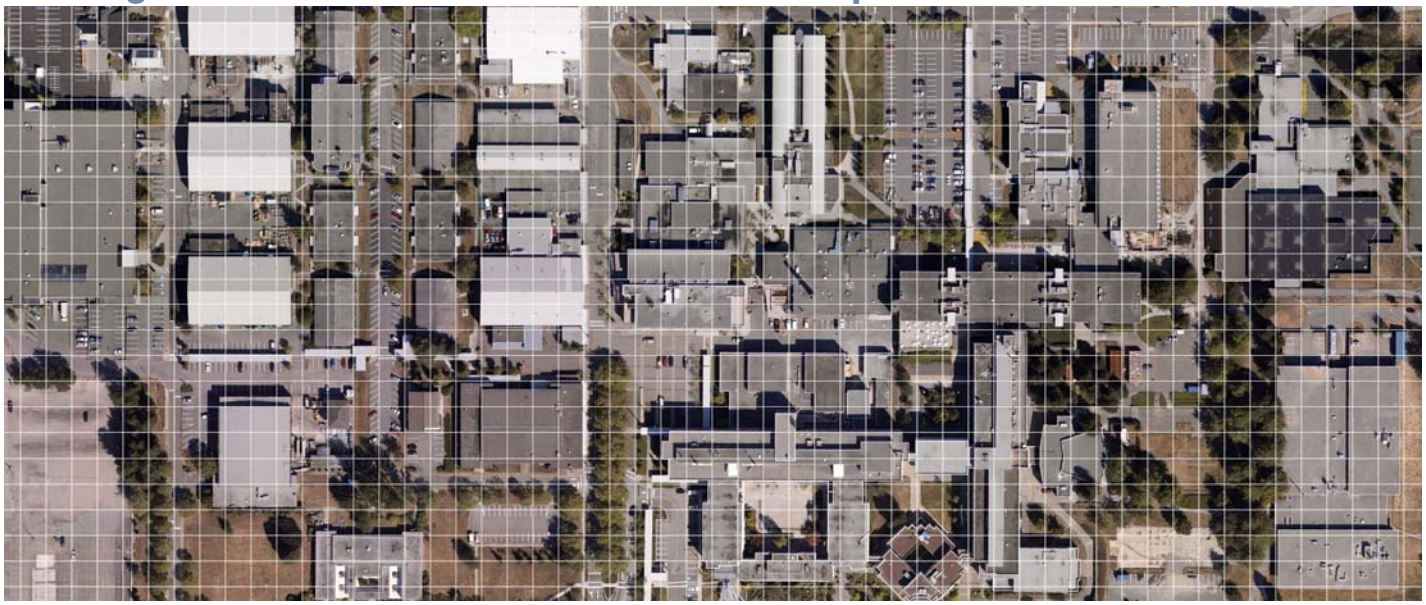
British Columbia Institute of Technology
Burnaby Campus Master Plan - Stage 1

Package C – Master Plan Elements and Objectives



Final Report

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Educational Consulting Services Corp.

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Section 1:
Introduction

Master Plan for the BCIT Campus in Burnaby

The British Columbia Institute of Technology (BCIT) is developing a new Master Plan for its main campus in Burnaby, BC.

The Master Plan has been prompted by a need to address the pressures of growth and of programme changes, as well as a number of emerging concerns about the suitability and quality of certain campus buildings in relation to the functions they accommodate. The Plan has also been prompted by BCIT's ambitions to promote and assert itself as Canada's premier polytechnic institute.

Once adopted, the Master Plan will provide BCIT with a long-term decision-making and reference framework for the planning, renewal and expansion of its campus buildings and infrastructure. The planning horizon for the Master Plan is 20 years.

The Master Plan is being developed in two stages:

Stage 1: Facilities Review and Needs Assessment

The Facilities Review and Needs Assessment stage outlines long-term space requirements for BCIT based on the institution's academic and strategic plans, condition of the existing building inventory, and current and proposed patterns of utilization.

Stage 2: Campus Master Plan

The Campus Master Plan stage reconciles and articulates the results of Stage 1 with existing campus infrastructure, and describes the discrete measures, alternatives and development principles leading to the desired physical form of the campus on a long-term basis.

Stage 1 – Facilities Review and Needs Assessment

The purpose of the Stage 1 work is to quantify and describe the facilities and spaces required by BCIT to respond to enrolment growth, and to identify quality and utilization issues regarding existing facilities.

Planning Work up to This Point

Planning work up to this point has consisted of the following activities.

- Description of the existing utilization of instructional space compared to best scheduling practices and utilization targets.
- Description and quantification of BCIT's current and future space requirements in the context of three key parameters: long-term academic and enrolment plans of BCIT; degree of qualitative match between instructional activities and existing space; and Ministry of Advanced Education standards for teaching space utilization and allocation.

These activities resulted in the preparation by ECS and submission to BCIT of two reports:

- Package A – Instructional Space Inventory and Utilization (October 2004)
- Package B – Space Requirements for Programme Delivery (April 2005)

Purpose of "Package C" Document

This submission builds on the contents of the Package A and Package B documents and further incorporates the findings and observations by ECS collected to date in the context of building surveys, work with a steering committee and interviews. Specifically, the purpose of this document is to describe campus development objectives required to adapt the campus to meet the needs identified in the Study and to prepare for Stage 2 of the Master Plan development process.

Contents

Section 2 outlines the **Elements of the Master Plan**, a distillation and compilation of space requirements presented in a series of tables and based on the findings, results and observations collected by ECS during the preparation of Packages A and B. The future space requirements therefore consider multiple factors, including but not limited to student population growth, programme diversification, building renewal needs, strengthening of linkages with industry, etc.

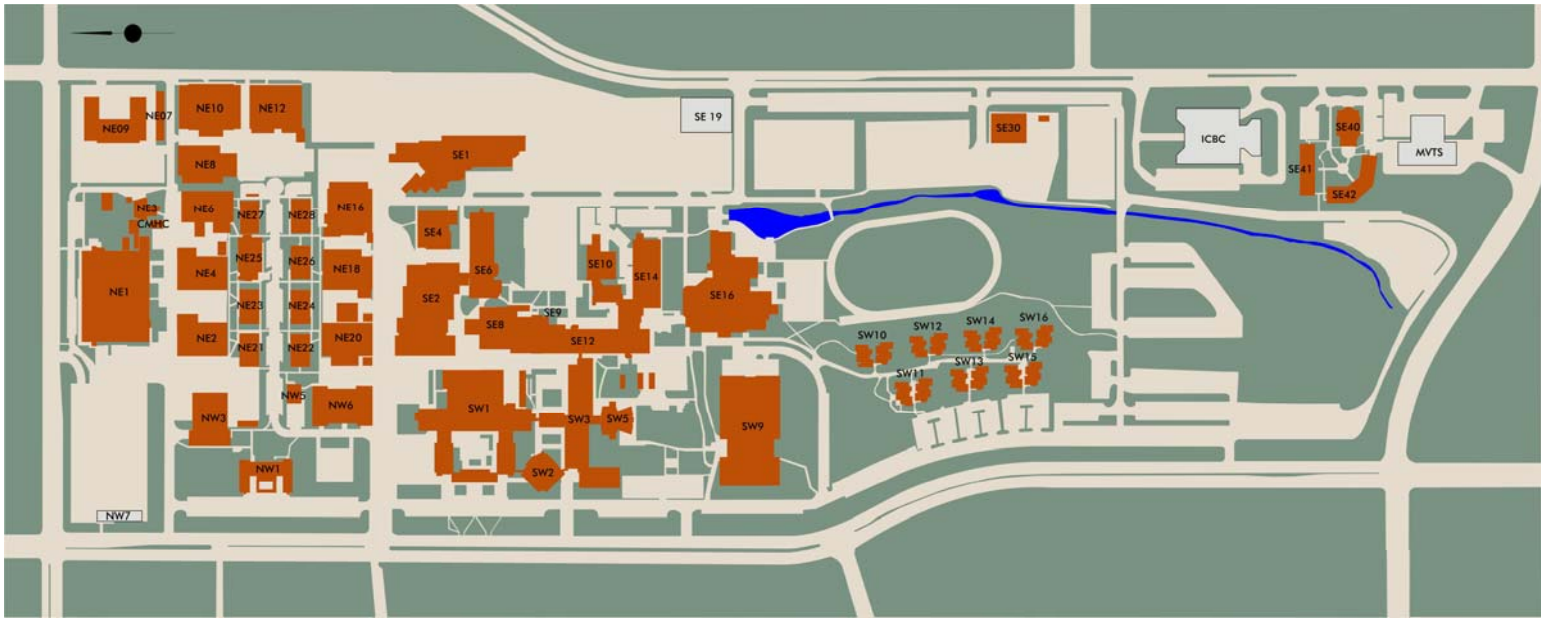
Section 3 describes seven **Campus Precincts** in which development projects could take place in the form of either new construction or renovations to existing buildings.

