

## Institutional Vision, Mission and Proposed Mandate Statement

*“Our future shall be continuous and consistent with our past, expanding upon and fulfilling the historic character of McMaster as an institution. We will not only reaffirm the importance of radical questioning at the heart of academic enterprise but we will ensure the integrity of our work by bringing a critical view to all of our practices — those which bear directly upon education and research as well as those less directly related to it.”*

President Patrick Deane

*Forward with Integrity*



**Ministry of Training, Colleges and Universities**



# Mandate Statement

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McMaster University, founded in 1887, is governed by the McMaster University Act, 1976. We operate under a bicameral system (Senate and Board of Governors) and in consultation and coordination with the Government of Ontario's Ministry of Training, Colleges and Universities.

As a research-focused student-centred university, we serve our community and society by nurturing and supporting the fulfillment of human potential: inspiring creativity and critical thinking, promoting an enduring love of learning and the habit of inquiry, and undertaking innovative research that extends the boundaries and enhances the efficacy of knowledge.

## Priorities

McMaster has identified three priorities that will focus our efforts over the next three years and beyond:

1. Strengthening the excellence of our research and our graduate education and training, while seeking opportunities to integrate research more purposefully into our academic mission;
2. Developing a distinctive, personalized, engaging and sustainable student experience; and
3. Enhancing the connections between McMaster and the communities we serve, locally, provincially, nationally and around the globe.

Our 127 years of achievement and leadership demonstrate our ability to innovate and drive change. We will continue to capitalize on our strengths and build on our hallmark interdisciplinary, inquiry-based, research-focused approach to education and scholarship. This will accelerate the transformation already occurring in our programs, while expanding access and strategically increasing enrolment within a sustainable framework.

Given that our classroom space is currently used at 117 per cent of its nominal capacity, enrolment growth is not without its challenges. To achieve the targeted growth that we are proposing, we will continue to explore creative approaches to teaching and learning. However, some increase in physical capacity will also be needed. We will continue to explore options and locations, both on our campus and within the local communities that we serve.

## Vision Statement

To achieve international distinction for creativity, innovation and excellence.

## Mission

"At McMaster, our purpose is the discovery, communication, and preservation of knowledge. In our teaching, research, and scholarship, we are committed to creativity, innovation, and excellence. We value integrity, quality, inclusiveness, and teamwork in everything we do. We inspire critical thinking, personal growth and a passion for lifelong learning. We serve the social, cultural, and economic needs of our community and our society."

## Relating Vision and Mission to the Proposed Mandate Statement

McMaster's vision, mission and mandate statement provide the foundation for our strategic planning. President Patrick Deane's letter, *Forward with Integrity*, outlines our commitment to transformation over the next decade. At McMaster, we strive to foster the creative and intellectual potential of our students, while at the same time preparing our graduates to build successful careers. It is our firm belief that higher education, when properly conceived, can and will lead to career success. We will continue to reimagine how best to equip our students for this success, as well as seamlessly integrate our expanding world-class research enterprise into our educational mission. Our research-focused student-centred approach to scholarship and learning within a research-intensive university differentiates us in the post-secondary landscape; this approach has informed our renowned programs and underpins the way in which we define our strategic priorities.

# Jobs, Innovation and Economic Development

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## Current Strengths

At McMaster, we appreciate the immense challenges that lie ahead for the government relating to Ontario's economic recovery. Universities are an important part of Ontario's economic future and play a key role in regional economic development. McMaster focuses on the development of highly qualified people through a research and learning experience that is aligned with the job market and with economic development. This is evidenced by McMaster's 2010 graduating class, which tracked an impressive employment rate of 89 per cent six months after graduation and 92.3 per cent two years after graduation.

McMaster is also a significant source of employment in the Hamilton region. With roughly 7,800 full-time faculty and staff, we are one of the largest employers in the greater Hamilton area. McMaster's Downtown Centre (home to our Centre for Continuing Education) has helped revitalize Hamilton's downtown for more than a decade. Currently under construction, a new downtown Hamilton health campus will provide patient care, clinical services and educational learning opportunities.

A major hub of research and innovation, McMaster generates ground-breaking discoveries that have a positive impact in Ontario and beyond. Our research will help the province build a healthy and sustainable future. We also participate in several public-private partnerships, sharing ideas, resources and facilities to improve overall competitiveness and productivity.

