1. Introduction

One of the most often heard complaints by Unit managers at the University of Waterloo is: “we have a shortage of space”. With the significant growth since 2000 in both undergraduate and graduate student numbers and the faculty complement, as well as the associated increase in research funding and activity, it is undeniable that the University faces significantly more space related pressures than had been the case in the past. This has led to the campus wide campaigns to fund-raise for new buildings to provide space to accommodate the increased activity. However, as a random walk-about will readily reveal, there is a non-trivial amount of space on the campus which is either unused, under-used or poorly used. Thus, while new space will most certainly be required, it is also incumbent upon the institution to ensure that best use is being made of existing space resources in order to minimize the costs associated with new building construction. As noted by the 2005 Council of Ontario Universities report on Inventory of Physical Facilities, “with increased emphasis on accountability, universities are expected to ensure that their use of resources, including physical facilities, is efficient and that appropriate information on utilization is available to government and the wider public.” Given that space is expensive to acquire, to operate and to maintain, it clearly must be managed effectively and utilized efficiently. Indeed, the least expensive “new” space to be had is that which currently exists but is not efficiently deployed.

There are several, readily-identifiable, different types of space to be considered in any space-related planning within the University. These include academic offices, administrative offices, research laboratories, classrooms, teaching laboratories, study space and student life space. Each of these types of space is addressed in this Task Force report.
2. Terms of Reference

The Kempenfelt Bay Retreat of 2007 provided terms of reference to guide the work of the Task Force. These were:

- **To carry out a system-wide review of processes used for space inventory, needs and utilization.**
- **To identify opportunities for better utilization of existing space.**
- **To determine long-term space needs in support of UW's 6th Decade Plan.**
- **To identify short-term space needs and to recommend interim solutions.**
- **To recommend processes for classroom use planning, coordination, maintenance and upgrade.**
- **To recommend a central space resource management structure.**

During the course of its work, the Task Force consulted broadly and also invited four individuals to attend meetings to provide additional input. These latter four individuals were: (1) Ron Venter, who has conducted a systematic review of Engineering space; (2) Charlene Schumm, on behalf of the Registrar's Office to provide a perspective on classroom scheduling and use; (3) Jonah Levine, then Vice-President, Education of the Federation of Students, on behalf of undergraduate students; (4) Ian MacKinnon, then President of the Graduate Students Association, on behalf of graduate students (at one such meeting, IM was unable to attend at the last minute and was represented by Craig Sloss, then VPCO of the GSA). In addition, at its first meeting the Task Force decided to ask Mr. Scott Nicoll to join its membership in view of his familiarity with space campus-wide and space issues in many sectors of the campus.

The recommendations which follow are organized with respect to each of the terms of reference guiding the Task Force. Several of these recommendations were presented in the October 2007 Preliminary Report of the Task Force which was endorsed by Executive Council on November 14, 2007.
3. Analysis and Recommendations

A. To carry out a system-wide review of processes used for space inventory, needs and utilization.

The University reports triennially to the Council of Ontario Universities (COU) on its inventory of physical facilities, with the most recent report having been submitted in September 2008. Based on metrics such as total FTE undergraduate students, undergraduate laboratory contact hours, number of research personnel, FTE faculty, FTE graduate students and FTE non-academic staff, the COU report determines the institutional space requirements based on COU space standards. These standards are very discipline specific and multipliers to be used against each metric are determined for each academic discipline within the Ontario universities system.

