

**TO:** Planning and Budget Committee

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**DATE:** April 23, 2010 for May 5, 2010

**AGENDA ITEM:** 6

**ITEM IDENTIFICATION:**

Interim Project Planning Report for an Oral Health Science Complex

**JURISDICTIONAL INFORMATION:**

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

**BACKGROUND:**

The Faculty of Dentistry, founded in 1875, is the largest, oldest and academically strongest professional dental school in Canada.

Along with providing education at the undergraduate, graduate and PhD levels, the Faculty of Dentistry provides excellent oral care for a largely under-served population through the offering of public clinics. It operates an oral health care facility that maintains a patient base of approximately 20,000 active cases providing both general practice and specialty care, mainly to those who would not be able to afford dental care elsewhere.

All of these functions and activities, plus the Dental Research Institute, the University of Toronto Centre for the Study of Pain and the Dentistry Museum are accommodated within an aging building at 124 Edward Street. The building was constructed in 1959, with an addition built in the 1970's and its last significant renovation occurred in 1985. Over time, this building has experienced significant deterioration of its physical plant and its general layout and infrastructure have proven inadequate in satisfying the Faculty's current needs, let alone those of the future. This building and a small research satellite in the Fitzgerald Building cannot meet the challenges or initiatives of the Faculty of Dentistry for the coming decades.

Despite an aging and inadequate physical plant, the Faculty of Dentistry has managed to maintain its international reputation for excellence in education, clinical services and research. However, the present facility at 124 Edward Street does not meet the standard necessary for

educational innovation or growth. Clinical teaching methodology is limited by an inflexible and constrained environment. The development and application of innovative and modern electronic and other teaching methods available is limited by the current design of the clinics, teaching laboratories, seminar rooms and lecture theatres which severely compromises the student experience. International, national and provincial demands for expansion of some of the specialty programs cannot be met without improved, modernized and enlarged teaching clinics. In addition, there is government pressure and increasing demand for more positions in the International Dentist Advanced Placement Program for foreign trained dentists.

Consistent with the Faculty of Dentistry's academic plan and the University of Toronto's goal of providing the best learning experience for its students, it is proposed that a new Oral Health Science Complex be created to include modern facilities for both classrooms and teaching labs, a fiscally sound tertiary clinical facility, and appropriate facilities for the Dental Research Institute, all of which would allow the accredited programs in Dentistry to continue to grow and maintain their internationally recognized leadership role. It would also include a Dental Museum and provide for a future physical relationship with an expanded and improved University of Toronto Centre for the Study of Pain. The Faculty of Dentistry aims to be the leading Dental Education Institute in Canada. The Faculty believes it can achieve its goals through the creation of modern, functional space which is able to support cutting edge teaching techniques and practicalities.

## **HIGHLIGHTS**

A detailed utilization analysis of the Faculty's space requirements was undertaken and it was determined that a facility of 19,600 nasm (39,200 gross square meters) would be required to accommodate the Faculty of Dentistry. Based on the size and complexity of the space program, the committee reviewed all possible options to provide the required space for the Faculty of Dentistry.

Three options were studied in detail:

### Renovations to 124 Edward Street

While the basic academic and research programmes of the Faculty could possibly fit into the building with a storey and a half addition and extensive renovation to the existing building, there would still not be space to accommodate the intramural practice, any enrolment expansion or a contiguous physical presence for the Centre for the Study of Pain. Importantly, the Faculty would remain isolated from the rest of the campus. In order to build the additional storey and a half, the site would require zoning permissions that would entail a change to the medical helicopter flight path to the Hospital for Sick Children.

To be functional and effective, the space in the building would need to be significantly reorganized. Aside from the cost and disruption that this would involve, given the limitations of an existing building, an existing addition and a new addition that will come encumbered with restrictions on its use, it is extremely unlikely that the result would be optimal for the Faculty. Finally, raising funds to achieve a sub-optimal solution could be difficult. Consequently, the renovation and re-use of the existing Dentistry building proved to be unworkable, and costing was not pursued for this option.

### Construction of a New Building at 88-112 College Street (Site 14)

Site 14 is an available site, well situated to house the faculty of Dentistry. The close proximity to the other health science disciplines at the University and the teaching hospitals would provide opportunities to strengthen collaboration. The Faculty's research strengths are also compatible with initiatives at MaRS, located across the street. Access to public transportation (necessary for the clinical service) is readily available and more direct. However, this option would be a long term, high cost option. At 39,200 gross sq metres, the proposed building would be the largest constructed by the University since the 1960's.

The rough order of magnitude Total Project Cost for a new building for the Faculty of Dentistry constructed on Site 14 in 2010 dollars is estimated to be in the area of \$325M. The Faculty of Medicine has plans to relocate many of the current occupants and decommission most of the space currently occupied on Site 14, however, these are not yet complete. Additional funding will be required for these secondary effects.

The operating budget for a new building, if the Donnelly Centre for Cellular and Biomolecular Research at \$3.25M is taken as a model, could be expected to almost be doubled in a building of double the size, or about \$6.0M, an increase of \$3.1M for the Faculty of Dentistry. Due to the estimated costs of this option it is not being recommended.

### Purchase an Existing Building and Renovate

Given the high costs of developing a site for a new building for the Oral Health Centre, the Committee also considered purchasing an existing building that could be modified, renovated and modestly expanded to meet the programmatic needs of the Faculty of Dentistry. Although there may be a few options close to the health sciences precinct of the University, there have yet to be any negotiations regarding such a site.

The operating costs in a renovated building as described above with a modern vivarium could be expected to double to at least \$4.5M, an increase of \$1.6M annually in current dollars, for the Faculty of Dentistry.

In a scenario in which a building of adequate size is available, it is assumed that significant renovations will still be required, and that some unique program elements such as the large clinics and the Vivarium facilities will require new construction. If the university were to purchase a site with an existing building which could be modified to meet the needs of the Faculty of Dentistry the range of total project cost in 2010 dollars might be \$150M to \$165M and depending on the characteristics of the building. This range assumes approximately 6,800 GSM of new construction for clinics and Vivarium, and approximately 24,500 GSM of moderate to extensive renovation. Acquisition costs would be additional.

## **SCHEDULE**

This Interim Report is being brought forward for approval in principle of the increased space needs for the Faculty of Dentistry and to initiate fundraising for this purpose. Further refinement of the space requirements, site analysis and costs will be necessary to finalize the project committee report. A final report is expected to come forward for consideration once a site and a plan for acquisition meeting the requirements of the Faculty have been identified.

## **FUNDING SOURCES**

The estimated costs for the project being recommended as described in renovated space for the Faculty of Dentistry are in the \$150M - \$165M range exclusive of the cost to purchase the site. Funding for this project will be from external sources which will be identified in the final report.

## **RECOMMENDATIONS**

Recommendations:

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

1. THAT the Interim Project Planning Report for an Oral Health Science Complex be approved in principle to accommodate the activities and functions as described and to facilitate the necessary fundraising related to the proposed project.

**INTERIM REPORT OF  
THE PROJECT PLANNING  
COMMITTEE  
FOR AN ORAL HEALTH SCIENCE COMPLEX**

Campus and Facilities Planning  
April 26th, 2010

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# **INTERIM REPORT OF THE PROJECT PLANNING COMMITTEE FOR AN ORAL HEALTH SCIENCE COMPLEX**

## **EXECUTIVE SUMMARY**

The Faculty of Dentistry, founded in 1875, is the largest, oldest and academically strongest professional dental school in Canada.

Along with providing education at the undergraduate, graduate and PhD levels, the Faculty of Dentistry provides excellent oral care for a largely under-served population through the offering of public clinics. It operates an oral health care facility that maintains a patient base of approximately 20,000 active cases providing both general practice and specialty care, mainly to those who would not be able to afford dental care elsewhere.

All of these functions and activities, plus the Dental Research Institute, the University of Toronto Centre for the Study of Pain and the Dentistry Museum are accommodated within an aging building at 124 Edward Street. This building was constructed in 1959, with an addition built in the 1970's and its last significant renovation in 1985; over time, this building has experienced significant deterioration of its physical plant and its general layout and infrastructure have proven inadequate in satisfying the Faculty's current needs, let alone those of the future. This building and space for small research satellite in the Fitzgerald Building cannot meet the challenges or initiatives of the Faculty of Dentistry for the coming decades.

Despite an aging and inadequate physical plant, the Faculty of Dentistry has managed to maintain its international reputation for excellence in education, clinical services and research. However, the present facility at 124 Edward Street does not meet the standard necessary for educational innovation or growth. Clinical teaching methodology is limited by an inflexible and constrained environment. The development and application of innovative and modern electronic and other teaching methods available is limited by the current design of the clinics, teaching laboratories, seminar rooms and lecture theatres which severely compromises the student experience. International, national and provincial demands for expansion of some of the specialty programs cannot be met without improved, modernized and enlarged teaching clinics. In addition, there is government pressure and increasing demand for more positions in the International Dentist Advanced Placement Program for foreign trained dentists.

Consistent with the Faculty of Dentistry's academic plan and the University of Toronto's goal of providing the best learning experience for its students, it is proposed that a new Oral Health Science Complex be created to include modern facilities for both classrooms and teaching labs, a fiscally sound tertiary clinical facility, and appropriate facilities for the Dental Research Institute, all of which would allow the accredited programs in Dentistry to continue to grow and maintain their internationally recognized leadership role. It would also include a Dental Museum and provide for a future physical relationship with an expanded and improved University of Toronto Centre for the Study of Pain. The Faculty of Dentistry aims to be the leading Dental Education Institute in Canada. The Faculty believes it can achieve its goals through the creation of modern, functional space which is able to support cutting edge teaching techniques and practicalities.

A detailed utilization analysis of the Faculty's space requirements was undertaken and it was determined that a facility of 19,600 nasm (39,200 gross square meters) would be required to accommodate the Faculty of Dentistry. Based on the size and complexity of the space program, the committee reviewed all possible options to provide the required space for the Faculty of Dentistry. As the Project Committee determined that an interim report would be most appropriate for submission to Planning and Budget, the

Real Estate Office prepared total project cost estimates at an approximation, ballpark, level only in order to assist with further discussion and development of the project. As such, the normal detailed costing using an external cost consultant for all required elements was not undertaken.

Three options were studied in detail:

1. Renovate 124 Edward Street

While the basic academic and research programmes of the Faculty could possibly fit into the building with a storey and a half addition and extensive renovation to the existing building, there would still not be space to accommodate the intramural practice, any enrolment expansion or a contiguous physical presence for the Centre for the Study of Pain. Importantly, the Faculty would remain isolated from the rest of the campus. There is the problem, also, that in order to build the additional storey and a half, the site would require zoning permissions that would entail a change to the medical helicopter flight path.

To be functional and effective, the space in the building would need to be significantly re-organized. Aside from the cost and disruption that this would involve, given the limitations of an existing building, an existing addition and a new addition that will come encumbered with restrictions on its use, it is extremely unlikely that the result would be optimal for the Faculty. Finally, raising funds to achieve a sub-optimal solution could be difficult.

Consequently, the renovation and re-use of the existing Dentistry building proved to be unworkable, and costing was not pursued for this option.

2. Construct A New Building On Site 14

Site 14 is an available site, well situated to house the faculty of Dentistry. The close proximity to the health sciences disciplines at the University and the teaching hospitals would provide opportunities to strengthen collaboration. The Faculty's research strengths are also compatible with initiatives at MaRS, located across the street. Access to public transportation (necessary for the clinical service) is readily available and more direct. However, this option would be a long term, high cost option. At 39,200 gross sq metres, the proposed building would be the largest constructed by the University since the 1960's.

The rough order of magnitude Total Project Cost for a new building for the Faculty of Dentistry constructed on Site 14 in 2010 dollars is estimated to be in the area of \$325M. The Faculty of Medicine has plans to relocate many of the current occupants and decommission most of the space currently occupied on Site 14, however these are not yet complete. Additional funding will be required for these secondary effects.

There is a correlation between project size, complexity and expected total duration. In terms of peer University of Toronto projects, both the Donnelly CCBR and Leslie Dan Pharmacy building took about 4 ½ years from the appointment of an architect, occupancy. It is therefore possible that a project of the size and complexity of a new building for Dentistry could take at least five years – approximately 15 – 18 months in design and 42 - 45 months in construction.

The operating budget for a new building, if the CCBR at \$3.25M is taken as a model, could be expected to almost be doubled in a building of double the size, or about \$6.0M, an increase of \$3.1M for the Faculty of Dentistry.

The overall cost of this option was considered prohibitive.



### 3. Purchase an Existing Building and Renovate

Given the high costs of developing a site for a new building for the Oral Health Centre, the Committee also considered purchasing an existing building that could be modified, renovated and modestly expanded to meet the programmatic needs of the Faculty of Dentistry. Although there may be a few options close to the health sciences precinct of the University, there have yet to be any negotiations regarding such a site.

In a scenario in which a building of adequate size is available, it is assumed that significant renovations will still be required, and that some unique program elements such as the large clinics and the Vivarium facilities will require new construction. Potentially there could be areas of an existing building such as basement, service, core and utility space that might need little or no work. An existing building which could be modified to meet the needs of the Faculty of Dentistry the range of total project cost in 2010 dollars might be \$150M to \$165M and depending on the characteristics of the building. This range assumes approximately 6,800 GSM of new construction for clinics and Vivarium, and approximately 24,500 GSM of moderate to extensive renovation.

Acquisition costs would be additional.

A renovation scenario would permit a phased design and construction process and potentially could be carried out in perhaps 2 ½ - 3 years in total after acquiring the site.

The operating costs in a renovated building as described above with a modern vivarium, could be expected to double to at least \$4.5M, an increase of \$1.6M annually in current dollars, for the Faculty of Dentistry over the current operating costs.

