**Meeting**
1:30 p.m.
Needles Hall, Room 3407

Note: directions/parking information for external members has been distributed. Please convey regrets to Emily Schroeder at 519-888-4567, ext. 32749 or eschroeder@uwaterloo.ca.

### MEETING

#### OPEN SESSION

1. Conflict of Interest  
   Oral  Declaration

2. Remarks from the Chair  
   Oral  Information

3. Agenda/Additional Agenda Items  
   Oral  Input

**Consent Agenda**

**Motion:** To approve or receive for information by consent items 4-7 below.

4. Minutes of the 6 June 2017 Meeting  
   4  Decision

5. Report of the President  
   a. Sabbatical and Administrative Leaves/Administrative Appointments  
      12  Decision/Information  
   b. Recognition and Commendation  
      23  Information  
   c. Environmental Sustainability Strategy  
      Distributed  Information

6. Report of the Vice-President, Administration & Finance  
   a. Incidental Fee Changes  
      27  Decision

7. Report from the Executive Committee  
   28  Information

**Regular Agenda**

8. Business Arising from the Minutes  
   Input

9. Report of the President  
   a. President’s Update  
      29  Information/Discussion  
   b. Strategic Plan 2013-2018: Progress and Outcomes – Fall 2017 Update  
      44/Distributed  Information/Discussion
OPEN SESSION

   a. Undergraduate/Graduate Admissions Update – Cathy Newell Kelly, registrar and Jeff Casello, associate vice-president, graduate studies and postdoctoral affairs

BREAK

11. Reports from Committees
   a. Audit & Risk
   b. Building & Properties
   c. Finance & Investment
   d. Governance
   e. Pension & Benefits

12. Other Business

CONFIDENTIAL SESSION

13. Conflict of Interest

Consent Agenda

Motion: To approve or receive for information by consent items 14 and 15 below.

14. Minutes of the 6 June 2017 Meeting
15. Report of the President
   a. New Appointments with Tenure

Regular Agenda

16. Business Arising from the Minutes

17. Report of the President
   a. Donor List – FY15 Gifts and Pledges $250,000+

18. Naming Proposal

19. Reports from Committees
   a. Audit & Risk
   b. Governance

20. Other Business

21. Next Meeting: Tuesday 6 February 2018 at 1:30 p.m.

IN-CAMERA SESSION

22. Conflict of Interest
## IN-CAMERA SESSION

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KJJ/ees
24 October 2017

Karen Jack
University Secretary
Secretary to the Board of Governors
OPEN SESSION

1. CONFLICT OF INTEREST

Governors were asked to declare any conflicts they may have in relation to the items on the agenda. No conflicts were declared.

Governors were notified that conflict of interest declaration forms were distributed at places, and completed forms will be collected at the break.

2. REMARKS FROM THE CHAIR

Chair Forbes remarked upon her pleasure to return to the Board as chair and indicated that she looks forward to advancing the University’s strategic mission with fellow members.

Governor’s Last Meeting. Chair Forbes acknowledged Sally Gunz’s last meeting with thanks for her service. The Secretariat will hold a by-election by Senate to fill this position in the fall.

Governors’ First Meeting

A number of governors were attending their first meeting. The Chair acknowledged them, as follows:

- Community-at-Large Representatives:
  Cindy Forbes (chair of Board of Governors)
  Sheryl Kennedy (member of Audit & Risk Committee and Finance & Investment Committee)
  John Saabas (member of Finance & Investment Committee)

- Lieutenant Governor in Council Representatives:
  Kathy Bardswick (member of Pension & Benefits Committee)
  Peter Barr
  John Swainson (member of Audit & Risk Committee)
Faculty Representatives:
Jennifer Clapp (School of Environment, Resources and Sustainability)
Shannon Dea (Philosophy and Women’s Studies)
George Freeman (Electrical and Computer Engineering)
Bruce Richter (Combinatorics and Optimization)
Mark Seasons (School of Planning)

Undergraduate Student Representatives:
Hannah Beckett (Political Science – sent regrets, on co-op)
Antonio Brieva (president, Federation of Students)

Dinner Reception after Meeting
The Chair reminded all governors, vice-presidents and deans of the annual Board dinner to be held immediately after the meeting in the University Club.

Board of Governors Orientation
The Chair spoke to the Board of Governors orientation for new and returning governors held on Wednesday 24 May 2017. A summary of the day’s events is included in the open Governance Committee report. For governors who were unable to attend, the presentations have been uploaded to the Board of Governors SharePoint site.

President’s Golf Tournament
The Chair updated the Board on the 16th annual President’s Golf Tournament held on 5 June 2017 at Westmount Golf Club. All proceeds support the Athletics Excellence and Awards Fund. These funds provide for University of Waterloo student athletes and teams to compete at major championship competitions and receive awards.

3. AGENDA/ADDITIONAL AGENDA ITEMS
The Board heard a motion to approve the agenda as distributed, subject to the revision of Item 18.a., in the Report of the President, New Appointments with Tenure, in confidential session, and those changes sent to members on 3 June (revised open report from Pension & Benefits Committee [14.e.] with a clarification, date correction and new footnote; new open report for information from the Responsible Investing Working Group [14.f.]; revised confidential report from the Governance Committee [21.b.] with two new motions.

Pugh and Windsor. Carried unanimously.

Consent Agenda
The Board heard a motion to approve and/or receive for information by consent items 4-8 below, subject to noting that the Status of Women and Equity Committee mentioned on page 16 is a standing committee of the Faculty Association, not the University.

Dea and Arora.

4. MINUTES OF THE 4 APRIL 2017 MEETING
The Board approved the minutes of the meeting as distributed.

5. REPORT OF THE PRESIDENT
Recognition and Commendation. The Board received the report for information.
Sabbatical and Administrative Leaves and Administrative Appointments.

Motion: The Board heard a motion to approve the sabbatical leaves and changes as presented in the report.

The remaining items in the report were received for information.

6. REPORT OF THE VICE-PRESIDENT, ADMINISTRATION & FINANCE

Incidental Fees. The Board heard a motion to approve incidental fee changes as follows:

Motion: To approve the Federation of Students Fee as presented in the report.

Motion: To approve the Orientation Fee as presented in the report.

Motion: To approve the Federation of Students Administered Fee as presented in the report.

Motion: To approve the Graduate Student Association (GSA) Administered Fees as presented in the report.

7. REPORT FROM EXECUTIVE COMMITTEE

The Board received the report for information.

8. INSTITUTE FOR QUANTUM COMPUTING ANNUAL REPORT TO THE MINISTRY OF INNOVATION, SCIENCE, AND ECONOMIC DEVELOPMENT, EXECUTIVE SUMMARY

Motion: To approve the IQC annual report to ISED as presented in the report.

The question was called, and the motion carried unanimously.

Regular Agenda

9. BUSINESS ARISING FROM THE MINUTES

There was no business arising.

10. REPORT OF THE DEAN OF SCIENCE

Feridun Hamdullahpur introduced Dean Lemieux.

Dean Lemieux presented on the proposed new facility, Science Centre for Innovation. He spoke to: its layout and location; the intersection of the 3Is (innovation, internationalization and interdisciplinarity) with the thematic areas of biological and environmental sciences; the plan to enable interactions and new discoveries in various interdisciplinary themes; the integration with science entrepreneurship activities; the first global connector hub will be located in Hong Kong. In response to questions, Lemieux advised that the selected themes resulted from submitted proposals, the Accelerator Centre will have a presence, the goal is to enable new and emerging discoveries by enabling interactions, and the president spoke to funding efforts and the support evident from the government and donors.

11. REPORT OF THE PRESIDENT

President’s Update. The President updated the Board of Governors on a number of issues summarized in his written report, and otherwise, including: the Ontario budget (no new funding for enrollment growth, money is available through a competitive process for experiential education positions, technology funding), recent government visits, the federal Innovation Supercluster Initiative and how the University is looking to participate, community engagement activities, and the recent successful Innovation Summit. He invited members to reflect on the role of universities in today’s society. He spoke to: the value of a university education; challenges being faced; the complex social and environmental challenges facing society; the need for modernization; how Waterloo differentiates itself; the benefits of the 3I concept, with “imagination” added too; the need
12. REPORT OF THE VICE-PRESIDENT, ACADEMIC & PROVOST

Undergraduate Admissions Update. The Vice-President, Academic & Provost introduced Maureen Jones, interim university registrar. Jones provided the Board of Governors with an update on fall 2017 admissions. She advised that acceptances for fall 2017 are in line with expectations and the percentage receiving scholarships is up, indicating that the University will have a very strong incoming class. In response to questions, Jones and Orchard advised: work is being done to diversify the international complement; each Faculty has a different international strategy and some caps do exist; strategic enrollment planning considers space and capacity matters; admission levels and acceptance rates are based on experience and past behaviour.

Graduate Enrolment Update. The Vice-President, Academic & Provost introduced Jeff Casello, associate vice-president, graduate studies and postdoctoral affairs. Casello provided the Board with an update on fall 2017 graduate student enrolment. He advised that domestic acceptance rates are up two times from last year, international acceptances look good, and recent work with the Faculties has led to the University being ahead in terms of acceptance rates from where it was last year at this time. In discussion: the goal of increasing the University’s numbers of graduate students is being worked on actively and there is evidence of success.

13. CONFLICT OF INTEREST DECLARATION FORM

Governors were instructed to complete the forms, which were subsequently collected during the break.

14. REPORTS FROM COMMITTEES

Audit & Risk.

• Delegation of Authority to Approve University of Waterloo Financial Statements, 2016-17

The Board heard a motion that it delegate its authority to approve the University’s audited financial statements for the fiscal year ended 30 April 2017 (the “Financial Statements”) to the Board Executive Committee.

Heins and Swainson. Carried unanimously.

Heins agreed to have the committee look at the timing of the financial statements’ approval.

Building & Properties. The Board received the report for information.

Finance & Investment. The Board received the report for information.

Governance. The Board received the report for information. In response to a request, the chair agreed to share the “core competencies” document with the Board.

Pension & Benefits.

• Actuarial Valuation of the Pension Plan as at 1 January 2017

The Board heard a motion to approve the filing of the actuarial valuation report as at 1 January 2017 with the Financial Services Commission of Ontario (FSCO) and the Canada Revenue Agency (CRA).
Scott and Arora. After some minor clarifications by Huber, the motion carried unanimously.

The remaining items in the report were received for information.

**Responsible Investing Working Group.** The Board received the report for information.

**15. OTHER BUSINESS**

On behalf of the Board, the president acknowledged Ian Orchard’s last meeting and thanked him for his exceptional work. A round of applause and thanks from Orchard followed.

The Board convened in confidential session.

8 August 2017

Karen Jack
University Secretary
Secretary to the Board of Governors
CONFIDENTIAL SESSION

The confidential minutes have been removed.
The confidential minutes have been removed.
IN-CAMERA SESSION

The *in-camera* minutes have been removed.
FOR APPROVAL

1. **Sabbatical and Administrative Leaves**

The University of Waterloo Policy 3 – Sabbatical and Other Leaves for Faculty Members [excerpts below, full text available at: [http://uwaterloo.ca/secretariat-general-counsel/policies-procedures-guidelines/policy-3](http://uwaterloo.ca/secretariat-general-counsel/policies-procedures-guidelines/policy-3)] sets out the purpose of leaves for faculty members as well as the requirements/responsibilities of faculty who are granted such leave.

*The granting of a leave . . . depends on the University’s assessment of the value of such leave to the institution as well as to the individual, and on whether teaching and other responsibilities of the applicant can be adequately provided for in her/his absence. A faculty member who is granted a sabbatical or other leave is expected to return to duties in the University for at least one year and upon return will be expected to submit a brief report to the Department Chair regarding scholarly activities while on leave.*

*The purpose of a sabbatical leave is to contribute to professional development, enabling members to keep abreast of emerging developments in their particular fields and enhancing their effectiveness as teachers, researchers and scholars. Such leaves also help to prevent the development of closed or parochial environments by making it possible for faculty members to travel to differing locales where special research equipment may be available or specific discipline advances have been accomplished. Sabbaticals provide an opportunity for intellectual growth and enrichment as well as for scholarly renewal and reassessment.*

. . . the granting of sabbatical leave is contingent upon the faculty member’s department being able to make the necessary arrangements to accommodate such an absence, and also upon the financial resources of the University in any given year. Should problems arise in any of the above, it may be necessary to postpone individual requests until such time as all the conditions can be satisfied.

- **Sabbatical Leaves**
  - **Armitage, Derek,** Environment, Resources and Sustainability, July 1, 2018 to December 31, 2018 at 100% salary
    *I will undertake field-work activities associated with several SSHRC-funded projects for which I am the Principal Investigator (PI) or Co-Investigator (CI), including my SSHRC Insight Grant and the SSHRC OceanCanada Partnership Grant. I will also complete several research/writing projects including the draft of a new book.*
  - **Boychuk, Gerard,** Political Science, January 1, 2018 to June 30, 2018 at 100% salary
    *I will undertake a major research project on the causes and consequences of the emergence of populism as a political style in the northern Great Plains states and Canadian Prairie Provinces from 1900-1950. The project will require considerable research and dissemination travel within Canada and the United States.*
Boyle, Philip, Sociology and Legal Studies, January 1, 2018 to June 30, 2018 at 100% salary  
My research is concerned with contemporary developments in policing, security, and public safety, particularly in relation to cities and urban governance. My current project examines the historical and contemporary dimensions of critical infrastructure security and is funded by a SSHRC Insight Development Grant.

Callaghan, Jack, Kinesiology, January 1, 2018 to June 30, 2018 at 100% salary  
Pursuit of independent and collaborative research activities including short research trips to laboratories of collaborators in Canada, Australia and the United States of America for the purposes of acquisition of new skills, and collaborative research writing projects. Preparation of research grants for new initiatives in musculoskeletal injury prevention research. Preparation of manuscripts and reports from ongoing research projects for publication.

Cooper, Tara, Fine Arts, January 1, 2018 to June 30, 2018 at 85% salary  
I will develop “The Canadian Explorers’ Club” – a new creation/exhibition project with McGill University’s Redpath Museum. This includes researching the collection as an artist-in-resident, and a production-based residency with Vermont Studio Center. I will also be completing “Tall Tales of Mill Street”, a commissioned sculpture for Kitchener’s LRT, and have a solo exhibition at SNAP Gallery (Edmonton).

Courtenay, Simon, Environment, Resources and Sustainability, January 1, 2018 to December 31, 2018 at 100% salary  
I will pursue my research into the development and application of monitoring programs in support of cumulative effects assessment at the watershed and regional levels. Time will be divided among writing in Waterloo and ongoing research projects in Atlantic Canada and Australia (Australian Rivers Institute, Griffith University, Nathan) studying the Healthy Waterways Project, SE Queensland.

Cui, Bo, Electrical and Computer Engineering, January 1, 2018 to June 30, 2018 at 85% salary  
I will be concentrating on my research in microelectromechanical systems (MEMS), and nano-structure and device fabrication. I will also be travelling to the Beijing University of Chemical Technology to collaborate with Professor Duli Yu, Guogao Microsystems Inc. in China, the Electron, Ion, and Photon Beam Technology and Nanofabrication (EIPBN) conference in Puerto Rico, and the Nanotech-2018 conference in Rome for which I am the Organizing Committee Member.

Curtis, Lori, Economics, January 1, 2018 to June 30, 2018 at 85% salary  
Health, poverty, and inequality are recognized as multidimensional experiences necessitating rigorous studies which take the multidimensionality of their causes and consequences into consideration. My studies examine, in the Canadian context, who is recognized as ‘poor’ under different definitions of poverty, how increasing levels of trade affect health and inequality, and how in-hospital nutrition interventions may increase patient’s quality-of-life.

Dagtas, Secil, Anthropology, January 1, 2018 to June 30, 2018 at 100% salary  
I will be based in Lyon, France, as a residential fellow at the Collegium de Lyon and a participant of the UNESCO Chair “Memory, Cultures and Interculturality”. As part of the fellowship, I will give research lectures, write up research I have conducted in the past two years, revise already submitted work, and establish and strengthen ties with colleagues in Europe, Canada, and Turkey for my ongoing ethnographic and archival research on the religious experiences of displaced populations.
Damen, Mohamed Oussama, Electrical and Computer Engineering, January 1, 2018 to June 30, 2018 at 100% salary
I plan to visit Professor G. Caire at the Technical University of Berlin to collaborate on research on massive Multiple-Input Multiple-Output (MIMO) for 5G systems. The focus will mainly be multi-user hybrid beamforming and detection algorithms for massive MIMO, which has many applications in next generation wireless technology systems.

Davison, Daniel, Electrical and Computer Engineering, May 1, 2018 to April 30, 2019 at 100% salary
My research expertise is in the field of control systems engineering. In recent years, colleagues and I have developed a new multivariable control technique that, in preliminary simulations, has shown remarkable good performance despite being relatively simple to both design and to implement. I plan to apply this new technique in various biomedical application areas.

Duimering, Robert, Management Sciences, January 1, 2018 to December 31, 2018 at 85% salary
I will be preparing manuscripts describing recent field studies and experiments on the effects of incentives on group problem solving, adaptive planning behaviour, and communication about ambiguous stimuli. I will also be developing new research projects investigating human decision processes in information retrieval, and adaptive problem solving behaviour in entrepreneurial product development and other technical settings.

Emelko, Monica, Civil and Environmental Engineering, January 1, 2018 to December 31, 2018 at 85% salary
I will spend seven months in the United Kingdom at Rothamsted Research and five months in Alberta (Cities of Calgary and Fort McMurray) working on developing climate change adaptation strategies for drinking water utilities across Canada and globally.

Fernandes, Myra, Psychology, March 1, 2018 to August 31, 2018 at 85% salary
I will implement a neuroimaging study at Grand River Hospital to examine brain regions contributing to memory in senior citizens. I will examine spatial memory using virtual reality technologies, collaboratively with colleagues at University of Bordeaux. I will present data at a conference in Prague, showing how social anxiety influences memory and plan on writing manuscripts stemming from recent projects.

Ferrer, Ana, Economics, January 1, 2018 to June 30, 2018 at 85% salary
I plan to finish one paper in progress about understanding the effect of language proficiency on the assimilation of immigrants in Canada. I also plan to complete a draft of a new paper examining the integration of immigrant women in Spain.

Fletcher, Christopher, Geography and Environmental Management, January 1, 2018 to June 30, 2018 at 85% salary
I will write articles for publication arising from my various research projects investigating the physical processes underpinning climate variability and change. I will also undertake strategic planning to think deeply about how to better integrate current and future directions for my research program.
Fraser, Doreen, Philosophy, January 1, 2018 to June 30, 2018 at 80.3% salary
I will be completing a book manuscript on applied mathematics and analogical reasoning focusing on case studies in nineteenth and twentieth century physics. The main thesis is that the use of formal analogies to develop new theories was a novel methodology. I will also begin research on a new project of theoretical frameworks in physics.

Fu, Liping, Civil and Environmental Engineering, May 1, 2018 to April 30, 2019 at 85% salary
I will focus on three main activities including organizing a technical conference (2018 International Symposium on Winter Road Maintenance), exploring commercialization opportunities of new research results from my lab (e.g., application of Big Data and machine learning for traffic control), and working on my existing research projects, and preparing new research proposals. Furthermore, I plan to strengthen professional relationships with some leading research institutes around the world (e.g., giving talks at Imperial College London, Southwest Jiaotong University, and Tongji University; establishing a Canada-China joint transportation research and technology transfer centre).

Furtado, Nadine, Optometry, January 1, 2018 to June 30, 2018 at 100% salary
I will complete data acquisition and analysis for various research projects involving a variety of ocular health issues ranging from glaucoma to access to eye care. I will also use the time to work on manuscripts for these projects.

Gonzalez, Francisco, Economics, January 1, 2018 to June 30, 2018 at 85% salary
I will work on the macroeconomics of labour mismatch. The goal of this research project is to develop a framework to analyze the macroeconomic implications of labour mismatch --- the labour market misallocation of workers with different skills to jobs with different skill requirements.

Haas, Carl, Civil and Environmental Engineering, September 1, 2018 to August 31, 2019 at 90.6% salary
I have two objectives: a) complete a book entitled, “Infrastructure Computer Vision”, which will be used to augment teaching. b) develop collaborative research projects with colleagues at UW, ETH in Zurich, Technischen Universität (TU) Berlin and Chalmers University on Artificial Intelligence (AI) developments in construction and management of infrastructure systems.

Honek, John, Chemistry, January 1, 2019 to December 31, 2019 at 100% salary
I will conduct research on bionanomaterials and their characterization, developing 3D bioprinting for capsule proteins and bacteriophage.

Hutchings, Natalie, Optometry and Vision Science, January 1, 2018 to June 30, 2018 at 100% salary
I have recently been focusing my scholarship on ophthalmic lens research. I plan to complete a multimedia textbook on ophthalmic dispensing and develop some ophthalmic lens research projects for multi-centre data collection. In addition, I will be exploring methods of clinical assessment of competency for application in the optometry professional program.

Itier, Roxane J, Psychology, January 1, 2018 to June 30, 2018 at 85% salary
I plan to 1) finish a number of journal articles; 2) attend a workshop on EEG; 3) start a collaboration with researchers at York University regarding the combined use of electroencephalogram (EEG) and transcranial magnetic stimulation (TMS) neuroimaging techniques on a research project on face perception and 4) write a CIHR grant proposal.
Kelly, Allison, Psychology, January 1, 2018 to June 30, 2018 at 100% salary
My research focuses on the factors that contribute to the maintenance and alleviation of eating disorders. I will be continuing my work in this area and further developing projects with my graduate students and with collaborators at Toronto General Hospital and University of Ottawa. We will be analyzing data, writing manuscripts, and designing new studies.

Keshav, Srinivasan, Computer Science, January 1, 2018 to December 31, 2018 at 100% salary
I will continue to build on recent work in the emerging area of data-driven smart infrastructure. This includes sensor-driven optimal control of office lighting systems, personalized thermal control, and infrastructure for smart grids and smart cities.

Kirkpatrick, Sharon, Public Health and Health Systems, January 1, 2018 to June 30, 2018 at 100% salary
I will be continuing various methodologic and applied projects to strengthen the evidence on diet and health and to inform strategies to improve diet and reduce diet-related inequities, in addition to knowledge translation/exchange initiatives. International travel to further collaborations related to advancing evidence on diet and health and building capacity in dietary assessment is possible.

Legge, Raymond, Chemical Engineering, September 1, 2018 to August 31, 2019 at 100% salary
I will be spending time on research related to on-line approaches for monitoring water treatment processes. This work is in collaboration with colleagues at the University of Toronto. Some spin-offs of this research will have applications in the pharmaceutical and food sector which are also on-going research interests, particularly a novel solvent-free separation process of in-house design.

Liu, Jennifer, Anthropology, January 1, 2018 to June 30, 2018 at 85% salary
I will work on completion of write-up of my older Taiwan research, grant applications, and the continued development of new projects including a Gender Equity research project and my Zambia research.

Liu, Xinzhi, Applied Mathematics, January 1, 2018 to December 31, 2018 at 85% salary
I plan to devote myself to research on stability and synchronization of complex dynamical networks. Such networks are structures consisting of interconnected dynamical units called nodes. Each node can be a dynamical system with nontrivial behaviour. Examples include social relation networks, biological neural networks, communication networks, transportation networks, power grids, among many others. I will also try to increase my interactions with researchers in other institutions as much as possible.

MacDonald, Shana, Drama and Speech Communication, January 1, 2018 to June 30, 2018 at 100% salary
I will be pursuing research on feminist media practices and research-creation methods in public art contexts.

MacDougall, Heather, History, January 1, 2018 to June 30, 2018 at 100% salary
I will focus on writing a history of the adoption of the Measles, Mumps, Rubella (MMR) vaccine in Canada. From 1963 when the measles vaccine was licensed, Canadian public health officials, researchers, parents and pharmaceutical companies have debated the necessity, effectiveness and safety of the trivalent vaccine. This study of the political, economic and social factors contributing to vaccine hesitancy will contribute to contemporary policy discussions.
**Malone, Paul**, Germanic and Slavic Studies, January 1, 2018 to June 30, 2018 at 100% salary
I will be drafting and writing several articles and a planned monograph on the history of German-language comics. I will be travelling to Germany for research and to Japan, Australia and the United Kingdom for conference presentations on the topic.

**McCulloch, Daphne**, Optometry and Vision Sciences, January 1, 2018 to June 30, 2018 at 85% salary
I aim to advance two projects by collecting feasibility data in Waterloo and during short visits with collaborators. The first project is an investigation into early development and retina in humans using Optical Coherence Tomography (OCT) imaging and electroretinography. The second project is translation of a novel test of stereopsis (3D preparation) into an efficient clinical test.

**McKay, Kenneth**, Management Sciences, January 1, 2018 to June 30, 2018 at 100% salary
I will focus on the ‘innovation decision making process’ research initiated in 2014-17. The maturity assessment tools and project management tools are innovative, and are supported by artificial intelligence (AI) based interpretation of the assessment results. The tools will be ready by the end of 2017, and I will use this time for concentrated data gathering and analysis effort.

**Menezes, Alfred**, Combinatorics and Optimization, July 1, 2018 to December 31, 2018 at 85% salary
I will be focusing on my research program in post-quantum cryptography. I will be based in Waterloo, and will make short trips to work with colleagues at the University of Washington (Seattle), The Centre of Research and Advanced Studies of the National Polytechnic Institute (CINVESTAV) (Mexico), Indian Institute of Science (Bangalore), and Indian Statistical Institute (Kolkata).

**Mikkelsen, Susan**, Chemistry, January 1, 2018 to December 31, 2018 at 89.2% salary
Organization and writing of chapters for new text/reference book “Electrochemical Approaches to Experimental Bioscience: A Practical Introduction to Electrochemistry for Biochemists and Biologists”.

**Momani, Bessma**, Political Science, November 1, 2017 to April 30, 2018 at 85% salary
To study populism in the West as part of funding from SSHRC Knowledge Synthesis Grant.

**Morrison, Aimée**, English Language and Literature, January 1, 2018 to December 31, 2018 at 85% salary
I will complete writing a book under contract on Selfies and Life Writing, submit the book to the publisher and complete any revisions as requested. I will complete two one-off articles on humour/trauma in online comics and on Facebook memes as autobiographical prompts. I will also begin work on a new project, on social justice and social media, and submit a SSHRC IG application in the fall of 2018.

**Pope, Michael**, Chemical Engineering, July 1, 2018 to December 31, 2019 at 100% salary
I will focus on further developing current research thrusts in my lab including advanced materials development and processing strategies for improved electrochemical energy storage including next generation supercapacitors and rechargeable batteries. I will extend my expertise by starting work with new materials and plan to stimulate further industrial and academic collaborations by disseminating work nationally and internationally.

**Pritzker, Mark**, Chemical Engineering, September 1, 2018 to August 31, 2019 at 85% salary
I will focus on a relatively new topic – redox flow batteries for electrochemical energy conversion and storage. Another new research effort will be on the development of mean spherical approximation theory to predict electrolyte properties. I also plan to visit research collaborations in Mexico and France.
Przybylski, Maya, Architecture, January 1, 2018 to June 30, 2018 at 100% salary
I plan to synthesize research into three research papers. Disseminating this work, regarding architects’ role in shaping the Smart City as well as preparing my tenure application.

Qian, Zhu, Planning, May 1, 2018 to October 31, 2018 at 100% salary
I will focus on my research areas: impact of farmland preservation policy on urban land use intensity in China; urban morphology and local citizens in China’s historic neighborhoods; China’s concentrated resettlement communities; ghost cities in China.

Radovanovic, Pavle, Chemistry, January 1, 2018 to December 31, 2018 at 100% salary
I plan to spend part of my time at the University of California, Berkeley, in the laboratory of Professor Stephen Leone, where I will investigate functional nanomaterials using single-molecule and ultrafast extreme-UV (XUV)/soft X-ray spectroscopic methods. A part of my time will also be spent at the University of Bordeaux working on single nanostructure magneto-optical spectroscopy.

Salama, Magdy, Electrical and Computer Engineering, January 1, 2018 to December 31, 2018 at 85% salary
I will be staying at the University of Waterloo to focus on my research activities and to continue supervising my graduate students. My concentration will be my newly established research direction in Smart Distribution Systems with Hydro One and Natural Resources Canada. I also plan on submitting research proposal in the area of renewable energy resources to attract additional funding.

Servos, Mark, Biology, January 1, 2018 to December 31, 2018 at 100% salary
I will focus on advancing incorporation of new technologies and approaches internationally into environmental assessments to enhance and manage risks associated with emerging contaminants to aquatic ecosystems across watersheds. It will advance our understanding of multiple stressor interactions at watershed scales and assessment of the effectiveness of remedial actions.

Siegel, David, Applied Mathematics, January 1, 2018 to June 30, 2018 at 100% salary
I will be working with Kirk Lancaster of Wichita State University on capillary surfaces and finish previous research projects on chemical reaction networks.

Siemerling, Winfried, English Language and Literature, January 1, 2018 to June 30, 2018 at 85% salary
I will advance work on my 2017-22 SSHRC Insight Grant “Call and Responsibility: The Transformative Appeal and Reception Aesthetics of Black Canadian Literature, Film and Music” (Principal Investigator). I will further work on a new Insight Development Grant “Nonsimultaneity and Incomplete Time: From Block, Benjamin and the Franklin School to Contemporary Black Critique”.

Simpson, Trefford, Optometry and Vision Science, January 1, 2018 to December 31, 2018 at 100% salary
I work on ocular soft metrology, measuring how the ocular surfaces senses the world. I will work on sensory effects of painful and cold ocular stimulation using psychophysics, examine local autonomic effects of painful simulation (on tear film, pupil and ocular redness using psychophysiological methods, and work on developing new metrics to assess ocular surface sensing.
Slavcev, Roderick, Pharmacy, January 1, 2018 to June 30, 2018 at 100% salary
I will be dedicating my time toward developing new genetic research technology with Mediphage Biocuticals Inc. During this time I will be learning new techniques and working with state-of-art instruments at JLabs at Toronto (MaRS).

Statiev, Alex, History, January 1, 2018 to June 30, 2018 at 85% salary
I plan to write a series of articles on the campaigns fought by the Russian Imperial Army in the mountains and two articles on the Organisation of Ukrainian Nationalists in 1929-50.

Stillar, Glenn, Drama and Speech Communication, January 1, 2018 to June 30, 2018 at 85% salary
My research area is Digital Media Research and Fine-Art Practice: post-production editing, sound design, and dissemination of two feature length films titled “Catherine’s Journey” (Director Peter Pallotta; Director of Photography/Editor, Glenn Stillar), and “Grenadine 360” (360 – degree feature length film of Edward Albee Award-winning play “Grenadine” by Neil Weschler, Director of Photography/Editor, Glenn Stillar).

Stone, Michael, Geography and Environmental Management, January 1, 2018 to December 31, 2018 at 100% salary
I will work on two research projects: a) apply new fingerprinting modelling software developed by Dr. Adrian Collins (Rothamsted, UK) to geochemical data sets based on my NSERC funded research in Alberta, and b) model sediment-associated particle and contaminant dynamics in the Glenmore Reservoir, Calgary, Alberta for research partners at the City of Calgary.

Tahvildari, Laden, Electrical and Computer Engineering, January 1, 2018 to December 31, 2018 at 100% salary
I will visit the IBM Research Laboratory in Toronto, Microsoft in Seattle, and Google in San Francisco to initiate new R&D collaborations on Cloud-Based Software Engineering. I will also plan to consolidate my research collaborations with Lovell Corporation in Waterloo on a Self-Adaptive Platform for Social Impacts, and Communications Security Establishment (CSE) Canada in Ottawa on Adaptive Software Security.

Tam, Michael, Chemical Engineering, January 1, 2018 to June 30, 2018 at 85% salary
I plan to expand my research into engineered food systems by spending my sabbatical at two reputable food science and technology centres in New Zealand (University of Otago and Massey). I will continue my collaboration with Nanyang Technological University (NTU, Singapore), on anti-microbial systems and water. In addition, I will visit Aalto University in Finland to work on future challenges in cellulose nanomaterials.

Taylor, Bruce, Fine Arts, January 1, 2018 to June 30, 2018 at 100% salary
I will be creating a new body of work that is rooted in systems of expanding mathematical ratios which will culminate in an upcoming solo exhibition in 2018 at Jonathon Bancroft-Snell Gallery, London, England.

