73	1950
Robert F Osborne 1 (Bldg 430)	13.5	0.78	1970
Robert F Osborne 2 (Bldg 431)	7.5	0.66	1972
Total	\$ 45.8		

7.0 Key Risks

Project costs and schedule overruns are mitigated by UBC’s retained risk contingency policy, project risk management practices (e.g. risk registry). UBC will apply the experience gained from recently completed capital projects.

8.0 Project Schedule

Community Health Sciences																				
	`2018				`2019				`2020				`2021				`2022			
	Q1	Q2	Q3	Q4																
Planning	█																			
Design					█															
Tender												T								
Construction									█											
Occupancy																				█

Institution/ Campus	Project Title:	Category	Estimate	Priority
UBC Vancouver	Mathematics & Annex and LS Klinck Building Replacement	1 + 2	\$100 m	5 of 8

1.0 Current Situation

The Department of Mathematics at UBC is one of the strongest mathematics departments in Canada. The Department has strong connections with other departments and institutes at UBC, and has a major role in the cross-disciplinary Institute of Applied Mathematics (IAM), with members from across Science, Applied Science and other UBC faculties.

The layout, age, condition, and inadequate infrastructure of Mathematics, Mathematics Annex and LS Klinck restrict pedagogical development and growth in student numbers, and will not support program growth. This project proposes to replace the Mathematics Building and the Mathematics Annex, 2-storey wood frame structures with exterior stucco and interior plaster finishes constructed in 1924-5 and have now reached the end of their service life. The LS Klinck Building and addition have limited accessibility, lack a sprinkler system, and have been identified as very high seismic risk. Although building systems have been partially upgraded over time as needs have arisen or as renovations occurred, these buildings have large amounts of deferred maintenance and have had recent water and structural problems.

2.0 Project Description

Faculty/Department: Science – Mathematics including PIMS, IT and Integrated Sciences

This project proposes build 11,700 GSM to replace deteriorating buildings which have reached the end of service life. The proposed plan is to build an expansion and replacement facility to address teaching needs, fulfill capacity requirements and provide up to date, flexible space with full infrastructure capability. The project will include replacement of lecture theatres and classrooms that serve the wider precinct. A new structure will provide a more pleasant learning environment that will be designed to facilitate collaboration. A complicated scenario of swing space and consequential moves must accompany this project.

3.0 Project Objectives

- Provide higher capacity, more flexible and efficient facilities.

4.0 Options considered

Consideration of renewal and replacement options are underway. New expansion is required and detailed planning is underway to determine project scope costing, site analysis, funding/financing strategy.

5.0 Project Outcomes

- **Infrastructure Improvements**

Associated Deferred Maintenance	Deferred Maintenance in \$Ms	FCI	Built
Mathematics (Bldg 518)	8.05	0.78	1924
Mathematics Annex (Bldg 519)	2.71	0.69	1925
LS Klinck & Addition (Bldg 308, 308-1)	26.95	0.75	1947
Total	\$ 37.7		

- **Cost Effectiveness**

Consideration of renewal and replacement options are underway.

- **Energy & Emission Reduction** This project will target LEED Gold certification.

6.0 Project Cost/ Funding for Mathematics & Annex and LS Klinck Building Replacement

Estimate	Total
Planning and Design	\$9,000,000
Construction	\$70,000,000
Contingencies	\$5,080,000
Completion Costs	\$14,280,000
Taxes	\$1,640,000
Total	\$100,000,000

Proposed Funding	Amount
UBC	\$5,000,000
Government	\$80,000,000
Fundraising	\$15,000,000
Total	\$100,000,000

Annual Operating + Maintenance	Amount
New, Renewed Space \$92/GSM	\$ 2,025,610
Less Existing Space \$57.60/GSM	\$ 932,141
Total	\$1,093,469

Recapitalization Costs	Amount
Cyclical Maintenance	\$ 830,241
Modernization/ Upgrade	\$ 215,248
Total	\$1,045,489

7.0 Key Risks

Project costs and schedule overruns are mitigated by UBC’s retained risk contingency policy, project risk management practices (e.g. risk registry).

UBC will apply the experience gained from recently completed capital projects.

