Space Standards Review

College, University College and Institute System

CONTENTS

Executive Summary

EXECUTIVE SUMMARY

BC Is a Leader in the Use of Key Performance Indicator

A review of utilization and space standards and guidelines in other jurisdictions indicates that few jurisdictions have developed standards and guidelines for their college and community college systems and that even fewer capture existing utilization in an organized and comprehensive way. In this respect, BC is leading the way with the adoption of the Key Performance Indicator (KPI), an instrument that captures overall utilization in terms of annual student contact hours per student station. KPI captures both funded and non-funded student contact hours and gives the institutions the flexibility to offer programs in the way that best meets the needs of their student clientele.

Comparison of BC's Overall Utilization with Other Jurisdictions

It is difficult to assemble the required utilization data from other jurisdictions in order to compare their utilization with BC's. Many provinces and states do not track utilization, and there is considerable difference in the definitions of full-time equivalent students and funded and unfunded activity. However, our analysis indicates that institutions in BC have achieved rates of utilization that are comparable to institutions in both Ontario and Washington State, and superior to that achieved by institutions in Alberta. Moreover, BC's utilization rates have been realized while providing a far more decentralized service than provided by other systems, with campuses located in a large number of smaller communities.

Importance of FIS to Proposed Standards

BC institutions have implemented a Facilities Inventory System (FIS) to document the use of space at their facilities. Information from this system has been used extensively in this study as a basis to develop unit area standards, including standards for office, library, reading and study, lounge and food services space, space for additional services, as well as net to gross ratios.

Inconsistencies in the way space is categorized and the incompleteness of data for some institutions have limited the usefulness of this important tool. Institutions must recognize that better inventory information, based on the consistent application of definitions, will result in better, more informed standards, and, therefore, should adequately fund the systematic and ongoing update that is necessary to maintain this valuable database.

The FIS would prove even more useful if a field for function was added as this would enable analysis to be completed for student service space, faculty office and administrative space. In addition, all space belonging to an institution, regardless of use should be

documented to provide a complete picture of system resources.

Instructional Station Utilization

The proposed instructional station utilization standards are directly related to the Key Performance Indicator instrument and measure utilization as annual student contact hours per student station. Because BC has taken the lead in adopting this instrument, no precedents or direct comparison with other jurisdictions are available at this time.

The proposed instructional station utilization standards reflect the variety of campus types and sizes by providing broad banding of campuses by size, and by urban and non-urban context. In addition, the standards propose different utilization rates for classrooms/laboratories and shops/teaching kitchens.

The impact of program mix on instructional space utilization requires further investigation. Information about program mix on a campus-by-campus basis was not available for analysis at this time and should be developed in the future. While the relative proportion of classrooms/laboratories to shops/teaching kitchens is related to program mix, it does not fully indicate the impact of program mix on utilization.

Unit Area Standards – Instructional Stations

Unit area standards provide an allocation of space for a given unit of input, such as institutional stations or annual student contact hours. Proposed unit area standards have been developed for student instructional stations and for instructional support space, including six classroom/lecture theatre categories, nine laboratory categories and seven shop categories. A combination of information from the Facilities Inventory System, comparisons with other jurisdictions, "best practices" spaces within the BC system, and industry standards were used to develop the proposed standards. Industry standards were used to develop student station standards for upper-level laboratories as these are relatively new space types in the BC system that apply particularly to university colleges.

Unit Area Standards – Ancillary Support Space

It was not possible to develop comprehensive unit area standards for all ancillary support space at a campus due to inconsistencies in the way space has been documented in the FIS, the incompleteness of some FIS data bases and the poor articulation of some space types. For example, administrative offices could not be analyzed separately from faculty offices as, in many cases, they are not articulated separately.

Proposed unit area standards based on annual student contact hours (ASCHs) were developed for combined faculty and administrative office areas, combined library, reading and study and lounge space, food services and remaining campus activities. No specific faculty office standards have been provided. This enables institutions to allocate office resources as is appropriate in their particular case.

Again, information was not available to investigate the impact of program mix on the provision of ancillary support space. Program mix likely has an impact on library, study and reading space, and may have an impact on lounge space needs. It is recommended that the effect of program mix on ancillary support space be further analyzed.

Net to Gross Ratios

Net to gross ratios indicate the mark-up on net assignable area to account for corridors, mechanical spaces, washrooms and structural elements. Proposed net to gross ratio standards were developed from existing FIS information for various types of campus buildings, including classroom/laboratories, shop facilities, administration and student services, and libraries. A range of net to gross ratios was provided for each in order to account for differences in siting, geography, climate and facility size, all of which have an impact on the net to gross ratio that can be achieved.

Gross areas were not available for all buildings. It is recommended that gross areas for each building be developed in the future to better understand existing net to gross ratios.

Use of Standards

The recommended standards must be understood as starting points only, which only account for gross variations in the size, and geographical context of individual campuses. It is recognized that due to its set of unique and specific circumstances, a campus may legitimately fall above or below these standards, and that a functional program based on the unique requirements of each project should be developed for major projects.

In addition, other jurisdictions have recognized that the standards they have in place do not adequately address the specific objectives in each case. Although Alberta has a well developed set of standards and recently attempted their update, capital proposals are considered on a case-by-case basis, with special attention paid to "pressure points". California, with the most well developed (and copied) American standards, has indicated that new standards would likely be less specific, and would allow institutions greater flexibility to deliver programs in a rapidly changing environment.

Finally, the proposed standards should be monitored regularly to ensure they are fair and that, overall, they provide reasonable results as they are applied to the circumstances of each campus. They will require regular updating as pedagogy and the nature of program delivery change, or as new programs are developed.

For the specific standards, see *Section 3 – Proposed BC Standards.*

For a summary of recommendations made throughout the study, see *Appendix A – Summary of Study Recommendations.*

1. Introduction

Space   *College,*
Standards   *University College,*
Review   *and Institute System*   **BACKGROUND**

1. Introduction

BACKGROUND

The British Columbia college, institute and university college system encompasses a wide variety of sizes and types of campuses that accommodates the delivery of an equally broad range of programs and courses. The largest campus delivers 275 times more student contact hours annually than the smallest. Programs and courses range from afternoon continuing education refresher courses to four-year university degrees.

It is because of the richness and diversity of the college system that BC recently adopted the Key Performance Indicator, a utilization instrument that is able to capture this wide range of use and has as its basis the annual student contact hour.

In 1998, the colleges, institutes and university colleges of BC were asked by the Ministry to improve utilization for the next five years by agreeing to an annual increase of 2, 3 or 4% per year for that period. This will result in an overall increased capacity for the system of approximately 14% by 2002/03.

It is against this background that this study develops utilization and space standards for the college system. The standards will assist in capital project planning and development by identifying needs, prioritizing projects and providing a preliminary definition of required program areas.

Space   *College,*
Standards   *University College,*
Review   *and Institute System*   **BACKGROUND**

1. Introduction

STUDY OBJECTIVES

The initial objectives for the study were as follows:

1. To prepare a space guidelines, standards and utilization review of the BC College, University College and Institute system and compare with other provinces or states, in terms of the amount of space per equivalent student or contact hour, net to gross space ratios, and key influencing factors.

2. To prepare consistent space guidelines and standards for new and renovated space in terms of:

    - required area per student station for various instructional and instructional support types

    - typical area requirements for ancillary space types including student services, cafeterias, libraries, office space, storage and recreational space

    - net to gross ratios for various key building component types including classroom, laboratory, shop, administrative and library space

3. To provide documentation in a user-friendly format directed towards the institutions and their planning and design consultants.

Space   *College,*
Standards *University College,*
Review   *and Institute System*   **STUDY OBJECTIVES**

1. Introduction

1. Introduction

<u>PARTICIPANTS</u>

The Space Standards Review project was guided by the Space Guidelines Committee with membership as follows:

<u>Chair</u>   Cliff Neufeld   University College of the Cariboo

Linda Arnold   SIOC Representative
Alfred Bennallack   Ministry of Finance and
                                Corporate Relations
Ken Burt   Okanagan University College
Blaine Germaniuk   Okanagan University College
Mary Hoekstra   Vancouver Community College
Ric Kelm   Kwantlan University College
John Lewkowich   Ministry of Advanced Education,
                        Training and Technology (MAETT)
Peter Malcolm   North Island College
Jim Parker   MAETT
Maurice Rachwalski   MAETT
Alan Smith   Capilano College
Jay Strachan   Langara College
Larry Waddell   Vancouver Community College
Dave Wadeson   Malaspina University College
Walter Watkins   BCIT
John Wong   BCIT

<u>Project Manager</u>   Richard Collier   Capital Planning Consultant

<u>The RPG Partnership</u>   Steve Yeomans   Project Director
                                Mark Mehrer   Project Manager
                                Gladys Jarrard   Technical Support
                                Bonita Konig   Technical Support

Space
Standards
Review

College,
University College,
and Institute System

STUDY OBJECTIVES

1. Introduction

(0000\document\progreport.doc)

Space   *College,*
Standards   *University College,*
Review   *and Institute System*   **DEFINITION OF TERMS**

1. Introduction ————————————————————————————

DEFINITION OF TERMS

The following definitions apply to terms and acronyms used throughout the study.

Ancillary Support Space

Spaces that support the delivery of instruction, including office, libraries, lounges, reading and study space, cafeteria, data and computing services, health services, meeting and conference rooms, maintenances and physical plant offices and facilities, and storage. It does not include storage which is associated directly with instructional rooms.

Annual Student Contact Hours (ASCHs)

A unit of measure that represents the total number of hours of scheduled instruction given to students in one year.

ASCH

See Annual Student Contact Hours

ASM

Assignable Square Metres (see Net Assignable Area)

Building Service Area

The sum of all areas of a building used to support its cleaning and public hygiene functions.

Circulation Area

The sum of all areas required for physical access to some subdivision of space within a building, whether directly bounded by partitions or not.

Facilities Inventory System (FIS)

The database used by BC Institutions to collect, manipulate and report statistical information by Campus, Building, room, space code and Program, etc.

FIS

See Facilities Inventory System

FLE

See Full Load Equivalent

FTE

See Full-time Equivalent

Full Load Equivalent (FLE)

A unit of measure which is equal to the number of student contact hours a student with a full load of courses typically assumes.

Full Time Equivalent – Staff (FTE)

The conversion of an actual workload into the number of individuals who, if they were working a complete shift on a regular schedule basis, would be required to accommodate that workload.

Space   *College,*
Standards   *University College,*
Review   *and Institute System*   **DEFINITION OF TERMS**

1. Introduction

Full Time Equivalent – Student (FTE)

A unit of measure which is equal to a full course load in a particular program. Student contact hours per FTE may range from 400 to over 1,500, depending on the program.

Gross Building Area

The sum of the floor areas within the outside face of exterior walls for all stories or areas which have floor surfaces and are typically heated.

Within FIS, Gross Building Area is equal to Net Usable Area plus internal partitions and building structure.

Key Performance Indicator (KPI)

A measure of utilization in which all on-campus instructional activity is captured and compared to the notional (not actual) number of student stations available. The result is expressed as Annual Student Contact Hours per Student Station (ASCH/ST ST)

KPI   See Key Performance Indicator

Net Assignable Area

The sum of all areas on all floors of a building assigned to or available for assignment to an occupant or specific use, excluding all public hygiene mechanical, electrical and other building system areas and general circulation areas. Net assignable areas are measured from the inside surfaces of walls and partitions.

All numbered space code categories in the Facilities Inventory System (FIS) used by BC's institutions fall within Net Assignable Area, except 435 (Building Services Area in Library Complex), 530 (Building Services Area in Gymnasia) and 655 (Building Services Area in Food Services Area). These three space code categories are Non-Assignable Area as defined below.

Net to Gross Ratio

The result of dividing a building's Gross Area by its Net Assignable Area.

Net Usable Area

The sum of all areas on all floors of a building either assigned to or available for assignment to an occupant or specific use, or necessary for the general operation of a building.

Within FIS, Net Usable Area is the result of adding Net Assignable and Non-Assignable Area.

Non-Assignable Area

The sum of the building service area, the general circulation area and the mechanical, electrical and other building system areas, which are not assigned to an occupant or for specific use.

Within FIS, this is equal to Space Codes 435 (Building Services in Library Complex), 530 (Building Services in Gymnasia) , 655 (Building Services in Food Services Area) and 222

Room Utilization

The number of hours per week an instructional room can be expected to be in use.

SCH   See Student Contact Hour

Station Utilization or Utilization

Number of hours per unit of time a student station is occupied, or can be expected to be occupied.

Structural Area

The sum of all areas on all floors of a building that cannot be occupied or put to use because of structural building features, including exterior walls, interior walls and partitions.

Student Contact Hour (SCH)

A unit of measure that represents an hour of scheduled instruction given to students.

Unit Area Standard

The allocation of space for a given unit of input, such as an instructional station or annual student contact hour.

Weekly Student Contact Hour (WSCH)

A unit of measure that represents the number of hours of scheduled instruction given to students in a specific room type, i.e., classroom or laboratory, in a week.

WSCH   See Weekly Student Contact Hour

Space
Standards
Review

College,
University College,
and Institute System

DEFINITION OF TERMS

1. Introduction

Space   *College,*
Standards   *University College,*
Review   *and Institute System*   **BIBLIOGRAPHY AND SOURCES**

1. Introduction

(0000\document\progreport.doc)

BIBLIOGRAPHY AND SOURCES

Alberta Advanced Education and Career Development/ RMC/MGT. *Review of Space Guidelines*. 1994.

Alberta Advanced Education and Career Development/ RMC/MGT. *Appendix Document*. 1994.

Alberta Advanced Education and Career Development. *Access Fund Guide*. 1999.

Alberta Advanced Education and Manpower. *Campus Development Services Space Guidelines*. 1977.

Baker, Michael. *The Use of Standards and Comparative Space Data for Space Allocation*. 1984.

Bareither/Schilinger. *University Space Planning*. 1968.

California Post-Secondary Education Commission/MGT. *Survey of Space and Utilization Standards and Guidelines in the Fifty States*. 1990.

California Post-Secondary Education Commission/MGT. *Calculation of Base Factors for Comparison Institutions and Study Survey Instruments, A Second Report*. 1990.

California Post-Secondary Education Commission/MGT. *Study of Higher Education Space and Utilization Standards/Guidelines in California. Final Report*. 1990.

California Post-Secondary Education Commission. *Library Space Standards at the California State University*. 1991.

Council of Education Facility Planners, International (CEFPI). *Space Planning Guidelines*. 1985.

Council of Ontario Universities (COU). *COU Building Blocks – Users Guide*. 1998.

Dews, T. & Ragusa, S. "Critical Issues in Facilities Management, Vol. 7 Planning, Design and Construction", *Space Planning and Management*. 1990.

Fink, Ira. "Benchmarking: A New Approach to Space Planning" *Planning For Higher Education*. 1999.

Fink, Ira. "Electronic Campus, Electronic Classroom, Electronic Library, An Annotated Bibliography. 1995.

Fink, Ira. "Throwing Space Standards Out the Window – Part 1/ Part 2" *Facilities Manager*, 1998/99.

(0000\document\progreport.doc)

Handelsman, Elisa, ed. *The College and University Science Facilities Reference Book: 105 new project profiles.* Tradeline, Orinda, 1998.

Liebus, Gerhard. *Standards for Areas in Research Libraries.* 1974.

National Centre for Education Statistics. *Post-Secondary Education Facilities Inventory and Classification Manual.* 1992/94.

O'Brien, J. *Community College Capital Analysis Model; A Report to the Washington State Legislature.* 1984.

Ontario Colleges. *Facilities Management Operating Cost Summary Report, 1989/99.* 1999.

Paulien & Associates. *Computer Assisted Space Needs Analysis: Replacing the "Squeaky Wheel" as a Needs Prioritization Method.* 1994 SCUP Conference.

Storey, William. "Planning for Higher Education", *Creating Space Standards, The California Solution.* 1991.

University of Alberta. *Space Planning Guidelines.* 1968.

University of British Columbia/Ellenzweig Associates, Inc. *Classroom Design Guidelines and Standards.* 1996.

University of California, Santa Cruz. *Classroom Guidelines.* 1994.

University of Minnesota. *Minnesota Facilities Model.* 1993.

Washington State Board for Community and Technical Colleges. *1999 – 2001 Capital Budget Request and 1999 – 2009 Capital Program.* 1999.

Washington State Board for Community and Technical Colleges Capital Resource Committee. *Priority Concepts in Selecting Major Projects.* January 2000.

Washington State Board for Community and Technical Colleges Capital Resource Committee. *Cam Space Projections for Colleges.* 1999.

Washington State Board for Community and Technical Colleges/MGT. *Model Classroom Design for Communications Technology Center.* 1996.

2. Standards and Guidelines Review

Space   *College,*
Standards   *University College,*
Review   *and Institute System*   **INTRODUCTION**

2. Standards & Guidelines Review ──────────────────

(0000\document\progreport.doc)

INTRODUCTION

Section 2 - Standards and Guidelines Review includes the following major subsections:

- Major Issues and Factors, which provides a background discussion on the issues related to the development and application of utilization and space guidelines and standards

- Review Summary, which briefly summarizes the utilization and space standards and guidelines in BC and other jurisdictions

- Overall Utilization Within BC and Comparison with Other Jurisdictions, which summarizes the actual utilization achieved at BC institutions and compares these with institutions in other jurisdictions

- Instructional Space Utilization, which summarizes instruments used to capture utilization in BC and other jurisdictions, analyzes actual utilization at BC institutions to see if trends exist, and then develops and recommends utilization standards

- Unit Area Standards, including:

    – Instructional Station Space, which summarizes the standards and guidelines for instructional space in various jurisdictions, provides "best practices" examples of instructional space within BC institutions, and recommends standards for instructional stations and instructional support space

    – Ancillary Support Space, which summarizes the standards and guidelines for office, library, lounge, reading and study, cafeteria/food services, and remaining space in BC and other jurisdictions and, based on an analysis of support space in BC institutions, develops standards for ancillary support spaces

- Net to Gross Ratios, which summarizes available information on net to gross ratios for institutions in other jurisdictions and BC, and recommends net to gross ratio standards for specific building types

2. Standards & Guidelines Review

MAJOR ISSUES AND FACTORS

A number of issues and factors that may have an impact on both the development and application of utilization and space guidelines for post-secondary institutions were identified from a review of the utilization and space standards and guidelines of other jurisdictions. These issues and factors are included here, with particular attention given to those that, given the provincial context, have a significant impact on BC institutions. They are intended to provide greater perspective into the issues surrounding space and utilization guidelines.

The issues and factors include:

1. Purpose of Space Standards and Guidelines
2. Level of Detail and Specificity
3. Accuracy and Adequacy of Base Data
4. Relevancy of Guidelines to Old/Renovated Buildings
5. Variations in Program Delivery Methods and Scheduling
6. Shift in the Profile of a "Typical" Student
7. Bridging Activity/Provision of Space for Non-Base Funded Students
8. Policy of Decentralizing Services
9. Geographical Characteristics
10. Impact of Technology

1.   Purpose of Space Standards and Guidelines

There are two reasons for developing space guidelines and standards:

A. The first is to establish a preliminary project size for new capital developments. In this context, an input (Full Time Equivalents – FTEs, student headcount, Annual Student Contact Hours – ASCHs) is multiplied by a factor based on assumptions about station size and utilization to arrive at an estimate of project size. Station size tells us how much space is necessary per unit, utilization tells us how many stations are required.

More specific information on appropriate areas for specific student stations as well as support space enables planners and designers to develop statements of requirements for particular program areas.

B. The second reason for developing guidelines and standards is to establish a baseline to measure the utilization of currently used facilities. In this case, the measure indicates the effectiveness with which an institution is able to use its physical resources to deliver its educational programs and services. This measure may be used to identify or support the need for new construction.

2.   Level of Detail and Specificity

Guidelines and standards can extend from the macro level of annual student contact hour per student station or per square

Space   *College,*
Standards   *University College,*
Review   *and Institute System*   **MAJOR ISSUES AND FACTORS**

2. Standards & Guidelines Review

(0000\document\progreport.doc)

metre down to the number of square metres of space required for an office. The level of detail and specificity of the standards must be consistent with their intended purpose.

Each of BC's institutions is unique, with a different mix of programs and activities. Because of this, generalized overall standards, which may assume that one-size-fits-all, often overlook critical institutional differences. As a result, standards should be tailored, at the very least, to relevant categories of campuses.

However, while standards are typically understood to be fixed and inflexible, allowing little or no room to respond to the specific circumstances of a particular case or situation, the tremendous variety of institutions within the BC college, institute and university college system entails that standards must be understood as starting points only. The standards are able to account for the gross variations provided by the campus categories only. It is recognized that due to its set of unique and specific circumstances, a campus may legitimately fall above or below the set standard for its category.

In addition, standards should not attempt to be design criteria, imposing a single standard at a micro level. Standards should allow variations in design to better support the delivery of instructional programs.

3.   Accuracy and Adequacy of Base Data

For this report, information was provided by the colleges, university colleges and institutes of BC, the Ministry of Advanced Education, Training and Technology, and from other jurisdictions. Information includes Facilities Inventory System (FIS) data, student workload information and existing standards and guidelines.

The quality and completeness of FIS space inventory information varies among BC institutions and there is no assurance that each institution has applied definitions uniformly. While the use in BC of the *Post Secondary Education Facilities Inventory and Classification Manual* has provided a great deal more consistency in inventory information, inconsistencies still exist. For example, offices may or may not be identified as used by faculty or administration.

Analysis of ancillary space types is only possible if the function of each space is provided, e.g., whether an office belongs to Financial Aid, Student Association or Security.

It is recommended that either an audit of inventory information be completed by a single party or that an instructional session be conducted to train those staff from each institution who will be assembling inventory

Space   *College,*
Standards   *University College,*
Review   *and Institute System*   **MAJOR ISSUES AND FACTORS**

2. Standards & Guidelines Review ————————————

(0000\document\progreport.doc)

information to ensure the consistent application of definitions when assembling inventory information.

It is also recommended that a list of relevant functional units be developed as part of the FIS and that space be allocated to these categories where appropriate to assist in the analysis of all ancillary support space.

Definitions of FTE and student contact hours may differ from one jurisdiction to another. The use of FTE as a measure of workload for classrooms and laboratories is problematic in the college system as various programs have different numbers of student contact hours that attach to an FTE. The range within BC varies from approximately 500 student contact hours to over 1,500 student contact hours. The problem is compounded when a comparison is made of FTEs in BC to those in other jurisdictions.

Utilization guidelines in other jurisdictions are often based on the principle of "point in time" collection, usually just after the beginning of the semester, when the maximum number of students are competing for space. In academic programs this usually is taken in early September. While it is true that "point in time" collection provides a relevant indicator of facility need, not all institutions may experience their peak load at the same time or experience the same difference in peak to valley. Due to the variety of program types in BC and the difficulty in developing a peak load measure that can equitably be applied to all institutions, BC has moved from capturing utilization during the period of peak stable enrollment to capturing utilization throughout the year. Utilization guidelines which measure peak utilization thus need to be revised if they are going to apply to what is, in essence, average yearly utilization.

Every attempt has been made to ensure that, where comparisons are made, they are logical and accurate. Where possible, FTEs have been translated into student contact hours, which provide a more consistent indication of workload. However, the number of student contact hours embedded in the FTEs in another jurisdiction is not always available or necessarily comparable in every case.

4. Relevance of Standards to Old/Renovated Buildings

Space standards are often derived primarily for constructing new facilities, particularly with respect to expectations on achieving net to gross ratios. However, most institutions are faced with aging facilities that do not meet current standards with respect to environmental conditions, building code, access for those with disabilities and technology/information systems infrastructure.

Renovating these buildings typically results in lost or wasted net usable space as, for example, classrooms or offices may be

forced to fit within a structural or exterior window grid. Classroom and laboratory/shop station size guidelines, and net to gross guidelines will need to reflect the unique requirements of renovating existing space.

5. Variations in Program Delivery and Scheduling

It is important that differences in the way programs are delivered and the variations in the needs of students taking the programs are explored in the development of space standards.

Significant variations exist in the way programs are delivered at institutions within BC. For example, program length may vary from 4 to 8 weeks (for apprenticeship programs) to as long as one year for some vocational programs. Other programs include work term experience, with in-class instruction also scheduled periodically. These program variations tend to result in decreased utilization.

- The typical day for vocational programs is approximately 6 hours. As a result, running two program streams consecutively through the day entails starting the initial stream at 7:00 am, with the second stream ending at 7:00 to 8:00 pm. While it is possible to run two streams consecutively, typically only a single stream is offered. Consequently, the specialized teaching laboratories or shops required for these programs are underutilized.

- Course-based programs, such as academic and ESL programs, have shorter scheduled "periods", allowing more scheduling flexibility than the vocational programs. However, as students may have timetabling gaps, additional study and lounge space may be required to accommodate these students while they wait for their next class.

- While vocational programs may run year-round, the traditional academic program timetable follows the universities' calendar, with two main semesters beginning in September and January respectively, followed by spring and summer sessions. These sessions usually attract fewer students as students traditionally work through the summer to help pay for their extended programs of four or more years. Thus, it is difficult for university transfer programs to achieve consistently high year-round utilization.

- University college and other large campuses may have enough students in lower level courses to mount larger sections (assuming collective agreements allow this) that can make use of more space efficient lecture/ classroom space. This may be followed in upper level courses by more emphasis on seminar-type instruction which may be less space efficient than typical classrooms.

Space   *College,*
Standards   *University College,*
Review   *and Institute System*   **MAJOR ISSUES AND FACTORS**

2. Standards & Guidelines Review

(0000\document\progreport.doc)

While program information should be factored into a consideration of utilization, information about program mix is not currently available by campus for BC institutions. **It is recommended that information about program mix by campus should be developed and used to analyze utilization. This will result in a better understanding of the implications of program mix on utilization.**

6. Shift in the Profile of a "Typical" Student

There has been a system-wide trend towards an increasing number of mature adult students and part time students, who are often entering or returning to post-secondary education at an older age for career advancement or skills development. These students affect facility needs in terms of:

- more flexible timetabling of courses
- larger, more adaptable student stations
- extended access to library and study facilities
- more sophisticated student services
- on-campus child day care services
- additional parking

7. Bridging Activity: Provision of Space for Non-Base Funded Students

The percentage of program activity that is outside the Province's base funding system has increased and is captured by the Key Performance Indicator (KPI) utilization measure. This activity may be funded through the federal government, industry sources, or by continuing education or international education initiatives. Due to the increasing demand for and opportunity provided by non-funded programs, increasingly projects may involve private funding, joint ownership or lease-back arrangements as institutions take a more entrepreneurial stance.

It is difficult to address the space needs of such programs through common standards and, therefore, these program requirements should be addressed on a case-by-case basis. However, this space should be included within the FIS, as specially designated space.

Space   *College,*
Standards   *University College,*
Review   *and Institute System*   **MAJOR ISSUES AND FACTORS**

2. Standards & Guidelines Review ————————————————

(0000\document\progreport.doc)

8. Policy of Decentralizing Services

BC has maintained a policy of delivering post-secondary education and training using, at least in part, a decentralized model. This has enabled the delivery of programs in many small communities throughout BC through the development of a number of very small campuses. For example, Northwest Community College with approximately 1,300 FTE delivers its programs to 9 separate communities, with an average of approximately 144 FTE at each campus.