Turri, John, Philosophy, January 1, 2018 to June 30, 2018 at 85% salary
I plan to conduct research in the K-W area focusing on philosophy and cognitive science by completing three research articles on cross-cultural philosophy, beginning a book manuscript on experimental philosophy, and launching several other projects which will answer philosophical questions and advance the scientific understanding of social cognition and communication.
**Warley, Linda**, English Language and Literature, July 1, 2018 to December 31, 2018 at 85% salary  
*I will be conducting research on a book project concerning life narratives of German Canadians who were refugees in Eastern Europe in the final months of WWII. I will also be continuing my collaboration with colleagues at the University of Zagreb, Croatia, which will include participation in a Canadian literature symposium and giving lectures at select Central European universities.*

**Whitson, Jennifer**, Sociology and Legal Studies, January 1, 2018 to June 30, 2018 at 100% salary  
*I will conduct further field research and data analysis on two projects: 1) "Indie Interfaces: Exploring grassroots community support networks in the game industry", and 2) "Venture Labour and "Indie" Cultural Production". Part of my time will be spent at the Milieux Institute for Arts, Culture and Technology at Concordia University in Montreal.*

**Wilkins-Laflamme, Sarah**, Sociology and Legal Studies, July 1, 2018 to December 31, 2018 at 100% salary  
*I plan to visit two research centers specializing in the sociology of religion: the Centre for the Study of Religion and Society at the University of Notre-Dame and the Group Sociétés, Religions, Laïcités at the École des Hautes Études. During these visits, I will further develop my international networks and work on several ongoing research projects.*

**Wilson, Christopher**, Electrical and Computer Engineering, January 1, 2018 to June 30, 2018 at 85% salary  
*I will collaborate with “Rigetti Computing”, a start-up company in Berkeley, California working in commercializing quantum computing technology. I will lead a project exploring the intersection of quantum computing and machine learning.*

**Wolfe, Sarah**, School of Environment, Resources and Sustainability, July 1, 2018 to December 31, 2018 at 100% salary  
*I plan to: 1) establish and renew research relationships at three Israeli universities (HebrewU, HaifaU, and Technion); 2) perform data collection on conversion theory, rituals, environmental identity and water decisions at Uvic Centre for Studies in Religion and Society; 3) carry out a comparative data analysis of Canadian and Israeli media representations of drought; 4) complete four articles; and 5) write Israeli Science Foundation and SSHRC-IDG proposals.*

**Yu, Aiping**, Chemical Engineering, March 1, 2018 to August 31, 2018 at 85% salary  
*My research is focusing on the development of graphene and its derivative materials for supercapacitors, Li ion supercapacitors, and polymer composites. As the PI of seven research projects and co-PI of two collaborated projects, I will use the sabbatical time to catch up on the cutting edge research and satisfy the industry partners’ demand.*

- **Sabbatical Cancellation**  

- **Sabbatical Change**  
  Bauch, Christopher, Applied Mathematics, January 1, 2018 to June 30, 2018, to July 1, 2018 to December 31, 2018, at 100% salary.
Kroeker, Greta, History, July 1, 2017 to December 31, 2017, to January 1, 2018 to June 30, 2018, at 85% salary.

Leoni, Monica, Spanish and Latin American Studies, July 1, 2017 to June 30, 2018, to September 1, 2017 to August 31, 2018, at 100% salary.

- Administrative Leave
  Honek, John, Chemistry, September 1, 2018 to December 31, 2018 at 100% salary.  
  I will conduct research on bionanomaterials and their characterization, developing 3D bioprinting for capsule proteins and bacteriophage.

Willard, Ross, Pure Mathematics, January 1, 2018 to April 30, 2018 at 100% salary. 
I will spend one month each at LaTrobe University (Melbourne) and Vanderbilt University (Nashville), where I will engage in projects in universal algebra. In the remaining time, I will continue working on these and other projects while based in Waterloo.

FOR INFORMATION

2. Administrative Appointments
   Acheson, Katherine, re-appointment as Associate Dean, Undergraduate Programs, Faculty of Arts, September 1, 2017 to June 30, 2019.

   Boido, Mario, appointment as Acting Chair, Department of Spanish and Latin American Studies, Faculty of Arts, September 1, 2017 to August 31, 2018.

   Chesney, Bill, appointment as Associate Dean, Undergraduate Students, Faculty of Arts, September 1, 2017 to August 31, 2019.

   Culham, Richard, re-appointment as Associate Dean, International, Faculty of Engineering, July 1, 2017 to December 31, 2018.

   Culham, Richard, appointment as Vice Dean, Faculty of Engineering, July 1, 2017 to December 31, 2018.

   Danisch, Robert, appointment as Interim Chair, Drama and Speech Communication, Faculty of Arts, August 1, 2017 to June 30, 2018.

   Haas, Carl, appointment as Interim Chair, Civil and Environmental Engineering, Faculty of Engineering, September 1, 2017 to April 30, 2018.

   Karim, Karim, appointment as Associate Dean, Outreach, Faculty of Engineering, September 1, 2017 to August 31, 2020.

   Leoni, Monica, appointment as Chair, Department of Spanish and Latin American Studies, Faculty of Arts, September 1, 2018 to June 30, 2019.
Müller, Kirsten, appointment as Associate Dean, Graduate Studies, Faculty of Science, September 1, 2017 to August 31, 2018.

Park, Robert, appointment as Associate Dean, Cooperative Education and Planning, Faculty of Arts, September 1, 2017 to June 30, 2020.

Weber, Mark, appointment as Director, Conrad Business, Entrepreneurship and Technology Centre, Faculty of Engineering, January 1, 2018 to December 31, 2021

Administrative Appointment Changes

Park, Robert, appointment as Associate Dean, Infrastructure and Technology, Faculty of Arts, from July 1, 2016 to June 30, 2018, changed to July 1, 2016 to August 31, 2017.

Simpson, Jennifer, appointment as Chair, Graduate Studies, Faculty of Arts, from July 1, 2016 to August 31, 2018, changed to July 1, 2016 to July 31, 2017.

Warley Linda, appointment as Associate Dean, Graduate Studies, Faculty of Arts, from January 1, 2017 to December 31, 2017, changed to January 1, 2017 to June 30, 2018.

West, Jeff, appointment as Chair, Civil and Environmental Engineering, Faculty of Engineering, from January 1, 2017 to December 31, 2020, changed to January 1, 2017 to August 31, 2017.

Feridun Hamdullahpur
President
FOR INFORMATION

Recognition and Commendation

Winners of the annual Velocity Fund Finals were announced on Thursday 20 July 2017. During the competition, 10 companies pitched their businesses to a panel of judges representing the investment, startup and business communities. Judges considered innovation, market potential, market viability and overall pitch. The following three companies were grand-prize winners of $25,000 and space at Velocity: Altius Analytics Lab is a health-tech startup that helps occupational groups better manage musculoskeletal injuries; EPOCH is a skills and services marketplace that connects refugees and community members, using time as a means of exchange; and, VivaSpire is making lightweight wearable machines that purify oxygen from the air without the need for high pressure. Three of the five top-prize-winning companies are based at Velocity Science. For the first time, the prize of $10,000 for best hardware or science company went to a team that was not among the grand-prize winners.

Vena Medical is making navigating through arteries faster, easier and safer by providing physicians with a camera that sees through blood. During the VFF event, an additional 10 teams of University of Waterloo students competed for three prizes of $5,000 and access to Velocity workspaces. The winners of the Velocity $5K are described as follows: HALo works to provide manual wheelchair users with accessible solutions to motorize their wheelchairs; QuantWave provides faster, cheaper and simpler pathogen detection for drinking water and food suppliers; and, SheLeads is a story-based game that helps girls realize their unlimited leadership potential. The judges for the Velocity Fund $25K competition travelled from Palo Alto, San Francisco and Toronto. (adapted from the Daily Bulletin, 24 July 2017)

For the third year in a row, management engineering students have captured the top prize at the Canadian Operational Research Society (CORS) student paper competition. Alexandra Hayes, Christian Gould, Kevin Chu, and Srikajan Santhirakumaran came in first in the undergraduate category of this year’s competition held recently in Québec City. Their paper, entitled “End-to-End Analytics: Wait Time Management of Ontario MRI Services,” was based on the students’ Capstone Design project. The team previously won a 2016 Baylis Medical Capstone Award and also captured the top prize at the 2017 Management Engineering Design Symposium. The project was supervised by Hossein Abouee Mehrizi, a management sciences professor. In addition, Gizem Nemutlu, a management sciences doctoral candidate supervised by management sciences professor Fatih Safa Erenay, won second prize in the open category for her paper entitled “Optimal Vaccine Administration Policies Using Multi-dose Vials of Different Sizes.” The student paper competition recognizes the contribution of a paper directly to the field of operational research through the development of methodology or to another field through the application of operational research. The competition showcases the high quality of operational research education in Canada as well as the excellence of the new generation of operational researchers. (adapted from the Daily Bulletin, 25 August 2017)

The federal government announced on 30 August 2017 that Blair Feltmate, head of the Intact Centre on Climate Adaptation and faculty member in Environment, will chair a federal panel on climate change adaptation. Minister of Environment and Climate Change Catherine McKenna announced that Feltmate will chair the newly-launched Expert Panel on Climate Change Adaptation and Resilience Results. The Expert Panel will advise the Government of Canada on measuring progress on adaptation and climate resilience to better understand how federal, provincial, and territorial adaptation efforts are building Canada’s resilience to climate change, for instance, by providing up-to-date information, supporting climate-smart infrastructure, and updating building codes. The panel will also support the federal government in better communicating to Canadians how it is preparing for and adapting to the current and future impacts of climate change. The panel will support the Pan-Canadian Framework on Clean Growth and Climate Change, which is Canada’s plan to meet its greenhouse gas
emissions reduction target, build resilience to the impacts of climate change, and create clean growth and jobs through investments in clean technology, innovation, and infrastructure. (adapted from the Daily Bulletin, 31 August 2017)

Three researchers from the University of Waterloo are among the new fellows of The Royal Society of Canada (RSC) announced on Thursday 7 September 2017. The RSC fellows were recognized by their peers for outstanding scholarly, scientific, and artistic achievement. This year, 89 new fellows were elected by RSC. The Waterloo’s new RSC fellows are: David Blowes (earth and environmental sciences), Geoffrey Fong (psychology), and Weihua Zhuang (electrical and computer engineering). Blowes is recognized as an international leader in the field of environmental geochemistry. Through sophisticated laboratory, field and modelling studies, he has made groundbreaking contributions to our understanding of the release of contaminants from mine wastes. He has also made important contributions to the development of management practices for mine wastes and to the development of novel groundwater remediation technologies. Fong is one of world’s leading global health researchers, and has created and leads an immense research program that is evaluating the population-level impact of tobacco control policies in over 25 countries, covering over two-thirds of the world’s tobacco users. The International Tobacco Control (ITC) Project has made groundbreaking contributions to advancing science and policies to accelerate and strengthen governmental and advocacy efforts to combat the global tobacco epidemic. Zhuang is an internationally eminent researcher and a Tier I Canada Research Chair in wireless communication networks. She has made profound research contributions to resource allocation, distributed network control, and mobile user positioning. Her prolific achievements have led to significant advances in engineering solutions, and generated high impacts in the research community. (adapted from the Office of Research news, 7 September 2017)

Sarah Burch (geography and environmental science) and Frank Gu (chemical engineering) are among the new members of the Royal Society of Canada (RSC) College of New Scholars, Artists and Scientists. Members are awarded this distinction in recognition of having reached a high level of achievement at an early stage of their careers. They represent the emerging generation of scholars and leaders in science and the arts across the country. Burch, Canada Research Chair in Sustainability Governance and Innovation, is uncovering the pathways that communities follow as they transition toward resilient, low carbon patterns of development. She leads an international team of scholars exploring the governance of transformative change in urban spaces. Her widely cited research has influenced local, national, and international policymaking on climate change, biodiversity conservation, sustainability, and urban planning. Gu is internationally recognized for his pioneering contributions to nanotechnology engineering, particularly as they apply to targeted drug delivery and water treatment systems. A highly accomplished researcher and inventor, he pioneered the use of mucoadhesive nanoparticles for unprecedentedly high retention eye drops, demonstrated the first magnetically recyclable photocatalysts for water treatment, and developed stealth copolymers for targeted cancer therapy. He is now one of the foremost nanoengineering researchers in Canada. Founded in 2014, the College is a handpicked selection of top mid-career scholars and artists in Canada. Together, the members of the College will address issues of particular concern to new scholars, artists and scientists, for the advancement of understanding and the benefit of society, taking advantage of the College’s interdisciplinary approaches. Burch and Gu were among the 70 incoming members named by the Royal Society. The presentation of this cohort, sponsored by the Université de Montréal, will take place on Friday 24 November 24 in Winnipeg, Manitoba. (adapted from the Daily Bulletin, 9 September 2017)

The University of Waterloo, in collaboration with Mike and Ophelia Lazaridis, has launched a new $8-million research chair to further solidify Waterloo’s leadership in quantum information research. Raymond Laflamme becomes the Mike and Ophelia Lazaridis “John von Neumann” Chair in Quantum Information. Both Waterloo and Mike and Ophelia Lazaridis will support Laflamme’s research on error correction in quantum systems that is critical to the development of the quantum computer and other robust new quantum technologies. Harnessing the power of technologies at the atomic scale requires mechanisms to control these fragile, yet powerful behaviours. “This pioneering research in quantum technologies at Waterloo’s Institute for Quantum Computing (IQC) will help further establish our impact as a global leader in quantum research,” said Feridun Hamdullahpur. “The combination of Raymond Laflamme’s expertise and the Lazaridis family’s
generosity ensures that the world can continue to look to Waterloo for the latest advancements in quantum knowledge and technology.” During his keynote address at the Waterloo Innovation Summit, Mike Lazaridis praised Laflamme’s continued commitment to quantum research and his extensive achievements in positioning Canada as a quantum research powerhouse. “Raymond Laflamme is broadly recognized as a globally leading researcher in quantum error correction,” Lazaridis said. “His research contributions have led the development of quantum control, which is a building block to realizing quantum computing. His leadership and his many contributions to the University of Waterloo as the founding director have helped establish IQC as one of a handful of centres in the world for top researchers in quantum information science.” Laflamme joined the University of Waterloo in 2001 as a professor in the Department of Physics and Astronomy. He was the founding director of the IQC until his term ended earlier this year. Laflamme holds a Canada Research Chair in Quantum Information and was awarded the CAP-CRM Prize in Theoretical and Mathematical Physics earlier this year. He received the Queen Elizabeth II Jubilee Medal in 2013, and an honorary degree from the Université de Sherbrooke in 2012. He is a fellow of the American Association for the Advancement of Science, the American Physical Society, and the Royal Society of Canada, and is a founding faculty member at the Perimeter Institute for Theoretical Physics. (adapted from the Daily Bulletin, 21 September 2017)

Six HeForShe IMPACT scholarships have been awarded to exceptional female students entering their first year as undergraduates in science, technology, engineering or mathematics (STEM). The scholarships are part of the University of Waterloo’s commitment to encourage more young women to pursue fields in STEM, where females are currently underrepresented. Waterloo is the only Canadian university taking part in the UN Women’s HeForShe IMPACT 10x10x10 initiative to achieve gender parity. As part of this initiative, the University aims increase female representation in STEM education and careers, enhance female faculty representation, and promote female leaders into senior university positions. The six scholarship recipients are: Jiayue Cheng (business and computer science [double major]), Teresa Kang (computer science), Heather Musson (software engineering), Guia Janelle C. Pucyutan (mathematical physics), Alex Rynard (mathematical physics), and Christina Sullivan (mechatronics engineering). (adapted from Waterloo Stories, 22 September 2017)

Associate Vice-President Human Rights, Equity and Inclusion Diana Parry was honoured as one to the Oktoberfest Rogers Women of the Year on October 5, 2017. The celebration “takes time out to recognize and pay tribute to outstanding women in the community.” 44 women were nominated in ten categories. Parry was recognized in the Professional category, an award that “recognizes women for dedicating themselves to the pursuit of excellence in their chosen careers.” (adapted from the Daily Bulletin, 6 October 2017)

Doctor of Pharmacy student Munaza Saleem was selected from an applicant pool of young women across Canada to step into the role of Minister of National Defence for a day. Saleem is part of the Canadian #GirlsBelongHere initiative and one of 17 youth who are paired with government leaders, CEOs, and executives to illustrate every girl’s right to belong in influential roles. The Girls Belong Here campaign is to celebrate International Day of the Girl on October 11 and is part of Plan International’s global initiative which has over 500 participants in 60 countries. The purpose of the campaign is to put young leaders in positions of power to inspire girls to break down gender barriers preventing them from following their dreams. Saleem was first involved with Plan International Canada as part of the Because I am a Girl Speaker’s Bureau three years ago, where she delivered motivational speeches on female empowerment and creating positive change. (adapted from the Daily Bulletin, 12 October 2017)

A patch that delivers allergy medication to children developed by Waterloo students is one of only two Canadian projects to be shortlisted for this year’s international James Dyson Awards competition. It’s the fourth year in a row a University of Waterloo project has reached the final round. Avro Life Science, co-founded by Shakir Lakhani, a second-year nanotechnology engineering student, and Keean Sarani, a third-year science undergraduate and an incoming doctor of pharmacy student, has created an easy-to-use sticker that provides antihistamines to children through the skin and directly into the bloodstream. The patent-pending technology controls the release rate of the drug. Avro Life Science, now part of Velocity Science, won $25K in last December’s Velocity Fund Finals for the startup’s solution to provide an alternative form of allergy medication to
children without the hassle of pills and syrups. Since 2014, Waterloo student projects have figured prominently in the contest started by James Dyson, the British inventor of the bagless Dyson vacuum cleaner. The international winner will be announced on October 26, 2017. (adapted from the *Daily Bulletin*, 23 October 2017)
FOR APPROVAL

Incidental Fee Changes

1. Graduate Student Association (GSA) Fee
   It is recommended that the compulsory GSA Fee, assessed and collected each term from all full-time and part-time graduate students, be increased to $22.80 effective winter term 2018.

<table>
<thead>
<tr>
<th>Current</th>
<th>Proposed</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate full time</td>
<td>$20.50</td>
<td>$22.80</td>
</tr>
<tr>
<td>Graduate part time</td>
<td>$20.50</td>
<td>$22.80</td>
</tr>
</tbody>
</table>

   Comments:
   - The fee increase was approved at the General Meeting of the GSA held on September 27, 2017.
   - Payment of the fee is a requirement of registration and is non-refundable.
   - The fee was last increased in the winter 2016 from $18.50 to $20.50.

2. Graduate Student Association Administered Fee
   It is recommended that the compulsory GSA Administered Fee, assessed and collected from active full-time and part-time graduate students (excluding students enrolled in on-line programs), be increased for the Graduate House fee component only, by $5.50 per term from $18.00 to $23.50 (30.5%) effective winter term 2018.

<table>
<thead>
<tr>
<th>Current</th>
<th>Proposed</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate full time</td>
<td>$250.45</td>
<td>$255.95</td>
</tr>
<tr>
<td>Graduate part time</td>
<td>$161.00</td>
<td>$166.50</td>
</tr>
</tbody>
</table>

   Comments:
   - The Graduate House component of the fee increase was approved by the GSA Directors at a meeting of the GSA Board on September 27, 2017.
   - The Graduate House fee is refundable during the first three weeks of the term.
   - The Graduate House fee was last increased in the winter term 2016 from $17.50/term to $18.00/term.
   - Other components of this fee include Dental ($81.00), Health ($62.00), GRT Bus Pass ($89.45 – full time students only).

Dennis Huber
Vice-President,
Administration & Finance
This report is submitted following the committee’s deliberations during July/August 2017.

FOR INFORMATION

On 2 August 2017, the following resolution was passed on behalf of the Board of Governors. The resolution was effective as of 2 August 2017.

1. **Financial Statements for Year Ended 30 April 2017**
   Resolved that the Executive Committee of the Board of Governors approve the Financial Statements on behalf of the Board of Governors. (See [University of Waterloo Finance website](#) or hard copy distributed by mail.)

Cindy Forbes
Chair, Executive Committee
PRESIDENT’S UPDATE TO THE BOARD OF GOVERNORS
OCTOBER 31, 2017

Dear Governors,

I am pleased to provide you with a brief summary of major achievements, initiatives and updates since our last meeting in June along with an update on our Strategic Plan implementation as this marks the last year of our current plan. Although I tried to keep this update as concise and brief as possible, there have been numerous development since the last meeting. I will be happy to discuss any items in further detail.

ACHIEVEMENTS/CONGRATULATIONS

- Royal Society of Canada
  - Keith Hipel – Systems Design Engineering – winner of the 2017 RSC Miroslaw Romanowski Medal. This is the first time the University of Waterloo has won this prize and it recognizes scientific work related to environmental problems.
  - Newly elected Fellows
    - Geoff Fong – Psychology
    - David Blowes – Earth and Environmental Sciences
    - Weihua Zhuang – electrical and Computer Engineering
  - Newly elected members for The College of New Scholars, Artists and Scientists
    - Sarah Burch – Geography and Environmental Management
    - Frank Gu – Chemical Engineering
- Sustainable Development Solutions Network (a global initiative for the United Nations) – Waterloo through the Faculty of Environment has been chosen as host of the SDSN National Network for Canada. The goal of these networks is to mobilize knowledge institutions around the Sustainable Development Goals and the Paris Climate Agreement

RANKINGS

University World Rankings 2017

Key Statement: Waterloo’s position in international rankings is relatively stable since 2012. IAP continues to analyse ranking results in each of the ranking categories to understand changes in Waterloo’s results.
Maclean's 2018 Rankings

**Key Statement:** Waterloo maintained its number one position as most innovative university for 26 years and maintained or improved in all other reputational rankings.

**Key Statement:** Waterloo was #1 for percentage of operating expenditure devoted to scholarships and bursaries.

<table>
<thead>
<tr>
<th>University</th>
<th>% of operating expenditure devoted to scholarships and bursaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waterloo</td>
<td>14.8%</td>
</tr>
<tr>
<td>McGill</td>
<td>14.0%</td>
</tr>
<tr>
<td>Ottawa</td>
<td>11.5%</td>
</tr>
<tr>
<td>Queen's</td>
<td>11.5%</td>
</tr>
<tr>
<td>Dalhousie</td>
<td>11.1%</td>
</tr>
</tbody>
</table>

**Key Statement:** Waterloo was #1 for average entering grade of full-time, first year students entering university from high school.

<table>
<thead>
<tr>
<th>University</th>
<th>Average entering grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waterloo</td>
<td>90.4%</td>
</tr>
<tr>
<td>McGill</td>
<td>90.3%</td>
</tr>
<tr>
<td>Western</td>
<td>90.0%</td>
</tr>
<tr>
<td>Manitoba</td>
<td>89.2%</td>
</tr>
<tr>
<td>Queen's</td>
<td>89.0%</td>
</tr>
</tbody>
</table>

**Key Statement:** Waterloo was #4 for percentage of full-time, first-year students enrolled in fall 2015 who returned to university the following year.

<table>
<thead>
<tr>
<th>University</th>
<th>1st to 2nd year retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calgary</td>
<td>94.9%</td>
</tr>
<tr>
<td>Queen's</td>
<td>94.7%</td>
</tr>
<tr>
<td>Sherbrooke</td>
<td>93.8%</td>
</tr>
<tr>
<td>Waterloo</td>
<td>93.6%</td>
</tr>
<tr>
<td>Western</td>
<td>93.2%</td>
</tr>
</tbody>
</table>

**Maclean's Reputational Survey Breakdown**

<table>
<thead>
<tr>
<th>Category</th>
<th>2018</th>
<th>2017</th>
<th>Change From Previous Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest Quality</td>
<td>2</td>
<td>3</td>
<td>↑</td>
</tr>
<tr>
<td>Most Innovative</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Leaders of Tomorrow</td>
<td>2</td>
<td>3</td>
<td>↑</td>
</tr>
<tr>
<td>Best Overall</td>
<td>2</td>
<td>2</td>
<td>-</td>
</tr>
</tbody>
</table>
QS 2018 Graduate Employability Rankings

Key Statement: Waterloo ranked as number one university in Canada for employer partnerships and number four in the world.

Key Statement: Waterloo ranked second in Canada for graduate employability and 24th in the world.

Pitchbook Rankings (Fall 2017)

Key Statement: Waterloo ranked number one in Canada and 20th in the world for universities producing VC-backed entrepreneurs.

Key Statement: Waterloo ranked number one in Canada for producing unicorns and 4th in the world.

Key Statement: Waterloo ranked number one in Canada for capital raised by entrepreneurs and 20th in the world.

Key Statement: Top 5 companies listed for Waterloo using capital raised were: Wish, Pivotal Software, Kuaidi Dache, Instacart and Storm8.

WATERLOO PERFORMANCE INDICATORS - 2017

The University of Waterloo’s Performance Indicators provide high level measures of University activity and provide a statistical profile of the University of Waterloo. Several Performance indicators are also measures used to understand progress in achieving Strategic Plan goals and objectives. We have presented key statements about these metrics, and where possible, incorporated figures to illustrate the impact.

Enrolment

Key Statement: Total FTE enrolment (undergraduate and graduate students) increased by 3.4% between 2015/16 and 2016/17, to 34,325 FTEs.

Undergraduate Enrolment (Headcount)

Key Statement: Among undergraduate students, the proportion of full-time undergraduate co-op students increased 4.9% to 20,792 students and non co-op students increased by 1.1% from 10,091 in 2015/16 to 10,205 students in 2016/17 (full-time headcount). Total fall headcount of full-time undergraduate students in fall 2016 was 30,997 (2017 data will be available in November).

International Enrolment

Key Statement: While we will not confirm final numbers until after the official count date of November 1st, our best estimate at this time is that our international intake is up approximately 15% (over Fall 2016) at the undergraduate level. For graduate students, Waterloo’s count of accepted offers at the Masters level is up by 52% when compared to the average of the past two years. Accepted offers by international PhD students are up by 47% over the average of the past two years.
Key Statement: We are seeing greater diversity in the “countries of origin” of incoming international students. We are also seeing strong growth in Faculties that have historically had small international student populations (Applied Health Sciences, Environment, and Arts).

Retention (1st to 2nd Year)

Key statement: Waterloo’s retention rate of students from first year to second year for the 2015 student cohort was 93.6%. Waterloo’s retention rate was higher than both the U15 average (90.5%, Data excludes Laval, Saskatchewan and Alberta who did not participate and includes Waterloo) and the U6 (92.1%, data includes Waterloo).

Degrees Awarded

Key Statement: The number of total degrees awarded (PhD, Master, Bachelors) decreased slightly by 2.6% from 7,886 in 2015 to 7,679 in 2016.

Co-op Earnings

Key Statement: Average co-op employment earnings increased by 2.2% over 2015/16 in 2016/17 to $13,858.

Faculty

Key Statement: The number of regular, full-time faculty increased by 1.8% between 2015/16 and 2016/17, to 1,233.

Student-to-Faculty Ratio

Key Statement: Using preliminary data, the U15 student to faculty ratio in 2016 is 26.9 students-to-faculty (data excludes Montreal and includes Waterloo). Waterloo’s students-to-faculty ratio is slightly lower at 25.0.

Funding

Key Statement: Total sponsored research funding increased 12.7% between 2015/16 and 2016/17, reaching a total of $205.7M.

Operating Revenue

Key Statement: Total operating revenue grew from $686.6M in 2015/16 to $748.7M, an increase of 9.0%.

STRATEGIC PLAN UPDATE FALL 2017

The Annual Fall Strategic Plan Update has been distributed to all governance committees. In addition to updates on the progress of each of the eight themes, the 2017 Strategic Plan Update included a section focused on internationalization at Waterloo. Below you will find some key statements and initiatives within each theme. This year marks the last year of our current plan. For context, the overall budget for the 2013-2018 Strategic Plan was $14.2M.
Experiential Education - Highlights

Key Statement: First work-term employment rate grew from 91.4% to 94.5% between 2013/14 and 2016/17, and up from 92.6% in 2015/16.

Key Statement: Overall work-term employment rate grew from 96.6% to 97.7% between 2013/14 and 2016/17, up 0.4 percentage points over the last year, and exceeding the 95% target for the fourth consecutive year.

Key Statement: There were 213 more active co-op employers in 2016/17 compared to 2015/16. The number of active employers increased by 13.6% over four years.

Key Statement: The proportion of co-op students who reported skills learned at Waterloo were related to skills required for the job six months after graduation remained high at 95.7%; 96.1% at two years after graduation.

Key Initiatives:
- New Co-op 2.0 opportunities continued including flexible work terms, co-op specialization in research, first work term fundamental experiences, and industry/academic partnerships.
- EDGE is a new experiential education certificate for non co-op students which launched in September 2017. EDGE aims to improve graduate outcomes by assisting students in identifying and articulating the skills they develop during their undergraduate career.
- New approaches to employer recruitment included organizational changes to distribute business development resources to five regional teams across Canada.
- A new co-op research certificate which recognize students who choose to work in research-focused positions during at least three work terms and complete the research professional development and capstone requirements. Plans are underway to develop a professional development course in research fundamentals for interested co-op students.

Entrepreneurial University - Highlights

Key Statement: Significantly more entrepreneurial learning and development opportunities for students since 2013/14 includes a 67.6% increase in enrolment and 118.8% increase in the number of entrepreneurial for-credit and non-credit courses, workshops, and events. Significant investment in new entrepreneurial spaces (increased space in Velocity Science, Velocity Garage, and GreenHouse Social Impact Incubator), and new supports for hard tech in 2016/17.

Key statement: Investment funding for current students grew from $3.9M in 2013/14 to $21.0M in 2016/17. Among alumni, investment funding grew from $97.9M to $179.5M for the same period.

Key Initiatives:
- Expansion and renovations to Velocity Garage were completed in fall 2016. The new space is 37K sq ft and includes a science lab, assembly space, a workshop, a prototyping lab, co-working space, and meeting rooms.
- In 2015/16, Velocity housed 114 companies in Velocity Garage and 28 companies in Velocity Science.
- Velocity has added more supports for science and hard-tech companies and is building connections to other ecosystem supports that enable hard-tech innovation.
- Velocity Start up Company Updates
  - Competitions:
- EPOCH (connects refugees, supports organizations and local community - reducing re-integration time and cost) competed at HULT Prize Finals at the UN (1 of 6 finalist teams, of 50K+ applications). The team was joined by Canada’s Ambassador to the UN and met with senior civil servants from Immigration, Refugees, and Citizenship Canada. While they didn’t win, they received high praise and a personal endorsement from Bill Clinton. They are now back in Velocity, pursuing growth (more support orgs and refugees using their platform). They’re partnered with a Capstone engineering team to assist with development.
- Avro Life Science (medicated stickers to deliver seasonal allergy medication to children) has been shortlisted in the International round of the James Dyson Award, the fourth year running for a Velocity team.
- Elucid Labs (tri-corner for skin conditions), was named one of 2017’s top 20 most innovative companies by Canadian Innovation Exchange.
- Co-founder of Acorn Biolabs (cryopreservation of your young cells for future medical applications), Laura Vaughan, was named a 2017 Thiel Fellow.
- NanoCnet (nano-based ink to make better & lower-cost flexible/transparent electrodes) won Startup of the Year Award at CPES2017 (canadian printed electronics symposium). NanoCnet was born out of 2 UW PhD graduates.
- The NWC (better connecting tourism & local communities) was recognized as one of Latin America’s top 10 social entrepreneurs by i3 LATAM.
- Vivaspire (oxygen therapy via nanotech) won ‘most innovative startup’ at Hong Kong’s Jumpstarter competition.
- Suncayr (UV skin protection products) and Qidni Labs (bionic kidneys) were winning finalists in this year’s 43North competition, securing over $500K USD each.

○ Funding, Growth, Scaling:
  - Velocity is leading a collaboration between Waterloo-Toronto incubators and accelerators (MaRS, Communitech, DMZ, CDL, RICC, Next, AC, OneEleven, etc.) to identify the most investment-ready startups in the Waterloo-Toronto corridor and assemble them for 2 investor demo-day events in Toronto and the Bay Area, California. Over 40 companies have been assembled (of nearly 80 applicants) and will be pitching to 70+ investors in Toronto on Oct. 19 before pitching to US investors in the Bay area on Nov. 7th.
  - Kik raised nearly $100M in an Initial Coin Offering (ICO), as it launched a cryptocurrency, the highest profile ICO (initial coin offering) to date.
  - Embark (Autonomous trucking) raised $15M. Born out of the Velocity Residence, and now valued at $75M, the company also announced a partnership with semi-truck manufacturer Peterbilt.
  - Mappedin partnered with Apple to embed its wayfinding technology into iOS.
  - HelpWear & Gamelynx both participated in Y-Combinator’s accelerator (Summer 17 batch). They were 2 of 124 companies in the batch from 1000s of applications.
  - Thalmic Labs hired former Apple Retail lead and former Nokia/Microsoft VP; continues to demonstrate significant capacity to attract top global talent.
**Transformational Research – Highlights**

**Key Statement:** Considered by type, Tri-Agency funding comprises more than one quarter of the total sponsored research (25.7%) and federal funding comprised 21.9% of sponsored research funding in 2016/17.

