Concept and Feasibility Study
| A New Knowledge Commons

## EXECUTIVE SUMMARY

Competition amongst post secondary institutions has schools looking closely at the most effective use of their land, buildings, and infrastructure. New facilities that support learning and innovation are key components in strategic planning to vie for the top students, attract and maintain the best faculty as well as expand programs and improve ranking. As resources become scarcer there's a need to look, not only at new opportunities to build, but also to relook at existing structures. Many institutions are finding that with careful renovations and renewal, they can enhance and improve the use of their current buildings. With this in mind, McMaster University Library has proposed converting the existing spaces on the $2^{nd}$ and $3^{rd}$ floors of the Mills Library into a new Knowledge Commons.

The following study is a record of the recommendations developed with Graham Hill, University Librarian, regarding the space needs and estimated costs for the Knowledge Commons. These recommendations were developed with the participation and guidance of senior Library staff. They describe a practical and conceptual vision for a Knowledge Commons dedicated towards a broader focus synthesising traditional print resources with new technology and learning opportunities.

This initiative is being driven by:

- the need to integrate information resources with technology and expertise in an environment that supports active and interdisciplinary learning, problem-based learning and the spirit of "inquiry",

- the pressing need for access to more and better equipment,

- the need to accommodate and encourage collaborative work and breakout areas appropriate for small-group discussions,

- an increasing emphasis on Information Literacy spaces, instruction and skills,

- improving the service by other library units,

- a larger Public Space Utilization study being conducted across the University Library,

- a University-wide initiative to extend wireless access across large public spaces on campus via the " Wireless Canopy" project and

- a new and forward image for Mills Library and the McMaster Campus.

In anticipation of student demand for a Knowledge Commons, two schemes are documented in this Study. The first, Scheme A, looks at an around the clock operation that offers access to the Commons 24 hours of the day. In Scheme A, the Commons would be accessible after regular Library hours via an entrance on the east side of the building. The second, Scheme B, assumes that the Knowledge Commons would function within the regular hours of operation at Mills.

**EXECUTIVE SUMMARY** cont.

The process of this Study involved:

- site tours of the University of Toronto's Information Commons and Seneca at Newnham's Learning Commons accompanied by staff responsible for each institution's facility,

- meetings with senior Library staff to develop space requirements for the Knowledge Commons,

- testing the requirements in plan,

- meeting with engineering consultants on site to determine their recommendations for changes or additions to the existing infrastructure supporting the space requirements,

- providing drawings reflecting the recommendations of the study and

- providing a preliminary cost estimate to implement the recommendations.

This Study was made possible by the participation and guidance of:

- Graham Hill, University Librarian, McMaster University

- Vivian Lewis, Associate University Librarian (Services), McMaster University

- Paul Otto, Associate University Librarian (Information Technology), McMaster University

For the purposes of this Study, the Study Team assumed a construction start of May 2005 ending before September 2005.

Mills Memorial Library

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**EXECUTIVE SUMMARY**

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■ MOFFAT KINOSHITA ARCHITECTS

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## 1.0     CONTEXT OF THE STUDY

McMaster is recognized for innovation in education. The University is well known for its support of problem-based learning and the inquiry method.  Programs such as *Arts and Science* and *Engineering and Society* illustrate a strong commitment to active and interdisciplinary learning.  Recent trends suggest an increasing emphasis on collaborative work whereby students learn from each other both within and outside of the traditional classroom.

## 1.1     CURRENT ACADEMIC DIRECTIONS

The Knowledge Commons will build upon this reputation for innovation and help the University attract the highest calibre students. The facility will provide a rich environment for critical thinking and lifelong learning. The Commons will, in the words of *Refining Directions*, "put discovery at the centre of the learning experience."

In doing so, the Commons fully supports McMaster's three primary goals:

- **To provide an innovative and stimulating learning environment where students can prepare themselves to excel in life.**

  The Commons is envisioned as a vibrant, user-centred learning facility that provides a single point of access to knowledge resources, technology, software, assistance, instruction and study space. The facility will support the full range of the discovery process, from the initial identification and collection of information to the creation of the final essay, spreadsheet or presentation.

