



Ministry of Training, Colleges and Universities

Institutional Vision, Proposed Mandate Statement and Priority Objectives

A submission to begin the process of developing strategic mandate agreements (SMAs):

To:

The Ministry of Training, Colleges and Universities

From:

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Part 1: University of Waterloo - Proposed Mandate Statement

PART 1: MANDATE STATEMENT

Established to develop the talent and knowledge needed to drive economic and societal change, the University of Waterloo is a research-intensive post-secondary institution firmly centred on cultivating innovation through research across all disciplines. Waterloo's mandate is best expressed by its President, Feridun Hamdullahpur:

"Waterloo is the birthplace of a revolution. Since 1957, we've done education differently, harnessing the power of academia to meet the needs of society and build a better tomorrow. Connected with the world beyond university walls and inspired by the entrepreneurs and visionaries who support this institution, University of Waterloo students develop the confidence and competence to take risks and lead change. Our students and researchers shape the future of this planet by crossing boundaries, engaging challenges of global scope and relevance, and applying new knowledge in the pursuit of progress. Ideas start at Waterloo and those ideas change the world."

As Canada's innovation leader, Waterloo has embraced differentiation, offering our students a unique form of experience-based education. Waterloo pioneered co-operative education, believing it is a vital part of higher learning. In the past six years, this institution has created the Accelerator Centre, and the VeloCity and VeloCity Garage programs to support budding entrepreneurs as they launch new ventures. This has been a year of milestones for Waterloo. In April, Waterloo opened the new School of Public Health and Health Systems, where research is improving the lives of millions of people around the world. In September, the doors opened to the new Mike & Ophelia Lazaridis Quantum-Nano Centre, the heart of Ontario's evolving Quantum Valley. Before the year ends, a grand opening will be held for a new Digital Media campus in Stratford, and ground will be broken for the new University of Waterloo-Schlegel Research Institute for Aging, a unique living laboratory where students researching health and aging will work directly with residents of a long-term care facility on Waterloo's north campus.

Waterloo students, faculty and alumni will continue to drive change through discovery research and its application to address known and not yet imagined problems. This university differentiates itself from its peers in Ontario and across North America, in preparing generations of highly qualified and skilled graduates ready to lead the workforce and act as agents of change, fuelling innovation, prosperity and job creation here and around the globe.

Waterloo's contributions to the Ontario sector are evidenced through its pioneering work as the world's largest post-secondary co-operative education program where students earned approximately \$189 million in 2011/2012. Open Text, Desire2Learn, Certicom, Dalsa, Research in Motion, Aeryon Labs, Maplesoft, and Miovision Technologies are among leading Canadian employers that trace their roots to the University of Waterloo. Waterloo drives social innovation, through initiatives like the Canadian Index of Wellbeing, the Waterloo Institute for Social Innovation and Resilience, and research that has changed tobacco policy and food labelling in Canada and around the world.

PART 2: VISION STATEMENT

The University of Waterloo's vision is charted in the University of Waterloo Act: "The objects of the University are the pursuit of learning through scholarship, teaching and research within a spirit of free enquiry and expression."

We continue to embrace and imbue innovation in everything we do — from how we teach, to how we conduct research and how we build relationships — all with a goal to create a league of learners who will lead, support and implement innovations to advance all areas of the human condition. This aspiring vision deserves a suitable milestone: **in the next decade, Waterloo will be the first Canadian comprehensive university, without a medical or consolidated business school, to be ranked as a Top 100 post-secondary institution in the world.**

PART 3: PRIORITY OBJECTIVES

PRIORITY 1: RESEARCH ENABLED LEARNING

The University of Waterloo is first and foremost a research university. For five consecutive years, Waterloo has been Canada's top ranked comprehensive research university, according to Research Infosource. Students come to Waterloo from all over the world to learn from faculty whose teaching is inspired by their cutting edge, up-to-the-moment, research-enabled knowledge. University of Waterloo research underpins student learning and fuels innovation and discovery on the part of both faculty and student. Through a range of research that crosses all disciplines, Waterloo faculty integrate innovation and discovery in both traditional and alternative learning modalities. Novel research that pioneers discovery with engineering's emerging technologies has resulted in fostering "full-spectrum" innovation — from technology through policy advances.