Two important aspects of smaller campuses need to be considered:

- Smaller institutions do not have the critical mass to deliver a number of sections in the same course, which is a strategy to achieve higher utilization. In addition, there may not be sufficient demand to fill courses completely.

- Smaller institutions do not have the student enrollment to generate required minimum space for general support facilities such as athletic/recreation space or performing arts space or, even, library, cafeteria and student lounge/study space. Minimum guidelines must be set for those space types which campuses must have, regardless of size. In addition, minimum campus size guidelines must be established for those services which require a critical campus mass.

9. Geographical Characteristics

The varied geography of BC, which ranges from concentrations of people in the Lower Mainland, the Okanagan and southern Vancouver Island to villages and towns separated by miles of wilderness, has led to the development of colleges, university colleges and institutions which are each tailored to fit their unique local context. Recommended guidelines should recognize these differences by providing utilization and space guidelines that vary depending on the size and the location of each campus. Factors that may influence the space and utilization of a campus include:

- the relative remoteness of a campus. In some rural campuses, a significant portion of the student population commutes by car from other towns and villages. It is not reasonable to expect full utilization of night time-slots at these campuses as students may be reluctant to attend at night, due to the lengthy drive under the adverse winter driving conditions of early darkness, sub-zero temperatures and slippery or snow-covered roads.

- The climatic conditions of a campus. For example, campuses in the Lower Mainland and southern Vancouver Island may be able to function with lower net to gross ratios by providing a significant portion of

Space   *College,*
Standards   *University College,*
Review   *and Institute System*   **MAJOR ISSUES AND FACTORS**

2. Standards & Guidelines Review

circulation between functions external to the building. Both VCC's King Edward Campus and Malaspina's Nanaimo Campus have lower than typical net to gross ratios due to the use of external walkways that connect buildings or parts of the same building.

- The presence of a significant Aboriginal student population. The need for dedicated student services space and particular sensitivity to aboriginal issues in planning and design may be appropriate and will add to space requirements.

10. Impact of Technology

Technology can have a significant impact on the space required for the delivery of instruction and for ancillary support spaces. Impacts include:

- need for larger student station work surfaces in classrooms generally to accommodate laptop computers and in video-conferencing classrooms to accommodate microphones and other electronic paraphernalia

- storage adjacent to classrooms for multimedia equipment

- office and workspace for technicians charged with the monitoring and support of computer and video-conferencing facilities

- requirement for additional faculty office and support space to accommodate computers and printers.

However, trends toward miniaturization of technology should be monitored. For example, in the future flat-screen monitors may replace CRTs and will require less desktop space, possibly allowing smaller computer workstations.

Space   *College,*
Standards   *University College,*
Review   *and Institute System*   **MAJOR ISSUES AND FACTORS**

2. Standards & Guidelines Review

(0000\document\progreport.doc)

Space   *College,*
Standards   *University College,*   Canada
Review   *and Institute System*   **REVIEW SUMMARY**

2. Standards & Guidelines Review

(0000\document\progreport.doc)

REVIEW SUMMARY

RPG conducted a brief literature review and contacted other jurisdictions via telephone and e-mail to understand levels of actual utilization and space guidelines and standards used. The results of the investigations are summarized in the table below and the narrative that follows.

Table 1 – Summary Of Standards From Canadian/US Sources

Jurisdiction	Type		Available Space Standards			Utilization	
	College	University	Instruct.	Support Space	Net to Gross	Instruct.	Whole College
Canada							
1. Alberta	✔	✔	✔		✔	✔	
2. Alberta (RMC/MGT)			✔	✔	✔	✔	
3. British Columbia	✔		✔			✔	
4. Ontario – COU		✔	✔	✔			
5. Ontario – Colleges	✔					✔	✔
6. Saskatchewan							
U.S.							
7. California	✔		✔			✔	
8. Minnesota		✔	✔			✔	
9. Washington	✔		✔	✔		✔	✔
10. Georgia		✔				✔	

CANADA

1. Alberta

The Alberta government developed standards in the early 1970s which included a combination of global space allocations (m^2/FTE standards for each of five types of institutions) and detailed methodologies for sizing each component of an institution. The detailed methodology developed space allocations for specific components based on "per student FTE" allotments. For example, 0.7 net m^2/ student FTE was provided for student services. These standards and guidelines were expanded in 1984 and updated in 1989.

In 1994, a review of the standards was conducted to recommend changes. The resulting standards have not been officially adopted. (See 2. Alberta (RMC/MGT) below.)

In order to understand the capability of its current infrastructure in the face of rapidly expanding enrolments, Alberta commissioned a study in 1998 to calculate the number of Full Load Equivalent (FLE) students each institution would be able to accommodate, given specific assumptions around the utilization of instructional space. The study calculated a range of capability for each campus and compared these with the number of FLEs currently delivered. Two institutions had an actual FLE count that was higher than the higher end of the range, ten were below the lower

Space   *College,*
Standards   *University College,*   Canada
Review   *and Institute System*   **REVIEW SUMMARY**

2. Standards & Guidelines Review

(0000\document\progreport.doc)

end of the range and eight were within the range. Urban institutions generally had higher utilization than their rural counterparts.

In the same study, institutions were asked to identify "pressure points" which limited their ability to accommodate additional students. Included in the list were:

- aging buildings
- lack of technically equipped classrooms
- lack of computer labs
- lack of equipped study space
- office space restrictions
- student services
- food services
- parking
- student housing
- general lab space
- classrooms of the wrong size
- limited library space
- limited recreational space
- elevators

Of note is that office space restrictions, limited library space and aging buildings were identified as the three leading pressure points.

2. Alberta (RMC/MGT Study)

A review and update of the existing Alberta "Fenske" formula space guidelines and standards was conducted in 1994. Recommendations included removal of campus gross area guidelines as they fail to recognize the diversity of the institutions; increasing classroom utilization targets from 30 hours to 36 hours per week, based on a 15 hour day, Monday to Friday; maintaining station utilization at 70%; maintaining lab utilization at 30 hours per week; and increasing lab station utilization from 70% to 85%.

Additional recommendations for instructional space included increasing average classroom student station sizes to the university standard of 1.7 m^2 and the development and application of 5 lab station types following the model developed by the Council of Ontario Universities (COU) to better correspond to the specific space requirements of the programs. Lab and shop size standards ranged from 4.1 m^2 to 11.0 m^2 per student station, including lab support and service space, depending on the type.

The report also recommended standards for ancillary support space, including faculty and administrative offices, library/learning resources centre, auditorium, athletic services

Space   *College,*
Standards   *University College,*   Canada
Review   *and Institute System*   **REVIEW SUMMARY**

2. Standards & Guidelines Review

(0000\document\progreport.doc)

and food services.

3. British Columbia

British Columbia utilized the "Thorstenson" formulas to prepare *Instructional Facilities Utilization* (IFUS) until 1997. The IFUS reports captured room-by-room utilization at peak stable enrolment using a 52-hour base week. Some flexibility was built-in to enable institutions to adjust the utilization "window" to the day- and night-time periods which captured the greatest utilization.

In addition, four standards for classroom and lecture theatre student stations (depending on capacity of room) and standards for 13 specific types of instructional lab/shop student stations have been developed. The list of lab/shop station types is not comprehensive and, in at least one instance, is somewhat dated.

In 1998, the Ministry simplified the method required to document utilization, adopting the "Key Performance Indicator" (KPI) method. With KPI, all on-campus instructional activity is captured and compared to the notional (not actual) number of student stations available. The result is expressed as Annual Student Contact Hours per Student Station (ASCHs/ST ST).

In addition, BC institutions have assembled inventory information based on the National Center for Education Statistics (NCES) *Post Secondary Education Facilities Inventory and Classification Manual*.

Of note is the use by BC universities of Ontario's Council of Ontario Universities (COU) guidelines as a general guideline for determining overall formula allocations as well as individual faculty allocations.

4. Ontario Universities – Council of Ontario Universities (COU)

Initiated in 1972 and culminating in 1987 with *Building Blocks 7 – Final Report of the Task Force to Review COU Space Standards*, the Council of Ontario Universities (COU) has developed instruments to classify and inventory university-oriented space, and to prepare space entitlements based on input measures.

Space   *College,*
Standards   *University College,*   Canada
Review   *and Institute System*   **REVIEW SUMMARY**

2. Standards & Guidelines Review

COU space guidelines are derived from input measures as follows:

Space Type	Input measure
Classroom Facilities	Student FTE
Instructional Laboratory	Weekly Student Contact Hours
Research Lab Space	FTE Faculty plus other research appointments
Academic Offices and Support	FTE Faculty plus FTE Non-Academic Staff Office Support as % of above
Library Facilities/Study Space	
Collection	Collection Size
Study Space	Student FTE
Support	% of Collection and Study Space
Athletic/Recreation Space	Student FTE plus threshold allowance based on total student FTE ranges
Student Services, including Food Services, Bookstore/Merchandizing Facilities, Audio-Visual/ Television Facilities, Central Services, Health Service Facilities, Student Activity Space, Assembly and Exhibition Facilities	Student FTE
Maintenance Space	% of Net Assignable Space
Administrative Office and Related	FTE Non-Academic Staff plus Office Support as % of above

5. Ontario – Colleges

There are currently no space guidelines for the community college system. However, individuals with the government anticipate the development of a system similar to the "Building Blocks" model used in the Council of Ontario Universities (COU) system (see above).

The community colleges themselves have developed a utilization report which measures institutional activity per institution, expressed as Gross Area per Student. Colleges are characterized according to their urban/rural context and whether utilization has historically been low, medium or high.

6. Saskatchewan

Saskatchewan recently conducted a series of studies to review space guidelines and the funding structure for its universities. As a result, Saskatchewan universities will adopt the COU space standards and guidelines.

No standards are currently used for colleges in Saskatchewan. It is anticipated that standards based on the COU standards will be developed in the near future.

Other Canadian Jurisdictions

Colleges in Manitoba and the Maritime provinces are not required to provide utilization data. Guidelines and standards are not used for the planning of college facilities.

Space   *College,*
Standards   *University College,*   United States
Review   *and Institute System*   **REVIEW SUMMARY**

2. Standards & Guidelines Review

(0000\document\progreport.doc)

UNITED STATES

7. California

California is a recognized US leader in the development and analysis of space and utilization standards and guidelines. The state has developed standards and guidelines for classroom and laboratory/shop utilization (based on weekly student contact hours), classroom and laboratory/shop student station sizes (see *Appendix B – Lab/Shop Space Standards – Other Jurisdictions*), and faculty office sizes. Its utilization standards for instructional space are among the highest with a 70-hour base week and 85% station occupancy rate for laboratory/shop stations.

There is some concern that the utilization standards and guidelines, which stem from the early 1990's, may be somewhat dated and should undergo a review. It was indicated that one possible direction for future guidelines and standards might be an instrument like that developed by the California State University. This utilization measure, based on the more global Assignable Square Feet per student FTE, allows campuses greater flexibility and is more adaptable to new approaches in instructional delivery.

8. Georgia

A novel method of predicting space needs has been developed for the University System of Georgia, based on department by department benchmarking with comparable and "best-practices" institutions. The benchmark institutions are used to identify a range of Assignable Square Footage per Faculty benchmarks for departments and with which the Georgia institution departments are compared. Based on these comparisons, space projections are proposed which allow departments to match comparable "best practices" institutions.

9. Minnesota

The Minnesota Facilities Model (MFM) provides guidelines which indicate space requirements as well as providing a tool to assess the use of facilities. Used by the University of Minnesota, MFM has four components:

- a space inventory
- qualitative evaluation of existing space
- identification of program inputs
- application of space standards and allowances.

Inventories are based on the Department of Health, Education and Welfare's *Higher Education Facilities Inventory and Classification Manual* which is similar to the system used in BC. The facilities evaluation includes a physical condition rating as well as a functional rating. Inputs used to generate space requirements include faculty, administrative staff, Weekly

Space   *College,*
Standards   *University College,*   United States
Review   *and Institute System*   **REVIEW SUMMARY**

2. Standards & Guidelines Review ────────────────────

(0000\document\progreport.doc)

Student Contact Hours, equivalent volumes, student FTEs, employee headcount, total classroom/lab stations, Student Full Year Equivalents (FYEs). Allowances are provided for Recreational/Athletic facilities. About 170 instructional station standards are provided, including a breakdown of the area for the station itself and for support space. Almost all of these apply only to the university context. See page B.2, *Appendix B – Lab/Shop Space Standards – Other Jurisdictions.*

10. Washington

Washington State uses a Capital Analysis Model (CAM) method to evaluate the quantitative adequacy of on-campus facilities of community and technical colleges. The model uses future enrolment and space per FTE factors to set probable level of future space requirements. When compared to available space, the model supports decisions about the amounts and types of space that should be added to meet future enrolment demands. In addition, age of structure and quality of space are considered.

CAM does not include space factors for vocational instructional space, due to the wide range of space-per-student-station for various occupational training labs and shops.

CAM includes classroom station standards for general labs, science and computer labs and basic skills labs, classroom and academic lab utilization standards, as well as formula-based allocations and allowances for art, music, drama, auditorium, library/LRC, physical education, faculty offices, administration/student services, student centre and related, stores/maintenance and child care. An example which shows the application of the CAM is provided in *Appendix C – Washington CAM Method.*

Space College,
Standards University College,
Review and Institute System

OVERALL UTILIZATION WITHIN BC AND
COMPARISON WITH OTHER JURISDICTIONS

2. Standards & Guidelines Review

(0000\document\progreport.doc)

OVERALL UTILIZATION WITHIN BC AND COMPARISON WITH OTHER JURISDICTIONS

Using a variety of utilization measurements, this section provides a comparison of the utilization achieved at BC institutions with that of institutions in other jurisdictions, where comparable information is available. The jurisdictions include:

- Alberta
- Ontario
- Washington State

An undertaking of this nature is somewhat limited given the very small number of jurisdictions that have developed utilization summaries. Where it exists, utilization information has been developed for the particular needs and interests of the home jurisdiction. Thus, definitions for FTE and Student Contact Hours differ from jurisdiction to jurisdiction, and what is captured by one may not be captured by another.

As a result, this material needs to be viewed broadly, as a general indication of where things stand, and not one which can be scrutinized too closely.

Table 2, below, outlines the information available from each jurisdiction and from which the following comparisons have been developed. A complete table of information, showing the measures and outcomes for each institution in the comparison jurisdictions can be found in *Appendix D – Utilization Information from BC and Other Jurisdictions*.

Table 2 – Summary Of Available Information To Measure Unit Areas and Overall Utilization

Jurisdiction	Gross Area [1]	Instructional Areas, incl. Support [2]	No. of Student Stations	Student FTEs/ FLEs [3]	Student Contact Hours [4]
Alberta	✔	✔	✔	✔	✔
British Columbia	-	✔	✔	✔	✔
Ontario	✔	-	-	✔	✔
Washington	✔	-	-	✔	-

Notes:
1. *While Gross Area for British Columbia institutions was not available, Gross Area for BC has been derived as follows: total inventory information, minus non-program space such as child care facilities (if not part of-Early Childcare Education program) and residential space, is multiplied by an 8% factor to account for the internal partition and external wall areas which are not captured by the inventory.*
2. *Instructional support space includes associated storage, preparation rooms, etc.*
3. *Student FTEs/FLEs information is as follows:*
    - *Alberta FLEs includes credit (or funded) activity only;*
    - *British Columbia FTEs for 1997/98 are actual FTEs from "The History of FTE's", October 1999 and include funded activity only;*
    - *Ontario FTEs for 1998/99 include funded programs only;*
    - *Washington State FTEs for 1997/98 are from "1999-2001 Capital Budget Request and 1999 – 2000 Capital Program" document and include both funded and contract activity.*
4. *Student Contact Hours information is as follows:*
    - *Alberta SCHs are for 1997/98 and include credit activity only;*
    - *British Columbia SCHs are from "Key Performance Indicators" report and are for 1997/98. They include funded and non-funded activity;*
    - *Ontario SCHs were provided by the Ontario Ministry and are for 1998/99. They include funded activity only.*

Comparison of British Columbia With Other Jurisdictions

Space   *College,*
Standards   *University College,*
Review   *and Institute System*

**OVERALL UTILIZATION WITHIN BC AND
COMPARISON WITH OTHER JURISDICTIONS**

2. Standards & Guidelines Review

Table 3 and the graphs that follow summarize unit area and utilization information from each jurisdiction, providing overall totals.

Table 3 – Summary Of Unit Areas and Overall Utilization

Jurisdiction	Classroom Area per Station (m^2)	Laboratory/ Shop Area per Station (m^2)	ASCHs/ ST ST	Gross Area/FTE or FLE (m^2)	Gross Area/ ASCH (m^2)
Alberta	2.4	7.5	519	22.1	0.031
British Columbia	2.3	6.9	731	11.7	0.015
Ontario	-	-	-	10.2	0.014
Washington	-	-	-	9.2	-

Note that classroom and laboratory/shop areas include support space such as storage, preparation and balance rooms. In addition, BC institutions have agreed to increase their utilization per student station from between 10 and 20% by 2002/03 which will lower the Gross Area per ASCH from 0.014 m^2 per ASCH to 0.013.

Graph 1 – Comparison Of Classroom And Laboratory/Shop Station Unit Areas
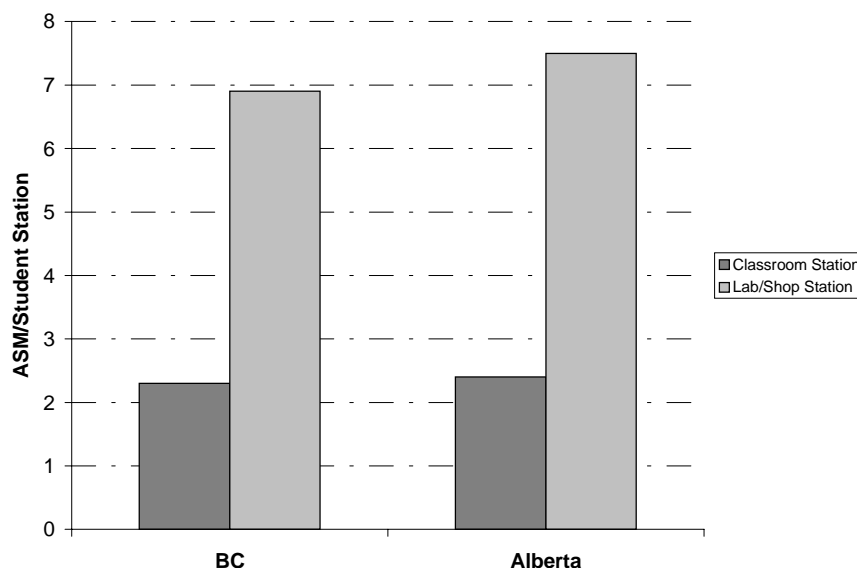
On average, BC has a slightly smaller unit area than Alberta for classroom student stations and associated support space. Laboratory and shop stations are on average over 8% smaller, assuming the mix of stations to be about equal. Note that this is an average and that variations in shop and lab ratios may be a significant factor.

Note: Not all information for BC institutions is available at this time. Information on station numbers has not been included for BCIT and Malaspina.

Space   *College,*
Standards   *University College,*
Review   *and Institute System*

**OVERALL UTILIZATION WITHIN BC AND
COMPARISON WITH OTHER JURISDICTIONS**

2. Standards & Guidelines Review ───────────────

**Graph 2 – Comparison Of Annual Student Contact Hours Per Student
Station**
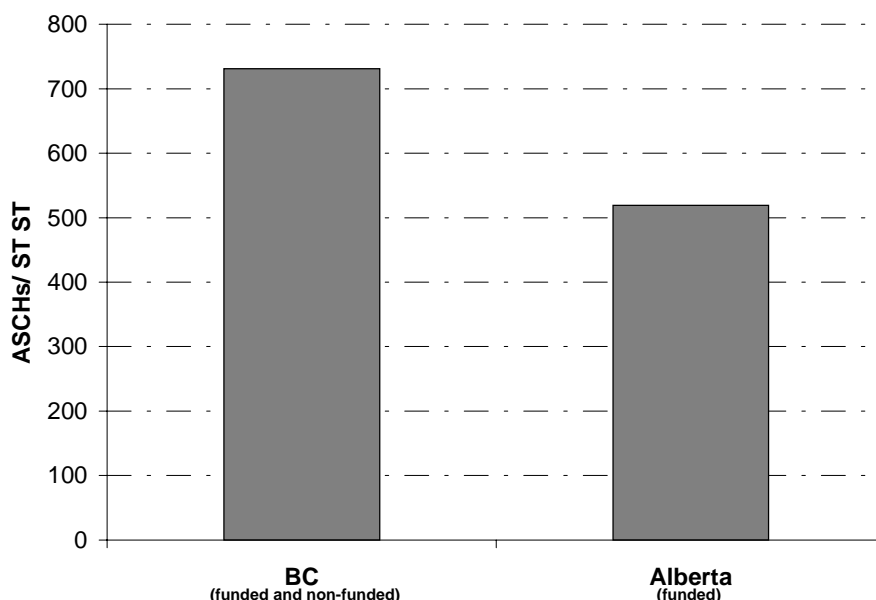
Graph 2 indicates that the British Columbia system has
significantly higher utilization than the Alberta system in terms of
Annual Student Contact Hours per student station. Note that
while BC utilization includes funded and non-funded activity,
Alberta includes credit activity only. However, the difference in
utilization of almost 40% should more than account for the
exclusion of non-funded activity as, for most jurisdictions, it
comprises a small proportion of total activity. Confirmation of this
assumption should be pursued.

Space   *College,*
Standards   *University College,*
Review   *and Institute System*

**OVERALL UTILIZATION WITHIN BC AND
COMPARISON WITH OTHER JURISDICTIONS**

2. Standards & Guidelines Review ────────────────────

Graph 3 – Comparison Of Gross Area Per FTE
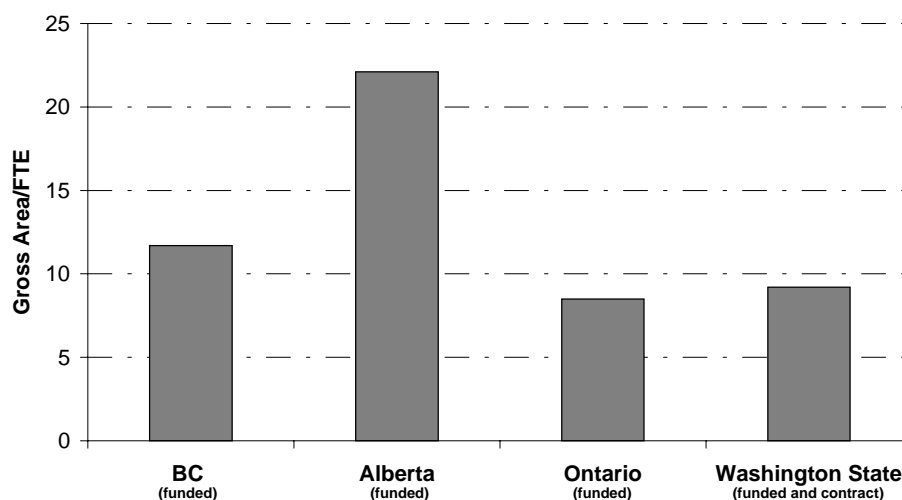
Graph 3, above, illustrates the gross area required to deliver each student FTE. Note that the gross area for BC institutions has been calculated (FIS x 1.08) and that FTEs for Alberta, Ontario and BC include funded FTEs only but that FTEs for Washington State include contract FTEs as well as funded FTEs. As a result, Washington State may indicate a lower comparable gross area per FTE.

Graph 3 indicates that institutions in BC use slightly more space than institutions in both Ontario and Washington State to deliver each student FTE but that the BC institutions use significantly less space per student FTE than institutions in Alberta.

Space *College,*
Standards *University College,*
Review *and Institute System*

**OVERALL UTILIZATION WITHIN BC AND
COMPARISON WITH OTHER JURISDICTIONS**

2. Standards & Guidelines Review

(0000\document\progreport.doc)

Graph 4 – Comparison Of Area Per Annual Student Contact Hour
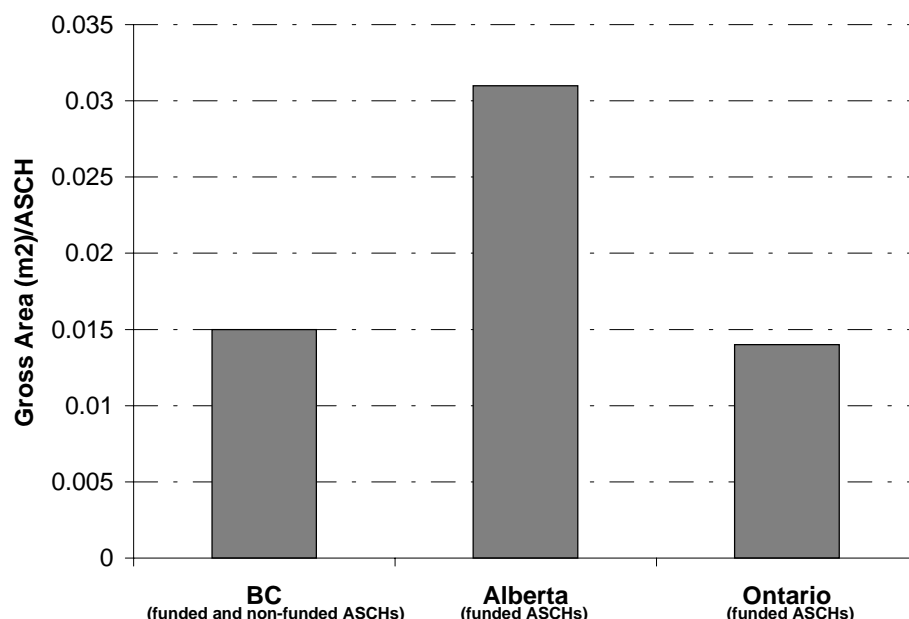
Graph 4, above, illustrates the gross area required to deliver each Annual Student Contact Hour. Note that ASCHs figures for Alberta and Ontario include funded (or credit) activities only and that Alberta's figure may not account for all lab/seminar time. BC includes both funded and non-funded activity. Alberta and Ontario were not able to indicate how much more activity as non-credit or non-funded is provided.

Institutions in Alberta uses substantially more space to deliver each student contact hour than those in both Ontario and BC. BC institutions appear to use slightly more space per student contact hour than those in Ontario.

Overall institutions in BC appear to have utilization rates that are comparable to those in both Ontario and Washington State and, according to these indicators, higher than that achieved by those in Alberta. BC's utilization rates have been achieved in the context of a policy of providing services to a large number of smaller communities. As the next section illustrates, utilization at campuses in smaller communities is generally lower than utilization of campuses situated in regional or urban centres.

