

BCIT Renew:
Five-Year Capital Plan 2014 to 2018

BCIT



June 2013

BCIT Five-Year Capital Plan: Overview

BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY (BCIT)

Established in 1964, the British Columbia Institute of Technology comprises six schools of study that operate at five campus locations. With 46,000 full and part time students, BCIT is one of the largest post-secondary education institutions in BC.

This Five-Year Capital Plan highlights the urgent need to provide modern, flexible facilities to support the delivery of education and research programs to ensure BCIT graduates are job-ready. In addition, the proposed capital plan supports institute priorities to address critical deferred maintenance, seismic safety, operational challenges and energy efficiency issues associated with 1960s-70s era buildings.

VISION

BCIT: Integral to the economic, social and environmental prosperity of British Columbia.

MISSION

The Mission of BCIT is to serve the success of learners and employers:

- By providing high quality technical training, and professional education and training, that supports our graduates as practitioners and as citizens; and
- By advancing the state of practice.

FACILITY RENEWAL

The focus of the Five-Year Capital Plan is to renew facilities at the Burnaby Campus. Apart from the recently completed Gateway Project, the Burnaby Campus has undergone limited capital renewal of buildings over the past two decades. The Burnaby Campus requires an injection of capital investment to enable BCIT to continue to meet its educational mission:

- Two-thirds of Burnaby Campus academic buildings (29 of 43) are more than forty years old;
- The deferred maintenance value of the buildings is very large, with a total value of $607 million (VFA study – Burnaby Campus);
- Two-thirds of Burnaby Campus buildings (29 of 43) are rated within the high seismic risk priority categories;
- Numerous buildings are functionally inadequate with building layouts, and teaching and social spaces that are inappropriate for modern learning and research;
- Building systems and infrastructure are obsolete and inefficient;
- Many buildings are unattractive and negatively impact Institute image and recruitment; and
- Energy efficiency and carbon reduction projects are featured in the Capital Plan as a means of achieving sustainability objectives and reducing operating expense.

BCIT Renew: Five-Year Capital Plan is a cost effective mix of projects that blends new construction with building renewal and upgrades. It is aligned with the provincial government's key policies and priorities, including "BC Jobs". The programs benefiting from this investment are for occupations projected to experience growth, and where training is needed, in the province.

PROJECT MANAGEMENT FRAMEWORK

The Capital Plan has been developed within BCIT's Project Management Framework that provides a consistent approach to facility analysis, planning and development. All capital investments will follow this process.

BCIT *Project Feasibility Process*

Ministry of Advanced Education, Innovation & Technology *CARG Process*

EMERGENCY FUNDING – HIGH RISK TO BUSINESS CONTINUITY

Critical Utilities Replacement (Burnaby Campus)

This project involves the renewal of utility infrastructure beneath Goard Way, which is the main entry into BCIT's Burnaby campus. The prime component of this renewal is the replacement of the major BC Hydro feed to the entire south campus, the receiving station and substation, all of which are beyond serviceable life. BC Hydro has informed BCIT that this service has been over capacity on several occasions which, because of the age of the equipment being stressed, is an extreme risk to the operations of BCIT and therefore the number one priority for renewal. Other underground utilities along this corridor will be impacted by this work and will be renewed at the same time due to end of serviceable life and proximity issues. This project provides utility services to approximately 30 major educational buildings accommodating 15,000 FTE students.

Heavy Equipment Land Transportation & Motive Power Transportation Centres

Motive Power Transportation is a key transportation training facility in BC. Phase One of this renewal involves relocating the Heavy Duty Motive Power Program from its leased space at the Great Northern Way Campus (GNW), to a new leased facility in the Lower Mainland.

The timing of the Phase One proposal is directly linked to the Provincially funded new Emily Carr University of Art & Design (ECUAD) facility at the GNW site. The ECUAD proposal, and related space for digital media enterprises, requires land and building area currently utilized by the BCIT Motive Power Program. **BCIT's Motive Power facility is obligated to move by 2014**. As the HD Motive Power Program has highly specialized shop requirements, a leased replacement facility will require significant tenant improvement and servicing upgrades.

Phase Two involves consolidating existing Motive Power programs (Automotive and Motorcycle Transportation) at the Burnaby Campus in one facility. Phase Two consolidation will enable the demolition of seven obsolete buildings that have a deferred maintenance and seismic deficiencies totaling $38.5 million.

RENEWAL PRIORITIES

BCIT Renew - School of Health Sciences (SoHS), Energy, Engineering & Computing

Another top priority for BCIT is the renewal and consolidation of School of Health Sciences facilities, including the construction of a new Centre for Simulation. This integrated and comprehensive renewal program will advance health education workflow training, and facilitate inter-professional collaboration. The comprehensive plan includes complete renewal of buildings SW03 and SW01, which are rated high seismic risk, and have 10-year deferred maintenance costs estimated at $133.5 million. These large buildings form the core of the BCIT campus, and together comprise 350,000 sf (32,500 m2). Preliminary cost estimates indicate the two buildings can be renewed at 55% and 65% of their replacement costs, respectively.

Renewal of these buildings, along with the construction of the Centre for Simulation building, will enable consolidation of the SoHS, and provide functional improvements for a number of other BCIT programs that share these facilities.

Steel Trades Renewal

This project involves comprehensive renewal of the Steel Trades Building (NE 12). This aging facility has many systems and components reaching end of life cycle. Both the VFA report and the seismic assessment confirm that a renewal and upgrade of life safety, seismic, electrical, mechanical, communications and interior spaces should be completed.

Capital Innovation Project – Biomass Power Generation

One innovation project has been proposed to introduce new technologies to existing facilities, and achieve energy use, waste disposal, and carbon offset reductions. A Wood Waste Reduction and Biomass Power Generation facility is proposed for Building NE02 and would function as a “Living Laboratory” demonstration project.

Library Commons/Media and Creative Communications

These two integrated projects involve structural upgrades and renovations to mitigate deferred maintenance risk, and functional inadequacies associated with existing buildings. The Library Renewal project includes an addition that will increase the capacity for student project learning, and enhance connections with the Media and Creative Communications program by linking both facilities with student and staff project collaboration spaces.

Learning and Teaching Centre/Information Technology

Building SE12 accommodates the Learning and Teaching Centre, School of Computing and Academic Studies, and Information Technology. This building is rated high seismic risk, and an initial study estimated the renewal cost to be approximately 80% of replacement cost. Therefore, a smaller, more efficient building is proposed to replace SE12. This new building would primarily serve the Learning and Teaching Centre and IT Services, and include facilities for BCIT’s primary data and communications infrastructure.

Skilled Trades Renewal

The Skilled Trades building is an outdated, 215,000 sf facility that will be split into two buildings. The existing building is rated high seismic risk (H1), with deferred maintenance costs of $56 million. The functional inadequacy of the building challenges the ability to provide modern instructional spaces and service equipment renewal. New, modern facilities will attract new learners to trades and building sciences.

CAPITAL PLAN SUBMISSION

In accordance with Ministry instructions, capital plan submission forms have been completed for each of these projects, and are listed in order of overall priority. In total, the Five-Year Capital Plan includes twelve projects with a value of $543.49 million, spread over the 2014/15 to 2018/19 timeframe. Cashflow projections for each project are summarized in the *Prioritized List of Proposed Projects*.

This capital plan strives to provide modern, flexible facilities that support the delivery of education and research programs required to prepare job-ready BCIT graduates. This plan also addresses critical deferred maintenance, seismic safety, and operating/energy use issues associated with older buildings at BCIT's Burnaby Campus.

All the initiatives identified in this Capital Plan are consistent with and support *BC's Job Plan* and the *Service Plans* of the Ministries.

#	Project Description	Project Category	Anticipated Construction Start Date	Anticipated Occupation Date	Project Completion Date (inc. Demolition)	Total Project Budget (inc. Escalation)	Total Cashflow Forecast (fiscal years, millions)					
							2014/15	2015/16	2016/17	2017/18	2018/19	Outgoing Years
1	Critical Utilities Replacement (Burnaby Campus)	High Risk to Business Continuity	Jul 2013	Jul 2015	Jul 2015	$9,600,000	$1.38	$4.86	$3.36	$0	$0	$0
2	Heavy Equipment Land Transportation Centre (Phase 1 - Mandatory Lease Relocation from GNW Campus)	High Risk to Business Continuity	Dec 2013	Jul 2014	Jul 2014	$17,000,000	$17.00	$0	$0	$0	$0	$0
3	BCIT Renew: Health Sciences Simulation	1. New Priority	Jan 2016	Jul 2017	Jul 2017	$65,160,000	$0.58	$8.17	$37.64	$18.82	$0	$0
3	BCIT Renew: Health Sciences, Energy & Engineering - SW01	2. Whole Asset Replacement & Renewal	Oct 2017	Apr 2019	Apr 2019	$66,600,000	$0.32	$1.15	$4.27	$10.14	$40.58	$10.14
3	BCIT Renew: Health Sciences & Computing - SW03	2. Whole Asset Replacement & Renewal	Jul 2018	Jul 2020	Jul 2020	$54,340,000	$0.13	$0.19	$1.63	$2.72	$2.72	$46.97
4	Steel Trades Renewal - NE12	2. Whole Asset Replacement & Renewal	Jul 2014	Jul 2015	Jul 2015	$9,300,000	$1.35	$4.67	$3.26	$0	$0	$0
5	Wood Waste Reduction & Biomass Power Generation - NE02	3. Capital Innovation Fund	Jul 2014	Apr 2015	Apr 2015	$1,500,000	$0.75	$0.75	$0	$0	$0	$0
6	Library Centre Renewal & Addition - SE14	2. Whole Asset Replacement & Renewal	Jul 2017	Jan 2019	Jan 2019	$25,000,000	$0	$0.50	$2.00	$7.50	$11.25	$3.75
7	Centre for Media & Creative Communications Renewal - SE10	2. Whole Asset Replacement & Renewal	Jul 2018	Jan 2020	Jan 2020	$15,000,000	$0	$0	$0.75	$4.50	$2.25	$7.50
8	Motive Power Transportation Centre (Phase 2 - Burnaby Campus)	1. New Priority	Oct 2017	Apr 2019	Oct 2019	$54,500,000	$0	$0	$2.73	$16.35	$21.80	$13.62
9	Teaching & Learning Centre/Information Technology - SE12	1. New Priority	Oct 2017	April 2019	July 2019	$67,000,000	$0	$0	$3.35	$3.35	$21.10	$40.20
10	Skilled Trades Renewal - NE01	1. New Priority	July 2018	July 2020	July 2021	$158,490,000	$0	$0	$0	$11.00	$12.68	$134.72
						$543,490,000	$21.51	$20.29	$58.99	$74.38	$112.38	$256.90

Note: all costs include taxes.

Project 1 – BCIT Five-Year Capital Plan
*High Risk to Business Continuity
Critical Utilities Replacement (Burnaby Campus)

1.0 CURRENT SITUATION

This project is primarily necessitated by the aging and over capacity electrical high voltage service to BCIT's central campus and risk to business continuity to deliver educational programs. BC Hydro has informed BCIT that this service is undersized and has been over capacity on several occasions which, due to the age of the equipment being stressed, is an **extreme risk** to the operations of BCIT.