8.0 Project Schedule

Math Building Renewal/Replacement (including LS Klinck Building)																				
	'2018			'2019				'2020				'2021				'2022				
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Planning																				
Design																				
Tender									T											
Construction																				
Occupancy																				

Institution/ Campus	Project Title:	Category	Estimate	Priority
UBC Vancouver	Geography Building Replacement	1	\$50 m	6 of 8

1.0 Current Situation

Similar in age and construction to the Mathematics Building and Annex, the layout, age, condition, and inadequate infrastructure of the Geography Building restricts pedagogical development and growth in student numbers, and will not support program growth.

This project proposes to demolish and replace the Geography Building, a 2-storey wood frame structure with exterior stucco and interior plaster finishes constructed in 1925 which has reached the end of its service life. Although building systems have been partially upgraded over time as needs have arisen or as renovations occurred, these buildings have large amounts of deferred maintenance and have had recent water and structural problems. Site investigation and seismic analysis to date indicate that the Geography building’s demolition or retrofit should result and reduced life safety risk on campus. A complicated scenario of swing space and consequential moves must accompany this project.

2.0 Project Description

Faculty/Department: Arts - Geography

This project proposes build a 8,300 GSM replacement facility to address teaching needs, fulfill capacity requirements and provide up to date, flexible space with full infrastructure capability. The project will include replacement of lecture theatres and classrooms that serve the wider precinct. A complicated scenario of swing space and consequential moves must accompany this project.

3.0 Project Objectives

- Provide higher capacity, more flexible and efficient facilities

4.0 Options considered

Consideration of renewal and replacement options are underway. New expansion is required and detailed planning is underway to determine project scope costing, site analysis, funding/financing strategy.

5.0 Project Outcomes

- **Infrastructure Improvements**

Associated Deferred Maintenance	Deferred Maintenance in \$Ms	FCI	Built
Geography (Bldg 401)	10.29	0.76	1925
Total	\$ 10.29		

- **Cost Effectiveness**

Consideration of renewal and replacement options are underway.

- **Energy & Emission Reduction** This project will target LEED Gold certification.

6.0 Project Cost/ Funding for Geography Building Replacement

Estimate	Total
Planning and Design	\$4,500,000
Construction	\$35,000,000
Contingencies	\$2,540,000
Completion Costs	\$7,140,000
Taxes	\$820,000
Total	\$50,000,000

Proposed Funding	Amount
UBC	\$3,000,000
Government	\$45,000,000
Fundraising	\$2,000,000
Total	\$50,000,000

Annual Operating + Maintenance	Amount
New Space @ \$92/GSM	\$ 763,600
Less Existing Space \$57.60/GSM	\$ 316,627
Total	\$ 446,973

Recapitalization Costs	Amount
Cyclical Maintenance	\$ 207,683
Modernization/ Upgrade	\$ 53,844
Total	\$261,527

7.0 Key Risks

Project costs and schedule overruns are mitigated by UBC’s retained risk contingency policy, project risk management practices (e.g. risk registry).

UBC will apply the experience gained from recently completed capital projects.

8.0 Project Schedule

Geography Building Replacement																					
	`2018				`2019				`2020				`2021				`2022				
	Q1	Q2	Q3	Q4																	
Planning	█																				
Design					█																
Tender									T												
Construction									█												
Occupancy																					

Institution/ Campus	Project Title:	Category	Estimate	Priority
UBC Vancouver	Asian Centre Renovation & Library Addition	1+2	\$16 m	7 of 8

1.0 Current Situation

Asian Studies department personnel (faculty, staff, sessional instructors, postdocs and graduate students) are currently split between two locations, inhabiting the south wing of the Asian Centre and space in the Auditorium Annex B, slated to become the Armoury Hub site within the next five years. Consolidation of the department within the Asian Centre will strengthen the department and provide a relocation strategy for those currently in Annex B. This will also better serve the nearly 10,000 enrollments per year in the Asian Studies program, of which approximately 35% are international students.

2.0 Project Description

This project proposes renovations and an addition to the Asian Centre. Project scope includes:

- Renovation of all levels of the existing Asian Centre within its existing walls and roof, to include:
 - Code and building life safety upgrades
 - Electrical, mechanical and information systems upgrades
 - Interior partitions, finish realignment and upgrades

- Low profile addition (possibly sub-grade with an open courtyard) to accommodate the additional space requirements.
- Improvements to the exterior moat and exterior informal learning landscape treatments.

The existing building area of the Asian Centre is 5,155 GSM (55,488 GSF). The proposed addition is approximately 1,140 GSM (12,270 GSF).

