

**FOR RECOMMENDATION**

**PUBLIC**

**OPEN SESSION**

**TO:** Planning & Budget Committee

**SPONSOR:** Professor Scott Mabury, Vice President, Operations and Real Estate Partnerships  
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**PRESENTER:** See Sponsor

**DATE:** March 23, 2022 for April 13, 2022

**AGENDA ITEM:** 4

**ITEM IDENTIFICATION:**

Capital Project: *Report of the Project Planning Committee for the University of Toronto Faculty of Dentistry Pre-Clinical Simulation Lab 4 Renewal – Project Scope and Sources of Funding*

**JURISDICTIONAL INFORMATION:**

Pursuant to section 4.2.3. of the Planning and Budget Committee’s terms of Reference, “...the Committee considers reports of project planning committees and recommends to the Academic Board approval in principle of projects (i.e. space plan, site, overall cost and sources of funds) with a capital cost as specified in the *Policy on Capital Planning and Capital Projects*.”

The *Policy on Capital Planning and Capital Projects* provides that capital projects with costs between \$10 million and \$50 million (Approval Level 2) on the St. George campus, will first be considered by the Planning & Budget Committee, which shall recommend approval to Academic Board. Such projects will be confirmed by the Executive Committee of the Governing Council on the recommendation of the Academic Board. [Section 3(b)(ii)(1)(a)] The Policy further states that "any financing will be approved by the Business Board". [Section 3(c)]

**GOVERNANCE PATH:**

**A. Project Planning Report**

1. **Planning & Budget [for recommendation] (April 13 2022)**
2. Academic Board [for approval] (April 27, 2022)
3. Executive Committee [for confirmation] (May 10, 2022)

**B. Execution of the Project:**

1. Business Board [for approval] (April 26, 2022)

**PREVIOUS ACTION TAKEN:**

In June of 2020 the Capital Project and Space Allocation Committee Executive (CaPS Exec) approved the Terms of Reference for the renovations of Clinic 2 and Lab 4 as the second phase of the Clinic Master Plan implementation.

In November of 2020, CaPS Executive approval was given to create a temporary off-site dental clinic to be operational by September 1, 2021. The Satellite Clinic also provide the Faculty with the minimum amount of operational swing space of house Clinic 2 operations allowing the Pre-Clinical Simulation Lab 4 Project to be temporarily housed within existing Clinic 2 space.

On April 1, 2021 CaPS Executive approved the request for funding to be made available to engage consultants to initiate design services for Pre-Clinical Lab 4 and Clinic 2 renovations, respectively, within Faculty of Dentistry.

On April 20, 2021 an RFSQ was issued for Consultants and closed on May 20, 2021. Three Consultant Teams were short listed.

On June 21, 2021 an RFP was issued to the three short listed Consultant Teams. The RFP closed on July 21, 2021. Interviews were held on August 4, 2021 and a Consultant Team was selected by committee on August 6, 2021. Architects Montgomery Sisam Architects a local architecture firm, teamed with Kahler Slater Architects (Milwaukee) were selected as the project architectural team.

On August 20, 2021 a further CaPS Executive application was approved to increase consultant fees to engage consultants to prepare schematic design materials through to 100% design development. The increase was to recalibrate fees between the Lab 4 and Clinic 2 project to align with the RFP fee proposal.

The Pre-Clinical Simulation Lab 4 renewal is expected to be delivered in two phases: Demolition and Abatement August 2022 – September 2022 and Construction January 2023 – June 2023. Project Fit-out and Occupancy is targeted for August 2023.

**HIGHLIGHTS:**

The Dentistry Building’s existing space at 124 Edward Street is challenged to meet the academic and clinical initiatives of the Faculty for the coming decades. The Faculty needs to meet the standards necessary for educational innovation and growth for all their space including clinical space. In addition to its teaching and research programs, Dentistry’s academic mission must also provide a health-care service as part of its clinical program. While other faculties can train students within hospital facilities, the Faculty of Dentistry must operate an independent oral health care facility that maintains a patient base of approximately 15,000 patients, providing care at both the general practice and specialty levels. The Faculty of Dentistry clinics are heavily used by the community and serves over 90,000 patient visits annually, many whom have difficulty accessing care from private practices.

A Clinic Master Plan was initiated by the Faculty in 2019 to identify opportunities for providing the Faculty of Dentistry students - and its patients - modern clinic space to process patients effectively and efficiently as well as meet current clinic practice standards. The Master Plan provides a reorganization of the Basement, 1st, 2nd and 3rd level clinics, classrooms, office and support space programs to target improved patient flow, wayfinding, operational efficiency and pedagogical requirements within the available space at 124 Edward Street. In order to achieve Clinic renewal and reorganization, the Master Plan included an 8 stage implementation phasing program. Clinical dentistry has evolved significantly from both infection prevention/control and technological standards and regulations surrounding infection control have been redefined in response to the COVID-19 pandemic. Due to increased awareness and regulatory pressures in regards to control of aerosol generating activities in dentistry, proposed pedagogical shifts and the compromised condition of the existing facilities, the Faculty of Dentistry identified the renovation of Clinic 2 and the Pre-Clinical Simulation Lab 4 as the next priority phase of the master plan.

The interim Project Planning Report included both the Pre-clinical Simulation Lab 4 renovation scope and the scope of the Clinic 2 renovations. The project has since been split into two separate projects with two separate TPCs approved concurrently at CaPS Executive for consultant fees. The Lab 4 project is scheduled to be completed prior to the Clinic 2 project; full governance approval is required for Lab 4.

This project will include the implementation of Phases 6 of the Clinic Master Plan to renovate the Pre-clinical Simulation Lab 4.

The Lab 4 Renewal project is an interior project and does not require Site Plan Approval or Rezoning.

Renovations to the Pre-Clinical Lab 4 will replace the existing outdated lab benches with 124 new stations equipped for modern digital dentistry. Existing lab support spaces will be renovated to include new support Labs including Radiology, Acrylic & Plaster and CAD CAM.

The project will renovate a total of 673.57 nasms of inventory space with 845.60 nasms and 1,155.70 non-assignable sqm of potential secondary effect renovation area. The project Space Program generates a project area of 673.57 nasms with a project gsm of 752.62 gsm. Necessary upgrades to building infrastructure, services and energy performance will be included in the renovations.

The Pre-Clinical Simulation Lab 4 renewal has included sustainability and energy efficiency in the design to achieve the targets stipulated in the Tri-Campus Energy Modelling & Utility Performances Standard and has the potential to achieve a LEED ID+C Gold rating should certification be requested. The sustainability upgrades to the existing building included in the Lab 4 project are in alignment with the overall Climate Positive Campus and Low-Carbon Actions Plan policies.

Project costing was completed at each stage of the design process. A Class B costing was provided by the Consultants in February 2022. UofT Capital Projects coordinated a 3<sup>rd</sup> party Class B costing at the same time. The Total Project Cost (TPC) included with this application is a result of these two Class B costing reports.

The Pre-Clinical Simulation Lab 4 renewal is expected to be delivered in two phases: Demolition and Abatement August 2022 – September 2022 and Construction January 2023 – June 2023. Project Fit-out and Occupancy is targeted for August 2023. During the demolition and abatement, existing concealed and inaccessible building conditions will be documented and addressed in the Contract Documents for the construction tender as a cost savings strategy to minimize project extras which have historically been an issue with renovations at the Dentistry Building at 124 Edward Street.

The Pre-Clinical Simulation Lab 4 Renewal will pursue a stipulated sum project delivery methodology with an anticipated start of demolition and abatement in August 2022 and a construction start in January 2023 with building occupancy in August 2023.

### **Schedule**

The proposed schedule for the project is as follows:

- |  |                          |
|--|--------------------------|
| • 100% Demolition & Abatement Documents      | March-May 2022           |
| • 100% Construction Documents (CD)           | October 2022             |
| • Building Permitting                        | May 2022                 |
| • Demolition & Abatement Tender & Award      | June-August 2022         |
| • Site Mobilization (Demolition & Abatement) | August 2022              |
| • Construction Tender & Award                | November - December 2022 |
| • Site Mobilization (Construction)           | January 2023             |
| • Substantial Performance                    | June 2023                |
| • Occupancy                                  | August 2023              |

### **FINANCIAL AND PLANNING IMPLICATIONS:**

Discussion of overall costs and sources of funds can be found in the *in camera* document for this project.

### **RECOMMENDATIONS:**

Be It Recommended:

THAT the project scope of the Faculty of Dentistry Pre-Clinical Simulation Lab 4 Renewal described in the *Report of the Project Planning Committee for the University of Toronto Faculty of Dentistry Pre-Clinical Simulation Lab 4 Renewal*, dated February 28, 2022, be approved in principle; and,

THAT the project totaling 752.62 gross square metres (gsm), be approved in principle, to be funded by a combination of Faculty of Dentistry Operating Funds, Future Major Capital Project Reserve, F&S Deferred Maintenance, and Fundraising.

**DOCUMENTATION PROVIDED:**

- *Report of the Project Planning Committee for the University of Toronto Faculty of Dentistry Pre-Clinical Simulation Lab 4 Renewal, dated February 28, 2022.*

# **Report of the Project Planning Committee for the**

## **University of Toronto Faculty of Dentistry**

### **Pre-Clinical Simulation Lab 4 Renewal**

February 28, 2022



## **I. Executive Summary**

The Dentistry building, located south-east of the main St. George Campus at 124 Edward Street was built in 1959, with an addition to the north side of the original building in 1985. The building houses the majority of the Faculty of Dentistry functions, including educational classrooms, wet and dry research labs, student activity spaces, administration spaces, as well as the Library and Dental Museum. The Faculty also provides dental care to the community through their public clinics which are also located at 124 Edward Street.

The Dentistry Building's existing space is challenged to meet the academic and clinical initiatives of the Faculty for the coming decades. The Faculty needs to meet the standards necessary for educational innovation and growth for all their space including clinical space. In addition to its teaching and research programs, Dentistry's academic mission must also provide a health-care service as part of its clinical program. While other faculties can train students within hospital facilities, the Faculty of Dentistry must operate an independent oral health care facility that maintains a patient base of approximately 15,000 patients, providing care at both the general practice and specialty levels. The Faculty of Dentistry clinics are heavily used by the community and serves over 90,000 patient visits annually, many whom have difficulty accessing care from private practices.

A Clinic Master Plan was initiated by the Faculty in 2019 to identify opportunities for providing the Faculty of Dentistry students - and its patients - modern clinic space to process patients effectively and efficiently as well as meet current clinic practice standards. The Master Plan provides a reorganization of the Basement, 1st, 2nd and 3rd level clinics, classrooms, office and support space programs to target improved patient flow, wayfinding, operational efficiency and pedagogical requirements within the available space at 124 Edward Street. In order to achieve Clinic renewal and reorganization, the Master Plan included an 8 stage implementation phasing program. Clinical dentistry has evolved significantly from both infection prevention/control and technological standards and regulations surrounding infection control have been redefined in response to the COVID-19 pandemic. Due to increased awareness and regulatory pressures in regards to control of aerosol generating activities in dentistry, proposed pedagogical shifts and the compromised condition of the existing facilities, the Faculty of Dentistry identified the renovation of Clinic 2 and the Pre-Clinical Simulation Lab 4 as the next priority phase of the master plan.

In June of 2020 the Capital Project and Space Allocation Committee (CaPS Exec) approved the Terms of Reference for the renovations of Clinic 2 and Lab 4.

In November of 2020, CaPS Executive approval was given to create a temporary off-site dental clinic to be operational by September 1, 2021. This Satellite Clinic provides the Faculty of Dentistry and its community patients with 41 purpose built COVID-19 regulation compliant operatories and accompanying support spaces. In addition to providing a facility for students to complete their Clinical Hours during the COVID-19 pandemic, the Satellite Clinic will provide the Faculty with the minimum amount of operational swing space to allow the completion of the Clinic 2 renovations and future Master Plan implementation renovations.

This project will include the implementation of Phases 6 of the Clinic Master Plan to renovate the Pre-clinical Simulation Lab 4.

Renovations to the Pre-Clinical Lab 4 will replace the existing outdated lab benches with 124 new stations equipped for modern digital dentistry. Existing lab support spaces will be renovated to include new support Labs including Radiology, Acrylic & Plaster and CAD CAM.

The project will renovate at total of 673.57 nasm of inventory space with 845.60 nasm and 1,155.70 non-assignable sm of potential secondary effect renovation area. The project Space Program generates a project area of 673.57 nasms with a project gsm of 752.62gsm. Necessary upgrades to building infrastructure, services and energy performance will be included in the renovations.

The Pre-Clinical Simulation Lab 4 renewal is expected to be delivered in two phases: Demolition and Abatement August 2022 – September 2022 and Construction January 2023 – June 2023. Project Fit-out and Occupancy is targeted for August 2023. During the demolition and abatement, existing concealed and inaccessible building conditions will be documented and addressed in the Contract Documents for the construction tender as a cost savings strategy to minimize project extras which have historically been an issue with renovations at the Dentistry Building at 124 Edward Street.

The Pre-Clinical Simulation Lab 4 renewal has included sustainability and energy efficiency in the design to achieve the targets stipulated in the Tri-Campus Energy Modelling & Utility Performances Standard and has the potential to achieve a LEED ID+C Gold rating should certification be requested. The sustainability upgrades to the existing building included in the Lab 4 project are in alignment with the overall Climate Positive Campus and Low-Carbon Actions Plan policies.

The interim Project Planning Report included both the Pre-clinical Simulation Lab 4 renovation scope and the scope of the Clinic 2 renovations. The project has since been split into two separate projects with two separate TPCs approved concurrently at CaPS Executive for consultant fees. The Lab 4 project is scheduled to be completed prior to the Clinic 2 project; full governance approval is required for Lab 4. This Report of the Project Planning Committee and appendices has been edited to reflect the Pre-Clinical Simulation Lab 4 project. Given that the Terms of Reference includes both Lab 4 and Clinic 2 and the projects are interdependent from a project phasing and space use analysis perspective, some content in this report will refer to the Clinic 2 renovation project and has been identified in square brackets as supporting information for the Lab 4 project.



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## II. Project Background

### a) Membership

Daniel Haas, Dean, Faculty of Dentistry

Mary Choi, Assistant Dean Administration, Faculty of Dentistry

Danielle Churchill, Manager, Building Operations & Services, Faculty of Dentistry

Jim Lai, Vice Dean Education, Faculty of Dentistry

James Posluns, Assistant Dean, Clinics, Faculty of Dentistry

Laura Tam, Associate Dean Undergraduate Education, Faculty of Dentistry

Margaret Provenza, Manager Clinics, Faculty of Dentistry

Jennifer Vatta, Manager Clinics, Faculty of Dentistry

Grace De Souza, Associate Professor, Faculty of Dentistry

Mariam Mousavi, Team Lead for Lab 4

James Fiege, Director IITS, Faculty of Dentistry

Luis Migule Valencia, DDS 2 Student, Undergraduate

Frederic Rochon, DDS 2 Student, Undergraduate

Ryan Noh, Graduate Student, recent DDS graduate

Ron Saporta, Chief Operations Officer, Property Services and Sustainability, Facilities & Services

Gordon Robins, Director, Utilities and Building Operations, Facilities & Services

Mary Byrne, Director, Property Management Group, Facilities & Services

Costas Catsaros, Director, Project Development, UPDC

Rajko Jakovic, Project Development Manager, Project Development, UPDC

Adam Trotter, Senior Planner, University Planning, UPDC

### b) Terms of Reference

1. Report on the detailed space program and floor plan to accommodate the teaching, research and associated support space on the Basement and 2nd Floor of the Dentistry Building within Lab 4 *[and Clinic 2 respectively]*.
2. *[Review the demand for increased and improved space and infection control in response to revisions in regulatory requirements, pedagogical shifts and improved patient experience to support the renovation of Clinic 2].*
3. Define a project area of work including a review of existing base building and systems conditions and provide recommendations for potential upgrades within the scope of work of the project.

4. Determine the secondary effects of the project including staging and sequencing in order for facilities to remain operational during renovations.
5. Identify the equipment and moveable furnishings necessary to the project and their estimated cost.
6. Identify requirements for networking and other electronic and data communications and their integration into the architecture of the building and their related costs.
7. Identify all security, occupational health and safety and accessibility requirements and their related costs.
8. *[Review and identify structural capacity for a 'mezzanine' level within the double height Clinic 2 space to accommodate additional operatories and provide flexibility as identified in the space program.]*
9. *[Review and provide recommendations for the improvement of the clinic patient entrance, accessibility, vertical circulation and wayfinding.]*
10. Recommend an overall building space plan that accommodates all users during the various construction phases to achieve the planned renovations and any necessary building infrastructure upgrades.
11. Demonstrate that the proposed space program will take into account the Council of Ontario Universities' and the University's own Space Standards.
12. Plan to realize maximum flexibility of space to permit future reallocation as programmatic needs and regulatory requirements change.
13. Determine a total project cost (TPC) estimate for the project, including costs of implementation in phases if required, and costs associated with secondary effects.
14. Identify all sources of funding for the capital project and report on any changes to operating costs once the project is complete.
15. Report by August 26th, 2020.

### **c) Background Information**

The Dentistry building, located south-east of the main St. George Campus at 124 Edward Street was built in 1959, with an addition to the north side of the original building in 1985. The building houses the majority of the Faculty of Dentistry functions, including educational classrooms, wet and dry research labs, student activity spaces, administration spaces, as well as the Library and Dental Museum. The Faculty also provides dental care to the community through their public clinics which are also located at 124 Edward Street.

The Dentistry Building's existing space is challenged to meet the academic and clinical initiatives of the Faculty for the coming decades. The Faculty needs to meet the standards necessary for educational innovation and growth for all their space including teaching and clinical spaces.

A Clinic Master Plan was initiated by the Faculty in 2019 to identify opportunities for providing the Faculty of Dentistry students - and its patients - modern clinic space to manage patients effectively and efficiently as well as to meet current clinic practice standards and pedagogical requirements. The Master Plan provides a reorganization of the Basement, 1st, 2nd and 3rd level clinics, classrooms, office and support space programs to target improvements within the available space at 124 Edward Street. In order to achieve Clinic renewal and reorganization, the Master Plan included an 8 stage implementation phasing

program. Through the Clinic Master Plan the Faculty has identified the priority for renewal to start with the Preclinical Simulation lab – Lab 4.

Clinical dentistry has evolved significantly from both infection prevention/control and technological standards. The teaching lab – Lab 4 is in dire need of modernization of lab facilities, instructional equipment and base building deferred maintenance upgrades as identified in the Clinic Master Plan.