Section 4 reflects on the findings and observations up to this point and proposes a series of **Campus Development Objectives** to guide the development of the Master Plan during Stage 2. Each objective is briefly described in terms of the following elements:

- Description and rationale.
- Presentation of examples and/or case studies that illustrate and further document how an objective can be implemented.
- In some instances, a preliminary space programme for a possible new building, based on the contents of Section 2.

Section 5 itemizes **Other Considerations** that must be incorporated into the plans, and an outline of planning tasks that ECS suggests should be included in the terms of references framing the Stage 2 work.

Campus Plan Showing Building Identification Codes



Section 2:
Elements of the Master Plan

Introduction

This section describes the requirements for new spaces at the main campus in response to growth, programme changes and current deficiencies. These have been defined on the basis of Package A and Package B work as well as consultation with stakeholders and observations by ECS.

The additional requirements are summarized below. Negative figures indicate vacated spaces that would become available for other uses.

Summary – Additional Space Requirements

Summary	NASM
Additional Instructional Space in Regular Academic Buildings	19,337
Additional Instructional Space in Workshop Buildings	971
Replacement of "Poor" Quonset Buildings - Non-Instructional Functions	2,262
Replacement of Motive Power Buildings	9,500
Library / Open-Access Computing / Study Facilities	2,550
Additional Faculty Office Space - Full-Time	2,118
Additional Faculty Office Space - Part-Time	589
Relocation and Expansion of Registrar, Student and Campus Service Functions	1,200
Allied Health Complex	10,000
Discovery Park Phase II Building	2,771
Total	**51,298**

New Space Requirements as a Result of Student Population Growth and Programme Changes

The following two tables summarize the main results found in the Package B – Space Requirements for Programme Delivery report submitted to BCIT in April 2005. Student population growth and programme changes over the next 15 years generate requirements for additional instructional spaces. It should be noted that some requirements are offset by the potential conversion of certain areas in existing buildings. The assumptions made regarding such conversions are also outlined in Section 4 of Package B.

Additional Instructional Space in Regular Academic Buildings

Additional Instructional Space in Regular Academic Buildings	NASM
Seminar Rooms / Classrooms - C1/C2	3,444
General Computer Laboratories - CM1	4,227
Specialized Computer Laboratory - CM2	5,482
Drafting Laboratory, Standard Drafting Tables - D1	151
Electronics / Electrical Lab, Computer System Stations - E3	2,152
Physical Sciences Laboratory, Services on Room Periphery - L2	505
Life Sciences Laboratory, Serviced Student Benches - L3	2,902
Simulation / Production Laboratory - L5	1,945
Media Production Studio - M2	94
Less Potential Conversion of Existing Space (Section 4 of Package B)	-1,565
Total	**19,337**

Additional Instructional Space in Workshop Academic Buildings

Additional Instructional Space in Workshop Buildings	NASM
Workshop, Fabrication and Heavy Industrial - W1	99
Workshop, Building Trades Excluding NE6 - W2	1,479
Replacement of NE6 Workshop - Plumbing & Pipe Trades	1,555
Less Potential Conversion of Existing Space (Section 4 of Package B)	-746
Less Equivalent of Automotive Workshop Vacated in SE8	-478
Less Equivalent of Auto Body Workshop Vacated in NE10	-938
Total	**971**

New Space Requirements as a Result of Building Replacement

Replacement of "Poor" Buildings

Appendix B identifies campus buildings that are considered to be in excellent, good, fair and poor condition. The replacement of buildings deemed to be of poor quality is an important element of the Master Plan.

The replacement of instructional spaces located in poor buildings is already embedded in the space requirements previously described on page 2-2. Provisions must be made for relocating elsewhere on campus non-instructional functions found in poor buildings.

Replacement of "Poor" Quonset Buildings - Non-Instructional Functions	NASM
NE 21 / NE22 / NE23 / NE24 / NE26 / NE27 / NE28	**2,262**

Replacement of Existing Buildings and Enhancement of the Motive Power Programming

Building NE16, an automotive workshop, is another "poor" building that should be replaced. This replacement should, however, be considered in the context of broader plans by BCIT to create on campus a Motive Power Complex that echoes BCIT's Aviation and Marine campuses. These plans imply that buildings NE18 and NE20, rated as "fair", would also have to be replaced, while automotive workshops in buildings NE10 and SE8 would be vacated. This is accounted for in the calculation of workshop requirements shown on page 2-2.

Space requirements for a new Motive Power complex are estimated at 9,500 NASM. This is equivalent to the current amount of space occupied in rather inefficient buildings. For planning purposes it is assumed that a purpose-built facility can be more efficient and allow for student and programme growth while remaining within a comparable overall footprint.

Replacement of Motive Power Buildings		NASM
Workshop Space Equivalent to NE16 / NE18/ NE20 / NE10 / SE8		7,500
Office / Corporate Training / Classroom / Support Space		2,000
	Total	**9,500**

Learner Support / Quality of Student Life

The significant increase in the future population of the campus calls for an investment in facilities supporting learners and improvements in the quality of student life. This includes enhancing and/or expanding library, learning resource and information commons spaces as well as areas where students can work in groups, socialize, relax and learn in less formal ways. Already it has been indicated that such spaces are at a premium on campus.

For planning purposes an "order-of-magnitude" requirement of 2,550 NASM is proposed to capture, within the context of the Master Plan, the need to provide additional space of this type on campus as more and more students attend BCIT.

Learner Support / Quality of Student Life

Library / Open-Access Computing / Study Facilities	**NASM**
50% of Existing Library Reading / Study and Stack Space in a Satellite or Expanded SE14	1,900
Additional Student Space - Quiet Study Space, Team Work Space	500
Graduate Student Amenities - Lounge and Work Rooms	150
Total	**2,550**

Faculty Offices

Requirements for additional full-time and part-time faculty offices are outlined below. These do not consider any shortages or surpluses currently prevailing on campus. They account only for the increases in the number of Annual Student Contact Hours (ASCH) forecast to be delivered by each school between 2005 and 2020.

Calculations for additional office space have been made assuming the following variables and inputs:

	% of FT Faculty	% of PT Faculty	Academic Year	Average Section Size	Weekly Hours of Instruction FT Faculty	Weekly Hours of Instruction PT Faculty
Business	60%	40%	32 weeks	40	20	8
Computing & Applied Science	60%	40%	32 weeks	40	20	8
Construction	80%	20%	32 weeks	18	30	15
Health Science	50%	50%	32 weeks	24	20	8
Manufacturing	80%	20%	32 weeks	18	30	15
Transportation	80%	20%	32 weeks	18	30	15

Full-time Faculty

Additional Faculty Office Space - Full-Time Full-time Staff (12 NASM per FTE Faculty)		NASM
Business - 60% of Increase from 1,850,000 to 3,649,000 ASCH		505
Comp. & Appl. Sc. - 60% of Increase from 846,000 to 1,531,000 ASCH		192
Construction - 80% of Increase from 3,213,000 to 4,374,000 ASCH		645
Health Science - 50% of Increase from 845,000 to 1,471,000 ASCH		244
Manuf. - 80% of Increase from 1,963,000 ASCH to 2,730,000 ASCH		425
Transportation - 80% of Increase from 691,000 to 884,000 ASCH		107
	Total	**2,118**

Faculty Offices (continued)

Part-time Faculty

Additional Faculty Office Space - Part-Time Part-time Staff (3 NASM per FTE Faculty)		NASM
Business - 40% of Increase from 1,850,000 to 3,649,000 ASCH		210
Comp. & Appl. Sc. - 40% of Increase from 846,000 to 1,531,000 ASCH		80
Construction - 20% of Increase from 3,213,000 to 4,374,000 ASCH		80
Health Science - 50% of Increase from 845,000 to 1,471,000 ASCH		153
Manuf. - 20% of Increase from 1,963,000 ASCH to 2,730,000 ASCH		53
Transportation - 20% of Increase from 691,000 to 884,000 ASCH		13
	Total	**589**

Expansion and Enhancement of Student Services

BCIT is not satisfied with the facilities housing its student services functions, including registration and admission, financial aid, visitor enquiries, etc. These consist of office suites and public areas totaling approximately 2,300 NASM on two floors of the west side of building SW1. They are cramped and their layout is confusing, thus affecting the quality of service and the overall impression gained by first time visitors and returning students.