3.0 Project Objectives

Consolidation of the department within the Asian Centre will strengthen the department and provide a relocation strategy for those currently in Annex B. This will also better serve the nearly 10,000 enrollments per year in the Asian Studies program, of which approximately 35% are international students.

4.0 Options Considered

Renewal of an underutilized, existing facility plus expansion is more cost effective and environmentally sustainable than building a new facility.

5.0 Project Outcomes

- **Infrastructure Improvements**

Associated Deferred Maintenance	Deferred Maintenance in \$Ms	FCI	Built
Asian Centre (046)	7.51	0.39	1975
Aud Anx B (863-2)	1.96	0.8	1969
Total	\$ 9.47		

- **Cost Effectiveness**

See Options Considered

- **Quality Education/ Innovation/ Strategic Alignment**

This proposed project will provide a cohesive centre for faculty research, enhanced access to the largest Asian language collection in Canada, and much needed innovative, informal learning space which will enable collaborations between students, faculty and local communities. 35% of the Asian Studies program are international students.

- **Energy & Emission Reduction**

This project will target LEED Gold certification.

6.0 Project Cost/Funding

Estimate	Total
Planning and Design	1,440,000
Construction	11,200,000
Contingencies	810,000
Completion Costs	2,286,000
Taxes	264,000
Total	\$16,000,000

Proposed Funding	Amount
AVED	8,000,000
Fundraising	8,000,000
Total	\$16,000,000

Annual Operating + Maintenance	Amount
Renewed Space @ \$92/GSM	477,197
New Space @ \$92/GSM	101,841
Total	\$ 579,038

Recapitalization	Amount
Cyclical Maintenance	237,831
Modernization/ Upgrade	63,015
Total	\$ 300,846

7.0 Key Risks

- Project costs and schedule overruns are mitigated by UBC’s retained risk contingency policy, project risk management practices (e.g. risk registry).
- UBC will apply the experience gained from recently completed capital projects.

8.0 Project Schedule

Asian Centre Renovation & Library Addition																				
	`2018				`2019				`2020				`2021				`2022			
	Q1	Q2	Q3	Q4																
Planning																				
Design																				
Tender									T											
Construction																				
Occupancy																				

Institution/ Campus	Project Title:	Category	Estimate	Priority
UBC Vancouver	The UBC Farm Centre	1	\$20 m	8 of 8

1.0 Current Situation

The Centre for Sustainable Food Systems (CSFS) at UBC Farm integrates interdisciplinary academic, community, and production programs to explore and exemplify healthy and sustainable food systems. It provides a globally unique research and teaching environment aimed at improving the sustainability and resiliency of our regional, national, and global food systems, embodying the concept of campus as a living lab, and providing researchers with a research platform where social, economic, and environmental interventions can be designed, tested, and monitored within a living food system. Research opportunities span the whole seed to plate continuum while integrating a multitude of disciplines and sectors to provide global leadership for transformation leading to resilient and secure future food systems.

2.0 Project Description

The proposed Food and Beverage Technology Centre (FBTC) at CSFS will promote the competitiveness of British Columbia’s \$8 billion food and natural health product processing industry through a multi-dimensional partnership between industry and the University of British Columbia.

The physical infrastructure for the Centre will consist of a main building (the “Farm Centre”) and supporting outbuildings, described as follows:

- The Farm Centre will be the face of the CSFS and the FBTC, housing research and teaching facilities; facilities for educational and community programs and events; children’s program facilities; offices for CSFS staff, faculty and partners; and residences for the site’s caretakers. It will be located near the entry gate to the UBC Farm.
- A series of outbuildings will support and enhance the Farm Centre and will include research, production and teaching greenhouses, facilities to support market activities, a workshop facility, and facilities to manage the livestock on the site.

3.0 Project Objectives

The FBTC facility will foster a competitive advantage in food and beverage product development for British Columbia by creating an innovation hub and knowledge portal that will be globally unique in four ways:

Vertical integration: The centre will facilitate collaboration between industry and UBC across the supply chain from agricultural cultivation, food pilot processing, culinary arts, and extending to food services, retail and export.

Jobs and Training: The centre will have the facilities and network of knowledge experts to be an incubator for food and beverage entrepreneurs, and a training ground for food technologists and scientists.