This project provides utility services to approximately 30 major educational buildings accommodating 15,000 FTE students.

2.0 PROJECT DESCRIPTION

This project involves the renewal of utility infrastructure beneath Goard Way, one of the main east-west corridors at BCIT's Burnaby campus. The prime component of this renewal is the replacement of the major BC Hydro feed to the entire south campus, the receiving station and substation, all of which are beyond serviceable life.

While the replacement of the main hydro feed to the south campus is the primary focus of this project, the program includes renewal of underground utilities along this corridor due to end of serviceable life and proximity issues. Engineering feasibility studies have been undertaken to define scope and budget. Design development for this project began May 2013. This project will include surface reinstatement and upgrade.

3.0 PROJECT CATEGORY

*High Risk to Business Continuity

4.0 PROJECT PRIORITY NUMBER

Rank: **(1)** of 10 projects.

5.0 PROJECT OBJECTIVES

- Remediate extreme risk to business continuity and program delivery.
- Provide adequate high voltage service to existing facilities and ensure capacity for future campus development as well as improve other adjacent utilities that are beyond serviceable life.
- Improved alignment with BCIT's and BC Hydro's long term objectives to:
  - > Support development of the primary electrical distribution on the campus perimeter.
  - > Provide flexibility for expansion of substation distribution connectivity in a grid pattern.
  - > Potential to provide a future redundant second power feed for business continuity.
- Implementation of high efficiency electrical services and potential district energy.
- Provide flexibility with district energy innovation initiatives and connectivity.

6.0 OPTIONS CONSIDERED

Status quo is not viable and poses extreme risk to BCIT's operations as a result of system failure. The provision of replacement is the only option to address this deficiency in electrical services.

7.0 PROJECT OUTCOMES

Infrastructure Improvements

This renewal project will mitigate the risk of equipment failure and service interruption to campus buildings that serve over 15,000 students. An interruption would potentially be for a substantial period of time as the aged equipment would likely not be repairable and replacements would be necessary. Service recovery could be up to 6 to 12 months.

The replacement of the receiving station and substation would enable the implementation of a grid pattern distribution system and provide flexibility for future secondary power feed expansion and district energy.

Cost Effectiveness

A planned renewal of these services will avoid the potential disruption to education programs and business continuity, reduce continual deferred maintenance and operational inefficiency.

Innovation

- The design team will consult with BCIT subject matter experts and other stakeholders.
- Design will incorporate MicroGrid district technology and allow for demand side management.
- Provides flexibility with district energy connectivity, which supports BC Hydro, and Natural Resources Canada objectives.
- Sustainable storm water management techniques will be integrated into the design.
- Grey water treatment or harvesting techniques will be assessed.

Strategic Alignment

- Supports BCIT Institute Strategic Initiative 4 – Stewardship and Resource Development to ensure that physical facilities and campus infrastructure needs are met through an integrated plan that accounts for teaching space, research facilities, equipment, information and education technologies, and environmental sustainability.
- Consistent with BC's sustainability objectives (*BC Climate Action Plan*).
- The Critical Utilities Replacement project supports the *Ministry of Energy, Mines and Natural Gas and Minister Responsible for Housing's 2013/2014-2015/2016 Service Plan*, particularly "Goal 2: Safe and environmentally responsible energy and mineral resource development and use".
  - > Objective 2.2: Clean energy resources, fuels and related technologies complemented by energy efficiency and conservation efforts across all sectors of the economy.

Quality Education

The risk of power disruption would potentially impact every student at the Burnaby Campus. This disruption could last a significant amount of time due to the replacement timeline of the effected equipment and could detrimentally affect curriculum delivery.

The projects design will include opportunities for living lab research initiatives related to MicroGrid district technology and sustainable stormwater management.

8.0 PROJECT COST/FUNDING

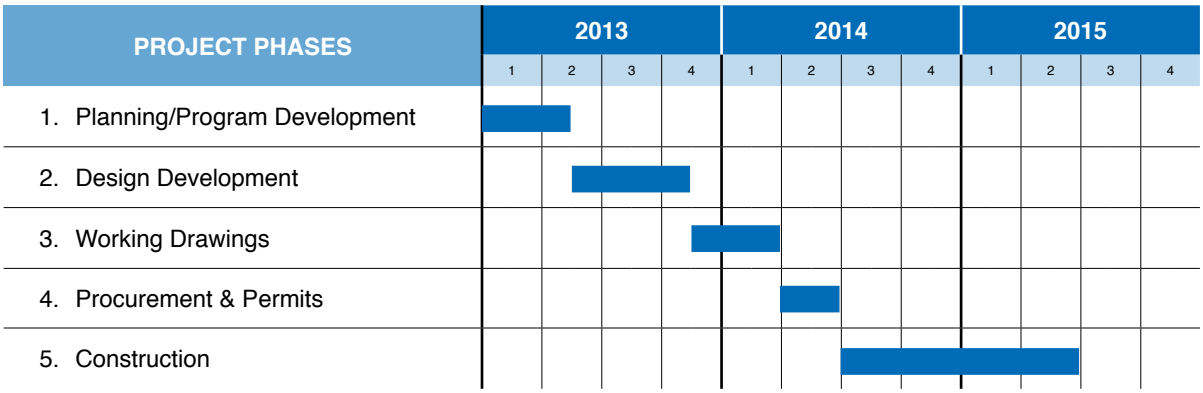
$9.6 MILLION – Total estimated escalated project cost.

9.0 KEY RISKS

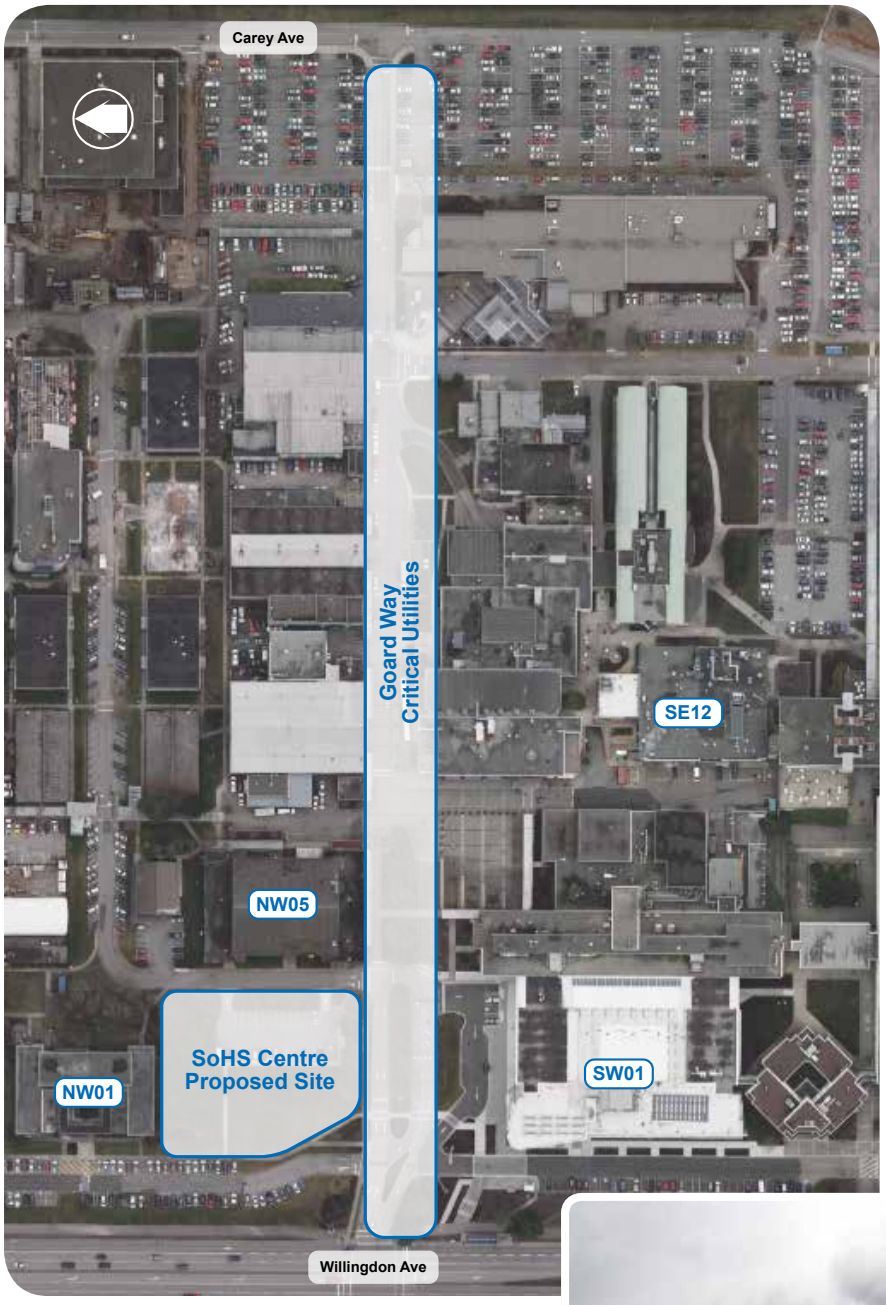
- Maintaining utilities fully functional while installing replacement pipes and duct banks.
- Uncertainty of location of existing utilities.
- Excavating alongside a live High Voltage duct bank.
- Hazmat abatement.

10.0 PROJECT SCHEDULE

- **Anticipated construction start date:** July 2014
- **Anticipated occupancy date:** July 2015



Critical Utilities Replacement - Southern Burnaby Campus



Project 2 – BCIT Five-Year Capital Plan
*High Risk to Business Continuity
Heavy Equipment Land Transportation Centre – Phase 1

1.0 CURRENT SITUATION

BCIT has initiated a feasibility study with Vancouver Community College (VCC) to investigate the viability of a joint relocation of Heavy Equipment Transportation programs to a shared lease facility.

BCIT's Program must be relocated from its current leased facilities at Great Northern Way Campus (GNWC) by summer 2014 to make room for the approved Emily Carr University of Art & Design (ECUAD) facility.

VCC's Heavy Duty/Commercial Transport programs are located at the Broadway campus in the City of Vancouver. Shop spaces are very overcrowded with utilization 177%. Additionally the configuration of the shop space is constrained and entails relocating multiple pieces of equipment on a daily basis to deliver programming.

The study is expected to be completed by the end of August 2013 and will provide detailed capital and operational cost estimates. Timing is critical for this project because of the move in of the new ECUAD facility.

2.0 PROJECT DESCRIPTION

The project involves an innovative joint initiative by BCIT and VCC which would see relocation of the BCIT Heavy Duty Motive Power Transportation Program from leased facilities at the GNWC to a new leased facility in the Lower Mainland. The initiative will also involve collaboration on program delivery.

For BCIT, the initiative is part of a phased approach to the renewal of facilities for the School of Transportation. Phase 1 involves relocation of the Heavy Duty Motive Power Program, currently accommodated in lease facilities at Great Northern Way. As the program has highly specialized shop requirements, a replacement facility is required to continue offering this industry based training program. Phase 2 involving the balance of the School's facilities is the subject of a separate submission within this capital plan.

