University of Toronto

OFFICE OF THE VICE-PROVOST, SPACE AND FACILITIES PLANNING

TO: Planning & Budget Committee

SPONSORS: Ron Venter, Vice-Provost, Space and Facilities Planning
CONTACT INFO: 416-978-5515; ron.venter@utoronto.ca

DATE: November 3rd, 2004 for November 10th, 2004.

AGENDA ITEM: 5

ITEM IDENTIFICATION:

Project Planning Committee Report for the Department of Mathematics, Phase I

JURISDICTIONAL INFORMATION:

Under the Policy on Capital Planning and Capital Projects, the Planning & Budget Committee reviews updates of the Project Planning Committee Reports prepared for a capital project and recommends to the Academic Board approval in principle of the project or changes within the approved scope.

PREVIOUS ACTION TAKEN:

The Department of Mathematics presently occupies approximately 2000 net assignable square metres scattered in six locations across campus. The departmental home is within Sidney Smith Hall band has program activities at 1 Spadina Cresent, Whitney Hall, the Earth Science Centre, Wetmore Hall and University College.

Most of the space allocated to the Department is in Sidney Smith Hall, a building that is severely overcrowded and houses almost twice the number of occupants for which it was designed. Problems related to space in Sidney Smith Hall for this Department and others within the Faculty of Arts & Science have been the focus of discussions for many years. Other problems that limited the ability to resolve space problems are the lack of capacity for increased infrastructure, consistent with emerging standards, and the presence of asbestos, making even the most minor of changes very expensive undertakings. Consolidation and necessary expansion of the all Department of Mathematics activities to Sidney Smith Hall is therefore impossible.

Recent reviews of the Department by the Ontario Council of Graduate Studies have also expressed serious concern about the operating space that is available to the unit and need to be addressed.

HIGHLIGHTS:

The Phase I plan for the Department of Mathematics is to outfit the previously shelled-in 6th floor of the Bahen Centre for Information Technology. This relocation for the Department of Mathematics is particularly advantageous as it positions the Department of Mathematics into an academic precinct in close proximity to the Departments of Computer Science, and Electrical & Computer Engineering both major occupants of the Bahen Centre for Information Technology [BCIT] and the Fields Institute which is immediately adjacent to the BCIT. It is envisaged that additional synergies and services within the Departments of Mathematics and Computer Sciences will be possible as a result of this relocation.

The phased-in plan requires the completion of these new accommodations on the 6th floor of the BCIT by July, 2005. This will allow the newly renovated facilities to be used on a temporary basis to house the Department of Economics during the period of renovation/ construction of their facilities commencing September 2005. Only when the Economics Building is complete, projected for September 2006, will the entire 6th floor of the BCIT be available for the Department of Mathematics. Phase I is but the first stage in the road to the consolidation of the Department of Mathematics, the second stage of the plan is to link the BCIT to the upper floors of 215 Huron Street and to plan for the expansion of Mathematics through the BCIT into selected floors of 215 Huron Street. The end objective is to consolidate all activities of the Department of Mathematics into the BCIT, predominantly the sixth floor, plus the upper floors of 215 Huron Street. It may also be necessary to assess the relative merits of accommodations in other buildings within the precinct, specifically the Hughes Building.

Under the Policy on Capital Planning and Capital Projects, the Project Planning Committee will continue through the implementation phase. The Working Executive of the Project Committee will comprise the lead User, a Planner and Implementer all of whom have been intimately associated with the project definition since its inception; this membership is:

User: Prof. J. Quastel

Planner: Elizabeth Sisam

Implementer: Julian Binks

This Working Executive will be expanded to include a Project Manager to be appointed by the Chief Capital Projects Officer. Consideration will also be given for the design of this project to be undertaken by staff internal to the University.

The total project cost [TPC] is estimated at $5,500,000 in 2005 dollars. The work of the existing Project Planning Committee will continue to explore the full consolidation of the Department of Mathematics.

FINANCIAL AND/OR PLANNING IMPLICATIONS:

It is very important that this project be initiated as soon as possible to accommodate the interim space needs of the Department of Economics in the short term and thereafter, possibly by September 2006, the Department of Mathematics. As a result an interim Project Planning Report has been provided at this time; the final report will be tabled at the Planning and Budget Committee scheduled for December 7th, 2004. This is necessary to ensure that the project can be initiated as soon as possible so as to complete the project in the summer of 2005.

The complete funding for this project will be provided by the Department of Mathematics and the Faculty of Arts and Science. As a result there is no impact on the level of borrowing to be provided through the University. The operating costs for the 6th floor will be assessed upon completion of the project and will be the responsibility of the Faculty of Arts and Science.