In June of 2020 the Capital Project and Space Allocation Committee (CaPS Exec) approved the Terms of Reference for the renovations of Clinic 2 and Lab 4.

In November of 2020, CaPS Executive approval was given to create a temporary off-site dental clinic to be operational by September 1, 2021. This Satellite Clinic provides the Faculty of Dentistry and its community patients with 41 purpose built COVID-19 regulation compliant operatories and accompanying support spaces. In addition to providing a facility for students to complete their Clinical Hours during the COVID-19 pandemic, the Satellite Clinic will provide the Faculty with the minimum amount of operational swing space to allow the completion of the Pre-Clinical Simulation Lab 4 and Clinic 2 renovations and future Master Plan implementation renovations.

Because of the affordances the Satellite Clinic will provide the Faculty of Dentistry, a strategic decision was made to move the Lab 4 renovation forward in order to utilise the existing Clinic 2 space as swing space. After completion of the Lab 4 renovation the Clinic 2 renovation will begin. Subsequent phases of the Clinic Master Plan will be prioritized and implemented using the Satellite Clinic during its 10 year lease period.

This project will include the implementation of Phase 6 of the Clinic Master Plan to renovate the Preclinical Simulation Lab 4.

The project will renovate at total of 673.57 nasm of inventory space with 845.60 nasm and 1,155.70 non-assignable sm of potential secondary effect renovation area. The project Space Program generates a project area of 673.57 nasms with a project gsm of 752.62gsm. Necessary upgrades to building infrastructure, services and energy performance will be included in the renovations.

As an appendix to this project, the Committee will also look at deferred maintenance and existing condition of base building services including Air Handling Units.

#### **d) Existing Space**

##### Existing space

The original Dentistry building was a shallow U-shaped, 5-storey (with basement), International Style, buff brick building completed in 1959 with a total gross floor area (gfa) of approximately 17,000 sq.m. The courtyard was filled in when an extension was put on the building in 1985 on the north and west sides, increasing the building size to approximately 24,550 gross square meters (gsm). The basement has a gross area footprint of 4,693 gsm, with a usable area of 1,918 nasm and 2,774 sq.m of non-assignable space; much of the basement is devoted to mechanical space, a loading facility and a parking garage.



124 Edward Street Building 065 South Elevation

**Table 1.1: Existing Space Inventory Faculty of Dentistry**

<b>COU Cat.</b>	<b>Category Description</b>	<b>Nasms</b>
1.0	Classroom Facilities	1,413.70
2.0	Laboratory - Undergraduate	4,963.36
3.0	Research Laboratory Space	4,842.96
4.0	Academic Dept Offices And Related Space	3,087.80
9.0	Plant Maintenance	104.93
11.0	Non-Library Study Space	150.59
14.0	Common Use And Student Activity	310.86
15.0	Assembly And Exhibition Facilities	149.51
16.0	Non-Assignable	7,684.37
	<b>Totals</b>	<b>22,708.08</b>

The Faculty of Dentistry currently occupies a total of 13,452.65 net assignable square meters (nasm) of space in the Dentistry Building, 197.98 nasms of leased space at 123 Edward Street, 785 nasms of lease space at the Satellite Clinic at 777 Bay Street (leased space), 71.57 nasms of lease space held at the Medical Sciences Building Comparative Medicine in rooms 3363 and 3363B – on loan to Dentistry and 411.58 of space within the MaRS building. The current space inventory for the Faculty of Dentistry is summarized as follows:

**Table 1.2 Existing space – Dentistry Space Inventory 2019-2020**

<b>COU Space Category</b>	<b>Category Description</b>	<b>124 Edward Street</b>	<b>777 Bay</b>	<b>123 Edward Street</b>	<b>MSB</b>	<b>Other</b>	<b>Total Nasm</b>
1.0	Classroom Facilities	1,401.70	12.00				
2.0	Laboratory - Undergraduate	4,283.36	680.00				
3.0	Research Laboratory Space	4,398.00		31.87	61.33	351.76	
4.0	Academic Dept Offices and Related Space	2,758.63	93.00	166.11	10.24	59.82	
11.0	Non-Library Study Space	150.59					
14.0	Common Use and Student Activity	310.86					
15.0	Assembly and Exhibition Facilities	149.51					
	<b>Total Nasm</b>	<b>13,452.65</b>	<b>785.00</b>	<b>197.98</b>	<b>71.57</b>	<b>411.58</b>	<b>14,918.78</b>
	Clinic Related	5,657.18	785.00				6,442.18
	Other	7,795.47		197.98	71.57	411.58	8,476.60

The Dentistry Building is solely for the Faculty’s use. The total existing net assignable area of the Dentistry Building is 14,159 nasm; 13,453 nasm dedicated to the Faculty of Dentistry, 602 nasm dedicated to the dentistry library (University Toronto Library division) and 105 nasm dedicated to plant maintenance for grounds-related storage and custodial accommodation. The net to gross factor is 1.7 which is quite low for a building of this type.

Classrooms

**Category 1.0 – Classrooms**

<b>COU Category</b>	<b>Program Description</b>	<b>2019/20</b>	<b>COU Input Measure</b>	<b>COU Generated Space</b>	<b>Existing Space Inventory</b>	<b>% P/G</b>
<b>1.0</b>	<b>Classrooms</b>	<b>FTE</b>	<b>1.11</b>	(nasm)	(nasm)	
1.0	Classrooms	432	1.11	479.52	1,413.70	295%

Currently at a total of 1,401.75 nasm, the Faculty of Dentistry has almost three times the standard allocated space for classroom facilities. This over-allocation is often the case for programs that are physically separated from the main campus since they do not have access to the central ACE inventory of classrooms.

Classroom bookings for Dentistry indicate fairly low usage levels, with an average utilization of approximately 11 hrs per week over the course of the 30 weeks in the school year. This is significantly under a recommended utilization rate of 34 hours per week, even when factoring in weekend and extra-curricular usage which averages approximately 2-3 hrs per week. Seminar rooms are less frequently booked than the large lecture rooms, ranging between 4-18 hours per week. It should be noted that usage levels of the classrooms varies considerably from week to week. At peak times classrooms can be booked for up to 30 hours per week, while at slow times, bookings run sometimes only 3 hours per week. Overall the clinic schedule dictates the lecture schedule as students are often in Clinic at the same time.

This large discrepancy between COU generated space and existing space brings to light several issues concerning Dentistry's Classroom Facilities:

- **Average Classroom Station Size:** The COU standard assumes a range of classroom station sizes, from 1.16 nasm to 3.56 nasm depending on size, configuration and furnishing, with an average station size of 2.1 nasm per student in a mix of room capacities and instruction delivery types (lecture, seminar, active learning). This is the result of a large number of seminar style rooms, whose layouts demand more space than classrooms or tiered lecture theatres with rows of closely spaced seats. The flat floor auditorium which is programmed at 2.02 nasm per station can accommodate term tests and exams, similar to the rooms in the new Exam Centre.
- **Classroom Utilization:** The COU guideline recommends 34 hours per week of scheduled classroom use (Monday through Friday) with scheduled evening use of 4 hours per week. As demonstrated by the classroom bookings, the academic program for the Faculty of Dentistry is not consistent with this standard. Scheduling between lectures and clinics appears to be a large hurdle for the Faculty in resolving its space issues. Currently it is necessary for DDS students and graduate students in clinical programs to take most of their lectures in the early mornings or over the lunch hours and attend their laboratory and clinical sessions the rest of the day. This is particularly difficult for 3rd and 4th year DDS students who are in clinic most of the day. Dental students are required to work with patients in the Clinics at set times each week, which often results in at least three years and occasionally all four years accommodated in the classrooms at the same time. Using other university classroom space is not a viable option as the time it takes getting between the Dentistry Building and St. George campus proper cannot be accommodated in the students' packed curriculum. The result is scheduling limitations and the provision of more than the standard number of classroom spaces. The COU guideline also does not address weekend use, which is typical for the Faculty of Dentistry.
- **Quality of Space:** Currently the Faculty uses most of the seminar rooms as breakout space from larger classes and specialty groups, with 10-12 people scheduled an average of 11 hours per week with some additional hours booked in other specialty meeting rooms. Many of these seminar rooms are former administrative meeting rooms and do not make optimal instructional spaces - students are at a disadvantage when classes are held within them. The use of these meeting rooms as classrooms has put a strain on the availability of meeting space for administrative and faculty use.

### **Undergraduate Teaching Laboratories**

The Undergraduate Teaching Laboratories space category includes labs, clinics and support spaces. 79% of Dentistry's total Undergraduate Teaching Laboratories space is clinic-related. Clinics are also dedicated for Graduate Student use which for the purposes of analysis are classified under the COU as Research Laboratories.



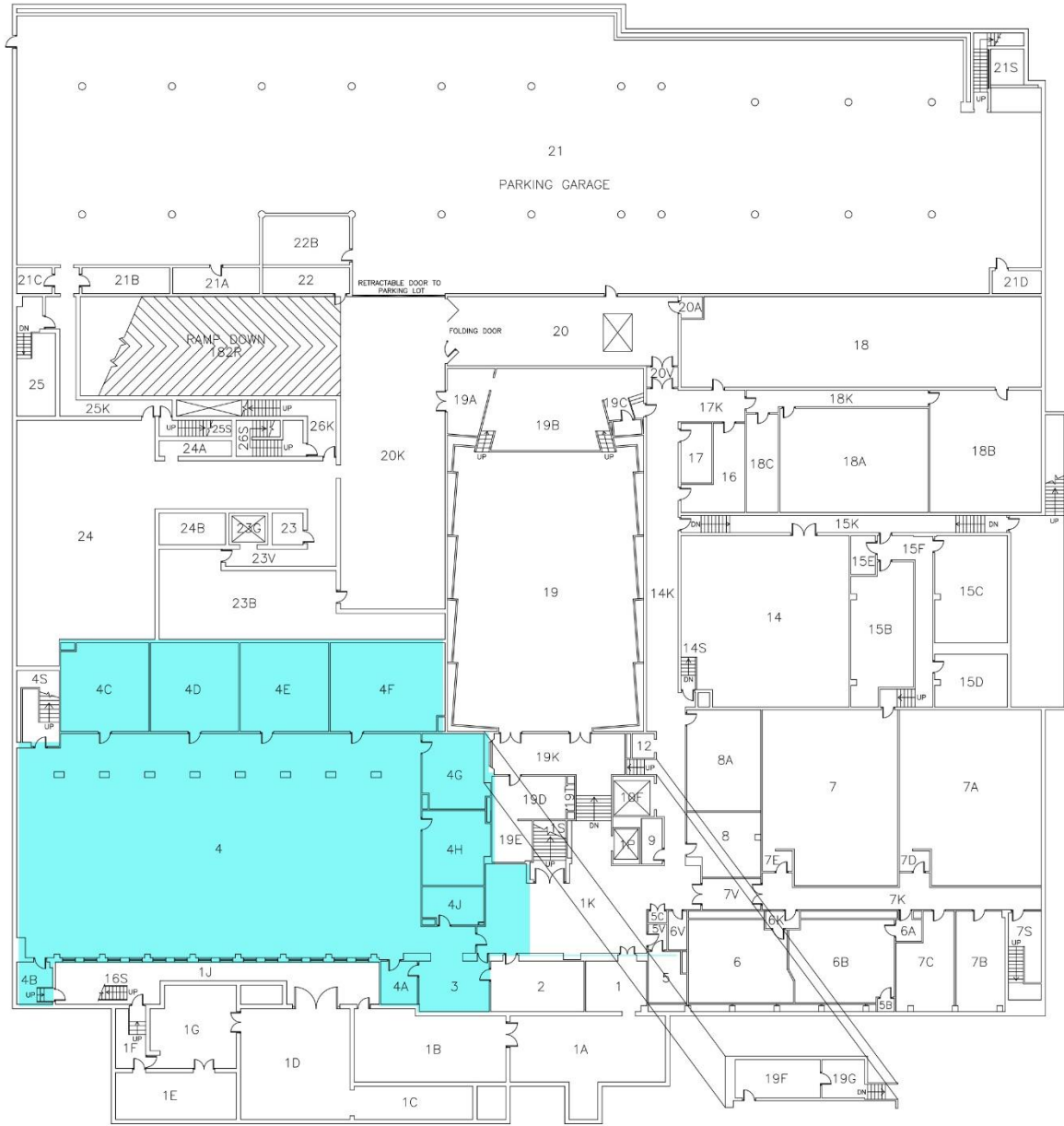
## Teaching Laboratories

There are two scheduled undergraduate teaching labs, one unscheduled teaching lab and various lab support spaces, all housed in the Dentistry Building. The Preclinical Simulation Lab (Lab 4) is equipped with 128 clinic simulator stations used mainly for simulated operative dentistry. The Biological Sciences Teaching Lab (Lab 216) is equipped with 124 stations, originally designed to support basic microscopy. Today, these stations mainly support instruction in histology and pathology using standard laptop computers. The room is also routinely booked for full class lectures. The unscheduled Undergraduate Senior Student Lab I (Room 113), formerly equipped with 124 stations, was converted into the centralized Medical Device Reprocessing Unit (MDR) as the first phase of the Clinic Master Plan implementation. Senior Lab activities have been consolidated into two rooms within the Preclinical Lab 4 in Rooms 3 and 4. As per the faculty's 2019/20 academic calendar, scheduled lab bookings total 45.50 hours per week for DDS1 and DDS2 courses. DDS3 and DDS4 courses do not require any scheduled teaching lab hours but instead the course work is delivered largely in the teaching clinics. DDS 3 and 4 courses periodically require access to lab support spaces.

The teaching labs are primarily pre-clinical and used for students to practice skills in a simulated environment, typically on mannequin heads, prior to working on actual patients. In the dentistry labs, students work at stools situated perpendicular to mannequin heads placed in a prone position, compared to traditional science teaching labs where undergraduate students generally work in pairs, side by side facing a bench top. The COU space factor of 0.60 for Dentistry Teaching Labs is intended to reflect this additional space requirement. Further consideration of additional station space to accommodate new technology, including monitors, is to be factored into the determination of station size.

### Lab 4

The Pre-clinical Lab 4 space is located in the South-West corner of the basement level with south facing glazing looking into a large light well. The existing lab is composed of one large instructional room with lab support spaces located around its north and east perimeter. Access to Lab 4 is via the main basement corridor to the east.



124 Edward Street Existing Basement Floor Plan with Existing Pre-Clinical Lab 4 Highlighted in Blue

The existing Space inventory for Lab for is shown in Tables 1.2 & 1.3 below.

**Existing Space Inventory – 124 Edward Street, Lab 4 – Preclinical Lab**

<b>COU Space Sub-Category</b>	<b>Category Description</b>	<b>Lab 4</b>
2.2	Teaching Laboratory Space	439.74
2.3	Teaching Laboratory Support Space	250.58
<b>Total Nasm</b>		<b>690.32</b>

**Existing space – 124 Edward Street, Lab 4 – Preclinical Lab**

<b>Room Description</b>	<b>Rm. No.</b>	<b>Qty.</b>	<b>Area Nasm</b>	<b>Total Nasm</b>
Storage Room	3	1	17.51	17.51
Instructional Lab	4	1	438.74	438.74
Team Leader's Office	4A	1	7.65	7.65
Lab Storage & Supply	4B	1	7.25	7.25
Lab Storage & Supply	4C	1	37.16	37.16
Casting Room	4D	1	37.82	37.82
Process & Knockout	4E	1	37.82	37.82
Polishing Room	4F	1	48.54	48.54
Dispensary	4G	1	23.51	23.51
Consult Room	4H	1	10.82	10.82
<b>Preclinical Lab (Lab 4) Total</b>				<b>690.32</b>

The existing instructional space contains 128 lab stations arranged in N-S oriented rows of 8 stations each with 16 common sink stations located at the north end of each row. The existing space allocated to the Preclinical Lab and support rooms is sufficient to the pedagogical and technical needs of the lab, based on a proposed floor plan and layout of new simulator benches provided to the Faculty by an equipment supplier. As dental simulators and their associated benches are specialized, this report utilized the expertise of those the Faculty to ensure that the space allocation was sufficient to fit the required number of benches in the current space profile.



Existing Pre-Clinical Simulation Lab 4 Lab Stations

Current lab support spaces include a Team Leader's Office, Dispensary and Casting, Process & Knockout, Polishing, Consult and Storage Rooms. The renovation to Lab 4 will reorganize and repurpose the existing support spaces to create new spaces which support digital dentistry as well as traditional methodologies. A new meeting room is envisioned in lieu of the consult room.

The undergraduate Preclinical Simulation Lab has deteriorated and poses significant challenges in a variety of ways: the bench sizing, construction and layout does not allow for the addition of new, modern simulators and does not reflect modern dental practice; deterioration of current millwork does not allow for proper cleaning/disinfection; and occupational strain injuries are often reported due to students being forced to sit in unnatural positions in order to work on the simulators.

Current dental instruction using plaster and acrylic molds are becoming obsolete as digital dentistry and CAD/CAM modelling have become the industry standard. The existing support laboratories including the existing casting room, polishing room and process and knock-out room are to be replaced with new lab spaces supporting new digital dentistry pedagogies and techniques.

In order to create an effective Preclinical Simulation teaching environment in the basement level of the Dentistry building, Lab 4 is to be renovated within the existing footprint to create an attractive, welcoming space that are ergonomically designed to enable students to learn in an effective way. The renovation will look to provide updated workstations complete with state-of-the-art simulation mannequins at open benching as well as provide updated support space and storage areas equipped to reflect modern dentistry's industry standards in terms of technological support and infection control procedures. The project will provide the infrastructure to support new advances in digital dentistry.

To maintain curricular operation in DDS1 & DDS2; the pre-clinical simulation lab will need to be staged elsewhere during renovation. It is envisioned that the current Clinic 2 space will provide space to stage.

## Undergraduate and Graduate Clinics and Related Spaces

The renovation of the Pre-clinical Simulation Lab 4 will require temporary staging within the existing Clinic 2 space. The following is an overview of the space use within the existing clinics to be used as a reference for construction and the faculty's operational coordination in order to maintain operations for both academic and clinical treatment facilities. The Lab 4 project scope does not include renovations to the clinic spaces.