Space requirements for both BCIT and VCC have been initially estimated at 140,000 sf (13,000 m^2) and include mechanic workshops, classroom spaces, vehicle storage, support facilities, student spaces and parking. Advanced technologies and teaching methods will be incorporated into the facility design.

Supported Programs

The following programs will be accommodated in Phase One:

BCIT

- Heavy Equipment
- Commercial Transport
- Mobile Forklift Equipment
- Rail Conductor

VCC

- Heavy Duty Diesel
- Commercial Transport

FTEs

No additional BCIT student FTEs are associated with this proposal.

Project Size

The proposed facility size is 140,000 sf (13,000 m^2).

3.0 PROJECT CATEGORY

*High Risk to Business Continuity

4.0 PROJECT PRIORITY NUMBER

Rank: **(2)** of 10 projects.

5.0 PROJECT OBJECTIVES

- Avoid educational program disruption at BCIT due to the Provincially funded ECUAD facility at GNWC.
- Consolidate Motive Heavy Duty Transportation programs at shared BCIT/VCC leased facility.
- Replace existing buildings that are functionally inadequate and in poor condition.
- Provide modern facilities that employ new technologies in Motive Power education.
- Alleviate current overcrowded conditions of the VCC Heavy Duty/Commercial Transport programs.
- Increase safety of students in the VCC Heavy Duty/Commercial Transport programs.
- Increase overall operational effectiveness of the VCC programs.
- Develop synergies around program delivery for similar programs between BCIT and VCC.
- Provide yard support space to accommodate the variety of types of equipment required for the program.
- Locate the Heavy Duty/Commercial Transport programs more central to student catchments.

Needs Assessment

- BCIT's current location is now deemed temporary pending the Provincially funded ECUAD/GNWC facility.

6.0 OPTIONS CONSIDERED

Presently, the long-term lease of a facility is the option currently being investigated through a joint feasibility plan with VCC, expected to be completed by August 2013.

- Status quo: not viable for BCIT because of the obligation to move. For VCC, it maintains current unsatisfactory situation.
- Lease Option: Subject to study confirmation of the lease of land and building option.
- New Building Option: A replacement facility at the Burnaby Campus is difficult to achieve due to the ECUAD project timeline.

7.0 PROJECT OUTCOMES

Infrastructure Improvements

- The new building will provide a purpose-designed facility that enables advanced instructional practice and technologies.
- The long-term lease location permits partnership synergies with VCC heavy duty and commercial transport programs and resources.
- Maintains educational program continuity for BCIT.
- Reduces occupational safety risks at VCC's Broadway Campus.

Cost Effectiveness

Cost implications are being investigated through the feasibility study and will result in the identification of a cost effective option that minimizes risk to business continuity.

Innovation

- Partnership and program efficiencies can be attained through the sharing of common facilities.
- Creates opportunities for further collaboration.
- The more central location of a transport facility within the lower mainland will better service transportation sector stakeholders.

Strategic Alignment

The Project is aligned with BC Government priorities and strategies:

- Supports the BC Government's goal of investing in transportation throughout BC – see "*Service Plan for 2011/12-2013/2014, Ministry of Transportation and Infrastructure*".
- Trades, transportation, equipment operators, and related occupations are expected to experience 153,000 job openings from expansion and replacement between 2010-2020 (*BC Labour Market Outlook 2010-2020*).
- BCIT and VCC work closely with industry, and have affiliations with fourteen private and public sector organizations in land transportation.
- The project increases collaboration, innovation and partnerships, as a collaborative initiative between VCC and BCIT that anticipates not only co-location of programs but opportunities for sharing of program delivery.
- Consistent with BC's sustainability objectives (*BC Climate Action Plan*).

Quality Education

- The project will facilitate the use of modern equipment and education workflow simulation.
- Provide opportunities (currently non-existent) to field test equipment.
- Enable students to work on a wider range of equipment, thereby developing a greater range of skills.

8.0 PROJECT FUNDING

$17 MILLION – Total estimated project cost

(Preliminary feasibility study underway will confirm value. This estimate is subject to change).

BCIT and VCC costs are both included in this estimate.

9.0 KEY RISKS

- Delays in funding risk disrupting programs due to the anticipated GNWC redevelopment scheme.
- Lease termination and continued annual lease expenditures.
- Continued higher operational inefficiencies and cost.

10.0 PROJECT SCHEDULE

- **Anticipated construction start date:** December 2013
- **Anticipated occupancy date:** August 2014

PROJECT PHASES	2013				2014				2015				2016			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Planning/Program Development																
2. Design Development																
3. Working Drawings																
4. Procurement & Permits																
5. Construction																

Current Site of Motive Transportation Centre at GNWC

Project 3 – BCIT Five-Year Capital Plan

BCIT Renew: Health Sciences Simulation

1.0 CURRENT SITUATION

The School of Health Sciences (SoHS) has evolved through a series of incremental changes, which have resulted in program spaces being scattered in seven buildings throughout the campus. In total, the School occupies approximately 86,000 sf (8,000 m^2) of building space. Many program spaces are undersized while other programs have unsuitable and/or inadequate functional space. Because of these scattered, unsuitable spaces, SoHS lacks a distinct identity on campus, and opportunities to facilitate inter-professionalism are non-existent. In general, 55% of current space is considered "unsatisfactory" or "completely unsatisfactory" by educators.

2.0 PROJECT DESCRIPTION

The proposed new Health Sciences Centre for Advanced Simulation (HSCAS) represents one component of a comprehensive and integrated facility renewal plan for BCIT's SoHS. A project identification report, dated March 2012, and a Concept Plan Report, dated February 2013, have been submitted to the Ministry, and describe the need for this new facility, plus the renewal of buildings SW01 and SW03.

The project includes a new simulation-based learning centre to consolidate and modernize BCIT's SoHS priority programs. The four-storey building, totaling 100,600 sf (9,350 m^2) gross, is designed to facilitate inter-professionalism, and to replicate workflows, such as those found at hospitals or community clinics, while incorporating flexibility for future changes in education practices.

Supported Programs

Programs accommodated in the proposed facility:

- Cardiology
- Clinical Genetics
- Diagnostic Medical Sonography
- Medical Laboratory
- Medical Radiography
- Nuclear Medicine
- Nursing RN
- Prosthetics Orthotics
- Radiation Therapy
- Specialty Nursing

FTEs

Approximately 1,700 students will be accommodated in the new HSCAS.

Project Size

The proposed gross building area is approximately 100,600 sf (9,350 m^2).

3.0 PROJECT CATEGORY

Category One: New Priority Projects

4.0 PROJECT PRIORITY NUMBER

Rank: **(3)** of 10 projects.

5.0 PROJECT OBJECTIVES

- Maintain BCIT's lead role in health education in British Columbia.
- Address the highest space needs for the School of Health Sciences.
- Consolidate SoHS programs.
- Provide a new simulation-based learning centre. Create an innovation centre that facilitates inter-professionalism, and replicates hospital or community clinic workflows, while incorporating flexibility for future changes in education practices.
- Replace deficient facilities with modern, flexible and sustainable facilities.
- Offer training partnerships with other healthcare providers, e.g. Fraser Health, SFU/UBC.

Needs Assessment

BCIT is a leader in healthcare in the province, delivering the largest number of nursing graduates annually, and supplying between 80-100% of graduates in Diagnostic Technologies, Specialty Nursing, Medical Laboratory Technology, Medical Radiography, and a series of allied health programs.

The School is severely challenged by functional inadequacy, building structural risk, and deficient building conditions associated with existing facilities.

Seismic Condition Assessment

The *structural analysis* (coordinated by Bush Bohlman & Partners) for the whole campus shows the buildings used by SoHS were largely constructed in the 1960s and 1970s. The seismic risk rating for most of these buildings is at the highest end of the scale (H1-High Risk), indicating potential structural failure during a major seismic event.

Building Conditions

The VFA facility condition audit concluded three buildings primarily utilized by SoHS (SW01, SE12 and SW03) were "poor or very poor", and have approximately $173.5 million in 10-year deferred maintenance (includes SE12).

6.0 OPTIONS CONSIDERED

As part of the Concept Plan Report, four options were considered and evaluated using five key criteria:

- Provide modern facilities for the SoHS (and other schools located in SW01 and SW03).
- Minimize deferred maintenance risk.
- Minimize seismic safety risk.
- Ensure cost effectiveness, and efficient construction project management.
- Maintain programs during renewal, and minimize disruption.

The four options were: Preferred, Status Quo, Complete Replacement of the SoHS, and Renewal of Existing Buildings Only with Provision of Off-Campus Swing Space. The Preferred Option best met the key criteria for evaluation. For details and the full evaluation please see the submitted *Concept Plan Report*, dated February 2013.

7.0 PROJECT OUTCOMES

Infrastructure Improvements

The four-storey HSCAS will comprise a gross floor area of 100,600 sf (9,350 m^2), and will enable consolidation of the SoHS from seven locations on the Burnaby Campus to a compact precinct of three buildings. This consolidation will provide the necessary swing space to enable the renewal of two other campus core buildings – SW01 and SW03.

Cost Effectiveness

The least expensive of the renewal options, the preferred option offers savings estimated at $29 million in capital costs over the next option, which necessitates the use of off-campus swing space. This option also provides $13 million per annum in operating savings, that includes necessary expenditures required to mitigate deferred maintenance.

Innovation

The new centre will combine the use of simulation technology with a building that can be reconfigured to simulate different health care environments and workflows – hospital, community clinic and home care. This new facility will encourage inter-professional education and interaction across all programs while remaining flexible to future innovations in health education and embrace new competencies as they evolve.

Strategic Alignment

The Health Sciences Centre for Simulation Project is aligned with BC government priorities and strategies:

- Health occupations are projected to have the strongest growth in the province over the next ten years, with an annual growth rate of 2.4% (*BC Labour Market Outlook 2010-2020*).
- The project supports the *Ministry of Health's 2010/2011-2012/2013 Service Plan*, particularly "Goal 4: Improved innovation, productivity, and efficiency in the delivery of health services".
- A new building will also permit the SoHS to explore partnering with other parties, including health authorities and universities. Conversations have begun with all health authorities, UBC and SFU.
- Consistent with BC's sustainability objectives (*BC Climate Action Plan*).

Quality Education

- Improve health education program delivery, and maintain BCIT's provincial leadership role.
- Provide new simulation space for health education and the shortage of practice education time at Lower Mainland hospitals.
- Provide a new model for health education and practice.
- Provide on-site opportunities for education and health delivery partnerships.
- Create opportunities for distance learning partnerships with other institutions.
- Act as a *resource hub* to an emerging provincial network, with capacity to assist in post-graduate competency assessment/training, international competency assessment, operational workflow assessments, and applied research.
- Provide seismically safe and modern facilities for students and staff.
- Provide swing space that will enable renewal of adjacent buildings.