For its own internal purposes, the University of Waterloo has also historically used its own standards for maintaining inventory and calculating space requirements. The COU system calculates space requirements as “net assignable square meters” (nasm) while the UW formula does so as “assignable square feet”. (Note that 1 nasm = 10.76 ft²) The task force identified the inefficiency of the dual inventory management requirements of the internal UW system and the COU reporting requirements, involving two different metrics, and noted the desirability of reducing this to a single system. The need to keep any inventory up-to-date, particularly in terms of use of space, was also noted in view of the extensive renovations of existing space in recent years. This gave rise to the enunciation of the need to monitor space inventory, requirement and usage on a regular basis in a systematic and objective way in the form of the following recommendations. In addition, these endorsed Recommendations were presented to the March 2008 Chairs’ Forum and appeared to have enthusiastic acceptance by those Chairs and other Unit heads present, who recognized them as potentially very effective management tools.
**Recommendation #1:** That the COU system be used by UW to inventory space and to calculate the theoretical space need generated by the suite of COU determined metrics.

**Recommendation #2:** That an electronic template be developed by Institutional Analysis and Planning (IAP) to be used by managers locally at the Department, Faculty and Administrative Unit level to inventory space and to determine the theoretical space need.

**Recommendation #3:** Particularly with respect to classroom usage, that a template be developed to assess the efficiency of space usage.

A template based on Recommendations 1 and 2 has now been prepared by IAP and has been used to assess Space Inventory and Space Generated in the Department of Chemistry (see Appendix 1). An interpretation of the results of this assessment is also included in the Appendix.

**B. To identify opportunities for better utilization of existing space.**

With respect to classroom usage, the Task Force heard of inefficiencies in classroom usage which result from unreasonable actions and demands by faculty and, apparently, permitted by Department Chairs. These include the refusal to lecture on Mondays and Fridays; insisting on lecturing only on Tuesdays and Thursdays; arbitrary elimination of one class per week of a three class sequence, thus leaving a classroom unoccupied one-hour per week; insisting on larger classrooms than are actually needed; refusing to teach in specified classrooms; etc.

**Recommendation #4:** That full-time faculty members will be required to be available to teach during the core hours of 8:30-5:30, Monday to Friday. It will be recognized however that it may be desirable to teach outside these core hours, e.g., until 10:00 in the evening, on occasion.
On May 23, 2008 VPAP Amit Chakma sent a memo to all Chairs and Directors of Academic Units noting the endorsement of Recommendation #4 by Deans' Council and encouraging its use to maximize classroom utilization.

With respect to office space, the Task Force noted that, in many instances, individuals who had dual reporting structures, membership in more than one Unit or an administrative position in addition to an academic appointment also had more than one office. This then leads to a significant inefficiency in usage of valuable office space.

**Recommendation #5:** No person shall have more than one office.

* It can be recognized that rare exceptions to this recommendation may be made, at the discretion of a Dean or non-Academic unit manager, in unusual instances such as, for example, when a faculty member holds a joint appointment in two areas that are significantly separated.

With respect to research space, the Task Force acknowledged the natural tendency of individuals to hold space which was unused or inefficiently used in the hopes of future expanded activity. This led to the identification of the need for policies to assess need for space and to monitor usage of space.

**Recommendation #6:** That each Unit will develop a policy for the efficient assignment and utilization of space and, where appropriate, that Department and/or Faculty as well as academic support unit peer-review committees be struck for monitoring of efficiency of space usage and for space assignment.

It is the intention of Recommendation #6 that space assignment be regarded as being subject to review on a regular basis and that, whenever possible, space renovations and new space construction be designed to be flexible so that reassignment would be relatively straightforward.
C. To determine long-term space needs in support of UW's 6th Decade Plan

The predecessor to the current Task Force had solicited input from units on short-, medium- (within the next 5 years) and long-term (beyond 5 years) space needs some three years ago. A consideration of the responses indicated that, in large measure, these had represented hopeful aspirations or desires rather than realistic, realizable goals or needs. Although the Task Force initially considered the desirability of re-issuing a modified request to units, it was ultimately decided to post-pone this until after an initial, campus-wide analysis of space through the templates described under Term of Reference #1 above had been carried out. In addition, while long-term aspirations were indeed regarded as desirable, in order to bring reality and feasibility to a goal for the Unit, it was recognized that a sound academic and business plan would be required which included the mechanism by which new space was to be funded.