Plans to increase the size of the complex and improve its visibility and stature on the campus have been discussed within BCIT for some time, including with ECS during consultations in November 2004. For planning purposes in the context of Stage 2 of the Master Plan, an area figure of 3,500 NASM has been defined to describe the space required for a new, purpose-built "one-stop-shopping" and "welcome" complex in a prominent and accessible location on campus. This is a 50% increase over the existing allocation.

In Section 4 it is proposed that the complex be amalgamated in an even larger general academic building that would also house the "Quality of Student Life" spaces previously described (page 2-5). It is hoped that this co-location will lead to synergies that will translate into the design of a landmark "gateway" building.

Expansion of Registrar and Student Services Facilities

Relocation and Expansion of Registrar, Student and Campus Service Functions from SW1 (not Including Security Office)	**NASM**
Registrar, Student and Campus Services Offices Vacated from 1st and 2nd Floor of SW01	-2,300
"One-Stop Shopping" Student Services and Campus Welcome Centre	3,500
Total	**1,200**

Partnerships and Linkages

Allied Health Complex

BCIT is considering the establishment of a stand-alone Allied Health Complex that would house a combination of instructional, clinical and medical laboratory facilities working in partnership with local, provincial and western Canadian health care providers. This would include out-patient clinics, pre-service and in-service training of health care providers, regional medical laboratory services, etc. A hotel that can be converted into a temporary hospital in the event of a disaster emergency would be part of the complex as well.

An "order-of-magnitude" figure of 10,000 NASM for this complex is proposed for consideration in the Master Plan.

Allied Health Complex	
Medical Laboratories	2,000
Clinical and Research Facilities	1,000
Instructional Facilities	1,500
Offices	1,000
Support & Services	1,500
Hotel / Short-term Stay Residence / Disaster Hospital (80 rooms)	3,000
Total	**10,000**

Discovery Park Phase II

BCIT has entered into discussions with Discovery Parks regarding the construction of a second "Technology Place" building on campus and this must be considered in the Master Plan.

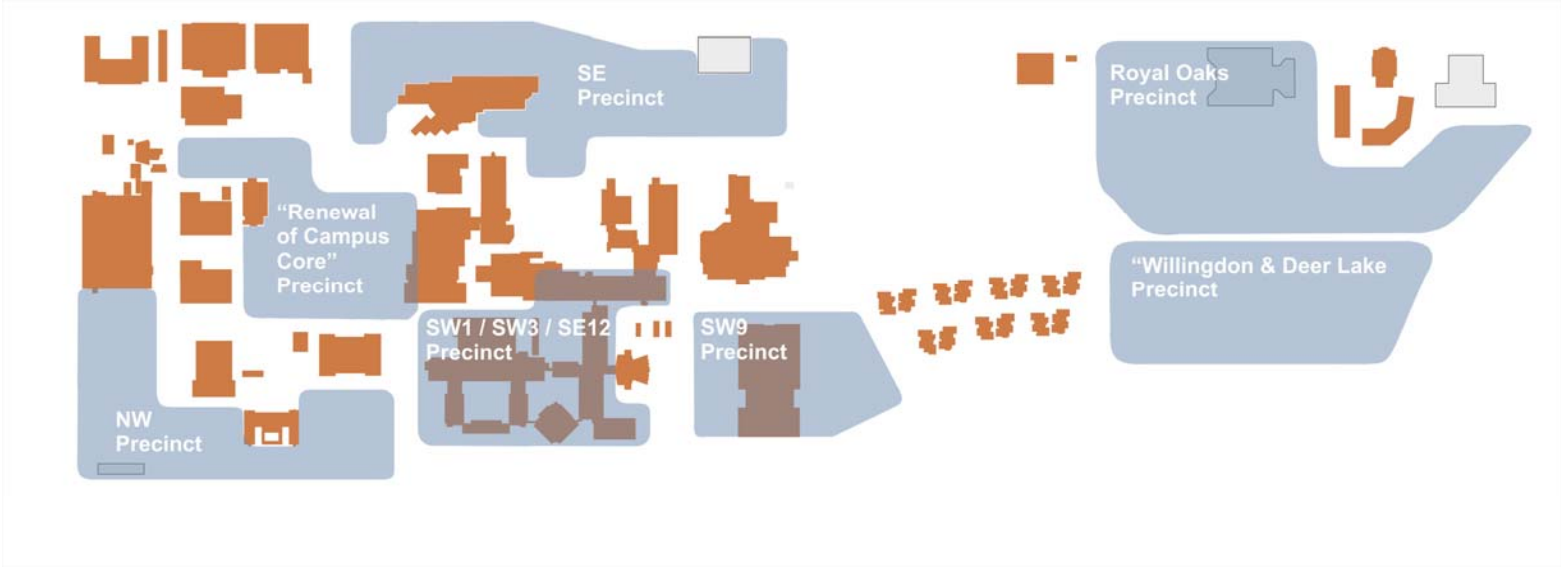
Discovery Park Phase II Building	**NASM**
Total	**2,771**

Section 3:
Campus Precincts

Introduction

A major aspect of the Stage 2 master planning work will be to explore and define how possible new building initiatives and examples described in Section 4 can be woven into the fabric of the campus and can contribute positively to its cohesiveness, image and efficiency.

A diagram of the campus below outlines the boundaries of seven precincts, or zones, where the proposed capital projects could be located, or in some cases must be located. In some instances the precincts abut the footprint of existing buildings. This is to suggest that new buildings *could* be linked to existing ones in some manner. In some instances the precincts overlap the footprint of existing buildings. This indicates that renovations are proposed or should be considered within these buildings.



Precinct Descriptions

"Renewal of Campus Core" Precinct

The "Renewal of Campus Core" Precinct overlaps the current location of buildings deemed to be of poor quality that should be removed from the inventory.

The site presents challenges in terms of demolition / construction sequencing, and grade changes. However, it has the potential of becoming the core of the campus. Ideally, new plans should strive to eliminate the physical delineation that existed and can still be felt between the former site of the Pacific Vocational Institute on the north side of the property and the original BCIT on the south side, before the two institutions merged.

High density functions immediately north of building SE2 would be particularly welcome. The location would also be a sensible choice to locate "Campus Gateway" functions, as described in Section 4.

NW Precinct

The NW Precinct, at the intersection of Willingdon and Canada Way, is particularly attractive in terms of its visibility and potential for BCIT to leverage some of its value on a long term basis through either land parceling or some form of partnership. "Campus Gateway" functions can be located in this precinct.

SE Precinct

The SE Precinct has been identified as a potential location for activities related to the schools of Construction and Manufacturing, Electronics & Industrial Processes along with the potential construction of a Phase II building by BC's Discovery Parks Trust.

SW1 / SW3 / SE 12 Precinct

The SW1 / SW3 / SE 12 Precinct describes a zone of existing buildings to be renovated to accommodate growing or new programmes, or alternatively provide general purpose instructional space in the form of classrooms and general computer laboratories.

Precinct Descriptions (continued)

SW9 Precinct

Building SW9 features a unique mix of workshops, laboratories, auditoria and office suites well suited for housing a fairly wide array of academic and applied research ventures. It already enjoys its own "street presence", with a separate vehicular access point.

Royal Oaks Precinct

The Royal Oaks Precinct encompasses the southeast quadrant of the campus, and overlaps the Insurance Corporation of British Columbia property in the eventuality that BCIT purchases it or enters into some form of agreement with the provincial agency regarding the use of this facility.

Willingdon and Deer Lake Precinct

The Willingdon and Deer Lake Precinct at the southwest corner of the campus property is bordered by two major arterial roads. Like the NW precinct, it also enjoys good street visibility. BCIT may wish to leverage the location in terms of its market value or potential for partnerships.

Section 4:
Campus Development Objectives

Introduction

This section outlines campus development objectives that should guide the Master Plan during Stage 2. These objectives are:

- Objective A Develop a New Campus Gateway
- Objective B Invest in Learner Support Infrastructure
- Objective C Create Landmark Buildings and Foster School Identity
- Objective D Integrate Training, Academic and Applied Research Activities
- Objective E Renew Existing Buildings

The rationale for each objective is explained in the pages that follow. The explanations are accompanied by examples and one case study illustrating how the objectives could be implemented in the context of the Master Plan. Preliminary space programmes have also been assembled as a means of providing some perspective on the magnitude and potential impacts on the campus. These space programmes are based on information already presented in Section 2.

