



University Planning Committee 2006/07 – Chief Information Officer

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 \$3.057 million Technology Fund

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PART I: CONTEXT

Mission and Vision

Achieve international distinction for creativity, innovation and excellence enabled by technology.

The University Technology Strategy describes a bold vision, a portfolio of projects shown in the diagram below, and an investment of about \$35 million to update the technology landscape at McMaster:

		Student Experience	Research/Academic
University Without Boundaries	Governance	Student Portal	Institute for Arts and Technology
Business Intelligence	Governance Model Technology Committee	Integrated Student Services	Collaborative Research "Hot Houses"
Sustained Success	Investment Model	Knowledge Commons	Shareable High Performance Computing
IT Audit and Risk Assessment	Communications Strategy	Student Technology Centres	Knowledge Management
Key Performance Indicators	Problem Based Learning	Technology Accessibility	Open Information Research Initiative
Application Portfolios	Support and Outreach Program	Standards	Service Excellence
Student Information	faculty Portal	Technology Standards and Best Practices	Service Excellence d Service Delivery Model
Financial and Asset Management	Problem Based Learning Centre(s) of Excellence	Managed Infrastructure	Partnership Models Service Advisory Council
Document Management	Web Conferencing	Wireless Canopy	Foundation Projects
Alumni and Donor Relationship Management	Smart Classrooms	Disaster Recovery and Business Continuity	Student Self Registration
Portal Creation and Management	Premier Learning Community	Data Centre Consolidation	HR and Payroll
Space Planning and Management	Community Education Portal - Connect Hamilton	Campus Expansion and Construction	Project Management Office
	Hospital and Community Partnership Model	Technology Replacement Program	
		Security Road Map	

Status of Previously Reported Initiatives

A brief status report is provided for each project identified in the 2006/07 budget submission:

“Fix” MUGSI

The absolute highest priority was to “fix” MUGSI so that students can access marks, register, drop and add courses, review fee assessment and do related functions. Performance in January 2006 was simply unacceptable and similar problems were anticipated during future peak periods.

Hindsight suggests that the decision to add a web-based front-end to a batch mainframe system that could only support 500 students at any one time and was only available from 8 am to 8 pm may not have been prudent. However, the solution needs to work for at least the next three to five years while planning and implementation of new financial and student information systems progresses. The alternative is to invest in a mainframe with additional processing capability. Queen's and U of T have recently selected this option.

A multi-faceted approach to sustain the dinosaur was developed. Some detail is provided given the serious nature of the problem.

Technology Services invested over \$300,000 obtained from salary “savings” for new servers, hired staff to modify key programs, acquired additional disk space on the mainframe, and sought external advice about capacity planning and system performance.

Key changes included:

- ' relocation of authentication, grade reports and personal timetables from the mainframe to other servers and in future to the new student portal
- ' implementation of proxy and caching for MUGSI applications which enabled the mainframe to do more transaction processing
- ' acquisition of additional mainframe disk space to enable accurate and timely stress testing
- ' modification to hundreds of programs to enable system availability during batch processing

The changes resulted in a significant service improvement as MUGSI is now available to students 23.5 hours by 7 days. However, the mainframe is running at 90% capacity during peak periods which exceeds acceptable performance. The implementation of Registration by Section planned for July 2007 has mainframe performance implications and staff will continue to carefully monitor performance.

The key performance indicator is availability and performance of the mainframe to meet student demand at peak periods.

On January 4, 2007, a new record for the number of student transactions in one day was achieved: 152,110.

About 4,000 distinct undergraduates accessed the system daily in the first few days of 2007 and generated an average of 47 transactions per student for a total of 369,971 transactions in 3 days. This is an increase from the total of 108,736 undergraduate transactions in the first three days of 2006 and an increase in the average number of transactions per student from 18 to 47.

Processing of examinations has similarly increased by over 30% from 2005 to 2006 in the fall term.

Computer Room Upgrades

Existing computer rooms lack sufficient air conditioning, uninterruptible power supplies, and essential power to support existing applications and simply cannot support the addition of new equipment. Some new equipment acquired for the student portal and other applications cannot be turned on.

Technology Services and Physical Plant developed a plan to upgrade both main computer rooms and to use space in Health Sciences' computer room for immediate needs.