Recommendation #7: That any long-term space needs be identified as the result of an approved plan and that a means of securing the space associated with that plan be identified.

D. To identify short-term space needs and to recommend interim solutions

The Task Force noted that any additional short-term space needs should also be the result of an approved plan. That said, unforeseen consequences of, for example, enrollment fluctuations will occur. It was felt, however, that some short-term space crises were the result of poor planning, such as space related to the arrival of a new faculty or staff member (i.e. office and/or laboratory space) not being determined before the hire is completed.

Recommendation #8: That all Request to Recruit forms for new faculty and staff members include an acknowledgement of the space required for that member and that a solution be identified to accommodate that requirement.
The new Research Advancement Center (RAC) is intended to be a solution for many short-term space problems. Since its opening in May 2008, it has served as the temporary home of the School of Pharmacy, the Canadian Water Network, the Institute for Quantum Computing and some faculty members of the new Nanotechnology undergraduate program. Each of these activities is temporarily housed in the RAC awaiting the completion and occupancy of new buildings currently under construction or location of alternative off-campus space. One of the guiding principles for occupancy of the RAC has been that all prospective occupants wishing to move into the RAC must have an exit strategy, that is, a realizable longer-term space plan for the activity. This should then be applicable to any plan for occupancy of any space, whatever its location, that is only required on a short-term basis.

**Recommendation #9:** Any plans to occupy space on a short-term basis must be accompanied by a long-term solution to accommodate the activity and a time frame within which a transfer of the activity will be effected.

In addition, very recent experience has shown that opportunities can exist for sharing or trading space across Faculties that can significantly mitigate short-term space crises.

**E. To recommend processes for classroom use planning, coordination, maintenance and upgrade.**

Some of the issues associated with classroom use planning have been addressed under Term of Reference B above. Additionally, increased flexibility in classroom scheduling could be attained if departmentally “controlled” space could be made available during at least part of the teaching day. The Task Force also was made aware that a Working Group established by the Registrar's Office had developed a protocol to inventory the quality of the Registrar-controlled teaching classrooms and intended imminently to conduct such an inventory. This inventory was completed in April 2008 and a Final Report of this Working Group is in preparation. Once the
analysis based on this inventory is completed, then a systematic program to bring all such space up to a minimum set of standards is to be developed.

The principle was also enunciated that, since undergraduate teaching is a principal mission of the University, that high quality classroom space is critical.

**Recommendation #10:** That use of departmentally-controlled classroom space be assessed using the template system outlined above (Recommendation #3) in order to arrive at an optimal method of sharing such space for Registrar scheduled teaching.

**Recommendation #11:** That a systematic inventory of classroom quality be conducted to provide the basis for a renewal program of teaching space.

**Recommendation #12:** That a Classroom Improvement Fund be established, to be deployed on an annual basis, in an area where the need is perceived to be the greatest.

**F. To recommend a central space resource management structure.**

The Task Force believes that the primary assets of the University are its people, its finances and its space. While there are departments such as Human Resources and Finance to manage people and money, there is no comparable organism to manage space. While the view is widely held that Faculties hold the vast majority of space and therefore should be left to manage their own space, it is also true that, particularly where short-term space solutions need to be found, it would be extremely advantageous if there were a single individual who had a comprehensive knowledge of space inventory and use throughout the University as a whole. Recent experience in the RAC is illustrative of the value of this.

**Recommendation #13:** That a person (preferably a senior faculty member with an understanding of and familiarity with space issues) be appointed to
an administrative position whose mandate would be to take charge of analysis, planning and management of Space issues within the entire University community. Each of the Space Peer Review Committees created under Recommendation #6 would report to this new position and the incumbent would be present at all Space audits conducted by the Peer Review Committees. This individual would then also be responsible for ensuring common standards for Space usage across the University and would be a key resource person in all short, medium and long term space planning exercises.
Summary of Recommendations

1. That the COU system be used to inventory space and to calculate the theoretical space need generated by the suite of COU determined metrics.

