7. Resource Allocation

Our resources directly impact our ability to achieve the important and ambitious academic goals we have set in our Academic Plan. Over the past year, we effectively and strategically used our resources, including space, budget, infrastructure and personnel, to advance our excellence in research and innovation, support faculty and staff, and create an extraordinary learning environment for our students.

In 2014–2015, we maintained a strong financial position, with total revenue growing 7.5 per cent over the previous year, due primarily to increases in research funding, tuition and international student enrolment. Revenue growth, in conjunction with careful fiscal management and judicious budgeting, supported ongoing infrastructure upgrades and investments in strategic Faculty initiatives, and built financial reserves for future renewal and other key priorities.

The Dean's Strategic Fund (DSF) held its fifth annual call for proposals for projects that will have a broad impact within the Faculty, such as furthering our Academic Plan goals in developing multi-departmental and collaborative initiatives. From this call, we committed $3.97 million for 13 initiatives, bringing total funding to $18 million since the DSF was created in 2011. DSF projects funded in 2015 include:

- Engineering Education for Sustainable Cities in Africa, an initiative from the Centre for Global Engineering and the departments of Civil (CivE) and Mechanical & Industrial Engineering (MIE). This cross-disciplinary research program will focus on developing engineering education strategies that can lead to sustainable infrastructure for future global mega-cities, particularly for African cities that are expected to experience tremendous population growth in the coming decades.
- The Collaboratory for Advanced Learning and Innovation in Bioengineering Research and Education, from the Institute of Biomaterials and Biomedical Engineering (IBBME). This initiative will provide enhanced learning opportunities in synthetic biology, physiology and advanced functional imaging. In addition, there will be an expansion of the related IBBME laboratories and development of a suite of cross-departmental collaborative courses between U of T Engineering and the Faculty of Medicine.

We allocate part of the DSF to the Engineering Instructional Innovation Program (EIIP) to support the development of new teaching approaches and better curriculum to improve the student experience. In 2014–2015, we funded an additional three initiatives through this program, bringing the total number of EIIP initiatives to eleven:

- The University of Toronto Institute for Aerospace Studies (UTIAS) and MIE received funding to offer integrated and complementary courses to MEng students in both programs by renovating two classrooms — one at UTIAS's Downsview location and one in the Mechanical Engineering Building on the downtown campus. The leading-edge tools and equipment will allow students to participate in lectures delivered from either location. A pilot graduate course designed specifically for "parallel classrooms" will also be developed with content from both fields.
- An initiative known as *Re-engineering Mathematics Education* will improve engineering education and re-energize engineering mathematics instruction.
- Funding was also awarded for development work to enhance instruction in thermodynamics, which will better connect theory with practice.

Previously funded initiatives also made excellent progress in 2014–2015. These include a project in Chemical Engineering & Applied Chemistry to develop collaborative skills in technical courses using team-based learning, and an initiative through Materials Science & Engineering to redesign the entire first-year materials program to improve the student experience through the creation of several types of reusable learning objects.

We made tremendous progress in 2015 toward our vision for the Centre for Engineering Innovation & Entrepreneurship (CEIE). Significant milestones included demolition of the existing structure on the site (February), rezoning by the City of Toronto (May), and tendering and awarding the construction contract (March and June). The commitment and generosity of our entire U of T Engineering community enabled us to break ground on June 24, 2015, at a celebratory event with more than 200 alumni, faculty, staff, students, industry partners and friends. Construction has progressed well over the summer and fall, and we are on track for this transformative new building to open in 2017.

We are maximizing our facilities through strategic renovations and innovative approaches to revitalizing existing spaces. We continue to test the pilot Technology Enhanced Active Learning (TEAL) room in the Sandford Fleming Building, which serves as a prototype for the active and collaborative learning spaces in the CEIE. We are testing different layouts and technologies and gathering feedback to determine the most effective design to ensure these unique rooms will encourage dynamic group work and successfully facilitate blended modalities of teaching and design. In addition, we are currently in discussion with Academic and Campus Events (ACE) to trade use of TEAL rooms in the CEIE for other classrooms located in U of T Engineering. CEIE is a Faculty of Applied Science & Engineering building and we will be able to optimize the use and capacity of all our classrooms by allowing ACE to use the CEIE TEAL rooms when they are not used by the

Faculty in exchange for the Faculty gaining space in current ACE rooms. This partnership will expand the options for our faculty and students and will increase the number of classrooms available to us.