RECOMMENDATIONS:

That, subject to a review by the Planning and Budget Committee at its meeting on December 7th, 2004 of the final Project Planning Report, the Planning and Budget Committee recommend to the Academic Board,

1. THAT the Interim Project Planning Report for the Department of Mathematics, Phase I at the University of Toronto be approved in principle.

2. THAT the project scope as identified in the Project Planning Report which requires the outfitting of the entire sixth floor of the Bahen Centre for Information Technology be approved at a cost of $5,500,000. The full funding for this project will be provided from the operating budgets within the Faculty of Arts and Science.

INTERIM
PROJECT PLANNING REPORT
Department of Mathematics, Phase 1
[Final Project Report to be tabled at Planning and Budget Committee on December 7, 2004]

Relocation and Consolidation
Department of Mathematics
Faculty of Arts and Science

Prepared by Planning and Infrastructure
Faculty of Arts and Science and the
Office of Vice Provost, Space and Facilities Planning

I. Membership

Prof. J. Quastel	Acting Chair, Department of Mathematics
R. deSouza	Assistant Dean, Faculty of Arts and Science
J. Binks	Manager, Project Planning, Capital Projects
R. Swail	Acting Assistant V-P, Facilities and Services
G. Milgrom	Senior Facilities Planner, Campus and Facilities Planning
E. Siciunas	Computer & Networking Services, University Computing
D. Dewees	Interim Chair, Department of Economics
Prof. E. Bierstone	Faculty, Department of Mathematics
Prof. A. Nachman	Faculty, Department of Mathematics
G. Lynch	Graduate Student, Department of Mathematics
B. Leslie	Administrative Staff, Department of Mathematics
V. Ivrii	Faculty, Department of Mathematics

II. Terms of Reference

1. Determine a functional layout and space requirements for the Department of Mathematics.
2. Make recommendations regarding the location of the Department and review options for its accommodation, including a possible phase approach, if required, to accommodate the interim needs of the other Departments within the Faculty of Arts and Science.
3. Determine a detailed space program for the Department of Mathematics taking into account Council of Ontario Universities' and the University of Toronto's space standards.
4. Identify the capital cost of construction, including renovations, data and communications.
5. Identify all operating costs for the facility.
6. Identify all security and occupational health and safety requirements and their related costs.
7. Identify deferred maintenance issues that could impact the project and possible additional sources of funding that could address these particular issues.
8. Identify all communication and computer networks and interfaces that are required by the Department
9. Identify all proposed sources of funding
10. Report by January 30, 2005

III. Background Information

The Department of Mathematics presently occupies approximately 2,200 net assignable square meters scattered in six locations across the St. George campus. The departmental home is within Sidney Smith Hall with incomplete satellite activities at 1 Spadina Crescent, Whitney Hall the Earth Science Centre, Wetmore Hall and University College. Within Sidney Smith Hall the Department is randomly scattered over four floors.

Most of the space allocated the Department is in Sidney Smith Hall, a building that is severely overcrowded and houses almost twice the number of occupants for which it was designed. Problems related to space in Sidney Smith for this Department and others within the Faculty of Arts and Science have been the focus of discussions for many years. Other problems that limit the ability to resolve space problems are the lack of capacity for increased infrastructure required in today's facilities and the presence of asbestos making even the most minor changes unaffordable. Consolidation and necessary expansion of the Department of Mathematics activities to Sidney Smith Hall is therefore impossible.

Recent external and Ontario Council of Graduate Studies reviews of the Department by the have expressed serious concerns about the operating space that is available to the unit and need to be addressed. This Project Planning Committee will determine the space requirements for the Department of Mathematics and propose a suitable location on the St. George campus.

IV. Statement of Academic Plan

The Department of Mathematics is widely recognized as the strongest in Canada and ranks among the top ten mathematics departments among publicly funded universities in North America. The department's goal in the next few years is to solidify its reputation as a major international research and teaching centre, providing leadership in mathematical research nationally and internationally, and attracting and training the next generation of leaders.

The Department numbers 51.25 tenure stream faculty, across three campuses; of these 7.5 are at UTSC and 6.5 area UTM. At St. George there are 3.75 CLTA's, 2.65 Senior Lecturers and 5.75 Lecturers. There are also a number of CLTA's, lecturers and senior lecturers at the other campuses. The tri-campus department functions as a unified intellectual community with all graduate activity, and most UTSC and UTM appointments spending significant time at the St. George campus. The Department presently has 8 administrative staff as well as 1.85 computer system programmers. In addition there is a librarian for the Mathematics and Statistics library as well as a library technician. The faculty/student ratio is small relative to comparable publicly funded American or Canadian universities. At St. George, 7000 students are taught with fewer than 40 tenure stream faculty. There has been some effort on the part of the university to

rectify the situation with an allocation of eight positions in the faculty complement at St. George in the Arts and Science academic plan *Stepping Up for 2004-2010* (7 retirements will take place during this period). In addition the Department is continuing to search for 2 Senior CRC positions. As in any leading mathematics department, there is a steady flow of visitors, research collaborators and speakers at the weekly colloquia and many seminars. Estimates in any one year run at 20 visitors, who stay for a month or more, with an additional 100 visitors having shorter stays. The Department has a very successful graduate program with about 30 M.Sc. and 60 Ph.D. students. The graduate program is expected to expand by about 25% during the next five years.