## Key Initiatives

- McMaster is well-placed to lead and take advantage of the knowledge economy in Hamilton. As an incubation site for new business start-ups, the McMaster Innovation Park (MIP) is a distinct benefit to McMaster student and faculty entrepreneurs.
- We are focused on mentoring and developing a new generation of successful Ontario-led businesses. Providing students with the entrepreneurial infrastructure to develop their ideas is part of McMaster's culture and is related to future research and educational programs. Indeed, during the past three years (2010-2013) we have fostered almost 120 student-led start-up companies, many of these getting their start at the McMaster Innovation Park.
- McMaster has established inter-institutional partnerships to benefit student employment, primarily in partnership with Mohawk College. These include our hallmark Bachelor of Technology Program, as well as joint BA-certificate and degree-completion programs.
- McMaster's proposed new Masters of Biomedical Discovery and Commercialization program will focus on the rapidly emerging area of biomedical discovery and innovation. Students with entrepreneurial interests in biochemistry and biomedical sciences engage in a multidisciplinary training program designed to produce career-ready graduates who combine practical research skills with strong business acumen.
- McMaster is one of only a handful of universities in the world to house a nuclear research reactor on its campus. Our reactor is used to support major education and research initiatives within our province.
- McMaster is a leader in technology licensing with around 350 active licenses (the highest number of any Canadian institution), generating approximately \$4.4 million annually (2012).
- Graduates from McMaster's programs in Studio Art, Art History, Music, Theatre, Multimedia, Cultural Studies, as well as History and Commerce, continue to play a critical role in the creative economy in Hamilton. According to Hamilton's Downtown Employment Survey, the creative industries accounted for 2,060 jobs in 2012. This represents a growth rate of more than 22 per cent over two years, compared to the overall growth rate of less than two per cent.
- The MBA program at the DeGroot School of Business has produced almost 7,000 MBA graduates with a 95 per cent employment rate.
- The McMaster Automotive Resource Centre brings together both the private and public sectors to develop, design and test hybrid vehicle technology. McMaster is one of a select number of universities in the world equipped to train students in the complete design and build of a vehicle on our own campus.

## Direction

Students at McMaster have access to many opportunities through the resources described above. Our students can shape a distinctive, personalized learning experience to align their education with a career in their desired field. To facilitate thoughtful decision making along the way, McMaster is developing an interactive website for student planning. The McMaster Academic Planner (MAP) will be an online, interactive, "one-stop-shop" for both prospective students and current undergraduates at all levels. This interactive tool, piloted by the Faculty of Science, will allow students to make more informed choices and subsequently enrol in the program best-suited to their desired

path. It will help boost retention rates, and develop an improved student journey that will lead to well-developed, transferable skills. Our proposed, highly novel program in Biomedical Discovery and Commercialization sets the stage for a new generation of engaged and entrepreneurial scientists, and will develop a paradigm that can be replicated across campus.

The McMaster Innovation Park is now home to numerous university-based start-ups and supporting functions, including the Don Pether Incubation Centre. McMaster is also launching a Centre for Student Entrepreneurship. This hub for innovation will build on our entrepreneurial environment and expertise in commercialization. It will bring together student-led start-up companies, directed facilities, support mechanisms and industry partners in a common space that will focus on collaboration, interaction and start-up incubation. Students will have the opportunity to interact with leaders in the field and will have access to the tools and resources they need to embark upon new business ventures.

## Teaching and Learning

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### Current Strengths

McMaster has transformed post-secondary teaching and learning over many decades. Our Faculty of Health Sciences pioneered inquiry- and problem-based approaches to learning. These signature pedagogies have since benefited multiple programs at McMaster, and are recognized and adopted worldwide, from the University of Calgary to Harvard Medical School. Our high-profile success stories, such as the MD Program, the Arts and Science Program and, more recently, the Bachelor of Health Sciences Program, have informed and influenced the creation of the Honours Integrated Science Program (iSci), as well as the complete redesign of high-enrolment courses into blended formats that incorporate the latest technology-enabled learning.

McMaster is also committed to further integrating our world-class research enterprise into teaching and learning, and connecting the learning experience to our local, national and international communities. Exceptional innovation and creativity have placed McMaster in the top 100 universities in the world, and we apply these strengths with equal passion to discovery and learning. As evidence of our commitment to this we have hosted the headquarters of the Society for Teaching and Learning in Higher Education (STLHE) since its inception. In addition, our AVP (Teaching and Learning) serves as Vice-President of the International Consortium of Educational Developers.

McMaster students enjoy high retention and graduation rates; according to the most recent Maclean's rankings, McMaster's graduation rate is the third highest in the country. We are involved in piloting the Collegiate Learning Assessment (CLA) and the Assessment of Higher Education Learning Outcomes (AHELO). We also measure the experience of our undergraduate and graduate students through the National Survey of Student Engagement (NSSE) and the Canadian Graduate and Professional Student Survey (CGPSS). McMaster consistently ranks higher than the Ontario average in the categories of academic challenge, active and collaborative learning environments, enriching educational experiences and supportive campus environment.