Objective A Develop a New Campus Gateway

BCIT's main campus in Burnaby has become, over time, more and more inward-looking and disconnected from its broader surroundings. The more recent and generally more attractive facilities added to the campus, such as buildings SE2, SE6 and SE4, have been built in the centre of the campus, away from its edges. Meanwhile, the buildings that line Canada Way and Willingdon Avenue, the main interface between BCIT and the "outside" world, are set back too far from the streets they line and project a somewhat anonymous and uninviting image.

BCIT is aware of the conditions described above. The Institute wishes to create a new "gateway" building for the campus that will address latent issues of wayfinding, image and the creation of inviting student services facilities.

Achievement of the Objective

Example
Hearth Building Student Lounge and Campus "Gateway"
Southern Alberta Institute of Technology
Calgary, Alberta

A multi-use building is proposed as a means of creating a new gateway for the campus at the same time as creating additional capacity for general student population growth.

The service functions proposed in the building would include "One Stop Shopping" registrar and campus "Welcome Centre" services as well as lounge and study space for students.

The academic functions would be fairly generic in nature (classrooms and general computer laboratories) and would serve the entire campus. Such instructional spaces would be particularly relevant to the School of Business.

Objective A Develop a New Campus Gateway (continued)

The new complex would be a sizable addition to the campus. It has the potential of being a vibrant, high traffic facility because of the functions it would house *if* it is located on the right site. Accordingly, choosing the right location for the building is crucial. ECS believes sites located within both the "Renewal of the Campus Core" and the NW precincts should be considered during Stage 2 of the Master Plan. Potential footprints should be assessed in terms of their contribution to the fabric of the campus, with a focus on the following points (some of which may be contradictory).

- Ease of access and identification of the complex as the "Campus Gateway" by visitors (accessed from Willingdon Avenue via Goard Way).
- Contribution to the establishment of a stronger link and continuity between the north (former PVI) and south (original BCIT) portions of the campus.
- Contribution to the image of the campus.
- Distribution of classroom and communal spaces on campus, particularly in relation to the well established SE2 and SE6 buildings (which already feature the Great Hall and a sizable number of general-purpose classrooms).

Preliminary Space Programme

New Gateway and General Academic Building		NASM		GSM
Less Potential Conversion of Existing Space (Section 4 of Package B) - 50% of Line 10		-782		
C1/C2 Seminar Rooms / Classrooms - 50% of Line 1		1,722		
C1/C2 Seminar Rooms / Classrooms from SW9		707		
CM1 - General Computer Laboratories - CM1		4,227		
Additional Full-Time Faculty Offices - Business		505		
Additional Part-Time Faculty Offices - Business		210		
	Sub-total	6,589	1.66	10,938
Additional Student Space - Great Hall, Quiet Study Space, Team Work Space		500	1.25	625
"One-Stop Shopping" Student Services and Campus Welcome Centre		3,500	1.42	4,970
	Total	**10,589**		**16,533**

Objective B Invest in Learner Support Infrastructure

The expansion of learner support infrastructure can take many forms, including conventional library facilities, information commons, learning centres, etc. The need to expand is prompted by the forecasted increase in student population, the introduction of applied degree, post-graduate and applied research activities on campus and an existing shortage of study and work spaces. More importantly, an investment in such facilities will be required as BCIT begins to offer programmes and courses that rely in part or totally on information technologies, project-based learning in group settings, etc.

Achievement of the Objective

The proposed expansion could take the form of either one of the following projects.

The additional space could be attached to a Campus Gateway building as previously described, thus implying the creation of a satellite point of service for academic support services in either the "Renewal of the Campus Core" or the NW precincts.

Alternatively, the additional space could be attached to building SE14. The merits of both locations, and their implications for BCIT and learner support, should be explored during Stage 2.

Objective B Invest in Learner Support Infrastructure (continued)

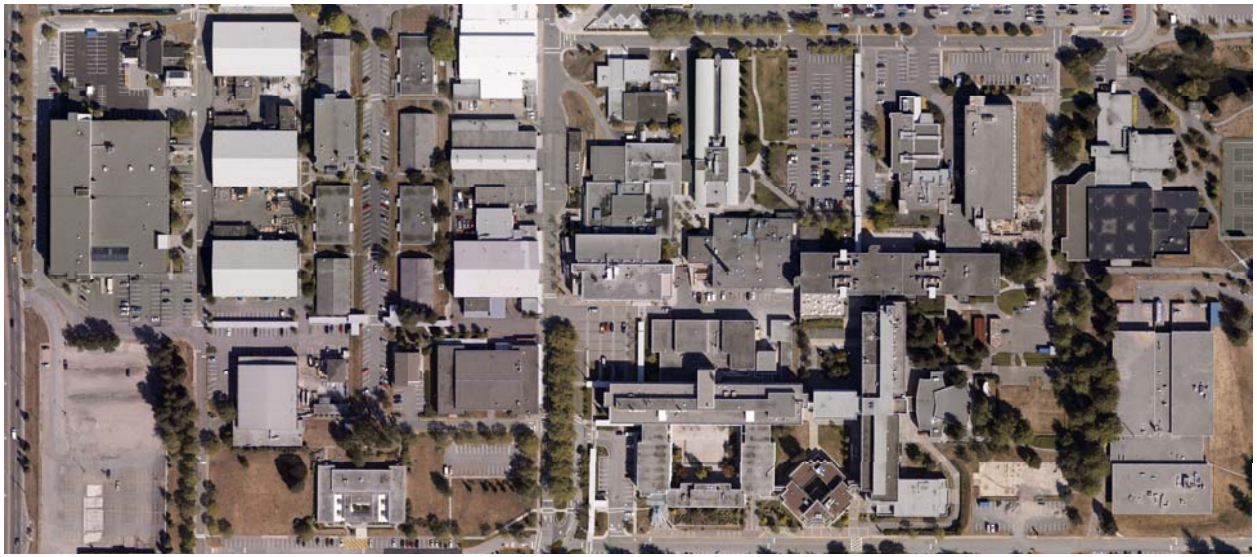
Preliminary Space Programme

The expansion can take many forms, including conventional library facilities, information commons, learning centres, etc. At this time, an "order-of-magnitude" space allocation of 1,900 NASM for additional library and learner support facilities is proposed. This amount of space corresponds to approximately 50% of the assignable Library areas found in building SE14. The actual figure will likely change when detailed planning for this expansion takes places. This should not affect how such an expansion is considered within the Master Plan.

Expansion of Learner Support Services	NASM		GSM
50% of Existing Library Reading / Study and Stack Space in a Satellite or Expanded SE14	**1,900**	1.42	**2,698**

Objective C Create Landmark Buildings and Foster School Identity

The Burnaby campus is a collection of functional but, for the most part, unremarkable if not drab buildings. There are exceptions, including building SE2 and NW1. In recent years BCIT has built relatively small stand-alone buildings (SE4) and extensions to existing facilities (SE14). This approach should, if at all possible, be avoided in future. It fragments the campus without contributing to its image, cohesiveness and functionality.



An Absence of Landmark Buildings

BCIT should aim to package its future requirements for additional space into large, well designed and prominent landmark academic buildings that project the image of a dynamic, valued and successful institution. As per the three examples outlined below, it would be best to organize this on the basis of programme families, or even schools (with the exception of the "Gateway" facility previously described).

Objective C Create Landmark Buildings and Foster School Identity (continued)

Achievement of the Objective - Example A

School of Advanced Technology - T Building
Algonquin College,
Ottawa, Ontario

Griffiths, Rankin Cook Architects

In this example BCIT would build an **Advanced Technology Complex** that addresses the pressures of enrolment growth and allows the consolidation, in one location, of the academic programmes making use of the electrical, electronics and drafting laboratories currently distributed across most of the campus. These relocations would enhance the cohesiveness, identity and image of the Technology programmes. Equally important, the relocations would yield vacant space in existing buildings that can be renovated and converted to other uses in response to other needs within the Institute.

Objective C Create Landmark Buildings and Foster School Identity (continued)

Preliminary Space Programme - Example A

In the preliminary space programme shown below it is assumed that BCIT is seeking to consolidate all its electrical, electronics and specialized new computer facilities in a new building in SE1.