8.0 PROJECT COST/FUNDING

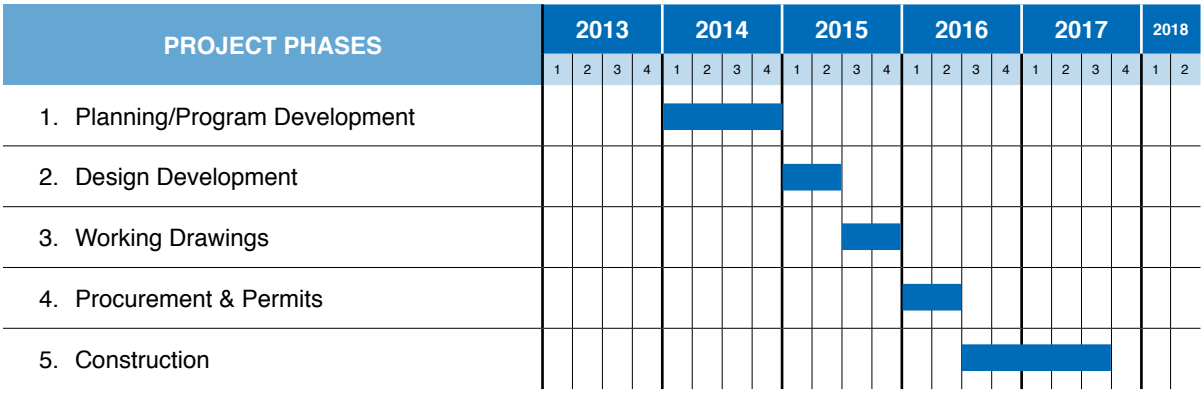
$65.16 MILLION – Total estimated escalated project cost.

9.0 KEY RISKS

- Current facilities do not allow the full use and potential of simulation training to ensure effective practice (clinical) education is achieved.
- Limitations to BCIT's leadership role and responsibility to health education in BC
- Limitations to education practice and student exposure to healthcare innovation and best practice delivery.
- Limitation to educational training partnerships (on-site and distance).

10.0 PROJECT SCHEDULE

- **Anticipated construction start date:** July 2016
- **Anticipated occupancy date:** October 2017



Proposed Site of HSCAS

Project 3 – BCIT Five-Year Capital Plan

BCIT Renew: Health Sciences, Energy & Engineering – SW01

1.0 CURRENT SITUATION

SW01 was constructed in 1964. This four-storey rectangular building has 271,000 sf (25,200 m^2) total gross area. The gross area reflects newly captured space through the Gateway Project.

The east wing of SW01 has been categorized as having a high seismic risk (H1) by Bush Bohlman & Partners, indicating potential structural failure during a major seismic event. Based on VFA building assessments for the next ten years, an estimated $70.5 million of deferred maintenance is required to maintain SW01. Further to these structural and seismic issues, there are functional inadequacies of some of the teaching spaces in SW01.

2.0 PROJECT DESCRIPTION

The proposed renewal of Building SW01 represents one component of a comprehensive and integrated facility renewal plan for BCIT's School of Health Sciences. A BCIT Health Sciences Renewal Project Concept Plan Report, dated February 2013, was provided to the Ministry, and describes the need for this renewed facility, the development of the Health Science Centre for Simulation, and the renewal of building SW03.

Renovation of the balance of the SW01 Main Wing will address deferred maintenance, as will the structural seismic upgrade of the East Wing. This renewal project will complete outstanding functional renovation to classrooms, project rooms, labs, and research facilities not previously included in the scope of the SW01 Gateway Project, estimated at 206,500 sf (19,200 m^2). The scope of renewal includes building system replacement, seismic upgrade, and deferred maintenance.

Supported Programs

Currently, the following SoHS programs are located within SW01:

- Biomedical Engineering
- Clinical Genetics Technology
- Environmental Health Technology
- Medical Laboratory
- Occupational Health & Safety
- Prosthetics Orthotics
- Radiation Therapy
- Medical Radiography

Other Supported Schools and Services

- School of Construction & Environment
- School of Computing & Academic Studies
- Food Process Resource Centre
- School of Energy
- Student Services
- Administration

FTEs

No additional student FTEs are associated with this proposal.

Project Size

The area of the building to be renewed is approximately 206,500 sf (19,200 m^2).

Structural seismic deficiencies exist within 26,230 sf (2,440 m^2) of the single-storey portion of the East Wing, whereas base building renewal work is required on the full 206,500 sf (19,200 m^2).3.0

3.0 PROJECT CATEGORY

Category Two: Whole Asset Replacement & Renewal

4.0 PROJECT PRIORITY NUMBER

Rank: **(3)** of 10 projects.

5.0 PROJECT OBJECTIVES

- Leverage the capital investment in the Gateway SW01 project.
- Seismic safety structural upgrades.
- Upgrade critical deferred maintenance conditions identified by VFA.
- Provide modern, flexible learning and research facilities.
- Create more efficient and functional space design.
- Consolidate SoHS programs.
- Renew a key facility situated in the core academic precinct.
- Reduce energy use and operating costs.

Needs Assessment

- SoHS facilities are located in seven different buildings distributed across the Burnaby Campus. This proposal enables consolidation of SoHS programs into three adjacent buildings.
- 55% of current space was rated “unsatisfactory” or “completely unsatisfactory” by educators.
- Seismic structural analysis conducted by Bush, Bohlman & Partners classified the building as **H1 – High Seismic Risk**.
- The building has a VFA Facility Condition Index of **0.29 FCI**.

6.0 OPTIONS CONSIDERED

As this project is integrated with the HSCAS and the Health Sciences Facility Renewal - SW03 projects, the options considered are the same: Preferred, Status Quo, Complete Replacement of the SoHS, and Renewal of Existing Buildings Only with Provision of Off-Campus Swing Space. For details and the full evaluation please see the submitted *Concept Plan Report*, dated February 2013.

7.0 PROJECT OUTCOMES

Infrastructure Improvements

- Complete the modernization of SW01 – Gateway Project.
- Improve health education program delivery, and maintain BCIT's provincial leadership role.
- Provide necessary support space for the Health Sciences Centre for Simulation.
- Provide seismically safe accommodation.
- Upgrade entire building to modern standards and services (VFA report).
- Permit consolidation of SoHS programs.
- Improve program utilization through more efficient and flexible functional design.
- Support BCIT Burnaby Campus Development planning objectives.

Cost Effectiveness

The complete renewal of SW01 mitigates 10-year deferred maintenance costs of $70.5 million, which is more expensive than the $66.6 million estimated project cost. Adding further value, this renewal cost is 65% of the whole asset replacement cost. Innovation

A complete major functional renovation of SW01 classrooms, project rooms, labs and research facilities would provide modern learning environments and informal learning spaces. Space reconfiguration will enable flexibility to changing education requirements. The replacement of building systems provides for the adoption of energy saving electrical, mechanical and plumbing systems, while replacing exterior envelope systems increases the provision of natural light and improves energy efficiency.

Strategic Alignment

The Project is aligned with BC government priorities and strategies:

- Health occupations are projected to have the strongest growth in the province over the next ten years, with an annual growth rate of 2.4% (*BC Labour Market Outlook 2010-2020*).
- The project supports the *Ministry of Health's 2010/2011-2012/2013 Service Plan*, particularly "Goal 4: Improved innovation, productivity, and efficiency in the delivery of health services".
- The Project is also aligned with BCIT's Strategic Vision and Campus Development Plan.
- Consistent with BC's sustainability objectives (*BC Climate Action Plan*).

Quality Education

The Health Sciences Facility renewal will improve health education program delivery and maintain BCIT's provincial leadership role by providing 21st century learning environments.

8.0 PROJECT COST/FUNDING

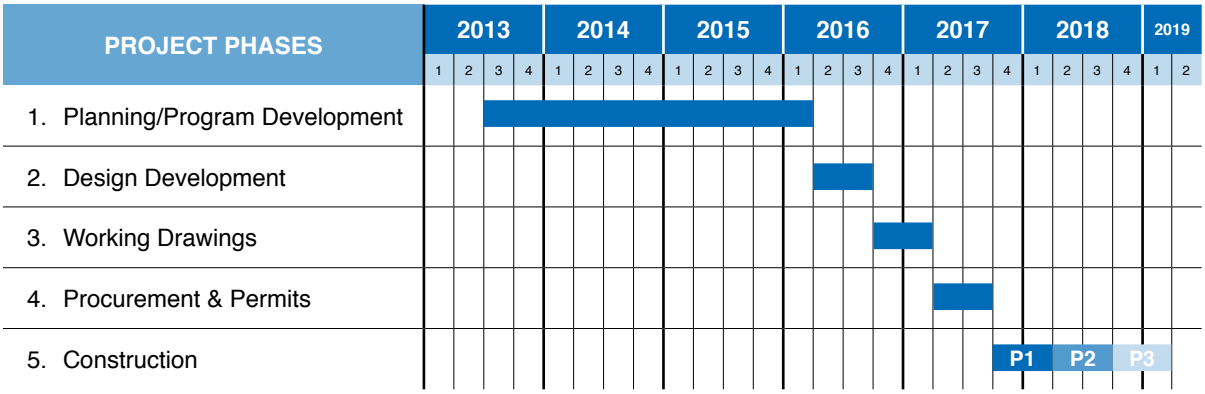
$66.6 MILLION – Total estimated project cost; 65% of the whole asset replacement cost.

9.0 KEY RISKS

- Inadequate swing space available to allow for programs to be decanted from the building during renewal – disruption to program delivery.
- Hazardous materials mitigation.
- Disruptions to program continuity in the event of a seismic event/deferred maintenance.

10.0 PROJECT SCHEDULE

- **Anticipated construction start date:** October 2017
- **Anticipated occupancy date:** April 2019



SW01 Context Map

Project 3 – BCIT Five-Year Capital Plan

BCIT Renew: Health Sciences & Computing – SW03

1.0 CURRENT SITUATION

Constructed in 1967, SW03 is a four-storey building, with approximately 146,000 sf (13,500 m^2) total gross area. The second largest building on the Burnaby Campus, SW03 has three separate wings and a breezeway block (approximately 13,000 sf/1,200 m^2) that connects SW03 to SW01.

SW03 has been categorized as having a high seismic risk (H1) by Bush Bohlman & Partners, indicating potential structural failure during a major seismic event. Based on VFA building assessments for the next ten years, an estimated $63 million of deferred maintenance is required. Further to these structural and seismic issues, there are functional inadequacies of some of the teaching spaces in SW03.

2.0 PROJECT DESCRIPTION

The proposed renewal of Building SW03 represents one component of a comprehensive and integrated facility renewal plan for BCIT's SoHS. A BCIT Health Sciences Renewal Project Concept Plan Report, dated February 2013, was provided to the Ministry, and describes the need for this renewed facility, the development of the HSCAS, and the renewal of building SW01.

Renewal of the second largest building at the Burnaby Campus will include functional improvements, structural upgrades, energy efficiency upgrades, and deferred maintenance mitigation. Structural upgrades will enable the development of additional space through the enclosure of a breezeway, and a more efficient layout of existing spaces. A fully upgraded building will provide gross space of 146,000 sf (13,500 m^2) at 55% of replacement cost.