### Direction

We have recently renewed our commitment to the scholarship of teaching and learning by transforming the Centre for Leadership in Learning (CLL) into the McMaster Institute for Innovation and Excellence in Teaching and Learning (MIETL). Supported by a substantial increase in institutional funding, MIETL will provide strong pedagogical and technological expertise, coupled with a cadre of cross-appointed faculty members engaged in evidence-based research on the practice of teaching. MIETL is the first institute in Canada to employ a team of students as apprentices and collaborators in helping to significantly improve the quality of the student experience. With this new institute, McMaster is on track to become Canada's premier centre for evidence-based pedagogy at a research-intensive university. McMaster has already demonstrated success in this area, through our Program for Educational and Research Development in the Faculty of Health Sciences, which has had a profound influence on evidence-based medical education, nationally and internationally. Our aim is to apply and evaluate the efficacy of diverse pedagogical approaches – from online delivery to flipped classrooms.

A key focus will be to develop and implement new and expanded experiential and self-directed learning opportunities, including service learning, professional training programs, community-engaged scholarship, student entrepreneurship and support for the commercialization of graduate research. Experiential learning provides the opportunity for students to develop the skills needed to move quickly into a rewarding career. We will also continue to support students with academic placements, student project grants and internships. Assistance in the form of career planning, a coordinated and well-connected placement service and an environment that enables student and faculty entrepreneurship are all critical for student success.

Our recently launched Student Learning Portfolio is an essential component in a more personalized learning experience at McMaster. This online tool facilitates the thoughtful integration of classroom and extracurricular learning with the students' personal goals. It will position our students for success by encouraging the habit of self-reflection, allowing students to consider their goals, reflect upon the value of their learning activities and record their accomplishments.

Another exciting enabler for growth, led by our innovative and popular Bachelor of Health Sciences Program, will provide valuable options for undergraduate students, such as flexible scheduling and shorter course modules offered throughout all three terms. The program also opens new pathways to engage students with primary research.

Projects funded through the Productivity and Innovation Fund (PIF) will allow McMaster to reimagine the use of technology to leverage blended learning, while strengthening high-quality, personalized learning experiences that are sustainable and resource-efficient. We highlight three of the eleven PIF projects in which we are involved:

- McMaster's institutional project aims to transform the first-year experience by enhancing student self-direction, skills and engagement. This project incorporates the most successful elements of McMaster's current blended and integrated learning models and makes them available to a greater number of students.
- McMaster, in partnership with Guelph and others, is developing Canada's most robust and innovative Quality Assurance Program. We adopt best practices in learning outcomes assessment and adapt them to McMaster's unique learning environment.
- McMaster is leading a remarkable collaboration amongst Ontario's most research-intensive universities that will create learning modules to facilitate the development of professional skills among graduate students. These modules will address topics such as career preparation, entrepreneurship, teaching and learning and community-engaged scholarship. They will be made available at no cost to all Ontario universities.

## Metrics

We have some concern that MTCU-developed metrics in this area focus on co-op education as the primary measurable form of experiential learning, and fully online courses as the only measurable form of technology-enabled learning. We believe these two aspects of education involve a much richer range of approaches and that the metrics need to account for these. McMaster would therefore include the following institution-specific metrics:

1. Percentage of courses that include experiential learning opportunities.
2. Percentage of courses that involve extensive use of technology-enabled learning, including online delivery, blended learning or flipped classroom approaches, and learning portfolios.

# Student Population

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## Current Strengths

McMaster shares the Ontario government's goal of increasing the number of underrepresented students in the post-secondary education sector. In 2011-12, McMaster welcomed 5,000 first-generation students (representing about 17 per cent of McMaster students), almost 500 (2 per cent) Indigenous learners (First Nations, Métis, and Inuit) and 1,400 (5 per cent) students with disabilities.<sup>1</sup> We continually strive to improve access and supports for students of all ethnic backgrounds, religious beliefs, and sexual and gender identities.

To support these efforts, the President's Advisory Committee on Building an Inclusive Community (PACBIC) serves as a valuable hub, open to the entire campus community, for discussion and generation of ideas. As well, the McMaster Library is piloting a program with provincial partners to digitize and deposit course materials into a shared repository for students with disabilities across the province.

## Indigenous Students

McMaster is in close proximity to two distinct Indigenous populations: the more than 11,000 people at Six Nations Grand River, and a similar number of Indigenous residents in Hamilton. We have a strong partnership with Six Nations Polytechnic (SNP), which enables us to assist students seeking university degrees to transition to McMaster and to support an Indigenous Knowledge Centre that is quickly becoming a regional hub for research.

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<sup>1</sup> Data subject to uncertainty due to self-identification.