While the CEIE is a key component in our strategy to alleviate our urgent space issues, we also continue to audit our existing facilities and infrastructure to ensure our faculty members can continue their innovative research and our students have access to the best laboratories, classrooms, club and study spaces. In 2014–2015, we made significant improvements to several facilities, including the installation of hallway study seating in the Bahen Centre, which accommodates 87 students. This seating gives Engineering students opportunities to study and complete assignments between classes and is part of our goal to continually improve the student experience. In the Galbraith Building, we completed the first and second phases of renovations to the Electrical Energy Systems Lab, with the design and replacement of the supporting high-voltage electrical infrastructure and stations. The third phase of the project is underway and will entail the purchase of equipment infrastructure and the development of new experimental systems to teach undergraduate and graduate courses that will focus on the creation of micro-grids, renewable energy and enabled smart grids. In summer 2015, our Human Resources team moved into newly renovated space in the Fields Institute to improve service delivery to the U of T Engineering community.

In 2014, the Ontario Centre for Characterization of Advanced Materials (OCCAM) opened to offer highly specialized tools to understand and manipulate matter at the atomic scale. The centre also emphasizes collaborative and multidisciplinary investigations and expects to facilitate more than 350 different research programs annually involving academic researchers and private companies. To support these programs, we renovated existing research labs to install electromagnetic shielding systems and a suite of electron microscopes. Other projects completed this past year included washroom renovations in the Galbraith Building to provide additional capacity and improve the distribution of men's and women's facilities, and completion of an electronic access control system for the Wallberg Building/D.L. Pratt Building complex to improve security for students, faculty and staff.

While we continue to be strategic and prudent in managing our resources, advancement remains a critical part of ensuring we can address both our academic and capital priorities. We had a highly successful fundraising year for philanthropic and research gifts in 2014–2015, with support from alumni, graduating students and other members of our vibrant community reaching $34.9 million. Alumni around the world have generously supported the CEIE and we are working with many of our engineering Asia-Pacific alumni groups

toward ambitious fundraising goals. Together with gifts from industry partners, this support will enable us to set a new standard for engineering education and research. In addition to the CEIE, we attracted strong support for research, education and entrepreneurship across diverse disciplines, including major gifts for biomedical engineering and for an entrepreneurship incubator at UTIAS. With our 2014–2015 advancement results, we have raised more than $152 million toward our campaign goal of $200 million for Boundless: The Campaign for the University of Toronto. We will continue our efforts to seek new and repeat donations to fully offset the remaining CEIE mortgage financing by the time the building opens in 2017.

RESOURCE ALLOCATION: YEAR 4 PROGRESS HIGHLIGHTS

7.1 Maximize quality academic time and effectiveness by increasing engagement in high value activities that support students' academic experience, contribute to knowledge creation, and advance engineering research frontiers.

- Added two administrative directors to further the mandates of BioZone and the Centre for Water Innovation, and one administrator to support the Institute for Robotics and Mechatronics and the Toronto Institute of Advanced Manufacturing, all starting in summer 2015
- Lowered our undergraduate-to-graduate student ratio to 2.24 in 2014–2015, from 2.35 the previous year, marking progress toward our long-term goal of 1.5 to help optimize academic time and classroom resources
- Reviewed with our academic units the local workload policies in conjunction with the University's Workload Policy and Procedures for Faculty and Librarians (WLPP)

7.2 Place emphasis on Engineering's strategic research areas when considering faculty hires.

- Initiated an interdisciplinary academic search for three new faculty members, focusing on cross-disciplinarity, diversity, research and teaching excellence, after successfully hiring three new interdisciplinary cross-appointed faculty members in 2013–2014

7.3 Provide a supportive environment for faculty members through mechanisms such as start-up funding, teaching skills workshops, and assistance via Associate Chairs, Research to create successful research proposals.

- Held a lunch-time panel series for faculty on best practices in research, including a session on collaborative and partnership research
- Prepared junior faculty to apply for Early Research Awards (ERA) by hosting a panel called "Succeeding in the ERA" and initiating an internal expert review during the competition to critique each of the Faculty's applications

- Supported NSERC Strategic Partnership Grants (SPG) and Collaborative Research and Training Experience (CREATE) applications
- Focused on industry-sponsored research and matching funding for various granting agency competitions
- Provided support to Ontario Research Fund–Research Excellence (ORF-RE) team applications and worked with faculty to build industry consortia
- Worked with faculty, particularly junior faculty, through the Faculty's Research Committee and Directors of Corporate Partnerships, to identify and pursue industry partners
- Continued to share best practices through the Research Committee to foster growth of Tri-Council sponsored research, which in turn affects the Faculty's Canada Research Chair (CRC) allocation
- Initiated a year-long teaching and learning workshop series coordinated jointly by the office of the Vice-Dean, Undergraduate, the Teaching Methods and Resources Committee, and students in the Masters/PhD collaborative program in Engineering Education

