

Master Planning for Medicine

Faculty of Medicine

Toronto is the only city its size in the world with just one medical school. The Faculty of Medicine at the University of Toronto not only trains the next generation of leading physicians and scientists, but anchors one of the largest biomedical clusters in North America, with a network of nine affiliated teaching hospitals and 25 community-affiliated hospitals and sites.

With a long and storied history of significant and influential medical firsts – from the discovery of insulin and stem cells to the first electronic heart pacemaker and first lung transplant – U of T Medicine is recognized around the world as a research powerhouse. The Faculty is home to over 7,500 students (1,450 MD and health profession students) across 25 departments, 16 interdisciplinary centres and institutes, 79 post-MD programs and 14 graduate units spanning basic, clinical and rehabilitation sciences, translational research and health systems domains.

Most recently, U of T Medicine ranked #11 in the world in the 2018 QS World University Rankings. (By comparison, McGill Medicine ranked #21 and UBC #29.) The Faculty's expertise in an array of medical and scientific fields attracts considerable research funding – \$850M in total, including the research hospitals – and our faculty win more awards and prizes than their peers at any other Canadian university. U of T Medicine is first in Canada and fifth in the world for publications in the 50 highest-impact journals in medicine and related fields. And over the last five years, Medicine has generated 11 new start-up companies, more than 40 new priority patent applications and 200 invention disclosures.

The Faculty's alumni community is made up of a network of over 55,000 health-care leaders, including more than 20,000 former medical residents and fellows. The Faculty also delivers Continuing Professional Development to more than 40,000 course registrants per year.

Facilities

The Faculty occupies almost 60,000 net assignable square metres (nasm) / 646,000 nsf on campus, both St. George and Mississauga and in leased space.

This equates to over 1.2M gross square feet over 11 campus buildings (92%) and 7 leased facilities (8%). More than half of the space, 52% is research with administration at 32% and education 16%.

Research comprises the most sophisticated, sensitive, diverse and infrastructure intensive facilities in the faculty's portfolio. Specialty facilities include nuclear magnetic resonance (NMR) facility, microscopy imaging, animal care facilities, and, in vivo and in vitro containment level 3 (CL3) research facilities. Research changes rapidly and the challenge is to keep up with new demands.

In terms of education space, there is a shift away from large room didactic teaching to small room active learning in almost all education sectors, but primarily in the MD Program.

Current and Emerging Challenges

Today, we are facing a number of challenges in meeting the facility requirements for Research and Education. TDCCBR is now 12 years old and yet it is already unable to support new research initiatives. The building is overcrowded and the researchers require greater dry lab (computational) space, appropriate storage for ultra-low temperature freezer space and resolution of ventilation issues related to higher level containment requirements. The reversion of campus buildings Banting, Best (ongoing) and FitzGerald while adding leased space in MaRS and Krembil has reduced the overall space footprint while adding a financial strain on the Faculty. This has been exacerbated by new leases with hospitals for clinical administration units and leases for clinical administrative units that were previously located on campus.

The renovations, relocations, consolidations and leasehold additions have only partially addressed the research needs of the faculty and many facilities in the Medical Sciences building still have not been renovated since 1968.

Additionally, the focus on research facilities has not addressed changing teaching needs, such as the shift to small group active learning or on increased needs in teaching labs. New needs that have arisen related to teaching includes those required for the MD Program curriculum change and the expansion of Rehabilitation Sciences enrolment.

Although significant work has occurred in both facilities and space allocations and usage over the last 10 years, much remains to be done. Much of the work has been noteworthy and it highlights the areas that are now in need of repair and re-envisioning.

The faculty has contracted and rationalized space over several years and has vacated two full buildings and most of a third. Overall, the quantity of space is limited, and requests are challenging to fulfill, both for renovations (lack of swing space, lack of space for secondary effects) and ongoing requests (new hires, changes in teaching methods, new research equipment). We are essentially close to full capacity at present, with no flexibility for maneuvering or growth.

The MD Program has made changes to the curriculum from primarily didactic to primarily active learning, which is not supported by the large tiered classrooms. Teaching has shifted to the hospital based institutes and there is a growing lack of attachment to the University and MD Program.

Active learning is also more and more utilized in undergraduate life sciences education which is currently supported in 50 year old lab rooms.