McMaster has several approaches to create and enhance necessary pathways. The Indigenous Education Council (IEC) is tasked with promoting and advocating for the advancement of Indigenous education at McMaster. The Faculty of Social Sciences is implementing programming that takes into consideration the multiple barriers faced by Indigenous students. Building on our successful minor in Indigenous Studies (450 course registrations), a new honours program in Indigenous Studies has just been approved internally and will soon be submitted to the Quality Council and MTCU. Projected enrolment for this new program is expected to be around 50. We are also working to create a graduate-level, interdisciplinary diploma in Indigenous Studies. In the last two years, the Faculty of Social Sciences has hired three new tenure-track Indigenous faculty. Working with the Indigenous Physicians Association of Canada (IPAC), McMaster led the development of an Aboriginal health curriculum, now used at all Canadian medical schools. In the past decade, the Medical and Rehabilitation Sciences (Occupational Therapy and Physiotherapy) programs have operated a facilitated admissions process for self-declared Indigenous applicants, supported by the Aboriginal Health Sciences Office (ASHS); in the last decade the MD program has graduated 58 Indigenous students, the highest number in the country. A faculty member, serving as chair of diversity and engagement, ensures that diversity issues feature prominently in the curriculum. We are committed to adjusting curriculum and pedagogies across the campus to build a more inclusive environment for Indigenous learners.

### ***Crown Wards and Other At-Risk Groups***

During the last five years, as part of a provincially funded initiative, McMaster has worked with community partners to build educational pathways for Crown wards. Under McMaster's leadership, this program has grown by a factor of 10, from 35 Crown wards in 2009 to 265 in 2013. We are proud to have signed the provincial invitation in 2013 that offers Crown wards tuition-free university education.

Our Venture Camps Program, which provides engineering and science summer camps to primary and secondary school students as well as school workshops throughout the year, offers bursaries and special outreach programs that support the participation of at-risk youth.

The Faculty of Social Sciences, as part of its focus on building pathways for high school students, offers a new life-mapping course for first-year students, as well as three free university-level courses for 80 at-risk Hamilton students. We have also pioneered the McMaster Discovery Program, which offers tuition-free university-level courses to Hamilton residents who faced barriers to post-secondary education.

### ***International Students***

McMaster's international reputation for scholarship and learning has always made this university an attractive destination for students from abroad, particularly at the graduate level. Many of these students remain in Ontario, making direct contributions to our economy and our society. McMaster is focused on developing a coordinated institutional strategy for our international activities, intended to enhance the experiences of international students studying on our campus, as well as developing partnerships that will increase the impact of our global engagement and provide additional opportunities for our students to develop as global citizens.

### **Direction**

McMaster will continue to support efforts to increase diversity and create avenues for underrepresented and at-risk students.

Ongoing discussion within the IEC and with Six Nations Polytechnic will identify a richer set of pathways for Indigenous learners. The new programs and diplomas currently under development will be augmented by the opening of an Indigenous Students Centre in L.R. Wilson Hall (2015). We will continue to focus our attention both on Haudenosaunee peoples and culture, in collaboration with Six Nations, as well as on urban Aboriginal students. Through a number of recent faculty hires, McMaster now has nationally recognized expertise in community-engaged approaches to research and teaching.

McMaster is also developing an approach that will foster the integration of international students into our community, while encouraging all of our students, both domestic and international, to embrace their roles as global citizens. We will embark on a process of increased international recruitment, through a coherent and coordinated strategy for internationalization that will include the development of a bridging program for students entering McMaster from abroad.

# Research and Graduate Education

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## Current Strengths

Since 2005, McMaster has consistently ranked second in the province for research intensity. We are also one of only two Ontario universities consistently ranked among the top 100 universities in the world. Our research impact – using the H-index to measure the quantity and quality of McMaster research publications – indicates we are well above the average in Ontario and among our U15 peers. McMaster is home to 70 Canada Research Chairs (CRCs), 97 endowed chairs, 12 endowed professorships, one Canada Excellence Research Chair (CERC) and seven Natural Sciences and Engineering Research Council (NSERC) industrial research chairs. With more than 100 research centres and institutes, McMaster is a globally competitive research powerhouse and innovation incubator.

McMaster excels at interdisciplinary and collaborative research, working with industrial, government and community partners, as well as other academic institutions around the globe. We are ideally positioned to play a vital role in Ontario's economic development and to enhance the social and cultural fabric of our province. We have the expertise and a proven track record in commercialization, technology transfer and entrepreneurship, in collaboration with a broad spectrum of industry partners. With the opening of the Lewis & Ruth Sherman Centre for Digital Scholarship, the first such centre in Ontario, we are at the forefront of digital approaches to research across multiple disciplines.

McMaster's success is due in large part to investments in our world-class infrastructure and technology from the Ontario government, the Canadian government and the private sector. Our research excellence has allowed us to successfully attract high levels of funding. McMaster has the highest average total tri-council funding allocation per principal investigator (\$71,367) of Ontario's research-intensive universities. From 1999 to 2009, our research intensity grew by 210 per cent to approximately \$310,000 per full-time faculty member, whereas the average growth during this period at other Canadian medical-doctoral universities was just over 140 per cent.