Space   *College,*
Standards   *University College,*
Review   *and Institute System*

**OVERALL UTILIZATION WITHIN BC AND
COMPARISON WITH OTHER JURISDICTIONS**

2. Standards & Guidelines Review

(0000\document\progreport.doc)

Space   *College,*
Standards   *University College,*   Introduction
Review   *and Institute System*   **INSTRUCTIONAL SPACE UTILIZATION**

2. Standards & Guidelines Review

(0000\document\progreport.doc)

INSTRUCTIONAL SPACE
UTILIZATION

INTRODUCTION

This section includes the following:

- this Introduction, which provides some background into the definitions and terms used in discussions of utilization

- a Review of Existing Standards, which provides a summary of utilization standards used in other jurisdictions and in BC.

- an Analysis of BC Utilization, which determines trends which may be of assistance in the development of utilization standards for BC institutions.

- Development of an Annual Student Contact Hours Per Student Station Standard, which develops and recommends ASCHs/ST ST utilization standards for various campus types.

The terms typically used in the development of utilization standards and guidelines and the measurement of the actual utilization of instructional space are as follows:

- Reporting Week, which is the week established to collect utilization information, which typically is a few weeks after the beginning of the fall term at the time of peak stable load

- Base Week, which is the number of hours in the Reporting Week that instructional space is expected to be utilized.

- Average Weekly Room Utilization, which is the number of hours in the Base Week that an instructional room can be expected to be in use (if a standard) or is actually in use (if actual utilization is measured). Average Weekly Room Utilization may also be expressed as a percentage of the Base Week.

- Average Station Occupancy, which is the percentage of actual or expected student station occupancy when rooms are used

- Weekly Student Contact Hours or Station Utilization, which is the number of hours per week a student station can be expected to be used (if a standard) or is actually in use (if actual utilization is measured).

Space   *College,*
Standards   *University College,*   Introduction
Review   *and Institute System*   **INSTRUCTIONAL SPACE UTILIZATION**

2. Standards & Guidelines Review ─────────────────────

(0000\document\progreport.doc)

The following equation indicates the relationship between Average Weekly Room Utilization, Average Station Occupancy and Weekly Student Contact Hours.

Average Weekly Room Utilization	X	Average Station Occupancy	=	Weekly Student Contact Hours

Space   *College,*
Standards   *University College,*   Review of Existing Utilization Standards
Review   *and Institute System*   **INSTRUCTIONAL SPACE UTILIZATION**

2. Standards & Guidelines Review

(0000\document\progreport.doc)

REVIEW OF EXISTING UTILIZATION STANDARDS

Table 4 summarizes the utilization standards for instructional space for various jurisdictions in North America.

Table 4 – Comparison Of Instructional Space Utilization Standards And Guidelines

		CLASSROOMS				SHOPS / LABORATORIES			
	Base Week (hrs/wk)	Average Weekly Room Utilization (hrs/wk)	Average Weekly Room Utilization (%)	Average Station Occupancy (%)	Weekly Student Hours	Average Weekly Room Utilization (hrs/wk)	Average Weekly Room Utilization (%)	Average Station Occupancy (%)	Weekly Student Hours
<u>Canada</u>									
Alberta	45	30	67%	70%	21.0	20	44%	80%	16
Alberta - RMC/MGT	45	36	80%	70%	25.2	24	53%	80%	19.2
BC	52	35.8	69%	80%	28.6	30	58%	80%	24
Ontario Universities	45	30	67%	62%	18.6	18	40%	75%	13.5
Ontario Colleges [1]	70	37.5	54%	80%	30.0	30 - 37.5	43% - 54%	n/a	12.9-20.25
<u>U.S.</u>									
California	70	42	60%	71.4%	30.0	25	36%	80%	20
Colorado [1]	45	30	67%	67%	20.1	20-30	44% - 67%	80%	8.8 - 20.1
Minnesota	45	30	67%	60%	18.0	20	44%	80%	16
Oregon [1]	45	33	73%	60%	19.8	22	49%	80%	17.6
Utah [1]	45	33.75	75%	67%	22.6	24	53%	80%	19.2
Washington									
Up to 1000 FTE	45	33.75	75%	70%	23.6	27	60%	80%	21.6
Above 1000 FTE	45	36	80%	71%	25.6	27	60%	80%	21.6

<u>Notes:</u>

1 From Alberta Advanced Education and Career Development "Facilities Accommodation Capability Study", p. 6

While use of the Thorstenson formula, as shown for BC in Table 4, has been discontinued, the following review describes how the Thorstenson formula, and, in fact, how all such utilization standards generally, are used:

The Average Weekly Room Utilization (AWRU) was based on a Base Week of 52 hours. 40 of the Base Week hours were daytime hours for which an Average Weekly Room Utilization standard of 70% was assumed (for classrooms); 12 of the hours were evening hours, for which an Average Weekly Room Utilization standard of 65% was used (for classrooms).

The result is a Weekly Student Hour Standard of 28.6 hours, as shown in the following equation:

Space   *College,*
Standards   *University College,*   Review of Existing Utilization Standards
Review   *and Institute System*   **INSTRUCTIONAL SPACE UTILIZATION**

2. Standards & Guidelines Review

AWRU = 40 daytime hours X 70% + 12 evening hours X 65% = 35.8 hours (or 69% of Base Week)

The standard for Weekly Student Contact Hours (WSCHs) is calculated by multiplying the standard/guideline for Average Weekly Room Utilization (AWRU) by the standard/guideline for Average Station Occupancy (ASO).

In the case of BC classrooms, this was:

WSCHs = 35.8 hours (AWRU) X 80% (ASO) = 28.6 hours/week

Table 4 indicates that while most jurisdictions use a 45-hour base week, some jurisdictions use a base week with an extended number of hours. For example, BC previously used a 52-hour base week, and California currently uses a 70-hour base, assuming availability of classrooms from 800 to 2200, Monday through Friday.

Average Weekly Room Utilization standards/guidelines for classrooms vary from 30 to 42 hours, with an average of 34 hours per week. BC used a 35.8-hour per week standard, just slightly higher than the average.

Classroom Average Station Occupancy standards/guidelines vary from 62% (Ontario Universities) to 80% (Ontario and BC Colleges) with the average around 68%. In the mid-90's expectations for Average Station Occupancy in BC had risen to 90%, significantly higher than the average.

In general, Average Weekly Room Utilization standards/ guidelines for shops and laboratories tend to be lower than for classrooms, but with higher expectations for Average Station Occupancy. Standards for Average Weekly Room Utilization range from a low of 18 hours per week (Ontario Universities) to a high of 37.5 hours per week (Ontario Colleges), with an average of about 24 hours. BC had an Average Weekly Room Utilization standard of 30 hours which is significantly higher than the average.

All jurisdictions have shop and laboratory Average Station Occupancy standards or guidelines of 80% for colleges.

There are increased opportunities for intensive scheduling of classrooms and some laboratory spaces in larger institutions. In recognition of this, Washington State has implemented a stepped utilization standard for classrooms and selected labs which takes effect at the 1,000 FTE threshold.

Space *College,*
Standards *University College,*
Review *and Institute System*

Review of Existing Utilization Standards
INSTRUCTIONAL SPACE UTILIZATION

2. Standards & Guidelines Review ——————————————————

Annual Student Contact Hours per Student Station

As noted above, BC has discontinued use of the Thorstenson formula and now uses the more global Key Performance Indicator (KPI) which measures utilization as Annual Student Contact Hours per Student Station (ASCHs/ST ST). BC is leading other jurisdictions in the adoption of this instrument and as a result, straightforward comparisons with other jurisdictions are not available.

The KPI or ASCHs/ST ST instrument has the advantage of capturing all utilization within a week—including very early morning and weekend use—and all utilization within a year, including the summer months. In addition, the instrument provides institutions with greater flexibility in how they will structure, schedule and deliver programs as they are not required to focus their activity in the Reporting Week in an attempt to meet utilization expectations.

However, this instrument is not as useful as a planning tool from which the facilities needed to support a program can be derived, as programs may have peaks in demand that will need to be accommodated. Planning will require an analysis of peak section demand.

The KPI or ASCHs/ST ST instrument originally was used to report the actual utilization of each institution. It has since been used to develop campus utilization targets for BC institutions to the year 2002/03, as each institution has agreed with the Ministry on a year-by-year percentage increase of 2, 3 or 4 percent for a period of five years, beginning in 1997/98. As a result, utilization at BC institutions will be increasing by approximately 14% in that period.

Space   *College,*
Standards   *University College,*   Analysis of BC Utilization
Review   *and Institute System*   **INSTRUCTIONAL SPACE UTILIZATION**

2. Standards & Guidelines Review ───────────────────────────

ANALYSIS OF BC UTILIZATION

In an endeavour to develop utilization standards which are based on the ASCHs/ST ST instrument that can be applied to BC institutions, brief analyses were conducted of the effect of campus size, geography and climate, and ratio of classroom to laboratory/shop stations on utilization.

Campus Size

Graph 5 indicates the basic relationship between campus size in terms of total Annual Student Contact Hours (ASCHs) and utilization. The data for 62 of BC's campuses are presented in rank order of campus size, in terms of target Annual Student Contact Hours in 2003. Complete utilization information for each campus is included for reference as *Appendix E – BC Campuses by 2003 ASCH Target Size*. Note that the number of Annual Student Contract Hours for BCIT's Burnaby campus, which would otherwise be the last black diamond, has a value of over 9 million ASCHs and is not shown.

Graph 5 – Comparison Of Utilization And Institution Size

Space   *College,*
Standards   *University College,*
Review   *and Institute System*

Analysis of BC Utilization
INSTRUCTIONAL SPACE UTILIZATION
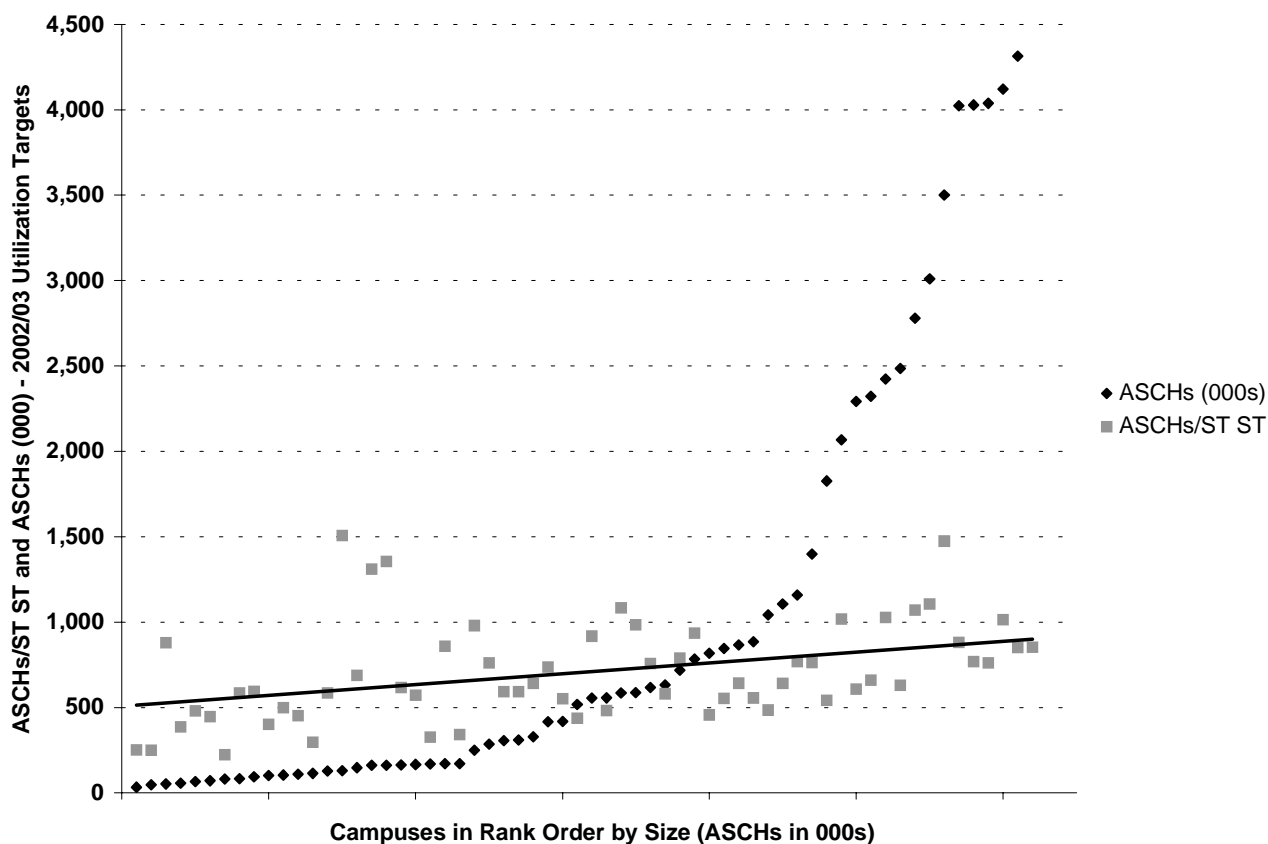
2. Standards & Guidelines Review

The trendline in Graph 5 indicates a definite increase in utilization as campus size, measured in terms of ASCHs, increases, rising from a low of approximately 500 ASCHs/ST ST for the smaller campuses to approximately 900 ASCHs/ST ST for the campuses which have high total ASCHs. The total actual range is approximately 250 ASCHs to 1,500 ASCHs. The likely causes of the lower utilization at smaller campuses are discussed in the previous section, *Major Issues and Factors*, Topic 8. "Policy of Decentralizing Services".

It is recommended that campus size be factored into utilization standards, with lower utilization expected of small campuses.

Small campuses are defined as those with less than 250,000 ASCHs, mid-sized campuses as those with between 250,000 and 1,250,000 ASCHs and large campuses as those with over 1,250,000 ASCHs.

Urban and Non-Urban Context

BC campuses are located in a varied geography and climatic context that has an impact on utilization. For example, many non-urban campuses have smaller student catchment populations. Students attending non-urban campuses may have to commute long distances to attend courses, particularly in the evening, when they may face the hazardous driving conditions of sub-zero temperatures, freezing rain, and snow. Similarly, with shorter summer/fair weather periods in some areas of BC, there may be less demand for summer programs as potential students become focussed on other pursuits and opportunities.

Graph 6 considers the impact that geography and climate have on utilization, in terms of the relative urban and non-urban context of the campus. The average utilization of campuses in terms of ASCHs/ST ST is compared for mid-sized campuses which have between 250,000 and 1,250,000 ASCHs. Small campuses of less than 250,000 ASCHs are not included because of the small number of urban campuses in this group. Large campuses are also not included as it is assumed large campuses generally are located in urban areas.

The distribution of campuses according to these categories can be found in *Appendix F – BC Campuses by Size and Context*.

Space   *College,*
Standards   *University College,*   Analysis of BC Utilization
Review   *and Institute System*   **INSTRUCTIONAL SPACE UTILIZATION**

2. Standards & Guidelines Review

Graph 6 – Comparison Of Campus Utilization Considering Urban And Non-Urban Context

Mid-Sized Campuses (250,000 - 1,250,000 ASCHs)
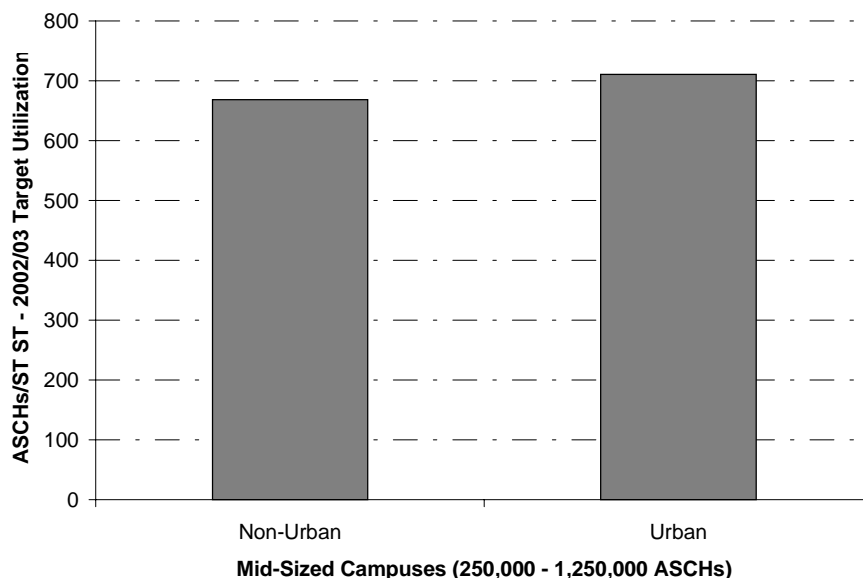
Graph 6 shows that mid-sized non-urban campuses have a slightly lower (6%) average utilization than their urban mid-sized counterparts.

It is recommended that the urban and non-urban context be factored into utilization standards, with slightly lower utilization expected of non-urban campuses.

Program Mix

While it is generally agreed that program mix has an impact on utilization of instructional spaces, data on programs by campus (rather than institution) were not available for this study, and so an analysis of the influence of program mix on utilization was not conducted.

It is recommended that data on program mix by campus be developed so that an analysis can be conducted on the impact of program type on utilization.

Space   *College,*
Standards   *University College,*   Analysis of BC Utilization
Review   *and Institute System*   **INSTRUCTIONAL SPACE UTILIZATION**

2. Standards & Guidelines Review ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

Ratios of Classroom Stations to Laboratory/Shop Stations

A brief analysis was conducted to determine whether the ratio of classroom stations to laboratory stations affects overall utilization. Based on the utilization standards and guidelines summarized in Table 4, a positive correlation between higher utilization and a greater proportion of classroom to lab stations would be expected as the utilization standards and guidelines of classroom stations is generally higher than those for laboratory and shop stations.

However, our analysis did not indicate a clear trend in utilization when campuses were grouped and compared according to ratios of laboratory/shop stations as total student stations. This may be due to the high utilization that science laboratories and computer labs receive.

It is recommended that the relative proportions of laboratory/shop stations to classroom stations should not be factored into utilization standards.

Ratios of Classroom/Laboratory Stations to Shop/Teaching Kitchen Stations

A second analysis was conducted to determine whether a correlation exists between the proportion of shop and teaching kitchen stations and overall utilization. As Graphs 7 and 8 indicate, for large and mid-sized campuses respectively, the proportion of shop stations has a strong impact on utilization, with a 30% difference between the average utilization at large campuses with 10% to 20% shop stations and large campuses with 0 to 1% shop stations. There is a similar difference in utilization shown in Graph 8 between the mid-sized campuses with over 20% shop stations and mid-sized campuses with 0 to 1% shop stations.

Space   *College,*
Standards   *University College,*   Analysis of BC Utilization
Review   *and Institute System*   **INSTRUCTIONAL SPACE UTILIZATION**

2. Standards & Guidelines Review ───────────────────────

(0000\document\progreport.doc)

**Graph 7 – Comparison Of Campus Utilization At Large Campuses
Considering Proportion Of Shop Stations**

Shop Stations as a Percent of Total Stations - Large Campuses
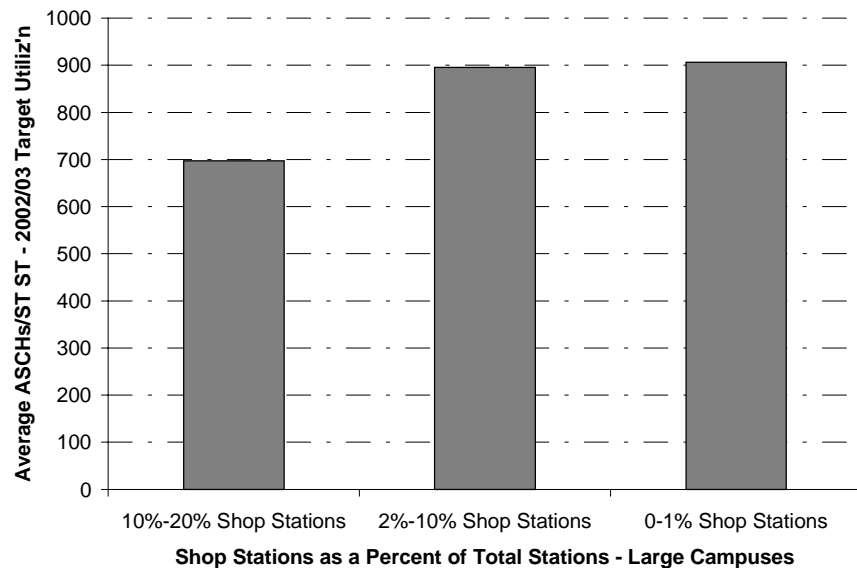
**Graph 8 – Comparison Of Campus Utilization At Mid-Sized Campuses
Considering Proportion Of Shop Stations**

Shop Stations as a Percent of Total Stations - Mid-Sized Campuses
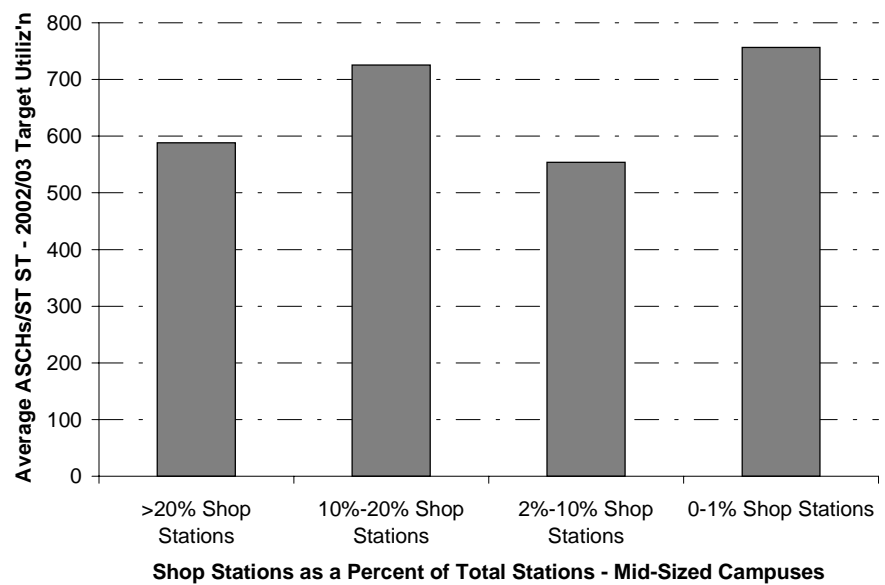
It is noteworthy that shop stations appear to have a greater impact on utilization than would be expected. This may be because the utilization of classrooms also is affected by the way shop-based programs are delivered. Classroom space and shop

Space   *College,*
Standards   *University College,*
Review   *and Institute System*

Analysis of BC Utilization
INSTRUCTIONAL SPACE UTILIZATION

2. Standards & Guidelines Review ───────────────

(0000\document\progreport.doc)

space may both be scheduled for use by the same program stream and thus decrease the average utilization of classrooms.

It is recommended that the relative proportions of shop and teaching kitchens to classroom and laboratory stations should be factored into campus utilization standards.

Space   *College,*
Standards   *University College,*
Review   *and Institute System*

Development of an Annual Student Contact
Hours Per Student Station Standard
INSTRUCTIONAL SPACE UTILIZATION

2. Standards & Guidelines Review

(0000\document\progreport.doc)

DEVELOPMENT OF AN ANNUAL STUDENT CONTACT HOURS PER STUDENT STATION STANDARD

In the previous section, the analyses indicated that the following criteria have an impact on utilization and should be taken into account when developing utilization standards for instructional space:

- campus size
- urban versus non-urban context
- the proportion of shops and teaching kitchen stations to classroom stations

Working from those basic principles, this section develops ASCHs/ST ST standards for various campus types.

It may be helpful to resurrect the previously used BC Thorstenson formula guideline to assess any proposed standard based on an ASCHs/ST ST instrument, as the Thorstenson formula is reasonably familiar to most individuals who have been involved in the college, institute and university college system. For classroom stations, the Thorstenson standards call for a utilization of 28.6 WSCHs/ST ST, as noted in 4. Assuming that institutions operate for 46 weeks per year, this is equal to approximately 1,300 ASCHs per classroom student station.

For laboratories and shop stations, the old BC Thorstenson standard is 24 WSCHs/ST ST, the highest of all jurisdictions. Annualized, again by multiplying by 46 weeks, this is equal to 1,100 ASCHs per laboratories and shop stations.

However, the Thorstenson standards were intended to set utilization during peak stable enrolment and so need to be adjusted to provide a standard of utilization that can be applied through an entire year. Assuming a factor of approximately 75% to compensate for this averaging of utilization, the resulting basic rates are approximately 1,000 ASCHs/ST ST for classroom stations and 825 ASCHs/ST ST for shop/laboratory stations.

As the previous section indicated, there is no strong trend indicating that laboratory stations have an actual lower utilization and so **it is recommended the lower rate of 825 ASCHs/ST ST only be applied to shop and teaching kitchen stations,** the presence of which has a negative impact on utilization.

The differences in actual utilization found in campus size should be reflected in the development of three utilization standards for the three campus size groupings. However, the mid-sized campuses should be further divided into urban and non-urban campuses, with slightly lower standards of utilization required for non-urban campuses than their urban counterparts.

Space   *College,*
Standards   *University College,*
Review   *and Institute System*

Development of an Annual Student Contact
Hours Per Student Station Standard
INSTRUCTIONAL SPACE UTILIZATION

2. Standards & Guidelines Review

(0000\document\progreport.doc)

Campuses which are unique because of their location, or
program mix should generally be treated as exceptions to these
recommended standards.

The base annualized Thorstenson formula standards have been
adjusted according to the actual utilization achieved by
campuses in the categories listed above. The result is similar to
the average 2002/03 target utilization for each category. **The
recommended standards are as follows:**

- **Large campuses are 100% of the annualized
  Thorstenson formula rates, i.e., at 1,000 ASCHs/ST
  ST for classroom and lab stations and at 825
  ASCHs/ST ST for shop/teaching kitchen stations**

- **Urban mid-sized campuses should be set at 80% of
  the annualized Thorstenson formula rates (800 and
  650 ASCHs/ST ST respectively)**

- **Non-urban mid-sized campuses should be set at
  75% of the annualized Thorstenson formula rates
  (750 and 620 respectively)**

- **small campuses should be set at 65% of the basic
  rates (650 and 540 ASCHs/ST ST respectively)**

Table 5 compares average actual utilization, the annualized
Thorstenson formula rates and the standards recommended
above.

Table 5 – Comparison Of Actual Utilization, Annualized Thorstenson And Recommended Standards

Campus Category	Actual Utilization (2002/03 Target) Mixed Classroom/ Laboratory/Shop (ASCHs/ST ST)	Thorstenson Formula Guideline (Annualized)		Recommended Standards	
		Classroom Stations (ASCHs/ST ST)	Laboratory/Shop Stations (ASCHs/ST ST)	Classroom/ Laboratory Stations (ASCHs/ST ST)	Shop/Teaching Kitchen Stations (ASCHs/ST ST)
Large Campuses	838 (averaged)	1,000	825	1,000	825
Mid-Sized Urban	700 (averaged)	1,000	825	800	650
Mid-Sized Non-Urban	668 (averaged)	1,000	825	750	620
Small Campuses	555 (averaged)	1,000	825	650	540

As Table 5 indicates, the recommended standards take into
account the utilization trends indicated by actual utilization,
whereas the Thorstenson formula guideline does not. The Actual
Utilization (2002/03 Target) which is a mixture of classroom,
laboratory and shop utilization falls, in all campus categories,
between the Recommended Standard for classroom/laboratory
stations and the Recommended Standard for shop/teaching
kitchen stations.