**Award Year:** 2016/17

**Faculty:** All

**Total Sponsored Research:** $205,684,473

Hover over the figure to see more details.

**Select award year and Faculty:**

**Award Year:**
- 2016/17

**Faculty:**
- (All)

**Purpose:** External funding enables ongoing research in legacy areas of strength, interdisciplinary research as well as research in new and emerging areas, and is a significant determinant of institutional rankings and reputation.

**Key Statement:** Total funding in 2016/17 from the Tri-Agencies is almost $53M, with almost 80% (79.0%) of the funding derived from the Natural Sciences and Engineering Research Council (NSERC), and the remaining 21% split between the Social Sciences and Humanities Research Council and the Canadian Institutes of Health Research.

**Award Year:** 2016/17

**Faculty:** All

**Total Tri-Agency Research:** $52,827,226

Hover over the figure to see more details.

**Select award year and Faculty:**

**Award Year:**
- 2016/17

**Faculty:**
- (All)

**Why is this important:** Tri-Agency funds represent an investment in research discovery and innovation and also serve as the measure by which Canada Research Chairs are allocated. As Waterloo is a research-intensive university, Tri-Agency funding is critical to its success.
Key Statement: The proportion of Waterloo’s research funding from industry has remained stable at 30% between 2013/14 and 2016/17.

Key Initiatives:
- Waterloo increased internal supports to develop research proposals from a broader range of sectors, implement research projects, and facilitate nominations of Waterloo faculty for prestigious research awards and honours.
- Over four years, Waterloo has secured important major funding support for transdisciplinary research ranging from aging, quantum technologies, and water research to advanced manufacturing, actuarial science, and cyber infrastructure.
- Waterloo continues to develop and pursue new international research partnerships with elite institutions.

Outstanding Academic Programming - Highlights

Key Statement: The number of Waterloo subjects ranked in QS Top 100 Subject Rankings has increased from seven in 2013/14 to 13 in 2016/17.

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<td>Source: Quacquarelli Symonds (QS) World University Rankings, by Subject</td>
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Key Statement: Sixty per cent (59.2%) more graduate students enrolled in professional skills workshops in 2016/17 over 2013/14. Fifty more graduate workshops were offered in 2016/17 compared to 2013/14.

Key Statement: In 2017, more than half of respondents to the National Survey on Student Engagement (NSSE) reported that the University contributed “quite a bit” and “very much” to their ability to speak clearly and effectively (50.4%) and write clearly and effectively (57.4%). This is slightly greater than what was reported in 2014 (speak clearly and effectively, 48.3%; write clearly and effectively 54.7%).
**Key Statement:** Waterloo exceeded the 5% annual increase target, for the number of online courses in catalogue in two of three years, with an overall increase of 31.1% from 2013/14 to 2016/17.

**Key Statement:** There was an overall increase of 16.8% in enrolment in fully online courses since 2013/14.

**Key Statement:** Three new fully online programs were developed between 2013/14 and 2016/17. Eight of these fully online programs were at the undergraduate level and 13 are at the graduate level.

**Key Initiatives:**
- Waterloo developed 14 new or restructured programs (four undergraduate and 10 graduate).
- Completed the Strategic Enrolment Management (SEM) pilot project in the Faculty of Arts. All Faculties are developing new SEM plans.

**Global Prominence and Internationalization - Highlights**

**Key Statement:** International students as a proportion of their respective populations increased by 4.6 percentage points for undergraduates, and by 3.6 percentage points for graduate students between 2013/14 and 2016/17.

**Key Statement:** The number of international co-op work terms have increased by 32.0% since 2013/14 to 2,653 in 2016/17.

**Key Initiatives:**
- Graduate Studies and Postdoctoral Affairs (GSPA) established a Graduate International and Admissions Specialist position, to create a more personalized application experience for applicants to the China Scholarship Council program and the Mexico CONACyT scholarship program.
- Ongoing funding for the International Research Partnership Grant program.

**Vibrant Student Experience - Highlights**

**Key Statement:** In 2017, fewer students who participated in the NSSE survey reported that the University “quite a bit” and “very much” placed an emphasis on helping them manage non-academic responsibilities (27.4% in 2017; 31.7% in 2014) and provided opportunities to be involved socially at University (49.1% in 2017; 53.5% in 2014).

**Key Statement:** In both 2014 and 2017, over half of students who participated in the NSSE survey rated their interactions with student services staff between 5 and 7, with 7 being “excellent” (57.6% in 2017; 59.6% 2014).

**Key Statement:** According to NSSE, more students reported spending six or more hours per week participating in co-curricular activities in 2017 (32.8%), compared to 2014 (28.1%).

**Key Initiatives:**
- The Student Success Office (SSO), Graduate Studies and Postdoctoral Affairs (GSPA), and the Registrar’s Office used student and staff feedback to develop the new Student Services Centre, to be launched in 2018.
• Consulting broadly with students, faculty, and staff, the Student Success Office has further developed the mobile student portal to integrate with LEARN and to include access to mental health resources. Total mobile users now exceed 10K, based on iOS and Android devices.
• Between 2013 and 2016 the amount of new student study space available increased by 18.0%. The Student Services Centre and renovations to the Student Life Centre/Physical Activities Complex are both in progress.
• The President’s Advisory Committee on Student Mental Health (PAC-SMH) is underway with a report due in early 2018. The PAC-SMH established five supporting panels (Academic, Mental Health Experts, Student Services, Student Experiences and Community Partners) to conduct focused analysis on key topics. A final report will be completed in early 2018.

Robust Employer-Employee - Highlights

Key Statement: The proportion of female hires increased by 10.3 percentage points since 2015/16 to 68.3% in 2016/17.

Key Statement: Since 2013/14, 1,660 employees have participated in Principles of Inclusivity training.

Key Initiatives:
• Waterloo was recognized as one of Canada’s Top 100 Employers in 2016/17 and in 2017-18

Sound Values - Highlights

Key Statement: Almost 30% (29.8%) of Waterloo’s faculty were female in 2016/17, similar to the proportion reported in 2015/16 (29.6%).

Key Initiatives:
• Achieved annual goal of retrofitting and launching 29% (more than 60) inclusive, single-use washrooms in of 55 campus buildings. This initiative was well received by students, faculty, and staff.
• Policy 42, Prevention and Response to Sexual Violence, was established for students, faculty, and staff, effective January 2017.
• Appointed a Sexual Violence Response Coordinator
• Appointed an Associate Vice-President, Human Rights, Equity and Inclusion
• Waterloo’s commitment to advance gender equity remains a top priority. We entered our third year co-leading the global HeForShe IMPACT 10x10x10 movement. Under our IMPACT commitments, we are meeting and exceeding our targets to increase the numbers of girls and women in our STEM outreach experiences and activities, increase the number of women in tenure-track positions, and increase the number of women in leadership positions.
• A President’s Advisory Committee on an Indigenous Strategy has been established with a mandate to develop an Indigenization Strategy for the university, including, but not limited to, developing a response to calls to action of the Truth and Reconciliation Commission (TRC) of Canada with particular respect to those pertaining to higher education. Our strategy is directed at engaging with the entire University communicate and affiliated colleges and universities. The Advisory Committee has established working groups to address specific areas of interest and has invited involvement of members from within and outside of the university community. The five areas included:
  o Curriculum and academic programming
  o Community engagement
  o Policy and procedures
FEDERAL INNOVATION SUPERCLUSTERS - UPDATE

The Innovation Superclusters Initiative was officially launched in May of 2017. This initiative will select up to five superclusters that accelerate Canada’s global advantage in highly innovative industries such as advanced manufacturing, agri-food, clean technology, digital technology, health/biosciences, clean resources, infrastructure and transportation.

The University of Waterloo evaluated opportunities to either partner or support proposals based on existing collaborations with industry, other universities, or engagement and support from our faculties and individual faculty members. Waterloo wrote 12 letters in support of supercluster LOI proposals.

Of the short list of nine, three of our initial partners have been successful in moving to the next stage including:

- Advanced Manufacturing (Toronto-Waterloo Corridor)
  - Building Canada’s Advanced Manufacturing Supercluster - Lead PSE Partner
- Artificial Intelligence - Digital Economy
  - AI Powered Supply Chain Supercluster - PSE Partner
  - (IVADO -- Institute for Data Visualization, Montreal/Quebec City)
- Cleantech
  - CLEER Innovation Supercluster – Support (Ontario Mining Sector)

The other six proposals moving to the next stage are:
- Digital Technology (B.C.)
- Protein Innovation/Agriculture (Saskatchewan)
- Aerospace Simulation (Montreal)
- Ocean Technologies (Halifax)
- Agriculture/Quality Food (Calgary)
- Infrastructure Technology (Alberta)

The deadline for full proposals will be November 24th with the winning consortia announced in early 2018.

WATERLOO INNOVATION SUMMIT-2017

The fifth Waterloo Innovation Summit was hosted by the University on September 13-15, 2017. The sold-out event welcomed 300 thought leaders from across Canada and as far away as China, Japan, and Hong Kong. The Summit was co-chaired by broadcaster and author Amanda Lang and Toronto entrepreneur Michael Serbinis. The theme, “Hacking the Future,” allowed for analysis of the impact of disruptive technologies, including artificial intelligence, cybersecurity, crypto-currency, and quantum. Keynotes and panels included corporate and policy perspectives, and featured, among others, Mike Lazaridis, JB Straubel of Tesla, and Ted Livingston of Kik.

The Summit showcased the University’s broad partnerships within the region. The high impact program was held at the University and CIGI, with receptions at Lazaridis Hall and Shopify. Seventy attendees also experienced an optional ecosystem tour of the region. Special Shoulder events, including engagement opportunities with keynote speakers and a President’s
dinner, were also hosted. The Summit was presented in collaboration with sponsors and partners, including Communitech, the Lazaridis Institute, Blackberry, SAP, and others.

Feedback from attendees and partners was overwhelmingly positive regarding the high calibre of program content and Summit experience. We met our audience segment registration goals including 50% from business/industry, 25% government and 25% academic sectors. There was an increase in attendees from across Canada and internationally.

**STRATEGIC MANDATE AGREEMENT (SMA) – UPDATE**

Waterloo finalized a new Strategic Mandate Agreement with the provincial government, signing on October 4, 2017. The SMA is the result of negotiations with the Ministry’s SMA Special Advisor throughout the spring and summer. The SMA operationalizes elements of the new provincial funding formula and sets in place parameters to guide the university’s enrolment growth plan and overall funding for the next three years. Waterloo was successful in negotiating funding to support growth in graduate programs, at both the Masters and PhD level. Significant work will be needed in order to achieve the targets negotiated, but the associated funding for those enrolments will enable Waterloo to continue to build its strength as a graduate-intensive research institution.

Waterloo also established performance metrics and targets in the SMA for five different differentiation priorities set by the provincial government - Student Experience, Innovation in Teaching and Learning Excellence, Access and Equity, Research Excellence and Impact, and Innovation, Economic Development and Community Engagement. Waterloo will report on its performance on each of these metrics through its annual SMA report back each year.

**STRATEGIC ENROLMENT MANAGEMENT - UPDATE**

Enrolment Planning - Year-one enrolment tracking as of August/September indicates that Waterloo has surpassed its intake targets for both domestic and international students. It is estimated that by the official count date (Nov 1st) Waterloo will be 2% above last year’s actual first-year intake and 7% above this year’s fall intake target.

Initial progress has been made in addressing the report’s recommendations, including: (1) consultations with WBM stakeholders to identify information needs and gaps that will inform a budget model workflow implementation plan; (2) creation of a secure SharePoint site to specifically support the processes of the Strategic Budget Advisory Committee (SBAC).

**RESEARCH UPDATE**

**Waterloo Startup Fund - Update**

The Office of Research, through the leadership of the Waterloo Commercialization Office (WatCo), has been exploring the viability of establishing a $100M Waterloo Start-up Fund targeting investment in the creation of startups primarily based on disruptive faculty based research discoveries. The Fund model is inspired by what is referred to as the “patient capital” model that has been embraced in the UK over the past ten years with dedicated investment partnerships with individual universities. Such notable institutions as University College London, Cambridge University and Oxford University all have sizable dedicated startup venture funds with Oxford having the largest such fund with £580 M of capital under management. The patient capital model operates under the philosophy that providing more significant levels of early seed capital, approaching $1.5M, enables university based startups to attract and secure professional
management, build out products, and scale business development much sooner and with a higher
degree of likelihood of success. The “patient” aspect of the model recognizes that pulling
technology out of universities at a very early stage is risky and thus the fund needs to be
committed to longer time horizons for eventual returns as well as having a tolerance to make
subsequent investments along the way. As such, the Waterloo Startup Fund is being conceived to
provide each startup with access to a total of $5M based on achieving milestones over the first
few years of development. The University has entered a partnership with a European based
investment advisory firm with experience in such university based fund models.

Canada 150 Research Chairs

The Federal Government established the Canada 150 Research Chairs Program (C150) to enhance
Canada’s reputation as a global centre for science, research and innovation excellence. This
program was introduced to attract the world’s brightest talent to Canadian campuses. A total of
462 applications were received from applicants residing in 56 countries. Nominations were
prepared for the eight selected candidates, and submitted on September 15th. Final decisions are
expected toward the end of the year.

ADVEMENT UPDATE

Critical to sustainable growth in fundraising is our 5-prong strategic framework for integrating the
work of the Advancement teams at the University of Waterloo throughout the faculty and
centralized teams:

1. Alumni and Donor-centred decision-making and strategy-setting
2. Faculty focus
3. President and leadership engagement
4. Central Advancement optimization
5. Accountability and results

The underlying premise is that well-coordinated, collegial, partnership-driven pipelines that engage
the Deans, the President, relationship managers and volunteers will build sophisticated, strategic,
sustainable and fruitful relationships with current and potential donors that will yield a greater
number of and more generous philanthropic gifts for the University of Waterloo.

Since the beginning of the fiscal year, extensive consultations and planning exercises for 2017-2018
have taken place to align with these key areas alongside a considerable increase in alumni and donor
activity.

1. Alumni and Donor centred strategies:
   o Pipeline development
     ▪ Together with all six Faculty Advancement Directors and the Central
       Advancement management team, our team is engaged in building a university-
       wide pipeline that is transparent and shows growth and movement in donor
       relationships. Activities outlined below are an integral part of the pipeline
       expansion and strategic management.
   o Outreach
     ▪ Reunion 2017 hosted 4,600 attendees, a 44% increase from last year. For the
       first time, alumni were able to add a donation to their transaction when
       registering for the events resulting in 104 gifts and raising $7,426, a 32% and
       39% increase in total reunion giving respectively.
   o Alumni-student Bridge
- During Orientation Week’s Family Welcome event 43 volunteers, including 25 alumni, welcomed our future alumni to their new homes in Village 1, Ron Eydt Village (REV), and the New Residence Building. Sharing the day’s activities on SnapChat garnered an impressive 15,000 views. All incoming first-year students (7,000+) received an Alumni postcard and popular double-sided magnet.
  - **Alumni-in Residence**
    - This new program is designed to foster the development of critical life skills through workshops and day-to-day interactions. By giving students access to a network of experienced peers and alumni, the program will provide students with a sense of community and support their mental health and wellbeing. Additionally, students will graduate having developed a strong sense of what being an alumnus means - the services and benefits we offer and an appreciation for the importance of giving back by volunteering and giving.
  - **Volunteer / International**
    - Since June, Alumni Relations has been involved with 10 events globally hosted by volunteers including 75 chapter volunteers and 20 global ambassadors. Volunteers are located in: Canada, US, UAE, Trinidad and Tobago, Switzerland, Germany, England, France, Australia, Singapore, South Korea, China, Israel, Cyprus, India, Indonesia, Malaysia, New Zealand and Pakistan. Two of our chapter volunteers have been the recipients of Young Alumni awards (Arts and AHS). Jon Kwan in Singapore hosted one of our most successful sendoff events yet, turnout was close to 30, with 12 incoming students represented.

2. Faculty engagement:

Several meetings with the Deans and Faculty Advancement Directors have led to collaboration agreements between each Faculty and the Central Advancement team to clarify roles and responsibilities, build the pipeline of major and principal current and prospective donors, and establish a mechanism for creating shared financial goals. Guided by past results, each Faculty developed Conservative, Ambitious and Aggressive fundraising goals. Once the goals and the agreements are agreed to by the Deans, we will increase the pace of prospect identification, projects and plans to meet the goals.

3. President and leadership engagement:

Weekly President’s Travel Committee meetings maximize the effectiveness of the President’s advancement schedule. Activities from May 1, 2017 – October 31, 2017 have increased by 200% over last year.

4. Accountability, transparency and results:

A clear objective of the planning and re-organization initiatives as described above is increased ambition and sustainable growth in the University of Waterloo’s fundraising results in the next five years.

**Planned Giving**

UW surpassed $100M in gift expectancies in September with two gifts led by the leadership giving team with an increased planned gift to $2.5 million and a new gift of $2 million. A Planned Giving survey achieved a very successful 6% response rate leading to 7 confirmed planned gifts, 84 leads and 186 donors who said they plan to give in the next year.
FY 2017-18 Financial Results and Projections

As of September 30, 2017, total new gifts and pledges were $4.541 million comparing favourably with last year’s results for the same period of $3.172 million.

There are a number of large gifts in the pipeline that we expect to book prior to the end of next month. In addition, the drive to engage the President’s and Deans’ time and attention on our pipeline is beginning to move relationships in a more purposeful and strategic manner which should yield sustainable fundraising growth in the next 18 months. As a consequence of the negotiations of the collaboration agreements, firm fundraising goals are being set, creating new norms for sustainable growth and goal-setting in future years.
LEARN MORE:

uwaterloo.ca/strategic-plan-action
MESSAGE FROM THE PRESIDENT AND PROVOST

Over the last four years, the University of Waterloo has pursued the implementation of our strategic plan, “A Distinguished Past, A Distinctive Future” with focused determination.

Working closely with Faculties, stakeholders, and the Executive Council, and with engagement from constituencies across campus, we have made key investments, realigned resources, and made bold progress on our eight theme areas. Our leadership teams and Deans have been a key driving force behind the strategic plan to continually ensure that our strategic plan remains a living, vibrant document with robust monitoring and accountability elements.

In this update, you will find evidence of this unwavering commitment to our strategic plan, illustrated through:

› four years of progress and impact measures;
› highlights of some key initiatives implemented by our eight themes;
› a focus on internationalization at Waterloo; and
› updates from each of our six Faculties highlighting their efforts in strategic plan theme areas.

For more in-depth detail about each of our themes, and the progress we have made, you can visit our dashboards at: uwaterloo.ca/strategic-plan.

We are pleased with this progress, but there is still much work to do to fulfill our mission to be one of the top innovation universities in the world. In the next year we will complete the final year of our strategic plan and create a summative report to capture outcomes of the five year process. Between 2018 and 2019, this report, and other evidence, informed and prioritized through broad consultation of our stakeholders, will provide the foundation upon which we build the next cycle of our strategic plan. Our next strategic plan will be ready for launch with an action plan and an integrated accountability framework in 2020. A timeline outlining this work is featured at the end of this report.

As we look towards our fourth and final year of implementing this plan, we reflect with gratitude on the significant contributions of our previous Vice President Academic and Provost Ian Orchard, for his exceptional work in advancing this strategic plan. We also thank our campus community for their continued support and turn our eyes towards the final year of this vital initiative.

Sincerely,

FERIDUN HAMDULLAHPUR
PRESIDENT AND VICE-CHANCELLOR
UNIVERSITY OF WATERLOO

D. GEORGE DIXON
INTERIM VICE-PRESIDENT ACADEMIC & PROVOST
UNIVERSITY OF WATERLOO
INTRODUCTION AND HIGHLIGHTS

This is the University of Waterloo’s fourth annual report on Progress & Outcomes related to the implementation of our Strategic Plan. With just one year remaining in our current strategic plan cycle, we have met and exceeded important targets established by our themes, and identified initiatives that will advance our progress. Some of our progress is summarized here.

› In Experiential Education, we have reimagined key facets of our mission and our organizational structure to deliver a new type of co-op experience (flex terms), a work-ready certificate for non-co-op students (EDGE), and a revitalized marketing and recruitment strategy for new employers to diversify the employer base. Co-op enrolment as a proportion of total enrolment grew from 63.4% in 2013/14 to 67.1% in 2016/17. First work-term employment rate grew from 91.4% to 94.5% and overall work-term employment rate grew from 96.6% to 97.7% for the same time period, exceeding the 95% target for the fourth consecutive year. The number of active employers increased by 13.6% over four years.

› Creating an entrepreneurial university has resulted in significantly more entrepreneurial learning and development opportunities for students (67.6% increase in enrolment and 118.8% increase in the number of entrepreneurial for-credit and non-credit courses, workshops, and events), with significant investment in new entrepreneurial spaces (increased space in Velocity Science, Velocity Garage, and GreenHouse Social Impact Incubator), and new supports for hard tech in 2016/17. Investment funding for current students grew from $3.9M in 2013/14 to $21.0M in 2016/17. Among alumni, investment funding grew from $97.9M to $179.5M for the same period. The proportion of Velocity-based student ventures that are still active after one year increased from 84.3% in 2013/14 to 89.0% in 2016/17, well above industry benchmarks.

› Transformational Research increased resources and supports to facilitate research at Waterloo. In 2016/17, Waterloo’s total sponsored research exceeded the overall target by $6.8M, a total increase since 2013/14 of 13.7%. Waterloo also increased internal supports to develop research proposals from a broader range of sectors, implement research projects, and facilitate nominations of Waterloo faculty for prestigious research awards and honours. Over four years, Waterloo has secured important major funding support for transdisciplinary research ranging from aging, quantum technologies, and water research to advanced manufacturing, actuarial science, and cyber infrastructure. Waterloo continues to develop and pursue new international research partnerships with elite institutions.

› Advancing our outstanding academic programming remained a priority in 2016/17. The number of Waterloo subjects ranked in the top 100 Quacquarelli Symonds (QS) Subject Rankings grew from seven in 2013/14 to 13 in 2016/17. Sixty per cent (59.2%) more graduate students enrolled in professional skills workshops and a new Thesis Fundamentals workshop was developed. Waterloo exceeded the target for the number of online courses available annually in two of three years, with an overall increase of 31.1% from 2013/14 to 2016/17. There was an overall increase of 16.8% in enrolment in fully online courses since 2013/14 and three new fully online programs are now available. Waterloo developed 14 new or restructured programs (four undergraduate and 10 graduate). All Faculties are developing new Strategic Enrolment Management plans.

› Waterloo’s international ranking has remained relatively stable since 2013/14 and international research funding fluctuated overall but remained at $17.4M in 2016/17, the same as 2013/14. The proportion of undergraduate and graduate international students has increased steadily since 2013/14 by 4.6 percentage points among undergraduates and 3.6 percentage points among graduate students. The number of international co-op work terms have increased by 32.0% since 2013/14.

› More progress has been made in the area of vibrant student experience. Consulting broadly with students, faculty, and staff, the Student Success Office has further developed the mobile student portal to integrate with LEARN and to include access to mental health resources. Between 2013 and 2016 the amount of new student study space available increased by 18.0%. The Student Services Centre and renovations to the Student Life Centre/Physical Activities Complex are both in progress. The President’s Advisory Committee on Student Mental Health is underway with a report due in early 2018.

› Under the Robust Employer-Employee Relationship theme, numerous new and ongoing improvements have been made to recruitment and retention processes and procedures since 2013/14. Waterloo has been recognized as one of Canada’s Top 100 Employers.

› Building on our sound values, Waterloo continues to support training and policy development activities related to equity, diversity, and inclusion. Annual goals of retrofitting and launching inclusive, single-use washrooms are being met and well received by the Waterloo community.

We have made important progress in 2016/17. Our next report in fall 2018 will provide a comprehensive summary of the outcomes that we have achieved over the five years of our strategic plan and will contribute important evidence for our next strategic plan cycle.
EXPERIENTIAL EDUCATION
Progress and Outcomes | Fall 2017 Update

OBJECTIVE 1 | Educate outstanding and world-ready graduates whose skills are in high demand globally

<table>
<thead>
<tr>
<th>MEASURES</th>
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</thead>
<tbody>
<tr>
<td>First work-term employment rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Employment rates indicate Waterloo’s effectiveness in providing support in the first work-term application process. First work-term employment is an important indicator of future co-op success.</td>
</tr>
<tr>
<td>Source: Co-operative Education and Career Action (CECA)</td>
<td>91.4%</td>
<td>92.6%</td>
<td>92.6%</td>
<td>94.5%</td>
<td>The proportion of first work-term students who are employed has increased consistently since 2013/14, with a total four year increase of 3.1 percentage points.</td>
</tr>
<tr>
<td>Proportion of co-op graduates who reported skills learned at Waterloo were related to skills required for job at six months after graduation</td>
<td>2011</td>
<td>2012</td>
<td>2013</td>
<td>2014</td>
<td>Co-op graduates’ perception of the skills they learned at Waterloo, compared to the skills they require for employment, is consistently high, and significantly higher than for non co-op graduates.</td>
</tr>
<tr>
<td>Source: Ontario University Graduate Survey (OUGS)</td>
<td>94.6%</td>
<td>94.8%</td>
<td>95.6%</td>
<td>95.7%</td>
<td>Besides the co-op work-term experience itself, another way that co-op students learn about and develop, soft skills that are required in the workplace, is through mandatory Waterloo Professional Development (WatPD) courses.</td>
</tr>
<tr>
<td>Co-op graduate employment rate six months after graduation</td>
<td>2011</td>
<td>2012</td>
<td>2013</td>
<td>2014</td>
<td>Co-op graduate employment rate is one way to understand the relevance of graduates’ education to work opportunities.</td>
</tr>
<tr>
<td>Source: OUGS</td>
<td>91.0%</td>
<td>90.7%</td>
<td>91.7%</td>
<td>88.7%</td>
<td>A key objective of co-op education is to provide graduates with the experience, skills, and networks necessary to gain employment after graduation. The rate for 2014 non co-op graduates was 83.3% at six months.</td>
</tr>
</tbody>
</table>

WHAT WE DID IN 2016/17

> In fall 2016, more than 20,700 full-time, undergraduate students were enrolled in co-operative education at Waterloo, an increase of 4.9% over 2015/16. Considered as a proportion of total full-time, undergraduate enrolment, co-op enrolment grew from 63.4% in 2013 to 67.1% in 2016.

> Development of Co-op 2.0, the evolution of co-operative education, continued at Waterloo. Consultations with student groups to maximize the value and relevance of new Co-op 2.0 opportunities continued including flexible work terms, co-op specialization in research, first work-term fundamental experiences, and industry/academic partnerships.

> As part of Co-op 2.0, co-op flex terms are being piloted. Any student may opt for a flexible work term to pursue an opportunity that involves humanitarian work, is a single work term with two different employers, or is consistent with that individual’s career goals but may not fulfill normal credit-granting criteria for a work term. Flex work terms will be fully launched in fall 2018.

> The third pilot of the Co-op Living Learning Community (LLC) fine-tuned activities and supports for students. Results to date indicate that co-op students who participated in the LLC gained first work-term employment earlier in the recruitment cycle, which can reduce stress in the academic term preceding the work term.

> EDGE, a new experiential education certificate for non co-op students, was approved by Senate in May 2016. EDGE aims to improve graduate outcomes by assisting students in identifying and articulating the skills they develop during their undergraduate career. Students complete required workshops, participate in work or community-based courses, and develop a post-graduation career plan to achieve their EDGE certification. A pilot of the skills identification and articulation workshop was successfully implemented with two large first-year classes in the Faculties of Applied Health Sciences and Environment. The full EDGE program will launch in September 2017.

OBJECTIVE 2 | Develop an innovative culture of Experiential Education at the University

<table>
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<tbody>
<tr>
<td>Overall work-term employment rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Work-term employment rates indicate how effective Waterloo is at ensuring students receive co-op work-term opportunities. A student may complete more than one work term each year. The employment rate reported here captures the percentage of scheduled work terms filled over the course of the entire year.</td>
</tr>
<tr>
<td>Source: CECA</td>
<td>96.6%</td>
<td>97.0%</td>
<td>97.3%</td>
<td>97.7%</td>
<td>Between 2015/16 and 2016/17, the total number of co-op work terms increased by 2.5%, compared to 6.3% in the prior year.</td>
</tr>
<tr>
<td>Number of co-op work terms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The increasing number of work terms reflects increasing demand for work-related experiential education.</td>
</tr>
<tr>
<td>Source: CECA</td>
<td>16,781</td>
<td>17,628</td>
<td>18,730</td>
<td>19,188</td>
<td>TARGET: Overall target for work-term employment rate is 95% each year. Over 6,000 students seek co-op employment each term. Maintaining this rate is an ongoing challenge due to significant increases in co-op enrolment and economic volatility.</td>
</tr>
<tr>
<td>Total co-op student earnings (self-reported data)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Co-op programs offer an opportunity for students to earn income while attending school and to make a contribution to the economy.</td>
</tr>
<tr>
<td>Source: CECA</td>
<td>$191.2M</td>
<td>$206.3M</td>
<td>$225.9M</td>
<td>$240.5M</td>
<td>Work-term earnings have increased 25.8% since 2013/14 and 6.5% since 2015/16.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Numbers have been re-stated for all years as a result of moving to a different system (Job Mine to WaterlooWorks) and improved data integrity practices in 2016.</td>
</tr>
</tbody>
</table>
OBJECTIVE 2 | Develop an innovative culture of Experiential Education at the University

WHAT WE DID IN 2016/17

> A small working group began to work on a model for co-op in graduate programs that is reflective of the knowledge level, research underpinnings, and career ambitions of graduate students.

> The Co-operative and Experiential Education portfolio was introduced at the University in February 2017, under the leadership of the Associate Provost Co-operative and Experiential Education, bringing together Co-op, the Centre for Career Action, EDGE, Waterloo Professional Development (WatPD) and the Waterloo Centre for Advancement of Co-operative Education (CACE). The new structure integrates existing units while aligning reporting structure level and accountability.

OBJECTIVE 3 | Enlarge the resource base of professionally credentialled and/or discipline-relevant employers

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<tbody>
<tr>
<td>Number of active employers — hired at least one student in the previous three years</td>
<td>Source: CECA</td>
<td>6,093</td>
<td>6,384</td>
<td>6,706</td>
<td>6,919</td>
</tr>
<tr>
<td>Number of new employers — hired a student for the first time in the given fiscal year</td>
<td>Source: CECA</td>
<td>1,304</td>
<td>1,050</td>
<td>1,562</td>
<td>1,440</td>
</tr>
<tr>
<td>Employer rating of student performance as very good to outstanding</td>
<td>Source: CECA</td>
<td>93.1%</td>
<td>93.2%</td>
<td>93.3%</td>
<td>93.5%</td>
</tr>
</tbody>
</table>

WHAT WE DID IN 2016/17

> New approaches to employer recruitment included organizational changes to distribute business development resources to the five regional teams across Canada (West, Central East, Central West, GTA, East), the addition of two business developers to marketing, and a new market researcher to provide data-driven strategic information to the team. This change facilitates a regional, labour-market driven approach to strategic marketing and job development, and shifts resources to where student employment need is greatest. Strategic plans aligned to specific targets for each regional team will be in place for most regions by end of 2017.

> Marketing outreach continues to identify, cultivate, and manage the strongest number of relevant prospective employer leads from attendance and participation in over 50 industry-based conferences and tradeshows a year. The number of prospective employer inquiries by email, phone, and web has increased over 300% in the past three years.

OBJECTIVE 4 | Achieve a closer integration of research opportunities and co-op work terms

WHAT WE DID IN 2016/17

> Waterloo’s Senate approved a co-op specialization in research as part of its new co-op certificate program. The co-op research certificate recognizes students who choose to work in research-focused positions during at least three work terms and complete the research professional development and capstone requirements. Plans are underway to develop a professional development course in research fundamentals for interested co-op students.

OBJECTIVE 5 | Expand experiential education to include service-based activities and international programs

WHAT WE DID IN 2016/17

> Both flex terms and the EDGE program will incorporate service-based and international activities as ways to fulfill either co-op or EDGE program requirements.

> The EDGE program extends experiential education to service-based activities by allowing students to pair their volunteer experiences with the completion of a professional development course. Students enhance their learning, receive feedback on their performance, and reflect on the role that service-based experiences play in their personal and professional development.

> Philanthropic contributions have provided opportunities for paid co-op work terms at the United Way.