Some funding was allocated in the Physical Plant budget to add essential power and air conditioning. An additional \$800K is estimated to bring the rooms to standard. Every available penny from the Technology Services operating budget is set aside for this purpose. The JHE computer room will be completed in Q2 2007 from operating funds and the Gilmour Hall computer room in 2007/08 from the Technology Fund.

The mainframe capacity issue combined with an environment with insufficient power and air conditioning creates frequent challenges and results in an ongoing reactive focus on crisis management.

Implementation of MacViP (Payroll and Human Resources) Project

Initiated in 2004, this project is designed to implement a Human Resources and Payroll solution from DLGL with customization to meet McMaster needs. It replaces a legacy Payroll system and enables legislative compliance, labour relations changes, financial and audit controls, and enhanced reporting.

MacViP has been implemented for about 600 hourly employees (previously known as roll 2 & 5) and about 2500 graduate student employees (previously known as Roll 4) and pays have been issued accurately and on-time. New HR and Payroll processes have been designed and documented and 82 individuals have been trained to use MacViP. Interfaces with 15 other systems have been developed and implemented.

Revised pay statements have been designed and implemented for all employees being paid through MacViP giving more complete and meaningful information to employees.

New technologies have been implemented including an Oracle-based database, the ViP packaged solution and a number of add-on components required for scheduling (CA7), file transfer (Tumbleweed), pay statement creation, cheque creation, and a new approach to system testing including testing tools and 490 re-useable test cases.

The final payroll release for former rolls 1 and 3 (faculty and staff) is planned for the second quarter of 2007. Staff will then review the Human Resources self-serve phase.

The project has not been without problems. It is taking longer than expected because of the:

- sad nature of the data in the legacy system and the related conversion challenges
- complexity of interfaces
- ongoing labour relations matters requiring modifications to both old and new systems
- complexity of pro-rating graduate students pay and scholarships
- shift to a position-based system
- variety of processes and needs in all departments
- culture change related to package, project management and best practice implementation and
- need to consult with a diverse range of players with competing priorities and needs

The delay has translated into an expected over-expenditure of about \$600,000. The over expenditure can be accommodated within the Technology Fund envelope from a cash flow perspective but will impact available funds for projects in 2007/08.

Phase B of the project will provide additional customization for pension management, the pension calculator and additional HR functionality. This phase was funded at just under \$500,000. For cash flow management this has been used to fund part of the Phase A over-expenditure. Based on experience with payroll implementation, it is appropriate to review future direction and evaluate the scope and functionality required.

Registration by Section

This project targeted for completion in the second quarter of 2007 will enable undergraduate students to register in their lecture sections, labs and tutorials; allow them to build their personal timetables in a real-time, user-friendly manner and provide conflict checking. It will reduce workload to administer section changes and manage section enrolments. This project has proved to be more complex than originally expected and is over budget by \$500,000. Once again, the cash flow can be accommodated in 2006/07 and the shortfall must be addressed in the 2007/08 allocation.

Student Portal

This project will implement a portal that provides students with single sign on to the resources they need and provide a foundation for future on-line resources for students, faculty, staff, alumni, parents and the community. The portal which will meet the top dozen or so priorities identified by students will be launched in the second quarter of 2007. Functions in this initial phase include existing MUGSI services, grade reports, individual course timetables, WebCT interface, library interface, searchable master course timetable, search, e-mail, personal calendar, discussion forums, and targeted announcements by Faculty and year.

Future phases will include co-curricular records, application status, instant messaging, on-line grade report in lieu of transcript request, graduation information request, request for minor, request for exam schedule changes, job/volunteer opportunities, bookstore search and book lists, integration with Athletics registration, and personal notifications.

Smart Classrooms

This project upgraded data projector technology in 21 classrooms to a minimum standard: KTH 109, B104, B105; UH 101, 112, B116; ABB 162, 163, 164, 165; KTH B107, CNH 102, 106, and additional classrooms in renovated BSB. As phase 3 of BSB has been delayed, other classrooms will be addressed. UPC may recall that classroom renewal was identified as the highest priority by the Technology Committee and UPC urged to make base funding in the amount of \$300,000 available annually. While there was general agreement that this funding should be derived from the Quality Fund, this funding source was reduced and consequently no additional money was made available. This meant that no funds were available from the Technology Fund for the "Fix MUGSI" initiative.

The Technology Committee is aware of the lack of match between available technology and furniture both for smart classrooms and wireless locations.