The building at 124 Edward Street would be sold once the new facility is occupied and the proceeds from the sale applied to the cost of the new facility. It is not yet known what the anticipated proceeds may be for this building.

Fundraising by the Faculty is required to implement this project.

## II PROJECT BACKGROUND

### a) Membership

Dr. David Mock	Chair, Faculty of Dentistry
Dr. Luchiano Valenzano	Faculty of Dentistry
Dr. Dorothy McComb	Faculty of Dentistry
Dr. Christopher McCulloch	Faculty of Dentistry
Dr. Susan Alksnis	Faculty of Dentistry
Dr. Asbjorn Jokstad	Faculty of Dentistry
Ms. Rhea Gold	Faculty of Dentistry
Mr. Greg Mount	Faculty of Dentistry
Mr. Fanar Swaida	DDS student year 3, Faculty of Dentistry
Dr. TBD	Doctoral student - non specialty doctoral stream
Dr. Grace Bradley	Faculty of Dentistry
Dr. Daniel Haas	Faculty of Dentistry
Ms. Donna Crossan	Faculty of Dentistry
Mr. Julian Binks	Director, Planning & Estimating, Capital Projects, Real Estate Operations
Mr. Bruce Dodds	Director, Utilities and Building Operations, Facilities and Services
Mr. Ron Swail	Assistant Vice-President, Facilities and Services

Ms. Christine Harvey-Kane      Planner, Office of the AVP, Campus and Facilities Planning

Previous members

Dr. Philip Watson	Chair, Faculty of Dentistry
Dr. Barry Korzen	Faculty of Dentistry
Mr. Sanford Bell	DDS Student year 3, Faculty of Dentistry
Dr. Sara Al-Fadda	Doctoral Student - non specialty doctoral stream
Dr. Howard Tenenbaum	Faculty of Dentistry
Shirley Roll (secretary)	Facilities Planner, Campus and Facilities Planning
William Yasui	Facilities Planner, Campus and Facilities Planning

**b)      Terms of Reference**

The Project Committee must address the following terms:

1. Determine a space programme and functional layout to accommodate the Faculty of Dentistry. The space programme should accommodate the current requirements of the Faculty's educational, research and clinical service programmes and include related functions and facilities, such as its museum and The University of Toronto Centre for the Study of Pain, in accordance with their approved academic plan and identify how the future space requirements can be housed.
2. Demonstrate that the proposed space programme will take into account the Council of Ontario Universities' and the University's own Space Standards.
3. Plan to realize maximum flexibility of space to permit future reallocation as programme needs change.
4. Explore opportunities to accommodate the space program in the existing facilities at 124 Edward Street and identify other potential sites available on the St George campus, such as site 14.
5. Identify all equipment and moveable furnishings necessary to the project and their related costs.
6. Identify all data and communication requirements and their related costs.
7. Identify all security, occupational health and safety, and accessibility requirements and their related costs.
8. Determine the secondary effects to any new building project (including site remediation if hazardous materials are present) and resource implications of relocation of activities currently accommodated in the development site.
9. Provide a capital cost estimate for the renovations taking into account possible requirements for improvements to services and infrastructure upgrades to this site.
10. Identify all resource implications of the proposal including the necessary net increase to the annual operating budget of the University once this building is operational.
11. Provide a total project cost estimate and source of funding for the renovated building and related expenditures.
12. Report by December 2006

As the Project Committee is submitting an interim report at this time, the Real Estate Office prepared a total project cost estimate at an approximation, ballpark, level only to assist with further discussion and

development of the project. As such, the normal detailed costing using an external cost consultant for all required elements was not undertaken. Those items, covered in numbers 5- 11 above, will be further developed for a final report of the committee.

### **c) Background Information and Academic Directions**

The Faculty of Dentistry, founded in 1875, is the largest, oldest and academically strongest professional dental school in Canada. Currently it is the only Dental Faculty in Canada offering a full spectrum of dental programs including: a four-year Doctor of Dental Surgery (DDS), a five month International Dentist Advancement Placement Program for Foreign-Trained Dentists (IDAPP) linked to joining the DDS III class, an evaluation program of dental specialists from non-accredited programs (foreign-trained specialists), graduate programs in 10 dental specialties (of which three are unique in Canada), Master of Science and Doctoral programs in basic and clinical sciences, and programs in continuing dental education.

Along with the above dental programs, the Faculty of Dentistry provides excellent oral care for a largely under-served population through the offering of public clinics. It operates an oral health care facility that maintains a patient base of approximately 20,000 active cases providing both general practice and specialty care.

All of these functions and activities, plus the Dental Research Institute, the University of Toronto Centre for the Study of Pain and the Dentistry Museum are accommodated within an aging building at 124 Edward Street. This building was constructed in 1959, with an addition built in the 1970's and its last significant renovation in 1985; over time, this building has experienced significant deterioration of its physical plant, and its general layout and infrastructure have proven inadequate in satisfying the Faculty's current needs, let alone those of the future. This building and its small research satellite in the Fitzgerald Building cannot meet the challenges or initiatives of the Faculty of Dentistry for the coming decades.

As well, the location of 124 Edward Street, so far from the main University campus, and more significantly the other health sciences, is an obstacle to integration of services, research collaboration and shared teaching. The experience of the Faculty's students is adversely affected by isolation from their colleagues and campus activities.

Despite an aging and inadequate physical plant, the Faculty of Dentistry has managed to maintain its international reputation for excellence in education, clinical services and research. However, the present facility at 124 Edward Street, does not meet the standard necessary for educational innovation or growth. Clinical teaching methodology is limited by an inflexible and constrained environment. The development and application of innovative and modern electronic and other teaching methods available is limited by the current design of the clinics, teaching laboratories, seminar rooms and lecture theatres severely compromising the student experience. The building is not amenable to modernization of the clinics because of its design, and limitations related to items of deferred maintenance. International, national and provincial demands for expansion of some of the specialty programs cannot be met without improved, modernized and enlarged teaching clinics. In addition, there is government pressure and increasing demand for more positions in the IDAPP for foreign trained dentists.

The Dental Research Institute (DRI) is one of North America's leading biomedical research institutions with a focus on the study of oral health, oral health-care delivery and related sciences. It has an extraordinarily diversified membership including an interdisciplinary mix of researchers with backgrounds in health care, the social sciences, engineering, basic cellular and molecular biology, microbiology, and other related basic sciences and they represent a range of ethnic and training backgrounds. Almost all the new faculty members require modern laboratory space to maintain their research productivity however availability is severely restricted, and what is available is out of date. When the present building was constructed, many of the academic clinicians only required clinical facilities to maintain their scholarly activities. In keeping with the current research thrust it is obvious that this is no longer the case and searches for the best new academic staff are seriously compromised by the lack of available and modern research facilities. The Faculty's remote location from the main St. George Campus also creates barriers

to easy collaboration between Dentistry's scientists and those in nearby complementary faculties. Moving the Faculty of Dentistry to a location near the other Health Science disciplines would help to reduce those barriers.

The Faculty is extremely active in research having published collectively over 300 papers in high impact peer-reviewed journals during the 2003- 2004 academic year alone. Peer reviewed and some corporate research funding have increased yearly, exceeding \$9M in 2004-2005. This is an impressive figure for a relatively small faculty, limited only by space restrictions. In recent years the funding has diminished somewhat to approximately \$7 million, mainly because of the dwindling resources being provided by the three major Canadian funding organizations. An increase in the amount of wet lab space and modernization of the core facilities would facilitate the activity of faculty members eager to conduct research and numerous collaborations currently blossoming among our new and established scientists and clinicians. The recent establishment of a Centre for Clinical Research will continue to foster interaction between basic scientists and dentists putting an increased strain on the existing facilities. In addition the new facility would be an excellent enticement in recruiting and retaining the best talent in an increasingly competitive market, due to the mass retirement of research and clinical faculty across North America. To keep the Faculty of Dentistry at its current status as an internationally top-ranked research facility, expansion and modernization is critical and indeed overdue.

With a new and modernized facility, the Faculty of Dentistry would also be able to expand its graduate enrolment in both clinical and basic sciences if adequate research space were available. At present, many of the graduate students do not have dedicated work space or adequate access to computing facilities. There are also concerns about security issues because of the mix of students, staff and patients moving about the common spaces in the present building. The present structure does not permit separation of the various functions and therefore access is difficult to control, particularly after-hours. Needless to say, this severely impacts on the graduate student experience in the Faculty of Dentistry. Locating the Faculty of Dentistry near the other health sciences would also facilitate interdisciplinary research and clinical practice as well as transdisciplinary teaching.

The current status of Dentistry's facilities has taken a toll on faculty, students and staff, and has become a major obstacle to attracting and retaining the quality of personnel necessary to maintain the Faculty's high standards. With no improvement to the physical infrastructure, coupled with an inability to increase physical space, deterioration of the Faculty's clinical, pedagogical and research activity is inevitable. It is evident that, in order to proactively meet future challenges, the Faculty's current accommodations will need to be replaced with new state-of-the-art facilities that can be readily adaptable to meet the ever evolving and growing demands of dental education, research and clinical service.

Consistent with the Faculty of Dentistry's academic plan and the University of Toronto's goal of providing the best learning experience for its students, it is proposed that a new Oral Health Science Complex be constructed to include modern teaching facilities, modern teaching clinics, a fiscally sound tertiary clinical facility, and appropriate facilities for the Dental Research Institute, all of which would allow the accredited programs in Dentistry to continue to grow and maintain their internationally recognized leadership role. It would also include a Dental Museum and provide for a future physical relationship with an expanded and improved University of Toronto Centre for the Study of Pain. The Faculty of Dentistry aims to be the leading Dental Education Institute in Canada. The Faculty believes it can achieve its goals through the creation of modern, functional space which is able to support cutting edge teaching techniques and practicalities.

### III. PROJECT DESCRIPTION

#### a) Vision Statement

The Faculty of Dentistry's vision for the future of the faculty is a very simple one; *to be internationally recognized for excellence in dental and orofacial health, through education, research and patient care.*

The Faculty of Dentistry sees itself as a world leader in dental education. In truth, the Faculty of Dentistry at the University of Toronto has been widely reported as, although unofficially, as amongst the top six dental schools in North America, and the top-ranked dental school in Canada. It has been further noted that the program is the premiere research centre for Dentistry in Canada, and that first year admission averages rival Harvard's (ranked #2 in North America). The University of Toronto's Faculty of Dentistry is recognized throughout North America by those within the dental field as providing a rigorous education in dental care, focusing on a strong multidisciplinary program, and turning out quality research.

The scope of the work performed at the Faculty of Dentistry is broader and more inter-disciplinary than in the past. The term orofacial (defined as "relating to the mouth and face"), which is more encompassing than dental, is critical in fostering productive relationships with other health Faculties and professions. It will have implications for curriculum given the inter-professional nature of the term. It has huge implications for research because the Faculty depends on external collaborations to feed science research, both in terms of creativity and access to "big science" tools which in turn leads to being more competitive on the funding front.

The Faculty aims their efforts at the overall health of their patients and populations, not just at the health of one's teeth. This is at the heart of the convergence of Dentistry and Medicine. This is what drives the need for a new facility which can accommodate the newest technologies so that the Faculty can continue to lead the way in dental education in Canada.

There has been a long-held requirement to provide clinic space for undergraduate dental students to practice their dental skills on real patients. Medical students are able to practice within a hospital setting, while dental schools are required to provide large dental operatories to serve their students. The upside to this requirement is the ability to provide low-cost dental services to those who may not be able to afford dental care otherwise. Working with those who may be on the lower socioeconomic level of our society tends to suggest that these patients may also have other health issues that need attention. The correlation between regular, professional dental care and the health status of the patient in general has been widely reported through the mainstream media.

It is the Vision of the Faculty to provide these services in a comfortable, pleasant space, where modern equipment and diagnostic tools may be used in the treatment of patients. This in turn will teach dental students how to utilize these technologies, to better prepare them for the future.

#### b) Space Requirements

The Faculty of Dentistry is currently accommodated in 13,800 nasm at 124 Edward Street. The building was purpose built in 1958 (approximately 10,000 nasm and expanded in 1982 (an additional 4,000 nasm)). While all of the instructional space is located at this address, the Faculty also occupies additional research facilities in the Fitzgerald building (870 nasm). This brings the total amount of space allocated to the Faculty of Dentistry to 14,690 nasm.

Some researchers within the Faculty have expanded their labs into approximately 500 nasm of hospital space at Mt. Sinai hospital. Here, researchers are able to conduct clinical research within a hospital-based setting, allowing them to run clinical trials in an easily accessible venue. This space is not proposed to be relocated as part of this Planning project.

The Faculty of Dentistry has leased space off-site to house the Continuing Dental Education Centre in the SciCan building at Don Mills and Lawrence. This Centre, which provides instructional space for continuing education of practicing dental professionals, includes a digital classroom that seats 96, wet lab space for up to 32, staff offices and operatories for live surgeries that can be broadcast to the classroom. This off-site space is leased at a cost of \$150,000 annually, and is not proposed to be included in any new building venture.

In addition to developing a space program to accommodate the Faculty's academic programmes and research, the Faculty sought, and received approval from the Provost to include in this report the space requirements to accommodate an Intramural Practice, the one day per week practice required of Dentistry's professional faculty. In order to maintain the Faculty's international position, Dentistry would need to offer prospective new recruits access to these facilities. Prior to ultimately including such space, a business plan and governance model would have to be undertaken to ensure that such a clinic could be operated on a cost recovery basis and be appropriately administered.