New Advanced Tech./Electrical/Electronics/IT Building near SE1		NASM		GSM
Less Potential Conversion of Existing Space (Section 4 of Package B) - 50% of Line 10		-782		
C1/C2 Seminar Rooms / Classrooms - 50% of Line 1		1,722		
E3 Electronics / Electrical Lab, Computer System Stations		2,152		
Specialized Computer Laboratory - CM2		5,482		
E2 Laboratories in SE12		393		
D1 / E1 / E2 / E3 Laboratories from SW1		1,087		
E1 / E2 / E3 Laboratories from SW3		2,064		
D1 Laboratories from SW9		87		
D2 Laboratories from SW9		145		
E1 Laboratories from SW9		175		
Additional Full-Time Faculty Offices - Manufacturing		425		
Additional Part-Time Faculty Offices - Manufacturing		52		
	Total	**13,002**	1.66	**21,583**

Objective C Create Landmark Buildings and Foster School Identity (continued)

Achievement of the Objective – Example B

New Trades and Technology Centre
Kwantlen University College
Langley, British Columbia

Bunting Coady Architects

A new **Motive Power Complex** is being considered as a replacement for buildings NE16, NE18 and NE20 and the automotive and auto body workshops in buildings SE8 and NE10. The complex would be, in a manner that echoes BCIT's Aviation and Marine campuses, a high profile training venue catering to the needs of the automotive industry (and related disciplines).

Secondary benefits for the campus would be twofold:

- Replace workshop facilities located in either fair or poor buildings in the "Renewal of Campus Core" Precinct. These buildings were not designed for their current uses, cannot be improved, and over time will become liabilities.

- Free the campus core of low density use in favour, (as determined in the Master Plan), of higher density utilization. The site of building NE20, for example, could become the location of a new "Campus Gateway" easily accessed from Willingdon Avenue via Goard Way.

Objective C Create Landmark Buildings and Foster School Identity (continued)

Sample Space Programme for Example B

For planning purposes the amount of space estimated for the complex is 9,620 NASM and 14,169 GSM. This is equivalent to the amount of space currently occupied by Motive Power programmes, making the assumption that a purpose-built complex will be more efficient and thus capable of absorbing enrolment growth in an equivalent footprint.

New Motive Power Complex		NASM		GSM
Office / Corporate Training / Support Space Equivalent to NE16 / NE18 / NE20 / NE10 / SE8		2,000		
Additional Full-Time Faculty Offices - Transportation		107		
Additional Part-Time Faculty Offices - Transportation		13		
	Sub-total	2,120	1.66	3,519
Workshop Space Equivalent to NE16 / NE18/ NE20 / NE10		7,500	1.42	10,650
	Total	**9,620**		**14,169**

Objective C Create Landmark Buildings and Foster School Identity (continued)

Achievement of the Objective – Example C

Michener Institute for Applied Health Sciences
Toronto, Ontario

BCIT wishes to create on campus a stand alone **Allied Health Complex** that would house a combination of instructional, clinical and medical laboratory facilities working in partnership with local, provincial and western Canadian health care providers. A hotel that can be converted into a temporary hospital in the event of a disaster emergency would be part of the complex as well.

Sample Space Programme for Example C

Allied Health Complex		**NASM**		**GSM**
Medical Laboratories		2,000		
Clinical and Research Facilities		1,000		
Instructional Facilities		1,500		
Offices		1,000		
Support & Services		1,500		
Hotel / Short-term Stay Residence / Disaster Hospital (80 rooms)		3,000		
	Total	**10,000**	1.66	**16,600**

Objective D Integrate Training, Academic and Applied Research Activities

Leading institutions engaged in technology and engineering education are increasingly moving towards project-based multidisciplinary learning that integrates theory and practice and emphasizes group work and design projects as a means of delivering curriculum.

The core tenet of this approach is that students are active rather than passive participants in the learning process. Students take the initiative in seeking and understanding information and working with others to seek solutions to problems. By delivering a curriculum that emphasizes team and project-based activity, the institution expects to educate complete engineers / technologists who possess the requisite technical expertise and communication skills that are integral to industrial and business environments. Applied research typically flourishes in such environments and can easily involve the participation of students and faculty.

Walls and physical boundaries tend to matter less in such learning environments. Simpler and unencumbered spaces allocated on a project basis, and supported by general amenities such as common storage, tool cribs and testing facilities serving several programmes are desirable.

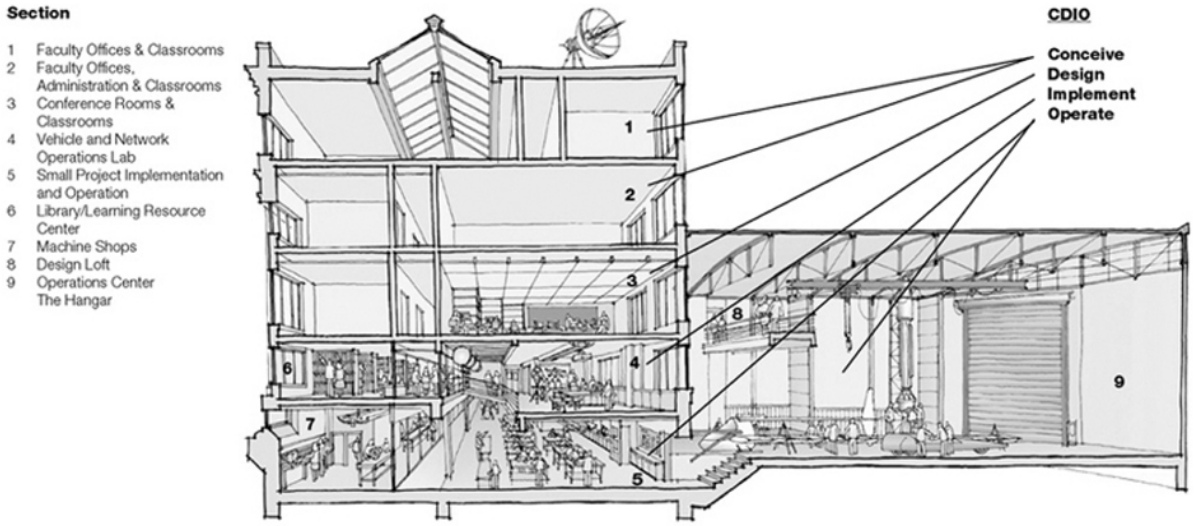
Achievement of the Objective - A Case Study

A case study from MIT provides a good example of a multi-disciplinary, polytechnic environment[1]:

The renovations and addition create highly flexible and open space that allows students and faculty to work in modern team environments throughout the building on projects of varying size and complexity. The design reorganizes the 50,000 square feet building to remove communication barriers between different teaching, research, and lab activities, as well as between students and faculty. Floors were removed and lowered, hallways demolished, and a central wind tunnel gave way to an open stair and light well.

[1] Source: Project Narrative, Design Share Web Site, (http://www.designshare.com/awards/review.asp?project_id=190)

Objective D Integrate Training, Academic and Applied Research Activities (continued)



Learning Laboratory for Complex Systems, MIT, Cambridge, Massachusetts

Cambridge Seven Associates Inc. (Architects)

Applying the "Conceive – Design – Implement – Operate" (CDIO) approach, the building is zoned functionally with cleaner, quieter "Conceive" spaces higher in the building, moving to the dirtier, noisier spaces below. The 6,000 square feet three story "Hangar" acts a "Think Tank" for large scale student projects and adds new connections to all three levels. All CDIO functions and student resources are visible and accessible from the central space. This creates openness, with new horizontal and vertical movement through the building, changing the culture of the environment.

Objective D Integrate Training, Academic and Applied Research Activities (continued)

Combining classroom functions and hands-on environments, the space physically translates the pedagogical approach and goals of the client to encompass the full range of engineering process skills in CDIO of complex systems. Applying lessons of the workplace to the academic setting, the new program works as a collaborative, physical environment supporting strategic mission, productivity, and recruitment of top talent.

Traditionally separate activities are compressed in smaller yet open spaces with communication. Students and faculty move from shop to classroom, from project areas to individual breakout spaces, from higher tech media rooms to links with the outside such as other universities, industry and government.

Essentially the Lab is a mini-company. Areas such as the Project Design Room specifically replicate facilities found in industry, allowing graduating students real-world experience. The new "Hangar" offers a place where large-scale projects such as human-powered aircraft and solar-powered cars, can be run on campus as part of the learning.

Objective D Integrate Training, Academic and Applied Research Activities (continued)

Sample Project – "Next Generation" Workshop Complex

As per the case study previously described, BCIT would create a highly flexible and adaptable workshop facility that departs from existing practices and that establishes the Institute as a leader in areas such as ambient intelligence, complex systems integration, integrated manufacturing, etc. The new building would be justified by a need to create additional workshop facilities in response to growth within the School of Construction and the School of Manufacturing, Electronics and Industrial Processes.