- **To achieve the next level in research results and reputation by building on existing and emerging areas of excellence.**

  The Commons will build upon the collection and service strengths of the University Library. The facility is envisioned, not as a computer lab, but as a bridge between the Library's rich print collections and the newer digital resources.

- **To build an inclusive community with a shared purpose**

  The Commons will serve as a gathering place for students and researchers from all areas of campus to participate in the discovery and learning process. The facility will support collaborative learning with innovative workstation and furniture design and with the provision of enhanced group study rooms.

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## 1.0    CONTEXT OF THE STUDY


### 1.2    PROJECTED NUMBER OF USERS

Enrolment at McMaster has been growing for several years.  This trend is expected to continue given current demographic patterns and university participation rates. McMaster is currently debating enrolment targets and the optimal size of the campus as part of its overall planning process. Although the final targets have not yet been set, even conservative estimates would suggest that the library must plan for significant increases in its user population over the next decade.

## 2.0    DESIGN GUIDELINES FOR A KNOWLEDGE COMMONS

The quantity and quality of spaces developed for the Knowledge Commons are shaped by the following objectives developed by Mills Library.

**Learning**:     To create an enriched learning environment, fully supportive of both individual discovery and collaborative learning.

**Space**:     To create a flexible, inviting environment which supports new and evolving forms of student learning; to create spaces which accommodate anticipated increases in the student population.

**Equipment**:     To vastly increase the number of public stations available in the Library.

**Resources**:     To create a state-of-the-art facility to showcase the Library's wealth of electronic and print resources.

**Expertise**:     To provide integrated, expert reference and technical assistance to users at the point of need.

**Instruction**:     To build upon the Library's highly successful instruction program; to provide opportunities for instruction in the effective use of productivity software, either in conjunction with or in addition to regular course-based and general library sessions.

**Access**:     To allow for extended hours of service, possibly 24 hours, if demand warrants and funding can be allocated.

**Reputation**:     To build upon McMaster's reputation for innovation, creativity and excellence.

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### 3.0 NEW OPPORTUNITIES FOR EXISTING LIBRARY SPACES

The mandate at the start of this Study was to test the feasibility of the McLay Reading Room for its ability to be renovated and renewed as the campus Knowledge Commons. As the Study progressed, it became apparent that more opportunities and flexibility in the use of the spaces would be realized by looking at the whole second floor as the Commons. Both the Reference Desk and collection are an important part of a synthesized academic library. The Study recommends the following renovations to enhance the learning experience at McMaster.

### 3.1 PATRON AREAS

**Entrance at Second Floor:** Celebrate the new Library initiative and integrate the existing Reference area with the new Knowledge Commons through new lighting adjacent to the entrance as well as using some of the new finishes applied in the McLay Reading Room.

**Reference / Technical Assistance Desk:** The Reference Desk would become the central point of assistance for the Commons facility. Modify the Reference Desk to function as a combined reference/technical assistance desk and maintain its visibility from the main staircase on the second floor; locate a second assistance point within McLay Reading Room.

**Access to Computers:** Accommodate 200 wired computers (100 in the McLay Reading Room, 94 in the Reference Area and 6 in the Collaborative Study Rooms) supporting access to library electronic resources, internet browsing, e-mail and productivity software (word processing, spreadsheets, presentation software) over the second floor. Each new Collaborative Study Room on the third floor will have one wired computer.

Include in the above stations a small number of wired Adaptive Technologies stations for students with visual disabilities.

Accommodate 120 wireless access connections over the second floor and third floor Collaborative Study Rooms.

**Printing/Copying:** In addition to existing services provide a new combined printer/copier hub (2 printers, 1 copier) in McLay, in close proximity to Assistance.

**Collaborative Study Rooms:** Provide six additional enclosed collaborative study rooms for up to 8 users. Each room will accommodate a whiteboard, one wired station plus wireless connectivity.