Space   *College,*
Standards   *University College,*
Review   *and Institute System*

Development of an Annual Student Contact
Hours Per Student Station Standard
INSTRUCTIONAL SPACE UTILIZATION

2. Standards & Guidelines Review

(0000\document\progreport.doc)

Graph 9, below, indicates visually how the recommended
standards compare to Actual Utilization. The upper grey bar is
the Classroom/Laboratory Standard, the lower grey bar is the
Shop/Teaching Kitchen Standard.

**Graph 9 – Comparison Of Actual Utilization and Recommended Utilization
Standards by Campus Type**
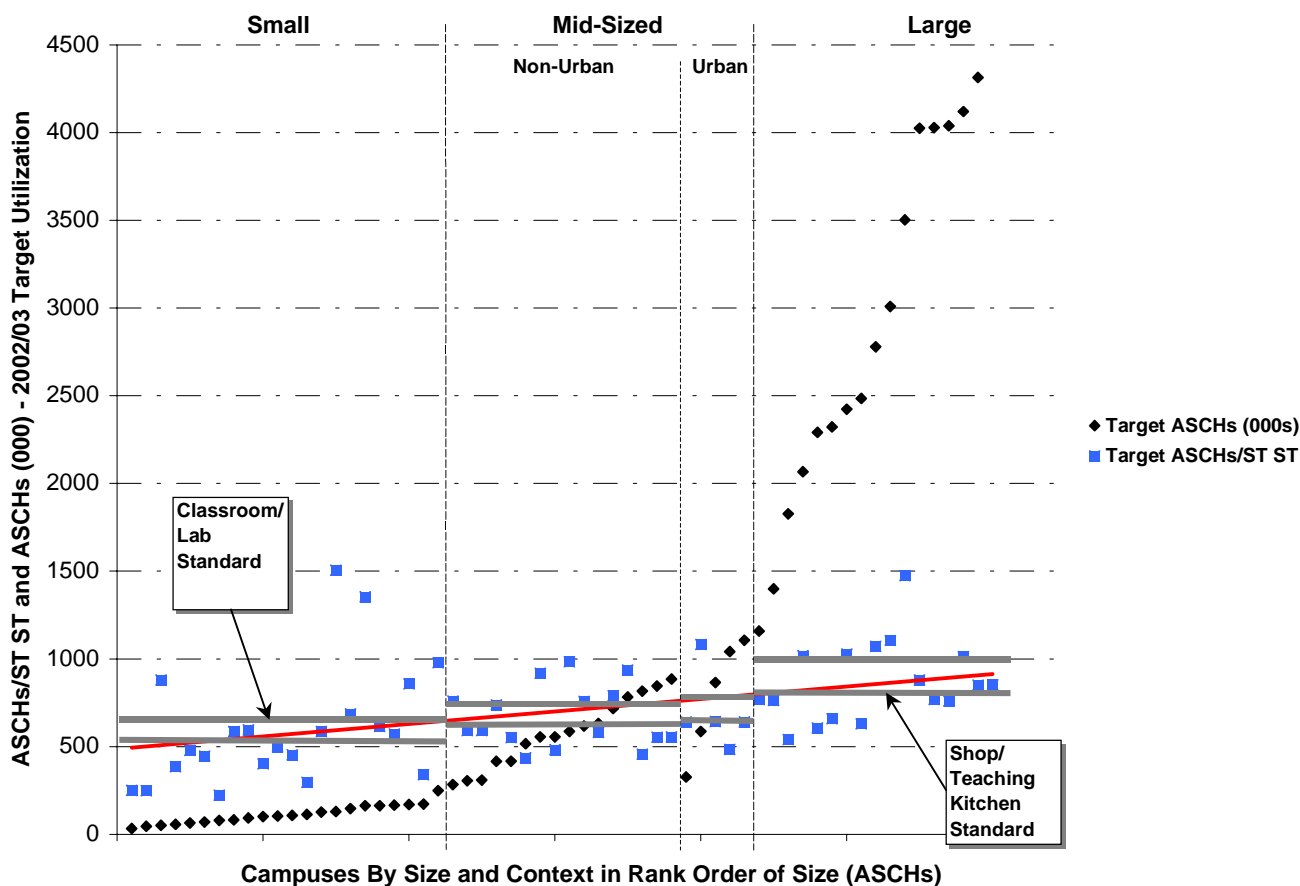
Graph 9 indicates that, while approximately 35% of large
campuses surpass the higher recommended standard for
classroom/laboratory stations, the majority of this group are very
close to the standard.   If the campus with the high utilization
(1,500 ASCHs/ST ST) is not counted, the remainder are on
average less than 5% above the higher recommended standard.
On the other hand, campuses which are below the standard
have, on average, room for an approximately 35% growth
potential before the standard is reached. On balance, for large
campuses, the system could accommodate between 10% and
14% more growth than the 2002/03 Utilization Targets.

25% of mid-sized urban campus, and approximately 40% of mid-
sized non-urban and small campuses have achieved a rate of

Space   *College,*
Standards   *University College,*
Review   *and Institute System*

Development of an Annual Student Contact
Hours Per Student Station Standard
INSTRUCTIONAL SPACE UTILIZATION

2. Standards & Guidelines Review ————————————

(0000\document\progreport.doc)

utilization that surpasses the higher recommended standards for classroom/laboratory stations.

<u>Calculation of Utilization Standards for Specific Campuses</u>

It is recommended that the application of the different utilization standards for classroom/laboratory stations and shop/teaching kitchens should be based on the proportions of stations of each type at a campus.

For example, if a large campus has 80% classroom/laboratory stations and 20% shop stations, the campus utilization target standard would be as follows:

1,000 ASCHs per station X 80% classroom/lab stations = 800 ASCHs/ST ST

plus

825 ASCHs per station X 20% shop/teaching kitchen stations = 165 ASCHs/ST ST

equals an overall utilization target standard of

965 ASCHs/ST ST

The recommended standards, based on ASCHs/ST ST, are unique in the world of post-secondary institutions. As BC is leading the way in this endeavour, there is no precedent in another jurisdiction that BC can use as a basis for the development of its own standard.

The standards are based largely on the information prepared by each institution through its facilities inventory system. Improvements in the consistency and application of definitions of spaces can be expected in the future and this will have an impact on how each campus compares to the recommended standards. **It is recommended that the standards be evaluated in the future to ensure levels of utilization are reasonable and that the instrument proves workable.**

Space   *College,*   Development of an Annual Student Contact
Standards   *University College,*   Hours Per Student Station Standard
Review   *and Institute System*   **INSTRUCTIONAL SPACE UTILIZATION**

2. Standards & Guidelines Review ————————————————————————————————

(0000\document\progreport.doc)

Space	College,	Instructional Stations
Standards	*University College,*	**UNIT AREA STANDARDS AND GUIDELINES**
Review	*and Institute System*	

2. Standards & Guidelines Review

(0000\document\progreport.doc)

UNIT AREA STANDARDS AND GUIDELINES

INSTRUCTIONAL STATIONS

Introduction

This section includes the following:

- Review Of Existing Instructional Space Standards And Guidelines, which summarizes the standards and guidelines for instructional space used in various jurisdictions

- Best Practices Examples, which summarizes the contributed and evaluated examples of effective instructional spaces in BC institutions

Review of Existing Instructional Space Standards and Guidelines

This section reviews existing student station space standards and guidelines from various jurisdictions. There are generally three types of space standards and guidelines:

1. standards and guidelines for specific station types, which provide per student station areas only and which do not include space for associated support functions

2. standards and guidelines for specific station types, which include both student station area and an allocation of space for associated support functions, e.g., storage, lab preparation, etc.

3. more generalized standards and guidelines which are averages of the amount of space required per station for all stations of a large category, e.g., academic laboratories, vocational shops, etc., or broad groupings of these along with associated support functions

The first type is useful to determine the theoretical student capacity of a room, achieved by applying the guideline as a divisor to the area of the classroom, laboratory or shop. The second and particularly the third, more generalized guidelines are, however, very useful in the preliminary calculation of space needs when planning a facility.

Classroom Stations

Table 6, on the next page, compares classroom student station standards and guidelines in various North American jurisdictions. Except for BC, the standards and guidelines include some provision for support space.

Space   *College,*
Standards   *University College,*
Review   *and Institute System*

Instructional Stations
UNIT AREA STANDARDS AND GUIDELINES

2. Standards & Guidelines Review

Table 6 –   **Classroom Student Station Size Standards And Guidelines By Jurisdiction**

Jurisdiction	Student Station Area (m^2)
Canada	
Alberta	
Colleges (Non-Technical)	1.4
Technical Institutes	1.6
Agriculture Colleges	1.6
Alberta (RMC/MGT)	1.7
British Columbia [1]	
Classrooms up to 56 m^2	2.3
Classrooms from 57 m^2 to 93 m^2	1.8
Classrooms larger than 94 m^2	1.3
Ontario (COU only)	1.4
United States	
California	1.4
Minnesota	1.5
Washington State	2.1

The relatively small classroom station size in some jurisdictions can only be achieved by providing a substantial proportion of classroom seating in larger classrooms. While this may be possible in universities and large colleges by using large section sizes (particularly for lower level courses), smaller colleges may not have the student numbers to mount the large sections that can make use of larger, more space efficient classrooms.

Of note is the trend in some jurisdictions to provide larger classroom station standards: Washington State has increased average classroom size from 1.86 m^2 to 2.09 m^2 (the odd sizes reflect the conversion from Imperial to metric measurement) to account for flexibility in room use (e.g., use of small-groups) and to reflect increased space requirements of high-tech classrooms equipped for multimedia presentations or interactive video.

The RMC/MGT study for Alberta AECD also recommended increasing the college and technical institute classroom station space standard from 1.4 and 1.6, respectively, to 1.7. In that study, the following rationale for the need to increase station size was provided (emphasis added):

- "a general trend towards the use of tables and chairs in all classrooms of less than 60-80 seats. Although *most prevalent in the community colleges* it is also occurring at the universities;
- the need to accommodate handicapped students;
- the need to accommodate additional student equipment such as personal computers
- the need to accommodate flexible furniture arrangements;
- the need to accommodate exam writing."

Space   *College,*
Standards *University College,*   Instructional Stations
Review   *and Institute System*   **UNIT AREA STANDARDS AND GUIDELINES**

2. Standards & Guidelines Review ────────────────────────────

(0000\document\progreport.doc)

BC has developed three classroom student station size standards based on room size, as shown in Table 6, above. The standards include a station size of 2.3 m^2 for rooms of up to 56 m^2 (i.e., up to 24 student stations), 1.8 m^2 for rooms between 57 and 93 m^2 (i.e., between 32 and 51 student stations), and 1.3 m^2 for classrooms and lecture theatres larger than 94 m^2 (i.e., 72 student stations and over). The average of these three station size standards is 1.8 m^2. Unlike standards and guidelines in other jurisdictions, BC's student station space standards do not include support space. Interestingly, the stepped approach to student station size adopted by the BC standards means that classrooms of 56 to 57 m^2 may accommodate anywhere between 25 and 31 students and that classrooms of 93 to 94 m^2 may accommodate anywhere between 52 and 71 students.

The broad range of campus sizes in BC, with the largest campus almost 300 times the size of the smallest in terms of annual student contact hours, results in each having a unique mix of classroom types and sizes. In this context, a single, generalized classroom standard cannot be fairly applied to all campuses.

Shop/Laboratory Stations

As in classroom student station space standards and guidelines, jurisdictions have applied the three approaches to laboratory and shop station size standards and guidelines which include:

1. student station space standards and guidelines for specific laboratories and shops;

2. standards and guidelines per station for specific laboratories and shops, including support space;

3. generalized standards and guidelines which cover broad categories of laboratories or shops and which include support space.

The advantages and disadvantages listed above also apply to laboratory and shop student station space standards and guidelines.

Table 7 summarizes the generalized laboratory and shop space standards and guidelines other jurisdictions have developed. Note that all standards and guidelines include support space.

Space   *College,*
Standards   *University College,*   Instructional Stations
Review   *and Institute System*   **UNIT AREA STANDARDS AND GUIDELINES**

2. Standards & Guidelines Review ───────────────────────────

(0000\document\progreport.doc)

Table 7 –   Laboratory And Shop Student Station Space Guidelines

Jurisdiction	Average Student Station Area (m^2)
Canada	
Alberta	
Colleges (Non-Technical)	6.5
Technical Institutes	9.3
Agriculture Colleges	9.3
Trades	9.3
Fine and Performing Arts	Specifically Programmed
Ontario (COU)	
Group W [1]	10.8
Group X [2]	8.1
Group Y [3]	3.75
Group Z [4]	4.05
United States	
Florida – Community Colleges	
Academic	5.1
Occupational	8.7
Washington State	
Science Lab	5.6
Basic Skills/Developmental	2.6
Vocational Labs/Shops	Specifically Programmed

Notes:
1.   *Includes Agriculture, Veterinary Medicine, Engineering, Metallurgy*
2.   *Includes Fine and Applied Arts, Biochemistry, Biology, Fisheries, Wildlife Management, Zoology, Architecture, Health Professions except Nursing*
3.   *Includes Education, Geography, Psychology.*
4.   *Includes Humanities, Administrative Studies, Economics, Law, Political Science, Sociology, Nursing, Computer Science, Mathematics.*

The RMC/MGT study conducted for Alberta's AECD recommended the adoption of a COU-type system, involving a small number of similarly sized laboratory/shop groupings, to take into account differences in program mixes at institutions in Alberta, including community colleges.

Washington State purposely has not developed standards for vocational labs and shops, "because of the wide range of space-per-student-station for various occupational training labs and shops."

BC, along with some other jurisdictions, has adopted student station space standards and guidelines that provide per station areas for specific laboratory and shop types. The number of laboratory and shop station types can be quite large. For example, the University of Minnesota has developed space standards for about 170 student station types, including separate standard areas for workstations and for support space. California, which includes support space in the station space standard, has 46 lab and shop standards with a total of 13 different station sizes. Both the Minnesota and California standards have been included for reference as *Appendix B – Lab/Shop Space Standards – Other Jurisdictions*.

Space   *College,*
Standards   *University College,*   Instructional Stations
Review   *and Institute System*   **UNIT AREA STANDARDS AND GUIDELINES**

2. Standards & Guidelines Review

(0000\document\progreport.doc)

BC has developed standards for 15 types of laboratories and shops, as shown in Table 8, below. Note that the Unit Area does not include support space.

Table 8 – BC Shop And Lab Student Station Space Standards

Student Station Type	Unit Area (m^2)
Laboratories	
Micro-computer Instruction	3.7
Micro-computer Access to Terminals	2.3
Science Labs	4.6
Dental Assisting Labs	6.9
Draughting Lab	8.6
Language Lab	3.5
Nursing Lab	6.4
Typing Lab	3.7
Accounting Lab	3.7
Shops	
Autobody Shop	20.4
Auto-mechanics Shop	20.4
Heavy Duty Mechanics Shop	33.0
Carpentry Shop	13.9
Intro. Electricity Shop	11.3
Welding Shop	5.6

Summary

For the fair application of BC's utilization standards, it is necessary to develop specific student station space standards that can be applied to rooms to derive a number of student stations which is consistent throughout the system.

As a result, **it is recommended that student station space standards continue to generally reflect the actual capacities of instructional rooms. This requires the provision of a number of different area per station standards for different room sizes, in the case of classrooms, and the development of standards for the more common laboratories and shops, that can be applied uniformly to all institutions.**

With a standard of this type, calculation of the area required to deliver a program conducted for planning purposes must proceed through a "bottom up" process of calculating required numbers of rooms of each type and capacity and adding a factor for support space. Though more complex, this ensures that planning can and will account for the variety of campus types and sizes in BC. For example, a campus comprised of lecture theatres and large classrooms will have significantly less area per student station than one comprised entirely of small classrooms.

A disadvantage of this type of standard is that support space is not subject to the application of uniform standards. As a result,

Space   *College,*
Standards   *University College,*   Instructional Stations
Review   *and Institute System*   **UNIT AREA STANDARDS AND GUIDELINES**

2. Standards & Guidelines Review ────────────────────────

functions, which are best, located within a lab or shop may be located in support space in order to provide more space per student station within the instructional space. **It is recommended that standards for classroom, laboratory and shop support space be developed to provide uniformity between campuses and to facilitate future planning endeavours.**

For unique laboratories and shops, areas for student stations should be developed by design professionals working in concert with institutional staff and Ministry officials. Student station areas and utilization for these spaces should be based on actual room capacity.

Best Practices Examples

To assist in the development of student station space standards, institutions in BC were canvassed for classrooms, laboratories and shops that were acknowledged by faculty and staff to be superior examples of a space type. In addition, tours were conducted of the University College of the Cariboo (Kamloops), Malaspina University College (Nanaimo), Kwantlen University College (Surrey and Langley), Capilano College (Lynmour) and BCIT (Burnaby) to evaluate and document instructional space. Table 9 summarizes the results of these surveys and tours. Best Practices examples that were documented more fully in the tours of the campuses are identified by italicized text and are included for reference in *Appendix G – Best Practices Examples.* Considerations for best practices included sightlines, workstation space, support for the range of information-technology (where applicable), entry/egress, space efficiency, and utilization over time.

A recommended station size standard and support space rate are included, based, where possible, on the best practices example. Where best practices were not available, the recommended standards are based on available industry standards.

Instructional support space rates, which include the space necessary to support the activities within an instructional area, have been developed from a review of inventory information and plans, and are included as a percentage of student station area.

Note that examples of upper level labs were not available within the BC college, university college and institute system, as the move to degree-granting status at university colleges is relatively new. There are no examples of labs which are built purposely to support upper level science courses.

Table 9 – Best Practices Summary Of Classrooms, Laboratories And Shops

Space Type	Capacity	Area/ ST ST	College	Campus	Building	Room No.	Comment

Space   *College,*
Standards   *University College,*
Review   *and Institute System*

Instructional Stations
UNIT AREA STANDARDS AND GUIDELINES

2. Standards & Guidelines Review

CLASSROOMS

Seminar/Small Classroom:

							Up to 24 Students
	20	2.70	OUC	KLO		122	
	23	2.34	OUC	N. Kelowna	SCI	249	
Best Practices	24	2.50	UCC	Kamloops	TT	149	*See Appendix G.1*

Recommended Standard: ***2.50***
Support Space Rate: ***5%***

Mid – Sized Classroom:

							25 to 60 students
	39	2.06	OUC	N. Kelowna	SCI	247	
	40	1.70	Langara		"B"	Various	Accommodates 5' x 2' tables; provides good instructor to student relationship
Best Practices	40	1.93	CPC	Lynmour	Cedar	231	*See Appendix G.2*

Recommended Standard: ***1.95***
Support Space Rate: ***5%***

Mid-Sized Tiered Classroom:

							25 to 60 students
	54	1.79	OUC	N. Kelowna	SCI	134	
Best Practices	*42*	*1.65*	*MUC*	*Nanaimo*	*356*	*315*	*See Appendix G.3*

Recommended Standard: ***1.65***
Support Space Rate: ***5%***

Large Classroom:

Over 60 students
Assumes tablet arm chairs

Recommended Standard: ***1.50***
Support Space Rate: ***5%***

Lecture Theatre:

	86	1.59	SLK	Castlegar	K	10	Excellent sightlines, ample work surface
	90	0.93 – 1.11	Langara		"A"	112a/b	Good acoustics and visibility
	155	1.44	UCFV	Abbotsford	B	101	
Best Practices	148	1.71	CPC	Lynmour	Cedar	148	*See Appendix G.4*

Recommended Standard: ***1.80***   Assumes fixed table
Support Space Rate: ***15%***

Videoconferencing Room:

	36	2.04	UCFV	Abbotsford	G	159	Accommodates TVs, cameras
Best Practices	27	2.29	UCC	Kamloops	Old Main	1472	*See Appendix G.5*

Recommended Standard: ***2.50***
Support Space Rate: ***15%***

LABORATORIES

Computer/Language/Business:

Computer Lab	36	3.17	Langara		"A"	340	Good use of space allowing privacy and good communication with instructor
	20	3.83	CPC	Lynmour	Cedar	232	Back-to-back desk arrangement allows instructor to assist students
	24	3.84	Langara		"A"	140	Contract training lab; large room of better quality with large work surfaces
	20	4.29	UCC	Kamloops	Old Main	1355	Part of a computer lab complex
Drop-in Computer	40	2.46	Langara		"B"	015/019	Maximum number of students for room w/o being crowded; good layout for attention to front of room

Space   *College,*
Standards   *University College,*   Instructional Stations
Review   *and Institute System*   **UNIT AREA STANDARDS AND GUIDELINES**

2. Standards & Guidelines Review

(0000\document\progreport.doc)

Space Type	Capacity	Area/ ST ST	College	Campus	Building	Room No.	Comment
Language Lab	24	2.93	UCFV	Abbotsford	D	221	Ample space between stations
Keyboarding Lab	36	3.05	UCFV	Abbotsford	D	223	Good sightlines
	36	3.59	CPC	Lynmour	Fir	212	
Best Practices – Drop-in Lab	15	2.40	UCC	Kamloops	Old Main	1329	*See Appendix G.6*
Best Practices – Instructional Lab	36	3.41	CPC	Lynmour	Fir	213	*See Appendix G.7*
Recommended Standard:		***3.40***					
Support Space Rate:		***10%***					
CAD/GIS/Drafting/Multimedia:							
	20	5.26	UCFV	Abbotsford	D	104	Multimedia lab
	18	6.27	VCC	City Centre		721	Comfortable working environment
Recommended Standard:		***6.00***					
Support Space Rate:		***15%***					
Dry Science Lab – Lower Level							
	40	2.73	Langara		"A"	228/ 229	Geography: Large workstations and storage address special course needs
	20	3.47	OUC	N. Kelowna	SCI	124	Geology
Best Practices	*36*	*2.77*	*Kwantlen*	*Langley*		*1310*	*See Appendix G.8.*
Recommended Standard:		***3.00***					
Support Space Rate:		***10%***					
Dry Science Lab – Upper Level							
	20	4.00	OUC	N. Kelowna	SCI	242	Physics
Best Practices	*28*	*4.64*	*Kwantlen*	*Surrey*	*E*	*106*	*See Appendix G.9.*
Recommended Standard:		***4.60***					
Support Space Rate:		***10%***					
Wet Science Lab – Lower Level							
	24	4.61	OUC	N. Kelowna	SCI	119	Lower Division Biology
	24	4.10	OUC	N. Kelowna	SCI	131	Anatomy/Physiology
	20	5.58	OUC	N. Kelowna	SCI	231	Chemistry
Best Practices	*20*	*4.92*	*CPC*	*Lynmour*	*Fir*	*306*	*See Appendix G.10.*
Recommended Standard:		***5.00***					
Support Space Rate:		***50%***					
Wet Science Lab – Upper Level							
Recommended Standard:		***6.00***					
Support Space Rate:		***50%***					
Electronics Lab							
Best Practices	20	8.8	UCC	Kamloops	TT	282	*See Appendix G.11.*
Recommended Standard:		***8.5***					
Support Space Rate:		***50%***					
Nursing/Community Care Lab							
Best Practices	*12*	*6.67*	*Kwantlen*	*Surrey*	*D*	*240*	*See Appendix G.12.*
Recommended Standard:		***7.00***					
Support Space Rate:		***30%***					
Fine Arts Studio – Painting/Drawing							
Foundation Studio	20	5.3	UCFV	Abbotsford		D113	Very flexible, allows different

2. Standards & Guidelines Review

Space Type	Capacity	Area/ ST ST	College	Campus	Building	Room No.	Comment
2-D studio	20	3.82	UCFV	Abbotsford		D115	activities to occur simultaneously Very flexible, allows different activities to occur simultaneously
Best Practices	*25*	*5.02*	*Capilano*	*Lynmour*	*SA*	*103*	*See Appendix G.13.*
Recommended Standard:		***5.00***					
Support Space Rate:		***30%***					
SHOPS							
Carpentry/Building Technologies							
Best Practices	*16*	*14.50*	*UCC*	*Kamloops*	*TT*	*230*	*See Appendix G.14.*
Recommended Standard:		***15.00***					
Support Space Rate:		***10%***					
Electrical Lab							
Best Practices	*16*	*14.62*	*BCIT*	*Burnaby*	*SE01*	*124*	*See Appendix G.15.*
Recommended Standard:		***15.00***					
Support Space Rate:		***55%***					
Welding	20	12.50	Kwantlen	Langley	East Wing	1900	Shop supports self-paced program
Best Practices	*48*	*9.90*	*UCC*	*Kamloops*	*TT*	*272*	*See Appendix G.16.*
Recommended Standard:		***10.00***					
Support Space Rate:		***25%***					
Machine Tools/Millwright							
Best Practices	*64*	*21.00*	*BCIT*	*Burnaby*	*NW06*	*100*	*See Appendix G.17.*
Recommended Standard:		***21.00***					
Support Space Rate:		***30%***					
Automotive Mechanics	20	21.90	UCC	Kamloops	TT	212	Good shared use of tool crib, parts-room, flexibility ensured with large open space
Best Practices	*18*	*23.80*	*Kwantlen*	*Langley*	*East Wing*	*1800*	*See Appendix G.18.*
Recommended Standard:		***22.00***					
Support Space Rate:		***15%***					
Heavy Duty/Commercial Transport/Diesel	36	22.90	MUC	Nanaimo	AS	N/A	As currently planned
Best Practices	*36*	*21.00*	*UCC*	*Kamloops*	*TT*	*204/208*	*See Appendix G.19.*
Recommended Standard:		***23.00***					
Support Space Rate:		***15%***					
Fine Arts Studio – Sculpture	12	8.8	UCFV	Abbotsford	D	105	Very flexible, allows different activities to occur simultaneously
Best Practices	*15/25*	*6.36/8.0*	*Capilano*	*Lynmour*	*SA*	*100/101*	*See Appendix G.20.*
Recommended Standard:		***7.50***					
Support Space Rate:		***35%***					

Space   *College,*
Standards   *University College,*   Instructional Stations
Review   *and Institute System*   **UNIT AREA STANDARDS AND GUIDELINES**

2. Standards & Guidelines Review ─────────────────────────

(0000\document\progreport.doc)

Space   *College,*
Standards   *University College,*   Ancillary Support Space
Review   *and Institute System*   **UNIT AREA STANDARDS AND GUIDELINES**

2. Standards & Guidelines Review ─────────────────────

(0000\document\progreport.doc)

ANCILLARY SUPPORT SPACE

This section includes the following:

- a Review Summary, which summarizes the results of a literature review of standards and guidelines that have been developed in other jurisdictions

- Analysis of Ancillary Support Space, which documents trends that may be of assistance in the development of space standards for BC institutions and recommends space standards.

Review Summary

A preliminary review of inventory information indicates that instructional space comprises only 30% to 50% of a college's overall area. The remaining spaces, what are here termed ancillary support spaces, are critical to the administration and delivery of the instructional activities.