Trends in research requirements include ongoing increasing safety compliance. More than half of the faculty's research space is located in the Medical Sciences building in which 80% of the space has only been surface refinished, if at all, and remains an ongoing challenge. Some of the related infrastructure risks include:

1. Many electrical, mechanical and structural systems are at end of life, and often stretched beyond capacity causing:
 - a. Risk to high cost research operations
 - b. Risk to high cost equipment
 - c. Safety risks to occupants
2. Reliability of, and confidence in building system performance, including back-up systems is of critical importance to scientists – currently not the case. Number of roofs leak causing risk to equipment and people.

How we got here

In 2008, the award winning Terrence Donnelly Centre for Cellular and Biomolecular Research (CCBR) had been open for just 2 years. It was the first new space for the Faculty of Medicine since 1968, and represented an investment in basic science research and teaching. The Faculty's research and teaching space was primarily University of Toronto buildings from the first half of the 20th century (pre-war). Clinical administrative departments were housed in hospital based space at no charge, and there were legacy allocations of space that created an equitable distribution among the various departments. Facility repairs at that time were primarily patch and paint – although some new facilities were starting to come on stream, notably the CFI funded 3D Imaging and Graduate Expansion funded Flow Cytometry Facilities in the Medical Sciences building.

Two master plans were prepared in house looking at the issues simultaneous with ongoing repairs and renovations. The first in 2012 reviewed the facilities from a quality perspective using 13 performance indicators. The recommendations from that report were that the faculty vacate the oldest buildings that continued to have wet research labs as these were not supportable uses. Compliance issues were looming.

The second master plan report focused on basic science research facilities and addressed the quantity of space. It reviewed the space allocations to the basic science departments in order to ascertain the need for new and increased science space to sustain the changing needs of biomedical research. This report reinforced the recommendation for a new basic science building.

Ongoing, many new facilities came online including research moved from the 1932 C. David Naylor building to the new Krembil Discovery tower, renovations for the MD Program (student lounge, Enrolment Services and administrative offices), new offices for Graduate Life Sciences and Institute of Medical Sciences and new offices for Advancement, CFO and HR departments. Repairs to research laboratories also occurred in order to comply with the new Canadian Biosafety Standards.

The master plans were instrumental in securing new research space from the Central University in the MaRS complex, creating vacancy in the Medical Sciences building, which along with federal and faculty funding allowing for a full renovation of 20% of wet research laboratories and all of the Division of Anatomy's teaching and morgue facilities.

As of summer 2018, wet research will no longer be housed in the Faculty's oldest buildings.

Looking Ahead

As we address the many challenges facing existing facilities, it is important that these be informed by a longer-term facilities vision and an associated Master Plan. This will ensure that we do not take any miss-steps in where we invest, and allow for orderly refurbishment of existing facilities, where appropriate, or timely planning and funding for any new facilities.

The University of Toronto, through the Towards 2030: A Long-term Planning Framework for the University of Toronto has set strategic direction that can and should inform a master plan process for the Faculty of Medicine. The Faculty and University's vision, mission and reputation are guiding principles in prioritizing planning for the future.

A master plan of this scope and scale requires specialty consultants, with detailed expertise in this area along with deep investigations and consultations with the various departments and divisions within the Faculty to understand future needs. A clear document outlining the current faculty profile and space provided to consultants would set the stage for consultations.

At the University of Toronto, a Project Planning Committee which subsequently reports in their standard format are the University's process for investigating, planning and creating eventual projects. A committee could be struck by the Faculty at the same time as a master plan committee with significant overlap which would guide the master plan process with consideration for a concurrent new build plan if appropriate. This could allow for a final master plan that recommends a new build, and a Project Planning Report for governance approval simultaneously.

Formal Project Planning Committees require Governance approval and have a specific composition of members.

To proceed, resources for master plan consultation must be allocated and an appropriate committee(s) formed.

Funding Challenges

At U of T, we are all challenged to keep our costs as low as possible given, amongst other factors, constraints on provincial grants, limits on tuition increases, labor and other cost escalation, and demographic factors. Additional challenges include fiscal implications from actions outside the university at the global political level. It is therefore imperative that the Faculty of Medicine have a longer term facilities plan to allow it sufficient time to develop related funding strategies.