Our research strength is also closely linked to our success in recruiting outstanding graduate students provincially, nationally and internationally, particularly at the PhD level. The number of graduate student applications from BIU-eligible students more than doubled (from about 2,850 to 5,800) between 2007-08 and 2012-13, in part because of our international reputation for excellence. Accordingly, we increased our proportion of FTE BIU-eligible graduate students faster than most research-intensive Ontario universities during this period. We have also progressively enhanced quality, as evidenced by our graduate students' success in garnering Vanier Graduate Scholarships, Canada's most prestigious and selective doctoral fellowship competition. McMaster students have won 45 Vanier awards – second in the province for the total number of awards, and first in the province in terms of awards-per-student.

Like many other research-intensive institutions in Ontario, our graduate growth has slowed recently due to a range of external factors, including increased uncertainty about federal granting program changes, a reduction in graduate funding linked to the guaranteed allocation of Ontario Graduate Scholarship (OGS) awards to non-research-intensive institutions, and increases in the number of new graduate programs at non-research-intensive universities. Some of these issues were addressed through an aggressive approach to competitive graduate funding such as the Vanier awards and the accelerated development of new PhD programs. Based on the plan outlined below we are now positioned to return to the strong and steady growth we saw between 2008 and 2012. However, we would urge the government to adopt policies that support differentiation in research intensity by reverting to a merit-based system for the allocation of OGS scholarships, while focusing new PhD programs at research-intensive institutions.

McMaster has recognized the critical importance of partnerships in generating additional funds to sustain excellence in research. Philanthropic giving to McMaster during the past decade has raised more than \$500 million to support our research strengths, as well as our teaching and learning priorities. During that time period, donor support has allowed the university to double the number of endowed chairs and triple the number of named professorships. Centres and institutes supported through philanthropy also enhance our ability to leverage funds from other partners.

Our research intensity is fundamental to our pedagogical model as a research-focused student-centred university. We weave interdisciplinary collaboration into all levels of the learning process, and we translate discovery into innovative undergraduate curriculum and cutting-edge graduate education. Our research findings not only benefit local, national and global communities, they also add tremendous value to the way we teach our students and prepare them for rewarding careers.

## Direction

McMaster is committed to supporting a world-class environment for discovery and learning. Our research will continue to reflect current and emerging social and economic issues of relevance to our local community and beyond our national borders. We will help to build a stronger economy and a healthier, more engaged society. McMaster's translational research and scholarly activities will provide relevance and impact over a wide range of disciplines and issues – including aging, infectious diseases, health policy, nuclear technology, water, poverty and digital media, to name a few. Initiatives such as the McMaster Centre for Scholarship in the Public Interest are intended to foster a more engaged citizenry by promoting an informed public discourse around issues of pressing cultural, political, social and ecological concern. We will also continue to lead interdisciplinary collaborations that span institutions. Current examples include the Canadian Longitudinal Study on Aging and Networks of Centres of Excellence, such as Allergen and the Centre for Probe Development and Commercialization.

As noted above, we are poised to resume the high rate of graduate growth achieved in the period up to 2012. During the past five years, our faculty complement increased by nearly 13 per cent, resulting in greater supervisory capacity, particularly at the doctoral level. Faculties have developed coordinated short- and long-term enrolment plans, and have committed to the creation of several new graduate programs, as outlined below. We also implemented a new system of incentive funding to help meet graduate growth goals, and we are providing additional funding to Faculties to help stabilize graduate support in the face of volatile federal funding. Outstanding master's students are being encouraged to transfer directly into doctoral programs while time-to-completion for doctoral students is decreasing. This two-pronged approach is creating new PhD spaces in some programs, while ensuring our current students enter the workforce more quickly. Additionally, we have committed funding for innovative, evidence-based recruitment approaches aimed at increasing the number of outstanding domestic applicants to our research-based graduate programs. Finally, we are partnering with like-minded institutions across the province to raise the profile of Ontario as the best destination in Canada for graduate study. Critically, McMaster is leading two of those key initiatives, one aimed at creating a graduate professional skills training portal, and the other highlighting the outstanding research created by Ontario's graduate students through the Ontario 3-Minute Thesis competition, hosted this year by McMaster. With all these initiatives in place, we are confident that enrolment levels for doctoral students will once again increase.