> The Canadian European Union (CANEU) Consortium Partners for Strengthening Transatlantic Student Mobility in Co-operative Education, known as CANEU COOP, is a partnership between the University of Waterloo, the University of Victoria, and two European institutions. It was recognized with an award for Outstanding Program in International Education, by the British Columbia Council for International Education.

> Co-op maintained a steady level of international mobility last year despite the shifting socio-political landscape.
UNIQUELY ENTREPRENEURIAL

Progress and Outcomes | Fall 2017 Update

OBJECTIVE 1 | Enhance student opportunities to participate in entrepreneurial activities

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<tbody>
<tr>
<td>Student enrolment in both credit and non-credit courses, workshops, and events related to entrepreneurship</td>
<td>10,002</td>
<td>12,416</td>
<td>15,694</td>
<td>16,759</td>
<td>&gt; Engaging more students in all forms of entrepreneurship endeavours is a key predictor of future entrepreneurship success of Waterloo students and alumni, and injects an entrepreneurial spirit across the University.</td>
</tr>
<tr>
<td>Number of for-credit and non-credit courses, workshops, and events related to entrepreneurship</td>
<td>239</td>
<td>291</td>
<td>387</td>
<td>523</td>
<td>&gt; Total enrolment in entrepreneurial activities increased by 6.8% in 2016/17 over 2015/16.</td>
</tr>
</tbody>
</table>

> Increased student access to the World’s Challenge Challenge, an inter-university competition, and the Problem Pitch Competition, a new competition developed with the Problem Lab, to encourage entrepreneurs to focus more deeply on a problem before addressing solutions. More than 150 students from all Faculties took part in the competitions. Regardless of competition outcomes, Velocity works with all participating students.

> The third cohort of the GreenHouse Social Impact Incubator co-operative education program placed 34 first-term co-op students with 27 regional social ventures.

> GreenHouse hosted nearly 30 events and over 800 students participated in these entrepreneurship experiences. GreenHouse also launched a new credit course for its live-in social incubator, and a second course will be added in fall 2017. The majority of students (70%) participating in GreenHouse were from the non-science, technology, engineering, and mathematics (STEM) disciplines. The program also maintained gender-balanced representation among participants.

> Twenty-two engineering students won a total of $60K at the 2017 Norman Esch Entrepreneurship Awards for Capstone Design competition.

> Engineer of the Future Fund awarded $53K in micro-seed funding to Waterloo Engineering students to support entrepreneurial initiatives.

> Program requirements for Conrad Business Entrepreneurship and Technology’s (CBET) entrepreneurship minor program have been refined and three new courses developed for the upcoming year.

> GreenHouse completed a $10M capital expansion to provide new learning and discovery space. The new space will open in fall 2017.

> Waterloo’s student club Entrepreneurship Society (EntSoc) is now working with Startup Waterloo to increase awareness and exposure to entrepreneurship, including students not typically engaged in entrepreneurship activities.

> Hosted six ConradConnect Live events to create and support a broader entrepreneurship community at Waterloo. Events were offered to all students, and 417 participated. ConradConnect also hosted workshops on a variety of themes of interest to entrepreneurial students.

WHAT WE DID IN 2016/17

OBJECTIVE 2 | Build relationships and generate opportunities with entrepreneurial communities and agencies

WHAT WE DID IN 2016/17

> More than 10,000 people tour Velocity Garage each year. This includes politicians and business leaders, influencers, venture capitalists, university/college leaders, school groups, and community members.

> Velocity secured an additional $327K in Canada Accelerator & Incubator Program (CAIP) funding over three years to help grow hardware/science startups.

> More than 1,000 students participated in the annual Hack the North hackathon, organized by Waterloo students and the Faculty of Engineering.

> The Water Network and the de Gaspé Beaubien Foundation created a new annual AquaHacking Challenge to find solutions for Lake Erie water issues. More than 350 students participated in the Challenge.

> Conrad Master of Business, Entrepreneurship and Technology (MBET) hosted three different international student entrepreneurship programs in summer 2017: Tec de Monterrey/Mexico, University of Santiago/Chile, and University of Strathmore/Kenya.

OBJECTIVE 3 | Advance commercialization and other forms of utilization of leading-edge entrepreneurial research and intellectual property

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</thead>
<tbody>
<tr>
<td>Investment funding of Waterloo ventures by student type</td>
<td>$3.9M</td>
<td>$15.7M</td>
<td>$4.4M</td>
<td>$21.0M</td>
<td>&gt; Investment funding secured for undergraduate and recent alumni entrepreneurial activities is one way to understand the scope and intensity of entrepreneurial activity at Waterloo.</td>
</tr>
</tbody>
</table>

> While the amount of investment funding secured by student-related ventures has fluctuated, there appears to be an overall upward trend in the amount of funding secured.

> Investment funding data is collected from surveys conducted with Waterloo student and alumni companies, one-on-one meetings with Waterloo-based companies, and media coverage. Variations in data reported may result from self-reporting and data gathering discrepancies.
WHAT WE DID IN 2016/17

> Expansion and renovations to Velocity Garage were completed in fall 2016. The new space is 37K sq ft and includes a science lab, assembly space, a workshop, a prototyping lab, co-working space, and meeting rooms. In 2015/16, Velocity housed 114 companies in Velocity Garage and 28 companies in Velocity Science.

> Waterloo Commercialization Office (WatCo) delivered 16 intellectual property (IP) education and awareness workshops, referred to as IP 101, including approximately 100 students participating in Applied Health Sciences’ (AHS) Hack4Health initiative. WatCo also developed and hosted a two-day workshop on IP and commercialization to students in the Natural Sciences and Engineering Research Council (NSERC)-funded Training toward Environmentally Responsible Resource Extraction-Collaborative, Research and Training Experience (TERRE-CREATE) program. The workshops incorporated a case study and work exercises.

> Velocity has added more supports for science and hard-tech companies and is building connections to other ecosystem supports that enable hard-tech innovation (e.g., IndieBio, Biomedical Zone, Office of Research & Ethics, and Hospital Innovation Groups). This has also led to an increase in the number of Masters/PhD student thesis projects being converted into commercially-viable start-ups.

> Velocity Garage launched new “Investor Meetings” to better connect incubator companies with investors. These meetings allow face-to-face interaction with potential investors who provide feedback and are a starting point for important founder/investor relationships.

> Over this past year, WatCo continued to lead Waterloo’s collaboration with the Accelerator Centre (AC). Through the AC JumpStart program, 12 Waterloo alumni-initiated startups received seed investments worth $720K cash and $120K in-kind mentoring.

> Worked with Chinese investors to raise $26M in venture capital funds for Waterloo startups co-locating in China.

> WatCo developed a new presentation on Waterloo’s creator-owned Intellectual Property policy and presented it to 300 students.

> GreenHouse is developing an ad hoc research network between campus-linked accelerators (CLAs) to explore learning outcomes supported by entrepreneurship training.

> WatCo continued providing assistance to a number of seed startup companies, including the following examples:

  - secured seed funding for the creation of a Hongzhou (China) startup to commercialize an Atomic Force Microscopy (AFM) tip, manufacturing technology developed by Professor Bo Cui;
  - licensed additional new technology to KA Imaging Inc. to support them in receiving a $1M Grand Challenges grant for targeting developing world applications;
  - provided negotiation support for Watech Power Inc., developer of a zinc-air flow battery technology and SSIMwave, developer of real-time video analytics software, to secure significant follow-on investment;
  - worked with Grand River Hospital to secure a license for software developed by Professor Helen Chen to enable the efficient transferring of patient data into government reporting and billing systems; and
  - licensed educational materials developed by AHS’s Murray Alzheimer Research and Education Program (MAREP) to several not-for-profit agencies to use as resources for caregivers.

WHAT WE DID IN 2016/17

> Fall 2016 and spring 2017 editions of Waterloo Magazine, with a circulation of more than 190K alumni, contained several stories that promoted Waterloo’s entrepreneurial culture.

> Multiple media mentions in national publications (Globe and Mail, Financial Post and Huffington Post) that link the University of Waterloo to entrepreneurship.

> More than 30 stories published on Waterloo’s homepage celebrating entrepreneurship.

> The Waterloo Innovation Summit in September 2016 brought together some of the world’s top private and public sector leaders to tackle the disruptive and defining trends that are driving innovation and entrepreneurship in Canada and globally.

OBJECTIVE 3 (Cont’d) | Advance commercialization and other forms of utilization of leading-edge entrepreneurial research and intellectual property

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<tbody>
<tr>
<td>Proportion of Velocity-based ventures that are still active after one year</td>
<td>84.3%</td>
<td>90.7%</td>
<td>87.0%</td>
<td>89.0%</td>
<td>&gt; New ventures’ survival rates after one year (the number of ventures that are still active or have been acquired after one year) are an industry standard, and provides an opportunity to understand how Waterloo supports and advances commercialization for University-based ventures. &gt; Waterloo provides important supports for Waterloo-based ventures. These supports ensure that Waterloo-based ventures are well-positioned to survive at least one year. &gt; The proportion of Velocity-based ventures that survived one year has remained relatively stable over four years.</td>
</tr>
</tbody>
</table>

Source: Velocity

WHAT WE DID IN 2016/17

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<tr>
<td>Waterloo’s rank in Maclean’s “most innovative university” category</td>
<td>#1</td>
<td>#1</td>
<td>#1</td>
<td>#1</td>
<td>&gt; Innovation is an important element of Waterloo’s entrepreneurship brand. Maclean’s “most innovative university” ranking is one way to understand how Waterloo’s brand is perceived nationally. &gt; Waterloo was ranked #1 in Maclean’s “most innovative university” category for the 25th year in a row. &gt; While important as an indicator of prestige, this indicator is dependent on the consistency of the survey methodology.</td>
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Source: Maclean’s University Ranking

| Waterloo’s rank in Venture Capital Pitchbook | #16 | #21 | #20 | #20 | > Venture Capital Pitchbook created a ranking of the top international universities producing venture capital-backed entrepreneurs. > Venture capital assessment and ranking is one of a very few objective indicators that allow institutional comparisons. |

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OBJECTIVE 4 | Make entrepreneurship a key element of the Waterloo brand

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**TRANSFORMATIONAL RESEARCH**

*Progress and Outcomes | Fall 2017 Update*

**OBJECTIVE 1** | Be recognized internationally for excellence and innovation in research, scholarship, and education

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</thead>
<tbody>
<tr>
<td>Research Infosource ranking (comprehensive universities)</td>
<td>#1</td>
<td>#1</td>
<td>#1</td>
<td>#1</td>
<td>&gt; Ranking of research and scholarship at Canadian universities is one way to understand research and innovation excellence. &lt;br&gt; &gt; Waterloo has maintained this top ranking for eight years, which is compelling testimony to the quality and impact of its research.</td>
</tr>
</tbody>
</table>

Source: Research Infosource

**WHAT WE DID IN 2016/17**

> Appointed an inaugural Awards Officer to work closely with Waterloo faculty to identify, pursue, and facilitate nominations of Waterloo faculty for prestigious research awards and honours. Importantly, in the Maclean’s annual ranking awards category, Waterloo has risen from 14th in 2010 to 7th place in 2016.

> Since 2011, Waterloo’s International Research Partnership Grant (IPRG) program has funded 122 projects, with an investment of over $1.6M and leveraged more than $2.4M in matching funds, for a total in excess of $13.3M in new grants awarded to Waterloo researchers.

**OBJECTIVE 2** | Enable conditions which support research excellence and impact

**WHAT WE DID IN 2016/17**

> Continued implementation of the Research Gateway Project. Kuali, a new ethics data system, is scheduled to be launched in February, 2018. The first phase of the Pure Researcher Portal will be launched in the spring of 2018, and Phase 2 is expected to go live in the early fall of 2018.

> Continued development of the Research Metrics Framework to streamline the provision of bibliometrics data for major funding applications and to inform discipline benchmarking processes.

> Hired a new manager to support foundation funding and non-profit public sector partnerships. Results from this new investment include a $125K contract for research on affordable transit, a $3M grant from the Canadian Frailty Network, and fulfillment of in-kind matching requirements for grants from the Canadian Institutes of Health Research (CIHR) and the Social Sciences and Humanities Research Council (SSHRC).

> Technical positions in science, technology, engineering, and mathematics (STEM) established in 2015/16 continue to have a positive impact on facilitating the use of major research equipment and facilities. New project management and accountant positions are now available on a cost-recovery basis for principal investigators (PIs) and their teams to reduce administrative burdens on them.

> The new *Role of the PI* resource is now available to support PIs understand and meet research project compliance obligations.

> Developed and implemented a new version of the web-based form for reporting IP and commercialization disclosures which is easier to complete and resulted in broader use of the form by the professorate during 2016/17.

> Created a Canada Research Chair Equity Action Plan Steering Committee to ensure Waterloo is an equitable, diverse, and inclusive community for those in the Canada Research Chair (CRC) Program, and the University at large.

**OBJECTIVE 3** | Increase interdisciplinary and trans-disciplinary research globally, nationally, and locally

**WHAT WE DID IN 2016/17**

> Submitted proposals for major funding in support of transdisciplinary research in additive manufacturing, climate change, adaptive robotics and machine intelligence, next generation cryptographic technologies, transformative quantum technologies, and global water futures. Funding was received for additive manufacturing, transformative quantum technologies, and global water futures. These are all areas in which the University demonstrates significant strength.

> Central funding for four University research institutes has been renewed: Institute for Quantum Computing, Waterloo Institute for Nanotechnology, Waterloo Institute for Sustainable Energy, and the Water Institute. The Games Institute, the Centre for Bioengineering and Biotechnology, and the Cybersecurity and Privacy Institute were named as University Centres or Institutes in early 2017.

**OBJECTIVE 4** | Strengthen the relationship between research and teaching at the undergraduate level

**WHAT WE DID IN 2016/17**

> Continued to work with Faculties and Co-operative Education and Career Action (CECA) to enhance opportunities for undergraduate research experience (e.g., co-op specialization in research). Forty per cent of Waterloo first-year students surveyed hope to work with a faculty member on a research project at some point during their undergraduate program.

> New co-op research certificate approved by Senate. Beginning in fall 2018, co-op students who have completed at least three research-focused co-op terms and a professional development and capstone requirement will be able to receive a co-op research certificate in addition to the co-op designation degree.
OBJECTIVE 5 | Build greater awareness, nationally and globally, of Waterloo’s research productivity and impact

<table>
<thead>
<tr>
<th>WHAT WE DID IN 2016/17</th>
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</thead>
<tbody>
<tr>
<td>Proposals for two additional Canada Excellence Research Chairs were submitted in late spring 2017; one in Adaptive Robotics and Machine Intelligence, the other in Next Generation Cryptographic Technologies.</td>
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</tbody>
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<table>
<thead>
<tr>
<th>WHAT WE DID IN 2016/17</th>
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<tbody>
<tr>
<td>Initiated a new annual publication, <em>Year in Review</em>, to highlight innovative research accomplishments. This publication will be distributed to Waterloo's stakeholders including current and potential domestic and international research partners, as well as key government leaders.</td>
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</table>

OBJECTIVE 6 | Identify and seize opportunities to lead in new/emerging research areas

<table>
<thead>
<tr>
<th>WHAT WE DID IN 2016/17</th>
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</thead>
<tbody>
<tr>
<td>Preparation for the submission of applications for Canada 150 Research Chairs in new and emerging areas of research was initiated. The submission deadline is September 2017.</td>
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</tbody>
</table>

MEASURES 2013/14 2014/15 2015/16 2016/17 WHAT DOES THIS MEAN?

<table>
<thead>
<tr>
<th>Proportion of U15 Tri-agency research funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.6% 9.1% 8.0% 9.3%</td>
</tr>
<tr>
<td>NATURAL SCIENCES AND ENGINEERING RESEARCH COUNCIL (NSERC)</td>
</tr>
<tr>
<td>SOCIAL SCIENCES AND HUMANITIES RESEARCH COUNCIL (SSHRC)</td>
</tr>
<tr>
<td>4.1% 4.1% 3.4% 3.7%</td>
</tr>
<tr>
<td>CANADIAN INSTITUTES OF HEALTH RESEARCH (CIHR)</td>
</tr>
<tr>
<td>1.5% 1.5% 1.1% 1.1%</td>
</tr>
</tbody>
</table>

> Tri-Agency data shown for 2016/17 are preliminary; official data will be available in fall 2017.

> NSERC funding and SSHRC funding for 2016/17 increased over the previous year by 1.3 percentage points and 0.3 percentage points (estimated), respectively, as a proportion of U15 funding.

> Minor fluctuations in the year-to-year proportion of U15 Tri-Agency funding held by Waterloo reflect, in part, grants that are ending and being replaced by new grants that may or may not be of the same value.

> These metrics should be viewed in the context that Waterloo is the only member of the Canadian U15 research intensive universities that does not have a medical school.

> Total sponsored research is a measure of the total research funding Waterloo receives for research from external sources (government, industry, foundations, and non-profits) and provides one way to understand Waterloo’s research productivity and impact.

TARGET: In 2016/17 Waterloo exceeded its target of increasing total sponsored research funding by 10% from the 2013/14 baseline by 2018. In 2016/17, Waterloo’s total sponsored research was $205.7M, 13.7% greater than the $180.9M baseline. Achieving this target one year early is important; however, it bears noting that federal and provincial research funding environments are typically not stable.

Source: Office of Research

> Industry investment in Waterloo research is indicative of its industrial relevance and also reflects the strong partnership Waterloo enjoys with the private sector at many levels.

> The proportion of funding from industry partners remained stable at 30.3% in 2016/17.

> Industrial research funding can often be leveraged with Tri-Agency funding because a number of Tri-Agency programs require an industrial funding match. Indeed, matching funds from industry indirectly drive eligibility for research funding from a number of sources including the Research Support Fund, Canada Research Chairs, and the Canada Foundation for Innovation.

Source: Office of Research

> The proportion of Waterloo publications co-authored with industrial collaborators is a meaningful proxy for research productivity and impact that is relevant to the private sector.

> The proportion of publications with industry collaborators decreased by 0.7 percentage points between 2015 and 2017.

> Publication with collaborators from industry is an important vehicle for knowledge translation, helping to ensure that, as appropriate, Waterloo research and innovation have real world application.

Source: Centre for Science and Technology Studies (CWTS) Leiden ranking

WHAT WE DID IN 2016/17

> Hired four Research Partnership Managers (three in corporate research, one in non-profit/public sector) to increase the number of research partnerships and attendant funding.

> Initiated a new annual publication, *Year in Review*, to highlight innovative research accomplishments. This publication will be distributed to Waterloo’s stakeholders including current and potential domestic and international research partners, as well as key government leaders.

> Prepared for the submission of applications for Canada 150 Research Chairs in new and emerging areas of research was initiated. The submission deadline is September 2017.

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<tr>
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<tr>
<td>$180.9M $181.2M $182.6M $205.7M</td>
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2018 TARGET: $198.9M

Source: Office of Research

<table>
<thead>
<tr>
<th>Proportion of funding from industry partners</th>
</tr>
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<tbody>
<tr>
<td>31.1% 31.0% 30.0% 30.3%</td>
</tr>
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</table>

Source: Office of Research

<table>
<thead>
<tr>
<th>Proportion of publications with industry collaborators</th>
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<tbody>
<tr>
<td>6.4% 6.3% 5.6%</td>
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</table>

Source: Centre for Science and Technology Studies (CWTS) Leiden ranking
OUTSTANDING ACADEMIC PROGRAMMING
Progress and Outcomes | Fall 2017 Update

OBJECTIVE 1 | Educate graduates uniquely prepared to address the challenges and opportunities of the 21st century

<table>
<thead>
<tr>
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<th>2015/16</th>
<th>2016/17</th>
<th>WHAT DOES THIS MEAN?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate student enrolment in professional and skills workshops</td>
<td>WORKSHOP OFFERED</td>
<td></td>
<td></td>
<td></td>
<td>&gt; Graduate student workshops offer opportunities for participants to develop a variety of professional skills beyond their academic degrees.</td>
</tr>
<tr>
<td></td>
<td>704</td>
<td>900</td>
<td>744</td>
<td>754</td>
<td>Changes in the number of workshops and participants reflects organizational changes in how workshops are offered and new workshops being included.</td>
</tr>
<tr>
<td></td>
<td>PARTICIPATION</td>
<td></td>
<td></td>
<td></td>
<td>&gt; Between 2015/16 and 2016/17, 10 additional graduate student professional and skills workshops were offered and 9.8% more students participated in them.</td>
</tr>
</tbody>
</table>

Source: Graduate Studies and Postdoctoral Affairs (GSPA)

Undergraduate first-year and senior students’ perception of Waterloo’s contribution to selected skills

<table>
<thead>
<tr>
<th>MEASURES</th>
<th>SPEAKING CLEARLY AND EFFECTIVELY</th>
<th>WRITING CLEARLY AND EFFECTIVELY</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>48.3%</td>
<td>2014</td>
</tr>
<tr>
<td>2017</td>
<td>50.4%</td>
<td>2017</td>
</tr>
</tbody>
</table>

> National surveys offer an opportunity to understand Waterloo students’ perceptions about their academic and skill development.

> Oral and written communications are important skills required by graduates, and will be monitored to understand changes. See the What We Did section for more information.

WHAT WE DID IN 2016/17

> Completed the Strategic Enrolment Management (SEM) pilot project in the Faculty of Arts. A new strategic enrolment manager was hired to develop, refine, and implement plans with all Faculties as part of an institution-wide plan.

> The Writing and Communication Centre (WCC) in partnership with Graduate Studies and Postdoctoral Affairs (GSPA) launched a new Thesis Fundamentals program for graduate students beginning the thesis and dissertation writing process. A three-day pilot academic speaking program for doctoral students was offered in July 2017, and will be delivered on a term basis going forward.

> With funding from eCampusOntario, Waterloo has partnered with Carleton, Ottawa, and Ryerson to determine the need and possible formats for a provincially-available certificate program in online teaching. Recommendations will be submitted in fall 2017.

> The Business at Waterloo Programs report was presented to leadership in January 2017. A key recommendation of the report is to create a Waterloo Business Hub that will serve as a creative collision space for business students and instructors, build synergistic opportunities with experiential education and entrepreneurial activities, and be a key differentiator for unconventional business education at Waterloo.

> The Canadian Professional and Graduate Student Survey (CGPSS) data suggest that Waterloo prepares graduate students for a diversity of careers. Over 40% of respondents felt prepared to enter research (48.3%), non-academic (49.4%) or consulting (44.1%) jobs, while about 20% (19.7%) indicated their readiness for entrepreneurial opportunities.

OBJECTIVE 2 | Enhance Waterloo’s excellence in academic programs

<table>
<thead>
<tr>
<th>MEASURES</th>
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<th>2014/15</th>
<th>2015/16</th>
<th>2016/17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject Rankings</td>
<td>Computer Science, Math</td>
<td>Computer Science, Math</td>
<td>Hospitality &amp; Leisure Management Studies*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOP 50</td>
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<td></td>
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<tr>
<td></td>
<td>TOP 100</td>
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*New subject added in 2016/17

WHAT WE DID IN 2016/17

> In the 2017/18 QS Subject Rankings, Waterloo ranked in 25 of 46 subjects and was ranked in the top 100 in 13 subjects and top 50 in three subjects.

> The Course Evaluation Project Team completed its three-year investigation of a best model for course evaluation at Waterloo. The report will be discussed at the September 2017 Senate meeting.

> Over the fall term, the Committee on Teaching and Learning Spaces solicited feedback from the campus community on newly constructed and renovated classrooms, and rooms in need of renovation. A “best and worst” classrooms survey and tours with instructors and students were completed in December 2016. Plans for renovating two large classrooms are underway.

OBJECTIVE 3 | Ensure teaching quality of the highest international standard

WHAT WE DID IN 2016/17

> The Centre for Teaching Excellence (CTE) built on existing programs to help instructors enhance their skills and knowledge in assessing student learning and developing courses that align learning outcomes, assessments, and instructional activities.
OBJECTIVE 3 (cont’d) Ensure teaching quality of the highest international standard

> St. Jerome’s University Professor Steven Bednarksi won the Society for Teaching and Learning in Higher Education’s prestigious Desire2Learn Innovation Award in Teaching and Learning. This is the second year in a row that a University of Waterloo faculty member has won this award.

> CTE’s Fundamentals of University Teaching program was accredited by the national Educational Developers Caucus, part of the Society for Teaching and Learning in Higher Education.

> Engineering Professor Gordon Stubley won the 3M National Teaching Fellowship award — the first for Waterloo since 2010.

> CTE’s annual Teaching and Learning Conference had more than 300 registrants, the largest number yet. Most were from Waterloo including faculty members and graduate students from all six Faculties, and more than 60 academic support unit staff members.

OBJECTIVE 4 Seek global awareness of Waterloo’s teaching expertise

WHAT WE DID IN 2016/2017

> CTE continued to develop communication materials to promote awareness of teaching excellence at Waterloo, including three new CTE teaching stories.

> CTE hired new staff to support external teaching award nominations, including developing resources to facilitate nominations and to help match nominees’ strengths and experiences with external awards.

> Waterloo’s Teaching Fellows Program continues to evolve. In 2016/17 the Faculty of Environment appointed two fellows, and the Faculty of Applied Health Sciences appointed three new fellows.

OBJECTIVE 5 Expand Waterloo’s footprint in the online learning market and provide leading-edge, technology-enabled learning opportunities

WHAT WE DID IN 2016/2017

> Through eCampus Ontario, Waterloo received $330K to develop a new graduate diploma in Climate Risk Management (Faculty of Environment) and almost $400K for four research and innovation projects. Two of these will specifically support projects in the Centre for Extended Learning (CEL).

> The Ontario Centres of Excellence funded CEL, the University of Guelph, and Crowdmark to improve the assessment process in online courses. The project addresses how to improve delivery and return of exams to and from remote locations, and streamlines the assessment processes for distance and classroom learners. An initial pilot of Crowdmark for a winter 2017 online course final exam was successful. Crowdmark enhanced their platform based on feedback for use in spring 2017.

> The Canadian Association for University Continuing Education (CAUCE) recognized Waterloo with a 2017 Program Award (non-credit programming, under 48 hours category) for its Opioid Education Partnership online program, developed by the School of Pharmacy in partnership with CEL.

> The first two Online Teaching Awards were awarded to Professors Edwin Ng (teaching) and Doug Cowan (course design), both of Renison University College.

> CEL is examining the potential for expanding its course offerings into other markets, with a focus on lifelong learners, alumni, and others, online and developing new offerings (such as micro credentials) to expand enrolments.

OBJECTIVE 6 Expand the appropriate use of technologies to enhance students’ learning experience

WHAT WE DID IN 2016/2017

> VoiceThread, a collaborative, multimedia slideshow that allows students and instructors to create, share, and receive feedback on content in multiple formats (text, audio, and video). It is being piloted in select online and on-campus courses and will be evaluated for ongoing use in the fall.

<table>
<thead>
<tr>
<th>MEASURES</th>
<th>2013/14</th>
<th>2014/15</th>
<th>2015/16</th>
<th>2016/17</th>
<th>WHAT DOES THIS MEAN?</th>
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<tbody>
<tr>
<td>Number of fully online courses in catalogue and number of classes offered, undergraduate and graduate</td>
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<td></td>
<td></td>
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<tr>
<td>IN CATALOGUE</td>
<td></td>
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<tr>
<td>286</td>
<td>309</td>
<td>320</td>
<td>375</td>
<td>TARGET: 300, 324, 336</td>
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<tr>
<td>TARGET: 300, 324, 336</td>
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<tr>
<td>Source: Centre for Extended Learning (CEL) + Institutional Analysis &amp; Planning (IAP)</td>
<td></td>
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<tr>
<td>CLASSES OFFERED*</td>
<td>432</td>
<td>501</td>
<td>539</td>
<td>515</td>
<td></td>
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<tr>
<td>TARGET: 436, 500, 532, 521</td>
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<td>*Note: Courses offered are dependent on departmental scheduling.</td>
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<tr>
<td>Enrolment in fully online courses</td>
<td>UNDERGRADUATE &amp; GRADUATE</td>
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<tr>
<td>36,946</td>
<td>39,819</td>
<td>41,858</td>
<td>43,165</td>
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<td></td>
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<tr>
<td>Target: 40,000</td>
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<tr>
<td>Source: IAP</td>
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<tr>
<td>Number of fully online programs</td>
<td>UNDERGRADUATE &amp; GRADUATE</td>
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<td>18</td>
<td>19</td>
<td>19</td>
<td>21</td>
<td></td>
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<tr>
<td>Target: 18, 20, 20, 22</td>
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<tr>
<td>Source: CEL</td>
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<tr>
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<th>2016/17</th>
<th>WHAT DOES THIS MEAN?</th>
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<tbody>
<tr>
<td>Proportion of LEARN course offerings that use discussion forums</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>21.0%</td>
<td>20.2%</td>
<td>18.8%</td>
<td>17.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source: CTE</td>
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> Discussion forums are one type of technology that enhances students’ learning experiences and is used as a proxy for understanding the use of learning technologies as a whole.

> Instructors are using a variety of educational technologies, including Maple TA and Piazza, to support student learning. Waterloo is currently only able to track usage of LEARN.

> The use of Maple TA and Piazza has increased since 2015/16.
INTERNATIONALIZATION AND WATERLOO

A commitment to international action is vital to achieving Waterloo’s strategic plan, building on our exceptional research, innovation in experiential education, and entrepreneurial focus. This outline provides a high level overview of Waterloo’s focus on building internationalization to support our institutional goals.

WHAT IS INTERNATIONALIZATION?

“... the intentional process of integrating an international, intercultural or global dimension into the purpose, functions and delivery of post-secondary education, in order to enhance the quality of education and research for all students and staff, and to make a meaningful contribution to society.”

- HANS DE WIT, international educator and higher education administrator

WHY IS IT IMPORTANT?

At Waterloo, de Wit’s perspective of internationalization is taking root. We are motivated by a belief that internationalization is vital in the 21st century to meet the world’s most challenging problems, and to respond to its most profound opportunities. The critical issues of our times — artificial intelligence, climate change, social inclusion, and others — are issues that are characterized by complexity. They need multiple lenses employing, for instance, different disciplines and a variety of theoretical foundations. Moreover, world-changing learning and research requires a commitment to bringing in, connecting with, and welcoming international perspectives.

MOVING FORWARD

Ranked as the 34th most internationalized university in the world, we have accomplished much, but have more work to do.

Internationalization contributes to the successful execution of all parts of Waterloo’s mission, as well as most of its strategic goals and objectives. Moving forward, internationalization will be vigorously pursued through multiple means: internationalization at home, internationalization abroad, and through international research and connections. Through these efforts — as is the Waterloo Way — potential synergies across these will always be top of mind.

INTERNATIONALIZATION AT HOME

What does this mean? Waterloo’s campus community is home to a wealth of global perspectives: international students who study here, international staff and faculty who develop their careers here, and Canadian students with their own diverse international experiences. Active and robust information and communication technologies facilitate how the Waterloo community actively engages with the rest of the world.

Why is it important? Allowing all members of the Waterloo community to reap the benefits of global learning, a campus environment that is simultaneously locally-grounded and internationally-connected, is critical. Waterloo will continue to work to advance global engagement by catalyzing, celebrating, and coordinating international and intercultural perspectives.

Moving forward: Waterloo will continue to be a global leader, integrating international experiences and opportunities to transform Waterloo into a vibrant, global-oriented community. Specific initiatives will include engaging international students in a broad range of on-campus activities, providing leadership opportunities for all students who have international experiences to share, celebrating the global diversity at Waterloo, and connecting to the broader international Waterloo community. Internationalization at home enriches our experiences with international perspectives and opportunities, while supporting our international students and faculty in an environment that celebrates and champions international diversity.

Almost 1 IN 5 WATERLOO UNDERGRADUATE STUDENTS are international

2 IN 5 WATERLOO GRADUATE STUDENTS are international

OVER 50 STUDENT-RUN CLUBS with an international focus

Participation in events and activities hosted by the International and Canadian Student Network grew by 43.6% since 2015/16

OVER 50% of Waterloo’s regular full-time faculty received a degree from outside of Canada
INTERNATIONALIZATION ABROAD

What does this mean? Travelling abroad is an important part of Waterloo’s internationalization agenda. Time spent in other countries inevitably makes individuals think differently as they bring their “home experiences” to bear in new settings. An international and intercultural mixing of ideas is thus unavoidable. “Internationalization abroad” refers to the opportunities for students, staff, and faculty to travel to another country.