Generally, ancillary support space may include the following:

- faculty offices
- administration
- student services, including counseling, financial aid, etc.
- library and audio-visual services
- cafeteria and food services
- bookstore
- student and staff lounges
- athletic and recreation space
- assembly space
- child care facilities
- building services and storage space

Guidelines and standards have been developed by a limited number of jurisdictions for these ancillary support areas. The standards and guidelines are summarized in Table 10 to provide an indication of the type of functions that are generally accounted for as well as the input measure for deriving the area of each function. Most use full-time equivalent students as the input, a measure that is not defined consistently by different jurisdictions and, as a result, is difficult to normalize across jurisdictions.

Space
Standards
Review

College,
University College,
and Institute System

Ancillary Support Space
UNIT AREA STANDARDS AND GUIDELINES

2. Standards & Guidelines Review

(0000\document\progreport.doc)

Table 10 – Institutional Ancillary Support Space Generators In Various Jurisdictions

	Art	Music	Drama	Faculty Offices	Admin. Offices	Library/Learning Resource Centre	Athletic/ Recreation	Auditorium/ Assembly	Student Centre & Related	Flexibililty Factor	Stores/ Maintenance	Child Care
Canada												
Alberta - Colleges and Universities	na	na	na	13.0 m²/ instructor @ 15:1 student FTE to instructor rate	13.0 m²/ administrator OR 1.0 m² per student FTE for combined Faculty/ Administrat'n	1.25 m²/ student FTE	1.00 m²/ student FTE	0.2 m²/ student FTE	1.1 m²/ student FTE	15% of Net Assignable	Included in Net to Gross Ratio of 1.54	May be included in Student Services
Ontario - COU - Universities	na	na	na	13.0 m²/FTE faculty + 15% and 30% support	13.0 m²/FTE staff and 30% support	Stack (equiv. Vols) + Study (0.5 m²/student FTE) + Support (25%)	0.9 m²/ student + 2,000 m2 (less than 4,000 FTE)/ 1,000 m2 (4,000 - 8,000 FTE)	See Student Centre and Relted	2.0 m²/ student FTE	na	1.5% of Net Assignable Area	na
United States Minnesota - Universities	na	na	na	13.9 m²/ adjusted head count	13.9 m²/ adjusted head count	Stack (equiv. Vols) + Study (.72 m²/student FTE) + Support (20 %)	Allowance 3790 m² (1,000 FTE) 6317 m² (5,000 students) + 0.8 m² Headcount factor	na	0.8 m²/ FYE student + .01 m²/StSt + .01 m2/ headcount employees	na	na	na
Washington State - Community Colleges	0.46 m² (1st 500) 0.18 m² (over 500)	0.28 m² (1st 500) 0.14 m² (over 500)	139 m² Allowance	.55 m²/ student FTE except vocational @ 0.7 m2/FTE	.83 m²/ student FTE (1st 1000) then 0.48 m²/ Student FTE	Various rates for Acad/Voc/Basic Skills for 1st 1000 FTE, decreased rates above 1000 FTE	2.4 m²/ FTE student (1st 500) then .93 m²/FTE	372 m² Allowance	1.2 m²/ student FTE (1st 1000) then 0.74 m²/ Student FTE	na	.65 m²/ student FTE (1st 1000) then 0.37 m²/ Student FTE	0.26 m²/ student FTE

Analysis of Ancillary Support Space

This section analyzes actual use of ancillary support space in BC institutions and compares these, where relevant, to those in other jurisdictions to develop standards and guidelines for BC institutions.

Analyses have been conducted for the following space types:

- Offices
- Library/Study and Lounge Space
- Cafeteria and Food Services
- Additional Campus Activity

Office Space

Separate analyses of administrative, faculty and student services office space at BC institutions are not possible as these space types are not consistently identified in institutional FIS data as belonging to one of these groups. As a result, this analysis must focus on office space in general.

Space   *College,*
Standards   *University College,*   Ancillary Support Space
Review   *and Institute System*   **UNIT AREA STANDARDS AND GUIDELINES**

2. Standards & Guidelines Review ———————————————

(0000\document\progreport.doc)

It is recommended that consistent methods of categorizing office space be developed that indicate the function each office serves, i.e., use by faculty, administrative staff, student services staff, student association, etc., and, in the case of faculty offices, to which program the office belongs. This will enable a more detailed analysis of office space utilization in the future.

Graph 10 shows the relation between the amount of total office space and Annual Student Contact Hours (ASCH) for the year 2002/03 for each campus in BC. Campuses are listed in rank, order by size in terms of ASCHs. The trendline indicates that smaller campuses have slightly less office space per ASCH than the larger campuses although rates, particularly for small campuses, are variable, ranging from as high as 0.025 net m^2/ASCH to a low of 0.0005, one-tenth of the high figure.

The trendline begins at approximately 1.3 net m^2 per 1,000 ASCHs and rises steadily increases to 1.5 net m^2 per 1,000 ASCHs.

Graph 10 - Comparison Of Office Space At BC Institutions

Space *College,*
Standards *University College,*
Review *and Institute System*

Ancillary Support Space
UNIT AREA STANDARDS AND GUIDELINES
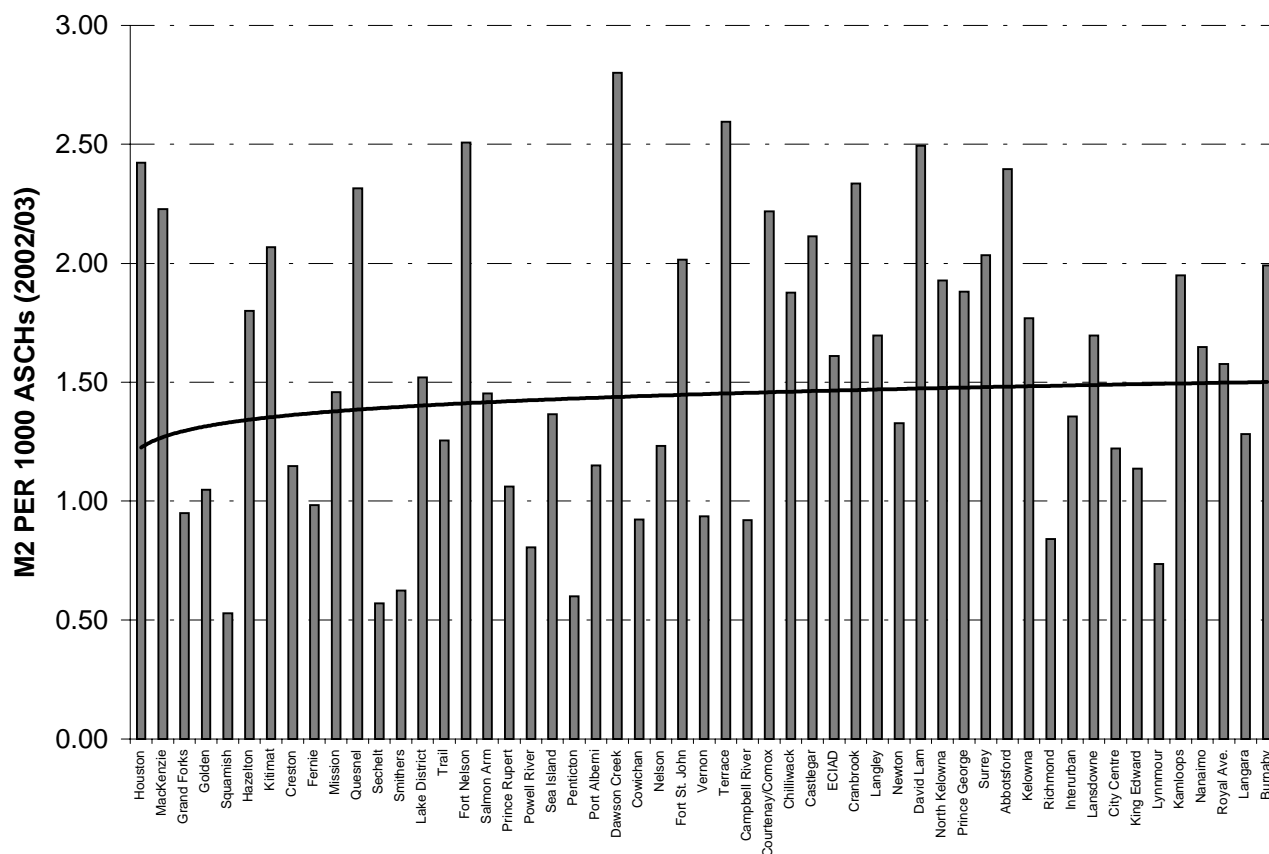
2. Standards & Guidelines Review ————————————————

(0000\document\progreport.doc)

Both Alberta and Washington State have office space guidelines which are based on area per student FTE. Alberta's is 1.0 net m^2 per FTE when administration and office space are combined. Assuming a range of 600 to 700 ASCHs per FTE, Alberta's office allocation can be translated to equal 1.4 to 1.7 net m^2 per 1,000 ASCHs. The RMC/MGT study recommended increasing the per office allocation of space by 1.0 m^2 to account for the use of computers in offices which translates into an approximately 7% increase in office allocation guidelines. This would increase the range from 1.5 to 1.8 net m^2 per 1,000 ASCHs.

Washington State's office space guidelines are more difficult to apply. The guideline for faculty offices is .55 net m^2 per student FTE except for vocational programs, which are 0.7 net m^2 per student FTE. Space guidelines for administrative offices are .83 net m^2 per student FTE for the first 1,000 FTEs, then decreasing to 0.48 net m^2 per student FTE for the remaining FTEs. This adds up to a range of between 1.03 and 1.53 net m^2 per student FTE which is somewhat higher than Alberta's standard although it could never approach the higher end. Translated to our ASCH measure, this is equal to between 1.6 and 2.5 net m^2 per 1,000 ASCHs.

It is recommended that, for administration, student support, and faculty office space, an overall net office space allocation of 1.6 net m^2 per 1,000 ASCHs be applied to the first 250,000 ASCHs and that a rate of 1.8 net m^2 per 1,000 ASCHs (or base of 400 m^2) apply to remaining ASCHs.

Within these allocations, institutions should be able to define how offices are best allocated. For example, in some programs it may be beneficial to accommodate faculty in an open office environment. Others may require private offices.

Included in the above recommendation are student services space such as registration, counselling, and financial aide. Current FIS data does not adequately or consistently identify student services space. As a result, an analysis of student service space alone could not be conducted on existing facilities.

A number of factors may have an impact on student service space needs, including program mix. Campuses with large proportions of students in academic and English as a second language programs may require more space for student admissions, counseling, registrar's office, etc. Further analysis needs to be done to confirm and quantify this.

Space   *College,*
Standards   *University College,*   Ancillary Support Space
Review   *and Institute System*   **UNIT AREA STANDARDS AND GUIDELINES**

2. Standards & Guidelines Review

(0000\document\progreport.doc)

Library/Study and Lounge Space

Graphs 11, 12 and 13 illustrate the relation between Annual
Student Contact Hours (ASCH) for the year 2002/03 for each
campus in BC in rank order of size, and respectively, the amount
of library space, lounge space and combined library and lounge
space, with the result expressed as m^2 per 1,000 ASCHs.

Graph 11 – Comparison Of Library/Av Space At BC Campuses
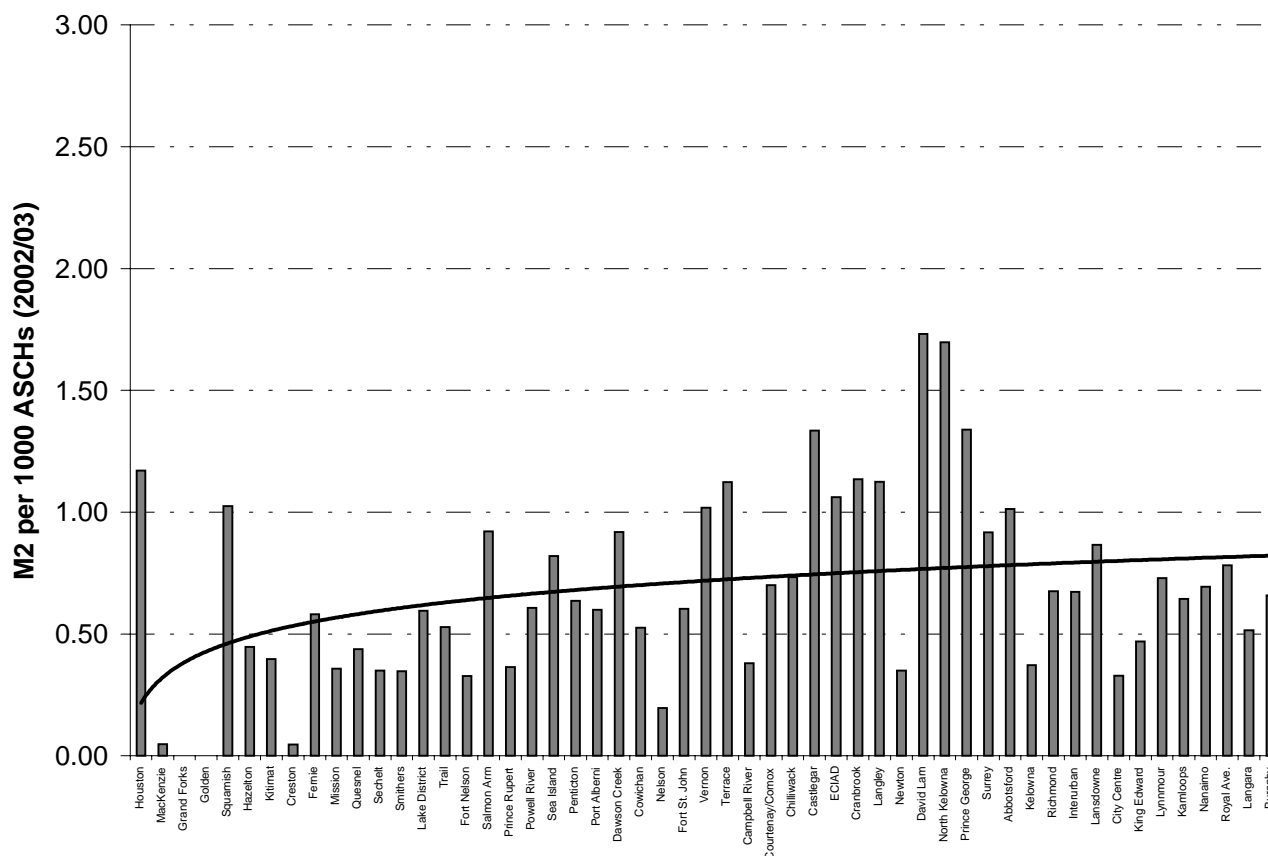
Graph 11 indicates that, in general, the proportion of library and
A/V space per ASCH increases as the size of an institution
increases. This is in part because some small campuses do not
have libraries or study space at all, but is also due to a general
trend that can be perceived, with the majority of small campuses
below the 0.5 net m^2 per 1,000 ASCHs range.

Alberta has a library/learning resource centre space allocation of
1.25 net m^2 per FTE. Again, assuming a range of 600 to 700
ASCHs per FTE, this translates to between 1.8 and 2.0 net m^2
per 1,000 ASCHs, which is substantially more area per ASCH
than provided by BC institutions. Only North Kelowna and David
Lam campuses approach this allocation.

Space   *College,*
Standards   *University College,*   Ancillary Support Space
Review   *and Institute System*   **UNIT AREA STANDARDS AND GUIDELINES**

2. Standards & Guidelines Review

All library space guidelines in other jurisdictions are based on stack numbers, which enables some libraries to grow more than others due to growth in collection size alone. Collection growth may be the result of poor policies on weeding collections and, as a result, is not a recommended approach.

Graph 12 - Comparison Of Lounge And Reading/Study Space At BC Campuses
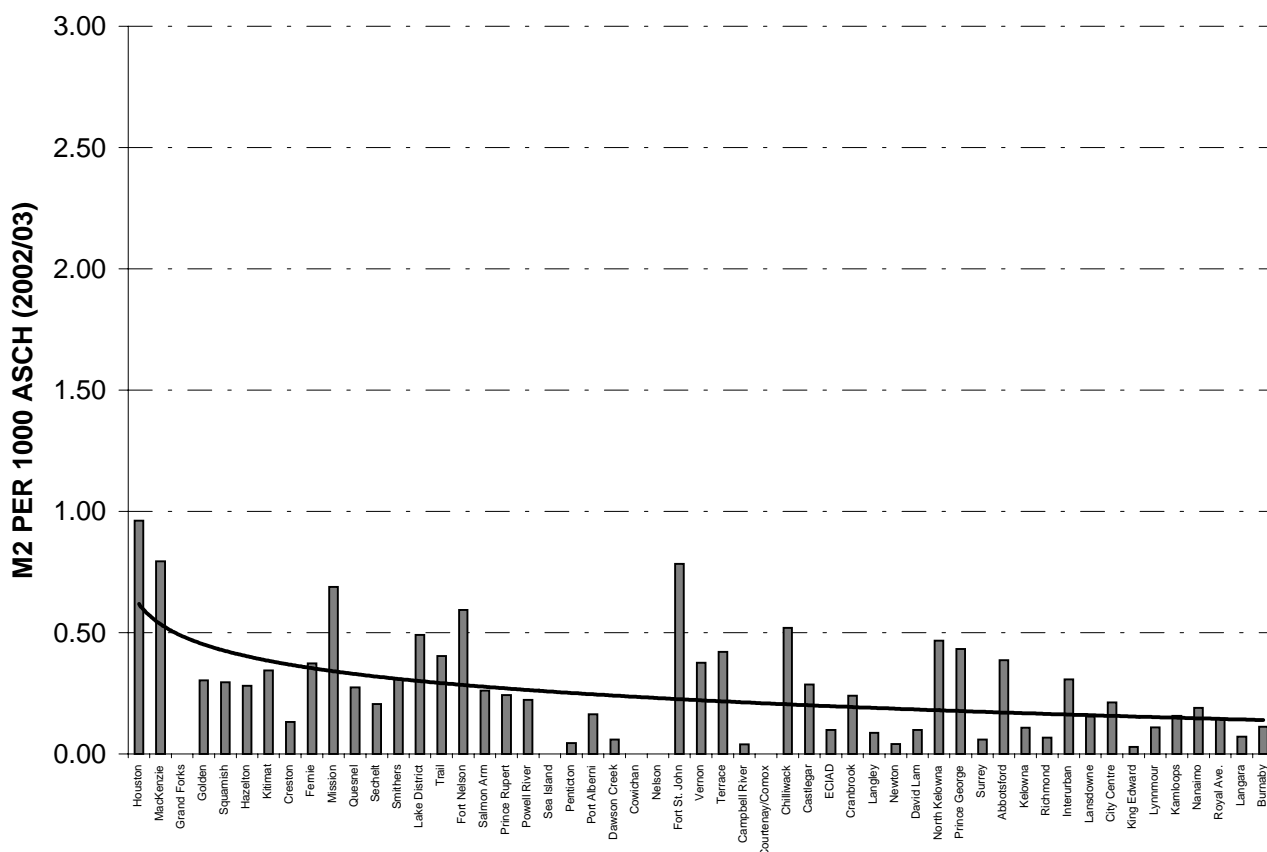
Graph 12 illustrates the amount of lounge and reading/study space that is provided at BC campuses. The ratios may include area for staff lounge space as these areas, in some cases, could not be extracted from the data.

In general, the trendline indicates that the larger the campus, measured in the 2002/02 projected ASCHs, the less space that is provided per ASCH for lounge and study/reading space. Small campuses tend to provide more lounge and reading/study space (approximately 1.0 net m^2 per 1,000 ASCHs) than library space, whereas large campuses tend to provide substantially more library space than lounge and reading/study space (which bottoms out at approximately 0.15 net m^2 per 1,000 ASCHs).

Space   *College,*
Standards   *University College,*   Ancillary Support Space
Review   *and Institute System*   **UNIT AREA STANDARDS AND GUIDELINES**

2. Standards & Guidelines Review

Graph 13 illustrates the result when library/AV, lounge and reading/study space are combined. It shows a strikingly flat trendline from the very smallest campuses to the largest.

Graph 13 – Comparison Of Combined Library/AV, Lounge And Reading/Study Space At BC Campuses
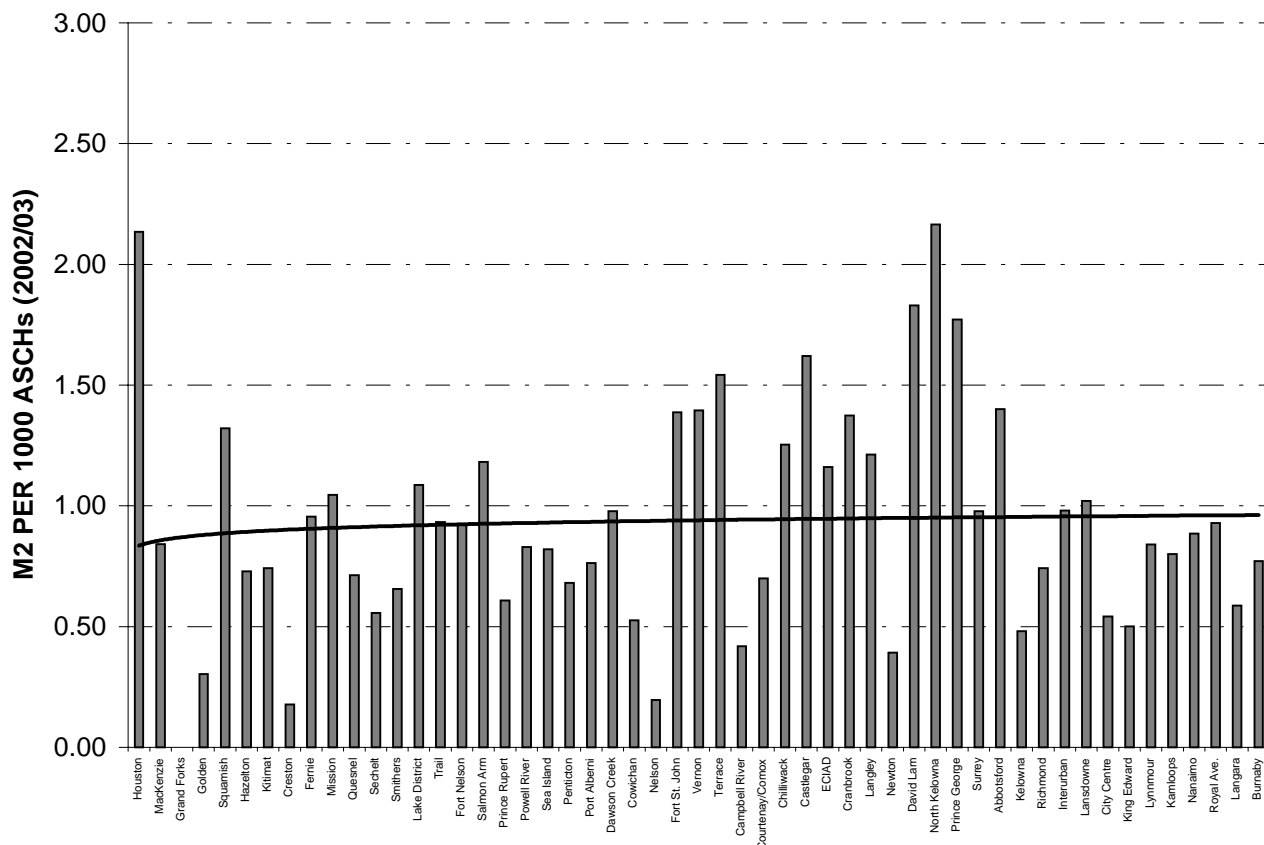
The consistency of the allocation of space per student for library, AV, lounge and reading/study across the complete spectrum of campuses in BC may be explained by the consistent need to provide seats for students when they are not in class.

The overall average of library, AV, lounge and reading/study space that is provided by campuses in BC is approximately 1.0 net m^2 per 1,000 ASCHs. This is only one-half of the area provided by Alberta for libraries and learning resource centres alone, using our derived calculations of between 1.8 and 2.0 net m^2 per 1,000 ASCHs.

In our best practices survey, the library at CNC's Prince George campus was recognized to be an effectively utilized space. Including AV space, the Prince George library delivers effective service at a rate of 1.3 net m^2 per 1,000 ASCHs. As a relatively

Space   *College,*
Standards   *University College,*   Ancillary Support Space
Review   *and Institute System*   **UNIT AREA STANDARDS AND GUIDELINES**

2. Standards & Guidelines Review ——————————————————

(0000\document\progreport.doc)

new facility, it likely is not operating at capacity, and so, adding a 15% growth factor, we can assume it will continue to deliver effective services at a rate of 1.1 net m^2 per 1,000 ASCHs. Assuming an additional 0.25 net m^2 per 1,000 ASCHs for lounge and study space (Prince George's existing figure is 0.43, at the high end), the overall allocation for library/AV, lounge and reading/study space is equal to 1.35 net m^2 per 1,000 ASCHs.

It is recommended that the standard for library/AV, lounge and reading/study space be combined. The rate of 1.35 net m^2 per 1,000 ASCHs should be generally applied to campuses, with institutions given the discretion to allocate resources to each function.

Another factor which may have an impact on the requirements for lounge and library space is program mix, particularly for academic and English as a second language programs. It is recommended that information about program mix at campuses should be developed and used to analyze the use of library, study and lounge space. The importance of informal study and meeting space for students in academic and professional programs has been widely documented.

Space   *College,*
Standards   *University College,*   Ancillary Support Space
Review   *and Institute System*   **UNIT AREA STANDARDS AND GUIDELINES**

2. Standards & Guidelines Review ────────────────────────────

(0000\document\progreport.doc)

Cafeteria and Food Services

Graph 14 indicates the relationship between cafeteria and food services area and campus size expressed in terms of as ASCHs for BC campuses. It excludes space for teaching kitchens but includes space for production kitchens and kitchen support areas.