At McMaster, we engage students at all levels in research activities and strive to creatively integrate research and teaching responsibilities. Graduate training in particular is central to sustaining our research intensity. We are targeting higher graduate enrolments for high-quality, interdisciplinary programs that are nationally and internationally recognized. We aim to introduce new graduate programs to meet Ontario's higher education and training needs. These new programs will include an increased emphasis on professional and practice-focused graduate degrees, which will prepare our students for a wide range of careers that require advanced understanding and problem-solving capabilities. They will also enable McMaster to translate the cutting-edge knowledge developed in the research environment to the practical training essential to the growth of the province's knowledge-based economy. This initiative will be complemented by a steady expansion of research-based master's and PhD places, as well as a continued emphasis on building the professional skills of students in all our graduate programs.

We will also focus on bridging the gap between research and commercialization, building on the proven success of our graduate programs in entrepreneurship in the Faculty of Engineering and the DeGroote School of Business. As well, McMaster Innovation Park, located near the university's campus, provides new opportunities for partnership with the private sector, as well as serving as a hub for stimulating local and provincial economic growth.

## Metrics

To effectively monitor our research success, particularly as it relates to applied research, McMaster would add, as an institution-specific metric, the level of industrial funding for research.

# Program Offerings

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## Current Strengths

McMaster has recently adopted a new budget model that uses a resource-centred management (RCM) approach. In this model, all funds coming to the university as a result of student enrolment (e.g. tuition and provincial grants) are allocated to the Faculties that register and teach the students. In this way, funding to each Faculty is dictated by their student enrolment levels. Faculties are also able to determine which programs are financially strong and which are not. Of the latter, Faculties can then decide whether and how to subsidize programs that are of strategic importance, or that prepare graduates with specialized and valuable attributes. While still in its early days, this model will be used to prioritize our program offerings.

McMaster has clear strengths in a number of areas, as outlined in more detail in Appendix 3, along with areas we feel are of strategic importance to the near-term development of the institution.

## Direction

Our program mix will be driven by opportunities that will enhance and build upon our research intensity, linking McMaster's areas of research excellence with opportunities that address the needs of society. Please see Appendix 3 for more information on proposed program growth.

# Institutional Collaboration to Support Student Mobility

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## Current Strengths

In 2012-13, McMaster enrolled 1,139 credit transfer students from 20 Ontario universities and 20 Ontario colleges of applied arts and technology. We have agreements in place with a variety of universities and colleges. A recent example is our participation in the University Credit Transfer Consortium to facilitate credit transfer for students. We will continue to develop new and expand existing partnerships to increase the flexibility with which students can complete their degrees. McMaster also has a large number of agreements with international partners that enable students at all levels to gain experience abroad. We expect these partnerships to be developed further over the coming years as part of our coordinated approach to internationalization.

A key differentiator of the McMaster approach to institutional collaboration and student mobility is our partnership with Mohawk College. We have arguably the strongest college-university partnership in Ontario. A source of pride for both institutions, this relationship is exceptional among research-intensive universities. Almost every Faculty at McMaster has an active partnership program with Mohawk and the variety has grown steadily. In 2013-14, more than 2,800 students were enrolled in one of these collaborative programs, which include a rich diversity of pathways, such as integrated high school entry degree programs, degree-completion programs for college graduates and elective programming for McMaster students. The Bachelor of Technology (BTech) program is unique in Ontario in offering both degree completion opportunities in four distinct programs as well as three integrated four-year degrees. Another example is the introduction of affiliated certificates in Business Studies and in Leadership and Management in the Not-for-Profit Sector, offered by Mohawk to McMaster Social Sciences students. Key to the partnership's success has been the willingness and ability to build on each other's strengths and capabilities, as well as a shared commitment to flexible, student-centred program choices. It should be noted that our partnerships with Mohawk provide opportunities for students from many Ontario colleges. For example, the BTech program is now open to any college that has an affinity program with us – currently there are 125 with such programs.

At the graduate level we are leading a PIF project on behalf of Ontario's research-intensive universities that aims to provide professional skills and career enhancement training to graduate students. These courses will be available online.

## Direction

McMaster understands the importance of establishing flexible pathways for students who wish to transfer to or from other post-secondary institutions. We are interested in exploring the role and potential of prior learning assessment and recognition (PLAR). We expect to strengthen our partnership with Mohawk and other colleges. The specific programs we develop will capitalize on the distinctive strengths of each institution; we intend ours to be a model that will be scalable across the system. We will also seek, as part of our overall strategy on internationalization, to develop deeper international relationships with a number of partners who share our approach and vision.

## Metrics

MTCU's mobility metrics focus on pathways that enable students to move and transfer credits between institutions. Based on our extensive partnerships with Mohawk, we believe it is important to encourage deeper forms of collaboration. Therefore, we have identified the number of and enrolment in jointly offered university/college programs as an institution-specific metric.

# Financial Sustainability

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McMaster students, programs and research have benefitted greatly from the University's commitment to prudent financial management. Our institutional debt rating by DBRS is AA (Low), the same as the province, and AA- with a stable outlook by S&P.