Why is it important? International travel can be challenging, exhilarating, and enriching. Academic literature suggests that individuals benefit through increased cultural awareness and understanding, improved employment prospects, and enhanced language skills. Conversations with individuals who have spent time in another country often yield anecdotes of a more personal nature: increased resiliency, more appreciation for diversity, greater understanding of oneself, and a heightened gratefulness for one’s home country. Waterloo will continue to offer multiple and varied opportunities for members to travel abroad.

Moving forward: Waterloo currently provides and facilitates a diverse selection of education, learning, and research, including:

- academic exchanges;
- competitions and contests;
- conferences and meetings;
- cultural events;
- field work;
- internships; and
- work terms.

Expanding these opportunities and making them more accessible, is a key focus of Waterloo’s efforts.

INTERNATIONAL RESEARCH AND CONNECTIONS

What does this mean? Waterloo seeks and establishes international connections with world-leading institutions, government agencies, businesses, civil society organizations, etc to engage with and nurture intensive collaboration.

Why is it important? International connections provide opportunities for joint initiatives and collaborations that bring together diverse perspectives, leverage other funding streams, identify potential new projects, and offer the prospect to extend and leverage research and learning initiatives.

51.3% of Waterloo’s publications in 2016/17 were co-authored with at least one international author.

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51.3% of Waterloo’s publications in 2016/17 were co-authored with at least one international author.

INTERNATIONALIZATION ABROAD

What does this mean? Travelling abroad is an important part of Waterloo’s internationalization agenda. Time spent in other countries inevitably makes individuals think differently as they bring their “home experiences” to bear in new settings. An international and intercultural mixing of ideas is thus unavoidable. “Internationalization abroad” refers to the opportunities for students, staff, and faculty to travel to another country.

Why is it important? International travel can be challenging, exhilarating, and enriching. Academic literature suggests that individuals benefit through increased cultural awareness and understanding, improved employment prospects, and enhanced language skills. Conversations with individuals who have spent time in another country often yield anecdotes of a more personal nature: increased resiliency, more appreciation for diversity, greater understanding of oneself, and a heightened gratefulness for one’s home country. Waterloo will continue to offer multiple and varied opportunities for members to travel abroad.

Moving forward: Waterloo currently provides and facilitates a diverse selection of education, learning, and research, including:

- academic exchanges;
- competitions and contests;
- conferences and meetings;
- cultural events;
- field work;
- internships; and
- work terms.

Expanding these opportunities and making them more accessible, is a key focus of Waterloo’s efforts.

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GLOBAL PROMINENCE AND INTERNATIONALIZATION
Progress and Outcomes | Fall 2017 Update

OBJECTIVE 1 | Be recognized internationally for excellence and innovation in education, research, and scholarship

<table>
<thead>
<tr>
<th>MEASURES</th>
<th>2013/14</th>
<th>2014/15</th>
<th>2015/16</th>
<th>2016/17</th>
<th>WHAT DOES THIS MEAN?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>International students as a proportion of their respective populations</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNDERGRADUATE</td>
<td>13.4% (1,809)</td>
<td>14.8% (4,256)</td>
<td>16.5% (4,797)</td>
<td>18.0% (5,988)</td>
<td>&gt; This measure monitors progress in attracting international students to the University.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>&gt; The proportion of international students reflected as a proportion of their respective populations grew by 1.5 percentage points among undergraduates and 1.4 percentage points among graduate students between 2015/16 and 2016/17.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>&gt; Steady increase in the recruitment of international students indicates Waterloo’s desirability as an academic institution internationally.</td>
</tr>
<tr>
<td>GRADUATE</td>
<td>34.9% (1,468)</td>
<td>35.7% (1,493)</td>
<td>37.1% (1,558)</td>
<td>38.5% (1,668)</td>
<td></td>
</tr>
<tr>
<td>Source: Institutional Analysis &amp; Planning (IAP)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Number of Waterloo alumni living outside of Canada</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>15,000</td>
<td>15,764</td>
<td>16,377</td>
<td>17,154</td>
<td>&gt; The number of Waterloo alumni living outside of Canada increased by 4.7% between 2015/16 and 2016/17. This is consistent with prior years.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>&gt; Alumni can be found in 150 countries around the world (outside of Canada). Excluding the United States, the top three countries where alumni live have remained the same over the last four years — China, the United Kingdom, and Australia.</td>
</tr>
<tr>
<td>Source: Office of Advancement</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>International research funding</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$17.4M</td>
<td>$20.1M</td>
<td>$19.9M</td>
<td>$17.4M</td>
<td>&gt; Research funding awarded by international sponsors contributes to achieving international recognition for excellence and innovation in education, research, and scholarship.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&gt; Research funding data is variable year-over-year and is not correlated directly with international research activity. As an example, in 2016/17 a multinational corporation changed the administration of a single large ($2.1M) research grant from an international office to a domestic office, resulting in a major change in the amount of research funding received from international sources without any real change to overall research funding.</td>
</tr>
<tr>
<td>Source: Office of Research</td>
<td></td>
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<tr>
<td><strong>World University Ranking results</strong></td>
<td></td>
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<tr>
<td>ARWU</td>
<td>151-200</td>
<td>201-300</td>
<td>201-300</td>
<td>201-300</td>
<td>&gt; International university rankings provide one way to interpret Waterloo’s performance in excellence and innovation in education, research, and scholarship in an international context.</td>
</tr>
<tr>
<td></td>
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<td></td>
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<td>&gt; Ranking results have remained relatively stable in 2015/16 and 2016/17.</td>
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<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>&gt; Many factors may affect ranking results, including changes in ranking methodologies, the composition of reputational survey participants, as well as university program mix and faculty composition (that is, the mix of early and later career stage researchers). Changes in ranking position are not necessarily the result of the changes in the University’s performance. Waterloo’s relative stability and ability to maintain its position is positive.</td>
</tr>
<tr>
<td>QS</td>
<td>180</td>
<td>169</td>
<td>152</td>
<td>152</td>
<td></td>
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<tr>
<td>THE</td>
<td>226-250</td>
<td>251-275</td>
<td>179</td>
<td>173</td>
<td></td>
</tr>
<tr>
<td>Source: IAP</td>
<td></td>
<td></td>
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</tbody>
</table>

WHAT WE DID IN 2016/17

> Graduate Studies and Postdoctoral Affairs (GSPA) established a Graduate International and Admissions Specialist position, to create a more personalized application experience for applicants to the China Scholarship Council program and the Mexico CONACYT scholarship program. Personalized email communications helped increase the number of applicants from Mexico.

> GSPA hosted a meeting with 16 current Mexican international graduate students to discuss their application experiences to the CONACYT scholarship program at Waterloo, to improve the application process, and to enhance recruitment activities.

> GSPA had a virtual booth at the EDUfindme virtual graduate fair, where they connected with approximately 400 students from around the world and answered students’ questions about attending Waterloo.

> Waterloo co-hosted a tour of four research intensive universities in southwestern Ontario for international secondary school guidance counsellors. This initiative resulted in an increase in applications from attending international secondary schools.

> The University of Waterloo was selected as one of nine global destinations included financial risk analysis, sustainable transport programs, and

> Thirty-four international secondary school students from 14 countries had a two-week interdisciplinary enrichment opportunity at the annual IDEAS Summer Experience program. Students created solutions to some of the world’s most complex issues and learned from all six Waterloo Faculties to improve their problem-solving abilities, research skills, and communication.

> The University of Waterloo won the gold award for the Best International Student Recruitment Brochure in the Creative Award Competition at the 12th Quacquarelli Symonds (QS) — Asia-Pacific Professional Leaders in Education Conference and Exhibition.

> Waterloo developed a substantive partnership with the University of Bordeaux to create new joint research and education programs that are primarily self-financed by the universities.

> The President of the National University of Singapore (ranked 12th by the QS World University Rankings), signed a Memorandum of Understanding for academic and research collaboration with the University of Waterloo following a visit that included discussions of Waterloo’s co-op and cybersecurity programs and tours of the Water Institute, Velocity, and the Institute for Quantum Computing.

> Eleven joint-research projects across several Faculties were funded through the International Research Partnership Grant program, in partnership with several leading Chinese institutions. Funded projects included financial risk analysis, sustainable transport programs, and
OBJECTIVE 1 (cont’d) | Be recognized internationally for excellence and innovation in education, research, and scholarship

- Facebook’s hardware development division announced a new partnership with the University of Waterloo and 16 other world-class universities (including Harvard and Princeton). It aims to allow swifter collaboration on technology research projects.
- At the World Congress Experience 2017, the Society of Automotive Engineers (SAE) International and General Motors announced that the University of Waterloo is one of eight North American finalists that will compete in the upcoming autonomous vehicle design competition, AutoDrive Challenge™.
- At the 2017 Australia-Canada Economic Leadership Forum, President Hamdullahpur participated in a panel to discuss how institutions of higher education can serve as economic engines.
- President Hamdullahpur travelled to South Korea in March 2017 to speak about the co-operative education model with the Korean National Assembly, participated in the Times Higher Education's Asia Universities Summit, visited with alumni at an evening reception, and networked with local business leaders at a Canadian embassy event.

OBJECTIVE 2 | Educate globally literate and world-ready graduates

<table>
<thead>
<tr>
<th>MEASURES</th>
<th>2013/14</th>
<th>2014/15</th>
<th>2015/16</th>
<th>2016/17</th>
<th>WHAT DOES THIS MEAN?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of international co-op work terms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&gt; International co-op work terms are one way that Waterloo students can have an international experience.</td>
</tr>
<tr>
<td>Source: Co-operative Education &amp; Career Action (CECA)</td>
<td>2,010</td>
<td>2,319</td>
<td>2,698</td>
<td>2,653</td>
<td>&gt; Since 2013/14, the number of international co-op work terms has increased by 32.0%. This upward trend reflects Co-operative Education and Career Action’s (CECA) focus on increasing the number of international experiential opportunities available for Waterloo students. In particular, CECA is trying to increase the amount and extent of funding support for them.</td>
</tr>
<tr>
<td>Number of outbound students participating in non co-op international experiential learning programs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&gt; This measure captures the number of Waterloo students who travel internationally for non co-op learning.</td>
</tr>
<tr>
<td>Source: Waterloo International</td>
<td>312</td>
<td>658</td>
<td>629</td>
<td>961</td>
<td>&gt; Waterloo changed how non co-op international experiential learning programs were identified and counted during the course of the strategic plan. Thus, data across years may not be directly comparable.</td>
</tr>
</tbody>
</table>

Outbound mobility map

This map illustrates the countries where Waterloo undergraduate and graduate students are travelling as part of University-sanctioned international experiences. These include both co-op and non co-op opportunities.

Source: CECA and Student Success Office

WHAT WE DID IN 2016/17

- Staff from Co-operative Education and Career Action (CECA) discussed international work terms at the Global Internship Conference (GIC), the Co-operative Education and Internship Association (CEIA) conference, and the Canadian Association for Co-operative Education (CAFCE) conference.
- The Beijing Institute of Technology selected Waterloo as a recipient of the Study Abroad Scholarship and the China Scholarship Council Degree Scholarship. Waterloo undergraduate and graduate students across all six Faculties will have the opportunity to apply for and receive scholarships to study at the Beijing Institute of Technology during 2018.
- Waterloo increased the number of International Student Experience Awards to support undergraduate and graduate students who engage in eligible study abroad programs, international co-op work terms, internships, or research experience outside of Canada. Donors were given the opportunity to have their donations matched by the University of Waterloo.
- Six three-person student teams competed in the World’s Challenge Challenge at Waterloo to develop a solution to one of the United Nations’ Sustainable Development Goals. The winning team, the RAPTRS, won $1K towards an international travel experience for each participant and advanced to the first International World’s Challenge Challenge competition in May 2017.
- Waterloo hosted its second Model G20 2016 Conference, the only dedicated G20 conference in Canada. Faculty, staff, and students with an interest in global governance took part in the event, investigated global issues, engaged in specialized discourse, and listened to esteemed keynote speakers.
- Twelve Waterloo students participated in the Explore Southern Africa program, a 25-day international program that gives students a non-Western perspective of poverty, education, and community development through experiential learning and travel. The unique itinerary exposed students to challenging conditions, including a visit to Namibia’s impoverished Katutura Township and Robben Island, the maximum security prison that held Nelson Mandela.
OBJECTIVE 1  | Deliver excellent student services through an integrated student-focused approach

**MEASURES** | **RESULTS** | **WHAT DOES THIS MEAN?**
--- | --- | ---
Proportion of graduating students satisfied with concern shown by the University | 2012: 50.3%  
2015: 48.1%  
*Source: Canadian University Survey Consortium (CUSC) 2012 and 2015 Q1* | > This indicator provides an understanding of students’ satisfaction with the care and concern demonstrated by members of the University community.
> Graduating students’ perception of concern shown by the University has remained consistent. The difference between 2012 and 2015 is not statistically significant.
> CUSC Graduating Year survey will be implemented again in 2018.

Proportion of first-year and graduating undergraduate students reporting University emphasis on helping manage non-academic responsibilities | 2014: 31.7%  
2017: 27.4%  
*Source: National Survey of Student Engagement (NSSE) 2014 and 2017 Q1* | > Student perception of University supports is one way to understand how they are experiencing University support services.
> CUSC survey data for perception of concern shown by the University is typically used to assess this measure (shown above); however, this survey will not be implemented again until 2018.
> The proportion of first-year and graduating undergraduate students who participated in the survey and reported that the University “quite a bit” and “very much” places an emphasis on helping manage non-academic responsibilities declined by 4.3 percentage points between 2014 and 2017. This difference is statistically significant.
> Student experience data is used on an ongoing basis to help Waterloo leadership provide better supports for students. Some of these efforts are described in the What We Did in 2016/17 section.

Proportion of graduate and undergraduate students reporting University interest in well-being of students | 2016: 73.8%  
*Source: National College Health Association (NCHA) Survey 2016 Q67* | > Student perception about University interest in student well-being is one way to understand the effectiveness of student services.
> Almost three-quarters of undergraduate and graduate students who participated in the survey reported that the University shows an interest in the well-being of students.
> NCHA will be administered again in 2019.

WHAT WE DID IN 2016/17

> The Student Success Office (SSO), Graduate Studies and Postdoctoral Affairs (GSPA), and the Registrar’s Office used student and staff feedback to develop the new Student Services Centre, to be launched in 2018. The diagram below outlines the development of this new unit. It will provide many common student services more efficiently through online self-service or a single campus location including automated case management, appointment scheduling, and queuing supports to help students make the most efficient use of their time.
> The Student Portal team successfully launched Waterloo’s mobile student portal in fall 2016. Total mobile users now exceed 10K, based on iOS and Android devices. Students have been engaged throughout the development of this new platform. New features are being added, including integration with LEARN and orientation programming, and the addition of mental health resources.
> In partnership with Institutional Analysis and Planning (IAP), a data analysis project has been initiated to create and use a survey framework incorporating five surveys and questions to better assess and understand the quality of the student experience.
> IAP and SSO are leading an initiative with Faculties and other administrative support units to better understand and build collaborative efforts to address student experience data results from the National Survey on Student Engagement with the ultimate objective to improve student experience.

Improved Student Experience

**WINTER 2016**

- **DEVELOP NEW DEDICATED STUDENT SERVICES CENTRE**
- **STREAMLINE STUDENT SERVICES**
- **ENHANCE TECHNOLOGY SUPPORT**
- **REVITALIZE PHYSICAL SPACE IN NEEDLES HALL**

**LAUNCH 2018**

OBJECTIVE 2  | Provide enabling experiences, programs and supports, including student leadership development opportunities, in order to develop student potential

**MEASURES** | **RESULTS** | **WHAT DOES THIS MEAN?**
--- | --- | ---
Proportion of graduating students reported University’s contribution to leadership skills | 2012: 50.6%  
2015: 44.5%*  
*Source: CUSC 2012 Q15 and 2015 Q1*  
*Much, Very much* | > Students’ perception of development opportunities for leadership skills provides an understanding of satisfaction with enabling opportunities. The ability to compare this data is somewhat limited because the wording of the question changed in 2015 from the University’s contribution to leadership skill development to “ability to lead a group to achieve an objective.”
> CUSC Graduating Year survey will be implemented again in 2018.

*N*ote: Not comparable to other years due to changes in data collection.
WHAT WE DID IN 2016/17

> The President and leadership, with student and staff stakeholders across campus, established the President’s Advisory Committee on Student Mental Health (PAC-SMH) to address the issue of student mental health within the larger societal context. The PAC-SMH established five supporting panels (Academic, Mental Health Experts, Student Services, Student Experiences and Community Partners) to conduct focused analysis on key topics. The panels will collect and review data and information to advise on the progress of mental health initiatives across the University, and examine root causes of student stress, anxiety, and depression, and how to mitigate them. A final report will be completed in early 2018.

> Over 100 Student Leadership Program workshops were offered in 2016/17 with 468 unique participants. Average attendance at workshops increased by 29.6% between 2015/16 and 2016/17. Since 2013, over 500 students have completed the full program (over 70 in 2016/17) which includes 12 workshops, and received their Student Leadership Program e-certificate.

> The Learning Services team collaborated with over 40 faculty and staff members from across campus. Together they developed 22 projects to support student learning and development impacting over 4,200 students. One partnership was the creation of six five-minute presentations that teach students study skills. These presentations are being integrated into key first-year courses.

OBJECTIVE 3 | Develop strong partnerships within and between academic and non-academic units to enhance the positive student experience

WHAT WE DID IN 2012

> Building on a recommendation from the Campus Wellness Planning Team, the Campus Wellness Coordinating Forum was proposed in December 2015. The purpose of this forum is to inventory existing campus student wellness activities, assess expansion opportunities, and identify gaps in approaches to student wellness. Initial meetings have scoped the breadth of the project. Work on this initiative will continue in 2017/18.

OBJECTIVE 4 | Build a community of communities by providing an environment where students, faculty and staff can connect

WHAT WE DID IN 2016/17

> Between 2013 and 2016, the amount of new student study space available, increased by 18.0%, based on the Council of Ontario Universities space study.

> The Student Life Centre (SLC)/Physical Activities Complex (PAC) Expansion project is under construction and is projected to open in fall 2018. This 63,000+ square feet building will physically connect the SLC and the PAC and will add student study, social, fitness, dining, and collaboration space. See www.uwaterloo.ca/aps/slcpac.

> Student space was renovated in three important University buildings. This included:

- tables, chairs, and lounge seating installed for eating and social activities in Hagey Hall;
- lounge seating and fixed study tables and chairs with data and electrical capabilities in Burt Matthews Hall; and
- in the Science Teaching Complex more lounge seating and fixed study tables and chairs with electrical capabilities for students’ use.

OBJECTIVE 5 | Deepen the connections between students and the City of Waterloo community

WHAT WE DID IN 2016/17

> Working together with the City of Waterloo’s Town and Gown Committee, Waterloo conducted a Student Housing Survey. Over 6,600 Waterloo students participated in the survey to better understand Waterloo’s student experiences in the community, expectations for housing, distribution of housing in the community, and student’s sense of belonging in Waterloo. Results show that among Waterloo students who responded to the survey, two-thirds (67.3%) reported that living off-campus improved their sense of belonging to the Waterloo community, and almost nine in 10 (89.6%) reported that their interactions with neighbours have been positive.
OBJECTIVE 1 | Be a destination of choice for superior individuals seeking employment

<table>
<thead>
<tr>
<th>MEASURES</th>
<th>2013/14</th>
<th>2014/15</th>
<th>2015/16</th>
<th>2016/17</th>
<th>WHAT DOES THIS MEAN?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall employee turnover rate</td>
<td>3.7%</td>
<td>4.1%</td>
<td>4.8%</td>
<td>4.6%</td>
<td>&gt; The turnover rate is the proportion of all employees who leave employment at the University, including those who leave as a result of retirement.</td>
</tr>
<tr>
<td>Proportion of female staff hires</td>
<td>56.8%</td>
<td>65.3%</td>
<td>58.0%</td>
<td>68.3%</td>
<td>&gt; The proportion of female staff hires is one way to understand how the University’s gender diversity reflects the community from which it recruits its staff.</td>
</tr>
</tbody>
</table>

Source: Human Resources (HR) and HR

WHAT WE DID IN 2016/17

> As part of a comprehensive technology renewal program, launched and/or selected new employee Human Resources (HR) systems, including:
  - a talent acquisition system, iCIMS, to support the hiring of staff. New functionality supports both external and internal candidates accessing job advertisements;
  - a pension system, Ariel, which provides plan members with an improved myPENSIONinfo portal equipped with a user-friendly interface, the ability to view beneficiary designations and annual pension statements, and a tool to generate estimated pension projections; and
  - a Human Resources Management System, Workday, was selected and is being implemented to address Waterloo’s need for an upgraded Human Resources Management System and payroll system.
> Developed a new onboarding website for managers, which includes detailed instructions for hiring and video tutorials to support manager development.
> Continued to conduct exit surveys with all departing employees, launched an employee transfer survey, and developed a survey for new employees. These surveys help build understanding about why employees choose Waterloo, leave the University, and move between departments.
> Increased participation in the Excellence Canada program. Human Resources, the Library, the Office of the Vice-President, Academic and Provost, and Organizational and Human Development achieved silver certifications in the Excellence, Innovation and Wellness (EIW) program. Moving forward, Waterloo is integrating the EIW Standard at the gold level for the University as a whole, as opposed to certifying each Faculty, office, and service unit individually. The Excellence Canada Advisory Committee has conducted a University-wide survey of employees and focus groups with staff, faculty, and Canadian Union of Public Employees (CUPE) employees to begin to assess the University against the EIW Standard.
> Conducted a compensation review of administrative salaries on the USG scale, along with an independent review of the University’s job evaluation process.
> Conducted a University-wide Human Resources (HR) satisfaction survey to gain a better understanding of employees’ satisfaction with HR services. Survey results establish a baseline upon which to measure its progress moving forward in supporting Waterloo’s goal of becoming a destination of choice for talented and engaged employees.
> Launched a new online presence for accessibility at Waterloo, which includes information about legislation, the University’s accessibility services, and a directory of campus accessibility features including entrances, elevators, washrooms, and parking.

The University of Waterloo was selected as one of Canada’s Top 100 Employers and one of Waterloo Area’s Top Employers for 2017. Waterloo was recognized for its pension and benefit offerings, retirement preparation programs, vacation allotment for employees, and onsite amenities, among others.
## OBJECTIVE 2 | Enable staff to fulfill their potential in a career at the University

### MEASURES

<table>
<thead>
<tr>
<th>Employee participation in Principles of Inclusivity workshops</th>
<th>2013/14</th>
<th>2014/15</th>
<th>2015/16</th>
<th>2016/17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source: Organizational &amp; Human Development (OHD)</td>
<td>577</td>
<td>287</td>
<td>407</td>
<td>389</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of managers who participated in leadership training</th>
<th>2013/14</th>
<th>2014/15</th>
<th>2015/16</th>
<th>2016/17</th>
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</thead>
<tbody>
<tr>
<td>Source: OHD</td>
<td>31</td>
<td>49</td>
<td>32</td>
<td>96</td>
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<table>
<thead>
<tr>
<th>Proportion of internal staff hires</th>
<th>2013/14</th>
<th>2014/15</th>
<th>2015/16</th>
<th>2016/17</th>
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</thead>
<tbody>
<tr>
<td>Source: HR</td>
<td>45.0%</td>
<td>61.2%</td>
<td>49.0%</td>
<td>48.6%</td>
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### WHAT DOES THIS MEAN?

- The number of employees who have completed at least one of the Principles of Inclusivity workshops provides an indication of how Waterloo is building an inclusive employee community.
- The number of employees who complete at least one of the Principles of Inclusivity workshops varies annually. To date, 31% of Waterloo’s regular, ongoing staff have taken at least one of the University’s Principles of Inclusivity workshops.
- All new regular Waterloo staff are highly encouraged to attend Principles of Inclusivity workshops as part of their onboarding process. Current staff are also encouraged to take the workshops. These workshops build an understanding of what inclusivity means, and how it is articulated, at Waterloo.

### WHAT WE DID IN 2016/17

- Piloted the first cohort experience of Organizational and Human Development’s (OHD) award-winning Principles of Inclusivity seven-workshop series. The Principles of Inclusivity series has been featured at the College and University Professionals Association (CUPA) Human Resources (HR) annual conference, the Guelph Accessibility Conference, and in a special topic webinar for CUPA-HR. The program has also been nominated for the CUPA-HR Inclusivity Award for 2017.
- Reorganized the HR department to better support strategic priorities and the evolving needs of Waterloo’s workforce. Changes included an increased focus on process improvement to support departmental continuous improvement activities, including the pilot of an internal Lean consortium to facilitate continuous improvement activities, and to facilitate greater collaboration across departments.
- Increased support and resources to enable a healthy workplace, including:
  - launched a new Employee and Family Assistance Program (EFAP), which includes 24/7 access to confidential counselling services, a website with extensive health and wellness resources, and onsite workshops for employees;
  - delivered 21 workshops for managers as part of a nation-wide case study project with Mindful Employer Canada, sponsored by Ministry of Labour. This study, which began in 2015/16, will build capacity for positive workplace mental health;
  - supported healthy workplace initiatives through the Staff Excellence Fund, including subsidizing participation in the UW Fitness Program for Staff Association members; and
  - announced plans for a health and wellness day and a workplace accessibility day in 2017/18. These University-wide events will raise awareness of wellness and accessibility services and resources.
- In support of the HeForShe 10X10X10 goals, facilitated discussions with faculty members on the development of an academic leadership framework.
- Continued to provide core development workshops throughout the year for staff. All new staff members are now highly encouraged to take all four core development workshops – Integrity Matters, Exceptional Service, Principles of Leadership, Principles of Inclusivity – within their first 12-18 months at Waterloo.
- Welcomed 1,400 employees to the tenth annual Staff Conference, which included a special anniversary event featuring Margaret Trudeau. New in 2016/17, OHD coordinated a Management Development Day, which was attended by 36% of employees in manager or supervisor roles.
- Developed the concept for a Staff Enhancement Experience - Canada (SEE-Canada) Program to provide staff members with the opportunity to travel and engage in collaborative work with partner institutions within Canada. This program complements Waterloo International’s Staff International Experience Fund, which was launched in 2014.
- Coordinated the second cohort of OHD’s Success through Mentorship program aimed at enhancing employee development through paired relationships. The program has been expanded and further developed. This year’s program has been refined to include additional professional development and networking opportunities.
- Continued to implement the OHD’s leadership training programs to increase leadership capacity across campus through leadership training programs including Leadership Essentials, Leadership Foundations, and Success through Mentorship. To share Waterloo’s approach to leadership development, OHD participated in a panel at the Network for Change and Continuous Improvement (NCCI) conference focused on how higher education institutions are responding to this challenge.
OBJECTIVE 1 | Develop a strong, vibrant and integrated community

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<th>MEASURES</th>
<th>2013/14</th>
<th>2014/15</th>
<th>2015/16</th>
<th>2016/17</th>
<th>WHAT DOES THIS MEAN?</th>
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| Proportion of female undergraduate and graduate students at Waterloo | 44.3% | 44.7% | 45.5% | 46.2% | > Student demographic information supports planning and developing equity initiatives that meet the needs of Waterloo’s increasingly diverse community.  
> The proportion of female undergraduate and graduate students at Waterloo has consistently increased by 1.9 percentage points since 2013/14.  
> This data assists with the development and planning of equity initiatives (see objective 3). |
| Source: Institutional Analysis & Planning (IAP) | |
| Proportion of students registered with AccessAbility Services | 5.1% | 5.4% | 6.1% | 3.8% | > Waterloo has a diverse student body which includes students with disabilities.  
> The proportion of students registered with AccessAbility Services fluctuates between 3.8% and 6.1% of the student body. In 2016/17, 3.8% of students registered with the office.  
> Waterloo students register with the Office of AccessAbility, to provide information about their condition and identify their needs. |
| Source: AccessAbility Services | |
| Proportion of first-year students who self-identify as a member of a visible minority or racialized group | 61.3% | 63.4% | 61.3% | 63.4% | > Waterloo attracts students from diverse backgrounds.  
> A slightly greater proportion of first-year students (2.1 percentage points) identified as a member of a visible minority or a racialized group in 2016 compared to 2013.  
> This data is self-reported through the CUSC survey. |
| Source: Canadian University Survey Consortium (CUSC) 2013 Q52 and 2016 Eth1-13 | |

WHAT WE DID IN 2016/17

> Continued to expand Academic Leadership Program to include associate chairs and associate deans in 2016. Plans for an integrated staff and academic leadership programs are underway. Both staff and academic (faculty) leaders will be provided with the same set of foundational development programs, with specialized programming suited to their specific responsibilities to follow.

OBJECTIVE 2 | Deepen and broaden the University’s approach to integrity

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<th>2015/16</th>
<th>2016/17</th>
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| Number of staff members who participated in Staff Integrity Workshop | 90 | 54 | 79 | 137 | > Staff participation in integrity workshops provides one way to understand staff engagement with integrity.  
> Over four years, 360 staff have participated in staff integrity workshops at Waterloo.  
> The “Integrity Matters” workshop is slowly becoming recognized as a valuable session for all staff members. |
| Source: Organizational and Human Development (OHD) | |
| Number of graduate students who participated in Academic Integrity Module | 2,207 | 2,191 | 2,229 | 2,245 | > The number of students who participate in academic integrity learning opportunities can provide an indication of the extent of student engagement with academic integrity at the University.  
> The Academic Integrity Module workshop is required for all graduate students in their first term at Waterloo. This requirement reinforces the importance of integrity in work, study, and play at Waterloo.  
> TARGET: By 2018, 100% of graduate students will have completed the Graduate Academic Integrity Module (Graduate AIM) within their first term at Waterloo. This target has been achieved. Measures are in place to ensure that all graduate students complete AIM. |
| Source: Office of Academic Integrity | |

WHAT WE DID IN 2016/17

> Continued to distribute integrity messaging (posters and digital screens) across campus. Other promotional items (post-it notes) were provided to all incoming undergraduate and graduate students.  
> Partnered with Renison University College and received eCampus grant to develop and pilot a mobile application to introduce students to academic integrity (AI). The goal of the project is to develop an effective way to ensure that all new undergraduate students receive AI training.
WHAT WE DID IN 2016/17

Developed, piloted, and began implementing equitable recruitment strategy for Canada Research Chairs (CRCs), including successful implementation of a tracking survey to assess diversity of the applicant pool.


Policy 42, Prevention and Response to Sexual Violence, was established for students, faculty, and staff, effective January 2017. The policy articulates Waterloo’s commitment to address sexual violence. In the coming year the focus will be on providing education, training, and resources for individuals responsible for implementing the Policy.

Continue to develop additional components of the Making Spaces Program to create affirming spaces on campus.

OBJECTIVE 3 | Develop a supportive campus community that proactively articulates, promotes, and effects change to achieve equity for students, faculty, and staff through policies, programs, and practice

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<th>2016/17</th>
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</tr>
</thead>
</table>
| Proportion of full-time, female staff | 66.4% | 65.7% | 66.5% | 66.8% |  > The proportion of full-time staff who are female is used as an indicator for gender balance. Note that the data for the proportion of female new hires is reported under the Robust Employer Employee Relationship theme.  
  > The proportion of full-time, female staff has remained relatively constant, increasing only slightly by 0.4% since 2013/14.  
  > Demographic data informs the development of equity initiatives. |
| Proportion of full-time, regular female faculty | 28.1% | 29.4% | 29.6% | 29.8% |  > For equity to thrive, a supportive campus climate is critical. Efforts are underway to increase awareness and support the promotion of equity campus-wide.  
  > The proportion of full-time, regular female faculty in 2016/17 was 29.8%, 0.2 percentage points greater than in 2015/16.  
  > The proportion of full-time, regular female faculty is used as an indicator for gender equity among University faculty.  
  > TARGET: The HeForShe campaign goal is to achieve 30% female representation in the faculty cohort by 2020. The University will continue its efforts to improve gender balance in the faculty cohort, even after the target has been achieved. |
| Number of participants who completed the Equity, Diversity, and Inclusion sessions | 2014/15 | 2015/16 | 2016/17 |  > The number of participants who attend learning and development sessions can be an indicator of the extent of awareness of equity and diversity as well as the potential capacity for promoting equity at Waterloo.  
  > In 2016/17, 3,262 students and employees participated in equity, diversity and inclusion related learning and development sessions. |

WHAT WE DID IN 2016/17

> Developed, piloted, and began implementing equitable recruitment strategy for Canada Research Chairs (CRCs), including successful implementation of a tracking survey to assess diversity of the applicant pool.


> Policy 42, Prevention and Response to Sexual Violence, was established for students, faculty, and staff, effective January 2017. The policy articulates Waterloo’s commitment to address sexual violence. In the coming year the focus will be on providing education, training, and resources for individuals responsible for implementing the Policy.