Graph 14 – Comparison Of Cafeteria And Food Services Space At BC Campuses
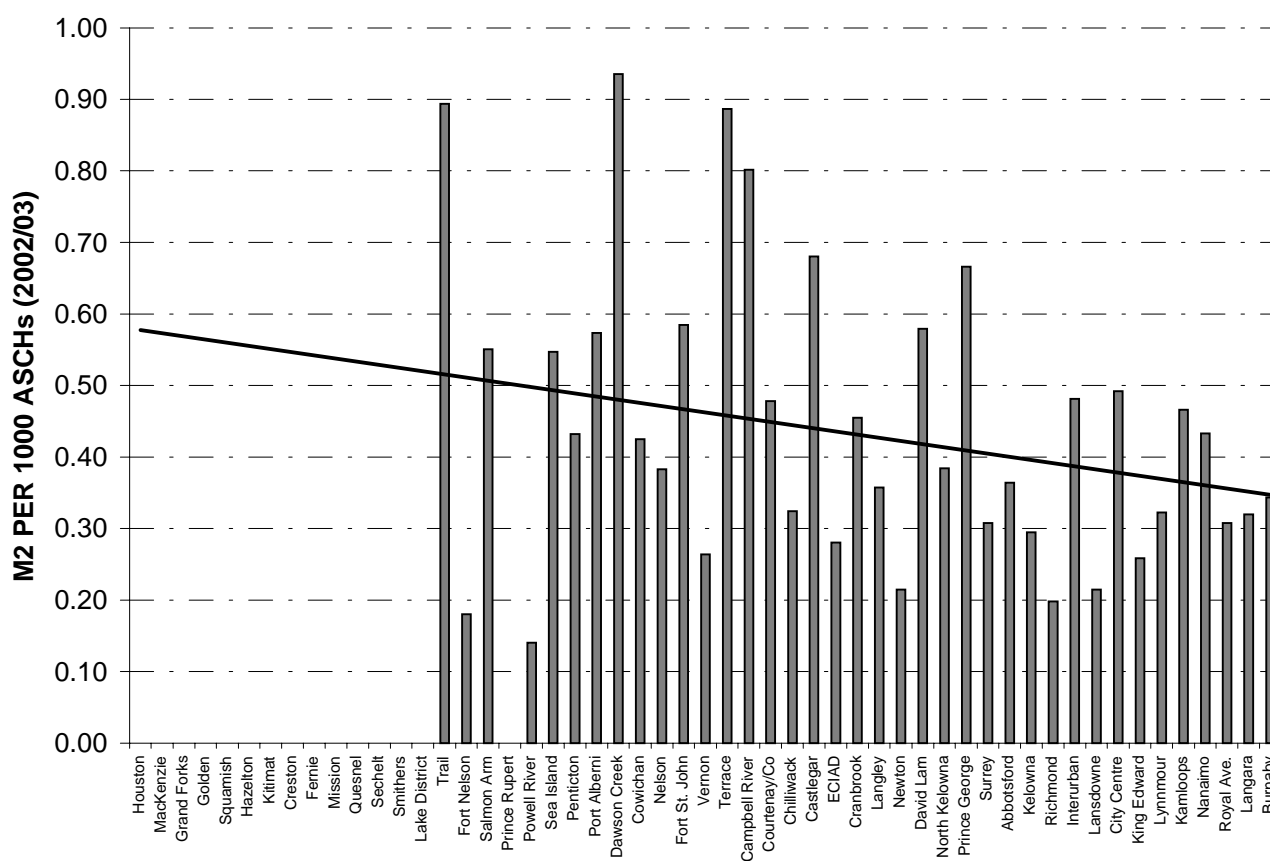
The trendline indicates that the larger the campus in terms of ASCHs the less space per ASCH that is provided for cafeteria and food services. As well, campuses below a size of approximately 200,000 ASCHs generally do not have food services or cafeterias.

The range of space provided is quite large, ranging from 0.20 net m^2 per 1,000 ASCH at the low end, to a high of 0.9. The majority of campuses, however, are centred on the 0.3 to 0.4 net m^2 per 1,000 ASCHs range.

Space   *College,*
Standards   *University College,*
Review   *and Institute System*

Ancillary Support Space
UNIT AREA STANDARDS AND GUIDELINES

2. Standards & Guidelines Review ——————————————

(0000\document\progreport.doc)

Alberta used a space guideline of 0.4 net m^2 per student FTE for calculating cafeteria space. The guideline is based on the assumption of 2.70 m^2/meal served, three 40 minute shifts and expectation that one/third of students will eat at the cafeteria. This guideline, translated into ASCHs by using a range of 600 to 700 ASCHs per FTE, is equal to 0.57 to 0.67 net m^2 per 1,000 ASCHs which, again, is well above the typical area for cafeteria at BC institutions. There are, however, a small number of institutions that approach the Alberta allocation.

The cafeteria at the Kelowna campus has been identified as a best practices space. However, it was largely based on the teaching kitchen program areas. It is advisable to identify a preferred practices cafeteria area for comparative purposes.

It is recommended that a standard of 0.5 net m^2 per 1,000 ASCHs, slightly below that of Alberta, be used for cafeteria and food services for campuses larger than 200,000 ASCHs.

A number of other factors may have an impact on food service needs, including the number or proportion of residential students, geography, the presence of teaching kitchens and available commercial space in close proximity to the campus. These factors should be considered when applying the above standards.

Additional Campus Activity

Space for the remaining functions that are typical of most campuses has been analyzed as additional campus activity. Included in this category are meeting and conference rooms, theatres, health facilities, maintenance and building support, and data and computing facilities. Excluded from the analysis are spaces that tend to be unique to a given campus or which lend themselves to a case-by-case consideration, such as bookstores and other merchandizing space, residential facilities, athletics and recreation space, and child care facilities.

Graph 15 indicates the relationship between space for this additional activity and campus size expressed in terms of area per 1,000 ASCHs for BC campuses.

Space   *College,*
Standards   *University College,*   Ancillary Support Space
Review   *and Institute System*   **UNIT AREA STANDARDS AND GUIDELINES**

2. Standards & Guidelines Review ────────────────────────

(0000\document\progreport.doc)

Graph 15 – Comparison Of Space For Additional Activities At BC Campuses
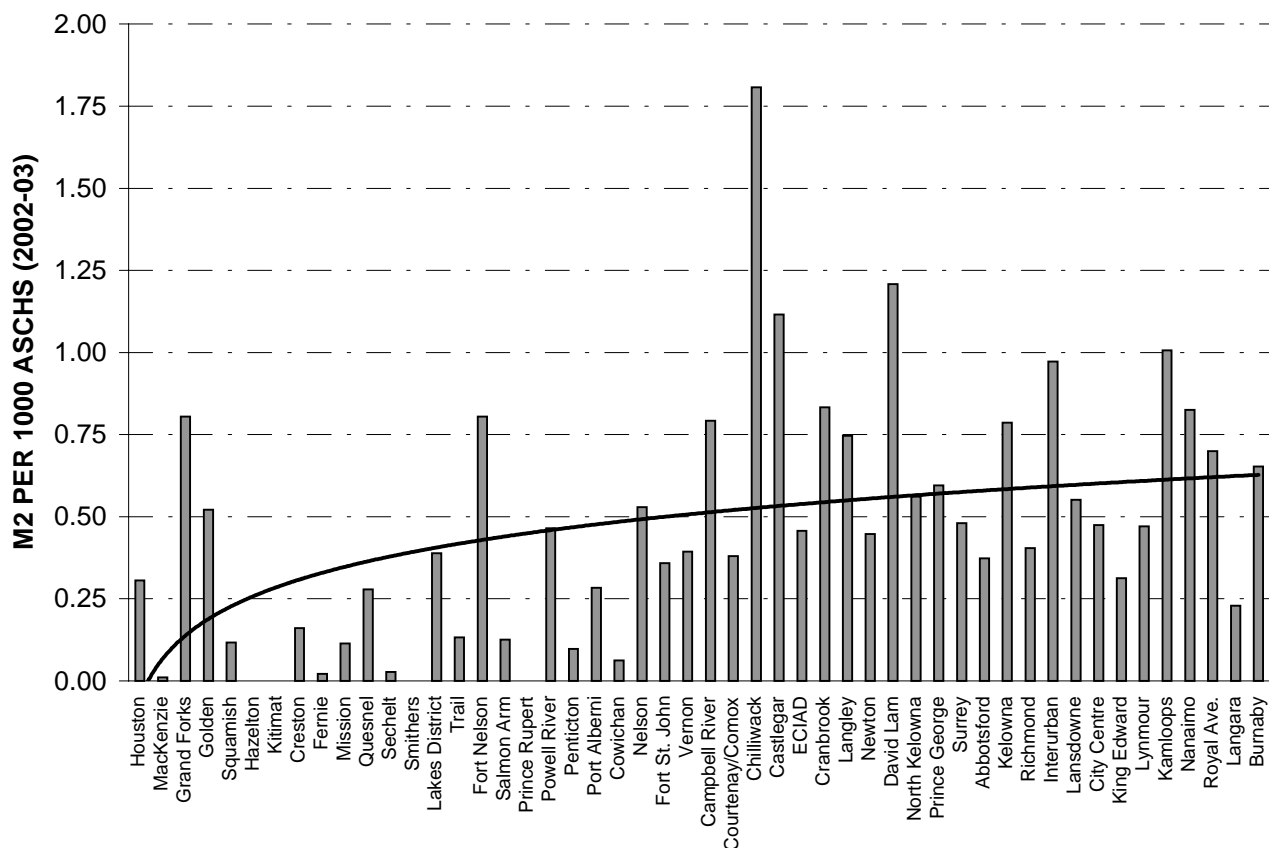
In general, the trendline indicates that the larger the campus the greater the amount of additional support space per 1,000 ASCHs that is provided. Small campuses may have a complete absence of additional activity space. The relatively high ratio of space per 1,000 ASCHs for some campuses may reflect the provision of a theatre (e.g., Chilliwack Campus) or support space designed to accommodate more than current student numbers (e.g., David Lam Campus).

It is recommended that a standard of 0.25 net m^2 per 1,000 ASCHs be used for a campus' first 250,000 ASCHs, and that a standard of 0.65 m^2 per 1,000 ASCHs apply to remaining ASCHs. This is an interim standard only and should be confirmed when more comprehensive FIS data is available.

Space   *College,*
Standards   *University College,*   Ancillary Support Space
Review   *and Institute System*   **UNIT AREA STANDARDS AND GUIDELINES**

2. Standards & Guidelines Review ───────────────────────────

(0000\document\progreport.doc)

Space   *College,*
Standards   *University College,*
Review   *and Institute System*   **NET TO GROSS RATIOS**

2. Standards & Guidelines Review

(0000\document\progreport.doc)

NET TO GROSS RATIOS

While a great deal of attention has been given to the development of standards and guidelines for instructional space in many jurisdictions – which may comprise as little as 30% of a campus or building's physical plant – very little attention has been given by these jurisdictions to net to gross ratios, which may comprise over half of a building's overall area.

This section summarizes the information that is available on net to gross ratios in BC and other jurisdictions. Terms used in the analysis of net to gross ratios include:

- Net Assignable Area, the area used to accommodate a specific function or occupant. Examples of net assignable areas include offices, classrooms, laboratories, storage rooms, etc. Measurements are taken from inside wall to inside wall. Net assignable area does not include mechanical, electrical, structural and other building systems areas, washrooms, or circulation areas.

  All numbered space code categories in the Facilities Inventory System (FIS) fall within Net Assignable Area, except 435 (Building Services Area in Library Complex), 530 (Building Services Area in Gymnasium) and 655 (Building Services Area in Food Services Area). These two space code categories are Non-Assignable Area as defined below.

- Non-Assignable Area, the area used to accommodate mechanical, electrical and other building systems, janitorial closets, washrooms, and circulation areas. Examples of non-assignable areas include mechanical rooms, corridors, lobbies, etc. At times the distinction between net assignable and non-assignable space may be difficult to determine. For example, a large mall type space is used both for general circulation (non-assignable) and as lounge space (net assignable).

  Non-assignable Area is categorized as 435 (Building Services Area in Library Complex), 530 (Building Services Area in Gymnasium) 655 (Building Services Area in Food Services area) and ZZZ space in the FIS.

- Usable Area, as used by the FIS, is the result of adding net assignable and non-assignable areas.

- Gross Area is the total area of a building including exterior walls, structural members, and internal partitions. It typically applies only to roofed, heated space, which is surrounded by exterior walls. Gross area is the result of adding usable area and structural area.

Space   *College,*
Standards   *University College,*
Review   *and Institute System*   **NET TO GROSS RATIOS**

2. Standards & Guidelines Review

(0000\document\progreport.doc)

- Net to Gross Ratios are calculated by dividing the Gross Area by the building's Net Assignable Area.

Although the space that the net to gross ratio identifies is often construed as "design" space, adequate circulation, washrooms and mechanical rooms are necessary and are, in many cases, driven by the relevant building codes, to ensure that a building functions properly and is safe for occupants. Buildings with large corridors or significant mechanical areas will have larger net to gross ratios. Again, large corridors may be multifunctional, and, when this is the case, should not be understood as purely non-assignable area.

Other Jurisdictions

For comparison, information from other jurisdictions is included. This information should be viewed cautiously, as net to gross ratios may be calculated slightly differently. In addition, climate and geography may have an impact on circulation and mechanical space requirements.

The Alberta Fenske formula provides an assignable area to gross area ratio of approximately 1.54 for campuses as a whole. However, this includes maintenance and stores space.

Published articles have indicated that for five science teaching facilities at U.S. colleges and community colleges, the ratio of net area to gross area varies from 1.51 to 1.70, with the average ratio around 1.62. Sciences facilities have some of the highest net to gross ratios

California State University provides direction for a portion of the net to gross factor through its standards for corridor widths, which are as follows:

- Corridors with offices on each side: 1,829 mm (6 ft)
- Corridors with offices on one side and instructional rooms on the other: 2,438 mm (8 ft)
- Corridors with instructional rooms on each side: 3,048 m (10 ft)

British Columbia

BC has made a significant investment into a Facilities Information System (FIS). As a result, **it is recommended that, where possible, data from this system and the methodology of this system should be used to calculate net to gross ratios.**

Table 11 provides a comparison of select buildings organized according to building type. The Gross Area for these buildings is compared to Total Usable Area and Total Assignable Area, based on the FIS data. The recommended net to gross standards are included.

It is important to note that because the net to gross ratio standards have been derived from FIS data, they likely differ from the ratios commonly used in the design industry as individual spaces may be categorized as net space or may be included in the net to gross ratio mark-up.

2. Standards & Guidelines Review

Table 11 – Comparison Of Gross Area, Total Usable (FIS Total) and Total Assignable For Selected Buildings

Building	Gross Area (m²)	Total Usable: FIS Total (m²)	Ratio to Gross Area	Total Assignable: FIS - ZZZ (m²)	Ratio to Gross Area
Classroom/Lab Buildings					
Capilano Classroom Building	4,316	4,000	1.08	2,876	1.50
Camosun College General Purpose Bldg *	1,904	1,763	1.08	1,335	1.43
Malaspina Education/Social Sciences	4,310	3,960	1.09	2,668	1.62
UCC Arts and Education Building *	5,543	5,132	1.08	3,546	1.56
OUC North Kelowna, Arts Building	6,589	5,805	1.14	3,934	1.67
OUC North Kelowna, Sciences Building	6,358	5,856	1.09	3,967	1.60
Totals	29,020	26,516	1.09	18,325	1.58
Recommended Guideline: 1.50 - 1.60					
Shops					
UCC Trades and Technology Building **	10,236	9,252	1.11	6,859	1.49
Recommended Guideline: 1.40 - 1.45					
Administrative/Student Services Buildings					
Capilano Student Service Building	10,704	10,117	1.06	7,089	1.51
OUC North Kelowna	3,953	3,817	1.04	2,862	1.38
Recommended Guideline: 1.40 - 1.50					
Library Buildings					
Capilano Library Building *	7,943	7,355	1.08	5,319	1.49
UCFV Library Building *	4,479	4,148	1.08	3,007	1.49
OUC North Kelowna	3,553	3,332	1.07	2,827	1.26
Recommended Guideline: 1.45 - 1.50					

<u>Notes:</u>
*   *Gross Area has been calculated by multiplying Total Usable by 1.08.*
** *Building includes office and classrooms as well as shop space.*

In Table 11, Total Usable is equal to Total Assignable Area plus Non-Assignable Area. Total Assignable Area includes all space that can be allocated to a specific function or occupant, except janitorial and public hygiene functions. Non-Assignable Area, categorized as ZZZ space in the FIS, includes circulation space (corridors, lobbies, staircases, etc.), building systems space (mechanical and electrical rooms, etc.) and public hygiene space (public washrooms, janitorial closets, etc.). The remaining area of the building, after Total Assignable Area and Non-Assignable Area are removed is equal to the structural area of the building and the area of all interior partitions.

A range for net to gross ratios has been provided for specific building types in Table 11. A number of factors can influence the net to gross ratio, including:

- the type of space. For example, an open office environment will result in a lower net to gross ratio than that achieved by the accommodating the same functions in enclosed offices. This is due to two factors. First, the

partitions between offices in the second instance will be included in the net to gross ratio. Second, and more importantly, the aisles between workstations in the open office scheme will be included in the Net Assignable Area. In the enclosed office scheme they will be included as Building Service space and not as Net Assignable Area. As a result, though the gross areas of the two schemes may be very similar, the net to gross ratio will be significantly higher for the enclosed office scheme.

- climate and geography, which may allow access by external corridors and differences in the sizing of mechanical rooms.

- siting constraints. For example, the site may dictate the shape of a building or the building may be required to serve as a major campus pedestrian conduit.

- the number and type of occupants of a facility. For example, wheelchair access considerations serve to increase net to gross ratios as ramping or areas of refuge may be required. Again, numbers of occupants drive the requirement for public washrooms.

Improvements in the way FIS data is collected and reported will result in a better understanding of net to gross ratios within the BC college, institute and university college system. Possible improvements to the FIS data include developing a gross area for each building, ensuring that FIS data can be easily extracted by building, and that the building services categories (435, 530, 655 and ZZZ) are allocated only to building services functions and exclude storage and those portions of corridors and lobbies which serve functions besides circulation.

3. Proposed BC Standards

Space   *College,*
Standards   *University College,*
Review   *and Institute System*   **INSTRUCTIONAL SPACE UTILIZATION STANDARDS**

3. Proposed BC Standards ———————————————————

(0000\document\progreport.doc)

INSTRUCTIONAL SPACE UTILIZATION STANDARDS

The recommended utilization standards for instructional space are as follows:

| | Definition of Size | Context | ASCHs/ST ST | |
			Classroom/Laboratory	Shop/Teaching Kitchen
Large Campus	Over 1,250,000 ASCHs	N/A	1,000	825
Mid-Sized Campus	250,000 to 1,250,000 ASCHs	Urban	800	650
		Non-Urban	750	620
Small	Less than 250,000	N/A	650	540

Space   *College,*
Standards   *University College,*   Instructional Station Space Standards
Review   *and Institute System*   **UNIT AREA STANDARDS**

3. Proposed BC Standards

UNIT AREA STANDARDS

INSTRUCTIONAL STATION SPACE STANDARDS

Station Type	Definition	Area/ST ST (net m^2)	Support Space Rate
Classroom/Lecture Theatre			
Seminar/Small Classroom	Up to 60.0 m^2	2.50	5%
Mid-Sized Classroom	61.0 and 117 m^2	1.95	5%
Mid-Sized Tiered Classroom	40.0 and 100 m^2	1.65	5%
Large Classroom	Over 117 m^2	1.50	5%
Lecture Theatre	Over 100 m^2	1.80	15%
Videoconferencing Room		2.50	15%
Laboratories			
Computer/Language/Business		3.40	10%
CAD/GIS/Drafting/Multimedia		5.50	15%
Dry Science– Lower Level		3.00	10%
Dry Science– Upper Level		4.60	10%
Wet Science– Lower Level		5.00	50%
Wet Science– Upper Level		6.00	50%
Electronics		8.50	50%
Nursing/Community Care		7.00	30%
Fine Arts Studio – Painting/Drawing		5.00	30%
Shops			
Carpentry/Building Trades		15.00	10%
Electrical		15.00	55%
Welding		10.00	25%
Machine Tools/Millwright		21.00	30%
Automotive Mechanics		22.00	15%
Heavy Duty/Diesel		23.00	15%
Fine Arts Studio – Sculpture		7.50	35%

Space College,
Standards University College,   Ancillary Support Space Standards
Review and Institute System   **UNIT AREA STANDARDS**

3. Proposed BC Standards

ANCILLARY SUPPORT SPACE STANDARDS

Space Type	Campus Size	Allocation per 1000 ASCHs (net m^2)
Office – Administration and Faculty	First 250,000 ASCHs	1.6
	Over 250,000 ASCHs	1.8
Combined Library, Reading/Study, Lounge	All Campuses	1.35
Cafeteria/Food Services	Up to 200,000 ASCHs	Case-by-case
	Over 200,000 ASCHs	0.5
Additional Campus Activities	First 250,000 ASCHs	0.25
	Over 250,000 ASCHs	0.65

Space   *College,*
Standards *University College,*
Review   *and Institute System*   **NET TO GROSS RATIO STANDARDS**

3. Proposed BC Standards

(0000\document\progreport.doc)

NET TO GROSS RATIO STANDARDS

Building Type	Net to Gross Ratio – Range *
Classroom/Laboratory Building	1.50 – 1.60
Shops Building	1.40 – 1.45
Administrative/Student Services Building	1.40 – 1.50
Library Building	1.45 – 1.50

<u>Notes:</u>
*   Net to Gross ratios are based on FIS definitions which may differ from industry conventions. See p. 2.61 for definitions.

Appendices

Space   *College,*
Standards   *University College,*
Review   *and Institute System*

APPENDIX A –
SUMMARY OF STUDY RECOMMENDATIONS

Appendices ───────────────────────────────

(0000\document\progreport.doc)

APPENDIX A – SUMMARY OF STUDY RECOMMENDATIONS

Throughout the study, recommendations have been made regarding the Facilities Inventory System, analysis of program mix, utilization standards, unit area standards and net to gross ratio standards. They have been assembled together under these respective headings, for reference.

Facilities Inventory System

It is recommended that either an audit of inventory information be completed by a single party or that an instructional session be conducted to train those staff from each institution who will be assembling inventory information to ensure the consistent application of definitions when assembling inventory information.

It is recommended that a list of relevant functional units be developed as part of the FIS and that space be allocated to these categories where appropriate to assist in the analysis of all ancillary support space.

Program Mix

It is recommended that information about program mix by campus should be developed and used to analyze utilization. This will result in a better understanding of the implications of program mix on utilization.

Utilization Standard

It is recommended that campus size be factored into utilization standards, with lower utilization expected of small campuses.

It is recommended that data on program mix by campus be developed so that an analysis can be conducted on the impact of program type on utilization.

It is recommended that the relative proportions of laboratory/shop stations to classroom stations should not be factored into utilization standards.

It is recommended that the relative proportions of shop and teaching kitchens to classroom and laboratory stations should be factored into campus utilization standards.

It is recommended that the application of the different utilization standards for classroom/laboratory stations and shop/teaching kitchens should be based on the proportions of stations of each type at a campus.

It is recommended that the standards be evaluated in the future to ensure levels of utilization are reasonable and that the instrument proves workable.

Space   *College,*
Standards   *University College,*
Review   *and Institute System*

**APPENDIX A –
SUMMARY OF STUDY RECOMMENDATIONS**

Appendices ——————————————————————————

(0000\document\progreport.doc)

Unit Area Standards – Instructional Space

It is recommended that student station space standards continue to generally reflect the actual capacities of instructional rooms. This requires the provision of a number of different area per station standards for different room sizes, in the case of classrooms, and the development of standards for the more commonly found laboratories and shops, that can be applied uniformly to all institutions.

It is recommended that standards for classroom, laboratory and shop support space be developed to provide uniformity between campuses and to facilitate future planning endeavours.

For unique laboratories and shops, areas for student stations should be developed by design professionals working in concert with institutional staff and Ministry officials. Student station areas and utilization for these spaces should be based on actual room capacity.

Unit Area Standards – Ancillary Support Space

It is recommended that consistent methods of categorizing office space be developed that indicate the function each office serves, i.e., use by faculty, administrative staff, student services staff, student association, etc., and, in the case of faculty offices, to which program the office belongs. This will enable a more detailed analysis of office space utilization in the future.

It is recommended that, for administration, student support, and faculty office space, an overall net office space allocation of 1.6 net m^2 per 1,000 ASCHs be applied to the first 250,000 ASCHs and that a rate of 1.8 net m^2 per 1,000 ASCHs (or base of 400 m^2) apply to remaining ASCHs.

It is recommended that the standard for library/AV, lounge and reading/study space be combined. The rate of 1.35 net m^2 per 1,000 ASCHs should be generally applied to campuses, with institutions given the discretion to allocate resources to each function.

It is recommended that a standard of 0.5 net m^2 per 1,000 ASCHs, slightly below that of Alberta, be used for cafeteria and food services for campuses larger than 200,000 ASCHs.

It is recommended that a standard of 0.25 net m^2 per 1,000 ASCHs be used for a campus' first 250,000 ASCHs, and that a standard of 0.65 m^2 per 1,000 ASCHs apply to remaining ASCHs. This is an interim standard only and should be confirmed when more comprehensive FIS data is available.

Net to Gross Ratios

Space
Standards
Review

College,
University College,
and Institute System

APPENDIX A –
SUMMARY OF STUDY RECOMMENDATIONS

Appendices

(0000\document\progreport.doc)

It is recommended that, where possible, data from FIS and the methodology of FIS should be used to calculate net to gross ratios.

Space   *College,*
Standards   *University College,*
Review   *and Institute System*

**APPENDIX B –
LAB/SHOP SPACE STANDARDS – OTHER JURISDICTIONS**

Appendices ————————————————————————————

(0000\document\progreport.doc)

APPENDIX B – LAB/SHOP SPACE STANDARDS – OTHER JURISDICTIONS

The diagram below shows lab and workstation types and space standards as used by the State of California Community College system.

**EXHIBIT 5.1.2   Student Station Sizes (ASF)
by Discipline and Level for Teaching Labs
California Community Colleges**

Discipline	ASF[a]
Agriculture	115
Air Conditioning	130
Architecture	60
Auto-Body & Fender	200
Auto-Mechanic	200
Auto-Technology	75
Aviation Maintenance	175
Biological Sciences	55
Business and Management	30
Carpentry	175
Commercial Services	50
Communications	50
Computer & Information Science	40
Diesel	200
Dry-Wall	175
Education	75
Electricity	175
Engineering	75
Fine & Applied Arts	60
Foreign Language	35
Glazing	175
Graphic Arts	80
Health Services	50
Heavy Equipment	200
Home Economics	60
Interdisciplinary	60
Letters	35
Library Science	35
Machine Tools	90
Masonry	175
Mathematics	35
Metal Trades	90
Millwork	90
Painting	175
Physical Sciences	60
Plastering	175
Plastics	130
Plumbing	175
Psychology	35
Public Affairs & Service	50
Refrigeration	130
Roofing	175
Small Engine Repair	100
Social Sciences	35
Stationary Engine	200
Welding	90

a. Includes support space.

Space   *College,*
Standards   *University College,*   **APPENDIX B –**
Review   *and Institute System*   **LAB/SHOP SPACE STANDARDS – OTHER JURISDICTIONS**

Appendices ───

(0000\document\progreport.doc)

The following table is representative of the standards used by the University of Minnesota.