2. That an electronic template be developed by Institutional Analysis and Planning (IAP) to be used by managers locally at the Department, Faculty and Administrative Unit level to inventory space and to determine the theoretical space need.

3. Particularly with respect to classroom usage, that a template be developed to assess the efficiency of space usage.

4. That full-time faculty members will be required to be available to teach during the core hours of 8:30-5:30, Monday to Friday. It will be recognized however that it may be desirable to teach outside these core hours, e.g., until 10:00 in the evening, on occasion.

5. No person shall have more than one office.

6. That each Unit will develop a policy for the efficient assignment and utilization of space and, where appropriate, that Department and/or Faculty as well as academic support unit peer-review committees be struck for monitoring of efficiency of space usage and for space assignment.

7. That any long-term space needs be identified as being the result of an approved plan and that a means of securing the space associated with that plan be identified.

8. That all Request to Recruit forms for new faculty and staff members include an acknowledgement of the space required for that member and that a solution be identified to accommodate that requirement.

9. Any plans to occupy space on a short-term basis must be accompanied by a long-term solution to accommodate the activity and a time frame within which a transfer of the activity will be effected.

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Appendix 1: Analysis of Chemistry Space (see attached PDF)

**Notes:**

1. Classrooms: This analysis reveals that the Chemistry department houses a negligible amount of classroom space. While Registrar controlled classroom space does exist on campus to accommodate Chemistry teaching, it should be noted that almost all such teaching occurs in buildings outside of the Faculty of Science which can lead to a loss of identification by the students with the Department or Faculty.

2. Teaching Laboratories: The I/G ratio of 96.4% would indicate that there is a near-satisfactory amount of undergraduate laboratory space. However, the 3.6% deficit of 83 nasm does correspond roughly to a single medium-sized teaching laboratory.

3. Research Laboratories: Again, the I/G ratio of 97.5% would indicate a healthy research environment. The deficit of 136 nasm is roughly equal to the space normally assigned to a single experimental Chemistry faculty member.

4. Office Space: The analysis reveals a serious deficit (900 nasm) in office space, primarily that associated with graduate students and research appointments (primarily pdf's). For the most part, such personnel occupy a desk inside a laboratory which reduces space actually available for research activity and can present a potential health and safety risk.
Appendix 2.

A single individual was aware of pressing needs of new Chemical Engineering Nanotechnology hires, expanded needs by IQC to accommodate a high profile potential senior hire from MIT and Pharmacy research space requirements. All of these activities were to be accommodated in the RAC until completion of the Pharmacy fourth floor in late 2009 and completion of the QNC building in 2011. Simultaneously that individual was aware of laboratories in Earth Science and Physics that were being held unused pending future hires. Because of this knowledge in a single individual, it was possible to propose a series of temporary space trades to the satisfaction of all concerned.
UW is encountering challenges in scheduling courses into classrooms, given steadily growing enrolments and the addition of new academic programs. The University Space Usage and Management Task Force has examined this situation and is aware of the growing pressure.

Deans’ Council has reviewed and approved the following Task Force recommendation: “Full-time faculty members will be required to be available to teach during the core hours of 8:30 to 5:30, Monday to Friday. It is recognized, however, that it may be desirable to teach outside these core hours, e.g., until 10:00 in the evening, on occasion.”

By this memo Chairs, Directors and the Registrar’s Office are being informed that UW should be using the inventory of classroom space from 8:30 Monday morning to 5:30 on Friday afternoon. Given our severe space constraints, making full use of our classroom inventory is absolutely essential. Doing anything less undercuts our collective argument that our space shortage is real.