Supported Programs

Currently, the following SoHS programs are located within SW03:

- Basic Health Sciences
- Health Sciences Dean's Office
- Health Care Management
- Food Technology
- Medical Laboratory
- Medical Radiography
- Nursing RN
- Specialty Nursing
- Occupational Health & Safety

Other Supported Schools

- School of Computing & Academic Studies
- School of Construction & Environment
- School of Energy

FTEs

No additional student FTEs are associated with this proposal.

Project Size

The proposed facility size is 146,000 sf (13,500 m^2).

3.0 PROJECT CATEGORY

Category Two: Whole Asset Replacement & Renewal

4.0 PROJECT PRIORITY NUMBER

Rank: **(3)** of 10 projects.

5.0 PROJECT OBJECTIVES

- Seismic safety structural upgrades.
- Upgrade critical deferred maintenance conditions identified by VFA.
- Provide modern, flexible learning and research facilities.
- Create more efficient and functional space design.
- Consolidate SoHS programs.
- Renew a key facility situated in the core academic precinct.
- Reduce energy use and operating costs.

Needs Assessment

- SoHS facilities are located in seven different buildings distributed across the Burnaby Campus. This proposal enables consolidation of SoHS programs into three adjacent buildings.
- 55% of current space was rated “unsatisfactory” or “completely unsatisfactory” by educators.
- Seismic structural analysis conducted by Bush, Bohlman & Partners classified the building as **H1 – High Seismic Risk**.
- The building has a VFA Facility Condition Index of **0.48 FCI**.

6.0 OPTIONS CONSIDERED

As this project is integrated with the HSCAS and the Health Sciences Facility Renewal - SW01 projects, the options considered are the same: Preferred Option, Status Quo, Option 1: Complete Replacement of the SoHS, and Option 2: Renewal of Existing Buildings Only with Provision of Off-Campus Swing Space. For details and the full evaluation please see the submitted *Concept Plan Report*, dated February 2013.

7.0 PROJECT OUTCOMES

Infrastructure Improvements

- Provide necessary support space for the Health Science Centre for Simulation.
- Provide seismically safe accommodation.
- Upgrade entire building to modern standards and services (VFA report).
- Permit consolidation of SoHS programs.
- Improve program utilization through more efficient and flexible functional design.
- Support BCIT Burnaby Campus Development planning objectives.
- Enhance outside unused green space adjacent to the south elevation.

Cost Effectiveness

The complete renewal of SW03 mitigates 10-year deferred maintenance costs of $63 million, which is significantly more expensive than the $54.34 million estimated project cost. Adding further value, this renewal cost is 55% of the whole asset replacement cost.

Innovation

A complete major functional renovation of SW03 classrooms, project rooms, labs and research facilities would provide modern learning environments and informal learning spaces. Space reconfiguration will enable flexibility to changing education requirements. The replacement of building systems provides for the adoption of energy saving electrical, mechanical and plumbing systems, while replacing exterior envelope systems increases the provision of natural light and improves energy efficiency.

Strategic Alignment

The Project is aligned with BC government priorities and strategies:

- Health occupations are projected to have the strongest growth in the province over the next ten years, with an annual growth rate of 2.4% (*BC Labour Market Outlook 2010-2020*).
- The project supports the *Ministry of Health's 2010/2011-2012/2013 Service Plan*, particularly "Goal 4: Improved innovation, productivity, and efficiency in the delivery of health services".
- The Project is also aligned with BCIT's Strategic Vision and Campus Development Plan.
- Consistent with BC's sustainability objectives (*BC Climate Action Plan*).

Quality Education

The Health Sciences Facility renewal will improve health education program delivery and maintain BCIT's provincial leadership role by providing 21st century learning environments.

8.0 PROJECT COST/FUNDING

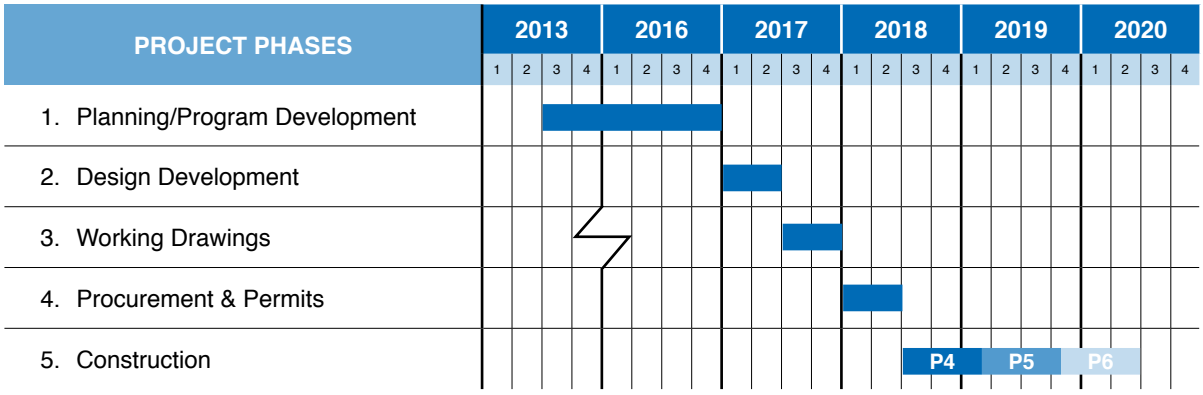
$54.34 MILLION – Total estimated project cost; 55% of the whole asset replacement cost.

9.0 KEY RISKS

- Inadequate swing space available to allow for programs to be decanted from the building during renewal – disruption to program delivery.
- Hazardous materials mitigation.
- Disruptions to program continuity in the event of a seismic event/deferred maintenance.

10.0 PROJECT SCHEDULE

- **Anticipated construction start date:** July 2018
- **Anticipated occupancy date:** July 2020



SW03 Context Map

Project 4 – BCIT Five-Year Capital Plan

Steel Trades Renewal – NE12

1.0 CURRENT SITUATION

NE 12 is an aging building with many systems and components reaching the end of their life cycle. Both the VFA report and the seismic assessment confirm that a renewal and upgrade of life safety, seismic, electrical, mechanical, communications and interior spaces should be completed.

NE12 has been categorized as having a high seismic risk (H1). Based on VFA building assessments for the next ten years, an estimated $7.3 million of deferred maintenance is required to maintain NE12. Further to these structural and seismic issues, there are functional inadequacies of some of the teaching spaces in NE12.

2.0 PROJECT DESCRIPTION

This project involves the complete update and renewal of the Steel Trades Building (NE12) at BCIT's Burnaby campus due to end of life cycle conditions. The scope of work includes:

- Renewed instructional workshops, classrooms, washrooms, and administration area.
- Seismic upgrades.
- Systems renewals.
- Fire alarm and sprinkler upgrades and renewals.
- Rooftop make up air units, exhaust fans, and duct work.
- Plumbing distribution piping.
- Natural gas and compressed air piping.
- Conversion of electrical distribution to the more efficient 575/3/60 system, panel boards and lighting.
- Exterior windows and doors.

Supported Programs

Currently, the following programs are located within NE12:

- Iron Worker Foundation
- Boiler Maker
- Iron Worker Generalist
- Metal Fabrication

FTEs

The Steel Trade Building supports **313 FTEs**.

Project Size

The existing facility size is 31,300 sf (2,910 m^2).

3.0 PROJECT CATEGORY

Category Two: Whole Asset Replacement & Renewal

4.0 PROJECT PRIORITY NUMBER

Rank: **(4)** of 10 projects.

5.0 PROJECT OBJECTIVES

- Seismic safety structural upgrades.
- Upgrade critical deferred maintenance conditions identified by VFA.
- Provide modern, flexible learning and research facilities.
- Create more efficient and functional space design. Renew a key facility situated in the core academic precinct.
- Reduce energy use and operating costs.
- More efficient use of space.
- Modernization to meet new technology requirements.
- Improve program image and recruitment.

Needs Assessment

- Seismic structural analysis conducted by Bush, Bohlman & Partners classified the building as **H1 – High Seismic Risk**.
- The building has a VFA Facility Condition Index of **0.42 FCI**.
- Functionally inadequate spaces.
- Create a more appropriate learning environment to meet more diverse groups in steel worker trades.

6.0 OPTIONS CONSIDERED

- Status Quo: does not address functional, structural and building system problems.
- Building Replacement: more costly than renewal.
- Renovation of Existing Building: preferred.

7.0 PROJECT OUTCOMES

Infrastructure Improvements

This will significantly improve the FCI and address code compliance issues. Indoor air quality will be significantly improved with new HVAC equipment and controls.

Cost Effectiveness

Renewed mechanical and electrical systems and exterior window upgrades will reduce energy consumption. A business case evaluation has been undertaken by the Quantity Surveyor to determine the renewal cost of this building is 41% of the current replacement value.

Innovation

Potential heat recovery from the exhaust and plumbing systems will be explored and utilized if feasible. Micro-grid technology will enable demand side control of the electrical usage.

Strategic Alignment

The Project is aligned with BC government priorities and strategies:

- Supports Ministry Goal #1 by providing facilities that support high quality education skills and trades training and produce job ready Steel Trades graduates.
- Supports BCIT Institute Strategic Initiative 4 – Stewardship and Resource Development to ensure that physical facilities and campus infrastructure needs are met through an integrated plan that accounts for teaching space, research facilities, equipment, information and education technologies.
- Consistent with BC's sustainability objectives (*BC Climate Action Plan*).

Quality Education

The existing systems have antiquated ventilation and lighting and do not promote the best learning environment. Renewal of these systems will greatly enhance the learning environment.

8.0 PROJECT COST/FUNDING

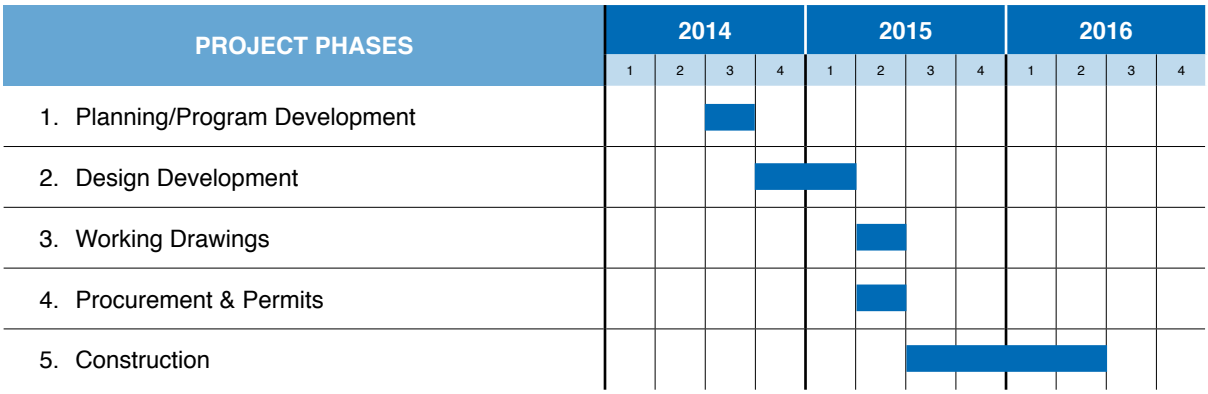
$9.3 MILLION – Total estimated project cost.

9.0 KEY RISKS

- Maintaining operations while renewals are underway.
- Budget control due to Construction Management.
- Fast tracking of design and construction schedules.