The Dentistry clinics are composed of spaces necessary to support both clinical function and teaching and research. The distinction between clinical use and pedagogical or research uses is not as clearly delineated as unlike most other health care related divisions of the University, the Faculty of Dentistry must provide in addition to its teaching programs a health-care service in order to fulfil its academic mission and student curriculum. While other faculties can train students within hospital facilities, the Faculty of Dentistry must operate an independent oral health care facility that maintains a patient base of approximately 15,000 active cases at any one time, providing care at both the general practice and specialty levels. Currently, the clinic handles in excess of 90,000 patient visits annually and this provision requires a substantial amount of space. 5,544.48 nasm or 41% of Dentistry's total space at 124 Edward Street is dedicated to clinic or clinic-related function (including administration and support). Up until the Satellite Clinic was built, 100% of Dentistry's total clinic space was located in the Dentistry Building alone. In September 2021, the temporary Satellite Clinic space at 777 Bay Street provided an additional 785 nasms of Clinical related space.

In the Dentistry Building, patient treatment space totals 1,938 nasm (undergraduate) + 898 nasm (graduate) and clinic support space is a further 1,252 nasm (undergraduate) + 1,109 nasm (graduate). Clinic space consists of patient treatment spaces (dental chairs and surgical bays), clinic support spaces (dispensaries, storage, sterilizers, recovery rooms, equipment rooms etc.). Graduate Student offices, Administrative offices for clinic staff or clinical faculty (including reception desks), and administrative support space (waiting rooms, meeting rooms, locker rooms, admin storage, staff lounges etc.) account for an additional 348 nasm. There are also two 12-seat seminar spaces that double as x-ray viewing and consult rooms.

Clinics are most heavily used by DDS3 and DDS4 students as well as the professional stream (specialty) Masters students. There are 2 large general clinics, primarily serving undergraduate students, and 10 ancillary and specialty clinics, with number of chairs or surgical bays noted below. Some specialties require more space than others. Periodontics, Endodontics, Orthodontics, taught at the undergraduate and graduate levels result in additional space requirements within the clinic setting. Surgical suites as well as Paediatric clinics, designed for both teaching and patient comfort, also require some additional space.

The two existing general clinics have open operatories with 143 dental chairs, each occupying an average of 10 nasm per chair.

The patient population, of approximately 15,000 active cases in any given month, is largely from the lower socioeconomic strata, with over 85% of patients reporting an annual income of less than \$40,000.00 per year. Most would be unable to obtain adequate oral health care were it not for these clinics. Over 90,000 patients visit the clinics annually. Thus, in addition to a training and general health service component, the Faculty of Dentistry clinics also provide a much needed social service, but in an

antiquated public clinic environment that physically defies the provision of privacy, and complicates infection control.

The majority of the school's faculty teach in clinic, as well as 500 Instructors in Dentistry - primarily practicing professional dentists who come in for various hours every week to supervise students working in clinics. 117.60 FTE staff support the clinics, including hygienists, technicians, nurses, and clinic managers. Only 52 FTE of these staff require workstations, with the rest of the staff requiring lockers only. Prior to COVID-19, the Clinics were primarily operational from September to April with DDS 3 running into July and specialty Clinics running year round. Since the pandemic, clinics and the simulation lab have been open year round at a reduced capacity.

Temporary staging of Lab 4 Simulation instructional facilities within Clinic 2 will be required during construction. Phasing, scheduling and the extent of temporary renovations will be at the direction of the Faculty of Dentistry in consultation with Capital Projects, Consultants and the Contractor. The temporary staging of Lab 4 within Clinic 2 will be a separate project from the Lab 4 renovation and is identified in the secondary effects section of this report. The Clinic 2 and Satellite Clinic information included in this report is for reference purposes in regard to staging capacity and coordination of Clinic 2 operations within the Satellite Clinic.

## Clinic 2

Clinic 2 is a large, open concept double-height clinical area that contains 78 dental units for use by undergraduate dental students during all 4 years of the program, pre-COVID-19. The Clinic also contains 16 semi-enclosed Prosthodontic and Endodontic operatories, one Implant Prosthodontic Unit and 1 Endodontic Surgery Suite for Graduate Student use.



Existing Clinic 2 from the North-East Corner

**Existing Space Inventory – 124 Edward Street, Clinic 2 Area**

<b>COU Space Category</b>	<b>Category Description</b>	<b>Clinic 2</b>
1.0	Classroom Facilities	55.79
2.0	Teaching Laboratory Space	812.23
3.0	Research Laboratory Space	557.25
4.0	Academic Dept Offices and Related Space	201.19
9.0	Plant Maintenance	20.42
16.0	Non-Assignable	405.09
	<b>Total Nasm</b>	<b>2,051.97</b>

The Clinic 2 dental units (chairs) are laid out in rows, separated horizontally by stand-alone desks that contain a computer terminal and a small work-surface table.

**Existing Space Use – 124 Edward Street, Clinic 2 Area**

<b>Room Description</b>	<b>Qty.</b>	<b>Area Nasm</b>
Clinical Examination	4	1,018.78
Clinical Special Treatment	3	42.93
Clinical Sterilization	1	13.14
Clinical Storage	4	52.56
Clinic Reception	1	16.24
Clinic Waiting Room	1	28.62
Seminar Room	2	55.79
Laboratory - Research	2	21.02
Laboratory - General	1	15.00
Laboratory Support	2	22.46
Laboratory Office	1	9.71
Laboratory Storage	2	17.52
Laboratory Lockers	1	14.64
Faculty Office	1	15.25
Admin Office - Single	6	89.54
Admin Office - Multi	1	15.92
Office Storage	1	1.71
Locker Room	3	125.87
Staff Room/Lounge	3	59.20
<b>Clinic 2 Total</b>		<b>1,635.90</b>

**Existing Clinic 2 Operatories**

<b>Operatory</b>	<b>Qty.</b>	<b>Operatory Area</b>	<b>Total Area (Nasm)</b>
Undergraduate Open	78	6.44	502.32
Graduate Semi-Closed	16	9.81	156.96
Graduate Enclosed	2	16.20/17.95	34.15
<b>Clinic 2 Total</b>	<b>94</b>		<b>693.43</b>



Clinical instruction and the Undergraduate Clinic is based on the availability and quantity of patient appointments. Students are scheduled a specific number of hours and are required to successfully attain competency when performing a stipulated range of treatments in the Clinic. In order to provide the opportunity for students to complete their clinical curriculum it is advantageous to maximize the number of patient appointments per term. Prior to COVID-19, Clinic 2 was used continuously to full capacity from September to March each academic year, with slightly reduced usage in May and June running in two shifts per day allowing for a maximum of 156 patient appointments per day.

Temporary Staging of simulators for DDS 1 & 2 Pre-Clinical curriculum will make use of the existing 78 dental chairs within Clinic 2. Dental chairs will be equipped with dental simulators for student use during scheduled instruction. Pre-clinical scheduling will need to be coordinated by the Faculty with the needs of DDS 3 & 4 and graduate work as well as with public Clinic operations. The Faculty will need to holistically re-assess their operating strategy with updates in COVID-19 policies from the Province, the RCDSO and UofT. Phasing plans during the current COVID-19 policies include the continuing use of the Satellite Clinic with limited use of Clinic 2 space to allow for the LAB 4 renovations as well as future renovations to Clinic 2.

### Satellite Clinic

The Satellite Clinic on the 22<sup>nd</sup> Floor of 777 Bay Street was initiated in November of 2020 in response to COVID-19 and the requirement by the RCDSO and PHO to require enclosed operatories for all Aerosol Generating Procedures (AGP) in dental care. The Satellite Clinic works in conjunction with the Clinics at 124 Edward Street to provide students with the minimum necessary COVID-19 regulation compliant facilities to achieve Clinical Hours towards graduation. The Satellite Clinic is leased space with a 10 year timeframe allowing it to act as temporary clinic space during the renovations to Clinic 2 and other phases of implementation of the Clinic Master Plan.



Satellite Clinic Enclosed Operatory



The following space program the space program for the Dentistry Satellite Clinic.

**Space Program**

COU Category	Cat. Description	Program	Quantity	Nasm
1.0	Classroom			
1.2	Non-Tiered Classroom	Seminar Room	1	12
2.0	Teaching Laboratory			
2.1	Teaching Laboratory	Enclosed Operatory	36	432
		AODA Operatory	4	60
2.2	Laboratory Support	Donning/Doffing	1	6
		Cart Storage	1	10
		Dispensary	1	15
		Sterilization	1	30
		Clean Storage	1	10
		Support Lab	1	12
		Brushing Stations/Computer Stations	6	12
		Computer Stations	4	8
		Waiting Room	1	30
4.0	Faculty and Administration Offices			
4.1	Faculty Office	Private Office	1	10
4.4	Administrative Staff Office	Reception	2	15
		Staff Workstation	5	25
4.5	Office Support	Staff Locker Room	1	5
		Staff Change Room	2	6
		Lounge/Lunch Room	1	20
		Storage - Supplies	1	12
14.0	Student Space	Student Locker Room	1	40
		Student Change Room	3	15
16.0	Non-Assignable	IT Switch Room	1	12

N.B. Satellite Clinic Space program as approved in principal by CaPS Exec. November 2020 to be updated with completion of project.

In order for the Satellite Clinic to provide enough Clinical curricular hours with a minimum amount of operatories the Faculty of Dentistry changed the current clinic schedule from 2 shifts per day to 3 shifts per day and assigned each clinical appointment to 2 students instead of 1. The analysis of instructional laboratory use looks at Weekly Scheduled Contact Hours (WSCH) which is the product of the number of lab enrolments x the number of scheduled lab hours. In a typical COU space program generation, the WSCH is multiplied by a COU determined/department specific space use factor to determine space need. In the case of the dentistry clinics, the analysis looks at the combination of number of operatory units and the available number of shifts per week to ascribe possible appointments per student per week. Using 40 enclosed operatories, 3 shifts and 2 students per appointment, the Satellite Clinic affords the following operational capacity and WSCH.

### Satellite Clinic Operational Capacity

Hours per Shift	Shifts per Day	Students per Shift per Operatory	# of Operatories	Number of Appointments per Day	Scheduled Contact Hours per Day	Weekly Scheduled Contact Hours (5 Days)
2.5	3	2	40	120	600	3000

In addition to the Satellite Clinic operatories, the Faculty of Dentistry has converted spaces within 124 Edward Street to enclosed operatories. Added to existing enclosed operatories these new spaces provide a total of 25 enclosed operatories at the existing Dentistry building.

During renovations of Lab 4 and Clinic 2, should AGP regulations continue to require enclosed operator procedures the Satellite Clinic, enclosed operatories and existing Clinic 1 operatories will be required to provide for the required curricular hours in Clinical work.

### Occupant profile

#### Academic Staff Profile

In the 2019/2020 academic year 69.67 FTE Faculty (including 36 part-time faculty equating to 20.65 FTE Part-time faculty, 49.02 FTE full-time faculty), 15.00 FTE Research Associates and 26.0 FTE Post-Doctoral fellows or Visiting Scientists were appointed at the Faculty. It is not expected for faculty to expand beyond current numbers; research associate and post- doctoral fellow positions will be contingent on available space and funding. Each full-time appointed academic staff is to be provided a single private office, with part-time faculty sharing space. Two cross appointed faculty are currently accommodated within their home-base, 2 FTE (PI) are located in leased space at 123 Edward Street and 0.6 FTE (PI) is located at MSB. All appointed faculty are in Dean's budget, hence none assigned to Lab 4. Some Faculty do occasional teaching in Lab 4.

#### Existing Faculty Compliment (FoD Total)

Faculty	FTE 2017/18	FTE 2019/20
Appointed Faculty	70.56	69.67
Research Associates	11.00	15.00
Post-Doctoral Fellows / Visiting Scholars	24.00	26.00
<b>Total academic Appointed Staff</b>	<b>105.56</b>	<b>110.67</b>

#### Sessional Staff Profile

There are currently 500 (headcount, not FTE) Instructors in Dentistry - primarily practicing professional dentists that support the DDS and Specialty programs. The majority of their efforts are in

clinical teaching, while approximately 100 instructors on average support the faculty through the provision of pre-clinical (simulation) teaching, seminars and lectures.

**Non-Academic PM & Confidential Staff Profile**

Currently there are a total of 19.00 FTE PM & Confidential staff. All are appointed full-time staff. Administrative staff levels are expected to remain consistent despite the planned enrolment expansion.

**Non-Academic PM & Confidential Staff (FoD Total)**

<b>Staff</b>	<b>FTE 2016/17</b>	<b>FTE 2019/20</b>
Administrative Staff requiring private offices	17	17
Administrative Staff requiring shared offices	2	2
<b>Total PM &amp; Confidential Staff</b>	<b>19.00</b>	<b>19.00</b>

**Non Academic Support Staff Profile**

The Faculty of Dentistry has a large complement of support staff including dental assistants, lab technicians, dispensary staff, clinic receptionists and faculty administration staff. Over half of the support staff work in Clinics at dental chairs or in labs and many do not require work space, although they may require locker room and support space. Some of the support staff require work spaces in either shared or private office space. 4 FTE (1 PM and 3 USW) for Continuing Dental Education (self-funded unit) are located in a leased space (123 Edward St) in private offices.

Staff for the Lab 4 Simulation Lab 4 consists of 1 FTE for the Team Leader. An existing office assigned to this position will be maintained with the renovation of Lab 4. In addition to the Team Leader there will be 3 Dental Assistant Staff who do not require work space but will be provided with a staff locker within the existing staff locker room.

**Non Academic Support Staff (FoD total)**

<b>Staff</b>	<b>FTE 2016/17</b>	<b>FTE 2019/20</b>
Non-Clinical Staff requiring private offices	17.00	17.00
Non-Clinical Staff requiring shared work space	29.00	29.00
Clinic Staff requiring private offices	20.00	20.00
Clinic Staff requiring shared work space	32.20	32.20
Clinic staff NOT requiring work space	65.40	65.40
<b>Total Non-Academic Staff</b>	<b>163.60</b>	<b>163.60</b>

## Student Profile

Dentistry's student enrolment is as follows:

### Student Cohort

Students	Count 2016/17	Count 2019/20
DDS 1 <sup>st</sup> year	96.00	96.00
DDS 2 <sup>nd</sup> year*	96.00	96.00
DDS 3 <sup>rd</sup> year*	120.00	120.00
DDS 4 <sup>th</sup> year*	120.00	120.00
IDAPP	24.00	24.00
<b>Total Undergrad</b>	<b>456.00</b>	<b>456.00</b>
MSc	14.00	14.00
MSc (w. Specialty Training)	77.00	77.00
PhD	22.00	22.00
PhD (w. Specialty Training)	2.00	2.00
<b>Total Grad</b>	<b>115.00</b>	<b>115.00</b>
<b>TOTAL STUDENT</b>	<b>571.00</b>	<b>571.00</b>

\* Students in the International Dentist Advanced Placement Program, 24 FTE, transfer into the DDS program in year 3 and are not part of the DDS program until that time. During the academic year the IDAPP students are present and often join the class for the second half of DDS2 raising the total DDS count by 24 from January to June.

In addition to the total student count above, there are 13.00 post-graduate positions available in the Hospital Dental Residency Program. Residents undertake supervised clinical experience in hospital dentistry as well as other hospital departments. These students have been excluded from the Total Student count as they do not generate any space requirements.

Clinical spaces are most heavily used by DDS3 and DDS4 students as well as the professional stream (specialty) Masters students. There are 2 large general clinics, primarily serving undergraduate students, and 10 specialty and ancillary clinics, with a number of chairs or surgical bays noted below. Some specialties require more space than others. Periodontics, Endodontics, Orthodontics, taught at the undergraduate and graduate levels result in additional space requirements within the clinic setting. Surgical suites as well as Paediatric Dentistry clinics, designed for both teaching and patient comfort, also require some additional space.

The majority of the school's faculty teach in clinic, as do 500 Instructors in Dentistry – primarily practicing professional dentists who come in for a few hours every week to supervise students working in clinics: typically 50 to 100 Instructors attend clinics in a given day. 117.60 FTE staff support the clinics, including dental hygienists, dental technicians, dental assistants, a select number of registered nurses, and clinic managers. Approximately 52 FTE of these staff require workstations, with the rest of the staff requiring lockers only. Prior to COVID-19, most clinics were operational from September to April with DDS3 extending to July, and most graduate specialty clinics and the Emergency clinics that are operational all year.

Space analysis for this project is only taking into consideration faculty, students, and staff involved in the preclinical undergraduate lab teaching, as they will be the primary users of the Lab. A space audit (2017) and Clinic Master Plan (2019) of the whole Faculty of Dentistry community was recently completed by University Planning. FTE faculty, staff and students for 2019/20 involved in preclinical teaching were used as input measures in the space analysis.

Due to the nature of the work done at the Faculty of Dentistry clinics, it is difficult to compare the needs of the Clinic to the COU space standards which do not have a specific category for clinic space. Thus, we have utilized the average amount of space required by each station including support space and compare to COU categories 2.0 and 3.0 (Teaching Labs and Research Labs).

Users of the Preclinical Lab are undergraduate students in DDS1, DDS2 and IDAPP students. Access to the Preclinical Lab by DDS3 and DDS4 students for use of Lab support spaces will be required but will not be accounted for through analysis at this time due to the haptic nature of this use. In addition, the Faculty leases out the Preclinical Lab to various outside groups for training and examinations which will be scheduled in non-academic periods by the faculty depending on availability

### **III. Project Description**

#### **a) Vision Statement**

The Faculty of Dentistry Clinical Practice is a robust multi-disciplinary Clinical Program with Clinics in all specialty areas. Clinical Practice provides treatment for a large and diverse patient population, many of whom have difficulty accessing care. The Practice also engages in Hospital and Community partnerships to add additional expertise and exposure to the student experience. The vision of Clinical Care as per the latest Faculty of Dentistry Strategic Plan is to, “Optimize our practices to provide outstanding clinical care for our community”. In order to achieve this vision, the following are the primary goals of the Clinical mandate:

1. Deliver outstanding care and service for all patients; and
2. Enrich the students’ clinical learning.

The Pre-Clinical Simulation Lab 4 Renewal seeks to implement upgrades to meet the objectives of the faculty’s academic mission and current regulatory requirements within the profession of dentistry and dental education in Ontario.

The development and application of innovative and modern electronic and other teaching methods available is limited by the current design and equipment of the teaching laboratories and seminar rooms, resulting in a compromising of the student experience. The Dentistry Building modernization is also dependent on necessary upgrades to base building servicing due to items of deferred maintenance.