The Terms of Reference included the Centre for the Study of Pain, a multi-disciplinary endeavour headed by Dentistry. The Centre is currently located in a single office within the Faculty of Dentistry building; it is a virtual Centre rather than an actual Centre. Although the Faculty would like to see the Centre achieve a real physical presence with the appropriate research labs and administrative space when the Faculty relocates to a new home, the Centre's space would complement rather than be an integral part of the Faculty of Dentistry. As such, this group's facility requirements are not included in the proposed space program but would be created independently of this report. As this Centre is widely viewed as a complement to the Faculty of Dentistry and the other health science faculties, it is important to provide the option of space for this group if they decide to relocate with the Faculty of Dentistry at some time in the future.

A detailed utilization analysis of the Faculty's space requirements was undertaken using the Council of Ontario Universities space guidelines. The Council of Ontario Universities space guidelines, also known as the Building Blocks space standards, are the current benchmarks used routinely within the Ontario university system to determine "space requirements" at a campus level. They consist of three components: a space classification scheme that describes the wide range of facilities that make up a university's physical plant; a series of input measures to serve as proxies for space demand and which are sensitive to changes in enrolments, numbers of faculty and staff and academic programs; and space utilization factors that predict space requirements based on assumptions regarding target use and size of facilities. These guidelines are particularly well suited for campus master planning exercises as they take a holistic approach to a wide range of campus needs, from classrooms to offices, from library space to food services. At the University of Toronto, the approach has been taken to adopt and adapt the COU space standards when used at a divisional level. They are always part of a responsive, objective process of analysis which is site specific and tailored to the individual unit being reviewed. The goal is to be standardized enough to provide not only a consistent but also an equitable approach to different types of facilities planning – whether for new construction, renovation or reallocation of facilities.

For the Faculty of Dentistry, the COU guidelines were applied directly using the input measures listed in the Faculty Profile below.

<b>Table 1 Faculty of Dentistry Profile</b>	<b>Current 2008/09</b>	<b>Planned Growth 2013/14</b>	<b>Total</b>
FTE Academics	71.87		71.87
FTE Research Associates	2		2
FTE Postdoctoral Fellows	7		7
FTE Non-Academic Staff:			
FTE Admin Staff – Not Requiring Offices - Clin/Tch	102.55		111.15
FTE Admin Staff Requiring Offices	79.00		70.40
Subtotal FTE Admin Staff	181.55		181.55
FTE Undergraduate Students:			
DDS Year One	66	-2	64
DDS Year Two	66	-2	64
DDS Year Three	96	-2	94
DDS Year Four	93	1	94
Subtotal FTE DDS	321	-5	316
FTE Graduate Students			
FTE Doctoral - PHD	30.3	-.3	30
FTE Masters- Doctoral Stream - MSc	19.3	4.7	24
FTE Masters- Professional Stream	68.3	1.7	70
Subtotal FTE Graduate Students	117.9	6.1	124
Total FTE Students	438.9	1.1	440
Undergraduate Dental Residents	13		13

- IDAPP Summer (13 FTE 08/09 + Growth 2 FTE) transfer into DDS Year 3 each Fall
- Potentially an additional 46 FTE DDS, or 10% growth, could be accommodated if a building project were to occur. At this time there is no approved increase in the number of DDS students.

As the committee worked through the detailed space requirement analysis (see Appendix A for details) it was determined that in a few areas the particular needs of the Faculty demonstrated a need for variances to the COU space guidelines. The table below compares the existing facilities of the Faculty to the space generated by the COU guidelines and finally, to the space program developed to accommodate the Faculty. The discussion that follows explains the need for variances.

<b>Table 2 – Comparison of Existing Facilities, COU Guidelines and Proposed Space Program</b>				
<b>Category of Space</b>	<b>Existing Nasm</b>	<b>COU Guidelines 2013/2014</b>	<b>Proposed Space Program Nasm</b>	<b>% Proposed / COU</b>
Classroom Facilities	972	541	1,035	191%
Teaching Labs - Wet			1,421	
Teaching Labs - Clinic			4,781	
<b>Subtotal UG Teaching Labs</b>	<b>4,532</b>	<b>5,270</b>	<b>6,202</b>	<b>118%</b>
Research Facilities - Wet Labs			3,299	
Research Facilities - Animal Services			1,134	
Research Facilities - Grad Clinics and Research Clinics			1,734	
<b>Subtotal Research Clinics, Labs and Animal Facilities</b>	<b>3,790</b>	<b>6,227</b>	<b>6,167</b>	<b>99%</b>
Academic Offices	1,176	1,191	1,121	94%
Graduate Student Spaces	166	524	480	92%
Non-Academic Staff Offices	1,311	1,027	996	97%
Departmental Support Space	1,143	1,019	1,083	106%
<b>Subtotal Office Facilities</b>	<b>3,796</b>	<b>3,761</b>	<b>3,680</b>	<b>98%</b>
Library Facilities (Study and Collection)	755	548	603	110%
Student and Central Services:		880		
Student Common Use & Activity Space	431		772	
Food Services (Seating for Staff and Students)	312		350	
Leased space for Café			incl above	
Museum	103		130	
<b>Subtotal Student and Central Services</b>	<b>846</b>	<b>880</b>	<b>1,252</b>	<b>142%</b>
Dentistry Building Shipping and Receiving		294	460	156%
<b>Subtotal - Faculty Specific Space Categories</b>	<b>14,691</b>	<b>17,521</b>	<b>19,399</b>	<b>111%</b>
Intramural Practice			200	
<b>Subtotal - Other Space Categories</b>	<b>0</b>		<b>200</b>	
<b>Total Nasm</b>	<b>14,691</b>	<b>17,521</b>	<b>19,599</b>	

Whereas the COU Space Guidelines would generate approximately 17,500 nasm for the Faculty of Dentistry, or 3,000 nasm (20%) more than its current allocation, the proposed space program is for 19,600 nasm. The additional 2,000 nasm falls primarily in a few areas, classrooms and teaching laboratories/clinics and a few other categories. As well, there is a provision for a facility for an Intramural Practice (200 nasm) which falls outside of the space categories normally covered by the COU guidelines.



## 1. Classrooms

There is a significant variance from the COU space guidelines for classroom space – while the guidelines suggest an allocation of 550 nasm, the space program provides for 1,035 nasm. Thus the three classrooms provided in the new facility will be managed by the Office of Space Management, with the Faculty having preferred booking rights and be sited so that access to other university users can be facilitated. This will ensure that the classrooms meet the minimum university utilization guideline of 34 hours scheduled use per week. The preferred location of these classrooms, on the main St. George campus, will ensure that the university community as a whole will benefit

The variance is the result of two issues:

- The average station size The COU standard assumes a range of classroom station sizes, from .9 nasm to 2.3 nasm depending on size, configuration and furnishing, with an average station size of 1.7 nasm. The Dentistry program provides for an average of 1.9 nasm in a mix of room capacities. This is the result of a large number of smaller meeting rooms, which are more space demanding than larger facilities and the flat floor auditorium which is programmed at 2.3 nasm per station to accommodate term tests and exams, similar to the rooms in the new Exam Centre.
- The COU guideline recommends 34 hours per week classroom utilization (Monday to Friday) but assumes evening utilization of 4 hours per week, which is not consistent with the academic program for the Faculty of Dentistry. However, the COU guideline does not address weekend use, which is standard for the Faculty.
  - It is anticipated that the two lecture rooms and the auditorium will be scheduled, from 19 to 32 hours each, with an average utilization of 25 hours Monday to Friday, as well as some full day use on Saturdays and Sundays for Continuing Education.
  - Currently the Faculty uses about 11 classrooms/seminar rooms scheduled an average of 20 hours per week with some additional hours booked in specialty meeting rooms. The program calls for an increase to 17 seminar/classrooms.

With regard to the utilization of the lecture theatre and auditorium, it is necessary for DDS students (and graduate students in clinical programs) to take most of their lectures in the early mornings, or at lunch times, and attend their laboratory and clinical sessions the rest of the day. In particular, dental students are required to work with patients in the Clinics at set times each week, which often results in three years and occasionally all four years accommodated in the classrooms at the same time. Using other university classroom space is difficult as getting to a classroom in another building and returning is time consuming, time that could not be accommodated in their already packed curriculum. These requirements result in scheduling limitations which place a strain on the allocation of time in classrooms. Thus the three classrooms provided in the new facility will be managed by the Office of Space Management, with the Faculty having preferred booking rights and be sited so that access to other university users can be facilitated. This will ensure that the classrooms meet the minimum university utilization guideline of 34 hours scheduled use per week. The preferred location of these classrooms, on the main St. George campus, will ensure that the university community as a whole will benefit from this resource.

The 14 seminar rooms (1@80, 2@20 and 11@12) are required to accommodate breakout sections of the larger classes and small group meetings in specialty areas. The need to increase the number of rooms to 14 from the current 11+ is based on the fact that many smaller classroom sessions are now housed in administrative meeting rooms. These rooms are not designed for optimal learning opportunities, and students are put at a disadvantage when classes are held within them. The use of these meeting rooms has put a further strain on the availability of meeting space for administrative and faculty use. These rooms will not be available to the general university community.

## 2. Teaching Labs/Clinics

There is also a variance from the COU space guidelines for teaching lab/clinic space – while the guidelines suggest an allocation of 5270 nasm, the space program provides for 6202 nasm. The variance is the result of these issues:

- a. Clinics are held at set days/times during the week, which results in a number of class years vying for classroom and teaching lab space at the same time. In fact, in some instances, all four years are receiving instruction at the same time during the day. This results in an increased load on teaching labs, and thus an increase in required space.
  - b. The wide range of disciplines taught in the Faculty of Dentistry must be practiced within the clinic setting. Periodontics, Endodontics, Orthodontics, taught at the undergraduate and graduate level results in additional space requirements within the clinic setting. Surgical suites as well as Paedeo clinics, designed for both teaching and patient comfort, require some additional space in order to provide optimum teaching facilities.
  - c. New technologies used in the study of dentistry are increasing the type of equipment used in the profession. The use of cat scans and pet scans are commonplace, as is the digitization of x-rays and other equipment. The addition of the computer to a clinic or teaching lab setting adds some space to each operatory or teaching bench. In addition, students begin their training using electronic teaching 'heads', which allows a student to practice dentistry on dummies which are connected to computerized systems. Being electronically connected can aid the student in their work, and allow the instructor to view the work of a student remotely. These connections also add space to be added to accommodate the 'head', as well as the computer monitor.
3. Student and Central Services fall into a number of different types of facilities:
- a. Student Facilities - The actual space allocated for student facilities provides 172 nasm of meeting and study (not including library spaces) and lounge space for the use of students. The 600 nasm balance is allocated to locker rooms with adjacent washrooms complete with showers. The locker rooms are a requirement of the Faculty of Dentistry, as all students are required to change out of street clothing and into 'scrubs' and clean shoes during any clinical or lab periods. Fluctuating gender percentages have created the need for flexible locker rooms which can provide adequate space for either gender as the ratio of male to female students changes.
  - b. Food Services – This allocation consists of two lunch rooms one, seating 200 students and one seating 40 staff, and one leased café space of 100 nasm. The lunch rooms are necessary to minimize the need for staff and students to leave the building between clinical sessions and thus maintain appropriate infection control whenever possible. The leased space would provide access to light fare for those accompanying patients to the clinics, as well as to dentistry students, and other students using the dentistry classrooms.
  - c. Museum - A total of 130 nasm has been allocated to the Dental Museum. This is a small increase over the 103 nasm which is currently in use by the Dental Museum and is under-sized for their needs. This collection is regarded by many in the Dental field to be one of the best in the world, rivalling that of the Smithsonian Institute, and the Faculty would like to have enough space to exhibit this collection.
4. Intramural Practice - The Intramural Practice, which does not exist in the current faculty of Dentistry, has been allocated 200 nasm. This space supports 5 operatories, reception and file storage space, amongst other functions. An intramural practice is commonplace at most Dental faculties around the world, as faculty members are required to keep up their clinical skills on a

regular basis by practicing as a clinical dentist. It has been a long-held desire for the Faculty to be able to provide a space for their faculty members to practice their skills.

It is not only the net assignable square metres (nasm) that are inadequate in the existing Dentistry Building, but also the gross assignable square metres. The ratio of gross area to assignable area (nasm) in 124 Edward Street is 1.6:1. Recent university buildings are generally constructed at a 2:1 ratio. This is especially important when there are large numbers of people, such as clinic users present and where there are significant mechanical and electrical requirements for wet labs and a Vivarium. The table below shows the theoretical difference in gross areas required to accommodate the existing and proposed space programs for the Faculty of Dentistry.

	Existing Nasm	COU Nasm Generated 2013/2014	Proposed Space Program Nasm
<b>Total Nasm</b>	<b>14,691</b>	<b>17,521</b>	<b>19,599</b>
<b>Ratio Gross to Nasm</b>	1.6	2	2
<b>Total Gross</b>	<b>23,898</b>	<b>35,043</b>	<b>39,198</b>

### c) Space Program

Consistent with the Faculty of Dentistry's academic plan and the University of Toronto's goal of providing the best learning experience for its students, it is proposed that a new Oral Health Science Complex be located within the University precinct. This space must include modern teaching facilities, state of the art teaching clinics, a fiscally sound tertiary clinical facility, and appropriate facilities for the Dental Research Institute, all of which would allow the accredited programs in Dentistry to continue to grow and maintain their internationally recognized leadership role. It would also include an expanded Dental Museum. An opportunity for the University of Toronto Centre for the Study of Pain to co-locate within the new building if appropriate space were available and if the Centre were able to raise the required funds, should also be considered.

The proposed space program for the Oral Health Science Complex is 19,599 net assignable square meters (nasm) or approximately 39,198 gross square meters. The space program is shown in detail in Table 3 and is described below.