Students come to Waterloo to learn how to lead, in a unique university culture that encourages risk-taking, discovery, real-world experience and drive. Recognizing that new knowledge cannot grow in isolation, Waterloo offers programs that span disciplines and faculties, and has developed innovative new programs through extensive partnerships and collaborations with a diverse range of industry, academia, and government. Waterloo will build on this experience to scale up its innovation leadership, enabling even greater entrepreneurship and breakthrough research by students, faculty and alumni. In the next decade, the university is committed to building a better future for Canada and the world by championing innovation and collaboration to create solutions relevant to the needs of today and tomorrow. To achieve these goals, the University of Waterloo will drive three key research enabled learning activities:

Action 1: Expand Graduate Program Offerings and Enrolment

As home to more than 35 senate-approved centres and institutes and 60 Canada Research Chairs, Waterloo's global research success continues to soar. As Ontario, along with the rest of the world, faces complex social, cultural, political and environmental issues, Waterloo research in these areas must keep pace. Students willing and ready to engage with cutting edge technology will continue to succeed in the workforce five, 10, and even 20 years in the future.

Waterloo has the wherewithal to accomplish needed expansion of graduate student experiences in traditional and non-traditional research arenas. The university is committed to improving its undergraduate to graduate ratio, recognizing this is directly related to productivity and

prosperity. In less than a decade, graduate enrolment at Waterloo has more than doubled; new graduate programs have been introduced at an average of five per year, and there are six online masters programs, with another six in development. Students from around the world want to come to Ontario to study and prepare for the future.

Expansion of graduate program offerings and enrolment at Waterloo will focus on three priority areas: online graduate programs, interdisciplinary graduate programs and building a more integrated English as a Second Language (ESL) programs for graduate students. Appropriate resources are required to support this expansion. From a policy perspective, revisions to the tuition framework and policies regarding international students are needed to support these efforts. In particular, a reduction of the international student levy and allowing high performing international students to be eligible for competitive scholarships will provide greater opportunity for qualified international students who want to study in Canada. In a global economy, domestic students benefit from studying and working alongside students from around the world.

Action 2: Accelerate Opportunities for Research Work Terms

Through its world-leading co-operative education program and growing experiential approaches, Waterloo plans to accelerate student opportunities for hands-on research experience. In research work terms (“R-terms”), students will work hand-in-hand with industry, business, government, non-governmental agencies, and other academics to integrate discovery into new processes, policies, products and opportunities for further exploration. The benefits of co-operative education are wide-ranging — employers receive a vital infusion of new ideas and energy, students test their knowledge and challenge conventions in a real world setting, and the experiential learning is brought back to the classroom, where it can benefit faculty and fellow students. By expanding its network of employers and academic partners, Waterloo will deliver new research opportunities for undergraduates in common and uncommon discovery environments.

Action 3: Address Faculty Life Cycle to Well Balance Productivity and Creativity

Faculty balance research, teaching and service in a dynamic and career long “life cycle.” Enhancing the productivity and creativity of faculty is critical to meet Waterloo’s aspirations for tightly linking research with learning. Efforts to understand and eventually optimize the faculty life cycle will take place within and across the full spectrum of faculty activities – research, teaching and service. The goal of this activity is to ensure that institutional policies and procedures are flexible across disciplines, reflective of the nature and demands of the various stages of the academic career, support the institution’s commitment to diversity and are set within a context of enhancing productivity and creativity in the quest for research excellence.

To support this action, a comprehensive review of policies and practices will be undertaken, with a schedule for continual review and revision put in place. These efforts will be led by the faculty and resourced by the administration. Consultations with Waterloo’s university peers and organizations such as HEQCO will be conducted to develop comprehensive productivity measures that embody the full faculty life cycle. Faculty and students — as well as their respective families and associates — will benefit from a greater understanding of the complex social impact of how best to foster productivity and creativity in a demanding modern world.

PRIORITY 2: INNOVATION ENABLED LEARNING

Developing and harnessing the creative talents of people, and creating a network of support and opportunity that will help move new discoveries quickly to market, are key to Ontario's future prosperity. To accomplish this, a new model for higher education is urgently needed. Although new models have begun to emerge in some areas of the world, there is room for Ontario and Canada to step up and lead the way.