High Level Vision for the Lab 4 Renewal:

- Improved teaching environment;

- Responsive to current technologies and practices with flexibility anticipating future trends;
- Implementation of enhance infection control and environmental health safety
- Operational efficiency;
- Aesthetically pleasing;
- Well-designed layout;
- Durable;
- Implementable while being an occupied building;
- Affordable;
- Accessible
- Amenable to future advancements in dentistry

The location of the Preclinical Lab 4 will remain unchanged at 124 Edward Street. Its size and location is suited for the tasks and projects that will continue to be taught to the newest practitioners of dentistry. In addition, the general layout of the lab is acceptable. The current bench model serves the Faculty well for demonstration purposes and for collaborative learning.

The entire lab renovation is predicated on the need for modern state-of-the-art preclinical simulation models. The current simulators are typodonts with plastic teeth mounted inside humanistic simulators. Rubberized cheeks are stretched over top, giving the illusion that a student is working on a real person. These simulators are circa 1995, so that students may experience a disconnect between the lab and clinics upon promotion to the clinical years of the program.

A modernization of the Preclinical Lab is badly needed with the objective of it becoming more of a simulation lab to soften the steep learning curve from the preclinical setting to the clinic. The current manikin set-up is obsolete. Today's students can process much more information through the use of preclinical simulators that more closely emulate the clinical environment and offer feedback on the treatment being delivered.

## **b) Statement of Academic Plan**

Our Faculty's philosophy is a commitment to the development of a high standard of student clinical competence through the experience of providing multi-disciplinary patient-centered comprehensive dental care in Faculty Clinics within an "evidence-based" overall educational curriculum. A number of defined core clinical experiences are required to ensure that students have been exposed to a minimum basic range of clinical practice in all clinical disciplines. Emphasis in all clinics is on the provision of appropriate and rational care for assigned patients according to patients' needs. The first step in the clinical competency learning process is in pre-clinical simulator instruction within Lab 4. The lab 4 DDS1, 2 and IDAPP curricula provide students with in-depth expertise on the fundamentals of dentistry, basic science and diagnostics. This prepares the students for in-clinic patient treatment in DDS 3 and 4.

One of Dentistry's strengths is clinical outcomes and education. The Faculty of Dentistry has a comprehensive Doctor of Dental Surgery (DDS), which is a 4 year undergraduate program, as well as graduate programs, MSc and PhD, both with Dental Specialty Training, graduating strong clinicians. Dentistry's Clinical practice Mission is to shape the future of dentistry and promote optimal health by:

1. Preparing the next generation of clinicians and leaders in the profession; and
2. Promoting comprehensive and patient-centred care from disease prevention to management

Ways to enrich the student experience in Lab 4 include:

1. Updated ergonomic lab stations with modern digital infrastructure;
2. Flexible instructional spaces, such as seminar rooms, to allow for multiple uses and break-out instruction;
3. Application and integration of innovative and modern electronic technology; and
4. Better integration across pre-clinical and clinical instruction and experience.

While the existing footprint of the Lab 4 space will not change, revisions to the programming, layout and technology within the existing space will support the academic mission of the faculty.

### **DDS Pre-Clinical Undergraduate Program**

The undergraduate program is supported by the following simulator lab station count within Lab 4:

#### **Simulator Lab Station Count Summary**

Space	Simulator Lab Station		
	Pre Renewal	Post Renewal	Delta
Lab 4	128	124	-4

The loss of 4 stations is due to space constraints and the slightly larger station size to allow for ergonomics and digital technology. A central teaching station has also been included in the program.

On any given day, 192 students require scheduled use of the Pre-clinical Lab 4. The 124 proposed stations will accommodate the 96 DDS 1 and 96 DDS 2 students through scheduling. The 24 IDPP students will be accommodated in conjunction with either DDS 1 or DDS2 (total of 120 stations required) or scheduled separately.

### **c) Space Requirements, Program and Functional Plan**

#### Space Requirements

##### **Classrooms**

The Simulation Lab 4 contains one seminar room accommodating 12 students.

Room Description	Qty.	Seats	Total Nasm
Seminar Room	1	12	20.75

Within the current Lab 4 space, there is an existing typodent/modelling room (4H) and a consultation room (4J) which will be combined to create a new seminar room with 12 person capacity. This room is to be used for scheduled instruction. However, its proximity to the Lab 4 Simulation Lab space facilitates its

use for unscheduled breakout and consult functions supporting the Clinics. Access to the seminar room directly from the basement corridor is to be provided to allow scheduled use of the seminar room while the Simulation Lab is in use.

**Undergraduate Teaching Laboratories**

The Undergraduate Teaching Laboratories space category includes labs, clinical space and associated support spaces. 3,200 nasms or 70% of Dentistry’s total Undergraduate Teaching Laboratories space is clinic-related. Thus, with regards to the space utilization analysis it is important to note the following factors:

- Dentistry simulation labs are unlike traditional teaching labs as they require that students work on dental simulators extending perpendicular to the lab bench. This is to simulate patient care and requires additional room to not only accommodate the lab station but clear passage between stations.

With regards to functionality, Dentistry’s existing teaching labs/clinics are outdated; they are not equipped with modern technology found in today’s practices and the existing building infrastructure of the Dentistry Building impairs their easy installation.

*Space Analysis*

The COU lab analysis is based on a typical station size based on discipline from which a space factor applied to Undergraduate lab WSCHs. Dentistry is categorized under Group X with a space factor of 0.6. This factor is based on a typical station size of 10.8 nasms factored through an 18 hour week at 75% occupancy. The 18 hours accounts for an additional 2 hours per week of lab prep time or unscheduled work beyond the standard 16 hours per week of a full course load.

COU Lab Space Factor Formula

$$\text{Nasms/Lab WSCH} = \text{Average Station Size (nasm)} / \text{Scheduled Hrs per Wk} \times \text{Seat Utilization}$$

**COU Analysis Teaching Laboratories\***

Category of Space	Inventory (I) NASM	Input Measure (WSCH)	Space Factor	COU Generated (G) NASM	% I/G
2.0 Laboratory - Undergraduate	4,283.36	6,391.50	0.60	3,834.90	112%

\*Excludes the Satellite Clinic at 777 Bay as it is a temporary space which should not be factored into end state facility planning

The 6,391.50 total Weekly Scheduled Contact Hours (WSCH) for teaching laboratories at the faculty of dentistry produces a COU derived space need of 3,834.90 nasm which is less than the current Category



2.0 inventory at 124 Edward Street. This total teaching lab number is further refined by reviewing Clinic and non-clinic related space use.

**2019/2020 Academic Schedule WSCH (2019-2020 1 Term) DDS 1, 2 & IDAPP**

Year	Clinical Hours/Wk	Laboratory Hours/Wk	Enrolment	Clinic WSCH	Lab WSCH	Total WSCH
DDS1	1.90	12.50	96	182.40	1,200.00	1,382.40
DDS2	3.50	11.60	96	336.00	1,113.60	1,449.60
IDAPP	1.60	12.90	24	38.4	309.6	348.00
<b>Total</b>	<b>7.00</b>	<b>37.00</b>	<b>216.00</b>	<b>556.80</b>	<b>2,623.20</b>	<b>3,108.00</b>

N.B. 30 weeks assumed per year

The total Weekly Scheduled Contact Hours (WSCH) for the DDS 1, 2 and IDPP in Clinics is 556.80 and 2,623.20 for Non- Clinic Teaching Labs.

*Pre-Clinical Teaching Laboratories*

Dentistry is a profession that requires a high degree of psychomotor skills and manual dexterity. During the first two years of the four-year program, a significant proportion of time in the curriculum is dedicated to the development of technical skills in a pre-clinical teaching laboratory. In this pre-clinical laboratory, first and second year students develop their technical skills on plastic teeth mounted in simulated patients prior to performing actual procedures on live patients in the clinic.

The pre-clinical teaching laboratory in the Faculty of Dentistry is used on a daily basis by 192 Undergraduate Doctor of Dental Surgery (DDS) Years 1 & 2 and 24 International Dentist Advanced Placement Program (IDAPP) students throughout the academic year. The IDAPP program begins in the winter term of the second year with integration into the general DDS3 class at the start of the following term. In this teaching laboratory, first and second year dental students make use of dental simulators known as manikins to develop their technical skills in operative dentistry, prosthodontics, endodontics, pediatric dentistry and biomaterials.

The main objective of modernizing the teaching laboratory is to better prepare students to provide dental care to members of the community. At present, many students struggle with the transition from the pre-clinical to the clinical environment, mainly due to a lack of continuity between the pre-clinical and the clinical learning environments, poor lighting and ergonomics.

A modernization of the teaching laboratory is necessary for learners to take full advantage of their time to develop the skills they critically need prior to provide treatment on live patients. Increased formative and summative feedback are integral to improved comprehension of the fundamentals of general dentistry.

There have been significant advances in dental technology since the current pre-clinical laboratory was constructed. The digital three-dimensional intraoral scan is quickly replacing the traditional alginate impression and plaster pour-up that has been the standard for more than a century. Tomorrow's practitioners must be proficient in this technology to provide state of the art care for their patients upon graduation. It is anticipated that the traditional method of making impressions and the fabrication of indirect restorations as it is currently taught will be removed from the curriculum by the early 2020's. In its place, the use of digital scanners to obtain an 'impression' of the mouth and three dimensional printing

to construct the indirect restoration will be the standard of practice. The Faculty must therefore, begin preparing to incorporate this technology now to remain in the forefront of dental education. The pre-clinical Lab 4, as it currently stands, cannot support this emerging technology.

The pre-clinical Laboratory 4 serves as a training model for first and second year students prior to their entry into the clinics in third and fourth year. The principles and foundations of infection control are taught during first and second year as part of the curriculum. While these concepts have evolved significantly over the years and will continue to do so into the future, the pre-clinical laboratory space has not kept up. The cabinetry is made of a porous material (wood) and is in poor repair. Instruments and other dental materials are stored in a manner that does not simulate a dental practice and does not support current principles of infection control. Students have been known to question the fundamentals of infection control and prevention when what they are learning in the classroom is not reflected in the pre-clinical setting. By having a pre-clinical laboratory that does not meet current standards of infection control, the Faculty is unable to thoroughly integrate an extremely important aspect of dental education.

Use of the Pre-clinical Lab 4 space by scheduled DDS1, DDS2 and IDPP students is as follows:

Course	Lab 4 Inventory (I) NASM	Input Measure (WSCH LAB)	Space Factor	COU Generated (G) NASM	% I/G
DDS1		1,200.00	0.60	720.00	
DDS2		1,113.60	0.60	668.16	
IDAPP		309.6	0.60	185.76	
<b>Total</b>	<b>690.32</b>	<b>2,623.20</b>	<b>0.6</b>	<b>1,573.92</b>	<b>44%</b>

The existing Lab is used by DDS 1, DDS 2 and IDAPP for an average of 30 hours per week. The existing space and curricular use translates to 44% of COU generated space. The average station size in Lab 4 is proposed to be at approx. 1.95 nasm with 124 stations. The total space - including lab support spaces - averaged across a class of 96 equates to 7.19 nasm per student. The station size that the COU assumes for this category of teaching laboratory space is 10.8 nasm. Operationally, the faculty accommodates the scheduled class time need within the existing space using a more efficient station size and more scheduled hours per week than COU standards.

While the footprint of the Preclinical Laboratory is to remain unchanged, major renovations within the existing space must take place in order to accommodate the updated simulators. The new simulators require a defined amount of space between the operators along the bench and between the rows of benches. It is anticipated that it will be possible to put at minimum 124 stations in the existing space by maximizing the bench design for maximum efficiency and by removing much of cabinetry that was present in the current design and replacing the storage provided by this cabinetry in lockers located along the walls, where space is readily available.

Within the existing pre-clinical laboratory, potentially more space is available for the simulators by extending the rows laterally or by potentially adding an additional bench row near the entrance of the space. While these modifications will lead to a decrease in the concentration of simulators throughout the laboratory, it will increase the complexity of the project overall.

One of the objectives of this project is the implementation of the clinic management system (axiUm) at the pre-clinical level. Electronic record keeping is routine in the modern practice of dentistry. Students need to be proficient in the use of the clinic management system prior to their entry into the clinics in third year. The implementation of the clinic management system into the pre-clinical laboratory requires the addition of a monitor at every station. The addition of the monitor, in addition to its IT support, requires the installation of hardware and equipment not part of the laboratory space as it currently stands.

The space demands of this additional equipment has been taken into consideration. The monitors will be mounted on brackets, affixed to the new laboratory benches so that additional counter space will not be required. In addition, the bulkheads between the benches will be designed that the IT services can be included with the other services required to operate the delivery systems located at each station.

A Preclinical Lab renovation provides the opportunity to make major improvements in the now 60 year old space. General room lighting as well as focused dental lighting will be improved throughout. The existing wood veneer millwork will be removed from each station and replaced with new benches offering electrical, data and services required for teaching in modern dentistry. Students will be provided lockers that allow for storage of dental tools and models away from the bench, freeing up more leg and elbow space, and audio-visual systems will be modernized, through the installations of monitors at each bench station enhancing the impact of preclinical demonstration on every student. No longer will a student's learning suffer because he or she 'cannot see'.

The adjunctive rooms must be refurbished to reflect the needs of modern dental practice. Overall, the rooms require improved lighting and ventilation, furniture and fixtures that reflect the needs of the modern pre-clinical teaching lab.

The current standard in dental education dictates that pre-clinical environments emulate the clinical environment as closely as possible. The pre-clinical environment must be:

- Able to simulate all aspects of clinical dentistry
- Have adequate space for teaching and learning.
- Conform to current standards of infection control
- Bright

In order to meet these criteria, the proposed Preclinical Laboratory will consist of rows of open, profession-standard benches that contain integral simulation systems, as close as is possible to those used in the clinical environment. There will be adequate space for the student to position him or herself ideally for any given procedure. The overhead dental light found at each station will be identical to that found on the clinical dental chair, and situated so that it is fully adjustable based on the needs of the student. The patient simulator is commercially available, and will be integrated into the new millwork. The simulators anatomy, size and ability to be positioned accurately emulates what the operator will experience when treating an actual patient

The Preclinical Laboratory Revitalization Project will also include an improved audiovisual system that permits the concurrent viewing of complex procedures by all learners. Instructors depend on the audio-visual system as an effective and efficient teaching tool. The system will include a mounted, movable

camera attached to a demonstration desk, multiple high definition monitors located throughout the laboratory, high-definition audio and full recording capability.

Office Space (COU Cat. 4.0)

The following tables indicate broad range of office space allocations. Many individual offices are significantly oversized due to their date of construction; the average academic private office size in the existing Dentistry Building is 11.54nasm. COU standards have trended toward smaller office size allocations. New offices in the program area are proposed at 11 nasm or less, in line with the University’s new, more efficient planning standard. Despite this, the Faculty is currently reviewing office allocation for Clinic administrative support looking to amalgamate space use where possible through shared office spaces. Office space is somewhat relegated to the material realities of the existing building – elements such as window spacing and column locations tend to predicate potential sizes for offices which will need to be considered during the design phase to look for efficiencies where possible.

This process may result in some disparity between the space generated by the current COU standards and the existing accommodations provided to Departments. Included in the below analysis is Office space at 124 Edward Street and 777 Bay Street.

**Office Space Analysis**

COU Category	EXISTING OFFICES	Existing FTE	COU Input Nasm	Generated Nasm (G)	Existing Inventory Nasm (I)	I/G
4.1	FTE Faculty	69.67	12	836.04	951.89	114%
4.2	FTE Research (PdF)	111.67	Factored 4.1, 4.2, 4.3	183.01	0.00	0%
4.3	FTE Grad Students	115	3	345.00	265.01	77%
4.4	FTE Non-academic	117.20	12	1,406.40	877.58	62%
4.5	Office Support	2,770.45 sm	.25	1,385.23	757.15	55%
<b>TOTAL</b>				<b>4,155.68</b>	<b>2,851.63</b>	<b>69%</b>

Included in the Current Space Program is the renovation to 1 existing lab technician’s office and the repurposing of a consultation room / technicians office to a new seminar room. The existing offices and their proposed relocated assigned space are as follows:

**Existing Offices within Lab 4 Scope Area**

Subcategory	Room Code	Room Name	Seat Capacity	Area (Nasm)
2.3	4A	Lab Technician’s Office	1.00	7.65
2.3	4J	Lab Technician’s Office (Consultation)	1.00	10.82
<b>Total</b>			<b>9.00</b>	<b>18.47</b>

### Proposed Offices within Lab 4 Scope Area

Subcategory	Room Name	Seat Capacity	Area (Nasm)
2.3	Office_1_Private_Team Leader	1.00	7.65
<b>Total</b>		<b>1.00</b>	<b>7.65</b>

The proposed renovations creates a net loss of 10.82 nasms of Category 2.3 space in the existing building inventory. This loss is absorbed by operational changes to Lab 4 including the casual use of the proposed seminar room for consultation. The proposed space program is compared to COU as follows:

COU Category	ACADEMIC OFFICES	Existing FTE	COU Input Nasm	Generated Nasm (G)	Proposed Inventory Nasm (P)	P/G
4.1	FTE Faculty	69.67	12	836.04	947.64	113%
4.2	FTE Research (PdF)	111.67	Factored 4.1, 4.2, 4.3	183.01	0.00	0%
4.3	FTE Grad Students	115	3	345.00	265.01	77%
4.4	FTE Non-academic	117.20	12	1,406.40	800.58	57%
4.5	Office Support	2,770.45 sm	.25	1,385.23	712.44	51%
<b>TOTAL</b>				<b>4,155.68</b>	<b>2,725.67</b>	<b>66%</b>

### Space Program

#### Space Program (PPR/RFP)

Program	Area (Nasm) PPR	Quantity	Total Area (Nasm)	Occupancy	Notes
<b>Lab 4</b>			<b>690.00</b>		
Meeting Seminar Room_Lab 4	33.00	1	33.00	1	13 to 15 seats
Instructional Lab_Lab 4	440.00	1	440.00	1	124 Stations Teaching Station at North End
Team Leader's Office_Lab 4	8.00	1	8.00	1	
Lab Storage & Supply - Small_Lab 4	8.00	1	8.00	1	
Lab Storage & Supply - Large_Lab 4	37.00	1	37.00	1	3 or 4 persons
Acrylic Lab / Plaster Lab	38.00	1	38.00	1	Groups of 6 or 8
Radiology Lab_Lab 4	38.00	1	38.00	1	10 persons / 1 unit per person
Cad Cam Lab_Lab 4	49.00	1	49.00	1	2 or 3 persons
Dispensary_Lab 4	23.00	1	23.00	1	
Lockers	10.00	1	10.00	1	216 Lockers - Vertically stacked in 2's
IITS LAN Closet	6.00	1	6.00		
<b>Total</b>			<b>690.00</b>		

**Space Program (Design)**

Program	Area (Nasm) PPR	Quantity	Total Area (Nasm)	Occupancy	Notes
<b>Lab 4</b>			<b>673.57</b>		
Meeting Seminar Room_Lab 4	22.22	1	22.22	1	12 seats
Instructional Lab_Lab 4	434.42	1	434.42	1	124 Stations Teaching Station at North End
Team Leader's Office_Lab 4	7.91	1	7.91	1	
Lab Storage & Supply - Large_Lab 4	43.69	1	43.69	1	3 or 4 persons
Acrylic Lab	14.88	1	14.88	1	Groups of 6 or 8
Plaster Lab	36.71	1	36.71	1	Groups of 6 or 8
Radiology Lab_Lab 4	24.19	1	24.19	1	10 persons / 1 unit per person
Cad Cam Lab_Lab 4	28.34	1	28.34	1	2 or 3 persons
Dispensary_Lab 4	25.97	1	25.97	1	
Lockers		1		1	216 Lockers - Vertically stacked in 2's Incl. in Instructional Lab 4
IDF	17.61	1	17.61		

**Total 673.57**

The design Space Program is 16.43 nasm less than the planned space program (PPR/RFP) which equates to a minimal 2.4% discrepancy. This can be accounted for in-room servicing non-assignable spaces and additional partitions between rooms. The variation in room area between the planned program and the design program is due to spatial efficiencies produced through specific equipment and furnishing placement and operational discussions with the Faculty during the design process.