#### Instructional Space

There are 3 types of instructional space in the Faculty of Dentistry: Classrooms (including seminar rooms), Teaching Labs, and Clinical Service.

#### Classrooms

Enrolment in any Faculty of Dentistry across Ontario is capped by the Provincial Government, to allow for the government to control the number of dentists who are graduated each year in the Province. This control allows universities to plan classrooms to house the finite number of students who may attend any courses within the Faculty. However with growing demands to expand programs, especially to foreign-trained doctors, these caps may be raised in the not too distant future. The space program provides some flexibility to accommodate this growth and to provide high quality classroom space for the university campus as a whole. The classrooms will fall under the jurisdiction of the Office of Space Management and should be designed in concert with that office as well as the Faculty of Dentistry.

- Two lecture halls (110 seats each) and one flat floor auditorium (110 seats) are to be provided and will fall under the jurisdiction of the Office of Space Management.

- The Faculty of Dentistry will have first call on booking these rooms for their courses (an estimated 25 hours per week each); remaining available hours will be utilized to accommodate other institutional needs. For this reason, the classrooms should be physically separated from the public clinics and from the private areas of the Faculty, and be accessible from a main entrance that can be controlled when the rest of the building is closed.
- 14 seminar rooms will be administered by Dentistry and located throughout the building to serve the specialty areas and allow for small breakout meetings.

The proposed lecture theatres at 1.7 nasm per station are similar to the recent design of the new Instructional Centre at UTM. They will utilize a wide tiered style and will provide clear lines of sight to the professor's podium and to the projection screens and boards with easy access for the professor (and students) to move back and forth between the lecture floor and the seating areas. Raked and semicircular arrangements work best for rooms of this size. Continuous writing surfaces will provide students with adequate and flexible desk space capable of safely holding laptop computers as well as notebooks and textbooks. The classrooms will be spaces of interaction, connectivity, and information exchange, not just locations in which lectures are delivered.

### Pre-Clinical Teaching Laboratories

In order for a student to learn the practice of Dentistry, the student needs to be able to learn the practical skills required in a close to real-life situation, prior to working on actual patients. In the pre-clinical teaching laboratories, students are able to work in a simulated environment on mannequins which allow the student dentist to practice skills, prior to working on live patients.

The current teaching laboratories in the Faculty of Dentistry are cramped and haven't been updated in many years. There is no modern technology in use, nor is there the infrastructure to allow it to be easily installed resulting in the current teaching methods being outdated. These labs, even if retrofitted, would not be large enough to handle the new technologies. In the new teaching labs proposed in this Planning Report, state-of-the-art computerized teaching simulations will be utilized to provide the student a more realistic experience, comparable to what is now being offered in most North American dental schools. The proposed space program would allow for appropriate accommodation.

In a traditional science teaching lab, undergraduate students generally work in pairs, side by side facing a benchtop. In dentistry, students work on stools, perpendicular to a mannequin head which is placed in a prone position. This creates the need for space to accommodate not only the dental student, but at times a left-handed and right handed person may need to work back to back. Enough space must be provided to allow for students to be able to work and concentrate without interference from their classmate.

The Faculty also provides placements for dental hygiene and dental assisting students from community colleges. This not only services the needs of these health auxiliary programs but also gives our students an opportunity to learn to work with them. This again poses an additional space challenge.

- 2 pre-clinical undergraduate Dentistry specific teaching labs are required (a 110 seat Biological Sciences Lab and a 110 seat Multidisciplinary Teaching Lab).
- These labs are to be located close to the lecture halls
- Due to the physical requirements needed to fulfil the clinical side of Dentistry, accessible lab benching is not required.

### Clinical Service – Public Dental Clinics for Undergraduate Teaching and Graduate Experience

Unlike most other 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. While the Faculty of Medicine can train its students within hospital facilities, the Faculty of Dentistry must operate an independent oral health care facility (a 'dental hospital' for all intents and purposes) that maintains a patient base of approximately 20,000 active cases at any one time, providing care at both the general practice and specialty levels. Currently, the clinic handles in excess of 60,000 patient visits annually.

This patient population 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. 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 Faculty of Dentistry, in fulfilling its societal mandate, should provide these patients with care in as comfortable and safe a setting as is available to others; however this is not feasible with the current clinic setup.

Recently, the Faculty of Dentistry developed a “Surgicentre” to provide oral health care for adults and children requiring general anaesthesia or deep sedation safely and efficiently. This Surgicentre helps compensate for restrictions on such services resulting from operating room closures in Ontario hospitals. At its initiation, a four month waiting list developed but even here, its expansion will be hampered by the lack of useable space.

The present facility is grossly inadequate and does not allow for modernization or growth. With the advent of technologically advanced dentistry techniques, the use of computers and digital devices in the care and treatment of dental patients has increased. In order to graduate students who are relevant, and can step into real-world situations, the use of these devices and techniques must be practiced along with the more basic techniques. Adequate space is required to accommodate these modern technologies.

A new and modern clinical facility would enable the Faculty of Dentistry to provide cost efficient and timely oral health services for various populations while improving the clinical education of undergraduate and graduate students.

- the undergraduate clinics (200 dental chairs) and the graduate clinics (126 dental chairs) are to be separate from each other as well as the other instructional space
- sinks in the operatories of all clinical areas to be wall mounted or freestanding rather than dropped into counters for reasons of infection control; faucets to be hand-free
- eyewash stations are required in all clinical areas
- all operatories are to be ambidextrous
- at least one operatory in each clinical area to be accessible such that a patient in a wheelchair is able to transfer to the dental chair with the help of his/her assistant; paediatrics would like all of their operatories to be accessible
- entire Paediatric Clinic to be acoustically separated from the rest of the facility
- the water to all of the operatories in all of the clinics to first run through a “waterclave” to sterilize it
- all of the hallways adjacent to the clinical areas need to be sized to accommodate a hospital stretcher
- at least one elevator has to be sized to accommodate a hospital stretcher
- sinks at operatories in Surgicentre to be in 6’ wide corridor which becomes the scrub area
- Dentistry students are required to work with patients in the Clinics at set times every morning and every afternoon. As the students are discouraged from wearing their scrubs outside of the building, easy access to classrooms and other areas, from the clinic should be provided.

### Sterilization & Dispensary

The Sterilization and Dispensary space is central to the safe and efficient running of the Public clinics. This function provides sterilization of instruments used in the clinics and teaching labs, as well as provides safe dispensation of drugs and equipment to the students working in the clinics.

The Space program requests one large central sterilization and Dispensary, as well as two satellite dispensaries, located within the Clinics. This will allow for ease of access by students to the instruments and pharmaceuticals that they may require during a clinical visit with a patient.

- a central sterilization and dispensary should be located close to the Public Dental Clinics
- satellite dispensary (s) should be located within the clinics. If the undergraduate clinics happen to be split into two separate areas or two separate floors, a satellite dispensary should be located in each space
- eyewash stations should be located within the dispensaries
- sinks to be wall mounted or freestanding rather than dropped into counters for reasons of infection control
- faucets to be hands free
- security measures will need to be in place due to the housing of narcotics and surgical instrumentation

#### Research Clinics (Centre for Clinical Research)

- The research clinics should be located within the research area, and away from public clinics and public areas
- Research clinics should be located conveniently to the animal care facility
- sinks in the operatories of all clinical areas to be wall mounted or freestanding rather than dropped into counters for reasons of infection control
- faucets to be hands-free
- eyewash stations are required in all clinical areas
- all operatories are to be ambidextrous

#### Research Wet Labs

Researchers at the Faculty of Dentistry have varied needs for each of their labs, which are as individual as their research. The range of research the faculty are undertaking is varied; from biomaterials and implants, to the study of the use of artificial bones in reconstruction, to the study of diseases of the mouth and jaw, these researchers are at the cutting edge of new thinking in their field. It is safe to say that a generic wet lab would include:

- Fume hoods and/or biological safety cabinets
- Modular benching
- Hot and cold running water, complete with hands-free faucets
- Eyewash stations, and in some cases deluge showers may be required
- Adequate power and data outlets to run modern equipment and computers
- Adequate storage for chemicals, equipment and supplies
- Easy access (for some) to Animal Services

#### Animal Services

The Animal Research Facility in the Faculty of Dentistry is unique in terms of its primary surgical role and experimental handling rooms which were created and continue to be maintained for its own specialty needs. The focus of the surgery that takes place within the Faculty of Dentistry is survival surgery, and this is rare within animal care facilities. This uniqueness places the Faculty in an enviable position to offer services to investigators from other institutions, such as the Hospital for Sick Children, Mt. Sinai, etc. These researchers seek out the facility because of the specific skill set and expertise that the Faculty and staff have in the area of survival surgical support services. Surgery hours have increased over the past few years, from 175 hours per year in 2003 to over 400 hours per year in 2005.

The variation of animals used in research at the Faculty of Dentistry is broad. Currently, rodents are the largest population in the Vivarium; however research also occurs using other species, such as rabbits, non-human primates, cats and dogs, amongst other animals. Due to the nature of research, populations ebb and flow, so ensuring enough housing rooms to handle all of the different species is vital to the continuing research quest.

Of late, there has been a dramatic increase in the use of rats in the Animal Research Facility, and these levels will, in all likelihood, continue to grow at a steady pace. The increase in the rat populations reflects the increased interest in molecular studies with rat models that have occurred in all health science fields.

Overall, the animal population has increased an average of 400 animals per year, corresponding roughly with the period of faculty renewal policy focusing on hiring new clinical faculty who are also active scientists. Most new hires are coming into the Faculty with PhD's in related biological and molecular fields. In fact the last 8 hires have all had PhD's and are all establishing research programmes. With our continued quest to recruit and hire PhD- trained researchers the strain on research space and animal facilities will continue to grow.

In 2005, the Faculty of Dentistry purchased and used approx 2092 animals. From those 2092 animals, 382 mice produced an additional 2792 mice, managed by the animal facilities on campus. 1900 animals were dedicated to high maintenance surgical protocols or long-term studies (as opposed to purely observational studies), signifying that the work being done is extensive and producing large amounts of data. The increase in mouse population is due to a push by CIHR to see more *in vivo* mechanistic studies done in research; the mouse is the animal of choice for *in vivo* studies due to cost.

The current space allocation of 283 nasms is woefully inadequate for the animal care facility. The space programme allocates 1,187 nasms to allow for the housing, care, feeding and research of these animals. The CCAC (The Canadian Council on Animal Care) has allowed the Faculty to continue to operate as currently accommodated, based on the level of care the animals get, and the promise of a new facility. In the proposed space program the Vivarium has been identified at the minimum required by the CCAC

- the facility will be located in a secure and restricted environment, away from and secure from public areas
- a large number of animal housing rooms will be required due to the animal species variations
- two offices are required within the facility
- facility design must conform with CCAC guidelines
- one elevator to be dedicated for animal and animal supplies transportation; this elevator should be in a discrete area, and shielded from public vision by use of a vestibule or dedicated corridor
- security and access, along with sight lines, to be highly restricted to the facility
- entire facility should be acoustically separated from the rest of the building, as well as being acoustically separated from outside noises from the street.
- change rooms and showers must be provided for animal care workers, researchers and students

#### Faculty & Academic Offices

- academic offices are to be located by both discipline and research lab wherever possible
- those faculty who have a basic science research lab and those working in the Vivarium should where feasible have their offices located close to their labs
- those faculty working in radiology and in paediatrics should have their office as close to their respective clinics as is feasible
- there will be one shared office for emeriti professors located near the library
- one academic office will be located adjacent to the Dispensary
- all other academic offices can be located away from the research and clinical areas and arranged by discipline

#### Non-Academic Offices

- the dedicated Faculty support staff will be located close to or among the members of the discipline they are responsible for
- if the layout permits these support spaces to be clustered together and still be functional for those in the related disciplines, it is preferable to do so as the staff can then easily fill in for each other when required.

### Graduate Student Offices

The graduate student office space will be shared, and appropriately located throughout the building.

- graduate student offices are to be located near the office of the supervising faculty
- not all graduate students require a dedicated desk space
- those working in Anaesthesia and Oral Surgery can share two desks in each discipline
- students working in Perio can use the desk spaces already provided in the Perio clinic;

Because student levels and needs fluctuate yearly, it may not be possible for graduate students to share desks in the future if populations. Any excess space could be allocated to visitors or allow for future student growth.

### Faculty Administration & Central Services

- Varied spaces and functions which provide support to administrative, instructional, and clinical functions within the Faculty of Dentistry.
- These will be allocated appropriately throughout the buildings to support academic and administrative units
- non-research and clinic-related administrative staff are to be located together clustered by function
- the student services clusters are to be located such that students do not have to pass by the Dean's Office to access these staff
- visitors to the Faculty will have need to easily locate the Continuing Education and Development office as well as the Dean's Office suite

### Library

The library is well used by the Dental Students. Holdings comprise more than 30,000 books, bound journals and DVDs. However, with the intention of relocating the Faculty to the main University of Toronto campus, it is believed that there may be less of a need for a dedicated Dental Library, due to the large number of libraries already on campus, and the increased use of online journals by students, over the use of hard copies. The Gerstein Science Information Centre, the home of the largest medical and science research collections in Canada, is located on the east side of Kings College Circle, easily accessible if the Faculty of Dentistry was relocated to the main campus.

- Provision has been planned to include quiet study space, computer lab, collaborative study space, 2 sizes of group study rooms and space to house the collection, housing a maximum of approximately 115 students.
- User Committees have requested abundant natural light, wireless connections throughout, and a comfortable atmosphere.

### Student Facilities

Student Facilities in the Faculty of Dentistry compromise locker rooms, club and lounge rooms.