> Continue to develop additional components of the Making Spaces Program to create affirming spaces on campus.

> Achieved annual goal of retrofitting and launching 29% (more than 60) inclusive, single-use washrooms in of 55 campus buildings. This initiative was well received by students, faculty, and staff. Additional retrofitting of washrooms to meet 50% coverage of 55 campus buildings is planned for the next year.

> Consultations on the processes associated with Policy 33 on Ethical Behaviour by major resource groups (Human Resources, Health and Safety, Conflict Management and Human Rights Office, and Equity Office) are underway. The Policy drafting committee also delivered a preliminary report to the strategic plan steering committee. The report recommended the development of a centre for neutral advice on reporting breaches of ethical behaviour which will co-ordinate supports for individuals, and provide either references to support informal problem resolution, or to a formal complaint case management office. The committee also identified the need for a robust incident management system for tracking and managing concerns and complaints.
HIGHLIGHTS

Waterloo’s six Faculties are vital partners to achievement in all areas of our Strategic Plan. Strategic Plan initiatives have supported Faculty leadership, particularly in the areas of Transformational Research and Outstanding Academic Programming.
Waterloo’s Faculties reported tremendous success in accessing funding in strategic areas in 2016/17. University-wide efforts facilitated Faculty access to resources that support research. Some of these are outlined below.

- Waterloo research projects have real world impacts. Some of these include:
  - leading one of the world’s largest and most comprehensive longitudinal studies of youth to reduce the future cancer burden in Canada using policies and programs;
  - creating tools for risk screening, care coordination, and patient engagement in decision-making, and implementing a standardized comprehensive geriatric assessment instrument in 10 Canadian hospitals;
  - responding to the Truth and Reconciliation Commission in partnership with the Waterloo Aboriginal Education Centre and Indigenous partners to raise awareness through The Mush Hole Project;
  - building a new facility for automotive research and testing;
  - expanding the Multi-Scale Additive Manufacturing Lab, to build new techniques and approaches for automotive and manufacturing processes;
  - approved testing for Autonomoose autonomous vehicle platform on all public roads in Ontario;
  - developing new, sustainable strategies for managing hazardous mine waste; and
  - exploring how bacteriophages can combat colon cancer.

- Waterloo researchers also advanced international research activities to address critical multinational issues including developing public health informatics and institutional capacity for linking climate change and health, building data repositories for polar regions, the study of groundwater pollution in arid regions, and management of agriculture pollutants.

- Three Waterloo researchers were named as fellows to the prestigious Royal Society of Canada: Professors Colin MacLeod (Arts), Jennifer Clapp (Environment), and Tamer Özsu (Math). Another three were named as members of the Royal Society of Canada, College of New Scholars, Artists and Scientists: Professors John Turri (Arts) and Zhongwei Chen and John Yeow (Engineering).

In 2016/17, Waterloo's Faculties continued to contribute to outstanding academic programming. Some examples of these academic programming successes are highlighted here.

- Arts teaching staff are implementing efforts to build English language competency skills across the Faculties of Engineering, Math, Science and Environment.
- New undergraduate and graduate courses and programs developed in 2016/17 included a new course-based master’s program in Recreation and Leisure Studies, a new course in Applied Health Sciences (AHS) for non-AHS students, a new minor in Urban Studies in Environment, two first-year Arts courses in Inquiring and Communication and Information and Analysis, and an online graduate diploma in Climate Risk Management. Senate approved a new undergraduate program in Data Science incorporating computer science and statistics.
- Waterloo’s Faculty of Math partnered with international institutions on a new dual degree doctoral program agreement with the Chinese Academy of Sciences, as well as a pan-African network of centres of excellence for postgraduate training, research, and engagement in mathematical sciences.
- Several Faculties continued to improve online learning opportunities through the development of STEM-aware (sciences, technology, engineering, and math) course development platforms, integration of more interactive learning technology into online courses, and the use of augmented online testing and evaluation software.

Faculties make important contributions to other areas of the strategic plan. These efforts enrich the University as a whole, and especially, student experiences. Some of these initiatives and activities are described here.

- New and renovated spaces in several Faculties enhance students’ campus experience including the AHS Expansion Building, Toby Jenkins Applied Health Research building, and the Faculty of Arts’ Hagey Hall Hub.
- All Faculties host or support entrepreneurial initiatives for students. This includes AHS’s Hack4Health 2.0 hosted by the Murray Alzheimer Research and Education Program, Arts’ stART up which provides education and mentorship opportunities, and several funds in Engineering to support Capstone Design competitions and student ventures.
- Several Science and Engineering students won numerous external entrepreneurial competitions with their ventures, including Suncayr, Medella Health, Arylla, and Penta Medical.
- Waterloo students across all Faculties participated in a range of experiential and international experiences. In Arts, the number of undergraduate students participating in international exchanges has doubled since 2012/13. Five students from four different Faculties (Arts, Engineering, Environment, and Science) participated in the Waterloo delegation at COP22, Conference of Parties to the United Nations Framework Convention on Climate Change.
- International competitions offer opportunities for students to engage in problem solving in high pressure situations:
  - Waterloo’s NanoRobotics Group captured first place at the Mobile Microrobotics Challenge at the International Conference for Robotics and Automation;
  - Applied Health Science, Arts, and Science students won the 2017 Hult Prize Regionals in London England; and
  - Math students finished sixth out of 568 institutions at the Putnam competition and 13th in the Association for Computing Machinery International Collegiate Programming Contest.
- Creating a better environment for students means tackling difficult issues. The Faculty of Arts hosted a number of initiatives to help students and others develop critical awareness and action to end sexual assault and harassment on campus and beyond.

LEARN MORE: uwaterloo.ca/strategic-plan-action
STRATEGIC INITIATIVES:

TRANSFORMATIONAL RESEARCH

› The Faculty of Applied Health and Sciences (AHS) expanded its physical footprint with the opening of two new facilities: the AHS Expansion Building and the Toby Jenkins Applied Health Research Building.

› Professor Scott Leatherdale was awarded $1.6M in funding from Canadian Institutes of Health Research (CIHR) to continue the COMPASS study—the world’s largest and most comprehensive longitudinal study of youth focused on using programs and policies to reduce the future cancer burden in Canada.

› The 2016 Patterns and Trends Report, published by the Propel Centre for Population Health Impact, included a special supplement on cannabis use in Canada. The report found that just as many teenagers use cannabis every day as smoke cigarettes, and there is a strong association between tobacco use and marijuana consumption.

› Professor Paul Stolee is project lead on a $2.6M grant from the Canadian Frailty Network to implement tools for risk screening, care coordination, and patient engagement in decision-making. Other AHS investigators include George Heckman, Jacobi Elliott, Samantha Meyer, and Justine Giosa.

› In another grant from the Canadian Frailty Network, Professors John Hirdes, George Heckman, and Heather Keller received funding to implement the standardized interRAI Acute Care Comprehensive Geriatric Assessment instrument in 10 Canadian hospitals. They will also work with other Canadian partners on a cluster randomized trial of targeted advance care planning in nursing homes.

› Quacquarelli Symonds (QS) ranked the University of Waterloo 13th in the world — and first in Canada — for Hospitality and Leisure Management Studies.

› In September, the Faculty released its first Impact Report, Health in 3D. The 32-page publication highlights research contributions across three different dimensions of health and seven impact areas.

› The Ministry of Health and Long-Term Care appointed Professor John Garcia to two task forces: the Executive Steering Committee for the Smoke-Free Ontario Strategy, and the Standards Implementation Task Force for Modernized Ontario Standards for Public Health Programs and Services.

› Researchers from the Department of Recreation and Leisure Studies received a 2017-18 Social Sciences and Humanities Research Council (SSHRC) Connection Grant entitled “Canada 150: engaging leisure legacies/creating leisure legacies.”
The Partnerships in Dementia Care Alliance (PiDC), led by Professor Sherry Dupuis and collaborators, performed nine shows of their research-based drama Cracked: New Light on Dementia — including one performance in conjunction with the Alzheimer Association International Conference in July. The manuscript for the play was also published in ReView: an anthology of plays committed to social justice.

The Professional Practice Center in Health Systems, led by Professors Ian McKillop and Helen Chen, has completed over $1M in knowledge translation projects delivering IT solutions in settings such as dialysis, transplant, cardiac care, and public health. The process has also created new experiential learning opportunities for graduate students.

The Centre of Research Expertise for the Prevention of Musculoskeletal Disorders (CRE-MSD) was selected by the Ontario Ministry of Labour to lead the redevelopment of provincial guidelines for the prevention of musculoskeletal disorders. The two-year $307K project involves multistakeholder, cross-industry sectors. CRE-MSD is also spearheading a national project to develop a Canadian standard to address issues related to paramedic equipment and emergency ground transport. Developed in collaboration with the Canadian Standard Association (CSA), Frontenac County, the Paramedics Association of Canada (PAC), and other industrial partners, the standard is the first of this kind in Canada. It received over $600K in cash and $500K of in-kind funding from Defense Research and Development Canada (DRDC).

Professor Kelly Skinner and colleagues from three universities received a four-year SSHRC Insight Grant to explore the multiplicity of food and social economies and experiences for Indigenous people living in the provincial north and urban centres in Manitoba and Ontario.

The Canadian Index of Wellbeing (CIW) launched its third national report: How are Canadians Really Doing? The report found that while Canada’s economy has recovered from the 2008 recession, well-being has not. In 2014, household spending on culture and recreation was at its lowest point in over two decades and Canadians are spending less time away on vacation or participating in leisure activities.

School of Public Health and Health Systems (SPHSS) faculty members and graduate students participated in a successful Ontario Coalition Institute Workshop on Global Health in September. The Global Health Group, led by Professor Susan Horton, is currently preparing a proposal for a Global Health Institute based in Applied Health Sciences. This initiative builds on the School’s existing strengths in the field. Current projects include the application of health informatics to enable local innovators to tackle challenges in Mongolia and building institutional capacity in Zambia to address linkages between climate change and health.

Professor Joon Lee was one of four researchers from the province to participate in the Ontario-China Young Scientist Exchange Program.

STRATEGIC INITIATIVES:

ACADEMIC PROGRAMMING

Three new teaching fellows (one from each academic unit) were appointed to raise the profile of teaching and learning in the Faculty. The fellows are responsible for overseeing the annual Applied Health Sciences Teaching Award, which was awarded to Professors Joe Quadrilatero and Elham Satvat in 2016.

On May 8, the Faculty kicked-off its 50th anniversary year with a special lunch and ceremony, followed by a Hallman lecture from the Hon. Anne McLellan. The lecture, which looked at the implications of legalizing marijuana in Canada, was hosted by the School of Public Health and Health Systems to mark their 40th anniversary. Over 225 people, including faculty, staff, alumni, and members of the general public attended the talk.

The new course-based master’s program in Recreation and Leisure Studies welcomed its first cohort in September 2016.

More than 150 students from other Faculties enrolled in AHS 100, Foundations of a Healthy Lifestyle, over two terms. The new course, a complement to AHS 107 (which is mandatory for all AHS students), promotes the basics of health, wellness, and disease prevention.

With support from the Network for Aging Research (NAR), graduate students hosted the second annual Symposium on Aging Research (SoAR) to initiate trans-departmental collaborations and engage in conversations on aging research. This year, SoAR featured a keynote by NAR researcher John Lewis to open the day.

Over 100 high school students competed in the 9th annual Brain Bee competition hosted by the Department of Kinesiology. The event winner advanced to the Canadian Institutes of Health Research Brain Bee.

In November 2016, the Murray Alzheimer Research and Education Program hosted Hack4Health 2.0. The two-day event generated ideas for practical applications to improve the lives of those living with Alzheimer’s disease or multiple sclerosis. Winning concepts included a low-profile bracelet providing a display of the current state of household devices (windows open, doors unlocked) and a personalized medicated transdermal patch based on specific medication plans.

A team of SPHSS students advanced as finalists in the Canadian Evaluation Society Student Case Competition in Vancouver and competed in the final round.
FACULTY OF ARTS
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STRATEGIC INITIATIVES:

TRANSFORMATIONAL RESEARCH

› Distinguished honours, awards, and research chairs awarded to Arts faculty and graduates, include:
  - Professor Jim Walker (history) was named Member of the Order of Canada for his influential scholarship on human rights and the role of Black Canadians in advancing racial equity;
  - John English, distinguished professor emeritus (history), was promoted to Officer of the Order of Canada for his contributions to Canada’s political heritage;
  - Professor Colin MacLeod (psychology) was named a Fellow of the Royal Society of Canada;
  - Professor Heather Douglas was named a Fellow of the American Association for the Advancement of Science (AAAS);
  - Professor John Turri (philosophy) was named a member of the College of New Scholars, Artists and Scientists, Royal Society of Canada, and also a Social Sciences and Humanities Research Council (SSHRC) Tier 2 Canada Research Chair (CRC) in Cognitive Science;
  - Professor Ramona Bobocel (psychology) was named a Fellow of the Canadian Psychological Association;
  - Professor Linda Warley (English) won the 2016 Gabrielle Roy Prize for her co-edited book, Canadian Graphic: Picturing Life Narratives;
  - Gord Pennycook’s (PhD ’16 psychology) lead-authored paper, “On the Reception and Detection of Pseudo-Profound Bullshit,” won an Ig Nobel Prize from Harvard University; and
  - Professor Chris Eliasmith (philosophy) was promoted to Tier 1 Natural Sciences and Engineering Research Council (NSERC) Canada Research Chair (CRC) in Theoretical Neuroscience.

› Ashley Rose Mehlenbacher (English) and Igor Grossmann (psychology) each received an Ontario Early Researcher Award.

› Jessie Thistle MA ’16 history, supervised by Professor Susan Roy, is the first Indigenous student to win both a Trudeau and a Vanier fellowship for his PhD studies.

› Professor Niaa Kelet-Mae (theatre and performance) delivered the keynote, addressing race and gender issues in Canada, at the University’s International Women’s Day dinner.

› Faculty and staff members in Arts collaborated with the Waterloo Aboriginal Education Centre, along with numerous Indigenous partners, to present The Mush Hole Project, a multidisciplinary performance at Canada’s oldest former residential school in Brantford, followed by a conference, Integrating Knowledges Summit, held at Waterloo.

› Arts and the Waterloo Aboriginal Education Centre have jointly launched the Indigenous Speaker Series, with two speakers presented in winter 2017.

STRATEGIC INITIATIVES:
OUTSTANDING ACADEMIC PROGRAMMING

› Arts continues to lead the Steering Committee, English Language Competency Initiative (SCELCI), with communications programming successfully implemented by Arts teaching staff and faculty in engineering, math, science, and in-progress in environment.

› Arts First director and co-director are well on the way in preparing the September 2018 launch of required first-year courses (Inquiry and Communication and Information and Analysis), with a website currently focused on recruitment of multidisciplinary teaching faculty.

› A working group of faculty and staff members developed an online quiz and related website to help current and prospective students find their best fit among the Faculty’s undergraduate programs in digital media. The fun and informative quiz has been taken 4,000+ times.

› Arts continues to offer and introduce courses that respond to our times. Examples include the English’s Popular Potter, history’s Digital History, and sociology’s International Migration. Such courses are highly engaging while developing critical insights and understanding of current challenges, popular trends, and future employment competencies.

STRATEGIC INITIATIVES:
EXPERIENTIAL AND ENTREPRENEURIAL

› Emma Vossen, a PhD candidate in English, was one of the five national winners of the SSHRC’s annual Storytellers competition; her entry focused on First Person Scholar, a game studies website founded by Waterloo English graduate students.

› A team of economics students, mentored by Professor Jean-Paul Lam, was among the finalists for the Bank of Canada’s Governor’s Challenge, where teams presented policy recommendations for keeping inflation low and stable.

› A group of Global Governance graduate students presented their research insights and ideas by invitation to Global Affairs Canada.

› A School of Accounting and Finance student and alumnus made up half the team who advanced to the finals of the Hult Prize competition for social justice and enterprise.

› A Global Business and Digital Arts student team had their class project implemented in the real world as the redesigned Stratford Police website and mobile app.

› Andria Bianchi, a PhD candidate in philosophy, won runner-up in the University’s Three Minute Thesis competition for her presentation on ethical considerations for those with dementia and sexual consent.

STRATEGIC INITIATIVES:
TEACHING EXCELLENCE

› Arts faculty members led a number of initiatives to help students and others develop critical awareness and action to end sexual assault and harassment on campus and beyond. These included:
   - the Faculty of Arts hosted a four-hour public Rape Culture teach-a-thon in September 2016 which featured 14 short lectures by professors from many departments, who addressed rape culture from their respective disciplinary perspectives; and
   - Drama and Speech Communication offered three fall courses with the shared theme “arresting rape culture;” the courses resulted in the winter term performance Unconscious Curriculum, an expert panel Gendered Violence on Campus: Institutional Policy and Practice, and an interactive art installation.

› Professor Doreen Fraser’s (philosophy) course, Quantum Mechanics for Everyone that focuses in part on leading research at Waterloo, became a regular course offering for any Waterloo undergraduate.

› Professor Frankie Condon (English) won the Federation of Students Excellence in Undergraduate Teaching Award for 2017.

STRATEGIC INITIATIVES:
VIBRANT STUDENT EXPERIENCE

› The Hagey Hall Hub opened in September 2016, just before Orientation Week. The three-story space represents the achievement of a critical strategic goal to enhance the on-campus experience of Arts students; it offers numerous study and social areas with comfortable seating, a coffee shop, and a bookable project room. The Hub’s official grand opening with donors present took place on February 10, 2017.

› Global Governance Master of Arts (MA) candidate Masroora Haque was a member of the Waterloo delegation at COP22, the Conference of Parties to the United Nations Framework Convention on Climate Change, held in Marrakech; she presented a research paper and contributed to action planning for the Paris Agreement.

› The Arts and Business Student Society initiated and led an entrepreneurship event specifically for Arts students called stARTup; it brought together a panel of five young alumni who are entrepreneurs to speak with current students about the ways in which an Arts education and skillset play a vital part in startup ventures.

› The number of Arts undergraduate students participating in international exchange has doubled over five years: in fall 2011, 33 students spent their academic term studying at an international partner university by fall 2016, 64 students participated in study-abroad experiences.
SWIRVE, AN ENDOSCOPE USING INFRARED LIGHT AND A FIBRE OPTIC CABLE DESIGNED AS A CAPSTONE DESIGN PROJECT BY MICHAEL PHILLIPS, LEFT, AND PHIL COOPER, RECEIVED $50K FROM THE PALIHAPITIYA/LAU VENTURE CREATION FUND AND $10K AT THE 2017 NORMAN ESCH ENTREPRENEURSHIP AWARDS COMPETITION.
Professors Mark Hancock, Pin-Han Ho, Ning Jiang, and Stephen Smith were awarded NSERC Discovery Accelerator Supplements awards in 2016.

Ontario’s Early Researcher Awards were received by Professors Vijay Ganesh, Mark Hancock, Hyung-Sool Lee, and Stephen Smith.

The Green and Intelligent Automotive (GAIA) Research Facility for automotive research and testing officially opened in September 2016.

STRATEGIC INITIATIVES:

EXPERIENTIAL EDUCATION

In the past year, Waterloo Engineering students completed a record 8,435 co-op work terms, achieving a 98.4% employment rate. The proportion of work terms filled outside of Canada increased again in 2016, reaching almost 17.9%.

The Alexa Fund Fellowship, supported by Amazon, was launched to provide support for Waterloo Engineering students who are exploring new ways to apply a voice-activated virtual assistant system.

The University of Waterloo NanoRobotics Group, comprised of nanotechnology and software engineering students, captured first place in the Mobile Microrobots Challenge at the International Conference for Robotics and Automation.

ENTREPRENEURIAL

$60K was awarded at the fourth annual Norman Esch Entrepreneurship Awards for Capstone Design competition for Engineering students. The Esch Foundation committed over $1M in renewed funding to support Enterprise Co-op awards, the Bridging Entrepreneurs to Students program, Master of Business, Entrepreneurship, and Technology scholarships, and Capstone Design awards.

Almost $53K in micro-seed funding was awarded to entrepreneurial Engineering students through the Engineer of the Future Fund.

Waterloo Engineering helped facilitate $400K in funding for three student and faculty-founded companies; Acerta, Elucid, and Knote. The program also offered students access to mentorship from faculty and Silicon Valley entrepreneurs and businesses.

The Palihapitiya/Lau Venture Creation Fund awarded $100K to help Capstone Design projects SWIRVE and VivaSpire become startups.

Medella Health, co-founded by a nanotechnology engineering student, captured an international runner-up award in the 2016 James Dyson Award competition. The smart contact lens that monitors glucose levels was the third project with its genesis in Capstone Design to win a top prize in three years.

Matthew Bailey, Aaron Grant, and Stephen Lake, mechatronics engineering alumni who founded Thalmic Labs in their graduating years, were named to the prestigious 2017 Forbes 30 Under 30 list.

STRATEGIC INITIATIVES:

ACADEMIC PROGRAMMING AND TEACHING EXCELLENCE

As part of an ongoing process of improvement that reflects student and faculty input, many Engineering programs revised their curricula.

Total undergraduate enrolment and the enrolment of women in the Faculty of Engineering again reached all-time highs in 2016 with 7,865 students, of whom more than a quarter — 27% — were women. The proportion of women in the first-year class reached 31% for the first time, up from 22% in 2013.

Of the new first-year students registered in the Faculty of Engineering in fall 2016, 86% had incoming high school averages of 90% or higher and 39% had averages of at least 95%. In both cases, this was a slight increase over fall 2015.

Over 12,300 applications to Engineering programs were received for fall 2017, an increase of about 6% over the previous year. Engineering was unfortunately unable to make offers to over 3,000 students who applied with high school averages of 90% or higher.

For the 2016 calendar year, Engineering awarded 1,209 undergraduate degrees and 643 graduate degrees.

Teaching and profession awards earned in 2016/17 include:
- Professor Sherman Shen was named a University Professor, the University of Waterloo’s highest academic honour;
- Professors Sanjeev Bedi and Dan Davison both received University of Waterloo Distinguished Teacher Awards;
- Professor Gordon Stubley was awarded a 3M National Teaching Fellowship;
- Engineering Graduate Studies established the Faculty of Engineering Award of Excellence in Graduate Supervision. The inaugural recipients were Professors Catherine Burns, Ali Elkamel, Carl Haas, and Susan Tighe;
- Mohammed Nassar, electrical and computer engineering doctoral candidate, was awarded an Amit & Meena Chakma Awards for Exceptional Teaching by a Student; and
- Associate Dean, Outreach, Mary Wells, received the Support of Women in the Engineering Profession Award from Engineers Canada and accepted an NSERC Science Promotion award for her leadership of the Ontario Network of Women in Engineering.
STRATEGIC INITIATIVES:  
TRANSFORMATIVE RESEARCH

› In recognition of the significant impact of her career research in environmental politics and her outstanding contributions to the understanding of global food policy and security, School of Environment, Resources, and Sustainability Professor Jennifer Clapp received Canada’s highest academic honour, being named to the Royal Society of Canada.

› The Polar Data repository became the 100th member of the International Council for Science World Data System and was named Canada’s National Antarctic Data Centre.

› Geography and Environmental Management Professors Merrin McCrae and Claude Dugany joined researchers from the Water Institute, the University of Saskatchewan, and other universities on the Global Water Futures initiative, the largest university-led water research program ever funded by the Canada First Research Excellence Fund.

› For his outstanding contribution to the field of ecology, School of Environment, Resources, and Sustainability Professor, Andrew Trant was awarded the prestigious William Skinner Cooper Award. Trant’s recent study found that 13,000 years of repeated human occupation by coastal First Nations enhanced temperate rainforest productivity.

› The Intact Centre for Climate Adaptation forged several partnerships and created programs to enhance knowledge mobilization, including the Home Flood Protection Program with the City of Burlington, and a report of best practices for making new residential communities flood-resilient with Standards Council Canada.

› School of Environment, Enterprise, and Development Professor Amelia Clarke gave international presentations at the United Nations Habitat III in Quito, Ecuador and the International Conference on Sustainable Development conference in New York City on the important role of partnerships in achieving the Sustainable Development Goals.

› Environment welcomed Banting Fellow Olivier Roy-Baillargeon, who joined the School of Planning to study transit adjacent communities with Pierre Filion.

› Two Environment professors were granted Ontario Early Researcher Awards: Knowledge Integration’s John McClevey to study the development of free/libre open source software in massive inter-organizational collaboration networks, and geography’s Derek Robinson who will use drones to better understand the impacts of climate, technology, and policy on Ontario farming.
› Professor Sean Geobey of the School of Environment, Enterprise, and Development, and his graduate students partnered with the City of Kitchener through the Smart Region Initiative to pilot a participatory budget experiment.

› In recognition of his pioneering research on tourism and climate change, Distinguished Professor Emeritus Geoffrey Wall was awarded the United Nations World Tourism Organization Ulysses Award for Excellence in the Creation and Dissemination of Knowledge in Tourism.

› Helping Canadians to prepare, respond to, and measure a changing climate, Shawna Peddle, director of the Partners for Action Research Network, was a featured presenter at the 2016 Livable Cities Forum.

› Widely respected lawyer and the newest faculty member to join the School of Environment, Enterprise, and Development, Marie-Claire Cordonier Segger was awarded the 2016 Justica Regorum Fundamentum award for exemplary, outstanding achievement and professional activities carried out in the field of protection of human rights.

› School of Planning professor Leia Minaker received a Career Development Award from the Canadian Cancer Society Research Institute for her work on lifestyle behaviours that prevent cancer in Canadian youth.

**STRATEGIC INITIATIVES:**

**OUTSTANDING ACADEMIC PROGRAMMING**

› The Faculty of Environment broke all previous attendance records welcoming world-renowned economist and development expert, Jeffrey Sachs, as keynote for the 2017 TD Walter Bean Lecture in the Environment.

› The Faculty of Environment hosted the largest Canadian Association of Geographer’s — Ontario Division conference in the organization’s history.

› A testament to the quality of their education, three female Environment alumni were named to Corporate Knights Top 30 Under 30 for Sustainability: Morgan Book, Tahnee Prior, and Dana Decent.

› The School of Planning announced a new minor in Urban Studies.

› Challenging students to see sustainability through a different lens, School of Environment, Resources and Sustainability professor Rob de Loë offered the first-ever Photography for Sustainability course.

› The Department of Geography and Environmental Management was awarded $330K from eCampus Ontario to create an online graduate diploma in Climate Risk Management.

**STRATEGIC INITIATIVES:**

**EXPERIENTIAL EDUCATION | VIBRANT STUDENT EXPERIENCE**

› The first cohort of young pilots trained under Sunwing Airlines’ intensive cadet program — Cameron Fuchs, Spencer Leckie, Siobhan O’Hanlon, and Chelsea Anne Edwards — were hired upon graduation as First Officers. The successful cadet program was renewed for another year.

› For the third year in a row, faculty and staff from the Faculty of Environment led a student delegation to the Conference of Parties (COP) climate change conference. The 2017 team attending COP22 in Marrakech, Morocco included five students from four different Faculties across campus.

› Five School of Planning students were selected to travel to Japan as part of a nine day Japan Friendship Ties Program called ‘Kakehashi’. The students visited the Earthquake Disaster Reconstruction site, met with students studying planning in Japan, and learned about the infrastructure and politics involved in the planning of a city the size of Tokyo.

› The Faculty launched its Leadership Breakfast Series which provides an opportunity for current student leaders to meet, learn from, and network with, established alumni over waffles and coffee.

› Alumni, students, donors, and the campus community came together to celebrate female entrepreneurship at the screening of *Dream, Girl*; a documentary co-produced by alumnus Komal Minhas.

› The TD Friends of the Environment Foundation donated seed funding for the Waterloo Urban Forest Revitalization Project to turn a “hidden gem” campus woodlot into a vibrant living laboratory for the campus and broader community.

› Parlaying his passion for sustainable urban food systems, fourth-year planning student Michael Wideman founded Eggplant. He joined St. Paul’s Greenhouse, placed second in the Jack Rosen Memorial Awards, won a Velocity $5K final, and has recently been accepted into Velocity Garage.

› The Faculty of Environment hosted its inaugural Awards Banquet to thank donors and recognize hard working student scholarship recipients.

› The 2017 Faculty of Environment holiday video was named one of the season’s Best University Holiday videos by Higher Education Marketing and College Web Editor.
STRATEGIC INITIATIVES:

TRANSFORMATIONAL RESEARCH

› The University of Waterloo is recognized as a world leader in mathematics and computer science. In 2016/17, the QS World University Rankings by Subject ranked mathematics at Waterloo 34th and computer science and information systems 31st. The Times Higher Education World University Rankings by Subject ranked Waterloo 23rd in the world for computer science.

› Faculty of Mathematics researchers earned $6.7M in funding from the Natural Sciences and Engineering Research Council (NSERC) in 2016/17, including a record high of $5.7M in Discovery Grants. NSERC funding to the Faculty increased by 13% since 2012/13.

› Professors Jo Atlee and Nancy Day are part of the Autonomoose autonomous vehicle platform project, an interdisciplinary research project that received government approval in November 2016 to test their autonomous vehicle platform innovations on all public roads in Ontario.

› Mathematics faculty continued to receive prestigious national and international awards, including:
  - Professor Raouf Boutaba was awarded a French National Institute for Computer Science and Applied Mathematics International Chair for 2017-2021;
  - Professor Ihab Ilyas now holds the Thomson Reuters-funded Research Chair in Data Cleaning from Theory to Practice;
  - Professor Tamer Özsu was named a Fellow of the Royal Society of Canada in 2016;
  - Professor Karen Yeats received a 2016 Humboldt Research Fellowship;
  - Professor Jo Atlee was named an Association for Computing Machinery Distinguished Member;
  - Distinguished Professor Emeritus John Brzozowski and Professor Ian Munro were recognized with Canadian Association of Computer Science 2016 Lifetime Achievement Awards;
  - Professor Lap Chi Lau won the CS-Can/Info-Can Outstanding Young Computer Science Researcher Award;
  - Professor Thomas Coleman was named a Fellow of the Society for Industrial and Applied Mathematics; and
  - Professor Stefan Steiner received the Brumbaugh Award from the American Society for Quality.
STRATEGIC INITIATIVES:

OUTSTANDING ACADEMIC PROGRAMMING

› A new Mathematics undergraduate program in data science, a discipline requiring substantive tools from computer science and statistics, has been approved by Senate.

› The Bachelor of Mathematics in Financial Analysis and Risk Management program (Finance Specialization) has been recognized by the Chartered Financial Analyst Institute.

› The Faculty of Mathematics has made significant progress toward its strategic goal to increase online learning opportunities. Enrolments in online courses have increased by 87% since 2012/2013. In 2016/17, over 3,200 students enrolled in 44 online sections of 29 courses.

› Building on its partnership with Maplesoft to build high school online courses on the Möbius platform, Waterloo has entered a new partnership to use Möbius to support teaching math at all levels. Möbius uses technology that keeps students actively engaged through interactive applications, visualizations, and immediate feedback.

› Mathematics has introduced and piloted the use of Crowdmark to provide digital support for marking final examinations, tests, and assignments. Integrated with Waterloo’s learning management system LEARN, Crowdmark makes marking faster, provides more immediate feedback for students, and includes quality controls. In less than two years, four million pages of assessments have been marked with Crowdmark.

› Mathematics is incorporating more interactive learning technology, including Piazza, a STEM-aware (science, technology, engineering, and math) online collaborative question and answer platform. In fall 2016, there were more than four million views of Q&A threads on Piazza by students in Faculty of Mathematics courses.

› Teaching Fellow Professor Brian Forrest has been recognized with two external teaching awards in recognition of his outstanding teaching and innovation in the classroom and online: the Mathematical Association of America’s Clarence Stephens Distinguished Teaching Award and the Fields Institute Margaret Sinclair Memorial Award.

› Professor David McKinnon won a 2017 University of Waterloo Distinguished Teacher Award.

› Sessional instructor Michelle Ashburner won the Federation of Students Teaching Award.

› 2016/17 marked record undergraduate and graduate enrolment, which have increased by 16% and 13% respectively over 2012/13. The percentage of women enrolled also reached new highs in 2016/17, with women comprising 35% of undergraduates and 29% of graduate students.

› The Faculty of Mathematics’ exceptional academic program quality is reflected in increasing demand by outstanding prospective students. The Faculty received over 14,700 applications for fall 2016 undergraduate admission, an increase of 62% since 2012.

STRATEGIC INITIATIVES:

VIBRANT STUDENT EXPERIENCE

› A new institutional partnership with Thompson Reuters includes access to the Eikon financial analysis system for the Finance Lab, providing students with enhanced opportunities to apply financial theory to practice.