At the 124 Edward Street Building the existing Gross to Nasm ratio is 1.7. The above design Lab 4 space program is considerably more efficient at a Gross to Nasum ratio of 1.12, including the South and West exterior walls, but not including secondary scope areas due to associated base building servicing upgrades.

<b>Gross-up Analysis</b>	
<b>Total Nasm</b>	<b>673.57</b>
Lab 4 gsm	752.62
Lab 4 Gross-up	1.12

Similarly programmed buildings from the University of Toronto St. George campus have the following comparative gross to nasm ratios. It should be noted that with the exception of a currently planned Pharmacy Clinic, Clinical space is unique to Dentistry at the St. George Campus.

<b>Building</b>	<b>Gross to Nasm Ratio</b>
Medical Sciences Building	2.1
Dentistry Building	1.7
Ramsay Wright Laboratories	1.8

Las Miller Chemical Laboratories	1.7
McLennan Physical Laboratories	1.9
Rehabilitation Sciences Building	1.7
Terrence Donnelly Centre for Cellular & Bio-molecular Research	2.1
Leslie L. Dan Pharmacy Building	2.1
Health Sciences Building	1.9
<b>Average</b>	<b>1.9</b>

## Functional Plan

### Lab 4 Renewal Guiding Principles

1. Updated lab stations with ergonomic design principles;
2. Flexible instructional spaces, such as seminar rooms, to allow for multiple uses and break-out instruction;
3. Application and integration of innovative and modern electronic digital technology; and
4. Better integration across pre-clinical and clinical instruction and experience.
5. Allow for AODA compliant accessibility;
6. Improve building systems including addressing deferred maintenance and increasing energy efficiency;
7. Improve access to daylight and visual connection/wayfinding between areas;
8. Identify any space that was freed-up as part of the renewal; and
9. Achieve the six key elements identified in the Clinical Renewal Working Group (see below).

In August 2017, a Clinical Renewal Working Group was formed to develop an overall clinical renewal plan that is efficient and meets all users and stakeholders. After nine months of consultation and an external review, the Faculty of Dentistry resulted in the following Clinical Renewal plan objectives to:

1. Improve the Student Experience;
2. Improve the Patient Experience; and
3. Improve Operational Efficiency.

To obtain these objectives, six key elements were identified:

1. Medical Device Reprocessing Unit (MDR)
  - ✓ The plan must include the centralization of medical device reprocessing that utilizes a documented workflow to receive, process and deliver instruments to all clinics in a safe and efficient manner. This goal was implemented in 2019 and the MDR Unit will be operational in 2021.
2. The Student Experience
  - ✓ The plan must provide for the required number of ideal-sized operatories with improvements particularly in the areas of layout, delivery and radiological services.
3. The Patient Experience

- ✓ The plan must include a layout that is easy for use by the public and provides for a clear demarcation between the clinical and the non-clinical areas.
4. Collaboration
    - ✓ The plan must include allowances for greater collaboration between the disciplines, particularly in the areas of graduate specialty education. For example, certain disciplines are naturally collaborative (i.e. oral surgery and anesthesia, periodontics and prosthodontics, orthodontics and paediatric dentistry), the closer these clinical disciplines are practices, the more efficient collaboration can occur.
  5. Efficiency of Operation
    - ✓ The plan must include significant use of shared spaces designed for multiple use to promote an efficiency of operation throughout the Faculty.
    - ✓ Reduce redundancy and increase greater utilization of clinical resources (i.e. chairs)
  6. Flexibility
    - ✓ The plan must make provision for flexible use of program area both within existing clinics and for new clinical spaces in the future. Flexibility includes the ability to improve and adapt to new technologies and pedagogy.
    - ✓

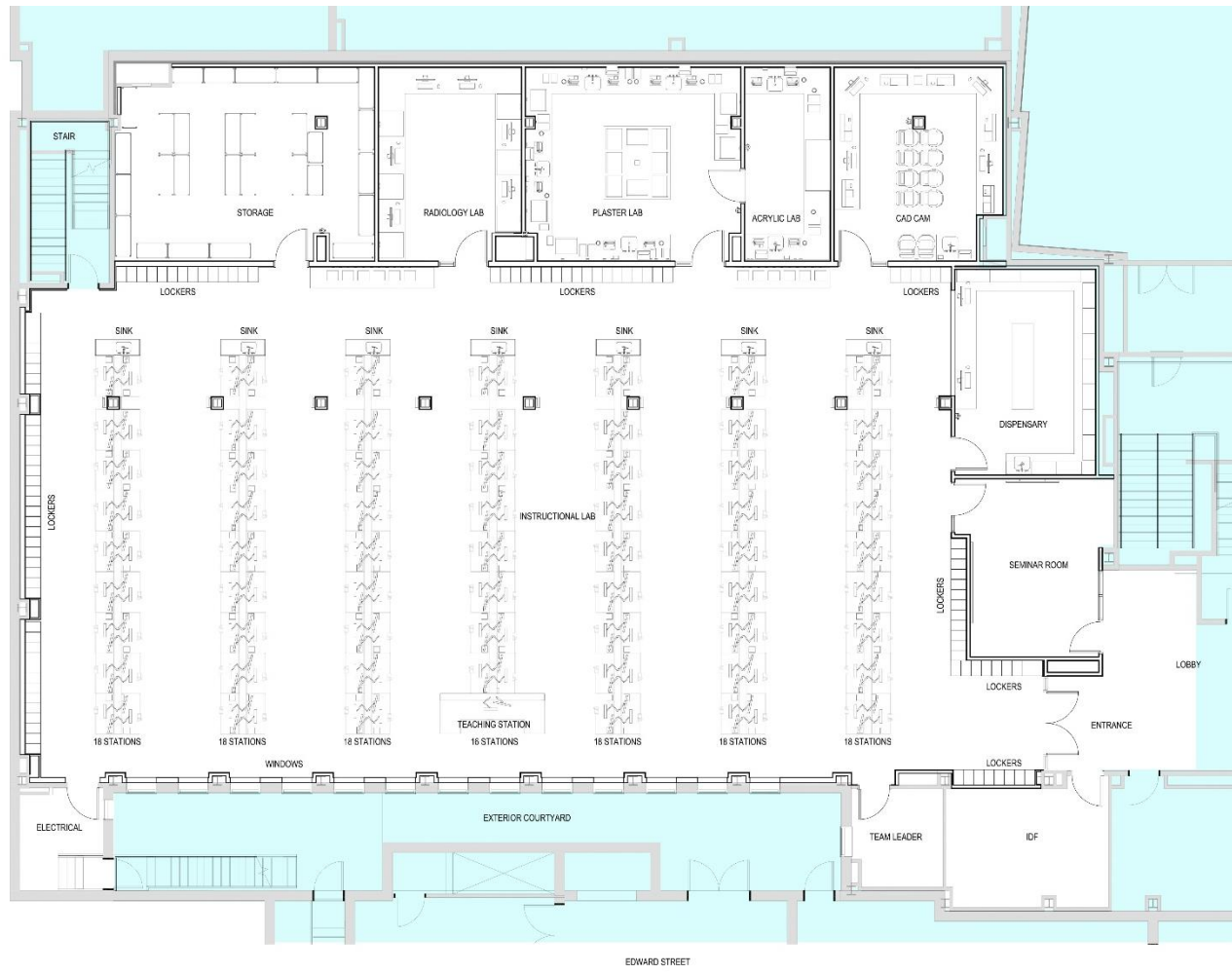
### Functional Plan

Basement:                      Renovation in Place of Pre-Clinical Simulation Lab (Lab 4) and teaching lab support spaces

   Exterior Building Envelope Upgrades

   Base Building servicing Mechanical and Electrical upgrades and equipment replacement





Pre-Clinical Simulation Lab 4 Floor Plan

Level 1: Base Building servicing Mechanical and Electrical upgrades and equipment replacement

Level 2: Temporary Renovation of existing Clinic 2 space to use existing dental chairs for simulation use while Lab 4 is under construction. Renovations are to be performed under a separate project by the Faculty of Dentistry and may include the following:

- Addition of Computer monitors and associated IT and DATA at each existing Clinic 2 Dental chair for use in simulation instruction DDS1 & DDS2

- IT/DATA upgrades to teaching station coordinated with dental chair simulators
- Storage room for Dental Simulator and monitor storage to allow use of space for Clinic 2 operations
- Temporary signage and wayfinding

Base Building servicing Mechanical and Electrical upgrades and equipment replacement

Level 3: Base Building servicing Mechanical and Electrical upgrades and equipment replacement

Level 4: Base Building servicing Mechanical and Electrical upgrades and equipment replacement

Level 5: Base Building servicing Mechanical and Electrical upgrades and equipment replacement

#### Description of Space Program Elements

##### **Preclinical Simulation Lab (Lab 4)**

The existing basement level Lab 4 will be renovated in the current space assigned to the Pre-clinical Lab. The main instructional lab will see new stations installed to replace the existing benching in North-South running rows of facing lab benches. An instructor's station will be located centrally at the South side of the instructional lab. The current bench model serves the Faculty well for demonstration purposes and for collaborative learning. The renovation focuses on improving the functionality and quality of the existing Preclinical Simulation lab as follows:

- Creating attractive, welcoming spaces that are ergonomically designed to enable students to learn in an effective way
- Creating a layout within the existing footprint that encourages efficient use of space, while keeping in mind the specialized nature of the needs of this lab
- Updating the existing storage room to accommodate new lab uses and student materials
- Providing student lockers at the perimeter of the Instruction Lab in addition to bench storage for Student storage
- Replacing the existing Process Room with a combined Plaster and Acrylic Support Lab
- Replacing the existing Casting Room with a Radiology Support Lab
- Replacing the existing Lab Equipment Workroom with a CAD CAM Milling Support Lab
- Renovating and modernizing the Existing Dispensary
- Combining the existing Typodont/Model Room with the existing Consultation Room to create a new 12 Seat Seminar Room
- Renovating the Existing Lab Team Leader's Office
- Replacing the Existing Lab Prep Room to be a new IT and Storage Room

- Updating the existing mechanical and Electrical Closet
- Replacing existing exterior windows with new energy efficient windows
- Improving the existing exterior envelope performance
- Replacing existing base building services serving Lab 4 including equipment upgrades
- Internet-capable workstations complete with state-of-the-art simulation mannequins at open benching
- Well-planned, efficiently used support space and storage areas to support the Preclinical lab

The existing entrance to Lab 4 will be renovated to be more transparent and reconfigured to include the existing lab prep room entrance. The new Lab entrance is to include direct access from the public corridor to the Seminar Room for use by upper year students while the Preclinical Lab is in use by DDS 1&2 students.

### **Clinic Faculty, Team Leader Office & Clinic Administration Offices**

The Single Lab Team Leader office will be renovated in-place. The office will be fully enclosed with the existing exterior window replaced, exterior envelope improvements and a glazed vision panel at the door.

### **Lab Storage**

A dedicated Lab storage room will be provided with individual storage lockers for student projects.

### **Radiology Support Lab**

A radiology support lab space will be included in the project scope with controlled access directly from the Instructional Lab Space.

### **Plaster & Acrylic Modelling Support Lab**

To provide foundational training to students, a Plaster and Acrylic Modelling Support Lab will be included in the project scope with controlled access directly from the Instructional Lab Space.

### **CAD/CAM Lab**

Within the bank of Support spaces a Cad Cam Lab will be provided accessed directly from the instructional lab The CAD/CAM milling Lab will be equipped with a hand sink and appropriately configured building services. Acoustic isolation and ventilation is to be considered in scale to the type of milling and machinery.

### **Lab Dispensary**

The existing Lab 4 Dispensary is to be renovated in-place.

The Dispensary is to be a secured space with a security shutter and a service counter at the instructional lab interface. Security measures will be installed within the dispensary.

The Dispensary is to include an eyewash station, wall mounted or freestanding sinks rather than dropped into counters for reasons of infection control and hands free faucets.

## **Lockers**

Student lockers will be provided at the perimeter walls of the Instructional Lab 4 space. Lockers will be double stacked to provide a total of 216 units. Lockers will be used for student storage of clothing, projects and instruments not requiring storage within the dedicated Lab Storage Room.

## **Seminar Room**

The two existing typodent/modelling room and a consultation room will be combined to form a new seminar room. The seminar room will be equipped with flexible furniture and audio visual equipment including a monitor. The seminar room is to provide seating for 12. The Seminar Rooms is to have vision glazing facing a public corridor and can be accessed directly from the Basement South Lobby space. Acoustic separation between the Instructional Lab, the Seminar Room and the Lobby will be specified.

## **Non-Assignable Spaces**

### **Corridors**

New and refinished corridor spaces are to be sized appropriately to use and to building code requirements. Existing terrazzo corridors will be repaired and refinished as required. New corridors will be finished to UofT standards in durable and easily maintained materials.

### **Custodian/Janitorial Rooms**

Janitorial Rooms are to be either retained in place or provided new as required by the Clinic layout. Janitorial Rooms will be access from public corridors.

### **Mechanical/Electrical Rooms**

Mechanical and electrical rooms, communications closets and building servicing shaft spaces are categorized as non-assignable. While new servicing and equipment upgrades and replacement will be included in the scope of the Lab 4 Renewal project, base building revisions to these spaces is not require.

## **d) Building Considerations & Sustainability**

### Standards of construction

A recent Facilities and Services Deferred Maintenance Report (2018) states the Dentistry building is ranked 4th highest in terms of total deferred maintenance cost, but ranked 27th in terms of the facilities condition index for St. George campus.

As this is a renovation, the standards of construction apply mostly to the interior. Finishes should be durable and of mid-range quality. All finishes are to be selected for durability, ease of maintenance and appropriate alignment with infection control regulations and procedures.

Building system and envelope elements such as windows are to be of high-quality for sustainability and durability.

### Building Characteristics and Massing

The original Dentistry building is a Six-storey, masonry brick building with concrete lintels and base. The existing Floor to Floor height varies throughout the building. The existing Clinic 2 space is a double height space for the majority of its floor area.

The walls appear to be uninsulated. The majority of the exterior envelope appears in good physical condition, particularly for a building of this age. There is some deterioration of the existing concrete ramp, base, columns and metal louvres along the Elm Street façade.

The 1985 infill/addition is composed mostly of mirrored glazing / curtain wall with aluminium pressure caps, exposed concrete columns and panelized pre-finished metal banding.

Improving thermal performance will require the addition of thermal insulation to the interior wall surfaces. The appropriate insulation value is to be reviewed and selected that maximizes the thermal performance of the wall, while mitigating any potential damage to the existing masonry.

The majority of the existing windows in the south wing are thin framed aluminum fixed or operable units of varying ages. These should be replaced with modern, thermally broken, double-glazed (minimum) insulated glass units with a low-e coating. They should match as close as possible the original windows that were designed for the building.

The existing structural system for the original U-shaped building consists of discrete concrete spread footings at each column location, and concrete strip footings running along the perimeter of the building below the exterior walls. The vertical load-bearing elements include interior concrete columns of varying sizes and perimeter load-bearing masonry walls. Floor systems of the building consist of concrete joists formed with blocks of clay tile to create the cavities, topped with structural concrete slabs, framing between concrete beams and/or load bearing masonry elements. Structural changes as a result of the building's use are expected to be restricted to the east building wing and roof where new mechanical systems dictate a need.

The existing floor finish is worn and requires replacement.

A new sprinkler system will be required to replace the existing wet sprinkler system in the renewed Pre-Clinical Simulation Lab 4. Existing fire hose cabinets are to remain.

### Elevators

The existing building contains 5 elevators: 2 elevators located adjacent to the Edward Street Entrance including a passenger elevator and a larger freight elevator and three passenger elevators located in the centre of the 1985 infill/addition.

The elevators are in good condition with the exception of the original freight elevator and passenger elevators, which are considered to be in fair condition. The freight elevator has been recently modernized and upgraded in support of the increase in use for the new MDR.. No major work is required on the South Passenger elevator at this time. Elevators are not out of compliance.

The Clinic Master Plan identified locations for two new AODA compliant passenger elevators serving the Elm Street Clinic Entrance Lobby in lieu of the existing non-compliant ramp providing direct access to the clinics. A new AODA compliant Machine-Room-Less (MRL) passenger elevator with capacity for an ambulance stretcher is proposed to serve the Elm Street Patient Waiting Area, Basement Level, Clinic 1 on the first floor, Clinic 2 on the second and Clinic 3 on the third floor. This elevator will be part of a future phase in conjunction with renovations to Clinic 2 and is included in this report for reference and coordination purposes within the scope of the Lab 4 renovations only.

### Sustainability design and energy conservation

The University of Toronto is committed to reducing its scope 1 and 2 greenhouse gas (GHG) emissions by at least 37% below its 1990 level of 116,959 tonnes eCO<sub>2</sub> by 2030, targeting a net-zero GHG institution by 2050. To accomplish this, the University has retired the previous Energy Performance and Modelling Standard (April 1, 2019) and introduced this now-governing Tri-Campus Energy Modelling & Utility Performances Standard. (refer to links listed at the end of this section) This new standard provides project-specific energy and water efficiency goals, used to calculate energy and GHG project budgets, as necessary to achieve our 2030 goal, while also introducing a streamlined modelling and documentation submission approach.