Locker rooms are a necessity for the Faculty of Dentistry. Students are expected to change out of street clothes and into scrubs upon arrival to the Faculty. Locker rooms must serve an always fluctuating student population. There was a time when males outnumbered females in the study of Dentistry; however this has not been the case of late. The male to female ratio of the student population generally fluctuates slightly. New locker rooms will allow for flexibility to ensure enough locker space to accommodate movement in the student gender population.

The locker rooms also serve to house lockers used by dental hygiene students coming to U of T from other schools, such as those students enrolled in dental hygiene programs at the community college



level. These lockers would be used less frequently; however they are still necessary to the smooth running of the clinics.

The space program provides for 500 full size student lockers. These will be located in 600 nasm spread out over 4 locker rooms designed to allow flexibility in accommodating the ever-changing ratio of male to female students.

Club Rooms and Student Lounge comprise approximately 172 nasms, providing space for students to gather and talk, relax or study quietly.

- Locker rooms to be divided by gender and to allow flexibility to accommodate fluctuations in gender enrolments
- Informal gathering areas to be provided for students
- Offices and meeting rooms will be assigned to house clubs and for group study

### Food Services

The proposed space program for the Food Services area is smaller than was assigned to this function in the past. The Faculty originally has 312 nasms, allocated to food services function. However, it was under-utilized, and has been re-purposed. The planned food services space will consist of one 200 nasm (for students) and one 50 nasm (for staff and faculty) multi-purpose lunch rooms, with seating and tables to serve those who brown-bag or purchase their lunches from an outside food service vendor. The space will also include vending machines for the purchase of snacks and beverages. These rooms could also be used for informal study spaces, large town hall meetings, or social gatherings where a large open space is required.

- the cafeteria at 124 Edward street was underutilized and, in fact, subsidized by other profitable food service operations on campus (it was closed in 2008), not a situation to replicate in the new facility
- Cafeteria style seating with no food service to be provided for approximately 200 students
- Lounge and cafeteria style seating to be provided for approximately 40 faculty members. This should be physically separate from the student food services area
- Vending machines providing healthy snacks and drinks should be provided in both areas
- 100 nasms has been allocated for the inclusion of a small coffee shop or café close to the Clinics to serve patients and their families, as well as staff, faculty and students

### Intramural Practice

The Faculty of Dentistry at the University of Toronto is one of the only Dental Faculties in North America which does not provide a forum for their faculty to conduct Intramural Practice. Clinical faculty must continue to practice not only to maintain their skills, but even more importantly to maintain credibility with clinical staff, colleagues, and students. The provision of an Intramural Practice within the Faculty is paramount to the ongoing support for clinician's practical skills, as well as an opportunity to provide an ongoing financial income to the Faculty.

At present this must be pursued off-site. At comparable institutions the Faculty Intramural Practice is facilitated within on-site facilities. The development of such a centre would not only allow the Faculty to provide improved oral health care to the population but would also provide for improved clinical teaching as well as even more opportunities for clinically-based research.

The inclusion of the Intramural Practice space will account for approximately 200 nasm, located so that it can be accessed easily from the street, or alternately located conveniently to elevators. This is a net gain of space, as there is currently not an Intramural Practice at the Faculty

- the intramural practice has been planned to provide clinical space to accommodate all of the disciplines in the Faculty and all faculty with at least a 70% appointment (50 people)
- while this facility will operate independently of the school, it will be connected physically in that it will be in the same building with internal connections to the rest of the building, as required, but with a separate patient entrance at the street
- proposed is a 5-operatory clinic, with separate reception and file storage.

### Museum

Over the years the Faculty of Dentistry has accumulated what most consider the best collection of historical artefacts chronicling the history of Dentistry. Unfortunately, most of these items have been hidden from the public due to severe space restrictions. Three emeritus faculty members have obtained funding and are in the process of producing a book by photographing and cataloguing this collection. The existence of the Faculty's collection has recently come to the attention of the Royal College of Dental Surgeons of Ontario who are quite anxious that it be made available to both the profession and the public.

Currently, the museum is housed in 103 nasms, which does not allow for the majority of the collection to be displayed. This report asks for the space allocated to the Museum to be modestly increased to 130 nasms.

- Should be located for ease of access by faculty, staff students and outside visitors, without impacting on the academic function of the building
- Security for this space is of utmost importance, as is controlled entry/exit points
- The museum is preferred to have an independent entry point from the street, so as to allow flexible opening/closing times and to discourage the public from investigating the faculty building unaccompanied.

### General Areas:

- the building requires two distinct entrances, a patient entrance to the clinics, and a main Faculty and student entrance. The entrances to the these two distinct areas need to be secure from each other but at the same time connected so that students, faculty and staff can easily move from one to the other without having to exit the building.
- Access will be required for pickup/drop off of patients, and for ambulance and WheelTrans transfers to the clinics

### **Faculty of Dentistry - Space Program**

<b>Room Description</b>	<b>No. Rooms</b>	<b>Unit NASM</b>	<b>Total Nasm</b>	<b>No Stns</b>
<b>Classrooms</b>				
Tiered Lecture Hall (110-Seat)	2	165	330	220
Flat Floor Auditorium	1	230	230	110
Seminar Room, 80 seats	1	120	120	80
Seminar Rooms, 20 seats	2	40	80	80
Seminar Rooms, 12 seats	10	24	240	180
Radiology - Undergraduate Interpretation and Seminar Room	1	35	35	12
<b>Sub-total - Classrooms</b>	<b>17</b>		<b>1,035</b>	<b>682</b>

**Teaching Labs**

Biological Sciences Tiered Teaching Lab (110 seat)	1	605	605	110
Biological Sciences Teaching Lab Storage Room	1	20	20	
Multidisciplinary Teaching Lab (110 seats)	1	550	550	110
Multidisciplinary Teaching Lab Materials Prep and Metal Casting Rm	1	13	13	
Multidisciplinary Teaching Lab Finishing and Polishing Room	1	24	24	
Multidisciplinary Teaching Lab Prep and Polymerization Rm	1	18	18	
Multidisciplinary Teaching Lab Radiology/Endodontics Prep Room	1	8	8	
Multidisciplinary Teaching Lab Biomaterials Ceramics Room	1	43	43	
Multidisciplinary Lab Materials and Equipment Storage Rooms	2	50	100	
Part-time Multidisciplinary Teaching Staff Prep Room	1	40	40	
<b>Subtotal - Teaching Labs</b>	<b>11</b>		<b>1,421</b>	<b>220</b>

**Instructional Offices**

Multidisciplinary Teaching Lab Team Leader Office	1	13	13	
<b>Subtotal - Instructional Offices</b>	<b>1</b>	<b>13</b>	<b>13</b>	

**Clinics Reception, etc.**

Clinics Main Patient Waiting Area	1	125	125	
Clinics Main Patient Reception Room	1	10	10	
Clinics Main Patient Cashiers Room	1	15	15	
Clinics Main Cashier/Patient Reception Staff Locker Room	1	15	15	
Clinics Main Patient Records Storage Area	1	250	250	
Clinics Main Chart Room	1	40	40	
Clinics Instructor Locker Room	2	45	90	
Clinical Support Staff Locker Room	6	20	120	
Clinical Support Staff Lounge	3	35	105	
<b>Sub-total - Clinics Reception, etc.</b>	<b>17</b>	<b>555</b>	<b>770</b>	

**Undergraduate Clinic**

Undergraduate Clinic Radiographic Suite	10	5	50	10
Undergraduate Clinic Open Operatory	2	1,664	3,328	200
Undergraduate Clinical Lab Room	2	21	42	
Undergraduate Clinic Dispensary	2	25	50	
Undergraduate Clinical Storage Room	2	13	26	
Undergraduate Technical Services Lab	1	75	75	
Undergraduate Student Lab	1	250	250	
<b>Subtotal - Undergraduate Clinic</b>	<b>20</b>	<b>2,053</b>	<b>3,821</b>	

**Clinical Administration**

Undergraduate Clinic Instructor Preparation/Conference Room	4	21	84	
Undergraduate Clinic Team Leader Office	2	13	26	

Undergraduate Clinical Central Administration - Assistant Dean	1	18	18	
Undergraduate Clinical Central Administration - Secretary	1	13	13	
Undergraduate Clinical Central Administration - Staff	10	13	130	
Undergraduate Clinical Central Administration - Office Support	1	16	16	
Undergraduate Technical Services Head Tech Office	1	13	13	
<b>Subtotal - Clinical Administration</b>	<b>20</b>	<b>107</b>	<b>300</b>	
<b>Graduate Clinics</b>				
Surgical Clinic Units	15	various	418	
Scrub Room(s)	3	4	12	
Surgicentre	1	99	99	
General Specialty Units	30	14	420	
Paediatric Dentistry/Orthodontics Units	20	9	186	
Graduate Clinic Storage Room	2	13	26	
Radiology - Panoramic Imaging Room	1	14	14	1
Radiology - Extra-Oral Imaging (Skull Room)	1	20	20	1
Radiology - Special Procedures Room	1	8	8	1
Radiology - Special Procedures Sialography Room	1	8	8	1
Radiology - Cone Beam CT <i>Suite</i>	1	40	40	
Radiology - Darkroom	1	12	12	
Radiology - PSP Plate Reader Room	1	5	5	
<b>Subtotal - Graduate Clinics</b>	<b>78</b>	<b>246</b>	<b>1,268</b>	
<b>Graduate Clinical Administration</b>				
Team Leaders Offices	3	13	39	
Radiology - Residents' Offices and Seminar Room	1	24	24	6
Radiology - Head Tech/Team Leader Office	1	13	13	
<b>Subtotal - Graduate Clinical Administration</b>	<b>5</b>	<b>50</b>	<b>76</b>	
<b>Graduate Clinic Radiology</b>				
Radiology - Technologists' Work Room	1	23	23	
Radiology - Storage Room	1	6	6	
<b>Subtotal - Graduate Clinic Radiology</b>	<b>2</b>	<b>29</b>	<b>29</b>	
<b>Sterilization and Dispensary</b>				
Central Sterilization Facility	1	150	150	
Central Clinics Dispensary	1	75	75	
Satellite Dispensary	2	25	50	
<b>Subtotal - Sterilization and Dispensary</b>	<b>4</b>	<b>250</b>	<b>275</b>	
<b>Research Clinics</b>				
RIC Patient Reception	1	12	12	

RIC Patient Waiting	1	14	14	
RIC Dental Operatory	5	18	90	5
RIC Clinical Materials Preparation Room	1	30	30	
RIC Clinical Cell Preparation Room	1	25	25	
RIC Clean Room Suite (class 1000 and class 100)	2	75	150	
RIC Clinical Bio-Analysis Laboratory	1	80	80	
RIC Clinical Storage	6	6	36	
<b>Subtotal - Research Clinics</b>	<b>18</b>	<b>260</b>	<b>437</b>	
<b>Research Administration</b>				
RIC Team Leader Office	1	13	13	
RIC Staff Office	2	13	26	
<b>Subtotal - Research Administration</b>	<b>3</b>	<b>26</b>	<b>39</b>	
<b>Non-Clinical Research Space</b>				
Non-Clinical Research Space	multi	various	2,838	
<b>Subtotal - Non-clinical Research Space</b>			<b>2,838</b>	
<b>Research Service</b>				
Service Unit - Large Instrument Room	4	16	64	
Service Unit - Cell Culture Suite	4	22	88	
Service Unit - Environmental-Control Room (4°C)	4	5	20	
Service Unit - Environmental-Control Room (37°C )	1	6	6	
Service Unit - Environmental-Control Room (25 to 48°C)	1	6	6	
Service Unit - Radioactive Room	2	15	30	
Service Unit - Mechanical Testing	1	45	45	
Service Unit - Sterilization & Glassware Washing Facility	4	20	80	
Service Unit - Electron Microscopy	2	20	40	
Service Unit - Light Microscopy	2	11	22	
Service Unit - Histology	1	60	60	
<b>Subtotal - Research Service</b>	<b>26</b>	<b>226</b>	<b>461</b>	
<b>Research Service Administration</b>				
Service - Technicians' Office	2	13	26	
Service - Dental Research Institute Offices	3	13	39	
<b>Subtotal - Research Service Administration</b>			<b>65</b>	
<b>Animal Care Facility</b>				
Animal Housing (Large)	1	45	45	
Animal Housing (Medium)	2	22	44	
Animal Housing (Small)	2	18	36	
Animal Receiving & Examination Room	1	13	13	
Quarantine Room	2	13	26	

Procedure Room (Medium)	3	21	63	
Procedure Room (Small)	2	9	18	
Surgeon Preparation & Scrub Room	2	7	14	
Animal Preparation & Pre-medication Room	2	11	22	
Surgical Operations	2	20	40	
Post-Operative Recovery Room	2	11	22	
Sterile Storage - (Shared Surgical)	1	8	8	
Equipment Storage (Shared Surgical)	1	29	29	
Cleaning Supplies (Shared Surgical)	1	12	12	
Necropsy	1	20	20	
Cage & Rack Washing & Sterilization	1	223	223	
Equipment & Rack Storage	1	60	60	
Feed & Bedding Storage	2	33	66	
Utility Room	1	15	15	
Short Term Storage	1	45	45	
Diet Kitchen & DCM Staff Office	1	13	13	
Facility Manager's Office	1	13	13	
Staff Break & Meeting Room	1	40	40	
Staff Change Room & Washroom	2	18	36	
Laundry	1	19	19	
Staff & Visitor Entry Vestibule	1	14	14	
Janitorial Closet	4	4	16	
Clean & Dirty Docks	1	145	145	
Waste Storage/Elimination	1	20	20	
Clean & Dirty Elevators & Vestibules	2	25	50	
<b>Subtotal - Animal Care Facility</b>	<b>46</b>		<b>1,187</b>	
<b>Resource Centre</b>				
Main Collection Space	1	150	150	
Individual (Quiet) Study Space, 20 stations	1	68	68	20
Collaborative Study Space, 48 stations	1	134	134	48
Group Study Room (Large), 12 stations	1	33	33	12
Group Study Room (Small), 2 @ 8 stations	2	23	46	16
Public Service Area	1	100	100	
Librarian's Office	2	13	26	
Library Technician Workspace	1	28	28	
Storage/Special Projects Area	1	18	18	
<b>Subtotal - Resource Centre</b>	<b>11</b>	<b>567</b>	<b>603</b>	
<b>Student Facilities</b>				
DSS/Graduate DSS Office (Meeting Room - 25 Persons)	1	26	26	
DSS/Graduate DSS Storage Room	1	15	15	
Student Lounge (Undergraduate - 25 seat)	1	43	43	