Health and sustainability: The centre’s facilities and knowledge expertise will integrate with UBC Farm’s sustainable food systems research and teaching capacities, and specialize in BC’s prospective competitive advantages in the global marketplace: the health and organic food sector, and sustainable production (reductions in waste and in water and energy usage).

Gateway to Asia and domestic market access: The centre’s partnerships between industry and UBC will focus on areas that will position the BC food processing ecosystem for competitiveness in the Asian and domestic markets, such as food safety, sensory innovation, and value-added BC agricultural products. The centre will promote food and beverage security for domestic markets by building local capacity.

4.0 Options Considered

No adequate facilities exist at the UBC Farm for this new program necessitating new construction.

5.0 Project Outcomes

- **Infrastructure Improvements**

The UBC Farm is underdeveloped and this project would shape its future planning direction.

- **Cost Effectiveness**

The proposed Food and Beverage Technology Centre (FBTC) at CSFS will promote the competitiveness of British Columbia’s \$8 billion food and natural health product processing industry through a multi-dimensional partnership between industry and UBC.

- **Quality Education/ Innovation/ Strategic Alignment**

The FBTC facility embodies the concept of campus as an agent of social change, where learners of all ages can immerse themselves in the stewardship of a working, productive landscape. More than 6800 students, through 60 courses, across 12 different UBC Faculties collaborate with the Centre on curricular activities ranging from community service learning to immersive internships to on-site lectures

- **Energy & Emission Reduction**

This project will target LEED Gold certification. The facilities will be built with a low carbon footprint, using low-tech, traditional sustainable materials and construction techniques wherever possible. It will be a research, education and demonstration facility for sustainable urban agriculture and food production.

6.0 Project Cost/Funding for the UBC Farm Centre

Estimate	Total
Planning and Design	\$1,800,000
Construction	\$14,000,000
Contingencies	\$1,026,000
Completion Costs	\$2,845,000
Taxes	\$329,000
Total	\$20,000,000

Proposed Funding	Amount
Government	\$9,000,000
Fundraising	\$11,000,000
Total	\$20,000,000

Annual Operating + Maintenance	Amount
New Space @ \$92/GSM	\$ 349,736
Total	\$ 349,736

Recapitalization	Amount
Cyclical Maintenance	\$ 142,741
Modernization/ Upgrade	\$ 37,820
Total	\$180,561

7.0 Key Risks

- Project costs and schedule overruns are mitigated by UBC’s retained risk contingency policy, project risk management practices (e.g. risk registry).
- UBC will apply the experience gained from recently completed capital projects.

8.0 Project Schedule

UBC Farm Centre																						
	`2018				`2019				`2020				`2021				`2022					
	Q1	Q2	Q3	Q4																		
Planning	█																					
Design		█																				
Tender						T																
Construction							█															
Occupancy												█										

Attachment 2: Seismic Impact of Five Year Capital Plan

	UBC Campus	Project	Seismic impact (Demolition or Renewal)
1	Vancouver	Biological, Environmental, and Biomedical Engineering Building	Civil & Mechanical Engineering Laboratories "Rusty Hut" (Bldg 307)
2	Vancouver	Chemistry Laboratory Complex (Undergraduate Chemistry Teaching Labs + Chemistry Physics Research Labs)	Chemistry A (Chem Physics) (Bldg 447) Chemistry B (Chem South-Bldg 148) Chemistry C (Chem East -Bldg 144) * Wesbrook Building & Annex (Bldg 864,867) *George Cunningham & Annex (Bldg 625, 624)
3	Okanagan	UBCO Industrial Scale Engineering Lab	
4	Vancouver	Community Health Sciences + Recreation Facility + War Memorial Gym Renewal	War Memorial Gym (Bldg 428) Robert F Osborne Centre Unit 1 (Bldg 430) Robert F Osborne Centre Unit 2 (Bldg 431)
5	Vancouver	Math Building Renewal/Replacement (including Klinck Building)	Mathematics & Annex (Bldg 518, 519) LS Klinck (Bldg 408, 408-1)
6	Vancouver	Geography Building	Geography (Bldg 401)
7	Vancouver	Asian Centre Renovation & Library Addition	Asian Centre (Bldg 046) Auditorium Annex B (Bldg 863-2)
8	Vancouver	UBC Farm Centre	Plant Science Field Building (Bldg 670) Botany Greenhouse 1,2 (Bldg 071-1,2)
		Total	

- If the Wesbrook/Cunningham site is selected, these buildings would be demolished.