

Space Standards Review

**College, University College
and Institute System**

The RPG Partnership
June 21, 2000

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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*.

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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.

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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.

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PARTICIPANTS

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

Chair

Cliff Neufeld	University College of the Cariboo
Linda Arnold	SIOC Representative
Alfred Bennallack	Ministry of Finance and Corporate Relations
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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
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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.

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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 Gymnasias) 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.

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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 Gymnasias), 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

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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.

1. Introduction

(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.