The University of Waterloo is perfectly positioned to develop the transformative model of higher education for Canada and the world, leveraging its culture of entrepreneurship, ties to the private sector, and track record of attracting students who embrace risk and new ideas, along with more than 55 years of success in experiential learning. Hundreds of start-ups, employing thousands of Canadians trace their roots to Waterloo, and stand testament to this university's ability to inspire entrepreneurial thinking and the ambition needed to drive economic and societal change.

Innovation is not just about products that can be sold, but about ideas that make a difference. For 20 years in a row, *Maclean's* magazine has confirmed Waterloo's reputation as Canada's most innovative university. *Maclean's* has named Waterloo both Canada's top university and the most likely to produce the leaders of tomorrow more often than any other institution in the country.

Waterloo's emerging model is strategically focused on the development of the leaders and entrepreneurs of tomorrow, and on a more efficient and effective discovery to market (D2M) system. This will focus not just on developing commercial products, but on social innovations and impactful scientific research. Work is already underway to develop and pilot this model, which will cluster and connect interdisciplinary scientific and technical talent and business expertise, support, services and resources. This will help build a workforce comprised of people with scientific and technical knowledge and skills and the collective capacity to think and act entrepreneurially, who are able to solve complex problems, think critically, and be collaborative, insightful and creative.

To develop this transformative higher education model Waterloo will develop an investigative process that focuses on learning outcomes and student development. This data will lead to innovations that help make learning deeper and more effective through an interdisciplinary, experiential, team- and project-based approach.

Waterloo has been working on developing and piloting this model for some time. In 2006, Waterloo partnered with the federal and provincial governments to create the Accelerator Centre, an incubator for start-up companies on the cusp of commercialization. By the end of 2012, 25 companies will have been fully formed, and more than 84 companies incubated with \$72M in external funding. These companies have generated \$43M in revenue and created over 600 jobs. In 2008, Waterloo undertook another bold experiment, piloting VeloCity, a new residential experience. VeloCity is a living and learning community that provides a unique opportunity for Waterloo students to be immersed in an innovative and entrepreneurial environment on campus. Students have access to the latest technologies and learn from an expert network of mentors and entrepreneurs. In 2010, Waterloo launched the VeloCity Garage to provide students and alumni with access to the ingredients needed for a successful startup: free space, mentoring, and a place to cultivate their concepts and their confidence. In less than four years VeloCity/VeloCity

Garage pilot has supported more than 180 projects, including 34 companies that have generated more than 200 jobs and attracted more than \$30M in venture capital.

In further support of innovation-enabled learning, Waterloo has introduced undergraduate courses and a graduate degree program in entrepreneurship through its Conrad Centre for Business, Entrepreneurship and Technology. Waterloo's newest launch is Research Entrepreneurs Accelerating Prosperity (REAP), a Faculty of Arts-led program that brings academic and private-sector partners together to explore new technologies — specifically those involving interactivity, responsiveness and digital display environments — to spark research entrepreneurship. In a society that urgently needs new and creative solutions, and where there is a heightened expectation for greater return on investment from university research, Waterloo knows how this new innovation-enabled learning model needs to work and is ready to aggressively scale-up its activities.

Action 1: Develop Additional Pilots

The primary entrepreneurial activities associated with VeloCity, VeloCity Garage and REAP have been based in IT, and digital and social media. Using experience gained through those activities, Waterloo will expand the VeloCity and VeloCity Garage concept — living, learning, discovery, inventing — in up to three new social and scientific areas identified through consultations with students, faculty, staff, alumni and other partners. Waterloo will realign housing resources and discovery space to support the pilots. This will form a strong foundation for the second activity in a transformative Discovery to Market model: **developing and building an Innovation Village.**

Action 2: Build a village around innovation

Learning, discovery, innovation, and entrepreneurship are all social acts centred on the uncovering, sharing, and application of new knowledge and ideas, which thrive in environments of diverse perspectives, backgrounds, disciplines and experiences. It is an environment not unlike a dynamic, thriving town or village. In fact, you could say, “it takes a village to raise an idea.” **The University of Waterloo is perfectly positioned to design and execute this “village” — one that will provide the template for a new model of higher education.**

An Innovation Village is more than just buildings. It requires providing the necessary infrastructure, building a vital network of support, and putting the right people in place. It is a place of living and learning, bringing together like-minded risk takers in an ecosystem fuelled by the energy of shared ideas, where fear of failure doesn't slow the pursuit of success. It is a place where knowledge pioneers have the necessary tools, laboratories and opportunities to pursue breakthroughs that will transform the way we work, play, travel, communicate, live and learn.