Document Management

This project is intended to demonstrate proof of concept and the value proposition for implementation of document management in the Office of the President, Office of the Provost, University Secretariat and Athletics. A Request for Proposal was issued and recently awarded to EMC. Subject to a successful pilot, the EMC solution will become the University standard for document management. The project budget was based on estimated costs which were lower than the actual costs as determined through the purchasing process. An additional \$85,000 will be required to implement the proof of concept and a further \$115,000 is proposed to support new processes, workflow, and forms.

Software Auditing and License Management Facility

This project involves the purchase, installation and configuration of Sassafras K2 auditing and license management software on servers and deployment of K2 clients on user desktops in Business, ECE, Health Sciences and Humanities. The intent is to better manage licensing costs by sharing so that licenses are made available to those who need them i.e. rather than buying a license for each desktop, licenses are "pooled".

GO Transit Student ID Process

This small project automated the validation of student eligibility for GO Transit passes, eliminated long line-ups at start of term and enhanced customer service.

Business Intelligence

This project expanded the data warehouse to include financial data to support the budget process and to include student records and other data required for the Undergraduate Program Review Process. Additional reports which have been delivered include tables for the Registrar's Report, information on teaching units, and level 1 education source. Prototype cubes of student data are in development.

A standardized budget template for five month budget reviews was implemented and accessed through the BI Portal. The immediate focus is the implementation of a financial management and reporting tool to better support budget management across the University.

Futures include deployment of a performance scorecard for key indicators on the University strategy map.

Thode Learning Commons Pilot Project

This project created a small Learning Commons (20 public stations with productivity and adaptive technologies software, and a scanner) in the lower level of the H.G. Thode Library of Science & Engineering.

Health Sciences Library e-Classroom

Laptops, wireless technology, portable instructor equipment and moveable furniture will be acquired to enable maximum flexibility in the new Health Sciences e-classroom. The renovations to the Health Sciences Library are now estimated to be completed in February 2007.

Payment Card Industry Standards Compliance

This small project will implement a common method of taking internet payment card transactions and will revise business processes and systems security in over 30 departments to meet the standards required by the payment card industry. Requirements and design of MacPay and programming of the prototype have been completed. Significant consultation with and education of key stakeholders has been completed.

Web Enhanced Learning and Communication

This project supports applications in Engineering and Health Sciences and investigates and evaluates technologies such as web conferencing and streaming media that provide web-enhanced learning and communication tools to support education.

Video Conference Classroom Project

This project will install video conferencing capacity for the Social Sciences. Stakeholders have been identified and involved with planning equipment options and space needs.

Construction Projects

Technology Services planned, designed, and implemented technology including security, telephones, and networks for the renovated BSB, the new David Braley Athletic Centre, and the Les Prince Hall, as well as many relocations.

Travel Management

While not specifically a technology initiative, this project is part of Inspiring Change, the Administrative Transformation initiative, and may be representative of a range of future projects designed to enhance service, simplify processes, and save money.

The purpose is to design a travel management and expense reimbursement process to:

- match travelers' needs for a quality travel experience and enable travelers to focus time and energy on the purpose of the trip rather than logistics and administration
- simplify the travel management and reimbursement process
- reduce the overall cost of travel
- achieve compliance with McMaster policy, Canada Revenue Agency, and external granting agencies' requirements

This is a two phase initiative. The first phase is intended to:

- Respond to traveler dissatisfaction and enhance client service
- Recommend policy changes that are clear in terms of accountability for policy and legislative compliance and define consequences for non-compliance
- Design a new process that is simple, understandable and makes compliance easy
- Define the scope and resources required for the second phase
- Model an effective process review

The second phase will implement new policies and processes and is intended to:

- Delight clients
- Save the University 5% of the annual investment in travel and expenses
- Achieve end-to-end processing of all reimbursements in less than 10 days
- Implement policies and processes that are simple, understandable and achieve established performance targets
- Achieve policy, CRA and external granting agencies' compliance

Recommendations may inform a pilot or proof of concept phase, may result in process changes, may result in new or revised contracts, and may be enabled by technology. A draft report will be circulated for review and comment in January 2007. The project will be completed when recommendations have been considered, an implementation plan developed, policy compliance achieved, and performance metrics put in place for ongoing travel management and expense reimbursement.

The project is also intended to act as a model for future process reviews and consequently project management best practices will be followed throughout the review including a collaborative, structured process.