Student Lounge (Graduate - 50-Seat)	1	88	88	
Student Locker Room (2 @ 75 lockers)	2	100	200	
Student Locker Room, Showers, Washroom (2 @ 175 lockers)	2	200	400	
<b>Subtotal - Student Facilities</b>	<b>8</b>	<b>472</b>	<b>772</b>	
<b>Faculty Administration &amp; Central Services</b>				
<b>A. Dean's Suite</b>				
Office - Dean (including washroom)	1	29	29	
Office - Secretary to the Dean	1	13	13	
Office - Assistant Dean	1	18	18	
Reception (/Waiting) Area (Shared)	1	15	15	
Faculty Meeting Room (28-Seat)	1	65	65	
Small Meeting Room (12-Seat)	1	27	27	
Kitchen (Shared)	1	10	10	
Storage Room	1	15	15	
<b>B. Student Services</b>				
Reception Area	1	13	13	
Private Administrative Staff Office	3	13	39	
Consultation Room	1	15	15	
Secure Storage	1	30	30	
Office (Supplies) Storage	1	10	10	
<b>C. Development, Alumni Relations &amp; Continuing Dental Education</b>				
Assistant Dean	1	18	18	
Executive Director Development & Alumni Affairs	1	15	15	
Administrative Assistant Alumni Affairs	1	13	13	
Executive Director Continuing Dental Education	1	15	15	
Coordinator Continuing Dental Education	1	13	13	
Administrative Assistant Continuing Dental Administration	2	13	26	
Admin/Waiting Area	1	13	13	
Office Support	1	13	13	126.00
<b>D. Human Resources</b>				
Staff Office	3	13	39	
Office Support	1	13	13	
<b>E. Financial Services</b>				
Office - Manager (Private)	1	15	15	
Office - Administrative Staff	5	13	65	
Office Support	2	13	26	
<b>F. Computer Services</b>				
Central Machine Room	1	26	26	
Help Desk & Public Access Workstations	1	30	30	
Office - IT Staff	6	13	78	
Storage Room	1	13	13	
Systems Maintenance & Development Room	1	26	26	

**G. Media Services Suite**

Customer Service & Reception Area	1	26	26
Digital Media Production Centre	1	60	60
Photography/Video Suite	1	80	80
Edit Suite	1	7	7
Control/Machine Room	1	20	20
Office (Private) - Manager's Office	1	13	13

**H. Central Services**

Mail Room	1	20	20
Photocopy/Shredding Facility	1	20	20
Laundry Facility	1	20	20
Staff Office - Mail/Photocopy/Laundry	1	13	13
Shipping & Receiving - Stock Storage	1	180	180
Shipping & Receiving - Furniture Storage	1	20	20
Shipping & Receiving - Office Supply/Paper Storage	1	10	10
Shipping & Receiving - Plaster & Stone Room	1	10	10
Shipping & Receiving - RO Water Unit (??)	1	10	10
Shipping & Receiving - Gas Cylinder Storage	1	20	20
Shipping & Receiving - Chemical Waste	1	10	10
Shipping & Receiving - Staff Office	2	13	26
Shipping & Receiving - Dock	1	200	200
Procurement & Building Services - Reception Area	1	13	13
Procurement & Building Services - Office Area	1	39	39
Procurement & Building Services - Office Support	1	13	13
<b>Subtotal - Faculty Administration &amp; Central Services</b>	<b>69</b>	<b>1,378</b>	<b>1,586</b>

**Faculty & Academic Offices**

Faculty Offices	81	13	1,053
Non-Academic Staff Offices	16	13	208
Graduate Student Office	120	4	480
Office Support	1	182	182
<b>Subtotal - Non-Academic Staff Offices</b>	<b>218</b>	<b>212</b>	<b>1,923</b>

**Ancillary Services & Miscellaneous**

Museum	1	130	130
Food Services (Lunchrooms 1 @ 200 nasm and 1 @ 50 nasm)	2		250
Leasehold Café	1	100	100
Intramural Practice	1	200	200
<b>Subtotal - Ancillary Services &amp; Miscellaneous</b>	<b>5</b>	<b>430</b>	<b>680</b>

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**Total** **19,599**



## IV. SITE OPPORTUNITIES

### a) 124 Edward Street

The Faculty's academic programme has developed significantly over the almost 50 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.

#### History of Built Form on the Site

The original building occupied by the Faculty of Dentistry at 124 Edward Street was constructed in 1958. In 1982, 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.

In addition, the current condition of the building is insufficient to properly sustain the current and future needs of the Faculty. Upgrades would be required to nearly all building systems, including HVAC, electrical, water and sewage, oral vacuum system, fire alarm system, etc. The animal care facility is woefully outdated, and requires a complete overhaul if it is to continue to be managed in a safe and humane way.

The biggest stumbling block is arguably the logistics of carrying out major infrastructure and renovations within an already over-utilized building. Construction would cause severe impacts to both the educational and clinical aspects of the program, and the outcome would still not provide adequate space for the Faculty to function as it should. Additionally, due to the fact that this project is obviously suboptimal, funding for this project would be difficult to obtain.

#### Existing Building Condition

Utilities and Operations have reported on the current condition of the building at 124 Edward Street with respect to the Faculty remaining in this building for the next 40 years, if their space requirements could be accommodated. The parking areas were not part of this report.

In summary, while the building itself is in reasonable condition, the activities of the Faculty appear to have exceeded the limits of the existing building. Should it be possible to accommodate the Faculty's space programme in the building with the storey and a half building addition, the following would have to be addressed:

- Asbestos expected to be present in the original 1959 wing of the building and would require decommissioning.
- A second water feed would need to be brought into the building.

- Large quantities of galvanized piping in the original building would need to be replaced with copper piping to eliminate the occurrence of rust in the water at the chairs in the clinics.
- Due to changes in use of some spaces and higher use than initially planned in others, upgrades to the facility's HVAC would be required. There could be limitations to the HVAC modifications, in some cases, due to available ceiling height.
- Proper levels of humidification cannot be achieved in the building due to the single glazed windows and the construction of the building envelope. New windows could be provided, however the building envelope could not easily accommodate the environmental change.
- For the current level of use and number of connections, the dust collector is undersized and produces insufficient suction to perform adequately.
- The oral vacuum system on the clinic chairs is undersized relative to its current use and requires upgrading to include a mercury recovery device.
- Possible inadequacy of power supply in the building which would depend upon the equipment required.
- An upgrade the building's sprinkler protection is recommended as only the newer part of the building is so protected, creating two levels of fire protection.
- The fire alarm system is obsolete and a newer, fully addressable system is recommended.
- The existing building's envelope and interiors suffer from a number of deferred maintenance and renewal needs including the interior wall coverings, flooring materials and ceilings in common spaces and clinics, as well as the replacement of the lobby glazing with tempered glass.
- A number of items have suffered due to deferred maintenance issues including small areas of spalled concrete, and replacement of water valves and gas nozzles.

#### Existing Zoning for the Site

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 the Hospital for Sick Children. 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.

#### Conclusion

While the basic academic and research programmes of the Faculty could possibly fit into the building with the storey and a half addition and extensive renovation to the existing building, there would still not be space to accommodate the intramural practice, any enrolment expansion or a contiguous physical presence for the Centre for the Study of Pain. Importantly, the Faculty would remain isolated from the rest of the campus. There is the problem, also, that in order to build the additional storey and a half, the site would require zoning permissions that would entail a change to the helicopter flight path.

To be functional and effective, the space in the building would need to be totally re-thought and a major re-working of the space would be required. Aside from the cost and disruption that this would involve, given the limitations of an existing building, an existing addition and a new addition that will come encumbered with restrictions on its use, it is extremely unlikely that the result would be space optimal to the Faculty's needs. Finally, raising funds to achieve a sub-optimal solution could be difficult.

The current building faces numerous unique challenges. Due to a lack of space and numerous ad hoc renovations over the years, these challenges have left the Faculty wanting. Mechanical and electrical systems are inadequate and outdated, floor areas are confusing and disjointed and the Faculty is unable to provide state of the art teaching methodologies due to the lack of infrastructure to support the modern equipment required in today's modern dental education

## b) Existing Site on St. George Campus – Site 14

An important consideration with respect to the site that Dentistry should occupy for the future is the desire to get back to being part of the St. George campus, and specifically part of the health sciences disciplines. Very close proximity to accessible public transportation is a priority for the Faculty as the patients who use the public dental clinics, which form the core of the students' dental education, will most often arrive this way.

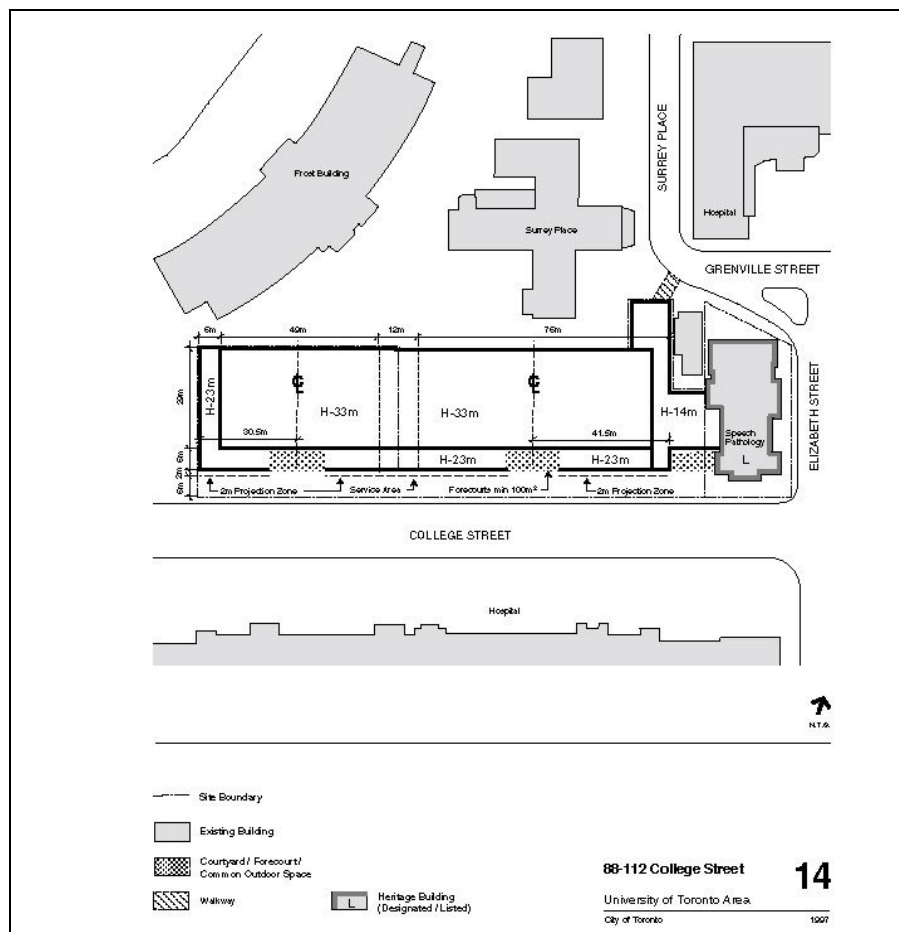
Site 14, the present site of the Banting and Best Institutes on College Street (100 and 112 College Street West), a house at 92 College Street and a church, a heritage building, at 88 College Street West, has been identified as being ideal for this purpose. The site includes a mixed collection of architectural styles that share a continuous green frontage to the street. To the north of the site are several buildings housing offices for the Government of Ontario, Surrey Place and Women's College Hospital. The site is ideally situated at the Queen's Park subway directly to the west and on the College streetcar line. Programmatically, the site lies within an important institutional research and discovery district, which has been reinforced by the establishment of the MaRS Centre in recent years. Most of the existing occupants are scheduled to move into new locations and the present buildings, in their current condition, do not suit University purposes.



**Fig**

**Figure 1: Site 14 - 88-112 College Street**

The approved development zoning envelope for this site could accommodate the expanded programs and activities required by the Faculty of Dentistry. Current development permissions allow 30,850gsm to 34,200gsm of program within a maximum of 8 floors institutional and commercial use zoning above grade, with an additional estimated 9500gsm below grade space on two levels for a total available program area of 40,350gsm to 43,700gsm.



**Figure 2: Site 14 Approved Envelope**

The University is currently exploring the possibility of increasing the size of the approved building envelope to more closely reflect the growing size of the neighbouring developments and respond to the strategies outlined in the City's Official Plan which stress intensification of the downtown core and, in particular, the avenues. The MaRS Centre, located on the south side of College at University directly south of Site 14, has adapted an original hospital building with new construction inserted to the south and 15-storey tower to the east. Future plans include an additional flanking tower to the west at University Avenue. The MaRS development has changed the immediate contextual character of the area and is thought to be a good model to follow for the redevelopment of Site this site.