7.4 Improve our chances of being awarded funding for capital projects by pre-planning for various opportunities consistent with our goals and suitable for external funding sources such as CFI, Ontario Ministry of Training, Colleges and Universities (MTCU) and other capital grants. Increase the quality and quantity of space particularly through fundraising for new and revitalized buildings.

- Received six CFI John R. Evans Leaders Fund grants for a total of over $1 million
- Received two CFI Innovation Fund grants for a total of over $3.3 million
- Increased Research Infrastructure Funds to $17.3 million in 2013–2014 (up from $5.9 million in 2012-2013)
- Raised almost $80 million to date in support of the CEIE building

7.5 Enhance teaching and design facilities, upgrade undergraduate laboratory space, and make flexible space available for extra-curricular activities.

- Supported several new initiatives to upgrade facilities and equipment through the Dean's Strategic Fund including:
    - renovation of the Unit Operations Laboratory in the Wallberg Building to create an additional 200 net assignable square metres (NASMs) of wet lab space and increase student capacity from 48 to 60;
    - Faculty-wide video conferencing facilities to develop three systems in each of the Wallberg, Bahen and the Mechanical Engineering buildings;
    - purchase of precision machining equipment for engineering capstone projects to give undergraduate and graduate students experience in the use of high-precision manufacturing equipment and metrology and improve the performance of the manufactured prototypes; and

    - improvement of prototyping services to researchers and students through the Toronto Nanofabrication Centre.
- Continued to evaluate the renovated Sandford Fleming TEAL room to aid in the final design of the TEAL spaces in the CEIE

7.6 Provide reliable, accessible, effective computing services; create study spaces within and outside computer laboratories, library and classrooms so as to enhance interactive learning and socialization where today's student 'lives'.

- Added 87 student study spaces to the Bahen Centre inventory of hallway seating
- Currently installing another 63 student study spaces in the Bahen Centre and 20 spaces in the Wallberg Building
- Initiated renovation in the Lassonde Mining Building for a student study area and conferencing centre
- Completing an undergraduate teaching laboratory space audit, with the final report expected in December 2015

7.7 Encourage timely degree completion among doctoral stream students; increase research funding and graduate fellowships to support graduate students.

- Held time to graduation to an average of 5.3 years for PhD students and 2.0 years for MASc students
- Implemented a new software tracking system in ECE to record the progress of PhD students, which will also be available for use in other departments and institutes
- Continued to develop detailed data on time-to-completion, fast-tracking and scholarship success rates with the goal of using this data to identify and share best practices, as well as identify problems to be addressed
- Increased total graduate funding by 5.2% to $42.8 million in 2013–2014, up from $40.7 million in 2012–2013

7.8 Establish a strong Case for Support that addresses the Faculty's resource requirements and aligns the Faculty's critical need for improved space in the context of addressing educational and research priorities.

- Raised almost $80 million to date in support of the CEIE building, the cornerstone of our Engineering campaign
- Designated nearly half of all funds raised in 2014–2015 to research, student experience and programs, and student scholarships and awards
- Relocated the Human Resources office to the Fields Institute to improve service delivery

7.9 Increase long-term philanthropic support by strengthening the culture of advancement within the Faculty.

- Conducted advancement stakeholder meetings in the departments of Chemical Engineering & Applied Chemistry, Civil Engineering and Mechanical & Industrial Engineering to facilitate philanthropy and alumni relations priorities
- Supported and actively worked throughout the year with each U of T Engineering department and institute advisory board
- Actively pursued opportunities with top corporate prospects to leverage partnerships and add value to research and technology development
- Carried out successful fundraising campaigns in Asia-Pacific for named rooms in the CEIE
- Partnered with the Engineering Society to launch Skule™ Alumni Outreach (SkuleAO), a student-run program to assist alumni who wish to support and enhance the experiences of current students
- Expanded engagement with current students — our future alumni — by creating a new alumni outreach director position on the Engineering Society, initiating the inaugural Engineering Society Reunion of current and past officers of the Engineering Society and increasing participation in Graditude, which encourages graduating students to give back to future students