**Newspaper Reading Area:** Maintain the Hamilton Spectator newspaper reading room. This function should continue in this location with seating, a reading table and newspaper racks.

**Telecom Closet:** Provide a telecommunications closet for new Telecom requirements.

**McLay Reading Room Exterior:** Make the presence of the new Knowledge Commons visible to the building exterior.

### 3.0 NEW OPPORTUNITIES FOR EXISTING LIBRARY SPACES

### 3.1 PATRON AREAS cont.

**Furniture and Arrangements:**

Quick Access: Provide 20 standing height stations for express searches in the McLay Reading Room and 4 in the Reference area.

Seated Computer Stations: Arrange the 80 new computer stations in the McLay Reading Room as a "pod" of 10 so arranged to offer opportunities for individual work as well as to encourage collaborative learning. The stations at the ends of each pod will accommodate 3 seats for group work. Arrange 90 new computer stations in the Reference area to encourage individual use. Furniture to suit 17" flat screen, CPU with burner to be attached under desktop, USB ports to be located in the front of each station, no scanner. It is important that the stations are fitted with wire management for both appearance as well as to prevent tripping hazards. Flat screen monitors will be bolted down for security. Provide a keyboard tray.

Tables: Provide 9 wired tables seating 6 each in the McLay Reading Room to support wireless laptop use. Provide 6 nonwired tables seating 8 for the Collaborative Study Rooms.

Seating: All seating at computer stations will be upholstered and provided with a limited amount of adjustability for a good ergonomic fit. Provide wheels to allow free movement at each station. Provide 61 soft seats in the McLay Reading Room and 18 in the Reference area with access to power to support wireless laptop use.

**Summary of Furnishing Items:**

| ITEM | | | NUMBER | TOTAL |
|------|------|------|--------|-------|
| Chairs | Computer | McLay | 167 | |
| | | Reference | 90 | |
| | | Collaborative Study | 54 | 311 |
| | Soft | McLay | 61 | |
| | | Reference | 18 | 79 |
| | Sofas | Newspaper Reading | 4 | 4 |
| Tables | Computer | McLay - rectangular | 64 | |
| | | McLay - semi round | 16 | |
| | | Reference | 94 | |
| | | Collaborative Study | 6 | 180 |
| | Study | McLay | 9 | |
| | | Collaborative Study | 6 | |
| | | Newspaper Reading | 1 | 16 |
| | Coffee | McLay | 13 | |
| | | Reference | 3 | |
| | | Collaborative Study | 2 | 18 |

3.0     NEW OPPORTUNITIES FOR EXISTING LIBRARY SPACES

3.2     STAFF AREAS

Mills is currently undertaking a larger Public Space Utilization study across the University Library. Unassigned office space created in the development of the Knowledge Commons concept design may be part of an overall strategy for relocation of staff areas improving both services and operations.

3.3     THE PRINT COLLECTION

The Commons would be situated alongside the Library's rich reference and documents collections. This physical adjacency would create a strong bridge between the University's rich print collections and the newer digital resources.

### 4.0    IMPLICATIONS OF TECHNOLOGY

### 4.1    ASSUMPTIONS

The Knowledge Commons will be located on the 2nd floor of Mills Library and will include the McLay Reading Room and open floor space on the second floor (excluding the area housing the government documents and reference collections) and the mezzanine areas on the 3rd floor.  This area will contain 200 computer workstations with Ethernet connections and wireless access points sufficient to support an initial maximum of 60 simultaneous connections in McLay and an additional 60 on the rest of the second floor. Currently the area contains 44 public workstations none of which are located in the McLay Reading Room.

### 4.2    IMPLICATIONS

The project will involve:

- the purchase of 156 workstations,
- wiring McLay in order to accommodate approximately 100 workstations,
- adding 56 additional Ethernet drops in the 2nd floor public spaces outside McLay,
- the addition of four, 48-port network switches and
- the construction of a new telecommunications closet on the 2nd floor.  The telecommunications closet will be linked to the main library server room (LB106) and from there into the campus backbone.