Wireless

The wireless canopy now has over 200 active wireless access points, with roughly 40 more in process of being added in a number of public areas across campus. Concurrent usage of the MacConnect system is now routinely peaking at over 800 simultaneous users on weekday afternoons. Roughly half is from locations in Mills Library, the Student Centre and MDCL. The rest is distributed at lower density at locations across campus where wireless is available and students can find a place to sit (and an electrical outlet to augment their laptop's battery). Appendix 1 shows the current state of the canopy.

Security Road Map and Common Authentication

Consistent with the Security Road Map developed in 2005, staff gave priority to common authentication as a stepping stone on the road to single sign-on. The transition for students was completed in 2006 and faculty and staff are in progress. The introduction of challenge questions to enable password resets should reduce the number of calls to the Service Desk by about 10,000 per year.

Security continues to be a very high priority and Technology Services is working with all faculties with a view to hardening security of servers and data starting with the most vulnerable points of risk. Many servers remain unprotected by firewalls and the basics of port, password, application, and data management need to be addressed.

Information Technology Infrastructure Library – Incident and Change Management

Technology Services is committed to the implementation of the Information Technology Infrastructure Library as a best practice for service management. Incident Management was implemented in 2005 and will be extended to all services in 2007. Change Management processes will be introduced in 2007.

Learning Commons

The University Library led this important and successful initiative in partnership with the Centre For Student Development, Centre for Leadership in Learning, and University Technology Services.

KEY HIGH LEVEL GOALS

Key high level indicators include:

1. Progress according to planned implementation of University Technology Strategy with related business benefits of cost avoidance, enhanced client service, better informed decision-making, and technology currency. This envisions the total transformation of the technology landscape at McMaster.
2. Creation of a client-centric, secure technology environment with exemplary client service and appropriate protection of data and applications including all aspects of e-commerce. This encompasses client education and implementation of best practices. The key indicators annually are customer satisfaction and no security breach resulting in reputational impact.
3. Implementation of Inspiring Change, the transformation of the Administration Division to improve client service, simplify processes and save money.

ENVIRONMENTAL SCAN: Major opportunities and challenges for the next one to three years:**Opportunities**

1. Open Source Solutions
2. Inspiring Change – Administration Transformation
3. Academic Transformation
4. Continued collaboration with the University community through the University Technology Committee, Service Advisory Council and Technology Roundtable
5. Continued partnership with the University Library and Centre for Leadership in Learning on initiatives such as the learning commons and course management software, web and video conferencing, podcasting, and innovative use of technology to support learning
6. Possible partnerships with other institutions

Challenges

1. Computer room environment and mainframe capacity
2. Budget challenge and fiscal restraint
3. Resistance to change
4. Managing expectations
5. Matching resources to projects and budget
6. Maintenance costs of new applications and staff support
7. Maintaining the old and new environments concurrently during transition
8. Things take time

PART II: ALIGNING MAJOR STRATEGIC INITIATIVES WITH *REFINING DIRECTIONS***GOALS AND CRITICAL SUCCESS FACTORS DERIVED FROM *REFINING DIRECTIONS***

The preliminary strategic priorities noted below support the following goals:

Goal: To provide an innovative learning environment where students can prepare themselves to excel in life

Goal: To build an inclusive community with a shared purpose

Critical Success Factor: To provide quality infrastructure (libraries, IT, space, etc)

Critical Success Factor: To provide effective academic administrative services and support

Critical Success Factor: To provide effective institutional administrative services and support

2007/08 TOP SIX STRATEGIC PRIORITIES

The 2007/08 Technology Services priorities are at an early stage and have not yet been considered by the University Technology Committee.