The University suggests a maximum envelope of 45,000gsm above grade and 9,500gsm below grade (54,500gsm), with a maximum height of 15 floors intutional use might well gain approval through Committee of Adjustment or re-zoning processes. Maximum development of the site would not only include demolition of the Banting (9,416 gsm) and Best buildings (6,927 gsm), but would also include the permitted demolition of the house at 92 College Street (592 gsm) and could possibly include connections to and renovation of the heritage listed Zion Church at 88 College (1734 gsm). The proposed envelope anticipates setbacks and stepbacks to align with the existing street frontage (6m setback) and to provide a cornice line at the 25m (6-storey) level. Landscape amenities such as lights, benches and bicycle parking are anticipated within one or more proposed landscaped entry forecourt(s). Servicing is anticipated to be located at the rear of the building at grade and potentially accessed through an integrated mid-block service entry lane off College Street, as per the 1997 Development Guidelines. Other public functions may require further lay-by or access lane connections. These should be well spaced from the service laneway, and provide distinct public attributes for differentiation. The envelope assumes one or two levels of basement use which will likely house the vivarium functions of the program.

The close proximity to the other health sciences at the University and the teaching hospitals would provide opportunities to strengthen collaboration. The Faculty's research strengths are also compatible with those at MaRS. Access to public transportation (necessary for the clinical service) is readily available and more direct.

If the new Faculty of Dentistry is to be built on the Banting and Best site (site 14), the current occupants of the buildings on the site will have to be relocated. Demolition of the existing buildings on site 14 (except for the heritage building) will be a secondary effect of creating a new facility on this site for the Faculty of Dentistry and the costs associated with the demolition form part of the total cost of this project.

These buildings currently have a total of approximately 10,000 nasm, however, only about 2,170 nasm are university functions which have been identified as potentially requiring relocation if the project were to move forward – Surgery (~600 nasm) and the Banting and Best Department of Medical Research (~1,570 nasm out of 2,477 nasm). However, this will need to be reviewed if a project is initiated.

#### Parking at 88 – 112 College Street (Site 14)

Site 14, the current home of the Banting and Best Institutes as well as the two smaller buildings at 88 and 92 College Street, was indicated on the July 05 parking inventory as having a total of 42 parking spaces. These 42 parking spaces are included the total number of parking spaces subject to the parking by-law so could, potentially, be replicated in a new project on this site. However, due to this site's proportions, the existence of a steam tunnel under the site, and its location along College Street, it is not an easy site on which to provide parking, especially considering that Dentistry wants a very large part of its space programme to be located at grade. This site is also very well served by public transit.

There is limited street parking in the vicinity of this site as well as several parking lots at neighbouring hospitals that could be used by patients wishing to drive to their appointments. Dentistry's faculty and staff would be able to apply for parking spaces at a variety of locations on campus.

An exit needs to be provided from the building for patients leaving the building directly from the recovery room in the clinics. There needs to be space at this exit for an ambulance to pull up, if required. Locating this exit relatively close to the main patient entrance could allow the space for the ambulance to double as a drop-off area for WheelTrans. This location must be separate and distinct from any service areas.

Bicycle parking is very important to the faculty, staff and students at the Faculty of Dentistry. The Faculty currently has 20-25 bicycle parking spaces secured within a cage along the Elm Street façade of the existing Dentistry building. They would like to see the number of parking spaces grow to 30 - 40 similarly situated spaces, based on the expected increase in student numbers, along with the increasing popularity of the green movement.

#### **c) Potential New Site**

Given the high costs of developing a site for a new building for the Oral Health Centre, the Committee also considered purchasing an existing building that could be modified, renovated and modestly expanded to meet the programmatic needs of the Faculty of Dentistry. Although there may be a few options close to the health sciences precinct of the University, there have yet to be any negotiations regarding such a site.

The Real Estate Office of the University of Toronto has indicated that there may be an opportunity to relocate the Faculty of Dentistry into a building or buildings located on land contiguous with the University precinct and easily accessible for both vehicles and pedestrians, in addition to being on the streetcar and/or subway line(s). The benefit of pursuing this option would be the ability to gain access to space that would require little renovation for certain program elements on an easily serviced site with access to public transportation and amenities.

If the University of Toronto were successful in acquiring such a property, the Faculty of Dentistry could be accommodated within a combination of renovated existing space and newly constructed infill space. In particular, it is likely that the Clinics and the Animal Care areas would need to be housed in purpose-built space.

Any new site would require a visible public entrance to accommodate, the public clinics and other publicly accessible spaces on the lower floors of the building.

Other existing amenities that would be beneficial would include a large classroom, central reception area and elevator lobby, as well as a more private elevator which could possibly be utilized for animal transportation to the Vivarium.

As with Site 14, there are similar requirements, such as:

- An exit will need to be provided from the building for patients leaving directly from the recovery room in the clinics. There needs to be space at this exit for an ambulance to pull up, if required. Locating this exit relatively close to the main patient entrance could allow the space for the ambulance to double as a drop-off area for WheelTrans. This location must be separate and distinct from any service areas.
- Bicycle parking is very important to the faculty, staff and students at the Faculty of Dentistry. The Faculty currently has 20-25 bicycle parking spaces secured within a cage along the Elm Street façade of the existing Dentistry building. They would like to see the number of parking spaces grow to 30 - 40 similarly situated spaces, based on the expected increase in student numbers, along with the increasing popularity of the green movement.

For the vast number of clients and students who will arrive at the site via public transportation, access to subway and/or streetcar lines with regular stops would be beneficial.

## V. RESOURCE IMPLICATIONS

### a) Total Project Cost Estimate

At 39,200 gross sq metres, the proposed building would be the largest constructed by the University since the 1960's. It would be larger than the Bahen Centre at 35,000 GSM and approximately twice the size of the CCBR building at 21,000 GSM. It would be surpassed in size on the St George campus only by Robarts Library and the Medical Sciences Building.

As the Project Committee is submitting an interim report at this time, the Real Estate Office prepared a total project cost estimate at an approximation, ballpark, level only, to assist with further discussion and development of the project. As such, the normal detailed costing using an external cost consultant for all required elements was not undertaken.

88 – 112 College Street - Site 14:

The rough order of magnitude Total Project Cost for the Faculty of Dentistry building project if constructed on Site 14 in 2010 dollars, is estimated to be in the area of \$325M.

The Faculty of Medicine has plans to relocate many of the current occupants and decommission most of the space currently occupied on Site 14, however, there are not yet plans for relocating the Department of Surgery and most of the Banting and Best Department of Medical Research, for this purpose assumed to occupy about 2,170 nasm. An additional \$6.0 million to \$12.0 million may be required for renovation assuming existing space can be found to accommodate these secondary effects and depending on

suitability. A complete new building of this magnitude would be expected to be in the \$32M range. All costs expressed in 2010 dollars. As these buildings are being used for staging and short term allocations for university functions, a full review of requirements would be required at the time a project is initiated on this site.

#### Renovated Existing Building:

In a scenario in which a building of adequate size is available, it is assumed that significant renovations will still be required, and that some unique program elements such as the large clinics and the Vivarium facilities will require new construction. Potentially also there could be areas of an existing building such as basement, service, core and utility space that might need little or no work. An existing building which could be modified to meet the needs of the Faculty of Dentistry the range of total project cost in 2010 dollars might be \$150M to \$165M not including any acquisition costs, and depending on the characteristics of the building. This range assumes approximately 6,800 GSM of new construction for clinics and Vivarium, and approximately 24,500 GSM of moderate to extensive renovation.

These approximate costs are subject to a variety of uncertainties, inflation in the construction industry, and the outcome of further planning and due diligence that would be required in either scenario.

The Total Project Cost for the Faculty of Dentistry building project, including all taxes, contingencies, permits and professional fees, furnishings and equipment, landscaping and miscellaneous costs, is estimated to be \$325 M. for Site 14 (excluding secondary effects) and potentially \$150 to \$165M (excluding land acquisition) if the university were to purchase a site with an existing building which could be modified to meet the needs of the Faculty of Dentistry.

For the moment an escalation factor of 4% per annum should be assumed.

#### **b) Schedule**

There is a correlation between project size, complexity and expected total duration. In terms of peer University of Toronto projects, both the Donnelly CCBR and Leslie Dan Pharmacy building took about 4 ½ years from the appointment of an architect, to occupancy. It is therefore possible that a project of the size and complexity of a new building for Dentistry could take at least five years – approximately 15 – 18 months in design and 42 - 45 months in construction.

A renovation scenario would permit a phased design and construction process and potentially could be carried out in substantially less time, perhaps 2 ½ - 3 years in total.

Depending on the process chosen for selection, the decision on choice of design team could take 3 – 6 months, in addition to the durations suggested above.

#### **c) Operating Costs**

A detailed utilization analysis of the Faculty's space requirements was undertaken and it was determined that a facility of 19,600 nasm (39,200 gross square meters) would be required to accommodate the Faculty of Dentistry. Based on the size and complexity of the space program, the committee reviewed all possible options to provide the required space for the Faculty of Dentistry. As the Project Committee determined that an interim report would be most appropriate for submission to Planning and Budget, the Real Estate Office prepared total project cost estimates at an approximation, ballpark, level only in order to assist with further discussion and development of the project. As such, the normal detailed costing using an external cost consultant for all required elements was not undertaken.

Three options were studied in detail:

1. Renovate 124 Edward Street

While the basic academic and research programmes of the Faculty could possibly fit into the building with a storey and a half addition and extensive renovation to the existing building, there would still not be space to accommodate the intramural practice, any enrolment expansion or a contiguous physical presence for the Centre for the Study of Pain. Importantly, the Faculty would remain isolated from the rest of the campus. There is the problem, also, that in order to build the additional storey and a half, the site would require zoning permissions that would entail a change to the medical helicopter flight path.

To be functional and effective, the space in the building would need to be significantly re-organized. Aside from the cost and disruption that this would involve, given the limitations of an existing building, an existing addition and a new addition that will come encumbered with restrictions on its use, it is extremely unlikely that the result would be optimal for the Faculty. Finally, raising funds to achieve a sub-optimal solution could be difficult.

Consequently, the renovation and re-use of the existing Dentistry building proved to be unworkable, and costing was not pursued for this option.

## 2. Construct A New Building On Site 14

Site 14 is an available site, well situated to house the faculty of Dentistry. The close proximity to the health sciences disciplines at the University and the teaching hospitals would provide opportunities to strengthen collaboration. The Faculty's research strengths are also compatible with initiatives at MaRS, located across the street. Access to public transportation (necessary for the clinical service) is readily available and more direct. However, this option would be a long term, high cost option.

At 39,200 gross sq metres, the proposed building would be the largest constructed by the University since the 1960's. The rough order of magnitude Total Project Cost for a new building for the Faculty of Dentistry constructed on Site 14 in 2010 dollars is estimated to be in the area of \$325M. The Faculty of Medicine has plans to relocate many of the current occupants and decommission most of the space currently occupied on Site 14, however these are not yet complete. Additional funding will be required for these secondary effects.

There is a correlation between project size, complexity and expected total duration. In terms of peer University of Toronto projects, both the Donnelly CCBR and Leslie Dan Pharmacy building took about 4 ½ years from the appointment of an architect, occupancy. It is therefore possible that a project of the size and complexity of a new building for Dentistry could take at least five years – approximately 15 – 18 months in design and 42 - 45 months in construction.

The operating budget for a new building, if the CCBR at \$3.25M annually is taken as a model, could be expected to almost be doubled in a building of double the size, or about \$6.0M, an increase of \$3.1M for the Faculty of Dentistry.

The overall cost of this option was considered prohibitive.

## 3. Purchase an Existing Building and Renovate

Given the high costs of developing a site for a new building for the Oral Health Centre, the Committee also considered purchasing an existing building that could be modified, renovated and modestly expanded to meet the programmatic needs of the Faculty of Dentistry. Although there may be a few options close to the health sciences precinct of the University, there have yet to be any negotiations regarding such a site.

In a scenario in which a building of adequate size is available, it is assumed that significant renovations will still be required, and that some unique program elements such as the large clinics and the Vivarium facilities will require new construction. Potentially there could be areas of



an existing building such as basement, service, core and utility space that might need little or no work. An existing building which could be modified to meet the needs of the Faculty of Dentistry the range of total project cost in 2010 dollars might be \$150M to \$165M and depending on the characteristics of the building. This range assumes approximately 6,800 GSM of new construction for clinics and Vivarium, and approximately 24,500 GSM of moderate to extensive renovation.

Acquisition costs would be additional.

A renovation scenario would permit a phased design and construction process and potentially could be carried out in perhaps 2 ½ - 3 years in total after acquiring the site.

The operating costs in a renovated building as described above with a modern vivarium, could be expected to double to at least \$4.5M, an increase of \$1.6M annually in current dollars, for the Faculty of Dentistry over the current operating costs.

The building at 124 Edward Street would be sold once the new facility is occupied and the proceeds from the sale applied to the cost of the new facility. It is not yet known what the anticipated proceeds may be for this building.

Fundraising by the Faculty is required to implement this project.

## **SCHEDULE**

This Interim Report is being brought forward for approval in principle of the increased space needs for the Faculty of Dentistry and to initiate fundraising for this purpose. Further refinement of the space requirements, site analysis and costs will be necessary to finalize the project committee report. A final report is expected to come forward for consideration once a site and a plan for acquisition meeting the requirements of the Faculty have been identified.

## **FUNDING SOURCES**

The estimated costs for the project being recommended as described in renovated space for the Faculty of Dentistry are in the \$150M - \$165M range exclusive of the cost to purchase the site. Funding for this project will be from external sources which will be identified in the final report.