The successful, foundational principle behind the VeloCity program was to create a nexus of talent, investment, support and opportunity, where creative, talented, ambitious faculty, students and external partners from diverse backgrounds and disciplines build on each other's ideas, and bring them to life. This is the key principle underlying the Innovation Village program. Here, however, the scale will be much larger.

Waterloo will develop both an Innovation Village concept and the resource plan. The Innovation Village will be a constantly evolving and dynamic community, created on Waterloo's north campus. It will include living, learning and event space for students and faculty, laboratory and fabrication space for a wide range of research, and amenities needed to attract and sustain entrepreneurial thinkers and researchers on the brink of new discoveries. Its success will depend on an integrated, critical mass of talent, amenities, facilities and services. Components of the Innovation Village include:

- A Discovery-to-Market (D2M) complex that integrates interdisciplinary research projects, commercialization, entrepreneurship and incubation involving faculty, students and alumni.
- Innovation Communities (IC), housed in an iconic new facility that integrates experiential learning and event space in a student residence environment. IC will focus on developing creative, entrepreneurial problem-solvers and leaders.
- A Faculty Research complex will enhance both the research activity in D2M and student learning and development in the IC.
- A Village Commons that provides the amenities required and expected by this creative community, including shops, restaurants, health and fitness facilities, green space, public transportation, and arts, cultural and entertainment enterprises.

The central challenge for Waterloo is not only to build a “village” that attracts and retains this critical mass, but also one that effectively integrates the various elements needed to sustain an ecosystem that enables innovation to thrive.

PRIORITY 3: TECHNOLOGY ENABLED LEARNING

The University of Waterloo recognizes that deep and comprehensive learning may benefit from more than textbooks and blackboards. As an institution that has long been a leader in computer science and technology, Waterloo is building on this expertise to make post-secondary education more effective and more accessible to students, staff and faculty, as well as to a broad set of learners across Ontario and beyond.

Waterloo's track record for developing and implementing technology-enabled programs speaks for itself. As a Canadian pioneer in distance education, Waterloo launched its correspondence program in 1968 as an entrepreneurial reaction to new teacher certification requirements. Now one of the province's largest online learning programs, Waterloo offers more than 275 online courses, five fully on-line bachelor degree programs, and six master degree programs with several more in development. Waterloo has also capitalized on technology-enabled learning to advance the quality of online teaching by developing an online training tool for graduate teaching assistants and instructors, a resource soon to be delivered in an open environment for use by other post-secondary institutions.

At Waterloo, technology enabled learning extends from students in the first year of their degree, to alumni and other lifelong learners able to pursue continuous professional learning throughout their careers. Technology enabled learning lends itself to a wide range of multi-institution collaborations. For many learners, it will erase geographical challenges and lessen financial burdens. Waterloo knows that the creation of such opportunities can be costly; already the

institution has begun to evaluate and realign institutional resources. Strong partnerships will also be needed, both with institutional peers and industry partners. Waterloo will continue to work closely with Desire2Learn, a company launched by a graduate, on these innovations. New research will enable Waterloo to better understand learning outcomes, supporting deeper, more effective learning for students, and leading to more efficient delivery of courses and programs across a variety of platforms. To advance efforts in technology-enabled learning, Waterloo will take three key actions:

Action 1: Build technology enabled learning assessment expertise

Waterloo recognizes that online and blended learning will be important strategies not only for its students and citizens of Ontario, but for learners around the world. Experience and confidence within these learning modalities will be key in developing productive, successful lifelong learners. To meet this need, Waterloo proposes to develop a lifelong learning success project which would: 1) identify factors in student success for online and blended learning; 2) help students assess in which of those areas personal growth and development may be needed; and 3) provide development opportunities to address those areas. Through the research required for this project, Waterloo will also identify predictors of at-risk students in online environments, and partner with Desire2Learn, a University of Waterloo spinoff specializing in education-enhancing software, to implement their Learning Analytics product to identify and better support at-risk students.