	PRIORITY PROJECTS <i>Note that detailed project plans will be developed and estimates refined.</i>	<i>Preliminary Estimate \$</i>
1.	<i>Implement business solutions-in-progress described above:</i>	
	<i>- MacVIP (Payroll and Human Resources) Implementation (06/07 shortfall)</i>	<i>600,000</i>
	<i>- Student Registration by Section (06/07shortfall)</i>	<i>500,000</i>
	<i>- Student Portal</i>	<i>Funded</i>
	<i>- Business Intelligence</i>	<i>Funded</i>
	<i>- Document Management Proof-of-Concept</i>	<i>200,000</i>
	<i>- Payment Compliance</i>	<i>Funded</i>
	<i>- Web Enhanced Learning Year 2</i>	<i>150,000</i>
2.	<i>Complete Computer Room Upgrades</i>	<i>500,000</i>
3.	<i>Continue commitment to service excellence, implementation of the security road map technology currency, classroom renewal</i>	<i>300,000</i>
4.	<i>Continue implementation of the University Technology Strategy. Initiate acquisition of new Financials to provide solid information for decision-making during a period of severe fiscal restraint. Acquire General Ledger, Accounts Payable, Purchasing applications. A further \$3 million in total may be required in 2008/09 & 2009/10.</i>	<i>800,000</i>
5.	<i>Inspiring Change, Administrative Transformation - Funding to be determined</i>	<i>0</i>
	<i>- Initiate Travel Management and Expense Reimbursement</i>	
	<i>- Conduct various process reviews and technology initiatives designed to save money, enhance service, simplify processes</i>	
6.	<i>MacVIP Human Resources</i> <i>Review direction and develop business case for subsequent phase which enables employee self-service. Note that application upgrade may be required prior to this phase.</i>	<i>500,000</i>
	Estimated Total Funding Required	3,565,000
	University Technology Fund Envelope based on 2006/07	3,050,000

Based on this preliminary list of priorities, the following projects will not be funded in the 2007/08 work program:

1. Replacement or upgrade of the mainframe
2. Course Management – Replacement for Web CT
3. Student Portal – subsequent phase to address next student priorities
4. Academic and Staff Portals
5. Student Information System – process review and needs definition
6. Business Intelligence Performance Scorecard
7. Financials – Research Accounting
8. Wireless Canopy Expansion
9. Other initiatives proposed by Faculties and Departments

CONCLUSION

The University Technology Strategy sets out a bold vision in support of *Refining Directions* and describes over forty projects designed to position the University community to access today's technology to support learning, research and administration. An annual investment of \$6 to 7 million was recommended to achieve implementation over 5 to 7 years.

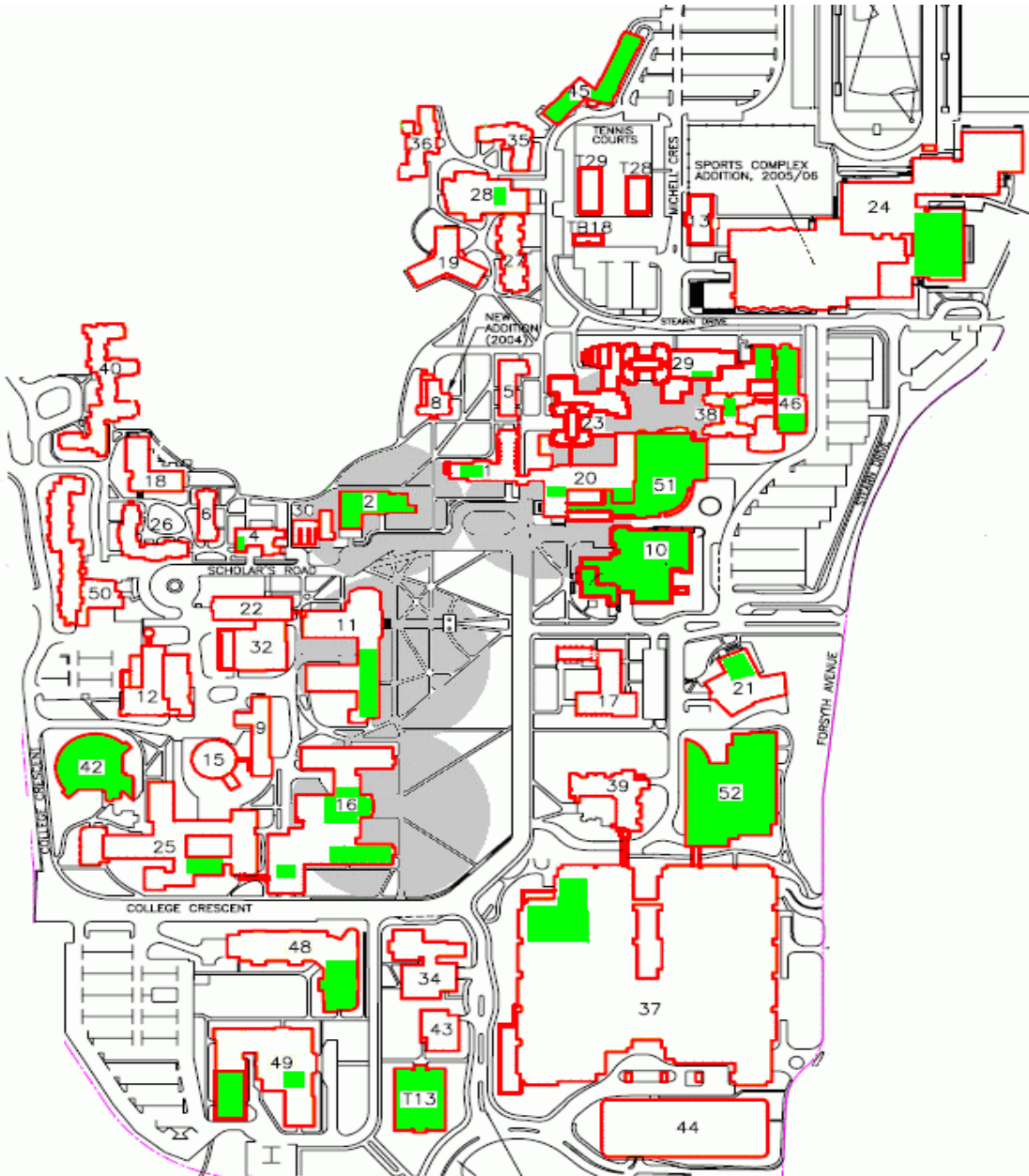
Based on an annual funding allocation of \$3 million, it will take at least a decade to replace existing outdated applications and infrastructure. New solutions will be at the end of their useful lifespan prior to the end of the cycle.