10.0 PROJECT SCHEDULE

- **Anticipated construction start date:** July 2014
- **Anticipated occupancy date:** July 2015



NE12 Context Map

Project 5 – BCIT Five-Year Capital Plan

Wood Waste Reduction & Biomass Power Generation – NE02

1.0 CURRENT SITUATION

This project was submitted in last year's Capital Plan. Over the last years discussions with partner agencies and the City of Burnaby has initiated continued support for this Capital Innovation Project.

2.0 PROJECT DESCRIPTION

The design and installation of a biomass-to-energy facility will integrate into the Burnaby Campus heating distribution system. The facility will house a 250 kw biomass boiler. Functioning as a "Living Laboratory", the building will include an outdoor interpretative teaching space, technology viewing windows, and displays. The project targets waste reduction of 250,000 kg per annum, and greenhouse gas emission reduction of 200 tonnes of CO_{2eq} annually.

Project Scope

A wood waste-to-energy facility that comprises a wood fuel preparation and storage system, a 775 sf (72 m^2) educational building, that houses a biomass boiler, a state-of-the-art air emissions filtering system and an advanced monitoring system. The small building will be attached to Building NE02. All the heat will be generated using construction wood waste (250,000 kg per year) from BCIT's carpentry and joinery workshops.

FTEs

No addition student FTEs are associated with this proposal in the short term.

3.0 PROJECT CATEGORY

Category Three: Capital Innovation Fund

4.0 PROJECT PRIORITY NUMBER

Rank: **(5)** of 10 projects.

5.0 PROJECT OBJECTIVES

- A step towards a four-fold reduction in energy and materials consumption for a portion of the Burnaby Campus, while maintaining service levels.
- A step towards achieving carbon neutrality through a reduction in greenhouse gas emissions resulting from the heating of the Burnaby Campus.
- Reduce Burnaby Campus emission offset payments.

Needs Assessment

- The building will assist in reducing energy use at BCIT while serving as a "Living Laboratory" educational model.
- BC Ministry of Environment emission and waste reduction targets.

6.0 OPTIONS CONSIDERED

- Status Quo: maintains higher energy usage.
- Biomass-to-Energy facility installation: preferred option.

7.0 PROJECT OUTCOMES

Infrastructure Improvements

- Reduce energy consumption for heating campus buildings.

Cost Effectiveness

- Net operation cost reduction savings: natural gas, carbon offset, and waste management (incremental operations and maintenance cost).

Innovation

- Demonstrate the viability of using construction wood waste in a biomass system and meet local emission standards.

Strategic Alignment

- Consistent with BC's sustainability objectives (*BC Climate Action Plan*).
- 2010 BC Government carbon neutrality requirements for all public service agencies.
- Metro Vancouver target an 80% reduction in urban wood waste at the landfill by 2020.
- Supports BCIT's "Living Laboratory" program to demonstrate new technology.

Quality Education

- Contributes to BCIT's delivery of education on sustainability across all Schools.

8.0 PROJECT COST/FUNDING

$1.5 MILLION – Total estimated project cost.

- BC Bioenergy Network has provided a **$130,000 grant** to showcase best-in-class technologies.
- BC Ministry of Environment has provided a letter of support for this project.
- A schematic design report for the biomass equipment specifications has been completed in 2013 (funded by BCIT School of Construction and the Environment).
- $13,000 per annum incremental operating and maintenance costs.

Annual Operating Cost Reductions

- Waste reduction of 250,000 kg per annum.
- Greenhouse gas emission reduction of 200 tonnes of CO_{2eq} per annum.
- $44,000 net savings ($57,000 from avoided purchase of carbon offsets and natural gas minus $13,000 of incremental O&M cost).

Return on Investment

- **Operations**: Cumulative annual savings are expected to recover the initial capital investment within a 8 to 10-year timeframe (capital investment for operations only/net annual savings).
- **Education**: To calculate the simple payback for this capital investment including the cost of building for education (i.e. cost of monitoring equipment, cost of educational building, etc.), the additional revenues generated from the new biomass facility would have to be factored in. This calculation has not been completed at this time.

9.0 KEY RISKS

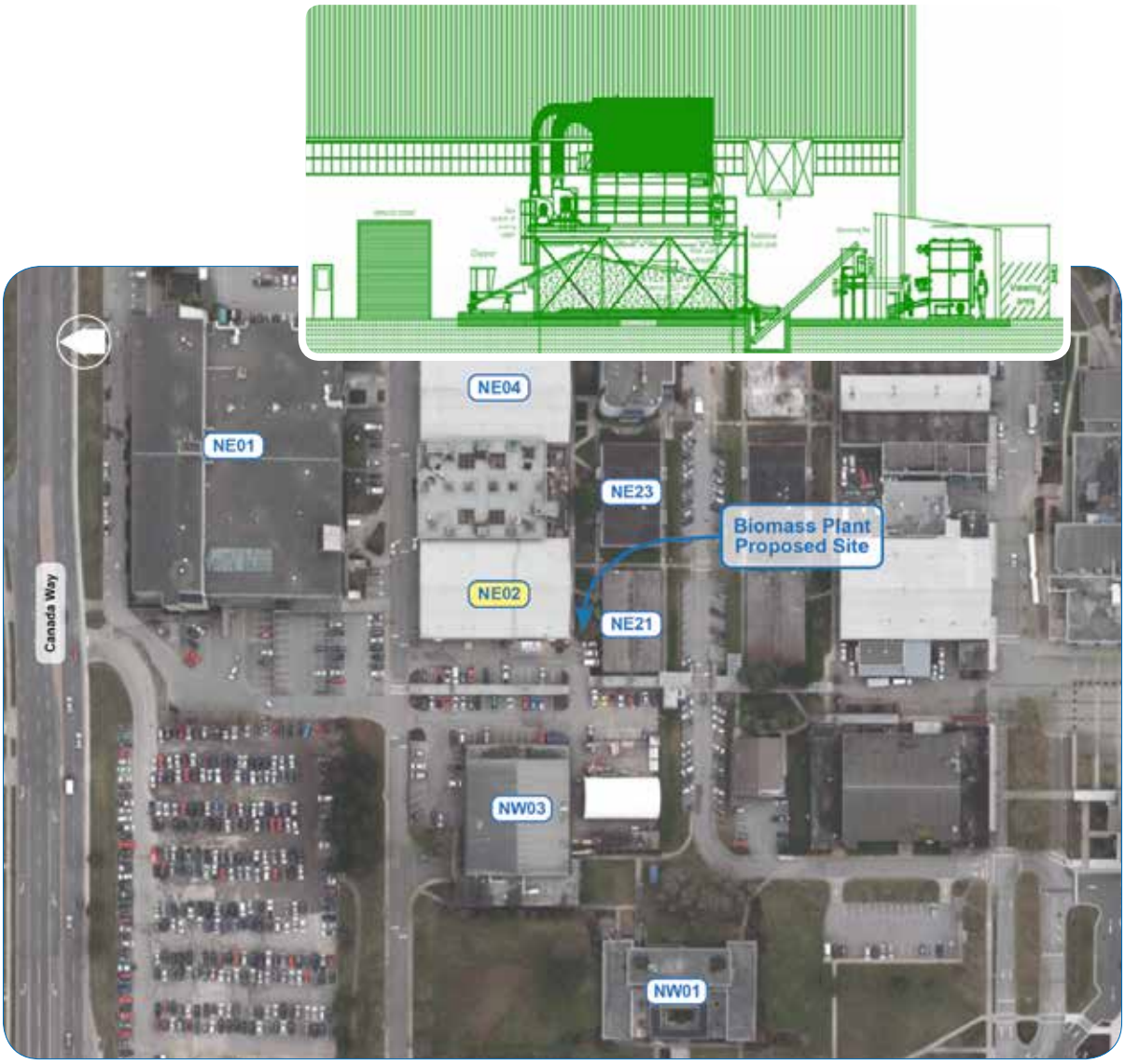
- Increasing energy costs.
- Increasing wood waste removal costs.

10.0 PROJECT SCHEDULE

- **Anticipated construction start date:** July 2014
- **Anticipated occupancy date:** July 2015

PROJECT PHASES	2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4
1. Planning/Program Development												
2. Design Development												
3. Working Drawings												
4. Procurement & Permits												
5. Construction												

Biomass Plant Proposed Site



Project 6 – BCIT Five-Year Capital Plan

Library Centre Renewal and Addition – SE14

1.0 CURRENT SITUATION

The library centre is a highly used facility that supports the entire campus community. Annually there are over 600,000 student visits to study and 5,000 student visits for use as instructional space. The library is functionally constrained to meet this scale of usage. The building has been identified as having high seismic risk and has a requirement for mechanical and electrical upgrades. Based on VFA building assessments for the next ten years, an estimated $21 million of deferred maintenance is required to maintain SE14.

2.0 PROJECT DESCRIPTION

The Library Centre Renewal and Addition project comprises structural upgrades to the existing library building and building envelope, building systems upgrades, and an addition of multi-functional collaboration spaces. The addition component will also integrate Media and Creative Communications facilities within SE14 and SE10.

Supported Programs

- Library services
- Media and creative communications

FTEs

No additional student FTEs are associated with this proposal.

Project Size

The renewed facility would have a total area of 114,475 sf (10,635 m^2), including the proposed addition of 40,000 sf.

3.0 PROJECT CATEGORY

Category Two: Whole Asset Replacement & Renewal Projects

4.0 PROJECT PRIORITY NUMBER

Rank: **(6)** of 10 projects.

5.0 PROJECT OBJECTIVES

- Increase student resource and collaboration spaces.
- Improve integration between the library, and Media and Creative Communication facilities.
- A seismically upgraded library facility.
- Upgrade mechanical and electrical systems.
- Improved operating costs efficiency.

Needs Assessment

- The 2005 BCIT Library Student Survey identified the need for additional group study spaces, and more unscheduled computer lab spaces, such as is offered in the 24-hour “eh Pod” facility.
- Structural analysis of the building performed by Bush, Bohlman & Partners, rated the building as **H3 – High Risk**.
- The VFA Facility Condition Index **(FCI) rating for the library building is 0.26,** and indicates required mechanical and electrical system upgrades.

6.0 OPTIONS CONSIDERED

- Status Quo: does not address functional problems.
- Renovation of Existing Building and Addition: preferred.
- Replacement building is not cost effective.

7.0 PROJECT OUTCOMES

Infrastructure Improvements

- Improve building seismic safety.
- Provide swing space to facilitate the renewal of SE10.
- Innovative storm water management infrastructure

Cost Effectiveness

- Improved operating costs.
- Mitigate 10-year deferred maintenance costs of $21 million.
- Provides an additional 40,000 sf of learning space.

At a total project cost of $25 million, this total is only $2.3 million more than the costs to mitigate deferred maintenance, yet delivers additional learning space designed to meet educational priorities.

Innovation

- Integration of library services and creative communications.

Strategic Alignment

- The project is aligned with BCIT priorities: *Strategic Plan* and Campus Development Plan.

Quality Education

- Improve student access to library services and collaboration study facilities.
- Improve integration of the library, and Media and Creative Communication facilities.