Wireless access supporting 60 users in McLay will be required as well as additional electrical wiring to support 156 new workstations and 120 wireless connections.

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## 5.0 EFFECT ON EXISTING BUILDING INFRASTRUCTURE

This study examines two approaches to the planning of a Knowledge Commons. The first scheme, Scheme A, anticipates demand for 24-hour access to the Commons area in the existing McLay Reading Room. McLay will function as around the clock operation offering services independent of the Mills Library operating hours – in effect it describes a autonomous function within a building. The Ontario Building Code dictates that in order for the Commons to function this way, the following requirements must be satisfied:

- barrier free accessibility,

- two emergency exits and

- access to washrooms.

The second scheme, Scheme B, assumes that the Knowledge Commons will function within the regular hours of operation at the Mills Library.

(Refer to Section 6.0 Preliminary Plans and Perspectives)

### 5.1 ARCHITECTURAL

**McLay Reading Room** (excludes Statistics Canada Research Data Centre Offices)

Provisions for Scheme A – 24 hour Access:

- a new exterior ramp and steps to existing east stairwell,

- a new lift in existing east stairwell for access from entrance landing to McLay Reading Room,

- a new corridor through the offices under the mezzanine to access the existing washrooms after regular Library hours,

- two new walls and double doors to secure the existing washroom area from the main Library for use after regular Library hours. The doors will unlock with the activation of a fire alarm allowing access to existing exit stairs on the second floor and

- a new emergency double exit door to Loading Dock. The doors will unlock with the activation of a fire alarm allowing access to the outside.

Provisions for Scheme A and Scheme B:

The doors to the McLay Reading Room will be replaced with doors with larger amounts of glass. Quick access stations will be built for 20 computers as well as 1 station to be dedicated to assistance. The office space under the mezzanine and west of the Research Data Centre will be demolished and an office area for a future tenant will be built. A new Telecom closet will also be constructed in this area.

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**5.0    EFFECT ON EXISTING BUILDING INFRASTRUCTURE**

5.1    ARCHITECTURAL - McLay Reading Room, Provisions for Scheme A and Scheme B cont.

Existing finishes that will be renewed include:

- the ceiling - to be fitted with new high performance acoustic tiles,

- the walls - to be repainted,

- the existing carpet - to be removed and replaced with new carpet tiles,

- the existing columns – to be finished in a new cladding and,

- window treatment - electrically operated perforated blinds will provide protection from the sun to computers at exterior windows. Consider using a number of different colours of fabric to express the Commons on the building exterior.

**Collaborative Study Room:** In the mezzanine space over the McLay Reading Room build 6 Collaborative Study Rooms with glazed partitions. An area will be furbished for newspaper reading and identified as the area recognizing The Spectator's gifting of this space. The paint will be removed from the glazed sections overlooking the McLay Reading Room.  Paint and new carpet will be selected to suit the colours and finishes of the McLay Reading Room.

**Reference Area**: The introduction of new computers into this area is an opportunity to reconsider the distribution of power and Ethernet connections.  A combination of through the floor and from the ceiling connections will require furring out at walls and columns. The existing carpet will be made good where the existing floor mounted receptacles will have been removed. Paint in the Reference Area and provide a small area of new carpet at the Reference Desk to suit the new colours and finishes selected for the McLay Reading Room. Make small adjustments to one end of the Reference Desk to accommodate the new technical assistance function.

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## 5.0    EFFECT ON EXISTING BUILDING INFRASTRUCTURE

### 5.2    MECHANICAL

**McLay Reading Room**: No mechanical modifications are required since the existing design air quantity will support the new cooling load based on 75ºF space and 54ºF supply air temperature. An allowance has been included to replace the existing cooling coil within the air handling unit serving this area. Approximately 60 sq. ft. of 8 row cooling coil is required. No mechanical revisions have been identified to accommodate Scheme A – 24 hour access to the McLay Reading Room.