Master Planning

Going forward, to continue and consolidate the efforts to date, a review and new vision is needed. Master planning is a tool that combines assessment of existing facilities (risk assessment and facilities

review) with needs futurecasting (overall needs and growth planning review). It can plot the way forward and address the appropriate facilities for the faculty to support development going forwards.

Futurecasting is a well established strategic planning approach to model the future for teaching and research for the Faculty of Medicine. It is a wholistic review of activities, occupant profiles, needs and project change that helps understand what is possible in the timeframe in question and how to take best advantage of opportunities. It is both a snapshot and a look forward which will allow for programming related to space usage going forwards.

It is a way to understand:

- Underlying dynamics
- The trajectory of new research and teaching
- The way enrolment evolves
- The challenges related to ongoing competition for students

Assessments would include but not limited to:

- Opportunity assessment of faculty operations, includes expansion planning
 - Evaluation and ranking of potential areas of growth to support the academic and research mission
 - Includes blue sky and visioning, do what's possible
- Evaluation of physical presence in relation to other University divisions and to external comparable Faculties of Medicine
 - Facilities to attract research and teaching
 - Facilities to represent the value the Faculty brings to the University and beyond
 - Leveraging our location, physical on campus, and experiential in Toronto
- Risk assessments – operations that are at risk due to infrastructure deficiencies
 - Evaluation of infrastructure at end of life and beyond capacity
 - Reliability of building systems performance such as roofs
- Facilities review – accommodation of needs, existing and preferred
 - Understanding the current facilities from a capacity perspective
- Master programme planning – what is actually needed for moving forward
 - Clear and detailed understanding of what is needed, where best to locate it and strategies to secure additional space if necessary
- Council of Ontario University's guideline assessment on the space allocation
 - Understanding space allocation in relation to the Ontario government guidelines
- Site investigations including secondary effects as an offshoot of possible new building consideration

A master plan incorporates the programming work with a review of all of the Faculty's current facilities, whether campus based or leased and makes recommendations for occupancy changes, refurbishment of

existing facilities, and new facilities in the context of a business plan. This sets the stage for addressing space needs in a proactive way by creating an optimal plan for the faculty's facilities needs into the future.

Recommendation

We recommend the University support and assist the faculty in:

1. The procurement of appropriate consultants to develop a Facilities Master Plan for the Faculty of Medicine, and in
2. Assuring compliance with University planning.

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Appendices

Appendix A, List of Campus Buildings

1. Best Institute
2. C. David Naylor Building
3. 88 College Street
4. Communication, Culture and Technology, UTM
5. Health Sciences Building
6. McMurrich Building
7. Medical Sciences Building
8. Old Admin Building, 263 McCaul
9. Rehabilitation Sciences Building, 500 University
10. Terrence Donnelly Centre for Cellular and Biomolecular Research
11. Terrence Donnelly Health Sciences Complex, UTM

Appendix B, List of Leased Facilities

1. 123 Edward Street
2. 190 Elizabeth Street
3. CAMH
4. Kensington Foundation
5. MaRS 2, part of 14th floor, 15th and 16th floors
6. Stewart Building
7. Krembil Discovery Tower

Appendix C, List of Sectors by Net Assignable Square Metres

Sector	nas	% of total
Administration	18,600	32%
Education	9,500	16%
Research	30,500	52%
	58,600	

Appendix D, Types of Space

1. Research
 - a. Containment level one and two wet research laboratories
 - b. *In vivo* and *in vitro* containment level three wet research laboratories
 - c. Vivarium
 - d. Gross anatomy facilities including morgue
 - e. Nuclear magnetic resonance research facility
 - f. Microscopy research facility
 - g. Flow Cytometry facility
 - h. 3D Imaging facility
 - i. Human feeding study facility
 - j. Drosophila environment room and related research facilities
 - k. Research support facilities including sterilization facility, Medstore, cold rooms, freezer farms
2. Teaching
 - a. Undergraduate teaching laboratories
 - b. Rehabilitation sciences classrooms, problem based learning rooms and simulation rooms
 - c. Seminar rooms and auditorium
 - d. Standardized patient program
3. Administrative offices
 - a. Dean's Office
 - b. Campus based departments' administrative offices
 - c. Clinical departments' administrative offices