Our ability to make strategic investments into the future relies on ongoing flexibility, diversification of revenue streams where possible, and prioritization of operating and capital expense to align with strategic priorities. However, McMaster's financial strength will remain challenged by pension and post-retirement benefit funding deficiencies. We anticipate qualifying for Stage II solvency relief on both our salary and hourly pension plans by virtue of focused management over several years that has led to increased employee contributions. Plan deficit payment requirements are fully funded but at significant operating cost. Deferred maintenance of \$285 million is another financial pressure. Although McMaster has developed a long-term plan for deferred maintenance, escalating costs in this area will require increased investment that will put further pressure on the operating budget. Adding to these pressures is the need for new infrastructure investments to realize our research-focused student-centred mission.

## Appendix 1: University Strategic Enrolment Projects

<b>Table 1: Baseline University Full-Time Headcounts (Eligible and Ineligible)</b>									
Baseline projection for the university as a whole. These should include additional capacity which has already been funded through capital projects currently underway. These projections should not include the impact of proposed projects, or assume provincial approval of future projects or associated policy decisions (e.g., program approvals, development of new campuses, etc.).									
	<b>Eligible Students</b>								
	<b>Actuals</b>			<b>Preliminary</b>	<b>Projected</b>				
	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Undergraduate	19835	20229	20547	20790	20850	20920	21010	21161	21311
Master's	1585	1578	1587	1531	1655	1722	1790	1836	1882
Ph.D.	897	918	892	861	910	939	969	994	1039
Total Eligible Full-Time Headcounts	22317	22725	23026	23182	23415	23582	23768	23991	24232
	<b>Ineligible Students</b>								
	<b>Actuals</b>			<b>Preliminary</b>	<b>Projected</b>				
	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Undergraduate	1333	1406	1473	1577	1584	1618	1652	1680	1707
Master's	317	365	401	411	476	529	583	627	672
Ph.D.	250	281	328	387	332	355	377	400	421
Total Ineligible Full-Time Headcounts	1900	2052	2202	2375	2391	2502	2612	2707	2801
Total Full-time University Headcount (Eligible + Ineligible)	24217	24777	25228	25557	25807	26083	26380	26697	27033

Table 1 Assumptions

- As directed by MTCU, the graduate growth (i.e. Master's and PhD) shown in Table 1 does not exceed the University's graduate expansion end state targets allocated for 2014/15.
- Table 1 does not include or assume the approval of future capital projects and/or new program approvals.

<b>Table 2: Projected University Full-Time Headcounts (Eligible and Ineligible)</b>									
Enrolment projection for the university as a whole. In addition to the baseline projections in Table 1, these projections should include the impact of proposed projects and provincial approval of future projects or associated policy decisions (e.g., program approvals, development of new campuses, etc.).									
	<b>Eligible Students</b>								
	<b>Actuals</b>			<b>Preliminary</b>	<b>Projected</b>				
	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Undergraduate	19835	20229	20547	20790	21117	21581	22101	22434	22731
Master's	1585	1578	1587	1531	1655	1761	2106	2222	2268
Ph.D.	897	918	892	861	910	974	1030	1082	1131
Total Eligible Full-Time Headcounts	22317	22725	23026	23182	23682	24315	25237	25738	26130
	<b>Ineligible Students</b>								
	<b>Actuals</b>			<b>Preliminary</b>	<b>Projected</b>				
	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Undergraduate	1333	1406	1473	1577	1620	1655	1696	1729	1763
Master's	317	365	401	411	516	670	810	869	921
Ph.D.	250	281	328	387	332	355	377	400	421
Total Ineligible Full-Time Headcounts	1900	2052	2202	2375	2467	2680	2883	2998	3106
Total Full-time University Headcount (Eligible + Ineligible)	24217	24777	25228	25557	26150	26996	28120	28736	29236

Table 2 Assumption

- Table 2 represents anticipated growth of eligible full-time undergraduate and graduate students in existing and new programs identified internally as areas of strategic focus. Thus, the projected total growth is contingent on all new programs being approved.
- The anticipated growth in Table 2 is contingent on the building of new, modern teaching and learning space.

## Opportunities for near-term undergraduate growth and capacity limitations

From 1980 to 2010 student enrolment at McMaster increased by 140 per cent, while space increased by only 63 per cent. The result is that, using Council of Ontario Universities (COU) standards, space on campus has slipped from 78 per cent of what is needed to 71 per cent. In terms of classrooms alone, utilization now stands at 117 per cent of nominal capacity. The consequence of this is that while student demand to study at McMaster continues to rise, our ability to accept increasing numbers of students is compromised. Entry cut-offs are rising and well-qualified students are denied entry into the program of their choice. We have and will continue to develop alternative modes of program delivery that optimize the use of space. These include the development of online courses and blended learning. We are particularly strong advocates of the latter whereby online content delivery is augmented by interactive learning experiences within flipped classrooms. While this methodology has been shown to produce excellent learning outcomes, even with fewer contact hours, the development of flipped classrooms requires significant capital investment and results in lower student density than traditional lecture theatres. We are also exploring greater space utilization during a 12-month period by offering some programs in a three-term format. None of these approaches will eliminate the need for additional teaching spaces, however, so our growth, especially at the undergraduate level, will be constrained until such additional physical capacity can be developed. We are continuing to explore options and locations, both on our own campus and within the local communities that we serve.