**Reference Area**: The additional of 60 new computers as indicated on the drawings will require the mechanical system to operate to its maximum in this area when all computers are in operation.  With design airflow to this area, the ambient temperature will be 75ºF to 76ºF when the supply temperature is 53ºF.  This is based on the existing replaces with T-8 tubes and electronic ballasts. An allowance has been included to modify the control of the supply air unit in order to reset the supply air temperature and maintain the temperature in this area.

**Collaborative Study Rooms**: Mechanical changes on the 3$^{rd}$ floor would include modifying the control on the existing VAV boxes serving this area so that the downstream pressure in the duct is maintained at a fixed value.  A thermostatically controlled volume damper will control the supply air to each space.  New linear diffusers are required in five of the spaces with reuse of existing diffusers in two other rooms. Exiting diffuser will be removed and ducts capped in 9 locations.  (Refer to drawing in Section 8.0 Notes and References.)

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## 5.0    EFFECT ON EXISTING BUILDING INFRASTRUCTURE

### 5.3    ELECTRICAL

**McLay Reading Room:** The existing ceiling hung lights will be replaced with 24 new fixtures that combine both direct and indirect lighting.  These fixtures will be mounted at a height 5 feet lower that the existing fixtures. Twelve new perimeter fixtures will supplement the lighting at the soft seating. A new electrical closet will accommodate the existing panels and one new panelboard. Power to the soft seating will be delivered in a new raceway along the building perimeter at windows. Power and Ethernet to the computer "pods" will be provided through the floor slab. Quick access stations will receive power and data either through the floor slab or at the new office walls depending on location. Data/power outlets are built into the furniture. Power is also required to:

- the tables and Assistance Station through the floor slab

- new printer/copier hub

- new exit lighting and a fire alarm pull station

- new lift for accessibility in existing east stair

- exterior lighting for new ramp and stair

- electrically operated blinds along exterior windows

Requirements for Scheme A, 24 Hour access, include door hold open devices and magnetic locks at the secure access to existing washrooms. After regular office hours the locks will release upon fire alarm system activation.

**Reference Area**: All floor mounted power/data outlets will be removed. Computer stations will receive power and data either through the slab, or from the ceiling through furred-out columns/walls, depending on location. The cold cathode lighting at the ceiling of the Reference Desk will be replace with new light pipe system.

**Collaborative Study Area**: Each study room will be provided with power and data. The existing lighting will be reused.

## 6.0 PRELIMINARY PLANS AND PERSPECTIVE

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## 7.0 EXPLORATORY PROJECT BUDGET

The preliminary cost estimate for the new Knowledge Commons, Scheme A, is as follows:

|  | Area (m2) | $/m2 | $,000's |
|---|---|---|---|
| McLay Reading Room | 771 | 947 | 730 |
| Reference Area | 604 | 282 | 170 |
| Collaborative Learning Rooms | 165 | 1,429 | 236 |
| **Total Construction Costs** | **1,540** | **738** | **1,136** |
| Furniture |  |  | 250 |
| Computers |  |  | 248 |
| Telecommunications Cabling |  |  | 81 |
| Security Hardware and Wiring - allow |  |  | 25 |
| Architectural & Consultants Fee (10% of construction costs) |  |  | 114 |
| **Total Project Costs** | **1,540** | **1,204** | **1,854** |

The Preliminary cost estimate identifies the cost savings associated with Scheme B, as $76,000.00.

ASSUMPTIONS:

The wireless signal will be installed in the McLay Reading Room following the renovations to this area as part of the "Wireless Canopy" project.

Costs for telecommunication cabling and computers noted above have been provided by Mills Library.

This estimate includes all direct construction costs, general contractor's overhead and profit, loose furnishings and equipment, architect's and engineer's fees, design and construction contingencies. Cost escalation assumes a May, 2005 construction start.

Excluded from the estimate are: hazardous waste removal, moving, administrative and financing costs and the GST.

Bidding conditions are expected to reflect 6 to 8 pre-selected general contractors, open bidding for sub-contractors, open specifications for materials and manufacturers. The above rates are order-of-magnitude (± 15%) for the purpose of program sizing and prioritization only.