› The Waterloo Black team — Andy Huang, Antonio Molina Lovett, and Jacob Jackson, with coach Troy Vasiga — placed 13th in the 2016 Association for Computing Machinery International Collegiate Programming Contest.

› Gabin Urbancic was awarded the 2016 Daniel G. Wright Undergraduate Scholarship by the Canadian Meteorological and Oceanographic Society.

› A record number of students participated in this year’s Small c Math Contest organized by Professor J. P. Patti.

› Waterloo finished sixth out of 568 institutions (behind Carnegie Mellon, Princeton, Harvard, MIT, and Stanford) at the Putnam competition, with 26 students among the top 501 individual competitors. Waterloo team members were Daniel Spivak, Anzo Zhao Yang Teh, and Antonio Molina Lovett, coached by Professor Stephen New.

› Colin Behenna was named Top Academic Canadian Interuniversity Sport All-Canadian. Colin is an exceptional varsity hockey player who is also a strong mathematics and business student.

STRATEGIC INITIATIVES:

GLOBAL OUTLOOK

› The READI (Risk Management, Economic Sustainability and Actuarial Science Development in Indonesia) initiative is gaining momentum. An agreement has been signed with the Universitas Prasetiya Mulya to help create an actuarial science co-operative education program there. Sun Life also donated $500K to establish a Fellowship in International Actuarial Science, awarded to Professor Ken Seng Tan.

› The Faculty of Mathematics and the Chinese Academy of Sciences have signed a new dual degree doctoral program agreement.

› The Faculty of Mathematics has entered into a bilateral agreement with the African Institute for Mathematical Sciences Next Einstein Initiative, a pan-African network of centres of excellence for postgraduate training, research, and engagement in mathematical sciences.
STRATEGIC INITIATIVES:

TRANSFORMATIONAL RESEARCH

› Canada Excellence Research Chairs Philippe Van Cappellen and David Cory received more than $90M in funding from the Canada First Research Excellence Fund for water and quantum research.

› Chemist Linda Nazar developed a safe, high-capacity zinc-ion battery that costs half the price of current lithium-ion batteries, yet lasts twice as long.

› Physicist Thomas Jennewein was the first to transmit a quantum key securely from a source on the ground to a receiver on an aircraft.

› The School of Optometry and Vision Science opened a Brain Injury Clinic in fall 2016 and provides comprehensive care, assessment, and rehabilitation to all brain injury patients.

› Optometrist and vision science doctoral student Emmanuel Alabi won the 2017 University of Waterloo Three Minute Thesis Competition. He is the third Science student to win the university level competition in five years.

› Astrophysicist Mike Hudson captured the first composite image of a dark matter bridge that connects galaxies together.

› An interdisciplinary team of biologists and earth scientists discovered Boreal Shield lakes are similar to oceans from the Archean Eon, a period more than 2.5 billion years ago.

› Waterloo Science research has been featured by numerous international, national and regional media outlets including the New Scientist, Motherboard, WIRED Magazine, Forbes, Newsweek, The Guardian, Macleans, Globe & Mail, Quirks & Quarks, CBC, and CTV.

› Several Science faculty received prestigious awards and honours this year:
  - chemist Linda Nazar was appointed University Professor for her career achievements in solid state materials and advanced battery research;
  - earth sciences Professor Emeritus John Cherry was the first Canadian to receive the prestigious Lee Kuan Yew Water Prize; and
  - chemist Marcel Nooijen was elected into the International Academy of Quantum Molecular Sciences (IAQMS) for his work in theoretical chemistry.
STRATEGIC INITIATIVES:

RESEARCH PARTNERSHIPS

› Earth scientist David Blowes is leading a $5.5M five-year initiative under Toward Environmentally Responsible Resource Extraction Network (TERRE-NET) to develop sustainable strategies for managing hazardous mine waste.

› Waterloo scientists partnered with the International Development Research Centre and six international research collaborations through the Water Joint Programming Initiative to tackle Legacies of Agriculture Pollutants (LEAP) on a global scale.

› Qatar and United Arab Emirates partnered with Waterloo earth scientists to study groundwater pollution in arid regions.

› Chemist Juewen Liu partnered with the Ontario Ministry of Environment and Climate Change to develop DNA-based sensors to detect pathogens and contaminants in water.

STRATEGIC INITIATIVES:

INDUSTRIAL PARTNERSHIPS AND COMMERCIALIZATION

› Chemist Scott Hopkins partnered with SCIEX and Pfizer to develop a new faster and cheaper method to help the pharmaceutical industry identify and test new drugs.

› Biologist Brian Dixon collaborated with Cedarlane labs to produce and market 45 different antibodies last year.

› Through their company Mediphage Biocaceuticals, Professors Roderick Slavcev and Jonathan Blay are working with global companies to explore how bacteriophages can combat colon cancer.

› The School of Pharmacy partnered with Apotex Inc. to provide support for graduate students, potential co-op placements and research projects of mutual interest.

› Pharmacy Professor Jonathan Blay partnered with Algae Dynamics Corp to research cannabis oils and explore the development and treatment of various types of cancer.

STRATEGIC INITIATIVES:

ENTREPRENEURSHIP

› Two Velocity Science companies, Suncayr and Medella Health, won top prizes in the Unlock Your Big Idea Pitch Competition.

› Medella Health won the National James Dyson Award and Velocity Science companies Arylla and Penta Medical were named Canadian runners-up.

› Several Science students competed in the 2017 Hult Prize Challenge and Team Epoch won the London, England Regionals and will compete for $1M at the International competition.

› Velocity Science companies and science entrepreneurs won $245K in funding at the Velocity Fund Final Competition this year.

STRATEGIC INITIATIVES:

ACADEMIC PROGRAMS

› Through a partnership with Conestoga College, Honours Biology and Biomedical Sciences students are able to earn a one-year Biotechnology Technician Diploma during their third year of undergraduate study.

› School of Pharmacy partnered with the Centre for Family Medicine Academic Health Team on the Health Sciences campus to offer the first primary care pharmacy residency in Canada that is not based in a hospital.

› Waterloo partnered with Maplesoft to enrich Sciences, Technology, Engineering, and Mathematics (STEM) education. Chemistry will be using Möbius in their first-year courses in fall 2017.

STRATEGIC INITIATIVES:

EXPERIENTIAL LEARNING AND TEACHING EXCELLENCE

› School of Pharmacy partnered with the McMaster University School of Medicine to develop TransEd, a free online educational module to assist health care students in learning how to deliver high-quality care to transgender patients.

› Professor Michael Beazely and Lecturer Richard Epp each received the 2017 Excellence in Science Teaching Award.

› Biologist Josh Neufeld used a variety of teaching strategies to make his new online Fundamentals of Microbiology course more interactive and personal for students.

› The School of Pharmacy is piloting the use of ExamSoft for online examinations, which allows instructors to enrich test questions with videos and other unique elements.

STRATEGIC INITIATIVES:

COMMUNITY OUTREACH AND GLOBAL ENGAGEMENT

› Pharmacy Professor Kelly Grindrod and graduate students partnered with local organizations to deliver e-health workshops to improve health literacy in seniors.

› The School of Pharmacy hosted a public lecture to discuss opioid uses and misuse in the Waterloo Region.

› The School of Pharmacy received the Best Community Outreach Initiative from the Canadian Council for the Advancement of Education (CCAE) for educating parents, first-responders and health care professionals about opioids and the value of naloxone for harm reduction.

› In April, the School of Optometry and Vision Science partnered with the Canadian Paralympic Committee to offer out-of-competition classification services for national para-sport athletes from across Canada.
This report is submitted following the committee’s meetings of 26 July 2017 and 12 October 2017.

FOR APPROVAL

1. APPOINTMENT OF EXTERNAL AUDITORS

Motion: To reappoint Ernst & Young as the university’s external auditors for the fiscal year ending 30 April 2018.

Background: This recommendation is made with the endorsement of the vice-president, administration & finance, and in conjunction with the approval of the audit plan and fee (item #3 of this report).

FOR INFORMATION

2. AUDITED FINANCIAL STATEMENTS

The audited Financial Statements for the fiscal year ended 30 April 2017 were provided to the members. A motion to recommend the approval of the audited Financial Statements was carried. Said Financial Statements were approved by the Board Executive Committee in August.

3. EXTERNAL AUDIT PLAN FOR 2018

The committee reviewed the external audit plan for the fiscal year ended 30 April 2018. For the upcoming year, the committee approved the overall planned audit approach together with the fees for the external audit plan as proposed by the external auditors (Ernst & Young).

4. EXTERNAL AUDIT FEES FOR 2017-2018 FISCAL YEAR

The committee approved a fee of $116,000 for the financial statement audit report; there is no increase compared to the previous year.

5. DIRECTOR’S AND OFFICERS’ INSURANCE

The committee reviewed a summary and noted that there were no significant changes in coverage from the previous year.

6. UNIVERSITY RISK MANAGEMENT PROJECT UPDATE

The committee received a status report on the university risk management program from the Secretariat, as well as the fourth biannual risk assessment prepared by the executive group. Risks are currently trending below the established risk appetites.

7. STATUTORY COMPLIANCE

The Secretariat maintains a list of federal and provincial statutes, municipal bylaws and international regulations posing the greatest potential risk for the university in the event of non-compliance.

Managers for institutional compliance have reviewed these statutes, bylaws and regulations, and each has signed a declaration indicating that, to the extent of their responsibility and to the best of their knowledge, there are no issues of material non-compliance related to their areas of responsibility as at
the date of their signature, subject only to the detail provided by the Director of Safety. With regards to safety training, the Safety Office provides mandatory and supplementary training courses to assist members of the university community in meeting their obligations to provide a safe, healthy work and educational environment; supervisors are accountable to ensure all required training is complete as required by Waterloo’s health, safety and environment program and not all have completed legislated mandatory training courses.

8. INTERNAL AUDIT SUMMARY UPDATE
The approved 2016-2017 internal audit plan has been completed. Internal audit is confident that management’s current plans to address outstanding observations will mitigate risk to an acceptable level.

9. COMMITTEE TERMS OF REFERENCE
The committee reviewed its terms of reference, which were found to be satisfactory.

T. Heins
Chair

/ar
This report is submitted following the committee’s meeting of 13 October 2017.

FOR APPROVAL

1. **Field House**

   **Motion:** That the Board of Governors approve an increase to the Field House project budget to $16.5 million (+10%), and to approve the awarding of a stipulated sum contract to Ira McDonald Construction Ltd. for $13,193,000 plus HST.

   **Background:**
   In February 2017, the Board of Governors approved a project budget of $15 million for the construction of a ~75,000 square foot indoor athletic space to be designed by Walter Fedy (Architects).

   Detailed design development over the following months produced five design options with varying sizes of playing field surfaces and the inclusion/exclusion of an elevated running track. Based on budget estimates developed in April, the 70,654 square foot field house option with the building link but excluding the elevated running track appeared to be achievable within the approved budget. The September 8th pre-tender estimate excluding several items with itemized pricing was $15.036 million. The project was then tendered.

   The tenders closed on September 28th with four of the six pre-qualified general contractors submitting bids. The low bid was $13,193,000 plus HST; the second low bid was within 3.6% of the low bid, and the remaining bids were within 7% and 10% of the low bid.

   The project budget (including net HST) impacts are as follows:

<table>
<thead>
<tr>
<th>Approved Budget</th>
<th>Revised Budget Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>$11,000,000</td>
</tr>
<tr>
<td>Contingency</td>
<td></td>
</tr>
<tr>
<td>- Design</td>
<td>$600,000</td>
</tr>
<tr>
<td>- Construction</td>
<td>$500,000</td>
</tr>
<tr>
<td>Professional Fees</td>
<td>$1,450,000</td>
</tr>
<tr>
<td>Testing, surveys, etc.</td>
<td>$50,000</td>
</tr>
<tr>
<td>Furniture/Furnishings</td>
<td>$300,000</td>
</tr>
<tr>
<td>Network Connectivity</td>
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<tr>
<td>Building Security</td>
<td>$75,000</td>
</tr>
<tr>
<td>Permits &amp; Development Charges</td>
<td>$975,000</td>
</tr>
</tbody>
</table>

   Total $15,000,000 $16,500,000 [+10%]

   The project will be funded through operating funds (and potential donations) over a period of less than 10 years.
2. Carl Pollock Hall – Three Renovation Projects

On behalf of the Board, the committee approved three renovation projects for facilities in Carl Pollock Hall (CPH) which will deliver the new Architectural Engineering program: (1) CPH First Floor Renovation – First Year Design Teaching Studio, $2.5 million; (2) CPH First Floor Renovation – Computer Lab/ Quiet Space/ Maker Space (3D printer/laser cutter), $0.9 million; and (3) CPH Third Floor Renovation – Upper Year Design Teaching Studio, $2.75 million. The source of funding for these projects will be operating funds. Staff will tender and award projects 1 and 2 in a single stipulated price contract using a phased construction approach.

Background: This new co-op program will be mounted with “Design from Day One” as its mantra. A common Architectural Engineering class held in a studio setting will be the core of each term to help knit together subjects such as design, aesthetics, culture, environment, and professionalism in the context of engineered buildings. A studio teaching experience, common in design-centric programs such as architecture and industrial design, allows for enhanced peer-learning, better collaborative work, inspiration from surroundings, rapid modelling and prototyping, while encouraging hands-on investigations and exploration. Another of the distinctive features of the program will be its 3A and 3B academic terms, during which students will take their classes at the Cambridge campus, immersed in the School of Architecture and working alongside architecture students. The program considers sustainability and environmental concerns of the built environment to be a fundamental part of all engineering design. As such, sustainability is not taught as a separate course or part of several courses, but is integrated into all design decisions and as an input or constraint to all relevant analysis.

3. Science Centre for Innovation – Appointment of Architects

On behalf of the Board, the committee approved the appointment of ZAS Architects to develop schematic designs and proceed into initial design development for Phase 2 of the Science Expansion project known as the Science Centre for Innovation with the initial fees not to exceed $2 million. The initial design fees will be funded from operating funds.

Background: Phase 1 of the Science Expansion project was awarded through a design-build contract to Bondfield Construction Ltd. together with ZAS Architects. Design & construction of this $45 million project commenced in 2012 and was completed in October 2016. The Phase 1 design contemplated the eventual construction of Phase 2 in the location just south of the Biology 1 building where the existing mechanical room and greenhouse are located and is consistent with the University’s Master Plan. The Faculty of Science is actively pursuing funding opportunities for Phase 2 with an expectation that 50% of the project funding may be in place in 2018. The Phase 2 project costs are estimated to be in excess of $60 million; this estimate will be refined once further design and analysis is completed. The Science Centre for Innovation will be primarily dedicated to research space, Velocity Science, space for the Science and Business Program, and research groups and centres. The sophisticated instrumentation spaces will provide for an integrated high throughput screening and analysis system, free electron laser, environmental particle analysis laboratory, as well as biochemical and structural biology laboratories. Part of the project design exercise will include a review of the existing mechanical systems (major chiller plant) located in the basement under the existing greenhouse to determine how to optimize its modernization.
4. General Oversight
The committee reviewed and accepted for information:
- the capital financing commitments associated with capital projects, and advises that these commitments fall within Waterloo’s board-approved debt policy
- the status of capital projects
- the work plan of the committee
- the results of the committee self-assessment for the 2016-2017 meeting cycle

For the purposes of orienting the committee to its responsibilities and to the physical campus, a guided tour of certain facilities on campus was held on 17 October 2017.

/mg

Martha George
Chair
This report is submitted following the committee’s meeting of 12 October 2017.

FOR INFORMATION

1. **Pension Fund Financial Statements**
   As part of the annual work plan, the committee reviewed the audited pension fund financial statements as at 31 December 2016. There were no issues of note. A copy of the financial statements can be requested from the committee secretary (mgrivicic@uwaterloo.ca) and can also be accessed online.

2. **Student Venture Fund SIPP**
   The committee approved the Statement of Investment Policies and Procedures for the Student Venture Fund within the School of Accounting and Finance.

   **Background:** The School of Accounting and Finance has an existing Student Investment Fund, where that fund’s Statement of Investment Policies and Procedures was previously approved by the Finance & Investment Committee. The school recently received a written commitment from the same donor of the Student Investment Fund to provide the new Student Venture Fund with a gift of $500,000 over five years and the potential for additional contributions. Students will evaluate early stage companies based on their management team, the product/technology/service, intellectual property, market opportunity, competitive advantage, market traction, strategy, capital requirements, valuation and expected return, and exit strategy. The students will be supported by an investment committee, industry mentors, and an advisory council similar to the mechanisms in place for the Student Investment Fund.

3. **General Oversight**
   **Investment Fund Performance.** The committee reviewed the performance of the registered pension plan, endowment fund, IQC trust fund, and payroll pension plan portfolios as at 30 June 2017. Considering all managers across all funds, the weighting toward value managers for global equity funds is lagging the buoyancy of growth-oriented portfolios. Nonetheless, all funds are meeting year-to-date policy benchmarks.

   **Governance:** The committee obtained progress updates on the work of the Responsible Investing Working Group and from the working group examining pension investment governance.

   **Currency Hedging.** The committee has elected to remove the currency hedge for the endowment and pension plan (with the latter subject to concurrence of the Pension & Benefits Committee) that was previously put into place by the committee. The committee has devoted its attention to this issue for a number of meetings and in making its decision has observed: lack of capacity for staff to give advice on tactical currency hedging moves; overall difficulty in forecasting currency shifts to make tactical moves, even for professionals; costs of executing currency hedging are largely negligible for the university; difficulty in accurately hedging based on domiciles of holdings, as multinational companies earn revenues worldwide; other universities and major pension plans elect to be unhedged or partially so; difficulty in conducting sufficient due diligence at the committee level. Finance will be able to implement the removal of the hedge in due course.

   **Review of Midterm Economic Drivers.** The committee reviewed the general investment principles for the investments under consideration, as well as the prevailing trends and economic developments that impact investment decisions and overall returns.

/mg

James Schlegel
Chair
This report is submitted to the Board of Governors following the meeting of the Governance Committee on 12 October 2017.

FOR INFORMATION

1. Board Retreat

Members of the Board are reminded to reserve Friday 1 December 2017 for the annual Board Retreat. The theme this year is “Disrupting the 21st Century University: Imagining UW@2025.” While the agenda is still under development, a draft is attached and all members are encouraged to attend.

Cindy Forbes
Chair, Governance Committee
BOARD OF GOVERNORS RETREAT
DECEMBER 1, 2017
DRAFT AGENDA

DISRUPTING THE 21ST CENTURY UNIVERSITY: Imagining UW @2025

9:00 – 9:10 Introductions and Welcome (Cindy Forbes)

9:10 – 9:20 Setting the Stage (Feridun Hamdullahpur)

9:20 – 10:20 Ontario Universities in the Knowledge Based Economy: What has to change? What will be needed to differentiate? (Glenn Craney, ADM Postsecondary Education Division, MAESD – Government Perspective) (David Lindsay, President and CEO, Council of Ontario Universities – System Perspective)

10:20 – 10:45 Break and Conversation

10:45 – 11:45 Panel: Digitally Intensive, Interdisciplinary Rich, Global, Student Focused Research University

Neil Randall
Robert Gorbet
Charmaine Dean
Two students

11:50 – 1:00 Lunch

Teaching and Learning Flipped: 21st Century Classroom
TBD

1:00 – 2:00 Breakout Sessions to Discuss the five priorities listed in the Vision Document

- Building a Student Rich Experience
- Being a Front Door to Innovation
- Finding New Ways of Doing Business
- Growing the University’s Influence and Reputation
- Valuing our People

2:00 – 2:30 Summary

2:30 – 2:45 Wrap up and Conclusion (CF, FH)
This report is submitted following the committee’s meeting of 16 June 2017, 8 September 2017 and 6 October 2017.

FOR APPROVAL

1. Actuarial Valuation of the Pension Plan as at 1 January 2017

Motion: To approve the filing of the actuarial valuation report as at 1 January 2017 with the Financial Services Commission of Ontario (FSCO) and the Canada Revenue Agency (CRA).

Background: The Board of Governors previously approved the filing of the actuarial valuation report at the meeting of 6 June 2017. Since that time, the pension plan has filed for Stage 2 solvency relief and at the 6 October 2017 meeting reviewed the revised actuarial valuation of the plan based on the assumption of Stage 2 solvency relief approval as well as applying the three year deferral period to the analysis contained within the valuation.

The University of Waterloo pension plan is an inflation-linked defined-benefit plan. The plan is funded by contributions from the employees and the University and by investment returns. The total annual contribution is determined by applying actuarial methods with assumptions about investment returns, mortality, inflation and salaries.

An actuarial valuation report is required to be filed at least every three years; notwithstanding this, in practice the committee commissions a report on an annual basis for its planning and the University’s budgeting purposes.

The 1 January 2017 report shows that the registered pension plan (the “Registered Plan”) is in a deficit position; however, the going concern deficit position has improved since the 1 January 2014 report both in terms of overall deficit and deficit as a percentage of total plan assets. The University continues to make additional contributions to meet the unfunded liability.

The plan has previously received approval for temporary solvency funding relief in connection with the 1 January 2014 actuarial valuation.

See Attachment #1 for a detailed summary of the actuarial valuation results for the Registered Plan. A complete copy of the report can be requested through the committee’s secretary at extension 38990.

2. Statement of Investment Policies and Procedures for University of Waterloo Pension Plan

Motion: To approve the 1 January 2017 version of the University of Waterloo Pension Plan (2011) Statement of Investment Policies and Procedures (the “SIPP”). See Attachment 2.

Background: Following its annual review to ensure compliance with legislative requirements and also soliciting in parallel input from the Finance & Investment Committee, the committee recommends approval of the revised document. The SIPP has been updated to reflect changes required/suggested by the regulator (Financial Services Commission of Ontario) in order to meet current regulations and/or best practices. All changes made in the SIPP were as a result of meeting these new regulations and best practices. Changes were also made to accommodate current objectives and governance at the University of Waterloo. No changes were made that result in a change of pension plan investment management or philosophy. A summary of the changes, as drafted by the plan’s consultant Aon Hewitt, is included as a covering document to Attachment 2.
FOR INFORMATION

3. Stage 2 Solvency Funding Relief Application

The university’s pension plan previously received Stage 1 approval for solvency funding relief as provided under Regulation 178/11 to the Pension Benefits Act and based on the filed actuarial valuation report of 1 January 2014. This Stage 2 funding relief allows the university to address the solvency deficit in the pension plan over a scheduled period of time by making additional special payments and provides an intentional approach to addressing the deficit.

At the committee’s June meeting, a motion was passed to file the application for solvency relief, and at the September meeting the committee considered whether to elect for one of two potential options for amortizing the solvency deficit: (1) to amortize the solvency deficit over ten (10) years starting 1 January 2018, or (2) to defer amortization for a three-year period from 2018-2021 with minimum interest-only payments over that period, then amortize the solvency deficit at 1 January 2021 over seven years. The committee elected to proceed with the latter solvency option, while also passing a resolution that the plan shall maintain as a minimum the additional voluntary special contribution to bring University contribution to 163% of member contributions (~$2.2 million per year in 2017) over the applicable three year deferral period.

4. General Oversight

The committee receives regular reports from the consulting actuary on legislative and policy changes anticipated and in force that impact public sector pensions, as well as changes implemented by other public sector pension plans. The committee discusses implications for the pension plan and takes the information into account when making decisions on matters including plan design, funding and administration.

As part of the general oversight function exercised by the committee, the committee has devoted attention to following issues: funded status of pension plans, including funding ratios, special payments, reserves, portion of at-risk funding within plans, and impact of market shifts on these calculations; philosophical considerations for managing the plan going forward; potential savings arising from the new pharmacare regime; university experience with disability management; benefits utilization; review of Board-approved 2017-18 operating budget; changes to going concern and solvency funding announced by the province; ongoing discussions within the sector pertaining to a jointly-sponsored pension plan; review of investment performance of pension plan investments; investment management offerings of the recently-formed Investment Management Corporation of Ontario.

Governance: The committee obtained progress updates on the work of the Responsible Investing Working Group and from the working group examining investment governance.

Holistic Benefits Review: The committee has commenced work on a plan to review the benefits offered to employees. This review would encompass plan benchmarking, potential options for plan redesign, and marketing of benefits. The exact content of the plan is still to be determined at the upcoming committee meetings, and it is anticipated that the entire process would run until 2019-20.

/mg

Marilyn Thompson
Chair
Attachment #1 - Summary of the Actuarial Valuation Results as at 1 January 2017

1. Financial Position of the Registered Plan

   a. **Going Concern Basis.** A valuation conducted on a going-concern basis is to determine the relationship between the respective values of the Registered Plan’s assets and accumulated liabilities, assuming the Registered Plan will be maintained indefinitely.

<table>
<thead>
<tr>
<th></th>
<th>01.01.2015</th>
<th>01.01.2016</th>
<th>01.01.2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actuarial value of assets</td>
<td>$1,272,144,692</td>
<td>$1,357,813,943</td>
<td>$1,473,514,888</td>
</tr>
<tr>
<td>Actuarial liability</td>
<td>$1,384,215,763</td>
<td>$1,463,929,240</td>
<td>$1,585,567,596</td>
</tr>
<tr>
<td>Funding excess (unfunded liability)</td>
<td>$(112,071,071)</td>
<td>$(106,115,297)</td>
<td>$(112,052,708)</td>
</tr>
<tr>
<td>Deferred asset gain (loss)</td>
<td>$44,365,045</td>
<td>$44,365,045</td>
<td>$44,365,045</td>
</tr>
<tr>
<td>Market value of assets</td>
<td>$1,316,509,737</td>
<td>$1,402,178,988</td>
<td>$1,517,879,933</td>
</tr>
</tbody>
</table>

   b. **Solvency Basis.** A valuation conducted on a solvency basis is used to determine the relationship between the respective values of the Registered Plan’s assets and its liabilities assuming the Registered Plan was wound up and settled on the valuation date by the purchase of annuities or the payment of lump-sum values. In accordance with the Pension Benefits Act, solvency liabilities exclude certain contractual benefits (e.g., indexing) in order to limit the magnitude of additional funding requirements for solvency purposes. Ignoring these obligations for solvency funding purposes does not, however, alter the contractual obligation with respect to indexing in place under the terms of the Registered Plan (the liability for indexation benefits is reflected in the going concern valuation position and funding requirements).

<table>
<thead>
<tr>
<th></th>
<th>01.01.2015</th>
<th>01.01.2016</th>
<th>01.01.2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solvency assets</td>
<td>$1,316,009,737</td>
<td>$1,401,678,988</td>
<td>$1,517,379,933</td>
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<tr>
<td>Solvency liability</td>
<td>$1,521,313,344</td>
<td>$1,689,999,086</td>
<td>$1,744,213,228</td>
</tr>
<tr>
<td>Present value of special payments</td>
<td></td>
<td>$69,855,540</td>
<td></td>
</tr>
<tr>
<td>Solvency excess/(deficiency)</td>
<td>$(205,303,607)</td>
<td>$(288,320,098)</td>
<td>$(156,977,755)</td>
</tr>
</tbody>
</table>

   The additional wind-up liability for indexation benefits is approximately $877.6 million at 1 January 2017, resulting in a hypothetical wind-up deficit of approximately $1,035 million at 1 January 2017 (including indexation). The solvency ratio has improved since January 1, 2016 due to increases in nominal government bond yields and asset gains during the year.

2. **Funding Requirements.** Member contributions for 2017 are approximately $31.2 million, or 7.38% of pensionable earnings. The University’s current service cost is approximately $36.0 million or 8.51% of pensionable earnings. The University is also making mandatory special payments of $12.7 million and additional special payments of $2.2 million to amortize the unfunded liability of the Registered Plan. This brings the University’s total contribution for 2017 to $50.9 million (163% of member contributions).

---

1 The 2015 numbers reflect the adoption of alternate assumptions, which use a CPI rate of 2%. Note: this moves the discount rate to 5.75% from 6.00%.
2 The 2016 figures reflect the reduction in the discount rate from 5.75% (CPI + 3.75%) to 5.70% (CPI + 3.70%)
3 The 2017 figures reflect the reduction in the discount rate from 5.70% (CPI + 3.70%) to 5.50% (CPI + 3.50%)
4 This funding reserve represents the difference between the market value of assets and the actuarial value of assets of the real return bonds at the date of sale. It will be held in reserve and recognized over time.
5 2016 Solvency Liabilities reflect the adoption of CPM 2014 Combined with Generational Improvements mortality tables
6 Solvency assets are net of $500,000 in estimated wind-up expenses.
3. Asset Mix

<table>
<thead>
<tr>
<th>Asset Mix (% of Total Market Value)</th>
<th>01.01.2014</th>
<th>01.01.2015</th>
<th>01.01.2016</th>
<th>01.01.2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real Return Bonds</td>
<td>17%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Fixed Income, Cash</td>
<td>34%</td>
<td>57%</td>
<td>54%</td>
<td>51%</td>
</tr>
<tr>
<td>Equities</td>
<td>41%</td>
<td>35%</td>
<td>38%</td>
<td>39%</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>7%</td>
</tr>
<tr>
<td>Real Estate</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

4. Membership Data

<table>
<thead>
<tr>
<th>Membership Data</th>
<th>01.01.2012</th>
<th>01.01.2013</th>
<th>01.01.2014</th>
<th>01.01.2015</th>
<th>01.01.2016</th>
<th>01.01.2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Members</td>
<td>3617</td>
<td>3760</td>
<td>3891</td>
<td>3940</td>
<td>4169</td>
<td>4326</td>
</tr>
<tr>
<td>LTD Members</td>
<td>96</td>
<td>94</td>
<td>97</td>
<td>86</td>
<td>84</td>
<td>74</td>
</tr>
<tr>
<td>Suspended Members</td>
<td>10</td>
<td>15</td>
<td>11</td>
<td>12</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Current Pensioners</td>
<td>1480</td>
<td>1555</td>
<td>1603</td>
<td>1673</td>
<td>1745</td>
<td>1837</td>
</tr>
<tr>
<td>Deferred Pensioners</td>
<td>447</td>
<td>448</td>
<td>484</td>
<td>490</td>
<td>501</td>
<td>489</td>
</tr>
<tr>
<td>Total</td>
<td>5650</td>
<td>5872</td>
<td>6086</td>
<td>6201</td>
<td>6509</td>
<td>6736</td>
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</table>

5. History of Asset Returns

<table>
<thead>
<tr>
<th>Year Ending</th>
<th>Return on Market Value</th>
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</thead>
<tbody>
<tr>
<td>31 December 2008</td>
<td>-21.51%</td>
</tr>
<tr>
<td>31 December 2009</td>
<td>14.70%</td>
</tr>
<tr>
<td>31 December 2010</td>
<td>8.49%</td>
</tr>
<tr>
<td>31 December 2011</td>
<td>2.89%</td>
</tr>
<tr>
<td>31 December 2012</td>
<td>9.10%</td>
</tr>
<tr>
<td>31 December 2013</td>
<td>13.1%</td>
</tr>
<tr>
<td>31 December 2014</td>
<td>9.43%</td>
</tr>
<tr>
<td>31 December 2015</td>
<td>5.23%</td>
</tr>
<tr>
<td>31 December 2016</td>
<td>6.95%</td>
</tr>
</tbody>
</table>

7 Asset mix is based on the underlying assets excluding in-transit contributions and payments.
8 The returns (after expenses) on market value have been calculated assuming contributions and benefit payments take place in the middle of the year. Returns for 2008 – 2013 exclude the real return bonds.
The SIPP has been updated to reflect changes required/suggested by the regulator (FSCO) in order to meet current regulations and/or best practices. All changes made in the SIPP were as a result of meeting these new regulations and best practices. Changes were also made to accommodate current objectives and governance at the University of Waterloo. No changes were made that result in a change of pension plan management or philosophy.