"Next Generation" Workshop Complex		NASM		GSM
Less Potential Conversion of Existing Space (Section 4 of Package B)		-746		
Less Equivalent of Auto Body Workshop Vacated in NE10		-938		
Less Equivalent of Auto Body Workshop Vacated in SE8		-478		
Workshop, Fabrication and Heavy Industrial - W1		99		
Workshop, Fabrication and Heavy Industrial - W1		692		
Workshop, Building Trades Excluding NE6 - W2		1,479		
Workshop - Plumbing & Pipe Trades (now in NE6)		1,555		
Workshop, Industrial Production & Maintenance - W4		1,927		
	Sub-total	3,590	1.42	5,098
Additional Full-Time Faculty Offices - Construction		645		
Additional Part-Time Faculty Offices - Construction		80		
	Sub-total	725	1.66	1,204
	Total	**4,315**		**6,301**

Objective D Integrate Training, Academic and Applied Research Activities (continued)

Additional Master Plan Consideration - Discovery Parks Phase II

Discovery Parks and BCIT have entered discussions regarding the construction of a second "Technology Place" building on campus based on terms roughly similar to ones put in place when the first Technology Place" facility was built in the SE Precinct. The new building would be located close to the Phase I facility (building SE19) in the SE Precinct. Opportunities might exist to improve the vertical and horizontal integration of BCIT's core activities with the occupants of the building.

New Discovery Park Building in SE1, SE19 & Project B1 Precinct		NASM		GSM
	Total	**2,771**	1.66	**4,600**

Objective E Renew Existing Buildings

BCIT must invest in the renewal of existing buildings at the same time as new buildings are being planned and built. Buildings such as NE1, SW1 and SW3, SW9 and SE12 in particular require substantial work to ensure that they remain an integral part of the campus fabric on a long term basis. The buildings are fundamentally too large and of too sound a construction to abandon or neglect in the context of the Master Plan.

Detailed space re-allocation plans that leverage vacated spaces and the physical features of existing buildings will help BCIT fulfill this objective. These will be complex undertakings with several design and implementation challenges. Additionally, they will be partly dependant on the prior implementation of other capital projects elsewhere on campus.

Renovation of Essex Hall at the University of Windsor

Objective E Renew Existing Buildings (continued)

Sample Project – Renovation of SW1 / SW3 / SE12

Renewal of and Expansion of Science Buildings
University of Ottawa
Ottawa, Ontario

Teeple Architects

In its current condition, and given its current mix of occupants, the SW1 / SW3 / SE12 complex is confusing, tired in appearance and contributes little to the positive image and identity of the schools and services it houses.

Based on the above, it is proposed that certain instructional spaces and services be relocated outside the complex as other Master Plan capital projects are implemented elsewhere on campus. For example, the relocation of E1, E2, E3, and D1 laboratories to a new Advanced Technology Building (as per Objective B) would free approximately 2,750 NASM, while the relocation of Registrar services (as per Objective A) would free approximately 2,300 NASM.

Objective E Renew Existing Buildings (continued)

The 5,050 NASM thus vacated would become available for other purposes, including, for example, conversion into life and physical science laboratories that would meet the future needs of the School of Health Science and the School of Computing and Academic Studies, and would also provide space for additional faculty offices. In addition, approximately 450 NASM of space would be available for the growth and rationalization of the Computer Services office complex in SE12.

Renovation of SW1, SW3 and SE12 for Expansion of Health Sciences / Faculty Offices for Computing and Academic Studies / Rationalization/Expansion of Computer Services in SE12	**NASM**	**GSM**
Relocation of D1 / E1 / E2 / E3 Laboratories from SW1, SW3 and SE12	-2,758	
Relocation of Registrar, Student and Campus Services Offices from 1st and 2nd Floor of SW01	-2,300	
Life Sciences Laboratory, Serviced Student Benches - L3 - Growth	2,902	
Life Sciences Laboratory, Serviced Student Benches - L3 - Relocated from SW9	198	
Life Science Laboratory, Services on Room Periphery - L4 - Relocated from SW9	151	
Additional Full-Time Faculty Offices - Health Sciences	244	
Additional Part-Time Faculty Offices - Health Sciences	153	
Additional Full-Time Faculty Offices - Computing & Academic Studies	192	
Additional Part-Time Faculty Offices - Computing & Academic Studies	80	
Offices and Office Services Relocated from SW9	536	
Graduate Student Amenities - Lounge and Work Rooms	150	
Expansion of Computer Services beyond Ground Floor of SE12 in SW1-SW3 Precinct	451	
Total	**0**	

This project is a complex undertaking with several design and implementation challenges. Additionally, it is partly dependant on the prior implementation of other capital projects elsewhere on campus.

Section 5:
Other Considerations

Introduction

This section discusses additional points that should be considered in the development of the Master Plan during Stage 2.

Integration of Building Condition, Deferred Maintenance, Building Renewal Considerations in the Master Plan and Future Capital Projects

The activity model and space needs requirements presented up to this point already account for the removal of buildings deemed to be in "poor" condition (as per Appendix B). This eliminates a portion of the deferred maintenance liability and building renewal issues BCIT might face. But this does not address what should be done with the remaining buildings deemed to be in "fair", "good" and even "excellent" condition. The Master Plan must consider deferred maintenance liabilities and the renewal of existing buildings in relation to the proposed capital projects previously outlined.

Functional "trade-offs", where a function poorly housed in an existing building is relocated in a new building and the space it vacates is renovated and/or converted to a more suitable use, is a mechanism that can be utilized to upgrade building quality and fit to function. Opportunities to implement such trade-offs should be considered in the inception stage of each new project (functional programmes and space programmes).

Building NE1, for example, which has been rated as 'Fair' condition, presents challenges related to its construction, location and the functions it houses. Opportunities might exist to resolve or alleviate some of the issues particular to this building through the relocation of some programmes and functions to new buildings such as the New Advanced Technology Building (Project B1), the New Trades and Skills Training Centre (Project E) or the New Motive Power Complex (Project D). The vacated spaces in NE1 can then be renovated.

Growth

Based on the Annual Student Contact Hour (ASCH) model described in the April 2005 – Package B report, daytime activity levels at BCIT are forecast to increase by 56%, growing from approximately 9,400,000 ASCH in 2005 to 14,600,000 ASCH in 2020. This includes full-time and part-time students enrolled in funded and un-funded programmes of the Institute.

Growth (continued)

A 56% increase will obviously place additional loads on campus services (food, recreation, bookstore, retail, etc.) and infrastructure (parking, energy, data, municipal utilities, etc.). The following briefly highlights points noted by ECS on how the Campus Master Plan should account for this growth beyond the projects already outlined up to this point.

Yards and Use of Outdoors Facilities for Instructional Purposes

Outdoor facilities and yards are essential in the delivery of certain programmes in construction, manufacturing and transportation for large steel fabrication projects, the storage of vehicles, etc. The Master Plan must ensure that existing and additional lands are designated for such purposes around the relevant existing and new buildings.

Access to Campus, Internal Circulation and Parking

Car and public transit volumes will increase. The capacity, location and expansion of the existing access points to the campus, parking lots, internal road networks and special infrastructure (loading docks, emergency vehicle access, etc.) must support growth and should be evaluated by BCIT (if not already done) in the context of the Master Plan. Above and beyond this general assessment, the following issues merit particular consideration.

- Vehicle circulation, or not, in the “Renewal of Campus Core” precinct.
- Short-term parking for visitors nearby the Campus Gateway.
- Sheltered walkways from parking lots to buildings.
- Adequacy and location of bus shelters on Willingdon. Possibility and implications of diverting bus routes to the campus gateway.

Growth (continued)

Site Infrastructure

The Master Plan must assess if the services to the site (water, sanitary sewers, storm drains, power, etc.) and the reticulation networks within the site can meet current and additional loads generated by growth. Conversely, the location and capacities of these services must guide the development of the Master Plan so as to leverage the capacity of the infrastructure already in place.

Food Services / Retail Services

Foods services will likely have to expand to meet a 56% growth in the population of the campus. Additional food-court style outlets can be incorporated in most of the capital projects described in Section 4. The General Academic and Campus Gateway building (Project A) for example could easily incorporate and benefit from food and retail outlets located in conjunction with the large 500 NASM student lounge being proposed. Relevant studies on the demand for such outlets can, however, be carried out on a project-by-project basis outside the scope of the Master Plan.

The location and size of the Bookstore also warrants consideration in the Master Plan. Currently the Bookstore, located Building SE2, focuses on the sales of textbooks and academic supplies. A distribution centre for distance education materials is located in Building NE9. Concerns exist at both locations regarding the amount of space allocated, ease of accessibility and shipping and receiving facilities. It should be noted that the Student Association operates a separate retail outlet in building SE2 focused on stationary supplies, BCIT logo and novelty items, etc.