By developing a better understanding of learning outcomes through research carried out by its faculty, Waterloo will also develop processes to evaluate foundational learning outcomes and identify gaps. This will allow the institution to provide online learning resources in a modular format to meet those gaps, enabling the most-dedicated students to leap-frog some coursework and complete their undergraduate degree in a shorter timeframe. Waterloo attracts many of the most dedicated, driven and talented students from across the province, the country, and beyond. Many of these students enter their degree program with much of the required foundational knowledge already mastered. For this cohort, a mechanism to demonstrate their knowledge, quickly meet any gaps, and complete their honours degree in less time would be a welcome innovation.

Action 2: Lead a regional university consortium to develop online course and resources

While technology already exists to deliver courses in ways that meet the needs of a variety of learners, offering identical courses in multiple modalities has traditionally been cost-prohibitive for individual universities. Waterloo offers several blended learning courses as part of its curriculum, incorporating online learning and redesigning classroom time to encourage more interactive learning opportunities. Collaboration is key to better, more efficient delivery, and Waterloo is leading the way in establishing a regional university consortium to support technology-enabled learning.

Building upon the university-to-university transfer credit for first-year courses recently agreed upon by seven Ontario universities, Waterloo will initiate, develop and lead a regional university consortium to enable collaborative development, re-use of courses, and sharing of services that support technology-enabled learning. Waterloo's proven experience in developing curriculum with industry and community partners includes programs like the online Master of Public Health

Program, the Federal Public Service Leadership resources, and the Pharmacy ADAPT program. Leveraging its partnership with Desire2Learn, Waterloo and the consortium of universities will explore innovative approaches for course sharing and exchange and develop delivery models that can be expanded across the province and beyond.

To start, the University of Waterloo will engage regional universities in discussions about the development of a regional consortium. This will include the development of a prospectus outlining the proposal, including system-wide efficiencies and productivity gains as well as costs and anticipated impacts. Waterloo will develop the system framework and sign consortium agreements with partner institutions, and has the experience and willingness to increase partnerships across higher education institutions.

Action 3: Lead the development of open courseware in Canada

More than a decade ago the Massachusetts Institute of Technology initiated the concept of sharing its academic excellence with the world by providing open courseware. Waterloo is ready to lead the way in bringing Canada's post-secondary strengths to the world, as this nation's leader in open courseware. Already under development by Waterloo's Faculty of Mathematics, open courseware will enable distribution of existing online courses. This pilot project will allow Waterloo to better understand the infrastructure and funds that will be needed to realize the vision of establishing Canada's open courseware platform.

Shared open courseware will lead to opportunities for re-use within other post-secondary institutions, and provide informal learning opportunities for a wide range of interested people, including prospective students, adult learners, and secondary school students seeking enrichment. Shared online educational resources can also enable and encourage growth in blended learning opportunities within post-secondary education — further enhancing physical resource efficiencies and faculty engagement with students. Ontario, and all of Canada, with its wide-ranging, often isolated citizenship can benefit greatly from technology-enabled learning. The MIT experience has provided a useful roadmap for how to develop and implement a broad open courseware presence. Waterloo can expand this into a networked highway of learning with the potential to improve Ontario's post-secondary attainment rate.

Waterloo will develop a prospectus and fundraising case statement outlining how best to develop and implement an open courseware program. This will include early engagement of faculty at Waterloo and other Canadian universities. From there, Waterloo will create an operational plan, fundraising plan, and evaluation framework for the underlying open courseware infrastructure and platform.

Innovation does not — cannot — stand still.

As Canada's most innovative university, Waterloo will continue to grow and evolve its programs and infrastructure, with the support of public and private sector partners. Waterloo will remain a thriving ecosystem where entrepreneurial and risk-taking students and faculty from around the world grow and learn in a unique culture of experience, opportunity and mentorship, as they research, test and prove new ideas, and work collaboratively to build a better tomorrow.