8.0 PROJECT COST/FUNDING

$25 MILLION – Total estimated project cost.

9.0 KEY RISKS

- Mechanical failure and seismic risk impacts on program continuity.
- Limitations on student access to library services and study needs.

10.0 PROJECT SCHEDULE

- **Anticipated construction start date:** July 2017
- **Anticipated occupancy date:** January 2019

PROJECT PHASES	2013				2014				2015				2016				2017				2018				2019	
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
1. Planning/Program Development																										
2. Design Development																										
3. Working Drawings																										
4. Procurement & Permits																										
5. Construction																										

SE14 Context Map

Project 7 – BCIT Five-Year Capital Plan

Centre for Media and Creative Communications Renewal – SE10

1.0 CURRENT SITUATION

Media and Communications are a dynamic and rapidly changing field of study. Current accommodation is very constrained and there are no common areas. The change in technology requires functional change to a number of spaces. A particular problem is the space for digital media. The building is also identified as a high risk seismically. Based on VFA building assessments for the next ten years, an estimated $11.6 million of deferred maintenance is required to maintain SE10.

2.0 PROJECT DESCRIPTION

A renewed centre for the Broadcast and Media Communications Department, and the Digital Arts Department in the School of Business. The Centre will be created through a renewal of the existing building, including seismic upgrading, upgrading of physical conditions, re-purposing of interior spaces to achieve a commons area, and improving circulation, equipment and studio space. These improvements will also be integrated with a 40,000 sf addition proposed for the Library Building (SE14).

This upgrade will enable programs to maintain educational integrity, permit continued program development, adopt new technologies, and respond to the rapidly changing environment for graduates and employers.

Supported Programs

- Broadcast and media communications.
- Digital arts.

FTEs

No additional student FTEs are associated with this proposal.

Project Size

The renewed facility will have a total area of 29,900 sf (2,780 m^2), plus additional space provided in the SE14 addition.

3.0 PROJECT CATEGORY

Category Two: Whole Asset Replacement & Renewal Projects

4.0 PROJECT PRIORITY NUMBER

Rank: **(7)** of 10 projects.

5.0 PROJECT OBJECTIVES

- Increase student project collaboration spaces, and improve integration between the library, and Media and Creative Communications facilities.
- Provide modern learning and production spaces for broadcasting, media, and digital arts.
- Enhance opportunities for partnerships with the private sector.
- Seismic and deferred maintenance renewal.
- Reduce building operating and energy use costs.

Needs Assessment

- Demand for media and creative communication skills are growing in BC. The sector employs 16,000 people, with two-thirds of the jobs located in Metro Vancouver.
- The existing facility has constrained spaces for instruction, equipment, and student collaboration areas.
- Structural analysis of the building performed by Bush, Bohlman & Partners rated the building **H3 – High Risk**.
- The VFA Facility Condition Index **(FCI) rating for SE10 is 0.40**, and indicates 10-year deferred maintenance costs of $11.6 million.

6.0 OPTIONS CONSIDERED

- Status Quo: does not provide modern teaching space environments necessitated by rapidly changing media and broadcasting technologies.
- New Building: this is not currently necessary and temporary accommodation would be very expensive.
- Renovation of Existing Building: preferred.

7.0 PROJECT OUTCOMES

Infrastructure Improvements

- Improve building seismic safety.
- Improve integration of the Media and Creative Communication facilities with the adjacent library facility.

Cost Effectiveness

- Improved operating costs.
- Mitigate 10-year deferred maintenance costs of $11.6 million.

Innovation

- Integration of media and creative communications with library services .

Strategic Alignment

- Aligns with BC Government policy: BC Film + Media has a mandate to expand and diversify this sector through tax credits, development funding, and marketing.
- Aligns with BCIT Strategic Plan and Campus Development Plan.

Quality Education

- Support a high value industry.
- Improve student access to collaboration project spaces.

8.0 PROJECT COST/FUNDING

$15 MILLION – Total estimated project cost.

9.0 KEY RISKS

- Mechanical failure and seismic risk impacts on program continuity.
- Quality of space impacting student and faculty work environment satisfaction.

10.0 PROJECT SCHEDULE

- **Anticipated construction start date:** Tied to SE14 Schedule - July 2018
- **Anticipated occupancy date:** January 2020

PROJECT PHASES	2013				2014				2015				2016				2017				2018				2019	
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
1. Planning/Program Development																										
2. Design Development																										
3. Working Drawings																										
4. Procurement & Permits																										
5. Construction																										

SE10 Context Map

Project 8 – BCIT Five-Year Capital Plan

Motive Power Transportation Centre – Phase 2

1.0 CURRENT SITUATION

The existing motive power facility on the BCIT campus at Burnaby is functionally inadequate with locations in seven buildings, five of which are also a high seismic risk. There is an estimated total of $38.5 million in deferred maintenance for all seven buildings.

2.0 PROJECT DESCRIPTION

Development of an integrated Motive Power Transportation Centre. This project involves the relocation of existing automotive programs from buildings in poor condition to a purpose-designed replacement facility of similar size.

The new facility will include automotive workshops, classrooms, vehicle storage, and support facilities. Siting the proposed facility needs to be determined during the schematic design phase. The project will also be designed to permit the construction of a five storey parkade above shop/classroom facility to enable the consolidation of existing surface parking at the campus and make better use of existing land.

This proposal addresses significant deferred maintenance, and seismic risk issues associated with seven older transportation program buildings situated on the Burnaby Campus. The project includes demolition and hazardous material abatement.

Supported Programs

Current programs that would be the subject of this change are:

- Automotive Mechanic/Technician
- Auto Collision
- Motorcycle and Marine Engine
- Power Equipment

FTEs

No additional student FTEs are associated with this proposal.

Project Size

The proposed facility size is 110,000 sf (10,219 m^2).

3.0 PROJECT CATEGORY

Category One: New Priority Projects

4.0 PROJECT PRIORITY NUMBER

Rank: **(8)** of 10 projects.

5.0 PROJECT OBJECTIVES

- Replace existing buildings that are functionally inadequate and in poor condition.
- Provide modern facilities that employ new technologies in Motive Power education.
- Support campus renewal by enabling the demolition of single-storey buildings that utilize a large footprint of land in the academic core of the Burnaby Campus.

- Consolidate programs into one integrated facility, and achieve programmatic and operating efficiencies.
- Introduce more sustainable use of Campus land by consolidating parking into garage structure.
- Contribute to campus plan by consolidation of buildings and parking.

Needs Assessment

The existing buildings have functional deficiencies for program instruction, such as large distances between shop areas and classrooms instructional areas, and poor supervision sight lines for instructors. Seven Motive Power buildings on the Burnaby Campus have seismic and deferred maintenance deficiencies that require a combined investment of approximately $38.5 million over the next five years.

	Seismic Risk Rating	***VFA Facility Condition Index***
Building NE 10:	High seismic risk (H1)	FCI = 0.43
Building NE 16:	High seismic risk (H2)	FCI = 0.52
Building NE 18:	High seismic risk (H2)	FCI = 0.58
Building NE 20:	Medium seismic risk (M)	FCI = 0.57
Building NE 22:	High seismic risk (H2)	FCI = 0.62
Building NE 24:	High seismic risk (H1)	FCI = 0.63
Building NE 28:	High seismic risk (H1)	FCI = 0.68

6.0 OPTIONS CONSIDERED

- Status Quo: considered inadequate for the long-term.
- Renovation of Existing Building: considered uneconomic.
- New Building: preferred.

7.0 PROJECT OUTCOMES

Infrastructure Improvements

- The new building will provide a purpose-designed facility that enables advanced instructional practice and technologies.
- Consolidates seven buildings.
- More efficient campus layout and implementation of Campus plan.

Cost Effectiveness

- Better use of campus land and resources:
  - > Permits the re-purposing of surface lots.
  - > Leverages land for campus redevelopment opportunities.
- Mitigates deferred maintenance costs of approximately $38.5 million.

Innovation

- Combines Transportation Centre – workshop/ classroom facility with parkade.
- Green design for parking garage.
- Funding partnership – BCIT to arrange alternate funding for parkade.

Strategic Alignment

The Project is aligned with BC Government priorities and strategies:

- Supports the BC Government's goal of investing in transportation throughout BC – see "*Service Plan for 2011/2012 - 2013/2014, Ministry of Transportation and Infrastructure*".
- Trades, transportation, equipment operators, and related occupations are expected to experience 153,000 job openings from expansion and replacement between 2010-2020 (*BC labour market Outlook 2010-2020*).
- Motive Power faculty work closely with industry, and have affiliations with fourteen public and private organizations in land transportation.

Quality Education

An integrated centre permits consolidation synergies with existing automotive programs and resources, lowers operating costs, and leverages access to existing student resources and campus infrastructure.

8.0 PROJECT COST/FUNDING

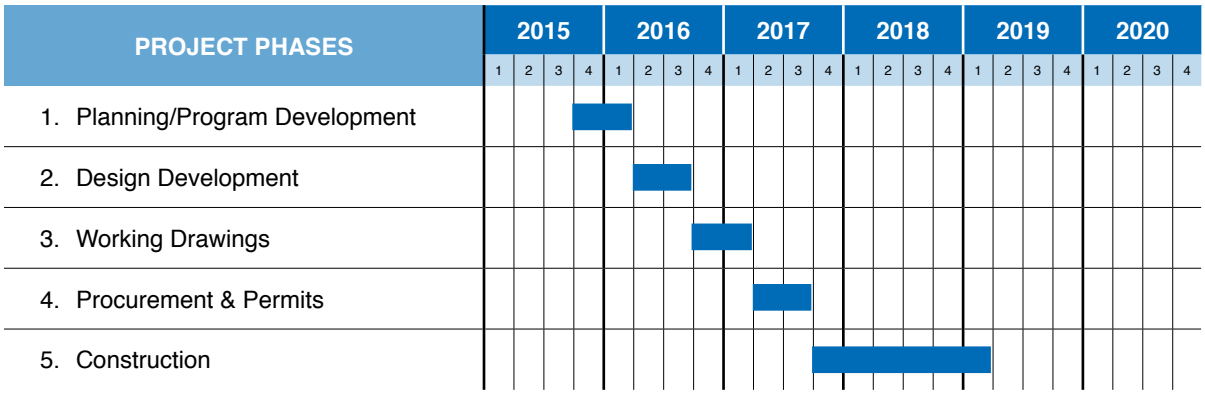
$54.5 MILLION – Total estimated project cost.

9.0 KEY RISKS

- Risk of program disruption through obsolete building system break-downs.
- Continued education programmatic and operational inefficiencies.
- High energy costs associated with operating seven separate, inefficient buildings.

10.0 PROJECT SCHEDULE

- **Anticipated construction start date:** October 2017
- **Anticipated occupancy date:** April 2019



Site of Motive Power Transportation Centre, Phase Two, to be determined.

Project 9 – BCIT Five-Year Capital Plan

Teaching and Learning Centre/Information Technology – SE12

1.0 CURRENT SITUATION

SE12 contains a number of Health Sciences programs that occupy approximately 30% of the building. The building is functionally inadequate for a number of these programs and is rated H1 – High Seismic Risk. Based on VFA building assessments for the next ten years, an estimated $40 million of deferred maintenance is required to maintain SE12. The renewal cost of this building is estimated at 80% of total replacement value and the buildings unusual structural design is not economical to renovate.