Academic Unit	Research Allowance ASF	Instructional Standard Station/Service ASF	Factor ASF
College of Agriculture			
Agriculture & Applied Econ.	20	15/1	1.0
Agricultural Engineering	300	80/16	6.0
Agronomy & Plant Genetics	220	55/9	4.0
Animal Science	300	80/16	6.0
Entomology	220	40/8	3.0
Food Science & Nutrition	300	70/10	5.0
Horticultural Science	300	55/9	4.0
Plant Pathology	220	55/9	4.0
Rhetoric	20	25/7	2.0
Soil Science	220	55/9	4.0
Col. of Arch & Landscape Arch.			
Architecture	80	70/10	5.0
Landscape Architecture	80	70/10	5.0
College of Biological Sciences			
Biochemistry	300	55/9	4.0
Ecology & Behav. Biology	300	55/9	4.0
General Biology Program	220	25/7	2.0
Genetics & Cell Biology	300	40/8	3.0
Plant Biology	300	55/9	4.0
College of Education			
Child Development	100	24/8	2.0
Curriculum & Instruction	80	40/8	3.0
Educational Policy & Admin.	20	15/1	1.0
Educational Psychology	100	24/8	2.0
Kinesiology	100	150/50	12.5
Social & Philosophical Found.	80	24/8	2.0
Voc. & Tech. Education Dept.	100	80/16	6.0
College of Human Ecology			
Design, Housing & Apparel	100	70/10	5.0
Family Social Science	40	25/7	2.0
Food Science & Nutrition	300	70/10	5.0
Social Work	20	15/1	1.0
Youth Development & Res.	40	25/7	2.0
College of Liberal Arts			
Afro American Studies	20	15/1	1.0
American Studies Program	20	15/1	1.0
Ancient Studies	20	30/2	.8*
Anthropology	100	30/18	3.0
Art History	40	16/16	2.0
Classical & Near Eastern Stu.	20	15/1	1.0
Communication Disorders	120	24/8	2.0
Comparative Literature	20	15/1	1.0
Composition and Commun.	20	15/1	1.0
Dance	100	150/50	12.5
Economics	20	15/1	1.0
English	20	15/1	1.0
French & Italian	20	30/2	.8*
Geography	100	40/8	3.0
German	20	30/2	.8*
History	20	15/1	1.0
International Studies	20	15/1	1.0
Journalism & Mass Comm.	40	40/8	3.0
Languages and Literatures	20	15/1	1.0
Music	40	40/8	3.0
Music - Practice	--	70/2	1.8*
Philosophy	20	15/1	1.0
Political Science	20	36/12	3.0
Psychology	220	24/8	2.0
Russian & E Eur. Studies	20	30/2	.8*
Scandinavian	20	30/2	.8*
Sociology	20	32/16	3.0
South Asian Studies	20	15/1	1.0
Spanish & Portuguese	20	30/2	.8*
Speech Communication	40	15/1	1.0
Statistics - Applied & Theor.	20	15/1	1.0
Studio Arts	220	90/6	6.0
Studio Arts - Studio	--	90/6	2.4*
Theater Arts	20	90/6	6.0
Women's Studies	20	15/1	1.0
College of Natural Resources			
Fisheries & Wildlife	220	40/8	3.0
Forest Products	300	55/9	4.0
Forest Resources	220	25/7	2.0

Space   *College,*
Standards   *University College,*
Review   *and Institute System*

**APPENDIX C –
WASHINGTON CAM METHOD**

Appendices ———————————————————————

(0000\document\progreport.doc)

APPENDIX C – WASHINGTON CAM METHOD

The diagram below illustrates for one campus the use of the Capital Analysis Model. Starting with assumptions of FTE delivered in the future, assignable areas for various types of instructional and support space are generated.

PLANNED 2005
AVERAGE ANNUAL FTEs
DAYTIME, ON-CAMPUS   PERCENT   COLLEGE: Olympic C.

ACADEMIC	2,005	63%
VOCATIONAL	829	26%
BASIC SKILLS	354	11%
TOTAL	3,188	100%

TYPE OF SPACE		INITIAL 1,000 FTEs						FTEs OVER 1,000						COMBINED ACADEMIC,VOC.,& B.SKILLS				COMBINED ACADEMIC				TOTALS
		630	FTES	260	FTEs	110	FTEs	1,378	FTES	569	FTEs	241	FTEs	1,000	FTES	2,188	FTEs	500	FTES	1,005	FTEs	
		RATE	ACADEMIC	RATE	VOC.	RATE	B SKILLS	RATE	ACADEMIC	RATE	VOC.	RATE	B.SKILLS	RATE	1st 1,000	RATE	OVER 1,000	RATE	1st 500	RATE	OVER 500	
GEN CLASSRM	Sq Ft	12.4	7,812	7.5	1,950			11.4	15,709	6.9	3,926				9,762		19,635					29,397
SCIENCE LABS	Sq Ft	6	3,780	3.5	910			5.2	7,166	3	1,707				4,690		8,873					13,563
COMPUTER LABS	Sq Ft	2.8	1,764	2.8	728	2.8	308	2.8	3,858	2.8	1,593	2.8	675		2,800		6,126					8,926
B. SKILLS LABS	Sq Ft					27.6	3,036					27.6	6,652		3,036		6,652					9,688
ART	Sq Ft																	5	2,500	2	2,010	4,510
MUSIC	Sq Ft																	3	1,500	1.5	1,508	3,008
DRAMA	Sq Ft																		1,500			1,500
AUDITORIUM *	Sq Ft																		4,000			4,000
LIBRARY/LRC	Sq Ft	16.8	10,584	12	3,120	12	1,320	8.5	11,713	7	3,983	7	1,687		15,024		17,383					32,407
PHYS EDUCATION	Sq Ft																	26	13,000	10	10,050	23,050
FACULTY OFFICE	Sq Ft	6	3,780	7.5	1,950	6	660	6	8,268	7.5	4,268	6	1,446		6,390		13,982					20,372
ADMIN./STU SERV.	Sq Ft	8.98	5,657	8.98	2,335	8.98	988	5.13	7,069	5.13	2,919	5.13	1,236		8,980		11,224					20,204
S CTR. & RELATE	Sq Ft	13.19	8,310	13.19	3,429	13.19	1,451	7.97	10,983	7.97	4,535	7.97	1,921		13,190		17,438					30,628
C STORES/MAINT	Sq Ft	7	4,410	7	1,820	7	770	4	5,512	4	2,276	4	964		7,000		8,752					15,752
CHILD CARE	Sq Ft	2.8	1,764	2.8	728	2.8	308	2.8	3,858	2.8	1,593	2.8	675		2,800		6,126					8,926

* NOTE: FIRST 500 ACADEMIC OR VOCATIONAL FTEs

APPENDIX D – UTILIZATION INFORMATION FROM BC AND OTHER JURISDICTIONS

The following table provides measures of service delivery and facilities and uses these to calculate a variety of utilization measures, including area per station, gross area per student FTE/FLE, gross area per ASCH and ASCHs/student station.

Jurisdiction	FIS Total Area (m²)	Gross Area (m²)	No. Student Stations	Area/ Station (m²)	Laboratory/ Shop Instructional Area (m²)	No. Student Stations	Area/ Station (m²)	Student FTE/FLE [1]	Annual Student Contact Hours	Gross Area/ Student FLE/FTE	Gross Area/ ASCH	ASCHs/ ST ST
Alberta												
ACAD		34,027	781	2.7	6,040	549	11.0	795	572,777	42.8	0.059	431
Fairview College		32,860	1,628	3.3	7,586	625	12.1	800	382,216	41.1	0.086	170
Grand Prairie		39,133	1,634	2.5	5,257	1,006	5.2	1,375	889,044	28.5	0.044	337
Grant MacEwan		108,574	4,639	2.2	13,946	3,233	4.3	6,850	3,093,247	15.9	0.035	393
Keyano College		39,125	900	3.2	6,146	702	8.8	1,255	669,420	31.2	0.058	418
Lakeland College		50,941	2,347	1.9	12,166	1,438	8.5	1,275	1,036,729	40.0	0.049	274
Lethbridge CC		62,332	2,599	3.1	12,975	1,271	10.2	3,330	2,624,766	18.7	0.024	678
Medicine Hat		39,569	1,733	3.1	7,052	1,318	5.4	1,950	1,087,490	20.3	0.036	356
Mount Royal		103,843	4,512	2.2	8,872	1,408	6.3	6,450	3,151,840	16.1	0.033	532
Olds College		54,963	1,304	2.9	8,675	960	9.0	1,130	908,504	48.6	0.060	401
Red Deer		53,915	2,088	2.4	12,908	1,836	7.0	3,685	2,127,061	14.6	0.025	542
NAIT		186,247	6,692	2.1	52,204	6,453	8.1	9,200	8,417,551	20.2	0.022	640
SAIT		210,818	5,486	2.4	43,122	5,395	8.0	8,686	7,473,935	24.3	0.028	687
Alberta Totals	-	1,016,347	36,343	2.4	196,949	26,194	7.5	45,986	32,434,580	22.1	0.031	519
British Columbia												
BCIT	n/a	n/a	n/a		n/a	n/a		n/a	n/a	n/a		
Camosun	60,491	65,330	4,272	2.3	16,174	1,875	8.6	5,846	4,785,759	11.2	0.014	779
Capilano	43,405	46,877	2,843	2.2	8,512	1,642	5.2	4,720	3,683,607	9.9	0.013	821
CNC	45,111	48,720	2,321	2.7	14,668	1,319	11.1	2,472	2,031,569	19.7	0.024	558
COR	19,563	21,128	1,225	2.6	5,286	583	9.1	1,238	1,207,266	17.1	0.018	668
Douglas	57,938	62,573	3,783	2.0	8,512	1,785	4.8	5,848	4,683,993	10.7	0.013	841
ECIAD	17,247	18,627	429	2.7	7,862	876	9.0	977	787,971	19.1	0.024	604
Kwantlen	70,860	76,529	4,384	2.6	20,693	2,976	7.0	7,636	5,533,260	10.0	0.014	752
Langara	36,948	39,904	3,738	1.7	6,073	1,581	3.8	5,283	3,921,485	7.6	0.010	737
Malaspina	56,533	61,056	n/a	n/a	n/a	n/a	n/a	5,179	4,405,020	11.8	0.014	n/a
NIC	21,052	22,736	1,391	2.7	7,638	991	7.7	2,070	1,666,568	11.0	0.014	700
NLC	28,718	31,015	1,048	3.0	7,471	664	11.3	1,699	1,955,944	18.3	0.016	1,142
North West CC	25,575	27,621	1,600	2.4	5,575	427	13.1	1,273	1,229,156	21.7	0.022	606
Okanagan UC	66,967	72,324	4,842	2.0	16,419	2,959	5.5	5,643	4,512,475	12.8	0.016	578
Selkirk	29,206	31,542	1,950	2.3	7,187	875	8.2	2,200	1,618,810	14.3	0.019	573
UCC	66,662	71,995	3,910	2.4	15,580	1,894	8.2	5,007	3,677,693	14.4	0.020	634
UCFraser Valley	45,481	49,119	3,034	2.2	10,899	2,025	5.4	4,280	2,685,881	11.5	0.018	531
VCC	54,647	59,019	3,677	2.3	14,942	2,795	5.3	7,463	6,982,457	7.9	0.008	1,079
Total	746,404	806,116	44,447	2.3	173,491	25,267	6.9	68,834	55,368,914	11.7	0.015	794
Ontario												
Algonquin		107,345						15,666	9,791,715	6.9	0.011	
Cambrian		91,687						5,413	3,259,418	16.9	0.028	
Canadore		44,975						3,817	2,274,143	11.8	0.020	
Centennial		91,687						13,451	8,379,852	6.8	0.011	
Conestoga		76,355						6,578	4,188,377	11.6	0.018	
Confederation		49,324						4,624	2,412,425	10.7	0.020	
Durham		58,190						6,139	3,909,364	9.5	0.015	
Fanshawe		89,184						12,296	7,481,299	7.3	0.012	
Fleming		59,080						7,545	4,648,776	7.8	0.013	
George Brown		114,067						14,509	8,580,066	7.9	0.013	
Georgian		61,425						7,146	4,415,286	8.6	0.014	
Humber		109,655						16,288	9,832,199	6.7	0.011	
La Cite		48,056						4,427	2,686,141	10.9	0.018	
Lambton		30,284						2,958	1,827,708	10.2	0.017	
Loyalist		37,730						4,020	2,531,202	9.4	0.015	
Mohawk		97,642						10,965	6,543,816	8.9	0.015	
Niagara		55,459						6,630	4,162,759	8.4	0.013	
Northern		44,161						1,951	1,206,380	22.6	0.037	
Sault		45,178						4,134	2,034,792	10.9	0.022	
Seneca		116,562						19,706	12,711,326	5.9	0.009	
Sheridan		84,208						13,479	8,657,050	6.2	0.010	
St. Clair		74,060						8,240	4,819,434	9.0	0.015	
St. Lawrence		66,888						6,552	3,958,444	10.2	0.017	
		1,653,202						196,534	120,311,972	8.4	0.014	

Space
Standards
Review

College,
University College,
and Institute System

**APPENDIX D – UTILIZATION INFORMATION
FROM BC AND OTHER JURISDICTIONS**

Appendices

Jurisdiction	FIS Total Area (m²)	Gross Area (m²)	No. Student Stations	Area/ Station (m²)	Laboratory/ Shop Instructional Area (m²)	No. Student Stations	Area/ Station (m²)	Student FTE/FLE [1]	Annual Student Contact Hours	Gross Area/ Student FLE/FTE	Gross Area/ ASCH	ASCHs/ ST ST
Washington												
Peninsula		16,589						2,543		6.5		
Grays Harbour		18,585						1,808		10.3		
Olympic		31,104						4,334		7.2		
Skagit Valley		38,327						3,990		9.6		
Everett		40,706						4,263		9.5		
Seattle Central		88,868						6,332		14.0		
Seattle North		68,677						4,533		15.2		
Seattle South		47,353						4,293		11.0		
Seattle Vocational Institute		10,591						469		22.6		
Shoreline		43,133						5,734		7.5		
Bellevue		48,809						8,360		5.8		
Highline		43,821						6,176		7.1		
Green River		43,816						5,928		7.4		
Pierce		40,873						7,832		5.2		
Centralia		22,793						2,371		9.6		
Lower Columbia		35,194						2,335		15.1		
Clark		52,694						6,406		8.2		
Wenatchee Valley		22,869						2,444		9.4		
Yakima Valley		36,502						3979		5.7		
Spokane		91,906						5715		37.6		
Spokane Falls		60,102						8,678		15.1		
Big Bend		36,601						1,522		6.4		
Columbia Basin		39,552						4,608		4.6		
Walla Walla		41,923						3,860		27.5		
Whatcom		18,587						2,779		4.0		
Tacoma		33,748						5,123		8.7		
Edmonds		47,267						6,668		17.0		
So. Puget Sound		26,747						3,443		5.2		
Bellingham		17,421						1,450		2.6		
Lake Washington		32,825						3,134		9.5		
Renton		35,398						3,877		24.4		
Bates		49,610						4,768		15.8		
Clover Park		42,564						3,697		11.0		
		1,325,555						143,452		9.2		

Notes:
1. *Student station numbers for BC institutions are based on inventory information 1995 and 1999/2000 developed and supplied by each institution.*

Space *College,*
Standards *University College,*
Review *and Institute System*

APPENDIX E –
BC CAMPUSES BY ASCH TARGET SIZE (2002/03)

Appendices ──

APPENDIX E – BC CAMPUSES BY ASCH TARGET SIZE (2002/03)

The table below lists BC campuses by target size in ASCHs based on target utilization for 2003.

	Institution	Campus	98/99 ASCHs/ST ST	98/99 ASCHs (000s)	2002/03 Target ASCHs/ST ST	2002/03 Target ASCHs (000s)
Small Campuses: Less Than 250,000 ASCHs (2002/03)	UCC	Merritt	218.36	29	251.11	33
	CNC	Nechako	227.36	43	250.1	47
	NWCC	Houston	765.36	46	880.16	53
	CNC	MacKenzie	352.23	52	387.45	57
	SLK	Grand Forks	436.24	60	479.86	66
	COR	Golden	406.05	65	446.66	72
	NIC	Port Hardy	187.20	67	224.64	80
	CPC	Squamish	510.12	72	586.64	83
	NWCC	Hazelton	517.15	82	594.72	94
	NWCC	Kitimat	350.03	89	402.53	102
	COR	Creston	453.55	95	498.91	105
	COR	Fernie	412.21	99	453.43	109
	UCFV	Mission	247.43	95	296.92	114
	CNC	Quesnel	553.32	120	586.65	127
	CPC	Sechelt	1,309.69	113	1506.14	130
	NLC	Chetwynd	573.15	123	687.78	148
	MUC	Parksville	1,139.86	141	1310.84	162
	NWCC	Smithers	1,177.58	142	1354.22	163
	NVIT	Merritt	513.73	137	616.48	164
	UCC	Williams Lake	497.93	145	572.62	167
	BCIT	PMTC	284.22	147	326.85	169
	CNC	Lake District	780.76	155	858.84	171
	SLK	Trail	310.13	157	341.14	173
	NLC	Fort Nelson	816.22	208	979.46	250
Mid-Sized Campuses: 250,000 to 1,250,000 ASCHs (2002/03)	OUC	Salmon Arm	661.59	248	760.83	285
	NWCC	Prince Rupert	515.20	266	592.48	306
	MUC	Powell River	515.39	270	592.7	311
	BCIT	Sea Island	558.05	285	641.76	328
	OUC	Penticton	640.82	362	736.94	416
	NIC	Port Alberni	459.75	348	551.7	418
	NLC	Dawson Creek	363.93	431	436.72	517
	MUC	Cowichan	798.82	483	918.64	555
	SLK	Nelson	438.55	506	482.41	557
	BCIT	Downtown	941.91	510	1083.2	587
	NLC	Fort St. John	820.45	489	984.54	587
	OUC	Vernon	659.50	537	758.43	618
	NWCC	Terrace	505.30	550	581.1	633
	NIC	Campbell River	659.10	598	790.92	718
	NIC	Courtenay/Comox	779.68	653	935.62	784
	UCFV	Chilliwack	381.15	681	457.38	817
	SLK	Castlegar	503.13	769	553.44	846
	ECIAD	Granville Island	584.43	788	642.87	867
	COR	Cranbrook	506.11	805	556.72	885
	KUC	Langley	404.61	869	485.53	1,043
	KUC	Newton	534.42	922	641.3	1,106
	Douglas	David Lam	668.77	1,008	769.09	1,159
Large Campuses: > 1,250,000 ASCHs (2002/03)	OUC	North Kelowna	664.41	1,217	764.07	1,400
	CNC	PrinceGeorge	492.69	1,661	541.96	1,827
	KUC	Surrey	848.67	1,723	1018.4	2,068
	UCFV	Abbotsford	506.39	1,910	607.67	2,292
	OUC	Kelowna	573.83	2,020	659.9	2,323
	KUC	Richmond	856.32	2,019	1027.58	2,423
	CMC	Interurban	573.40	2,259	630.74	2,485
	CMC	Landsdowne	974.11	2,527	1071.52	2,780
	VCC	City Centre	1,005.12	2,736	1105.63	3,010
	VCC	King Edward	1,340.49	3,183	1474.54	3,501
	CPC	Lynmour	766.47	3,499	881.44	4,024
	UCC	Kamloops	668.10	3,503	768.32	4,028
	MUC	Nanaimo	661.09	3,511	760.25	4,038
	Douglas	Royal	882.15	3,583	1014.47	4,120
	LGC	Langara	774.03	3,921	851.43	4,313
	BCIT	Burnaby	741.69	8,015	852.94	9,217

Space *College,*
Standards *University College,*
Review *and Institute System*

Appendices

APPENDIX F –
BC CAMPUSES BY SIZE AND CONTEXT

(0000\document\progreport.doc)

APPENDIX F – BC CAMPUSES BY SIZE AND CONTEXT

The table below organizes BC campuses according to size and geographical and climatic conditions.

Institution	Campus	Small: <250,000 ASCHS		Mid-Sized: >250,000 to 1,250,000 ASCHs		Large: >1,250,000 ASCHs
		Typical	Other	Non-Urban	Urban	
BCIT	Burnaby					✓
	PMTC		✓			
	Downtown				✓	
	Sea Island				✓	
CMC	Interurban					✓
	Lansdowne					✓
CPC	Lynnmour					✓
	Sechelt	✓				
	Squamish	✓				
CNC	Prince George					✓
	Lake District	✓				
	MacKenzie	✓				
	Nechako	✓				
	Quesnel	✓				
COR	Cranbrook					✓
	Creston	✓				
	Fernie	✓				
	Golden	✓				
	Invermere	✓				
Douglas	Royal Ave.					✓
	David Lam				✓	
ECIAD					✓	
KUC	Newton				✓	
	Langley				✓	
	Surrey					✓
	Richmond					✓
Langara						✓
MUC	Nanaimo					✓
	Powell River			✓		
	Cowichan			✓		
	Parksville		✓			
NVIT			✓			
NIC	Port Alberni			✓		
	Campbell River			✓		
	Courtenay/Comox			✓		
	Port Hardy	✓				
NLC	Chetwynd	✓				
	Dawson Creek			✓		
	Fort Nelson	✓				
	Fort St. John			✓		
NWCC	Terrace			✓		
	Prince Rupert			✓		
	Houston	✓				
	Hazelton	✓				
	Smithers	✓				
	Kitimat	✓				
OUC	Salmon Arm			✓		
	Kelowna					✓
	North Kelowna					✓
	Vernon			✓		
	Penticton			✓		
Selkirk	Nelson			✓		
	Grand Forks	✓				
	Trail	✓				
	Castlegar			✓		
UCC	Merrit	✓				
	Williams Lake	✓				
	Kamloops					✓
UCFV	Chilliwack			✓		
	Abbotsford					✓
	Mission	✓				✓
VCC	City Centre					✓
	King Edward					✓

Space *College,*
Guidelines *University College,*
Review *and Institute System*

APPENDIX G –
BEST PRACTICES EXAMPLES

Appendices ───────────────────────────────────────

(0000\document\progreport.doc)

Space Type: **1. Classroom**
A. Seminar or Small Classroom

Institution: *The University College of the Cariboo*
Campus: *Kamloops Campus*
Building: *Trades and Technology*
Room Number: *149*
Capacity*: 24*

Remarks: *Provides storage cabinets for specialized instruction in addition to adjacent storage room to store teaching aids. Includes ceiling-mounted TV and VCR.*

Area Per Student Station: *2.50 m^2*

Space *College,*
Guidelines *University College,*   **APPENDIX G –**
Review *and Institute System*   **BEST PRACTICES EXAMPLES**
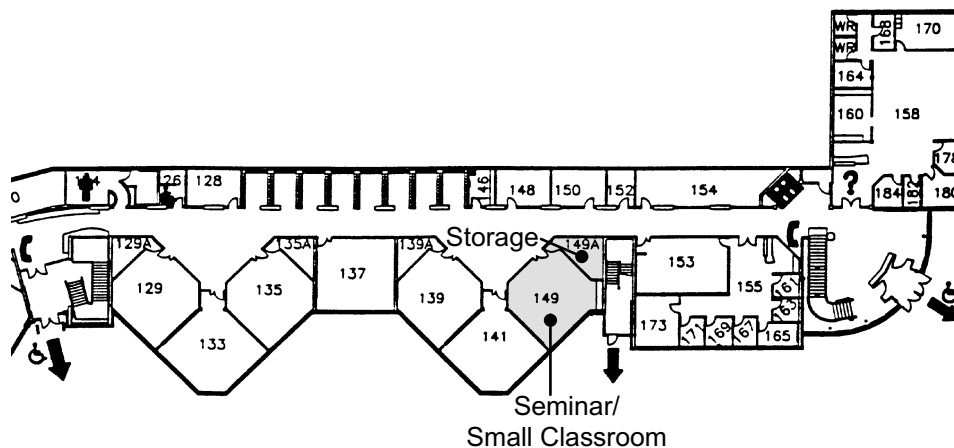
Appendices _____

(0000\document\progreport.doc)

Space Type: **1. Classroom**
                 B. Mid-Sized Classroom

Institution: *Capilano College*   ***Remarks:*** *Accommodates 5' x 3' tables; provides adequate*
Campus: *Lynmour Campus*   *comfort and workability for 20 tables/ instructor/AV*
Building: *Cedar*   *equipment*
Room Number: *231*
Capacity: *40*

Area Per Student Station: *1.93 m²*

Space   *College,*
Guidelines   *University College,*
Review   *and Institute System*
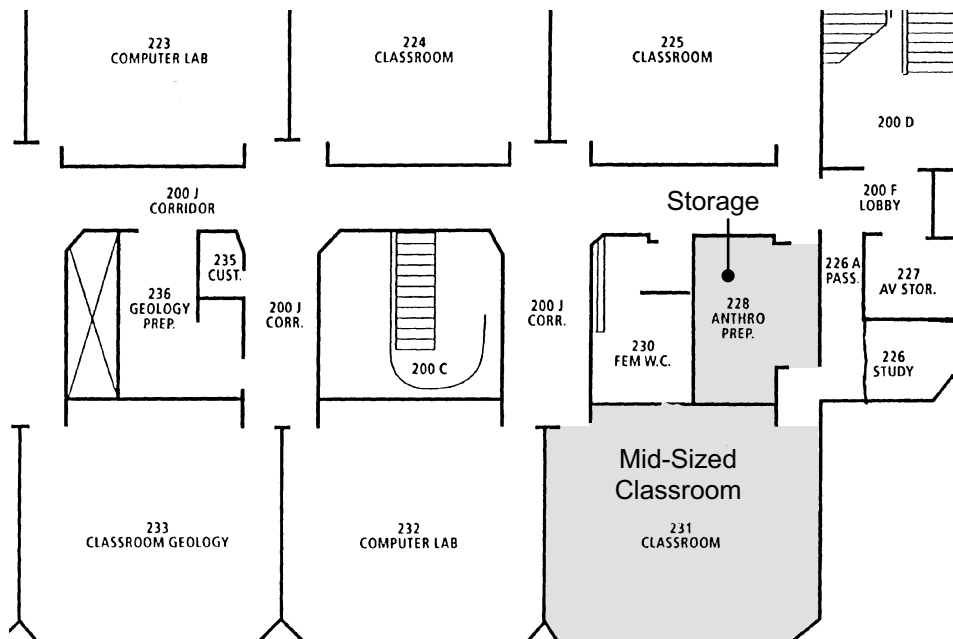
APPENDIX G –
BEST PRACTICES EXAMPLES

Appendices

Space Type: **1. Classroom**
              C. Mid-Sized Tiered Classroom

Institution: *Malaspina University College*
Campus: *Nanaimo Campus*
Building: *356*
Room Number: *315*
Capacity*: 42*

Remarks: *Room is an excellent example of a case-style room with ideal proportions for teaching and in-class discussion. Sight-lines to board and projection screen are adequate.*

Area Per Student Station: *1.65 m^2*

Space   *College,*
Guidelines   *University College,*
Review   *and Institute System*

**APPENDIX G –
BEST PRACTICES EXAMPLES**

Appendices

Space Type: **1. Classroom
D. Lecture Theatre**

Institution: *Capilano College*
Campus: *Lynmour Campus*
Building: *Cedar*
Room Number: *148*
Capacity: *91*

Remarks: Fixed continuous desks provide adequate worksurface for textbooks and notepaper. Fixed swing out seats allow compact aisles between the desks. Theatre does not meet current code requirements with regard to row aisle widths.

Area Per Student Station: *1.71 m^2*

Space   *College,*
Guidelines   *University College,*
Review   *and Institute System*

**APPENDIX G –
BEST PRACTICES EXAMPLES**

Appendices ──────────────────────────────────

(0000\document\progreport.doc)

Space Type: **1. Classroom
E. Videoconference Classroom**

Institution: *The University College of the Cariboo*
Campus: *Kamloops Campus*
Building: *Old Main*
Room Number: *1472*
Capacity: *27*

Area Per Student Station: *2.29 m^2*

Remarks: Movable desks provide just adequate worksurface for textbooks, notepaper and microphones. TVs (there are 4) could be ceiling mounted. Entry/egress pathways are somewhat constricted.