Recreation and Sports Facilities

Demand for recreation and sports facilities will likely increase, albeit not necessarily in direct proportion with the 56% activity growth factor previously described. Spaces of a social nature have been incorporated in the overall requirements in the form of a second great hall of approximately 500 NASM. This does not address the increase in demand to be expected in the sports and recreation facilities found in Building SE16 and the playing field. With the assumption that Building SE16 will continue to “anchor” such amenities, the Master Plan should account for the eventuality of its expansion in terms of footprint, campus circulation and access.

Growth (continued)

Student Association Facilities and BCIT Senior Management Offices

The Student Association will benefit from growth in the form of a larger body of students, more revenues through activity fees and levies, etc. As a result, the Student Association may wish to expand over time. Because building SE2 is already a pivotal location and a focal point of student life on campus, this could lead to a review of the past agreements that led to the co-habitation of the Student Association and BCIT's senior management offices. A possible relocation of the latter should be considered in the Master Plan in conjunction with other administrative facilities, as discussed below.

Consolidation of Administrative Facilities

Administrative and support offices are distributed across the campus in a number of buildings (NE1, NE9, NW1, SE12, SE16, SE41, etc.). This wide distribution creates several operational challenges that should be acknowledged in the Master Plan, and, if at all possible, addressed. Because securing funding to create new administrative space will be difficult, the range of measures available to BCIT to improve this space is limited. Most campus buildings were designed as academic or workshop facilities that cannot easily be converted to state-of-the-art administrative complexes[1].

The Master Plan should nevertheless attempt to identify a precinct, in existing and/or proposed buildings, where it would be advantageous to consolidate administrative functions on a long-term basis. This could be done by converting existing suites of administrative offices into, for example, classrooms. In turn, the requirement for new classrooms would be provided in a new building as offices instead.

[1] Building NW1 does not entirely fit this description and is more amenable to administrative uses.

Royal Oaks and "Willingdon & Deer Lake" Precincts

The long-term development of the Royal Oaks and "Willingdon & Deer Lake" precincts, as described in Section 3, creates some challenges because they are relatively remote from the campus core. Locating more academic activities within these precincts, such as the Motive Power Complex (Project D), may alleviate these concerns if the activity level is high enough to justify the provision of good services in that part of the campus. This, however, would likely have to be done at the expense of losing some degree of campus cohesiveness and integration within the remainder of the campus.

A prudent approach is to locate administrative and/or short duration training programmes and conference activities in the Royal Oaks complex. BCIT is already moving in this direction, which should be further defined and explored in the context of the Master Plan.

Residences

The residence complex (buildings SW10 to SW16) is nearing the end of its useful life. BCIT is already planning its replacement, perhaps in partnership with a third party and certainly along the lines of a new model that recognizes changing demand and new markets.

The Master Plan must indicate how and where the replacement of the residences can occur and how such a new complex will integrate itself to the fabric of the campus (or not).

At this time it appears that the preferred location for new residences remains the southwest quadrant of the campus, including the site of the existing residences and the "Willingdon and Deer Lake" precinct (as described in Section 3).

Appendix A:
Instructional Space Categories

C1 **Seminar Rooms / Classrooms**

Used for theoretical instruction and generally centrally scheduled for use by all schools and academic units. Furnished with loose or fixed tables and chairs, tablet arm seats, etc. Usually devoid of instructional aids particular to a programme or course subject. Some rooms may be furnished and configured to support the use of portable computers at each or some stations.

SW1 3190

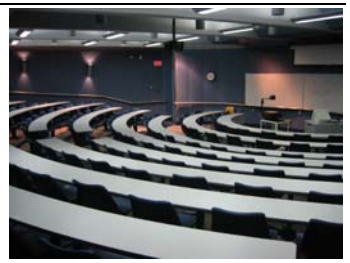
C2 **Dedicated Seminar Rooms / Classrooms**

Used for theoretical instruction and generally scheduled by a school or department. Furnished with loose or fixed tables and chairs, tablet arm seats, etc. May contain particular instructional aids and equipment used by students during or between classes.

NE1 110

C3 **Lecture Halls / Auditoria**

Sits 80 students or more. Used for theoretical instruction and generally centrally scheduled for use by all schools. Usually tiered fixed seating. Fixed furniture may provide power and data outlets for portable computers. Devoid of instructional aids particular to a programme or subject.



SW9 110

CM1 **General Computer Laboratories**

Equipped with general-purpose computers loaded with generic software applications (MS Office, Internet browser, etc.). Power and data service at each station. Usually centrally scheduled for general use by all schools. Open access given to students between classes.

SE14 125

CM2 **Specialized Computer Laboratory / Media**

Usually equipped with specialized computers loaded with specialized software applications. Power and data service at each station. Generally scheduled by a school or department. Access provided to students between classes on the basis of an access card system. The unique nature of the equipment and software implies that some students must complete assignments and project work in the laboratory.

SE10 229

D1 **Drafting Laboratory**

Supports drafting and graphic design activities. Furnished with drafting tables. Can occasionally be used as a classroom. No services. Generally scheduled on a class-by-class basis (as opposed to a studio allocation whereby a student is allocated a specific station for a specific length of time).

SW3 3675

D2	**Drafting Laboratory, Drafting Stations with Computers** Furnished with drafting tables and computer stations. Contains instructional aids and materials used by students during or between classes. Generally scheduled by a school or department.	 NE1 228

E1	**Electronics / Electrical Laboratory Equipped Student Benches** Furnished with student benches designed to accommodate standard electronic equipment (oscilloscopes, meters, computers, etc.). Typically supports bench top digital, analogue and basic electricity experiments and projects.	 SE1 134

E2	**Electronics / Electrical Laboratory Project Based / Equipment Specific Configuration** Configured and serviced around specific learning stations and learning aids. Typically supports modular-based instruction. May have specific electrical power requirements (high voltage, DC, etc.). Generally scheduled by a school or department.	 SE1 204

E3 **Electronics / Electrical Laboratory**
Computer System Student Station

Furnished with student benches designed to accommodate standard electronic equipment (oscilloscopes, meters, computers, etc.). Typically supports project work on PC hardware.

SW1 3555

L1 **Physical Sciences Laboratory**
Serviced Student Benches

Highly finished space furnished with serviced student benches to support instruction and experimental activities in "physical" sciences such as chemistry, physics, geology, etc. Requires services generally connected to purpose-designed building mechanical systems.

SW1 3030

L2 **Physical Sciences Laboratory**
Services on Room Periphery

Highly finished space furnished with peripheral benches to support instruction and experimental activities in "physical" sciences such as chemistry, physics, geology, etc. Student stations are not serviced and may consist of built-in casework or tables and chairs. Requires services generally connected to purpose-designed building mechanical systems.

SW1 2025

L3 **Life Sciences Laboratory**
Serviced Student Benches

Highly finished space furnished with serviced student benches to support instruction and experimental activities in "life" sciences such as biology, microbiology, medical laboratory technology, etc. Requires suitable services generally connected to purpose-designed building mechanical systems.

SE12 407

L4 **Life Sciences Laboratory**
Services on Room Periphery

Highly finished space furnished with peripheral benches to support instruction and experimental activities in "life" sciences such as microbiology, medical laboratory technology, etc. Student stations are not serviced and may consist of built-in casework or tables and chairs. Requires suitable services generally connected to purpose-designed mechanical systems.

SE12 413

L5 **Simulation / Production Laboratory**
Clean Materials & Processes

Purpose-designed, highly finished high bay space configured to house unique and highly specialized activities that duplicate industry settings. Requires suitable services generally connected to purpose-designed mechanical systems. Examples of such space include the Food Processing and Unit Operations laboratories in SW1.

SW1 1205

L6 **Project / Production Laboratory**
Industrial & Field Work Applications

Low or high bay space finished and configured to support instructional and fieldwork support activities that typically generate dust, vibration, noise, water or oil spillages, etc. Usually on the ground floor with direct access to the outside (overhead doors) to allow the easy movement of materials and equipment. Building services must account for the equipment in place and may require special features such as high voltage electrical service, compressed air, sediment traps, dust and fume extraction systems, etc. Examples of such space include the Civil Engineering Laboratory in SW3 and the Materials Laboratory in SW9.

SW3 1650

M2 **Media Production Studio**

Low or high bay space finished and configured to support media production activities, including film and sound recording. Generally supported by control rooms, post-production equipment rooms, etc.