The Department is presently housed in a number of sites across the campus. The largest group is in the east half of the fourth floor of Sidney Smith Hall. There are also a number of offices, a lounge and the department seminar room on the west end of the fifth floor of Sidney Smith Hall, as well as a couple of other offices scattered elsewhere in the building. Over the past five years some of the graduate students have been moved to offices of 1 Spadina Crescent, others to New College, and new faculty have been housed on two floor of an extension of the Earth Sciences building on Russell Street. A risk management laboratory is also housed at 1 Spadina with an individual faculty member and several postdoctoral fellows and graduate students. A computational laboratory was constructed in the basement of Whitney Hall, which houses several graduate students and postdoctoral fellows. The Mathematics and Statistics Library is located in the basement of Sidney Smith Hall.

There are, in addition, a number of extra-departmental groups. The Masters in Mathematical Finance program, while operated by the School of Graduate Studies and not the Mathematics Department itself, is nevertheless closely linked to the Department both by research subject, and because several of our faculty lead and teach in the program. It is presently housed in rented space at 720 Spadina Avenue.

The Fields Institute is a cooperative venture of the Ontario Ministry of Training, Colleges and Universities, NSERC and Carlton U., McMaster U., U. of Ottawa, U. of Waterloo, U. of Western Ontario and York U. as well as the University of Toronto and a number of affiliate universities and corporate sponsors. Their primary activity is thematic programs of either one half or a full year. It is located in at 222 College Street and is leased from the university.

IAIM (Institute for Applied and Interdisciplinary Mathematics) is a proposed interdisciplinary centre intended to bring together mathematically orientated researchers from different departments around the university. The intent is to create a cohesive network of mathematical scientists at the university with an incubator facility in which to stimulate and nurture interdisciplinary mathematics in both research and teaching. It has been designated as a divisional priority in the Stepping Up plan and is expected to go up for AIF funding in January 2005.

Research and graduate (as well as undergraduate) training in mathematics is a highly collaborative and somewhat spontaneous venture. Besides the poor quality, inadequacy, and inaccessibility of some of the space, being spread across campus and through several separate buildings has greatly hindered the research potential and training ability of the Department. This is the critical issue of the Department, highlighted, for example in the recent OCGS report where the graduate program was evaluated as "Good quality with a report", the indicated report being required by 2006 indicating progress in dealing with the space issue. From the report: "The amount of the quality of office space available to the graduate students in the Department of Mathematics is totally inadequate and an embarrassment for a university of the calibre of the University of Toronto… It is hard to imagine that the graduate students would be able do any serious research on the premises of the Department under such difficult conditions… We want to stress the fact that the Department as a whole is keenly aware of the space problem and that the measures that have been taken to try to deal with are likely the best that could have been taken under the circumstances".

If the Department is to maintain its status as one of the world's leading departments, it is essential that the entire department including the library be moved to a single, central location. The location needs to be renovated in a way that makes it possible for the department to excel in its various functions. The department's main research facilities are the library, the computer system and the computational lab. Adequate space must be available for each, located so as not to make their use inconvenient. From the OCGS report "We think that is particularly important for the preservation of the quality of the graduate program that the mathematics library be kept in the same building as the Mathematics Department." The Department of Mathematics also requires a dedicated seminar room as well as a small departmental lounge. It is not an exaggeration to say that a significant amount of the mathematical work of a good department takes place in the department lounge. It is also crucial for the success of IAIM that it has well designed space which will attract researchers from around the university and is conducive to interaction. Teaching vast numbers of undergraduates does not take place in only the classrooms. Large classes mean that significant numbers of students will need academic assistance, in and out of office hours. This appears to be more the case in mathematics than in other disciplines and puts extra demand on the infrastructure. If the hallways in the Department are too cramped the result will be a that with other faculty will unable to do their work.