## **RECOMMENDATIONS**

Recommendations:

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

1. THAT the Interim Project Planning Report for an Oral Health Science Complex be approved in principle to accommodate the activities and functions as described and to facilitate the necessary fundraising related to the proposed project.

# APPENDIX A – COU SPACE GUIDELINES

FACULTY OF DENTISTRY		Input Measure	NASM Generated	NASM Existing
Category	COU Space Formula			
<b>Classrooms</b>	# FTE students x 1.23 nasm			
	# FTE Undergraduate Students (planned for 2013/2014)			
	DDS Year One	64.00		
	DDS Year Two	64.00		
	DDS Year Three	94.00		
	DDS Year Four	94.00		
	<b>Subtotal FTE DDS</b>	<b>316.00</b>		
	# FTE Graduate Students			
	FTE Doctoral - PHD	30.00		
	FTE Masters- Doctoral Stream - MA	24.00		
FTE Masters- Professional Stream	70.00			
<b>Subtotal FTE Graduate Students</b>	<b>124.00</b>			
<b>Total FTE</b>		<b>440.00</b>		
	<b>Classroom Facilities Generated</b>		<b>541</b>	<b>972</b>
<b>Undergraduate Teaching Laboratories/ Clinics</b>	Undergraduate Weekly Lab/Clinic Student Contact Hours x .6 nasm (includes 46 FTE growth)			
	64 FTE 1st year DDS x (508 hours/26 weeks) 09/10 WSLCH from Calendar	1,250.46		
	64 FTE 2nd year DDS x (490hours/26 weeks) 09/10 WSLCH from Calendar	1,206.15		
	94 FTE 3rd year DDS x (919 hours/26 weeks) 09/10 WSLCH from Calendar	3,322.54		
	94 FTE 4th year DDS x (831 hours/26 weeks) 09/10 WSLCH from Calendar	3,004.38		
	<b>Total WSLCHs</b>	<b>8,783.54</b>		
	<b>Teaching Laboratory space required</b>		<b>5,270</b>	<b>4,532</b>
<b>Research Laboratories</b>	# FTE Faculty + 50% FTE graduate students + 50% FTE Pdfs/Res Assoc s x 45 nasm			
	# FTE Faculty	71.87		
	# FTE PdF and Research Associates x 50%	4.50		
	# FTE Graduate Students x 50%	62.00		
	<b>Total Input Measure</b>	<b>138.37</b>		
	<b>Research Laboratory space required</b>		<b>6,227</b>	<b>3,790</b>
<b>Academic Offices</b>	# FTE academic appointments + 15% supplement x 13 nasm			
	# FTE Faculty plus 15%	71.87		
	# FTE Research Associates	10.78		
	# FTE PdF	2.00		
	# FTE PdF	7.00		

		<b>Total Input Measure</b>	<b>91.65</b>		
		<b>Academic Office space required</b>		<b>1,191</b>	<b>1,176</b>
<b>Graduate Student Offices</b>	# FTE Graduate Students x 4 nasm				
	FTE Masters- Doctoral Stream - MA		24.00		
	FTE Masters- Professional Stream		73.00		
	# FTE Ph. D students		34.00		
		<b>Total Input Measure</b>	<b>131.00</b>		
	<b>Total Graduate Student Office Space Required</b>			<b>524</b>	<b>166</b>
<b>Non-Academic Offices</b>	# FTE non-academic appointments x 13 nasm				
	Admin Staff FTE requiring offices		79.00		
		<b>Total Input Measure</b>	<b>79.00</b>		
	<b>Non-Academic Office nasm required</b>			<b>1,027</b>	<b>1,311</b>
<b>Departmental Support Space</b>	sum of academic, non-academic and graduate student office space required x 25% plus support space for Clinical Staff - FTE		102.55		
	<b>Total Departmental Support Space required</b>			<b>1,019</b>	<b>1,143</b>
<b>General University Space</b>	<i>Library Study, .6 nasm per FTE student</i>		440	264	<b>755</b>
	<i>Equivalent Volumes, .005 per equivalent volume</i>		34,898	174	<i>incl above</i>
	<i>Library Office and Support Space, 25% of generated for stack &amp; study</i>		438	110	<i>incl above</i>
	<i>Student &amp; Common Use Space, Food Services, Museum, 2 nasm per FTE</i>		440	880	<b>846</b>
	<i>Plant Maintenance/Building Services, Bldg nasm *.015</i>		20,326	305	
				<b>1,733</b>	<b>1,601</b>
	<b>Grand Totals</b>			<b>17,532</b>	<b>14,691</b>

## **APPENDIX B**

**CONDITION REPORT OF 124 EDWARD STREET  
DEPARTMENT OF FACILITIES AND SERVICES  
UNIVERSITY OF TORONTO**

September 14, 2006

**MEMORANDUM TO: Shirley Roll**

**Re: Dentistry Project Planning Committee  
Condition of Existing Building at 124 Edward Street**

The original building was constructed in 1959, with a major addition in the mid 1980's. As a general comment, the facility used by the Faculty of Dentistry is in reasonable condition; however, the activities of the Faculty would appear in many cases to have exceeded the limits of the existing building. The following is a report on the limitations of the present conditions in light of the current and future requirements of the Faculty.

First, though, a general comment must be made on the assessment of the condition of a facility. In the annual joint report to the Ministry from the COU in collaboration with OAPPA, a clear distinction is made between "deferred maintenance" and "adaptation/renewal renovations". Specifically the term deferred maintenance is defined as "work that has been deferred on a planned or unplanned basis to a future budget cycle or postponed until funds become available". Adaptation / renewal renovations are defined as the renewal of facilities to change the interior alignment of space or physical characteristics of an existing building so that it can be used effectively, be adapted for new or modern use, or comply with existing codes. Deferred maintenance work is categorized from currently critical (i.e. requires immediate attention) to necessary/not yet critical (i.e. will require work to prevent further deterioration). Adaptation/renewal renovations are categorized as recommended (i.e. a sensible improvement to the facility, but not required for the most basic function of a facility), or "does not meet current codes/standards" (i.e. currently grandfathered under previous codes, but required if significant work is performed on the building).

### **Asbestos**

As a general statement, the 1959 wing of the building has asbestos, the 1980's wing does not. A detailed audit in line with the current regulations has been performed and we are awaiting the summary report.

Asbestos which is well maintained is a perfectly acceptable insulator. Costs incurred to abate this material in order to allow renovations, are simply considered part of the cost of that renovation, in the same way that tearing down a wall to allow expansion of a room would be. Damaged asbestos requiring repairs would be considered deferred maintenance.

### **City water feed**

There is only one feed from Elm Street. Isolating valves on the main upstream and downstream allow continued service in the event of a break on the main. If, however, the whole main is down, the building has no other source of water. Any adaptation of the facility should consider adding a second feed.

The original building contains large quantities of galvanized pipe, which sometimes causes rust at the chairs in the clinic. It is assumed that the re-working of the building to accommodate the Faculty's new directions would include replacement of this piping with copper as a matter of course.

### **Ventilation**

The ventilation system in the 1980's section of the building is quite adequate and in good condition.

The teaching and research areas of the building see unique challenges: there are workshop areas where students engage in grinding and firing of ceramics. The clinics handle large numbers of patients, with students, instructors and now computers in tow. Medical gases are used. Internal heat loads from sterilizers, computers, X-ray equipment and ovens have to be balanced by a supply air system that is now inadequate to the task, both in cooling capacity and their ability to maintain proper static pressure. Areas that were, for instance, formerly storage space, are now fitted out for laboratory use, with no improvements made to the ventilation. Upgrades to the facility if renovations are contemplated, would be hampered by the limited ceiling space available for ducts.

The existing building has very rudimentary controls with a single thermostat controlling the radiators, variable air volume box and reheats in multiple rooms. Many of the control valves are located in the ceiling, where the presence of asbestos increases the difficulty of maintenance.

Humidification is achieved using steam; however, proper levels cannot be maintained because the building envelope and single glazed windows would be targets for destructive condensation.

The support areas for the clinics are under-ventilated because of higher use than they were originally intended for. While the cooling system is able to pull the temperature down to improve comfort, the chemicals prepared and used in these areas still linger.

### **Special mechanical systems**

*Dust collector* – For the current level of use and number of connections, this equipment seems to be undersized, with not sufficient suction being produced.

*Vacuum system* – The surgical system is only 7 years old and seems to be adequate.

The oral vacuum system which serves the clinic chairs, on the other hand, is undersized for its current use. The tank is not large enough for the increased water flow and must be manually dumped when full. Solids are removed twice per year. The system should be upgraded with a mercury recovery device. When the galvanized branch lines were replaced two years ago, the risers were not. They may be subject to some corrosion.

*Dental compressed air system* – No problems are noted.

### **Air conditioning system chillers**

This will be replaced as part of the University's major Energy Efficiency program.

### **Emergency power**

Only life safety systems (i.e. fire alarms, lowering elevator to the ground floor, emergency lights) are provided with backup power in accordance with the minimum standard.

### **Electrical power**

The wiring for branch circuits is nearing the end of its life but it is assumed that the normal course of renovations to adapt the building to its projected needs would include replacement as a matter of course. Our understanding is that because of the additional power requirements imposed by the new computers and other equipment in the clinics, the X-ray and the chairs cannot be operated at the same time.

Present capacity of the power supply to the building is 1,680 kW. The present maximum load is 1,209 kW, leaving 471 kW spare. Assuming that additional floors would cover 23,000 square feet as was considered in 1999, and that typical loading would be 5 W per square feet plus 3 W per square feet for additional mechanical equipment, the total incremental load would be approximately only 184 kW, well within the available spare capacity. However, if the renovations include the installation of special equipment with substantial power draws, the effect on the available capacity would have to be separately evaluated.

### **Fire Safety**

Although there are no items that are currently required to be upgraded by retrofit legislation, we do have two comments for consideration, as follows:

#### 1) Sprinkler Protection

Sprinkler protection in the older half of the building is only provided in the below grade areas. In the newer part of the building, all areas are fully sprinklered. Although this is completely legal, it creates two distinct levels of fire protection. A fire in one part of the building would automatically be suppressed and likely extinguished in the early stages, whereas in another part of the building, a fire would spread unheeded by any suppression until the arrival of the fire department. If this building were built today, it would be fully sprinklered throughout, providing a consistent, higher level of protection.

## 2) Fire Alarm

The fire alarm system is obsolete by today's standards, and although it is not showing signs of imminent maintenance problems, it does not suit the building use as well as a newer system could.

Specifically, a newer system would be fully addressable, providing pinpoint information on any alarm condition, thereby allowing response personnel to investigate more efficiently, and ultimately reducing "down time" for the building and its occupants. Another enhancement with a newer system would be to change it to a two-stage system, with the inclusion of integrated voice communication, which would be complementary to the use of the building, since patients are routinely under anaesthesia and conditions are more like those in a B2 occupancy (similar to hospitals) with respect to their evacuation. With a two-stage system, there is an initial fire alarm "alert" signal that sounds a tone every 3 seconds over speakers, at which point occupants are made aware of a potential problem, but are not required to evacuate. Should on-site, trained supervisory staff determine that the alarm is not a fire, they have the opportunity to cancel an automatic total evacuation within the first 5 minutes of alarm. In addition, live voice announcements and instructions can be provided to give occupants additional information about the alarm condition. All of these features would be well suited to the special procedures and environment in this facility.

## **Building Fabric**

The existing building's envelope and interiors suffer from a number of deferred maintenance and renewal needs. Several of these would be eliminated during the course of renovations to adapt the present building to the enlarged functions of the Faculty. These would include renewal of the interior wall coverings of common areas, halls, lobbies and reception areas, replacement of flooring materials in common areas and renewal of ceilings in the common areas and clinics, as well as replacement of the lobby glazing with tempered glass.

The windows in the 1959 wing of the building are single-glazed, and require caulking. Return on investment through energy savings from double-glazing would not justify complete replacement, although better functionality of the building (i.e. humidity control) may be a rationale for including them in the renovations. If this is not a concern of the Faculty, then simple caulking may suffice.

Items that have suffered from insufficient funding for regular upkeep include: small areas of spalling concrete on exterior exist and walkways (\$25,000); replacement of the clinic isolation valves, many of which do not operate, requiring total building water shutdowns to affect repairs (\$100,000); and replacement of defective gas nozzles identified during bi-annual inspections (\$25,000).

The roof over the 1980's wing is nearing the end of its life and has started leaking. Depending on the adaptation plans for the existing building, replacement or even repairs may be precluded should additional floors be considered to accommodate the Faculty.



## **Landscaping**

It is assumed that during any major re-work of the building would include a re-design of the existing outdoor environment of the building. It is recommended that the new landscaping scheme should include not just new plantings and furniture, but also an irrigation system to better preserve the improvements the Faculty is considering.

Depending on the scope of the rebuilding of the existing structure, several deferred renewal and maintenance items may be eliminated in the course of that work. If not, these would include: repairs to existing hard surfaces (\$200,000); replacement of the concrete steps and pathways (\$80,000); repair of pavers and interlocking bricks along the east side (\$100,000); and new window well covers (\$60,000).

*Please note that the scope of this review does not include any requirements of the parking areas.*

## **Exterior Lighting**

A recent audit by the University Police has indicated a number of areas where lighting should be improved for the sake of personal safety. F&S will address these in the short term regardless of the eventual plans for the building.

I hope that this brief report provides the information required by the committee. Should there be any questions, I would be happy to answer them.

Bruce Dodds  
Director, Utilities and Building Operations

Copies to:     Ron Swail  
                  Gary Nower  
                  Ray Cheung