Space   *College,*
Guidelines   *University College,*
Review   *and Institute System*

APPENDIX G –
BEST PRACTICES EXAMPLES
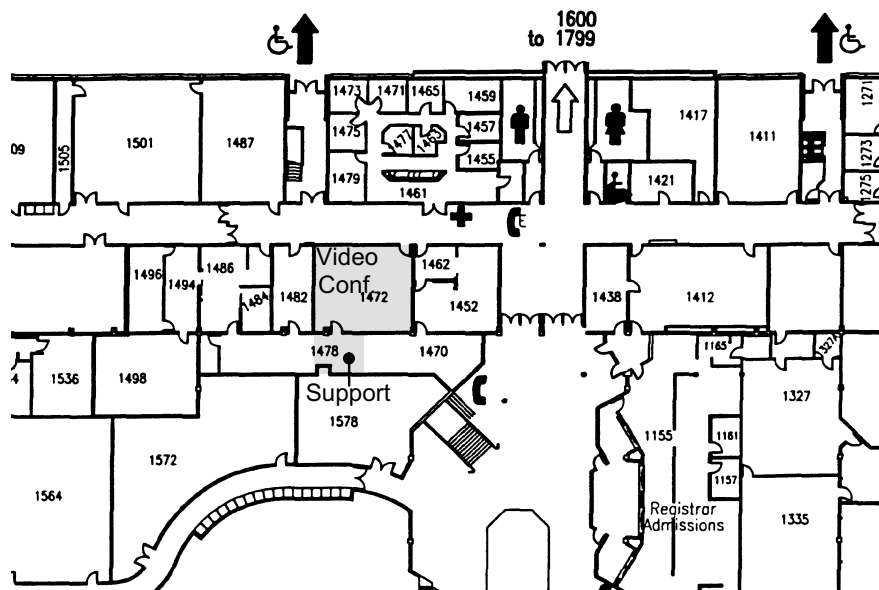
Appendices ──────────────────────────────────

Space Type: **2. Laboratory**
                 A. Computer/Language/Business – Drop-In Computer

Institution: *The University College of the Cariboo*
Campus: *Kamloops Campus*
Building: *Old Main*
Room Number: *1429*
Capacity*: 15*

Area Per Student Station: *2.40 m^2*

Remarks: Use of open corridor space for drop-in lab is space efficient. Lab precinct with a single entrance facilitates the effective monitoring and support of multiple labs.

Space *College,*
Guidelines *University College,*
Review *and Institute System*

**APPENDIX G –
BEST PRACTICES EXAMPLES**

Appendices _____

(0000\document\progreport.doc)
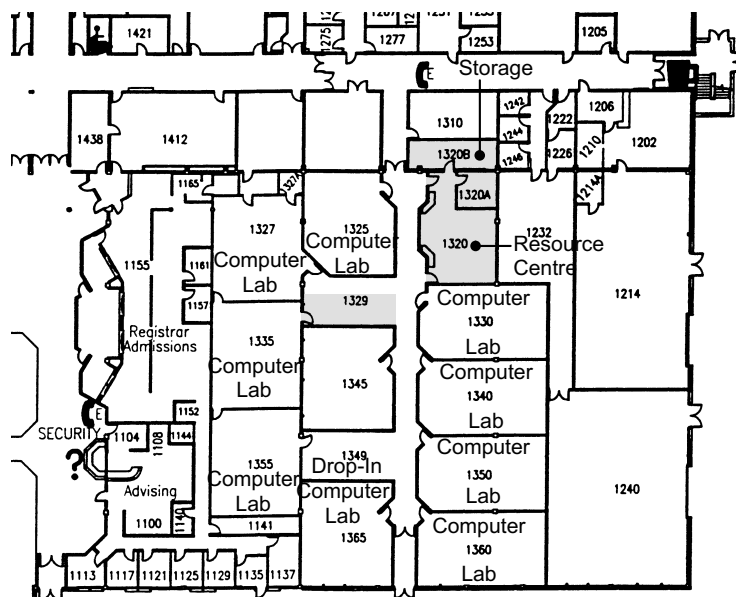
Space Type: **2. Laboratory**
              A. Computer/Language/Business – Instructional Computer Lab

Institution: *Capilano College*
Campus: *Lynmour Campus*
Building: *Fir*
Room Number: *213*
Capacity: *36*

Remarks: *Back-to-back desks at right angles to projection screen at front of room. Back counter allows use of laptop computers. Printer room is adjacent.*

Area Per Student Station: *3.41 m^2*

Space   *College,*
Guidelines   *University College,*   **APPENDIX G –**
Review   *and Institute System*   **BEST PRACTICES EXAMPLES**
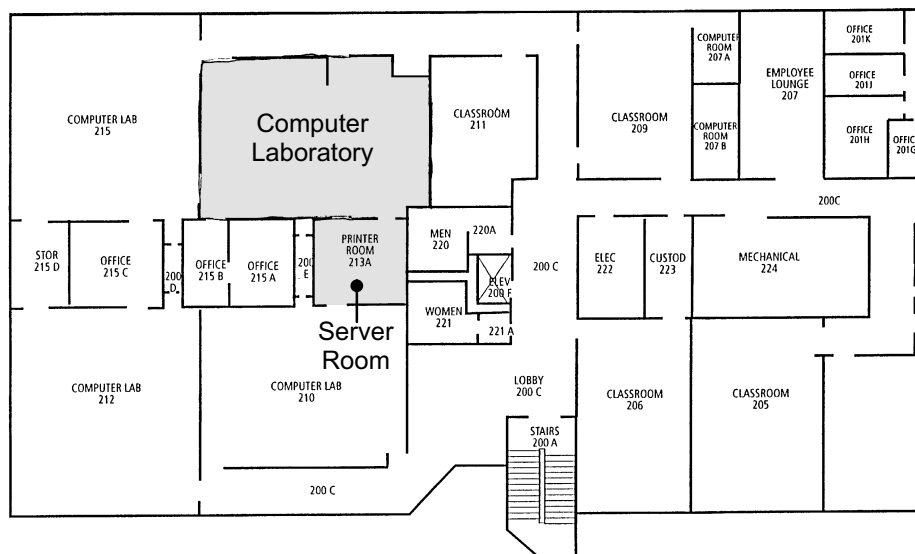
Appendices ─────────────────────────────────────

(0000\document\progreport.doc)

Space Type: **2. Laboratory**
                 B. Lower Level Dry Science

Institution: *Kwantlen University College*   **Remarks:**   *Geology Lab. Movable tables, side cupboards for*
Campus: *Langley Campus*   *storage, computer stations at rear of classroom.*
Building:
Room Number: *1310*
Capacity: *36*

Area Per Student Station: *2.77 m²*

Space   *College,*
Guidelines   *University College,*
Review   *and Institute System*

APPENDIX G –
BEST PRACTICES EXAMPLES
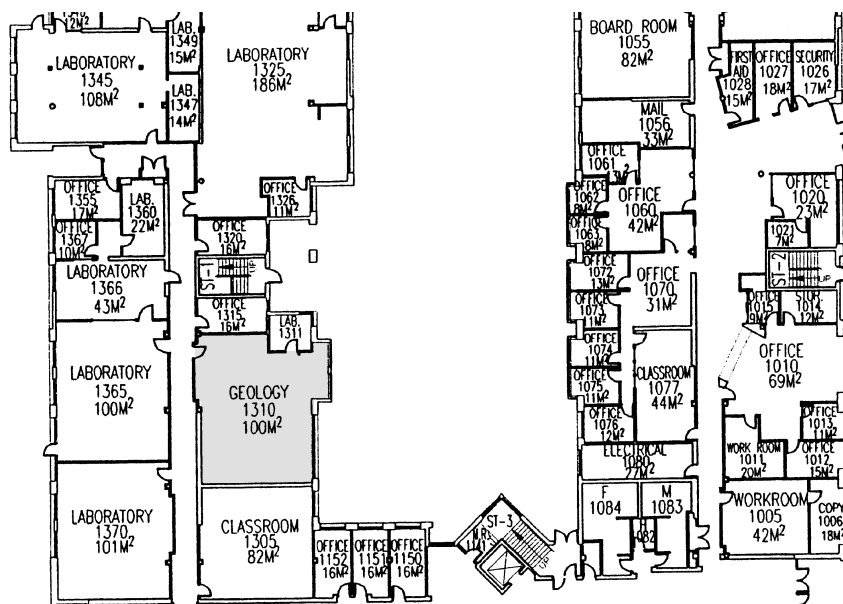
Appendices ———————————————————————————

(0000\document\progreport.doc)

Space Type: **2. Laboratory**
                      C. Upper Level Dry Science

Institution: *Kwantlen University College*
Campus: *Surrey Campus*
Building: *E*
Room Number: *106*
Capacity: *28*

Remarks: *Flexible environment for setting up and analyzing experiments. Closed storage would allow laboratory to be more multifunctional.*

Area Per Student Station: *2.5 m²*

Space   *College,*
Guidelines   *University College,*   **APPENDIX G –**
Review   *and Institute System*   **BEST PRACTICES EXAMPLES**
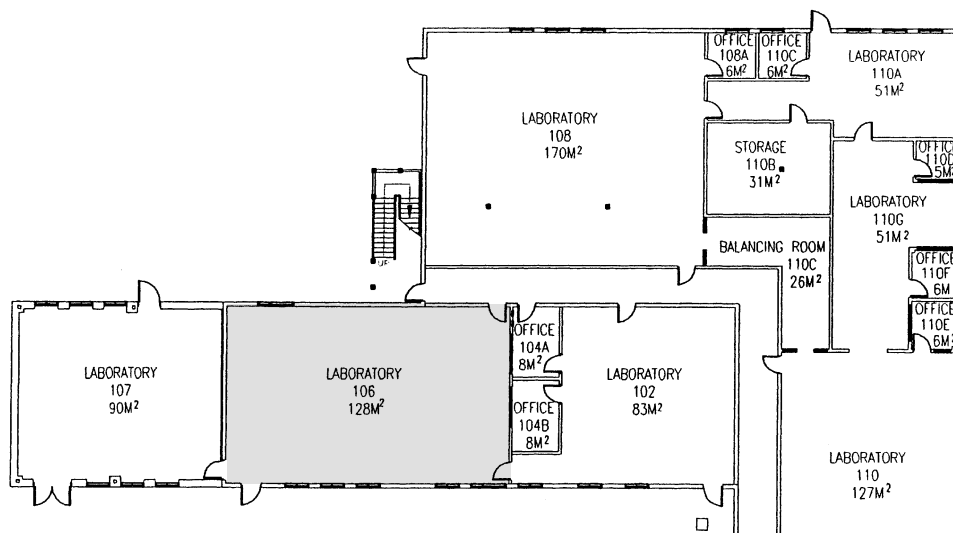
Appendices ─────────────────────────────────────

(0000\document\progreport.doc)

Space Type: **2. Laboratory**
D. Lower Level Wet Science

Institution: *Capilano College*   **Remarks:**   Good sightlines, entry and egress. Fumehoods
Campus: *Capilano Campus*   well placed, away from entrances. Preparation
Building: *Fir*   room is shared by three labs.
Room Number: *306*
Capacity: *20*

Area Per Student Station: *4.92 m²*

Space   *College,*
Guidelines   *University College,*   **APPENDIX G –**
Review   *and Institute System*   **BEST PRACTICES EXAMPLES**
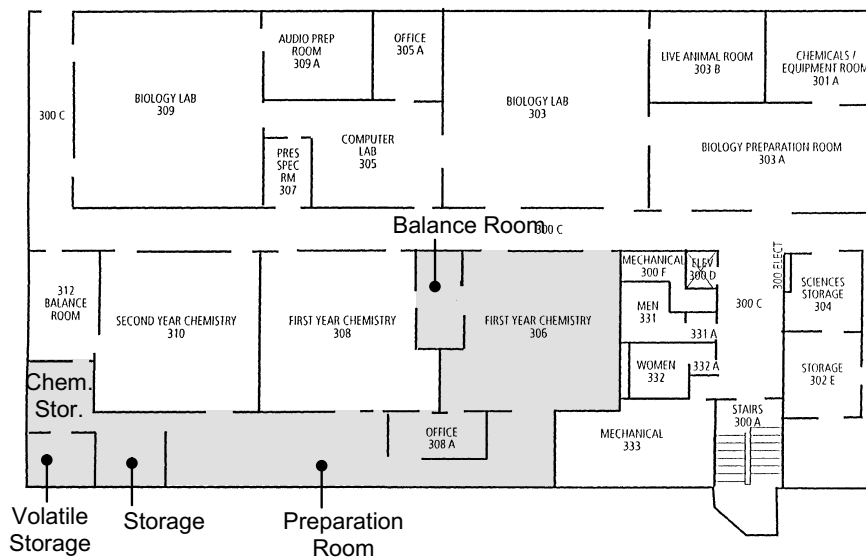
Appendices ─────────────────────────────────

(0000\document\progreport.doc)

Space Type: **2. Laboratory**
                E. Electronics

Institution: *The University College of the Cariboo*   **Remarks:**   Adequate layout space at workstation, aisles allow
Campus: *Kamloops Campus*   movement of portable electronic equipment.
Building: *Trades and Technology*
Room Number: *282*
Capacity: *20*

Area Per Student Station: *8.86 m^2*

Space   *College,*
Guidelines   *University College,*
Review   *and Institute System*
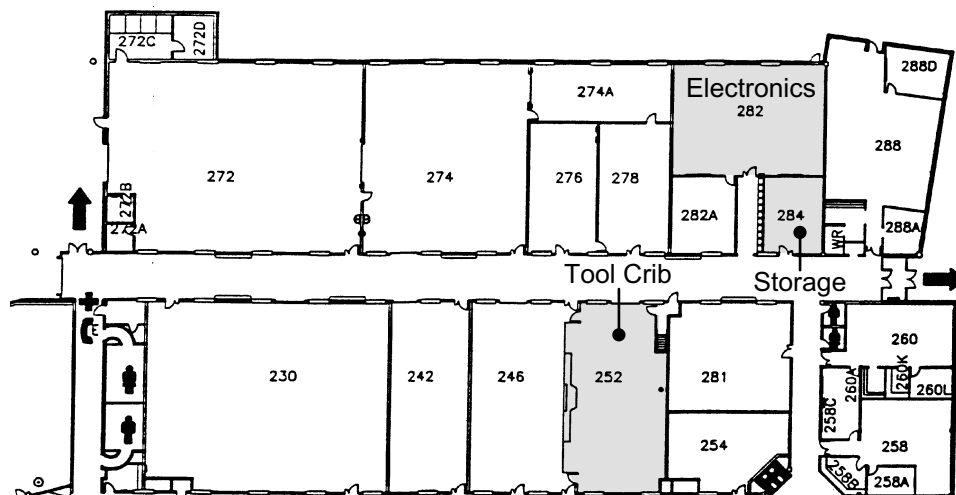
APPENDIX G –
BEST PRACTICES EXAMPLES

Appendices

Space Type: **2. Laboratory**
                 F. Nursing/Community Care

Institution: *Kwantlen University College*
Campus: *Surrey Campus*
Building: *D*
Room Number: *240*
Capacity*: 12*

Remarks: Nursing lab includes beds, meeting table (team room) and clean supplies area. Aisle widths could be larger.

Area Per Student Station: *6.67 m²*

Space   *College,*
Guidelines   *University College,*
Review   *and Institute System*

**APPENDIX G –
BEST PRACTICES EXAMPLES**

Appendices ───

Space Type: **2. Laboratory**
                 G. Fine Arts Studio – Painting and Drawing

Institution: *Capilano College*
Campus: *Lynmour Campus*
Building: *Studio Arts*
Room Number: *103*
Capacity: *25*

Remarks: Open space includes sink, drying cabinets and model platform. Supported by adjacent storage room and 2nd level storage above storage and offices area.

Area Per Student Station: *5.02 m^2*

Space   *College,*
Guidelines *University College,*   **APPENDIX G –**
Review   *and Institute System*   **BEST PRACTICES EXAMPLES**

Appendices ──

(0000\document\progreport.doc)

Space Type: **3. Shops**
                   A. Carpentry/Building Technologies

Institution: *The College of the Cariboo*   ***Remarks:***   Adequate space to layout projects while providing
Campus: *Kamloops Campus*   sufficient separation from power tools area.
Building: *Trades and Technology*
Room Number: *230*
Capacity*: 32*

Area Per Student Station: *14.50 m^2*

Space   *College,*
Guidelines   *University College,*
Review   *and Institute System*
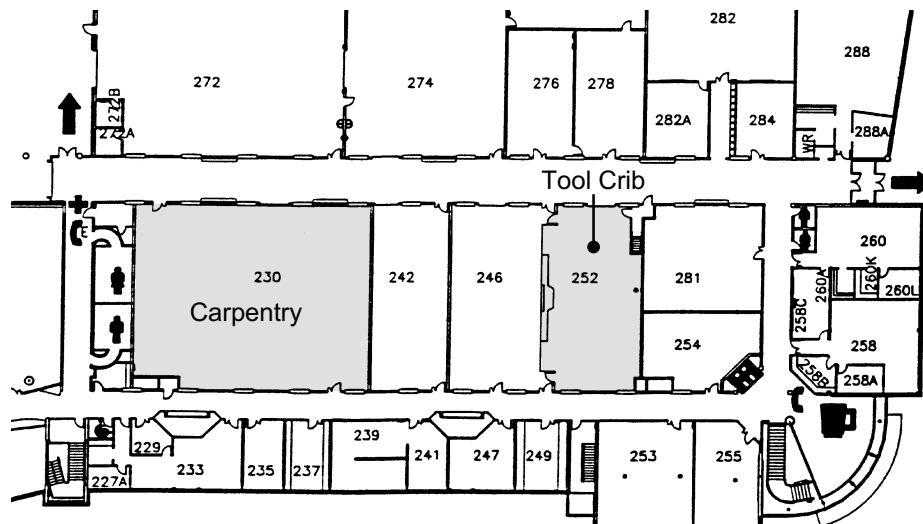
**APPENDIX G –
BEST PRACTICES EXAMPLES**

Appendices

Space Type: **3. Shops**
                B. Electrical

Institution: *BCIT*
Campus: *Burnaby Campus*
Building: *SE0I*
Room Number: *124*
Capacity: *16*

Remarks: *Simulated construction site provides students with exposure to all installation types and procedures. Adjacent work area accommodates support tools and storage.*

Area Per Student Station: *14.62 m^2*


Storage/Preparation

Electrical Lab

Space   *College,*
Guidelines *University College,*
Review   *and Institute System*
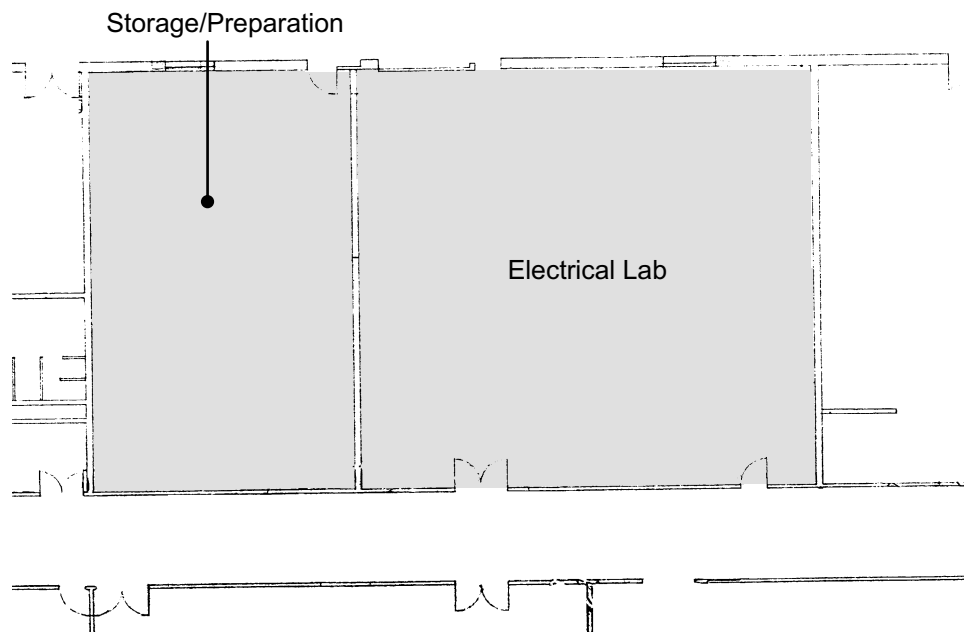
**APPENDIX G –
BEST PRACTICES EXAMPLES**

Appendices

Space Type: **3. Shops**
               C. Welding

Institution: *The University College of the Cariboo*
Campus: *Kamloops Campus*
Building: *Trades and Technology*
Room Number: *272*
Capacity: *48*

Area Per Student Station: *9.90 m²*

Remarks: Efficient design provides 16 gas welding stations, and 32 welding cubicles with welders stacked at one end.

Space
Guidelines
Review

College,
University College,
and Institute System
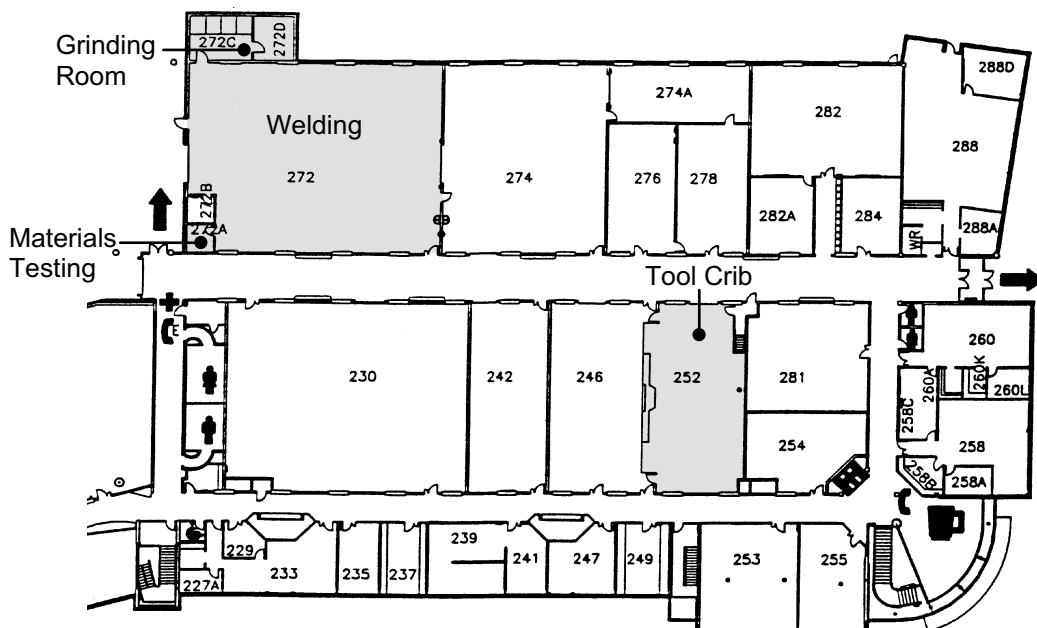
APPENDIX G –
BEST PRACTICES EXAMPLES

Appendices

Space Type: **3. Shops**
D. Machine Tools/Millwright

Institution: *BCIT*
Campus: *Burnaby Campus*
Building: *NW06*
Room Number: *100*
Capacity: *64*

Remarks: Large open space provides efficient space per station ratio. Support spaces flank open lab.

Area Per Student Station: *21.00 m²*

Space
Guidelines
Review

College,
University College,
and Institute System

APPENDIX G –
BEST PRACTICES EXAMPLES

Appendices

(0000\document\progreport.doc)

Space Type: **3. Shops**
E. Automotive Mechanics

Institution: *Kwantlen University College*
Campus: *Langley Campus*
Building:
Room Number: *1800*
Capacity*: 18*

Remarks: Open design allows flexibility in the future. Tool crib is shared by Automotive and Outdoor Power Equipment programs.

Area Per Student Station: *23.80 m²*

Space   *College,*
Guidelines *University College,*
Review   *and Institute System*

APPENDIX G –
BEST PRACTICES EXAMPLES

Appendices

Space Type: **3. Shops**
                F. Heavy Duty Mechanics/Commercial Transport/Diesel

Institution: *The University College of the Cariboo*
Campus: *Kamloops Campus*
Building: *Trades and Technology*
Room Number: *204/208*
Capacity: *36*

Remarks: Multiple bays allow easy movement of vehicles. Open shop is shared by Automotive and Small Engine Repair as are support spaces. Storage is in exterior sheds.

Area Per Student Station: *21.00 m²*

Space   *College,*
Guidelines   *University College,*
Review   *and Institute System*
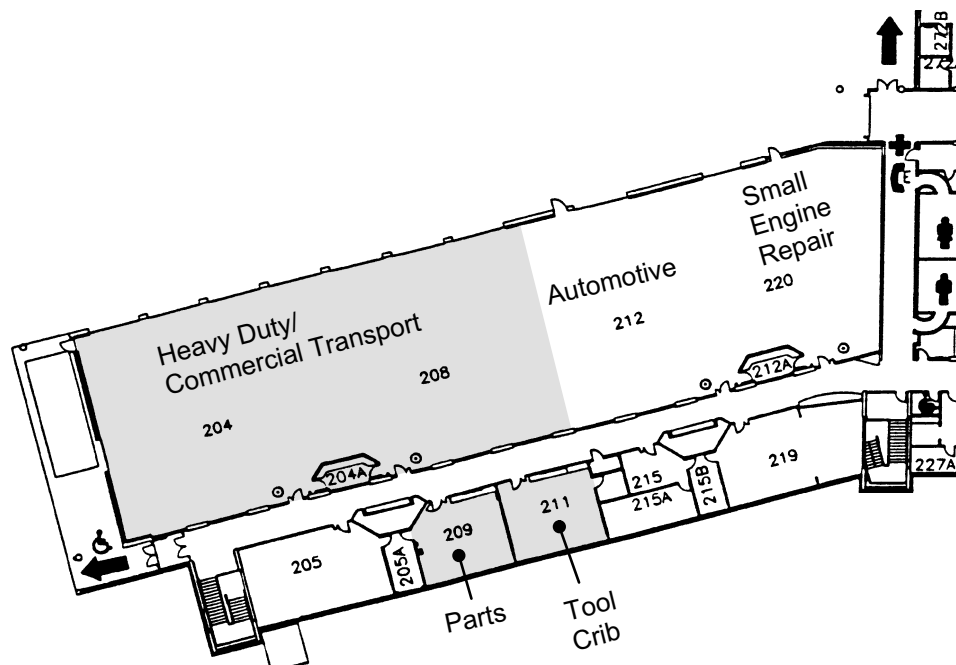
APPENDIX G –
BEST PRACTICES EXAMPLES

Appendices

Space Type: **3. Shops**
                 G. Fine Arts Studio - Sculpture

Institution: *Capilano University College*
Campus: *Lynmour Campus*
Building: *Studio Arts*
Room Number: *100/101*
Capacity: *15/25*

Remarks: Combined sculpture studios support a wide range of processes from ceramics, textiles to welding and carpentry. Additional storage is provided at mezzanine level.

Area Per Student Station: *6.36/8.00 m^2*