<table>
<thead>
<tr>
<th>New SIPP Section</th>
<th>Old SIPP Section</th>
<th>Comments</th>
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<tbody>
<tr>
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<td>Section 1</td>
<td></td>
</tr>
<tr>
<td>Section 1.02</td>
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<td>New section – regulator best practice</td>
</tr>
<tr>
<td>Section 1.03</td>
<td>n/a</td>
<td>New section – regulator requirement</td>
</tr>
<tr>
<td>Section 1.04</td>
<td>Section 1</td>
<td>Consolidation</td>
</tr>
<tr>
<td>Section 1.05</td>
<td>Section 2</td>
<td>Consolidation</td>
</tr>
<tr>
<td>Section 2.01</td>
<td>n/a</td>
<td>New section – regulator best practice</td>
</tr>
<tr>
<td>Section 2.02</td>
<td>2.02 (a) from Section 4, 2.02 (b) n/a</td>
<td>2.02 (b) regulator best practice</td>
</tr>
<tr>
<td>Section 2.03</td>
<td>Section 4</td>
<td>Updated return expectation</td>
</tr>
<tr>
<td>Section 2.04</td>
<td>Section 4</td>
<td>Consolidation</td>
</tr>
<tr>
<td>Section 2.05</td>
<td>Section 4</td>
<td>Asset mix table now more encompassing</td>
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<tr>
<td>Section 2.06</td>
<td>Section 4</td>
<td>Consolidation</td>
</tr>
<tr>
<td>Section 3.01</td>
<td>n/a</td>
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</tr>
<tr>
<td>Section 3.02</td>
<td>Section 5</td>
<td>Increased robustness of language/format</td>
</tr>
<tr>
<td>Section 3.03</td>
<td>Section 5</td>
<td>Increased robustness of language/format</td>
</tr>
<tr>
<td>Section 3.04</td>
<td>Section 5</td>
<td>Maximum in BBB rated securities changed from 10% to 15% to reflect increase in Index composition</td>
</tr>
<tr>
<td>Section 3.05</td>
<td>Section 5</td>
<td>Renumbering of ESG section – text unchanged</td>
</tr>
<tr>
<td>Section 3.06</td>
<td>n/a</td>
<td>New section – regulator best</td>
</tr>
<tr>
<td>Section 3.07</td>
<td>Section 8</td>
<td>Streamlined language</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Section 3.08</td>
<td>n/a</td>
<td>New section –regulator requirement</td>
</tr>
<tr>
<td>Section 3.09</td>
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<td>New section –regulator requirement</td>
</tr>
<tr>
<td>Section 3.10</td>
<td>Section 11</td>
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</tr>
<tr>
<td>Section 4.01</td>
<td>Section 3</td>
<td>Replaced references to RPPI with more generalized “UW”</td>
</tr>
<tr>
<td>Section 4.02</td>
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<td>Section 4.03</td>
<td>Section 12</td>
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</tr>
<tr>
<td>Section 5.01</td>
<td>Section 7</td>
<td>More robust language added</td>
</tr>
<tr>
<td>Section 5.02</td>
<td>n/a</td>
<td>New section –regulator requirement</td>
</tr>
<tr>
<td>Section 5.03</td>
<td>n/a</td>
<td>New section –regulator requirement</td>
</tr>
<tr>
<td>Section 5.04</td>
<td>n/a</td>
<td>New section –regulator requirement</td>
</tr>
<tr>
<td>Section 5.05</td>
<td>Section 13</td>
<td>Consolidation</td>
</tr>
<tr>
<td>Section 5.06</td>
<td>Section 9</td>
<td>Consolidation</td>
</tr>
<tr>
<td>Section 5.07</td>
<td>Section 10</td>
<td>Consolidation</td>
</tr>
<tr>
<td>Section 6.01</td>
<td>Section 7</td>
<td>More robust language added</td>
</tr>
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<td>Section 6.02</td>
<td>Section 14</td>
<td>Consolidation</td>
</tr>
<tr>
<td>Appendix A</td>
<td>Appendix A</td>
<td>Removed reference to RPPI</td>
</tr>
</tbody>
</table>
Statement of Investment Policies and Procedures

University of Waterloo Pension Plan (2011)

Registration number: 0310565

Effective January 1, 2017

APPROVED on this day of , 2017

________________________

on behalf of the University of Waterloo.

Replaces previous version which was last revised and effective on January 1, 2015.
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Section 1—Overview

1.01 Purpose of Statement

This Statement of Investment Policies and Procedures (the “Policy”) provides the framework for the investment of the assets for the University of Waterloo Pension Plan (2011), registration number 0310565 (the “Plan”). The University of Waterloo (“UW”) is the sponsor and legal administrator of the Plan.

This Policy is based on the “prudent person approach” to ensure the prudent investment and administration of the assets of the Plan. The Plan will be managed in accordance with the parameters set out in the *Income Tax Act* (Canada) (“ITA”) and the *Pension Benefits Act* (Ontario) (“PBA”), including their respective Regulations and all subsequent amendments, and any other applicable federal or provincial legislation and regulations governing the investment of pension funds, including Schedule III to the *Pension Benefits Standards Regulation, 1985* (Canada) (“PBSA”).

This Policy also seeks to establish ongoing communication between UW and others engaged in the administration of the Plan. It is intended to summarize and explain the investment beliefs but does not supersede the formal plan documents or the applicable provisions of the Acts governing the Plan. In case of any dispute between this document and the formal Plan documents, the formal Plan documents shall prevail.

1.02 Standard of Care

This Policy is based on the “prudent person approach” to ensure the prudent investment and administration of the assets of the Plan within the parameters set out in the PBA and the Regulations thereunder. UW shall exercise the care, diligence and skill in the administration and investment of the Plan that a person of ordinary prudence would exercise in dealing with the property of another person. Such persons must further use all knowledge and skill that they possess or ought to possess.

1.03 Objective of the Plan

The objective of the Plan is to provide members of the Plan with the retirement benefits prescribed under the terms thereof.

1.04 Administration

UW is the sponsor and legal administrator of the Plan and is therefore responsible for all matters relating to the administration, interpretation and application of the Plan.

1.05 Background of the Plan

The Plan is a contributory defined benefit plan, based upon an individual’s final average salary and years of participation in the Plan prior to retirement.

Most pensions paid under the Plan are escalated annually by the cost-of-living factor described in the Plan. For benefits accrued prior to January 1, 2014, liabilities will grow in direct relation to the
increase in the Consumer Price Index (“CPI”). For benefits accrued on or after January 1, 2014, liabilities will increase by 75% of the increase in CPI. A protocol has been developed to set out the parameters under which the Pension and Benefits Committee (“P&B Committee”), which has been set up by the Board to assist with the management of the pension plan, would increase the level of indexation beyond 75%. Notwithstanding the foregoing, if the increase in CPI in a given year exceeds 5%, then the indexation paid in that year will be determined by the P&B Committee, in its discretion, taking into account the Plan’s ability to afford such an increase.

Thus, to provide pensions at a reasonable cost, it is necessary to strive for sufficient/appropriate real investment returns on the Plan assets over medium- and long-term periods. The investment philosophy, policies and procedures adopted in this document will assist in the achievement of this goal in a prudent and effective manner.

This Policy has been developed taking into account factors such as:

a) The nature of the Plan’s liabilities;
b) The allocation of such liabilities between active and retired members;
c) The funded and solvency positions of the Plan;
d) The net cash flow position of the Plan;
e) The investment horizon of the Plan;
f) Historical and expected capital market returns; and
g) The benefits of investment diversification.
Section 2 — Asset Mix and Diversification Policy

2.01 Risk/Return Considerations

Investment objectives for the Plan have been established (a minimum return of CPI +3.5% net of expenses) with regard to the:

a) Structure and design of, and benefits provided by, the Plan;

b) Rate of return which would provide appropriate appreciation on the assets in the Plan;

c) Financial position of the Plan, as provided by actuarial valuations and projections;

d) The risk tolerance which is acceptable to UW in the Plan;

e) Demographics of the Plan membership; and

f) Special factors, if any, which UW considers significant.

2.02 Investment and Risk Philosophy

UW recognizes that, based on historical data, the asset classes most likely to produce the greatest return over time are also likely to exhibit the most volatility. Conversely, the asset classes likely to be the least volatile are likely to produce the lowest returns over time. Therefore, the investment philosophies and strategies must take into account both return and risk objectives.

a) Investment Philosophy

Active equity fund managers are to apply the long-term value approach by investing in companies at prices below their underlying long-term values to protect capital from loss and earn income over time. The fund managers will attempt to identify financially-sound companies with good potential profitability which are selling at a discount to their intrinsic value. Appropriate measures of low prices may consist of: low price-earnings, high dividend yields, significant discounts to book value and low price to free cash flow. Downside protection is obtained by seeking a margin of safety in terms of sound financial position and a low price in relation to intrinsic value. Appropriate measures of financial integrity include debt/equity ratios, financial leverage, asset turnover, profit margin, return on equity, and interest coverage. It is anticipated that purchases will be made when economic and issue-specific conditions are less than ideal and sentiment is uncertain or negative. Conversely, it is expected that gains will be realized when issue-specific factors are positive and sentiment is buoyant. Assets of the Fund are administered and managed on a combined basis through specialist portfolios. Fund managers will be expected to generate a rate of return in the first quartile or better over a market cycle.

b) Risk Philosophy

In order to achieve their long-term investment goals, the Plan must invest in assets that have uncertain returns. However, UW attempts to reduce the overall level of risk by diversifying the asset classes and further diversifying within each individual asset class.
## 2.03 Portfolio Return Expectations

The annualized rate of return of the Plan must exceed the annualized rate of increase in the CPI by at least 350 basis points net of the associated investment management fees over rolling ten-year period.

## 2.04 Expected Volatility

The volatility of the assets of the Plan is directly related to its asset mix. Since the fund managers do not have authority to make any type of leveraged investment on behalf of the Plan, the volatility of the assets of the Plan should be similar to the volatility of the Benchmark Portfolio set out in section 4.02 (Performance Measurement).

## 2.05 Asset Mix

The following benchmark portfolio is used by the Consulting Actuary to calculate the return assumptions for the Plan. At all times, the market value of the individual asset classes will be within the minimum and maximum aggregate investment limits as listed.

<table>
<thead>
<tr>
<th>Assets</th>
<th>Minimum %</th>
<th>Maximum %</th>
<th>Benchmark Portfolio %</th>
<th>Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>0.0</td>
<td>15.0</td>
<td>2.0</td>
<td>FTSE TMX Canada 91-Day T-Bill</td>
</tr>
<tr>
<td>Fixed Income</td>
<td>30.0</td>
<td>70.0</td>
<td>33.0</td>
<td>FTSE TMX Universe Bond</td>
</tr>
<tr>
<td>Total Fixed Income</td>
<td>30.0</td>
<td>70.0</td>
<td>35.0</td>
<td></td>
</tr>
<tr>
<td>Canadian Equity</td>
<td></td>
<td></td>
<td>15.0</td>
<td>S&amp;P/TSX Composite</td>
</tr>
<tr>
<td>Global Equity</td>
<td></td>
<td></td>
<td>40.0</td>
<td>MSCI World (CAD)</td>
</tr>
<tr>
<td>Total Equity</td>
<td>30.0</td>
<td>70.0</td>
<td>55.0</td>
<td></td>
</tr>
<tr>
<td>Infrastructure</td>
<td></td>
<td></td>
<td>5.0</td>
<td>UBS 50/50 (CAD)</td>
</tr>
<tr>
<td>Real Estate</td>
<td></td>
<td></td>
<td>5.0</td>
<td>FTSE EPRA/NAREIT Developed (CAD)</td>
</tr>
<tr>
<td>Total Alternatives</td>
<td>0.0</td>
<td>20.0</td>
<td>10.0</td>
<td></td>
</tr>
</tbody>
</table>

For the purpose of the total asset mix described above, the fund managers’ asset class pooled funds are deemed to be 100% invested, even though these funds may contain a portion held in cash and cash equivalent instruments.

The asset mix may deviate from the above mix, within the limits prescribed in the Policy. The monitoring of the asset mix and rebalancing guidelines are set out in Section 5.02 (Monitoring of Asset Mix). In order to ensure that the assets operate within the minimum and maximum ranges, UW shall review the asset mix on a quarterly basis. Rebalancing will be conducted as required.
2.06 Management Structure

A diversified management structure has been adopted for the Plan consisting of several managers. This structure has been adopted as it is believed that the different investment mandates will result in increased diversification, while reducing the 'manager risk' effect for the Plan.

The investment management structure employs a mix of active and passive management styles. Active management has been adopted for portions of the assets as it provides the opportunity to outperform common market indices over the long-term, while controlling active risk levels. Passive management has been adopted for portions of the assets as it minimizes the risk of underperformance relative to a benchmark index and is generally less expensive than active management.
Section 3 — Permitted and Prohibited Investments

3.01 General Guidelines

The investments of the Plan must comply with the requirements and restrictions imposed by the applicable legislation, including but not limited to the requirements of the ITA, the PBA and their respective Regulations, any other applicable federal or provincial legislation and regulations governing the investment of pension funds, including Schedule III to the PBSA and this Policy.

3.02 Permitted Investments

In general, and subject to the restrictions in this section (Section 3), the investment manager may invest in any of the following asset classes and in any of the investment instruments listed.

a) Total Plan Level
   i. UW shall not, directly or indirectly, lend or invest moneys of the Plan to or in any one person, any associated persons or any affiliated persons if:
      - 10% or more of the total market value of the Plan’s assets has already been lent or invested in total to, or in, the person, the associated persons or the affiliated corporations; or
      - 10% or more of the total market value of the Plan’s assets would be lent or invested in total to, or in, the person, the associated persons or the affiliated corporations as a result of the loan or investment.
   ii. UW shall not, directly or indirectly, invest the moneys of the Plan in the securities of a corporation to which are attached more than 30% of the votes that may be cast to elect the directors of the corporation.

b) Cash and Short Term Investments

   Cash on hand, demand deposits, treasury bills, short-term notes and bankers’ acceptances, commercial paper, term deposits and guaranteed investment certificates having a term of less than or equal to one year.

c) Fixed Income

   Bonds, debentures, or other debt instruments of corporations, Canadian Governments, Government agencies, or guaranteed by Governments, supranationals, federal real return bonds, mortgage-backed securities, mortgages, asset-backed securities, non-convertible preferred shares, term deposits, guaranteed investment certificates, insurance contracts, private placements and bonds where capital, interest or both are linked to increases in the cost-of-living (i.e. real return bonds).

d) Equities

   Common shares, preferred shares, American Depository Receipts, Foreign Depository Receipts, rights, warrants, installment receipts, index units, income trust units (including real estate investment trusts) and securities convertible into common shares.
e) Derivatives

The pooled funds in which the Plan invests may invest directly in derivatives to create synthetic exposures, or for hedging purposes, if their objectives and strategies permit, and if the exposure to derivatives is subject to limits based on the intended use and strategies for derivatives and the risks associated with them. Derivatives may also be used to hedge currency. Derivatives may not be used for speculative trading or to create a portfolio with leverage. Investment funds that invest in derivatives must comply with all applicable statutory provisions and regulations, including the Prudent Person Rule and must be invested and managed in accordance with regulatory derivatives best practices.

f) Pooled Funds

Investments in open-ended or closed-ended pooled funds provided that the assets of such funds are permissible investments under this Policy. While the guidelines in this Policy are intended to guide the management of the assets, it is recognized that, where pooled funds are held, there may be instances where there is a conflict between this policy and the investment policy of a pooled fund. In that case, the pooled fund policy shall dominate, subject to the compliance reporting procedures outlined in Section 4.03. However, the investment manager is expected to advise UW in the event of any material discrepancies between the above guidelines and the pooled fund’s own investment guidelines. In addition, the investment manager will ensure that UW has received a copy of the most recent version of the pooled fund policy and of any amendments made to the pooled fund policy.

3.03 Minimum Quality Requirements

a) Quality Standards

Within the investment restrictions for individual portfolios, all portfolios should hold a prudently diversified exposure to the intended market.

i. The minimum quality standard for individual bonds and debentures is ‘BBB’ or equivalent as rated by at least two Recognized Bond Rating Agencies, at the time of purchase. Where an investment in the portfolio is downgraded below a ‘BBB’ rating, the following steps will be taken:

- The investment manager will notify UW of the downgrade by telephone at the earliest possible opportunity;

- Within ten business days of the downgrade, the investment manager will advise UW in writing of the course of action taken or to be taken by the investment manager, and its rationale; and

- Immediately upon downgrade, the investment manager will place the asset on a Watch List subject to monthly review by the investment manager with UW until such time as the security matures, is sold or until it is upgraded to a level consistent with the purchase quality standards as expressed in the guidelines mentioned above.

ii. In cases in which the Recognized Bond Agencies to do not agree on the credit rating, the bond will be classified according to the methodology used by FTSE TMX, which states:

- If two agencies rate a security, use the lower of the two ratings;

- If three agencies rate a security, use the most common; or
- If all three disagree, use the middle rating.

b) Rating Agencies

For the purposes of this Policy, the following rating agencies shall be considered to be ‘Recognized Bond Rating Agencies:’

i. Dominion Bond Rating Agency;
ii. Standard and Poor’s; and
iii. Moody’s Investors Services.

3.04 Maximum Quantity Restrictions

a) Total Plan Level

No one holding shall represent more than 10% of the market value of the Plan’s assets.

b) Fixed Income

i. Maximum 15% of the market value of the Canadian fixed income securities shall be invested in BBB bonds or debentures

ii. Maximum 10% of the actively managed fixed income portfolio may be invested in debt denominated US currency, including debt issued by the US Government, its agencies and instrumentalities. No other foreign currency debt will be purchased.

c) Equities

No one equity holding shall represent more than 10% of the total market value of the manager’s portfolio.

3.05 Environmental, Social and Governance (‘ESG’) Factors

Consistent with its obligation to act in the best interest of the Plan, UW chooses investments and fund managers that it believes will deliver superior financial performance over the longer term. In this regard, UW does not consider ESG factors in choosing fund managers with whom it invests the assets of the Plan. UW recognizes, however, that some fund managers may consider ESG factors as a way of determining which investments will have the best economic outcome, but this is not a factor considered by UW when choosing fund managers nor are the Fund Managers instructed to consider the policies and practices of the various investments relating to ESG factors. In order to protect and enhance the value of the Plan’s investments, when choosing fund managers, UW considers criteria that include the fund managers’ business, staff, historical performance, and investment process. For the purposes of this section, ESG factors refer to the environmental, social and governance factors relevant to an investment that may have a financial impact on that investment.

3.06 Prior Notice Required

The fund managers shall not make investments in asset categories other than those explicitly permitted in the Policy, unless UW first consents in writing. Each fund manager’s portfolio shall also comply with all requirements and constraints in any supplementary document provided by UW.
3.07 **Securities and Cash Lending**

The fund managers and custodian may participate in securities lending programs for the purpose of generating revenue, subject to the provisions of the PBA, the ITA and their applicable Regulations, as applicable.

Such loans must be secured by cash and/or readily marketable government bonds, treasury bills and/or letters of credit, discount notes, banker’s acceptances of Canadian chartered banks or high quality, liquid equities. The amount of collateral taken for securities lending should reflect OSFI standards and best practices in local markets. This market value relationship must be calculated at least daily.

Fund managers and custodian participating in securities lending will make available the terms and conditions of any securities lending program(s) with UW.

3.08 **Short Selling**

Short selling and/or pair trading are not permitted.

3.09 **Liquidity**

Investments should be liquid enough so that they can be sold in a reasonable period of time. The investments should be valued at least monthly and selected to ensure sufficient liquidity to meet transaction needs.

3.10 **Borrowing**

The Plan shall not borrow money, except to cover short-term contingency and the borrowing is for a period that does not exceed ninety days, subject to the PBA, the ITA and the written permission of UW.
4.01 Delegation of Responsibility

The Board of Governors of the University of Waterloo (the “Board”) has established a Finance and Investment Committee (“F&I Committee”) to assist in the determination of UW’s overall investment philosophy, policies, objectives and strategies, and a P&B Committee to assist in the management of the pension fund. UW assists in carrying out the responsibilities listed below.

a) UW will:
   i. review this document annually;
   ii. review pension fund performance on at least a semi-annual basis;
   iii. review Fund Manager performance on at least a semi-annual basis; and
   iv. report to P&B Committee.

b) UW will make recommendations to P&B Committee and F&I Committee on:
   i. the content of this document;
   ii. the selection of Fund Managers; and
   iii. the purchase of specific investments.

c) Working with the F&I Committee with respect to investment philosophy, policies, objectives and strategies and taking into consideration the recommendations of UW, the P&B Committee will make recommendations to the Board in the following areas:
   i. the content of this document after its annual review;
   ii. the selection of a Consulting Actuary;
   iii. the selection of Fund Managers; and
   iv. the selection of a Custodian/Trustee to hold the pension fund assets.

d) In addition, the P&B Committee will:
   i. review this document annually, taking into consideration any recommended changes from UW and F&I Committee;
   ii. consider reports from UW on pension fund performance on at least a semi-annual basis;
   iii. consider reports from UW on Fund Manager performance on at least a semi-annual basis;
   iv. provide cash flow information to the Fund Managers, if necessary;
   v. be responsible for the delegation of any responsibilities not specifically mentioned;
   vi. report to Plan members on at least an annual basis; and
   vii. review and approve the purchase of specific investments.

e) The Fund Managers will:
   i. forward to UW quarterly reviews of investment performance, expectations of future returns on various asset classes and proposed investment strategies for the following 12 to 24 months;
ii. upon direction of the P&B Committee, invest in passive asset classes such as indexed bond funds, indexed equity funds, real-return bonds, etc.;

iii. manage asset mix and select securities within each asset class, subject to applicable legislation and the philosophy and other constraints set out in this document;

iv. advise the P&B Committee immediately of any changes in its senior investment personnel and/or significant changes in the size or mix of assets managed;

v. comply with all relevant laws concerning the investment of the pension fund; and

vi. complete and deliver a compliance report (see page 10) to the P&B Committee and the Fund’s Consulting Actuary each quarter. The compliance report will indicate whether or not the Fund Manager was in compliance with this Statement during the quarter. In the event that the Fund Manager is not in compliance with this Statement, the Fund Manager is required to advise the P&B Committee immediately, detail the nature of the non-compliance and recommend the appropriate course of action to remedy the situation.

vii. comply, at all times and in all respects, with the Code of Ethics and Standards of Professional Conduct as promulgated by the CFA Institute.

viii. manage the assets with the care, diligence and skill that an investment manager of ordinary prudence would use in dealing with pension plan assets.

ix. use all relevant knowledge and skill that they possess or ought to possess as a prudent investment manager.

f) The Consulting Actuary (or his/her delegate approved by P&B Committee and UW) will:

i. assist in the preparation and subsequent annual reviews of this document;

ii. participate in all reviews of the Fund Managers and the Plan;

iii. report, at least semi-annually, on the performance of the Fund Managers and the Plan;

iv. comment on any changes in the Plan’s benefits, membership or contribution flow which may affect how the Plan’s assets are invested;

v. comment on the impact of potential investment opportunities/strategies/legislative changes which may affect how the Plan’s assets are invested;

vi. assist in the implementation of this Statement;

vii. monitor the performance of the Plan and the Fund Managers on a regular basis, and contact the chair of the P&B Committee immediately if there are adverse changes of any kind, which warrant further review and/or investigation;

viii. support UW and the P&B Committee on matters related to investment management and administration of the Plan; and

ix. meet with UW and the P&B Committee as required.

g) The Custodian/Trustee will:

i. fulfill the regular duties required by law of a Custodian/Trustee and perform the specific duties required of the Custodian/Trustee pursuant to agreements entered into from time to time with UW; and
ii. provide UW with monthly portfolio printouts of all assets of the Plan and transactions during the period.

4.02 Performance Measurement

For purposes of evaluating the performance of the Plan and the fund managers, all rates of returns are measured over rolling four-year periods. Return objectives are net of fees and include realized and unrealized capital gains or losses plus income from all sources.

(a) Total Fund

Investment weightings and results for the Plan are to be tested regularly against a long-term Benchmark Portfolio comprising:

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTSE TMX Canada 91-Day T-Bill</td>
<td>2.0</td>
</tr>
<tr>
<td>FTSE TMX Universe Bond</td>
<td>33.0</td>
</tr>
<tr>
<td>S&amp;P/TSX Composite</td>
<td>15.0</td>
</tr>
<tr>
<td>MSCI World (CAD)</td>
<td>40.0</td>
</tr>
<tr>
<td>UBS 50/50 (CAD)</td>
<td>5.0</td>
</tr>
<tr>
<td>FTSE EPRA/NAREIT Developed (CAD)</td>
<td>5.0</td>
</tr>
</tbody>
</table>

(b) Investment Manager Mandates

Fund managers are subject to the following objectives on a gross of fees basis and over rolling four year periods:

<table>
<thead>
<tr>
<th>Investment Manager and Mandate</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDAM Universe Bond Index</td>
<td>Tracking error within +/- 6 basis points of index return</td>
</tr>
<tr>
<td>TDAM Short Term Corporate Bond</td>
<td>Index + 50 basis points</td>
</tr>
<tr>
<td>TDAM Emerald US Equity Index</td>
<td>Tracking error within +/- 8 basis points of index return</td>
</tr>
<tr>
<td>TDAM Emerald International Equity Index</td>
<td>Tracking error within +/- 20 basis points of index return</td>
</tr>
<tr>
<td>Sionna Canadian Equity</td>
<td>Index + 100 basis points</td>
</tr>
<tr>
<td>Oldfield Global Equity</td>
<td>Index + 200 basis points</td>
</tr>
<tr>
<td>Trilogy Global Equity</td>
<td>Index + 200 basis points</td>
</tr>
<tr>
<td>Walter Scott Global Equity</td>
<td>Index + 200 basis points</td>
</tr>
</tbody>
</table>

(c) Qualitative Monitoring

In addition to performance criteria, the following qualitative factors will also be monitored and evaluated:

i. Stability of the investment firm (personnel, assets under administration, operational capabilities, etc.);

ii. Investment objective and portfolio composition;
iii. Changes in the investment philosophy used in the investment fund;
iv. Consistency of style or approach; and
v. Adherence to investment policy statement.

4.03 Compliance Reporting by Investment Manager

The investment manager is required to complete and deliver a compliance report to UW and the
Plan's investment consultant each quarter. The compliance report will indicate whether or not the
investment manager was in compliance with this Policy during the quarter.

In the event that an investment manager is not in compliance with this Policy, the investment
manager is required to advise UW immediately, detail the nature of the non-compliance and
recommend an appropriate course of action to remedy the situation.

The Plan invests in pooled funds with separate investment policies. Should a conflict arise between
those investment policies and this Policy, the investment manager's pooled fund policy shall
dominate. However, the investment manager is required to advise UW immediately, detail the
nature of the conflict and recommend an appropriate course of action to remedy the situation.

4.04 Audit

At such time as an audit is required by the regulatory authorities, the Plan shall be audited annually
as at the fiscal year of the Plan, by external auditors appointed by UW.
Section 5 — Administration

5.01 Conflicts of Interest

a) Responsibilities

This standard, which is consistent with UW Policy 69 (Conflict of Interest) applies to UW and the members of UW, as well as to all agents employed by them, in the execution of their responsibilities under the PBA (the “Affected Persons”).

An “agent” is defined to mean a company, organization, association or individual, as well as its employees who are retained by UW to provide specific services with respect to the investment, administration and management of the assets of the Plan.

b) Disclosure

In the execution of their duties, the Affected Persons shall disclose any material conflict of interest relating to them, or any material ownership of securities, which could impair their ability to render unbiased advice, or to make unbiased decisions, affecting the administration of the Plan assets.

Further, it is expected that no Affected Person shall make any personal financial gain (direct or indirect) because of his or her fiduciary position. However, normal and reasonable fees and expenses incurred in the discharge of their responsibilities are permitted if documented and approved by UW.

No Affected Person shall accept a gift or gratuity or other personal favour, other than one of nominal value, from a person with whom they deal with in the course of performance of his or her duties and responsibilities for the Plan.

It is incumbent on any Affected Person who believes that he or she may have a conflict of interest, or who is aware of any conflict of interest, to disclose full details of the situation to the attention of UW immediately. UW, in turn, will decide what action is appropriate under the circumstances but, at a minimum, will table the matter at the next regular meeting of the P&B Committee.

No Affected Person who has or is required to make a disclosure as contemplated in this Policy shall participate in any discussion, decision or vote relating to any proposed investment or transaction in respect of which he or she has made or is required to make disclosure.

5.02 Monitoring of Asset Mix

In order to ensure that the assets of the Plan operate within the minimum and maximum ranges, as prescribed in the Policy in Section 2.05 (Asset Mix), UW shall review the asset mix at least quarterly. Rebalancing will be conducted as required.

5.03 Selecting Fund Managers

In the event that a new investment manager must be selected or additional investment manager(s) added, UW will undertake an investment manager search. The criteria used for selecting an Investment Manager will be consistent with the investment and risk philosophy set out in Section 2.02 (Investment and Risk Philosophy).
5.04 Monitoring Manager Performance

At least quarterly, the P&B Committee and UW will monitor and review:

a) Each investment manager’s staff turnover, consistency of style and record of service;

b) Each investment manager’s current economic outlook and investment strategies;

c) Each investment manager’s compliance with this Policy; and

d) Investment performance of the assets of the Plan in relation to the rate of return expectations outlined in this Policy.

5.05 Dismissal of an Investment Manager

Reasons for considering the termination of the services of an investment manager include, but are not limited to, the following factors:

a) Performance results which are below the stated performance benchmarks;

b) Changes in the overall structure of the Plan’s assets such that the investment manager’s services are no longer required;

c) Change in personnel, firm structure or investment philosophy which might adversely affect the potential return and/or risk level of the portfolio; and/or

d) Failure to adhere to this Policy.

The failure to achieve the goals stated in Section 4.02 (Performance Measurement) over a period of four consecutive years will require a reassessment of such goals and/or the appointment of an alternative investment manager.

5.06 Voting Rights

The voting rights acquired through the investments held by the Plan are delegated to the fund managers of the securities. Fund managers are expected to exercise all voting rights related to investments held by the Plan in the interests of the Plan’s members.

5.07 Valuation of Investments Not Regularly Traded

The following principles will apply for the valuation of investments that are not traded regularly:

a) Equities

Average of bid-and-ask prices from two major investment dealers, at least once every month.

b) Fixed Income

Same as for equities.
Section 6 — General Provisions

6.01 Related Party Transactions

UW, on behalf of the Plan, may not enter into a transaction with a related party unless:

a) The transaction is made for the operation or administration of the Plan under terms and conditions that are not less favourable to the Plan than market terms and conditions and such transaction does not involve the making of loans to, or investments in, the related party; or

b) The combined value of all transactions with the same related party is nominal or the transaction(s) is immaterial to the Plan.

For the purposes of this section, only the market value of the combined assets of the Plan shall be used as the criteria to determine whether a transaction is nominal or immaterial to the Plan. Transactions less than 0.5% of the combined market value of the assets of the Plan are considered nominal.

In addition, the prohibition to entering into transactions with a related party does not apply to investments:

a) In an investment fund in which investors other than the Administrator and its affiliates may invest and that complies with the requirements set out in Sections 9 and 11 of Schedule III to the PBSA;

b) In an unallocated general fund of a person authorized to carry on a life insurance business in Canada;

c) In securities issued or fully guaranteed by the Government of Canada, the government of a province, or an agency of either one of them;

d) In a fund composed of mortgage-backed securities that are fully guaranteed by the Government of Canada, the government of a province, or an agency of either one of them;

e) In a fund that replicates the composition of a widely recognized index of a broad class of securities traded at a marketplace (as that term is defined in the PBSA); and

f) That involve the purchase of a contract or agreement in respect of which the return is based on performance of a widely recognized index of a broad class of securities traded at a marketplace (as that term is defined in the PBSA).

A “related party” in respect of the Plan means:

a) A person who is the administrator of the Plan including any officer, director or employee of the administrator. It also includes the Managers and their employees, a union representing employees of the employer, a member of the Plan, a spouse or child of the persons named previously, or a corporation that is directly or indirectly controlled by the persons named previously, among others. Related party does not include government or a government agency, or a bank, trust company or other financial institution that holds the assets of the Plan, where that person is not the administrator of the Plan;

b) An officer, director or employee of one of the administrators of the Plan;

c) A person responsible for holding or investing the assets of the Plan, or any officer, director or employee thereof;

d) An association or union representing employees of UW, or an officer or employee thereof;
e) A member of the Plan;

f) The spouse or child of any person referred to in any of paragraphs (a) to (e);

g) An affiliate of UW;

h) A corporation that is directly or indirectly controlled by a person referred to in any of paragraphs (a) to (g); and/or

i) An entity in which a person referred to in paragraph (a) or (b), or the spouse or a child of such a person, has a substantial investment.

6.02 Policy Review

The P&B Committee shall review and either confirm or amend this Policy at least annually. The P&B Committee will also provide any amended copy of this Policy to the investment manager and the Plan’s actuary.
Appendix A — Investment Manager Compliance Letter

To be completed by fund managers immediately prior to each quarterly review.

UNIVERSITY OF WATERLOO
____________________, 201_

This is to certify that I/we have adhered to the guidelines contained in the January 2017 version of the “Statement of Investment Policies and Procedures” for the University of Waterloo Pension Plan (2011), approved by the Board of Governors of the University of Waterloo.

Signed _________________________

On behalf of _____________________

Date ___________________________