This standard is meant to inspire innovative designs based on absolute energy and GHG targets that are used to calculate energy and GHG performance budgets according to when the building is going to be constructed and the program use. The targets become more stringent over time as cost-effective technologies and delivery methods improve in conjunction with compliance paths with authority approvals.

The tool used to define the goals and budgets is called the “Charter” as completed by U of T staff before the call for design tenders is issued. The energy and GHG budgets for new construction are defined for the year that occupancy is scheduled in the project planning reports. The approved energy modelling procedures will be used to calculate the energy and GHG performance for the designs and will be compared to the Charter targets throughout the design stages.

These Standards and resulting models are not post-occupancy energy or GHG predictions – they are to be used as a comparative tool for building baseline and performance evaluation. Post-occupancy, the model will be updated (12 – 14 months post-occupancy) by the consulting team and compared to the final design model results.

All applicable Codes, Guidelines or Standards referenced in the standard are to be applicable to the current regulations within the project timeframe defined in the Charter. Estimates of the impact of any foreseeable future standards, codes and guidelines may be required and shall be presented to the U of T Implementation Team for consideration. In all cases, higher performance targets shall be the preferred targets.

## Utility Performance Requirements for New Construction Projects

### Energy

Construction projects must meet the project-specific energy performance targets established in the Project Charter. The requirements will be calculated using the Charter's archetype targets and project information, including: planned building space use, year of occupancy, presence of a connection to the U of T district steam or low temperature heating, and district chilled water energy systems. For buildings with mixed uses, the targets are area-weighted using the Project Charter to determine a set of performance targets that are representative of the building programming.

The renovation of existing buildings plays a critical part in U of T's plan to achieve the established 2030 GHG emission reduction target. UofT's Standard also identifies utility performance requirements and targets for renovation projects of varying scopes and complexities through a prescriptive pathway for minor renovations and performance pathway for major renovation projects.

The Project Consultant Team must complete and submit to UofT an energy simulation, key performance indicators (TEUI, TEDI, GHGI) with associated documentation at each stage of the design process to demonstrate ongoing compliance with these performance targets. At the completion of the commissioning, the energy model simulation must be updated to reflect the as-constructed building characteristics. This will form the basis of the project's baseline performance.

The targets will be revisited and adjusted regularly to ensure U of T remains in a leadership position. The progression of targets depends on numerous factors, many of which are outside U of T's direct control (e.g., the rate at which new technologies come to market). However, projects should anticipate the adjustments to the targets for 2022-2026 and 2026-2030 for all the key performance indicators included in the standard to account for increased capabilities of designers, technologies and the industry practices to meet net zero targets by 2030 in many jurisdictions, including the City of Toronto.

Beyond energy, additional performance levels include:

- 50% reduction in indoor water use over the LEED™ version 4 baseline;
- 60% reduction in outdoor water use over the LEED™ version 4 baseline; and
- Complete whole-building air tightness testing following the U of T Utilities & Building Operations Commissioning Process for Overall Building Commissioning (refer to links listed at the end of this section), and the US Army Corps of Engineers Air Leakage Test Protocol for Building Envelopes and submit air leakage testing report.

The above targets are combined with project-specific information to establish unique energy and water efficiency targets for every building based on floor area and different space use types. The project-specific goals are established as part of the Project Planning Report (PPR) using the separately enclosed Project Charter. The Project Charter outlines key project information, performance targets, and serves as a reference point throughout the project to ensure the performance goals are clearly understood by all involved parties and ultimately achieved.

To further ensure projects are developing in accordance with these performance requirements, documentation must be completed by the Project Consultant Team and/or the U of T Implementation Committee at each project stage. For each documentation item, the expectations and responsible parties are outlined in the Standard.

In addition to the energy performance, utilities performance and water efficiency targets mandated by the University through this standard other regulatory authorities and certification process will be included within the planning, design and implementation of all projects. The intent of these additional regulatory processes is to ensure that the high performance building required by the energy and water performance targets of this standard is part of a holistic approach to sustainable building practice. The following Certifications and regulations will be mandatory for all Renovation projects: LEED™ Silver minimum (non-certified); Minimum required Toronto Green Standard Tier. The minimum requirements for these certifications and regulations are not to supersede the energy, utilities and water efficiency performance targets of this standard. The decision to pursue full certification or a higher levels of LEED™, TGS and WELL™ certification will be at the discretion of the Project Planning Committee in consultation with University of Toronto Facilities and Services.

Project Planning, Implementation and Consultant teams are to address the embodied energy, embodied carbon and other GHG emissions associated with building materials. Building and Renovation projects will be required to report the embodied emissions of the building's structural and envelope materials using life-cycle assessment (LCA) software in compliance with the Canadian Green Building Council's recommended methodology. (CAGBC Zero Carbon Building Standard, May 2017: Pg. 7) The University of Toronto Facilities and Services will provide utility costs to the consultant team for the purposes of life cycle costing.

Sustainability Design: Energy Modelling and LEED™ Initiatives.

The Consultant Team prepared an energy model in compliance with the requirements of the University of Toronto Tri-Campus Energy Modelling & Utility Performances Standard using existing utility rates and existing base building information combined with new efficient design proposals. The resulting modelling was compared to the Project PPR Renovation Charter generated targets. The following is a summary of the resulting efficiencies expected in the Lab 4 project.



	UofT	Proposed
	Energy Target	DX/ Elec Coil DOAS + VRF FCUs
Space Heating		24,095.60
Space Cooling		40,036.50
Interior Fans		13,971.50
Interior Lighting		26,380.50
Pumps		-
Receptacle + Process		58,357.70
Domestic Hot Water		24,182.90
Total	214,516.38	187,024.70
TEUI, kWh/m <sup>2</sup>	276.83	241.35
GHGI, kgCO <sub>2</sub> /m <sup>2</sup>	31.20	12.07
TEUI Savings over Base		12.82%
GHGI Reduction over Base		61.31%

Chart from EXP: SUSTAINABILITY AND ENERGY MODELLING REPORT (100% DD SUBMISSION)

The resulting modelling was used to inform the mechanical and electrical designs for the base building upgrades servicing the Lab 4 space. Based on the energy results of the simulation exercise from the proposed system, it was recommended to utilize the DOAS DX Cooling & Electric heating coil and variable refrigerant flow (VRF) fan coil units (FCUs). The proposed system can reduce the annual energy consumption as compared to the target system by 12.82% and reduce the greenhouse gas emission by 61.31%. This is due to the high coefficient of performance of the VRF system as compared to the typical hydronic cooling and heating system. The VRF system also have better load distribution as the heating and cooling requirements can be delivered simultaneously depending on the room load demand. In conclusion the VRF system meets the energy target as per appendix C and have energy use and energy cost savings as compared to the LEED reference model.

Further to the energy use modelling, the design team was tasked to calibrate the design to achieve a (non-certified) LEED ID+C Silver minimum rating. The design centred on maximizing energy efficiency and water use reduction with additional measures in sustainable project and construction management processes and materials selection. Overall, the project design was able to achieve a 54% water use reduction – exceeding the Project Charter requirements. The following is a summary of the LEED Certification initiatives and considerations.

#### Sustainable Design – LEED ID+C

The project is being designed to a LEED Certification level of Silver, which requires at least 50 points be achieved within the rating system, along with meeting all Minimum Program Requirements and Prerequisites. Based on the current design provided by the team and the design development energy model, the project is tracking 32 Yes points and 33 Probable points. Sustainable design strategies include, but are not limited to:

- A fully Integrative Process which includes collaboration on the selection of building materials and on energy- and water-using systems, within the project boundary
- Coordination with existing building strategies which contribute to the LEED checklist
- Maximizing credits within the Location and Transportation category
- Utilizing an Alternative Compliance Path for Whole Building Water Use Reduction to earn points in the Water Efficiency Category
- Design for a high-performance building (Reference the Energy Modeling Section of this Narrative)
- Confirming design of a high-performance building through Commissioning
- Selection of materials that are locally sourced and provide transparency through Environmental Product Declarations (EPDs) and listing of the Material Ingredients (MI)
- Creating a healthy indoor environment through improved filtration and the selection of low-emitting materials within the thermal envelope

With 65 points identified, a LEED Silver designation would be achieved, should the project submit for certification. 15 additional points over the minimum 50 required give flexibility to the project team, should any credits be denied during the review phase(s). It also presents an opportunity for LEED Gold Certification.

#### Other Considerations

The Building at 124 Edward Street has been identified as part of the St. George Campus Utilities Master Plan and Climate Positive Campus policy. Current planning is targeting 2025 as the termination of natural gas to the building at 124 Edward Street. Equipment and servicing as part of the Lab 4 renovation includes for the use of low temperature hot water anticipating future fossil fuel free building servicing.

The existing south facing windows in Lab 4 will be replaced with new efficient windows as part of the lab renewal.

UofT Tri-Campus Energy Modelling & Utility Performance Standard:

[https://www.fs.utoronto.ca/wp-content/uploads/2020/08/U-of-T\\_Energy-Performance-and-Modelling-Standards\\_July1\\_2020\\_vs842020\\_w\\_CHARTER.pdf](https://www.fs.utoronto.ca/wp-content/uploads/2020/08/U-of-T_Energy-Performance-and-Modelling-Standards_July1_2020_vs842020_w_CHARTER.pdf)

UofT Overall Building Commissioning Standard:

<https://www.fs.utoronto.ca/wp-content/uploads/standards/commissioning/BuildingCommissioningProcess.pdf>

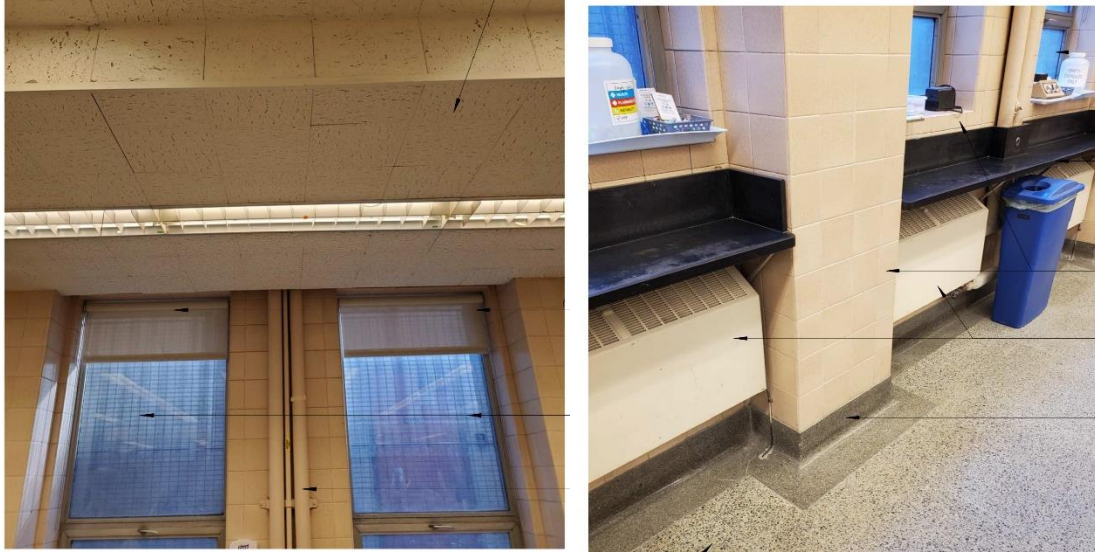
UofT Climate Positive Campus

<https://climatepositive.utoronto.ca/>

UofT Sustainability Office

<https://www.fs.utoronto.ca/sustainability/transforming-our-campus/>

Refer to project Renovation Charter available upon request.



Existing South Exterior Wall: Windows and Envelope

### Accessibility

The University is committed to equitable access to all of the building's facilities by the whole campus community. A Universal Design Consultant typically will be retained early in the design process to ensure that the consultant's recommendations will be incorporated into the built project.

To address the broad diversity of people who will use the facilities, the signage system will be designed to assist individuals with disabilities in identifying spaces (e.g. Braille, high contrast) and wayfinding. Attention will be given to the layout of the space and the materials used and the Manager of the AccessAbility Resource Centre will be consulted throughout the design process.

An amendment to the Ontario Building Code (2012) related to Accessibility was filed on December 27, 2013 (Ontario Regulation 368/13). Effective for applications submitted after January 1, 2015, the requirements are more stringent and impact the following areas relevant to this project: barrier-free path of travel, visual fire safety devices, washrooms, and seating in assembly spaces.

New or redeveloped exterior, and some interior (i.e. service counters, fixed queuing guides, and waiting areas), public space, must comply with Part IV.1, Design of Public Spaces Standards (Accessibility Standards for the Built Environment, Integrated Accessibility Standards of the Integrated Accessibility Standards, O.Reg. 191/11, <http://aoda.hrandequity.utoronto.ca/buildings/>). This would include approaches to new buildings. Maintenance, environmental mitigation, or environmental restoration excluded from this requirement.

Public space projects affecting exterior paths of travel, recreational trails, outdoor play spaces, or accessible on-street parking must include consultation with the public and persons with disabilities pursuant to aforementioned standards.

For additional information contact the University of Toronto's Equity, Diversity and Inclusion Office: <https://www.utsc.utoronto.ca/edio/> and AODA AccessAbility policies: <https://people.utoronto.ca/inclusion/accessibility/>

Accessible lab benches, sink stations and other lab and clinic facilities are to be provided in the renovation project.

### Personal safety and security

The building design must allow its students, faculty, staff and visitors' access as required and as allowed, safely and easily. At the same time, the design must be sensitive to the needs of those whose activities require security after hours. Limited areas of this building could be operational throughout the week for 24 hours a day.

A detailed security plan will need to be developed for each room, zone or floor, and factored into the design of the building to ensure that accessibility, security and functional objectives are all met simultaneously. Specific security requirements have been identified in the Room Data Sheets.

Personal safety is of paramount consideration. Transparent common rooms and public areas, including stairwells, are specified to be glazed where possible to allow for visual access.

A computerized card-entry system is to be reviewed, while still making significant considerations for personal safety and security at every opportunity. Doors to individual offices should be individually keyed, as should storage areas, and common & study lounges.

Dispensaries and stock and store rooms, radiology, patient records storage and sterilization facilities are to employ significant security measures to be reviewed in consultation with the Faculty of Dentistry and with Police Services and the Community Safety Office.

High security restricted access to stock and store rooms, patient records and Patient Payment stations is required. Eye wash stations are to be provided within Clinical spaces.

The security systems shall be an expansion of the existing UofT system. Licensing and capacity to support the renovation shall be expanded at the head end to accommodate new access control doors.

Access control shall be provided at the following locations:

- Main entrance to Lab 4 (auto door operator to trigger on valid card read)
- Entrance to seminar room from student lobby.

New controllers will be located in existing room 214T and have cabling run to the new security door.

### Signage, donor recognition

This project will need to provide all necessary signage, wayfinding and donor recognition associated with the building. Interior signage includes not only those signs mandated by the Ontario Building Code but also departmental identifications, room names and numbers, room schedules (as required) and interior wayfinding. Exterior signage includes building identification, street and road signage for pedestrian and

vehicular wayfinding, and other site-specific signage (e.g. parking, loading dock instructions, etc.). As well, building may utilize digital signage for the cycling of campus information, events, student services, etc.

All signage and wayfinding are to be compliant with University of Toronto Accessibility standards and AODA compliant.

UofT has specifications and standards for both interior, exterior and digital signage that the design team will be required to implement on this project. Exterior donor recognition signage will be subject to the University of Toronto Design Review Committee review.

One of the goals of the Elm Street Patient Entrance and Clinic 2 renovations is to provide a clarity of organization and use to the public clinics within the demanding constraints of the existing building. The spatial organization and finishes of the renovation are to be considered in developing a significant wayfinding and signage system for both the public and academic spaces within the Dentistry building and project scope boundary. Existing signage on the recently renovated 4<sup>th</sup> and 5<sup>th</sup> floors will need to be considered as a starting point along with consultation with Faculty and departmental stakeholders.

Naming valuations for the renovated spaces as well as elements within, such as labs, classrooms and operatories are currently being valued with the UofT Department of University Advancement's stewardship team.

### Non-assignable space

The existing loading dock is accessed from Elm Street at the West Façade of the building. The loading dock is at the basement level.

New and renovated areas within the building must include appropriate provision for or renovation of caretaking closets on each floor.

Caretaking design standards are posted on the web site <http://www.fs.utoronto.ca/wp-content/uploads/2015/05/caretaking-standard.pdf>.

### Mechanical/ Electrical and Data

#### Mechanical

The intent of the project is to provide mechanical system design to support the function and operation of the renovation of the Dental Simulation Lab (Lab 4) and surrounding area in the basement.

Currently, Lab 4 and surrounding areas are served by AHU-3 and AHU-16 located in the 5th floor mechanical room 547A for space conditioning. Additionally, exhaust fans EF-12, 13, 14 (EF-12 = 188 l/s, EF-13 = 188 l/s, EF-14 = 415 l/s) serve the four rooms north of the simulation lab (rooms 4C, 4D, 4E, and 4F). There are two exhaust hoods present in room 4E which are served by EF-13 & 14. The dust collector branches 2, 3, 4, and 5 serve the grinder room which is 4F. An additional branch of the dust collector, branch 1, serves room 4C but does not appear to be operational as the room is utilized as a storage.

The return fan of AHU-3 is located on 5th floor Mechanical Room and return fan of AHU- 16 is located in a mall penthouse on the roof (Room 602). AHU-3 serves the core lab area and room 4D while AHU-16 serves the surrounding rooms (4C, 4E, 4F, 4G, 4H, and 4J). The existing unit AHU-3 utilizes chilled water for cooling and steam for humidification. Heating is served by perimeter radiators within the lab space. AHU-16 utilizes glycol for heating and chilled water for cooling. The existing shafts adjacent to the space which are being utilized to serve the space were not visible or accessible during the site visit. Based on the available existing mechanical drawings and per discussions with the building operator, the shaft is fully utilized. Supply air to the space is distributed to ceiling mounted diffusers. All return air for the space is currently extracted through ceiling mounted grilles.

On June 08, 2021, an air audit report conducted by Enviro Balance Inc., was provided summarizing the operational characteristics, including but not limited to, airflow measurements at the unit, space airflow measurements, fan motor readings etc. for air handling units AHU-3, AHU-7, AHU-16, and AHU-21. Per the air audit report, the air handling unit AHU-3 currently serving the lab was measured with a supply airflow of 2,641 l/s and return airflow of 1,900 l/s. AHU-16, which serves rooms surrounding the lab rooms (along with other parts of the building) was measured with a supply airflow of 13,156 l/s. Based on the above presented data and detailed calculations, it can be concluded that Lab 4 and surrounding spaces have a higher cooling load due to their operations.