Technology can be an enabler of change, cost avoidance and process simplification but only if the commitment exists to change and to introduce standards. Open or community source presents an opportunity to work as part of a larger community of universities to acquire cost-effective solutions and will be carefully explored in the acquisition of a financial solution. Kuali, a suite of financial applications developed by and for universities in a consortium, represents the most cost-effective opportunity. Kuali Student is in the formative stages and will be similarly explored in future years.

The University Planning Committee is encouraged to champion standards, community source initiatives, new streamlined processes, and vanilla implementation of business solutions with a view to achieving the value proposition possible with today's technology.

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APPENDIX 1 MacConnect Wireless Coverage Map



Darker shading indicates wireless available indoors; lighter grey shading indicates outdoor wireless areas. Note that the buildings listed below are identified first by their campus building number.

- 02 - Hamilton Hall (11 Access Points)
- 04 - Refectory - Bridges Cafe (1 Access Point)
- 10 - Art Gallery - Main & Upper Galleries (2 Access Points)
- 10 - Mills Memorial Library Study Areas & Research Collections (27 Access Points)
- 11 - Burke Science 248 and 249 (4 Access Points)

- 16 - JHE - 1st Floor Lounge & 3rd Floor Study Area (6 Access Points)
- 20 - Gilmour Hall Council Chambers & 2nd floor Lounge (3 Access Points)
- 21 - Wentworth House - Grad Study Room (1 Access Point)
- 24 - Ivor Wynne Centre - Main Level (3 Access Points)
- 25 - Arthur Bourns Building - South Corridor Lounge (1 Access Point)
- 28 - Commons Rm 105 (1 Access Point)
- 29 - Togo Salmon Hall - 1st Floor Lobby (1 Access Point)
- 37 - Health Sciences Library - MUMC (9 Access Points)
- 38 - Kenneth Taylor Hall - 1st Floor Lobby & Basement (4 Access Points)
- 42 - Thode Library - Study Carrel Areas (11 Access Points)
- 45 - Les Prince - Study Areas (15 Access Points)
- 46 - Innis Library (5 Access Points)
- 46 - DeGroot School of Business - 1st Floor Lobby & Student Lounge, 5th Floor Student Common Area (8 Access Points)
- 48 - IAHS Library and 1st Floor Lobby (6 Access Points)
- 49 - Information Technology Building 1st Floor Lobby (2 Access Points)
- 49 - Information Technology Building: Annex (12 Access Points)
- 51 - McMaster University Student Centre (15 Access Points)
- 52 - MDCL - Michael G. DeGroot Centre for Learning & Discovery (43 Access Points)
- T13 - UTS Main Office (3 Access Points)
- Outdoor Areas - in front of JHE, BSB, Hamilton Hall, between MUSC and Mills & Arts Quad (5 Access Points)

An additional 39 access points are in progress.