SE10 163

W1 **Workshop**
Fabrication and Heavy Industrial

Low or high bay workshop space finished and serviced to support trades and technology instruction in subjects such as welding, steel fabrication, heavy equipment repair, etc. Significant building design consideration must be given to ventilation systems, floor loadings, height clearances and materials movement (cranes, forklifts, etc.). Usually at ground level with direct access to the outside (overhead doors) and supported by an outside work yard. Examples of such space include buildings NE8 (Welding) and NE12 (Fabrication).

NE8

Types of Instructional Spaces (continued)

W2 **Workshop**
Building Trades

Low or high bay workshop space finished and serviced to support trades and technology instruction in building and woods trades. Workshop areas consist of fixed production equipment zones (table saws, etc.), large student work benches, simulated installation environments (electrical wiring, plumbing, etc.) and open project areas allowing the construction of large projects. Usually at ground level with direct access to the outside (overhead doors) and supported by an outside work yard. Examples of such space include buildings NE2 (Joinery) and NE6 (Plumbing).

NE2

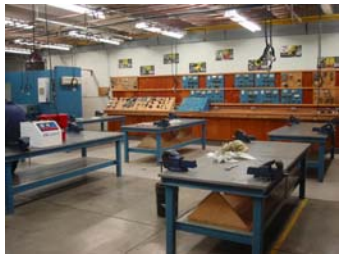
W3 **Workshop**
Mechanical Trades

Low or high bay workshop space finished and serviced to support trades and technology instruction in mechanical trades and technology, usually with a focus on the maintenance of auto and recreational vehicles and their systems (engines, transmissions, etc). Usually at ground level with direct access to the outside (overhead doors). Clearances between and around building structural elements (columns, load bearing walls) must allow the easy movement of vehicles. Examples of such space include buildings NE18 and NE20.

NE18

W4 **Workshop**
Industrial Production & Maintenance

Low or high bay workshop space finished and serviced to support trades and technology instruction in industrial production processes and the maintenance of equipment such as millwright, machinist, etc. Workshop areas will consist of large production equipment installations, machine tools areas, system installation simulators and student workbenches. Building services must account for the equipment in place and may require special features such as high voltage electrical service, compressed air, sediment traps, and fume extraction systems.



NE1 160

W5	**Workshop** **Outdoor Yard Space** Outdoor yard space located adjacent to trades buildings to support instruction. May be used on a scheduled basis. Generally fenced and secured area, including storage for tools and large equipment. May also provide services such as compressed air, power points, etc.	 Yard Outside NE 12

Appendix B:
Building Quality Assessment

Appendix B: Building Quality Assessment

Poor	Building deemed unsuitable for use and should be replaced or abandoned. The reasons for this assessment include serious deficiencies in or absence of appropriate mechanical systems, low quality building fabric that has reached or exceeded its lifespan, and difficulty or limited utility in conducting upgrading renovations.
Fair	Building deemed to offer adequate usable space but requires a substantial investment in major renovations (fabric and/or mechanical systems) on a long-term basis, and/or a change to a type of occupancy that is better suited to the original design and purpose of the structure.
Good	Purpose-designed building suited to its current use and generally in good physical condition (building fabric and mechanical systems). Good to excellent match between the space and activity. Through internal renovations and/or occupancy changes, has the potential to become an "Excellent" building.
Excellent	Purpose-designed building very well suited to its current use and in very good physical condition. Excellent match between space and activity.

Identification of Poor, Fair, Good and Excellent Building

Reference code on previous page.

Appendix C:
Polytechnic Status and Applied Research at BCIT

Appendix C: Polytechnic Status and Applied Research at BCIT

BCIT as Canada's Premier Polytechnic

Polytechnics are gaining prominence in Canada by providing to the communities they serve a rich and diverse combination of education and training resources. These cater to both the more immediate manpower-training needs of specific industries and to the broader demands of technology-related education. Polytechnics have also recently demonstrated a strong commitment towards applied research and partnerships with business and industry and are gaining, as a result, prominence in the technology and R&D sectors.

BCIT's identity statement, *"Canada's Premier Polytechnic"*, is indicative of the Institute's intent to stand out among its sister institutions. The 2004/05 to 2006/07 BCIT Service Plan identifies the following measures and values supporting that intent:

- Pursuit of career-focused technical and related education linked to the needs of the economy, spanning trades certification to degrees.
- Dedication of resources for applied research and technology transfer activities.
- Cultivation of partnerships with business and industry.

The measures and values listed above each have, in the context of the Campus Master Plan, facilities and infrastructure planning implications.

In particular, the "*Pursuit and support of career-focused education"* has already been the object of a separate Master Plan report by ECS reviewing the instructional and instructional support spaces of the campus. Please refer to the October 5, 2004 document titled *Package A - Instructional Space Inventory and Utilization*.

The "*Dedication of resources for applied research and technology transfer*" and the "*Cultivation of partnerships with business and industry"* aspects of the Master Plan are discussed below.

Applied Research and Technology Transfer

Description

Research and technology transfer activities at BCIT focus on technology-based problem-solving projects benefiting BCIT, its students and its industrial and commercial partners. Applied research projects are considered to be "beneficial" if they generate positive learning, economic, productivity and competitiveness outcomes for the aforementioned parties.

BCIT plans to integrate its applied research with its education and training activities, whereby existing knowledge, skills and equipment concurrently support both regular instructional activities and particular research projects. Applied research activities will leverage the expertise and the equipment already in place within the institution, across disciplines and technology sectors. An example of the approach described above could be as follows.

> BCIT agrees to develop a prototype for a new product being considered by a Vancouver-based industry. BCIT's rapid prototyping equipment, a facility the local industrial partner does not have, was the main reason for the award of the work to the Institute. In addition to the rapid prototyping equipment necessary for the development of the prototype, BCIT makes use of its training equipment in its machine workshop, its plastic injection workshop and of its mechatronics expertise (embodied in a particular member of staff) to build the prototype.
>
> Senior advanced-degree students participate in the project. Their chance of being subsequently hired by the industrial client is very good. A BCIT employee working in a leased Discovery Park office located on campus coordinates the prototyping work and liaises with the industrial partner.

Applied Research and Technology Transfer (continued)

At this time BCIT has identified a number of research themes it will pursue, including, but not limited to, the following:

- Complex Systems Integration
- Health Safety
- Ambient Intelligence

Existing Applied Research Activities and Infrastructure

As per the example outlined above, the current and future need for dedicated applied research facilities at BCIT will remain relatively small. Based on the results of an inventory analysis by ECS, approximately 2,957 square meters are dedicated to applied research on the main campus of BCIT. These facilities include:

Building	Building Name	Areas
NE 25	A.T.T.C.	84 net assignable square meters
NE 03	Centre for Applied Research	507 net assignable square meters
SE 19	Technology Place (Discovery Parks)	2,366 net assignable square meters 2,700 gross square meters (estimated)

The areas recorded in buildings NE25 and NE03 house activities directly related to BCIT applied research projects. Building SE 19, Technology Place, offers 30,000 square feet of office and laboratory space for lease to small or start-up technology companies. The facility is owned and operated by Discovery Parks on lands leased by BCIT. The presence and future of Discovery Parks on the main campus of BCIT is further discussed below.

Discovery Parks and Technology Place

Discovery Parks is an agency of the British Columbia government mandated to nurture and create linkages between post-secondary institutions engaged in research and the marketplace. The presence of a Discovery Parks facility at BCIT naturally compliments BCIT's vision and intent for applied research on campus. Occupants of the Technology Place are and will continue to be encouraged to make use of BCIT's resources and expertise in applied technologies and science, as per the example previously described or in any other manner deemed beneficial to all concerned.

Discovery Parks also owns and operates buildings at three BC universities, in downtown Vancouver and, coincidently, on the west side of Willingdon Road across the street from BCIT's main campus.

Building SE19, Technology Place, is a multi-tenant facility of approximately 2,700 square meters consisting of office and light research laboratories. The building was completed in 2001 and is now fully occupied by third-party tenants.

BCIT has recently requested that Discovery Parks build another building of approximately 4,600 square meters similar to Technology Place. This request was prompted by the success of Technology Place itself, the strong synergy opportunities and the further engagement of BCIT in advanced degree education. The request also supports BCIT's plans to increase its applied research activities four-fold over the next five years.

BCIT envisages the second phase of Technology Place as follows: 1) approximately 2,700 square meters leased to tenants as per the existing model; 2) 1,900 square meters built for occupancy by BCIT as "flex space" for research purposes. BCIT would lease the space from Discovery Park on terms yet to be determined.