The building currently has a combination of a legacy building automation system original to the building and a newer Siemens BAS for the recent renovation of the 4<sup>th</sup> and 5th floor in 2017.

The legacy BAS system was mainly for controls of air handling units, the basement chillers, and heating systems that is original to the building from 1958 and from the expansion in 1982.

The new Siemens BAS is mainly for controls of the new mechanical equipment that was part of the 4th and 5th floor renovation, which includes air handling unit, the aircooled chillers on the roof, and glycol and perimeter heating systems on the 6th floor mechanical penthouse. This Siemens BAS is also integrated into the University's Honeywell EMRS front-end system for graphics and user interface.

As part of the new work for Simulation Lab project, the new AHU, new exhaust fan, new boilers, new pumps, and any new major mechanical equipment will be provided with a new BAS system and integrated to the Honeywell EMRS. Extension of the BAS infrastructure will likely be required, where new supervisory controllers will be provided to integrate the mechanical equipment to the BAS. All control devices should be periodically checked and calibrated.

During user group meetings, it was discussed that UofT does not have any specific temperature or relative humidity controls requirements for Lab 4.

The following list consist of the major events in this project,

- Demolition of AHU-3 and associated ductwork and accessories within the space up to the riser.
- Demolition of AHU-16 branch ductwork and accessories up to the riser within Simulation Lab area.
- Provide new VRF system with individual space dedicated VRF units for space conditioning. New AHU shall be provided which will be capable of providing a total of 1,888 l/s of fresh air with 84 kW of electric heating capacity.
- Provide thermostats for each FCUs to be provided for space temperature control.
- Provide new high plume exhaust fan to serve all hoods in the lab area on level 3 roof.

- Cut back and cap all existing drainage, plumbing, natural gas, and compressed air branch piping connections back to main.
- Provide new drainage, plumbing, natural gas, and compressed air branch piping from their respective mains including all valves and accessories.
- Demolish existing and provide new sprinkler heads and branch piping to suit new space layout.
- Demolish existing panels and lighting serving the lab 4 space.
- Demolish existing distribution panel serving electrical panels in basement.
- Provide new distribution panel for basement, branch panels for lab 4 and new lighting for lab 4.

A new sprinkler system will be required to replace the existing wet sprinkler system in the renewed Pre-Clinical Simulation Lab 4. Existing fire hose cabinets are to remain.

The building is served with an 8" (200mm) steam line from Enwave District Heating at approximately 100 PSI. Annual peak demand prior to major 4<sup>th</sup> and 5<sup>th</sup> floor renovations in 2016 through 2018 was approximately 7,000 MBH. Steam is used for heating, process equipment (autoclave, sterilizers, etc.), domestic hot water and humidification. Heat exchangers convert the steam to hot water and glycol is used for perimeter heating and air handlers respectively. Steam to steam converters are used for air humidification for the recently renovated 4<sup>th</sup> and 5<sup>th</sup> floor.

During the 2017/2018 4<sup>th</sup> and 5<sup>th</sup> floor renovations, new steam lines and associated heat exchangers for the new air handling units and duct mounted re-heat coils serving those floors, as well as the replacement for the existing AH-21 steam heating were added. The existing steam line serving the AH-21 heating coil was capped and a new line was connected to the incoming steam line in the basement. The existing heating lines serving other floors were re-used for perimeter heating.

The steam piping is original to the building, except where added as part of the 4<sup>th</sup> and 5<sup>th</sup> floor renovations. Testing to determine wall thickness is required. The perimeter heating requires upgrade as it is original to the building. The water heat exchangers are past expected life as are a number of the distribution components such as pumps and valves. The Enwave abandoned high pressure condensate line and the condensate line is being returned via pumped condensate line, except at the 4<sup>th</sup> and 5<sup>th</sup> floor renovation, where it is temporarily being sent to drain.

There is no single, master document that incorporates all the changes done to the steam/heating system over the years. The creation of the as-built master drawing is recommended to be included as part of the Master Plan either in the planning or implementation phase of the project.

The areas to be addressed in the Clinical 2 Lab 4 renovations are served by multiple existing air handling units. The air handlers are mainly original to the building and are well maintained, based on the equipment age. The units should however all be replaced or rebuilt dependent on air handler box integrity and requirements for the space (outside air requirements, cooling, temperature control, humidification, etc.). Some units have chilled water cooling some are DX cooling. They all have glycol heating and do not have humidification. The AHU 21 was slowed down as it is no longer serving the 4<sup>th</sup> and 5<sup>th</sup> floor and the steam heating was replaced with glycol heating. The distribution ducts serving the laboratories are lined, the liner material has deteriorated and does enter the occupied areas in particulate form. It is recommended that these ducts be replaced. Air handling units are to be reviewed and considered as follows:

1. Air handling units and ductwork/devices serving affected areas will be replaced with new
2. AHU S-16&17 will be refurbished and updated to DDC controls
3. AHU 3 full replacement to support Lab 4 renovation
4. AHU 13 and 15 full replacement to support the Clinic 2 renovations

The chiller plant in the assessment, serves the areas identified in the master plan. There are two 250 tonne chillers, both are in good condition operated seasonally. The usual maximum load observed is around 350 ton. The cooling towers on the roof are in fair condition but require overhaul and possible replacement. A new 500-ton chiller / cooling tower plant replacement is to be reviewed and considered within the scope of the project.

During 4<sup>th</sup> and 5<sup>th</sup> floor lab renovation project the 200 tonne air controlled DX chiller was added on the roof. The maximum load has not yet been experienced as the labs have not been fully utilized.

The compressed air system is served by 3 units, each approximately 200 scfm; two units are oil free and one unit is lubricated with oil removal filtration. The lubricated unit is only used as a backup. These units are in generally good condition. There is no single, master document that incorporates all the changes done to the compressed air system generation and distribution over the years.

There used to be RO system serving the building, but it has been decommissioned and replaced with point of use polishing station.

There is a wet vacuum system serving clinics 1 & 2 (approximately 275 chairs) and lab 4 (approx. 120 chairs), and a dry system serving small clinic on the 2<sup>nd</sup> floor. The wet vacuum system pumps were replaced in 2018 using a quadruplex system with 350 scfm @ 22" Hg vacuum per pump, amalgam separators were added at that time. There is no single, master document that incorporates all the changes done to the vacuum distribution over the years.

There is limited use of natural gas in the building at the fume hoods. There is no single, master document that incorporates all the changes done to the natural gas distribution over the years.

The Building Automation System on the 4<sup>th</sup> and 5<sup>th</sup> floors is a brand new DDC Siemens integrated into enterprise level remote building automation and energy monitoring system (EMRS). The lower floors are managed using a number of systems, including CCMS, pneumatic and Automated Logic. These systems require replacement including changes in the sequence of operations, hardware and end devices to more effectively manage the building, reduce operating costs by incorporating into EMRS.

The incoming plumbing and drainage is original to the building, except where renovations took place. There is no lab drainage treatment although piping material is acid resistant to minimize adverse effect of the incidental spill. There is no single, master document that incorporates all the changes done to the plumbing and drainage distribution over the years.

There is presently a project to incorporate secondary domestic water feed to the building for improved resilience. This should be completed by early 2019.



The building fire safety systems located in the 1981 construction included sprinklers as per the code. The original 1950 construction has a stand pipe with no sprinklers except on floors 4 and 5. The alarm panel is a new CHUBB system.

Enclosed operatories are to consider the following system requirements:

1. Plan for one operatory that will have fan assisted HEPA return diffuser, to be confirmed during design.
2. If 35 min fallow time is required the AHU should be sized based on 13 ACH of total supply air, considering the ACH eq of 12 the assumption for unit sizing: OA min 15% , final filter MERV 13
3. 13ACH for sizing the AHU serving operatories. Design of the unit to be as outlined in the CSA requirements, with MERV 13 filters as a final ones. The exact number to be determined during design. No need for HEPA on the supply air.
4. The lobby area is also part of the renovation. Based on the recent conversations, the scope needs to include looking at the existing HVAC serving the area to address temperature and ventilation issues.

Refer to the 2019 Clinic Master Plan and Existing AHU audit and balancing report attached as an appendix to this report.

### Electrical

This section will outline the requirements for the electrical systems that are not addressed by the applicable codes and standards. The intent of these requirements is to obtain functional electrical systems that are adequately maintainable and expandable to suit the university facility's needs, while being economical to build and operate. The new electrical infrastructure will replace the distribution panel in the electrical riser room, so some disruption to the existing facility will be required. Scheduling this work will be specified to minimize this disruption as much as possible. Based on the preliminary proposed layout, we believe there will not be a significant change to the overall power draw of the process loads. However, there will be an overall increase to the building's load due to increased HVAC loads. Modification of the normal distribution in the renovated space will be required to accommodate the new loads.

Currently, the space is provided from six panels. These existing panels are old and obsolete, and removal of all panels are required.

The distribution panel DP-B is fed from the existing bus duct in the electrical riser room. This panel is old and obsolete, and removal of this panel is also required. The tap box and breaker serving this panel is also recommended to be removed, but removal shall be done during a later project that will remove upstream distribution. This shut down can be facilitated at the upstream 600V breakers so that the existing 208V breakers do not need to be opened. Existing panel tubs can remain, but a new bus with breakers will be installed, along with new wiring installed using existing conduit.

New panels shall be specified to serve the new Lab 4 space. There will be two 120/208V panels to serve receptacle loads and one 120/208V panel to serve lighting loads. New electrical panels will be located in the room identified in figure E3.

New IT loads will be served by an existing non-life safety panel (EDP-DD). The existing transformer serving this panel looks to be beyond its service life and will be replaced with a larger 30kVA transformer. The existing EDP-DD will also be replaced and renamed per the University of Toronto's

naming convention. Both the existing and new transformer and panel will be located in the main electrical room. Any existing circuits still in use will be reconnected to this panel. The existing IT room will also be further backed up by local rack mounted UPS units. The existing emergency panel serving the area is panel LP-EMB. This panel is fed from the non-life safety leg of the generator system. This panel is also connected to a contactor that will only receive power upon normal power source failure.

These panels are connected to light fixtures that are normally off but will turn on upon power failure. This type of lighting is consistent with a battery unit and remote heads, not with a generator and emergency panels. This panel serves emergency loads outside of the scope of the Lab 4 work, so it will be left as existing. New emergency lighting and exit signage for the new Lab 4 space will be connected to an existing life safety panel (LS-1) in the main electrical room. A total of 3 new circuits will be required. Refer to the preliminary electrical layouts of the basement and ground floors to illustrate proposed locations of equipment.

As part of the demolition scope of work, all existing power within the new Lab 4 space shall be removed back to source. All equipment for the Lab 4 shall be served from the new panels as noted above. All existing conduits serving other areas, passing through the space in the ceiling will be existing to remain. The loads served by these conduits will be in continuous operation, so they must remain live during the demolition phase. If these feeders require de-energization for any reason, authorization for building shutdown must be applied for well ahead of time as these conduits serve a significant portion of the building.

All wiring will come from above for receptacles and device connections for the student desks. Adjacent columns will be used as a pathway from the ceiling space to the desks for power and data. Student desks will have special marked receptacles that will be controlled by the occupancy sensors. All receptacles but the one used to power the computer will turn off when the room is vacant. All equipment shall be coordinated with the appropriate disciplines. Any new/replaced mechanical equipment that is specified will have new electrical connections. If the power source is connected to a panel that is from the original construction of the building, this panel will be replaced with new. New HVAC equipment will require new connections to the existing 600V switchboard. Housekeeping receptacles shall be provided throughout the Lab 4 area and a maintenance receptacle shall be provided near the new rooftop unit. Power receptacles shall be provided in the Lab 4 with types and quantities to suit equipment list and room layout and comply with code requirements.

As part of the demolition scope of work, all existing lighting, emergency lighting and controls within the Lab 4 space shall be removed back to source. All new luminaires shall be LED. The main source of lighting will be linear rows, with auxiliary spaces having LED troffers or strip lights. Lighting within the Lab 4 space will comply with IESNA recommendations for classroom use. The new LED luminaires shall have a colour temperature of approximately 4000 degrees Kelvin. CRI for the labs will be 90+, other spaces will have a CRI of 80+. A new lighting control system for the Lab 4 space shall be installed. This lighting control system will match the controls installed elsewhere in this building (Lutron). A multi-button keypad will be provided by the front door of Lab 4 so that a selection from multiple settings can be chosen to suit the space's use. The lighting control system shall have a connection to the AV system so that it can call any scene programmed in the lighting control as part of the AV sequence of events.

Occupancy sensors will be installed for two purposes: to prevent the 'Off' setting to be activated if there are any occupants in the room, and to automatically select the 'Off' setting if the room is unoccupied for a predetermined period of time. The individual rooms will have occupancy sensors and local controls with a

basic on/off control schematic. The new lighting control system shall have UL924 listed relays so that emergency lighting will be controlled with adjacent lighting in the space.

An input to the lighting control from the fire alarm system shall be provided so that the lighting controls can be overridden to 100% on in the event of a fire alarm. Power for normal lighting will be provided by the new 120/208V Lab 4 lighting panel. Power for emergency lighting will be provided by the existing 120/208V emergency panel. Exit signs will be running man type and shall be provided throughout the Lab 4 space as required by code.

### Fire Alarm

Existing fire alarm system is Edwards. The existing signaling devices within the Lab 4 space are bells. New bells shall be provided within the new Lab 4 space to suit the layout.

New detection and notification devices will be provided as required to suit the proposed floor plan. New devices to be connected to existing circuits in the area.

New strobes will be provided for the Lab 4 space if the ambient noise level can reach more than 87dBA, or if ear protection is used for any of the spaces.

A new booster panel will be required to serve these devices if strobes are deemed necessary.

A new fire alarm relay will be installed to interface with the lighting control system so that all lighting in the space will activate to 100% intensity upon fire alarm activation.

A new fire alarm relay will be installed to interface with the AV system to mute the AV system upon fire alarm activation. A new fire alarm relay and duct mounted smoke detectors will be installed to shut down any new air handling units upon fire alarm or smoke detector activation.

### Data & ITS

Any communications cabling serving the Lab 4 space shall be removed back to the source. The condition of the existing cabling cannot be determined and is likely not suitable for reuse due to age, and new cabling to support current and future bandwidth requirements is needed. Existing data and voice cables that are no longer required shall be pulled back to source and disposed.

An additional Telecommunications Room is proposed on the South end of the Lab. The room will have dimensions of 3.0m x 3.0m to house two (2) x 19"-44U equipment Racks securely bolted to the floor. Two (2) 6" Vertical Cable Managers will be installed for the Racks ends and one 8" in between the Racks. Floor finish will be sealed with anti-static material and will be gray off-white color. Temperature will be kept in the range of 18 to 24 C and the humidity between 30 to 55% RH.

The new Telecommunications Room will need to be supplied with connectivity from the existing data center located on Level 4. Routing to be determined during Design Development phase. FoD will provide a list of exact Network equipment to be installed including model numbers to calculate space capacity. All active equipment will be installed in cabinet #01 and passive equipment in cabinet #02.

Wireless Design to be provided by ITS Central Networking, who will determine the exact WAP locations based on a predictive wireless site survey to secure complete coverage based on Lab 4 Density and

Specific needs. Each WAP will have two (2) Category 6A cables that will be terminated in Room 214 where Wifi Centralized Switch is located and providing there is space for the number of added cables, once the WiFi design is provided this information will be confirmed.

### Audiovisual

The AV systems shall be designed over a centralized Audio Visual Network System (AVNS). The equipment will be based on the 2021-05-30\_LAB\_IT\_AV.xlsx file received, and any other supporting documentation provided by UofT including standards and guidelines.

The AV distribution between all sources and destinations shall be through the main AVNS switches provided by the AV vendor through the Crestron NVX platform. The audio distribution and processing will be provided over the QSC Q-SYS platform with wired and wireless microphones by Shure and Speakers from Meyer Sound.

AVNS cabling shall be CAT6A class EA standard and provided by the communications contractor with patch cords for AV devices.

The AV control system shall control all available AV devices and be interfaced with the lighting control system as indicated in the equipment list. These controls shall provide AV routing as well as volume and source control for audio. The lighting control shall recall the available lighting presets programed by the lighting control contractor.

A list of audiovisual equipment proposed for the Pre-Clinical Simulation Lab 4 space is available upon request.

### Environmental Health and Safety

The designated substances report summary for 124 Edward Street confirms asbestos materials are found throughout the building in various locations: fireproofing, ceiling tiles, light fixtures, on piping systems, mechanical equipment and duct insulation, within vinyl flooring and mastic, and in drywall joint compound. Asbestos is also suspected to be contained within locations that are presently hidden or are inaccessible, such as plaster, roofing materials, electrical wiring jacket, door liners, electrical panel backing, fire stop, window and door caulking, window glazing putty, cable trench & equipment and gaskets.

Lead contamination is presumed to be present within paint, solder on joints between copper pipe and fittings, solder on wire connections of electrical components, and metal coverings on older high voltage wires as well as glazing on ceramic tiles. Mercury is present in the electro-thermal switching devices, and vapours in the fluorescent light tubes and incandescent mercury bulbs.

Free crystalline silica is present in construction sand and concrete and masonry products.

The building has not been used for any manufacturing and no above-ground or below-ground fuel storage tanks are present within the building.

As the scope of work of the proposed project will involve disturbance of some asbestos-containing materials or other designated substances, an abatement phase is to be scheduled for all known and

accessible areas in advance the first phase of construction. Some additional abatement will likely be necessary as hidden or inaccessible areas are uncovered throughout the project.

University of Toronto Environmental Health and Safety working with the design consultants has developed a scope of work for the Designated Substances Survey. A pre-construction demolition and abatement Phase is scheduled for the project. This phase will have a separate Tender for the demolition and abatement contract award.

Additional potential hazardous materials located within the building at 124 Edward Street may include hazardous laboratory chemicals, biological agents and radiological materials.