2.0 PROJECT DESCRIPTION

The Teaching and Learning Centre/Information Technology replacement project mitigates significant functional and structural seismic deficiencies associated with Building SE12. Demolition of the building is proposed, replacing it with a 90,000 sf building. The project includes demolition and hazardous material abatement.

The replacement building will accommodate existing programs in SE12, such as the School of Computing and Academic Studies, the Teaching and Learning Centre, and Information Technology. Health Sciences programs currently occupy the fourth floor of the building, and will be accommodated in the proposed Health Sciences Renewal scheme (new HSCAS + SW03 + SW01).

Supported Programs

The new building will accommodate:

- School of Computing and Academic Studies
- Teaching and Learning Centre
- General purpose classrooms
- Information Technology

FTEs

No additional student FTEs are associated with this proposal.

Project Size

The proposed new building is 90,000 sf (6,680 m^2).

3.0 PROJECT CATEGORY

Category One: New Priority Projects

4.0 PROJECT PRIORITY NUMBER

Rank: **(9)** of 10 projects.

5.0 PROJECT OBJECTIVES

- Replacement of an existing structurally and functionally obsolete building.
- Construction of a modern building to serve the Teaching and Learning Centre, the School of Computing and Academic Studies, and IT services.
- Modernize computer data server and communication facilities.
- Maintain BCIT's leadership role in computer science education.

- Reduce building operating costs.
- Enable redevelopment of the SE12 site to improve campus circulation routes. Needs Assessment
- *Natural and Applied Science*, and related occupations, is one of the three employment groups identified as having the strongest growth in demand (*BC Labour Market Outlook 2010-20*). Some 62% of this occupational grouping is located in the Mainland/South West part of BC. Computer Information System professionals account for 50% of jobs in this grouping.
- The School of Computing offers more than 30 programs, and has 5,000+ full and part-time registrations per year.
- The existing SE12 building is functionally, structurally and physically obsolete, with estimated renewal costs of 80% of total replacement value.
- Structural analysis performed by Bush, Bohlman & Partners, revealed significant structural deficiencies. The building is rated **H1 – High Seismic Risk**.
- The VFA Facility Condition Index **(FCI) rating for SE12 is 0.47**, and indicates 10-year deferred maintenance costs of $40 million.

6.0 OPTIONS CONSIDERED

- Status Quo: does not address functional and structural issues.
- Renovation of Existing Building: not cost effective as renewal cost of this building is 80% of total replacement value and the buildings unusual structural design is not economical to renovate.
- Replacement with New Building: preferred.

7.0 PROJECT OUTCOMES

Infrastructure Improvements

- Modern educational environment.
- New building will be structurally safe.
- More appropriate location.
- Improvements to campus layout consistent with Campus Plan.

Cost Effectiveness

- Lower operating costs.
- Mitigate 10-year deferred maintenance costs of $40 million.

Innovation

- Purpose-designed for the School of Computing and Academic Studies, and the Teaching and Learning Centre.

Strategic Alignment

The Project is aligned with BC Government priorities and strategies:

- Supports the BC Government's "Jobs Plan".
- Computer Sciences, and related occupations, is one of the three employment groups identified as having the strongest growth in demand.
- Project aligned with BCIT priorities: Capital Plan 2012, Strategic Plan and Campus Plan.

Quality Education

The project will provide a modern educational environment.

8.0 PROJECT COST/FUNDING

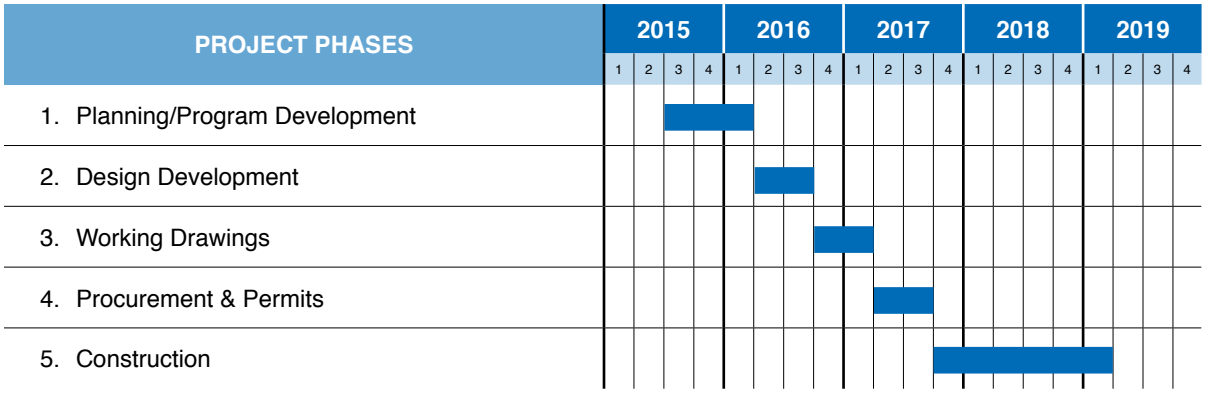
$67 MILLION – Total estimated project cost (including Hazmat abatement and demolition of SE12).

9.0 KEY RISKS

- Mechanical failure and seismic risk impacts on program continuity.
- Technology limitations on education programmatics.
- Reliability of Institute data and communication services.

10.0 PROJECT SCHEDULE

- **Anticipated construction start date:** October 2017
- **Anticipated occupancy date:** April 2019



SE12 Context Map

Project 10 – BCIT Five-Year Capital Plan

Skilled Trades Renewal – NE01

1.0 CURRENT SITUATION

NE01 is a large building comprising approximately 215,000 sf and is located on the northern end of the campus along Canada Way. With an FCI of 0.36, and ten-year deferred maintenance *risk exposure* totaling over $56 million, this functionally inadequate building is inconsistent with modern technology and teaching methods and inflexible and expensive to modify – the building is post-tension construction and is also classified as H1 (high seismic risk). Mechanical and electrical systems are obsolete and a completed hazmat study confirms the presence of extensive asbestos.

2.0 PROJECT DESCRIPTION

The project involves the deconstruction of the large old 215,000 sf building and the construction of two 125,000 sf replacement buildings. One building could house the academic components of the old building, while the other building could be for shops and trade components.

Supported Programs

Currently, the following programs are located within NE01:

- Architectural Science
- Architectural and Building Engineering Technology
- Architectural and Structural CADD and Graphics Technician
- Building Construction Technology
- Building Design and Architectural CAD
- Building Engineering/Building Science (Master of Applied Science)
- Building Science (Master of Engineering)
- Civil Engineering
- Construction Management
- Interior Design
- HVAC Refrigeration
- Millwright
- Electronics Technician

FTEs

No additional student FTEs are associated with this proposal.

Project Size

The proposal is for two buildings each 125,000 sf (11,600 m^2).

3.0 PROJECT CATEGORY

Category One: New Priority Projects

4.0 PROJECT PRIORITY NUMBER

Rank: **(10)** of 10 projects.

5.0 PROJECT OBJECTIVES

- Replace and old and large functionally inadequate building in poor condition.
- Provide two purpose-designed modern buildings with new technologies and teaching spaces.
- Mitigate large deferred maintenance costs and seismic risk.

Needs Assessment

BCIT is the largest trades training institution in BC, providing the majority of apprenticeship training in the province. To maintain this role it requires modern teaching facilities.

- Extensive deferred maintenance costs of a functionally obsolete and inflexible building.
- Changing educational needs.
- Seismic structural analysis conducted by Bush, Bohlman & Partners classified the building as **H1 – High Seismic Risk**.
- The building has a VFA Facility Condition Index of **0.36 FCI**.

6.0 OPTIONS CONSIDERED

- Status Quo: this is not cost effective or appropriate for a modern teaching and learning environment.
- Renovation of Existing Building: considered impractical.
- Replacement with New Building(s): preferred option.

7.0 PROJECT OUTCOMES

Infrastructure Improvements

- Provision of two new modern teaching environments for trades and academic education.
- Cost savings in operations and deferred maintenance.
- Improvement to a major gateway and key prominent street presence for BCIT – aligns with Campus Renewal.

Cost Effectiveness

- Replacement helps leverage land for further campus development.
- Mitigates $56 million in ten year deferred maintenance.

Innovation

- The buildings will incorporate a “Living Laboratory” concept through the exposure of building structure and systems to facilitate trades education.

Strategic Alignment

- Supports *BC Jobs Plan* and the *BC Skills and Training Plan* through trades education including apprenticeships in metal fabrication, plumbing, steam fitting, carpentry and iron working.
- BCIT has worked with numerous industry associations and agencies. Examples: ACCESS, delivering the Piping Foundation Program, Canfor, Concert Properties, Tomitek, Ledcor, PCL Constructors Westcoast Inc., and Scott Construction.

Quality Education

- Provide a modern educational environment.

8.0 PROJECT COST/FUNDING

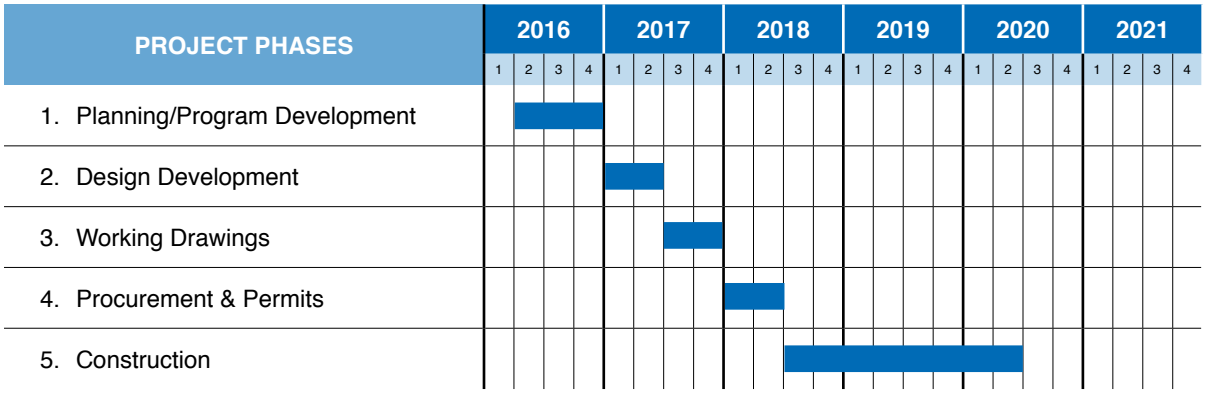
$158.5 MILLION – Total estimated project cost.

9.0 KEY RISKS

- Continued incremental expenditures in deferred maintenance, system breakdowns, and disruption of programs.

10.0 PROJECT SCHEDULE

- **Anticipated construction start date:** July 2018
- **Anticipated occupancy date:** July 2020



NE01 Context Map

BCIT Renew:
Five-Year Capital Plan
2014 to 2018

BCIT
BRITISH COLUMBIA
INSTITUTE OF TECHNOLOGY