It must be stressed that the result of inadequate space is that opportunities for teaching and research are missed because people simply give up and go work at home. From the OCGS report again: "we observed that the shared offices meant for the graduate students were practically all empty – nearly all the students we talked to during the interviews told us that they work at home…one of the important elements of a successful graduate program is the vitality of scientific discussions among graduate students. This can only happen if the students are able to work in comfortable offices, located in the same building." The same holds true for the faculty and their research and teaching. If the university truly desires to move up into the worldwide elite of publicly funded

universities, the mathematics department will enthusiastically build on our successes to help make it possible. But this can only be achieved with space comparable to peer and competitor institutions. The current space situation is simply an embarrassment.

V. Space Program

Existing Space

The Department of Mathematics currently occupies approximately **2182 NASM** in six buildings across the St. George Campus (see Appendix 1 for details). The departmental home is within Sidney Smith Hall with incomplete satellite activities at 1 Spadina Crescent, Whitney Hall, Earth Science Centre, Wetmore Hall and University College.

The space is comprised primarily of faculty and administrative offices with shared space for some research students and some support space for administrative functions and copying facilities.

The lack of space cohesion has been noted as cause for concern in external reviews and is the main issue preventing the Department from achieving its academic goals.

A detailed list of all space, including area and use, may be found in Appendix 1: Space Inventory.

VI. Functional Plan

Space Requirements

TBD

Identified Space

The sixth floor of the Bahen Centre has been identified as the ideal location for the Department of Mathematics. It's proximity to the Field's Institute and the Department of Computer Science greatly facilitate and strengthen the interaction which currently exists between these groups. The Director of the Field's Institute is strongly supportive of the proposed location and has assured the Dean that efforts will be made within the institute to share resources for the benefit of both groups.

The floor footprint offers 3400 gross square meters of space. Using the same factor to determine net assignable square meters as is used for the 6th floor, there are approximately 2000-2200 NASM available on this floor.

As the required space is office intensive, a preliminary study of the 6th floor has been undertaken. Ninety-seven offices, with some open areas for shared and common spaces

can be fitted into the space using a very efficient layout. Consequently, the space identified and available appears to suit the requirements.

Overflow space (almost certainly required) will need to be accommodated in 215 Huron Street when the Department of Philosophy relocates to the Medical Arts Building.

While this project will address the requirements of the Department of Mathematics, the renovations to the 6th floor of the Bahen Centre, will also allow the Department of Economics to make use of this new space as a transitional home while their facilities at 150 St. George Street are being renovated.

The total project cost estimate for the renovations to 150 St. George Street identified the funding required to accommodate the Department in rental facilities for the duration of the renovations. Rather than spending this allocation on external space, the funds will be redirected towards the renovation for mathematics. The criteria for renovations will address the Mathematics space program which is also suitable for Economics.

VII. Environmental Impact

As the space is office intensive and a relocation of existing facilities into an existing space, minimal environmental impact is anticipated. All University of Toronto policies relating to environmental impact will be followed.

VIII. Special Considerations

i. Space must permit interaction between faculty but must also provide sufficient space for large numbers of visiting undergraduate students. A careful balance between private and public areas is essential.

ii. The Department relies heavily on a robust high speed, high bandwidth IT network. Every effort will be made to coordinate this activity with the Department of Computer Science.

IX. Resource Implications

Project costs: TBD

X. Operating Costs

Operating costs for the Bahen Centre for Information Technology have been determined at $68 per gross square metre. The net increase of space occupied by the Department will be determined after calculating the gross floor area of vacated spaces. This operating cost for this incremental space will be funded by the Faculty of Arts and Science

XI. Other Related Costs

N/A

XII. Funding Sources and Cash Flow Analysis

The Faculty of Arts and Science is fully responsible for all identified costs up to $5,500,000 to be found within its operating budget.

XIII. Schedule

It is imperative that consolidation of the Department to one location be undertaken as soon as possible. This condition has existed for too long and remedies are anxiously awaited.

It would be appropriate to engage consultants to begin space layout immediately after approvals are granted with a planned occupancy for the fall of 2005. This will allow the Department of Economics to use the space temporarily while their facilities are being renovated. The Department of both will relocate to the 6th Floor Bahen are Economics moves to its new quarters.

XIV. Recommendations

That the Planning and Budget Committee recommend to the Academic Board:

1. THAT the Interim Project Planning Report for the Department of Mathematics, Phase I, at the University of Toronto be approved in principle.

2. THAT the project scope as identified in the Project Planning Report which requires the outfitting of the entire sixth floor of the Bahen Centre for Information Technology be approved at a cost of $5,500,000. The full funding for this project will be provided from the operating budgets within the Faculty of Arts and Science.

Appendices: TBD

1. **Space Inventory**
2. **Utilization Analysis**
3. **Equipment/Furnishing**
4. **Computing**
5. **Project Cost Estimate**
6. **Room Specification Sheets**