Consideration of the following is to be included in the Clinic Master Plan renewal project:

- ✓ Safety (supply ventilation, chemical hazard quantity, specialized equipment and venting requirements)
- ✓ Special safety hazards (biological, radiological, highly toxic chemicals)
- ✓ Special considerations for venting or sewage traps for hazardous chemicals
- ✓ Environmental health and safety
- ✓ Infection Prevention & Control (IPAC)

Further Environmental Health and Safety aspects to be considered included:

- Lighting appropriate to task and in compliance with Health and Safety, AODA and other authority requirements as well as all industry standard guidelines
- Ventilation safety (supply ventilation, chemical hazard quantity, specialized equipment and venting requirements including sewage traps for hazardous chemicals)
- Special safety hazards (biological, radiological, highly toxic chemicals)

## e) **Site Considerations**

### Site context

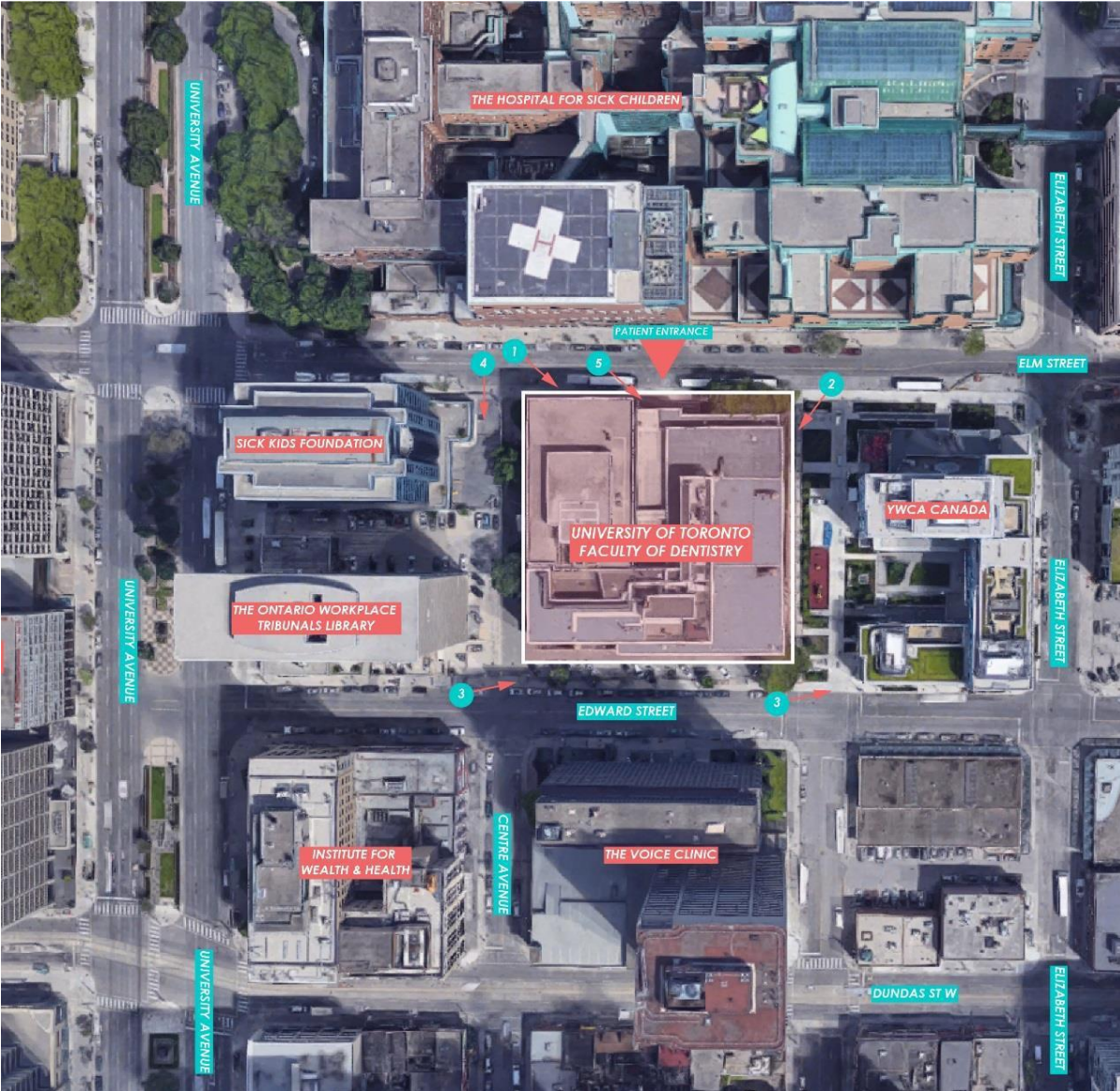
The Faculty has been housed at 124 Edward street for over 60 years. The building is located between Elm and Edward Streets to the North and South and through block pedestrian pathways to the East and a vehicular driveway to the West. The Hospital for Sick Children is located across Elm Street to the north and YWCA Canada is located directly to the East of the building. The western neighbour is 505 University Avenue, at 20+ storey building. 123 Edward Street is an 18+ storey building directly south.

### History of Built Form on the Site

The Faculty's academic programme has developed significantly over the greater than 60 years that they have been located at 124 Edward Street. In addition, the building has had to accommodate on-going changes in standards of care, infection control, environmental and occupational health and safety, accessibility, fire and life safety, et cetera. As these various types of changes have occurred, one major building addition and many renovations have been made to the facility.

The original building occupied by the Faculty of Dentistry at 124 Edward Street was constructed in 1959. In 1985, the Faculty built a substantial addition to the building to accommodate changing needs, effectively maximizing the footprint of the building on the site and building up to 5 floors on the west side of the building. Numerous smaller renovations have occurred over time and have resulted in a rather confusing and inefficient layout of space.

In 1999, a study was undertaken by the University of Toronto's department of Property Management, Design & Construction, to determine the feasibility of building additional floor space on top of the existing building. Due to the existing structure of the original building and the flight path of the paramedical helicopters that serve the Hospital for Sick Children, it was determined that the "new wing" of the Dentistry building could accommodate one additional floor, plus an additional half floor above this would be feasible, providing it was constructed from lightweight materials and restricted to office/classroom use. This proposal, one and one half stories of office space, would have provided an additional 1,580 nasm. Given the need for research laboratory space, this addition would not be adequate to provide the Faculty of Dentistry with sufficient space to grow both in size and in technology.



1. Clinical Entrance - Stairs
2. Chestnut Street/Pedestrian Path
3. Surface Parking
4. Access to Loading and Underground Parking
5. Clinical Entrance - Ramp

Master Plan

124 Edward Street is not included within the 2017 St. George Secondary Plan area and is subject to City of Toronto Zoning By-laws.

The 2019 Clinic Master Plan is attached as an appendix to this report.

UofT Design Review Committee (DRC) participation was not required for the Lab 4 project as there is not project impact to the public realm of Campus.

### Zoning regulations

Zoned Q T5.0 (institutional, 5x coverage)

A review of the current zoning by-law for the site indicates that, although the site is zoned to a maximum of 46 metres in height (approximately 10 storeys) and 5 times coverage of the lot, there are restrictions due to the site being at the low point of the flight path of the helicopters used by Sick Children's Hospital. Specifically, even should there be a major fire or act of God destroying the existing building, the site would not be allowed to be built back up to anything greater in non-residential floor area or building height than what existed on the site in 1993, i.e., the current building. It may be possible to apply for a re-zoning of the site, but the flight path issue would have to be resolved in order to have these restrictions removed.

The UofT Parking By-law states that in addition to the minimum/maximum required motor vehicle parking spaces on the St. George Campus, the University of Toronto shall provide not less than 20 motor vehicle parking spaces on the lands known municipally in 1996 as No. 124 Edward Street.

Work included within the scope of the Lab 4 project is limited to interior renovations and is not anticipated to require Rezoning, Site Plan Approval, or other Municipal Zoning or By-law related approvals which would impact bicycle parking. The Above information is for reference purposes.

### Site access

Access to the Dentistry Building is from either Edward Street or Elm Street.

### Edward Street

There are 20 existing surface parking spaces in a parking lot running along the South and South Western Edward Street extent of the building. These spaces are identified in the St. George Campus Secondary Plan Zoning By-law parking inventory as 'in addition' to the minimum/maximum required motor vehicle parking spaces on the St. George Campus, the University of Toronto shall provide not less than 20 motor vehicle parking spaces on the lands known municipally in 1996 as No. 124 Edward Street.

The main academic entrance to the building is from Edward Street. The entrance is at grade.

### Elm Street

The below grade loading area on the west side of the building and at grade south parking lot are entered via a north-south laneway accessed from Elm Street at the North-West corner of the site.



The main Clinic entrance to the building is from Elm Street. The entrance is at elevated and accessed by either one flight of steps or an exterior ramp. The existing exterior ramp is to be reviewed further for AODA and building code compliance.

#### Heritage status

The Dentistry building is not currently identified as being of Heritage status.

#### Site servicing; existing and proposed

Site servicing information to be provided upon request. Refer to appendices: 2018\_Dentistry Building Memorandum dated August 27, 2018.

#### Designated Substances

The University of Toronto will investigate and identify designated substances and other site-specific hazardous materials present within the project area as per appropriate regulations and the Ontario Occupational Health and Safety Act.

The Faculty of Dentistry is responsible for ensuring that all hazardous waste associated with their occupancy is removed and disposed of as per current regulatory and University standards.

### **f) Campus Infrastructure Considerations**

#### Utilities (Electrical capacity, water, gas , steam lines)

The Building at 124 Edward Street has been identified as part of the St. George Campus Utilities Master Plan and Climate Positive Campus policy. Current planning is targeting 2025 as the termination of natural gas to the building at 124 Edward Street. Equipment and servicing as part of the Lab 4 renovation includes for the use of low temperature hot water anticipating future fossil fuel-free building servicing.

Refer to Mechanical and Electrical sections of this report for further Utilities information.

## Bicycle parking

Bicycle parking post and ring stations are located:

At the east end of the parking lot at the South-East corner of the site. The existing capacity is for approx. 20 bicycles.

At the west side of the Elm Street entrance. The existing capacity is for approx.. 16 bicycles.

There is currently secured and covered bicycle parking at the North-west corner of the building. The capacity is to be confirmed.

Work included within the scope of the Lab 4 project is limited to interior renovations and is not anticipated to require Site Plan Approval, Toronto Green Standard or other Municipal Zoning or By-law related approvals which would impact bicycle parking. The Above information is for reference purposes.

### **g) Secondary Effects**

Secondary Effects of the project are to be determined with confirmation of construction phasing and operational requirements and scheduling. The following secondary effects are to be considered:

- ✓ The building will be occupied. Clinics are open all year with the exception of August. In August, there is little academic scheduling with most clinics closed, with exception of Emergency, Oral Surgery and specific graduate clinics. Academic planning activities are all year round
- ✓ Temporary accommodation of Pre-Clinical Simulation Lab 4 to be provided within Clinic 2 space. Temporary space to be completed prior to start of Lab 4 Renovation work under separate project by FoD. Clinic 2 use to continue at Satellite Clinic and temporary operatory spaces in conjunction with temporary Lab 4 operation. Scheduling of Lab 4/Clinic 2 and Satellite to be reviewed for potential efficiencies.
- ✓ Impacts as a result of COVID-19 could effect timeframes
- ✓ Access to building services to serve new renovated areas; temporary disruption of operations possible
- ✓ During installation of the new Passenger Elevator the patient entrance may need to be temporarily relocated to the Edward Street Entrance with vertical access provided by the South Passenger Elevator. Temporary wayfinding and communications strategies to be developed to inform Clinic Patients.
- ✓ Use of Satellite Clinic to maintain operations will vary depending on phase and scope of work. Curricular scheduling to be determined.
- ✓ Modernizing and upgrading the freight elevator (separate project) may require coordination with other work and functions.
- ✓ Construction staging area to be determined: may require reduction in surface parking to accommodate trailer and lay down area.
- ✓ Disruptions to departmental deliveries possible during construction
- ✓ Noise, dust and other construction effects to be limited to daytime and to consider existing neighbors to the East of 124 Edward Street
- ✓

## Potential Secondary Effects to 124 Edward Street

### Areas of Work Outside of Immediate Lab 4 Space Identified in Design Development Phase

Floor	Room No.	Room Name	Full Room / Partial	COU Sub-Cat.	Assignable Y/N	Area (nasm)
B	1A	Electrical Room	Full	16.2	N	54.88
	1B	Electrical Room	Full	16.2	N	50.61
	1K	Lobby	Full	16.2	N	87.38
	2	DSS Office	Full	14.1	Y	23.25
	9	Electrical Room	Full	16.2	N	4.60
	23B	Dust Collection Chamber	Full	16.2	N	78.74
	24	Mechanical Area	Partial	16.2	N	194.58
1	179	Telecommunications Closet (UTORnet)	Full	16.2	N	1.87
2	261	Telecommunications Closet (UTORnet)	Full	16.2	N	1.87
3	358	Telecommunications Closet (UTORnet)	Full	16.2	N	1.43
4	400K	Corridor	Partial	16.2	N	93.52
	410	Wet Research Lab	Partial	3.1	Y	784.71
	413	Server Room	Full	3.2	Y	37.74
	431	Telecommunications Closet (UTORnet)	Full	16.2	N	1.62
	484	Mechanical Room	Partial	16.2	N	206.86
	Roof	Third Floor Roof	Partial	NA	NA	NA
5	575	Mechanical Room	Partial	16.2	N	377.81

**Total** **2,001.47**

**Total Assignable** **845.70**

**Total Non-assignable** **1,155.77**

Work within the above areas is primarily related to the running of Mechanical, Electrical and IT services from Lab 4 to centralized services areas.

### Phasing

The Faculty of Dentistry must remain operational during renovations to Lab 4. Operations include Instruction, Research and Administrative functions. This requires that the scope of work for these project include a complex phasing plan which will rely on existing spaces within 124 Edward Street and the Satellite Clinic at 777 Bay Street. Academic Units and associated facilities will require temporary staging

and relocation in conjunction with the renovation work. During renovations a maximum number of functioning operatories for undergraduate and graduate use will be required. Depending on regulations surrounding COVID-19, further restrictions on operatory use may need to be factored into the phasing to account for enclosed operatory use for certain procedures.

The existing condition of the Dentistry Building is also to be considered in the phasing as areas of work may affect unrelated areas within the building via building service upgrades and environmental health and safety.

The following is a preliminary High Level Phasing Plan with areas of Project scope and secondary or operational effects delineated. The Consultant is to prepare a phasing plan with the Project Implementation Committee for inclusion in the tendered scope of work. Refer to Appendices for a comprehensive operational phasing plan.

Phases may be defined as individual construction projects depending on schedule, budget and operational criteria.

**Phase 1**

- Staging of Existing Lab 4 within Existing Clinic 2 Space (separate project by FoD)
- Pre-clinical Simulation Lab 4 Demolition and Abatement

**Phase 2**

- Pre-clinical Simulation Lab 4 Construction

The sequence and definition of the above suggested phases is to be reviewed by the Project Implementation Committee, the Consultants and the Contractor.

**Schedule**

**Project Milestone Schedule**

Milestone	Duration	Date
Architect Procurement	4 months	April – August 2021
CaPS Exec Cycle 6 for Consulting Fees		April 1, 2021
Issue RFSQ	1 month	April 2021
RFSQ Evaluation	3 weeks	Early June 2021
Issue RFP to shortlist	10 weeks	June 2021
RFP Evaluation / Consensus / Negotiation / Award	1 month	July-August 2021
<b>LAB 4</b>	<b>24 months</b>	<b>September 2021 – August 2023</b>
Schematic Design Phase	2 months	September – October 2021
Costing & Review	1 month	November 2021
Design Development Phase	2 months	December 2021 - Mid February 2022
Costing & Review	1 month	Mid-February to Mid-March 2022
CaPS Exec Cycle 5 Application for full Costs		March 4, 2022
Planning & Budget		April 13, 2022

Business Board		April 26, 2022
Academic Board		April 27, 2022
GC Executive Committee		May 10, 2022
Governing Council		May 19, 2022
Construction Documents (Abatement/Demo 100% + Construction 80%)	3 months	Mid-March – Mid-May 2022
Costing and Review	1 month	Mid May – Mid-June 2022
Demo/Abatement Tender, Award	3.5 months	Mid June - August 2022
Demo/Abatement Works	2 months	August – September 2022
Construction Document Revisions *	1 Month	October 2022
Construction Tender and Award	2 months	November - December 2022
Construction Phase	6 months	January 2023– June 2023
Substantial Performance	1 month	June 2023
Fit Out	1 month	July-August 2023
Occupancy		August 2023

\* Revisions to incorporate concealed conditions discovered during demolition and abatement into the contract documents

#### IV. Resource Implications

##### a) Total Project Cost Estimate

Project costing was completed at each stage of the design process. A Class B costing was provided by the Consultants in February 2022. UofT Capital Projects coordinated at 3<sup>rd</sup> party Class B costing at the same time. The Total Project Cost (TPC) included with this application is a result of these two Class B costing reports.

The Pre-Clinical Simulation Lab 4 renewal is expected to be delivered in two phases: Demolition and Abatement August 2022 – September 2022 and Construction January 2023 – June 2023. Project Fit-out and Occupancy is targeted for August 2023. During the demolition and abatement, existing concealed and inaccessible building conditions will be documented and addressed in the Contract Documents for the construction tender as a cost savings strategy to minimize project extras which have historically been an issue with renovations at the Dentistry Building at 124 Edward Street.

On April 1, 2021, consultant fees were approved by CaPS Executive to engage consultants to initiate design services.

The total estimated project cost for the Faculty of Dentistry Pre-Clinical Simulation Lab 4 Renewal is included in the attached appendices

## **b) Operating Costs**

As the Pre-Clinical Simulation Lab 4 Renewal project is a renovation in-place without significant programmatic change, the Faculty of Dentistry does not expect any significant changes to the operating costs after the renovation as most of instruments and materials used in the lab are purchased by students through student instrument fees. The Faculty is optimistic that there may be operational savings from utilities due to base building systems and exterior envelope efficiency upgrades.

## **c) Other Related Costs**

Other related costs include the staging cost of leasing 777 Bay St. at approximately \$1.5M annual cost including the lease cost and other incidental costs, (e.g. instrument transportation and additional staffing) These costs are to be pro-rated between the Pre-Clinical Simulation Lab 4 and the future Clinic 2 Renewal Projects.

## **d) Funding Sources**

The Faculty of Dentistry Pre-Clinical Simulation Lab 4 Renewal project will be funded through a combination of the following sources:

1. Faculty of Dentistry Operating Funds
2. Future Major Capital Project Reserve
3. F&S Deferred Maintenance
4. Fundraising

\*Any shortfall in fundraising will be financed through a short-term loan until such time as the fundraising meets its target.

## **APPENDICES:**

1. Total Project Cost Estimate under separate cover (on request to limited distribution)