AC/kg
### CHEMISTRY

**Fall 2004**

**Institutional Space Requirements As Measured By COU Space Standards, 2007-08**

<table>
<thead>
<tr>
<th>RESEARCH/TEACHING/ACADEMIC SUPPORT</th>
<th>Input Measure</th>
<th>Space Factor</th>
<th>Generated Space</th>
<th>Inventory</th>
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</thead>
<tbody>
<tr>
<td><strong>CLASSROOMS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total FTE Students</td>
<td>1,739.80</td>
<td>1.23</td>
<td>2,139.96</td>
<td>59.28</td>
</tr>
</tbody>
</table>

| **CLASS LABS**                    |              |              |                 |           |
| Lab Contact Hours W               | 0.00         | 0.8          | 0.00            | 0.00      |
| Lab Contact Hours X               | 3,851.50     | 0.6          | 2,310.90        | 2,228.21  |
| Lab Contact Hours Y               | 0.00         | 0.5          | 0.00            | 0.00      |
| Lab Contact Hours Z               | 0.00         | 0.3          | 0.00            | 0.00      |
| Unclassified                      | 0.00         |              | 0.00            |           |

Total Class Lab: 2,310.90, 2,228.21, 96.4

| **RESEARCH**                      |              |              |                 |           |
| Research Disciplines A            | 122.25       | 45.0         | 5,501.03        | 5,364.55  |
| Research Disciplines B            | 0.00         | 30.0         | 0.00            | 0.00      |
| Research Disciplines C            | 0.00         | 20.0         | 0.00            | 0.00      |
| Research Disciplines D            | 0.00         | 10.0         | 0.00            | 0.00      |
| Research Disciplines E            | 0.00         | 1.0          | 0.00            | 0.00      |
| Unclassified                      | 0.00         |              | 0.00            |           |

Total Research: 5,501.03, 5,364.55, 97.5

| **OFFICE - ACADEMIC**             |              |              |                 |           |
| Total FTE Faculty                 | 39.29        | 13.0         | 510.77          | 596.48    |
| Faculty Supplement                | 5.69         | 13.0         | 76.62           |           |
| Research Appointments             | 43.51        | 14.0         | 609.14          | 170.96    |
| Total FTE Grads                   | 121.80       | 4.0          | 487.20          | 322.81    |
| Total FTE Non-Acd Staff           | 19.50        | 13.0         | 253.50          | 242.29    |
| Office Service                    | 1,937.23     | 0.25         | 484.31          | 162.51    |

Total Academic Office: 2,421.53, 1,495.05, 61.7

| **OFFICE - ADMINISTRATIVE**       |              |              |                 |           |
| Total FTE Non-Acd Staff           | 0.00         | 13.0         | 0.00            | 0.00      |
| Office Service                    | 0.00         | 0.5          | 0.00            | 25.86     |

Total Office: 2,421.53, 1,520.91, 62.8

| **LIBRARY FACILITIES & CAMPUS STUDY SPACE** |              |              |                 |           |
| Study (Total FTE Students)         | 1,739.80     | 0.6          | 1,043.88        | 0.00      |
| Total Study and Student Computer Rooms | 1,043.88  |              | 0.00            | 0.00      |
| Traditional Static Shelving Space  | 0.00         | 0.005        | 0.00            |           |
| Mobile Compact Shelving            | 0.00         | 0.004        | 0.00            |           |
| Super High Density                 | 0.00         | 0.0035        | 0.00            |           |
| Total Stack                        | 0.00         |              | 0.00            |           |
| Library Support                    | 1,043.88     | 0.25         | 260.97          | 0.00      |

Total Library Facilities & Campus Study Space: 1,304.85, 0.00

**SUB-TOTAL: RESEARCH/TEACHING/ACAD SUPPORT** 13,678.26, 9,172.96, 67.1

**SUB-TOTAL: OTHER SPACE** 7.58

**TOTAL FORMULA AREAS** 13,678.26, 9,180.53, 67.1

Prepared by Institutional Analysis & Planning

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