## Appendix 2: College Strategic Enrolment Projections

Not Applicable.

## Appendix 3: Identifying Institutional Program Strengths and Strategic Areas of Focus

<b>Institutional Program Strengths</b>	
<b>Program Area</b>	<b>Total Full Time Headcount (Eligible) 2012-13</b>
Medical education and research	4121
Health and society	2783
Engineering and sustainability	2571
Science and discovery	3924
The digital economy	1248
Materials and manufacturing – from technology to policy	808
Business and economics	2413
Policy and ethics in a globalized world	1004
Human behaviour, culture and society	1436
The Arts and Creative Expression	416

McMaster University provides the following rationale for these areas of program strength, each of which is aligned with our strategic goals in research and education, as well as with our vision, as articulated in President Patrick Deane's letter, Forward with Integrity.

## **1. Medical education and research**

McMaster is the home of evidence-based medicine and has a long-standing reputation for innovation and excellence in medical education and research. The Michael G. DeGroot School of Medicine, which pioneered problem-based learning, typically ranks among the top medical schools in Canada and among the top 30 in the world. Medically relevant research and education occur across several Faculties at McMaster. Specific examples of research strength include: infectious and digestive diseases, stem cell and cardiovascular research, optimal aging and medical anthropology, as well as biomedical engineering. Our educational programs, such as those in rehabilitation sciences, medical sciences, biochemistry, psychology and neuroscience, kinesiology, medical radiation sciences and many more, are producing highly skilled graduates who are well-placed for success. McMaster will continue to build upon our renowned strength in medical education and research, enhancing the interdisciplinary collaborations among our Faculties and fostering the integration of discovery and learning in the health sciences.

## **2. Health and society**

McMaster's long-standing strength in medical discovery and learning in our Faculty of Health Sciences has had institutional impact. This has led to multidisciplinary interest in the determinants of health and their impact on the resilience of individuals, communities and society at large. This strength is demonstrated through a range of programs, including the renowned Bachelor of Health Sciences, as well as newer programs such as Health, Aging and Society. McMaster's Global Health Master's program combines health, policy, and international affairs and prepares graduates to make a difference to health systems, health policy and health care across the globe, while our planned Master's in Public Health builds on the University's renowned strengths in Health Policy and Health Research Methodology. Research strength and graduate training in health-related fields are also pervasive across all Faculties, including a number of cross-Faculty research centres and institutes. In addition, McMaster has developed community-based research partnerships, such as the "Health in the Hubs" initiative integrated into our nursing program. Innovative collaborations are also common, such as the Master's degree in Health Management and the proposed Biomedical Discovery and Commercialization Program.

## **3. Engineering and sustainability**

McMaster has a number of outstanding research and educational programs based in the Faculty of Engineering that include strong partnerships with Canadian and Ontario industry. Many of these touch on issues related to environmental, economic and social sustainability. There is also a strong overlap with other areas of strength, including the digital economy and materials and manufacturing. Industry support is evidenced through several externally funded NSERC industrial research chairs, and projects that have the strong support of Ontario Centres of Excellence (OCE) and FedDev Ontario. McMaster excels in driving innovations by seeking solutions that maximize efficiencies while reducing cost and waste, such as sustainable energy engineering, water technology and policy, chemical and materials processing, advanced manufacturing, and the earth and environmental sciences. The soon-to-be-built Hatch Engineering Centre for Experiential Learning (ExCEL) will serve as a living laboratory for sustainable building technologies, and cooperative management. A new Professorship in Water Policy and Research, cross-appointed to the Faculties of Engineering and Social Sciences, is evidence of McMaster's cutting-edge interdisciplinary work in this field. Students in the Bachelor of Fine Arts in Studio Art are exposed to emerging sustainable art practices, which is unique among such programs. McMaster also offers a sequence of university-wide, community-engaged learning courses called "Sustainable Futures".

## **4. Science and discovery**

As a research-intensive university, McMaster recognizes the critical need for basic research in the sciences. Curiosity driven research strives to understand such complexities as basic mathematical structures, the nature of the universe, the origins of life and the intricacies of human behaviour. It is the foundation for innovation and discovery at McMaster. Inquiry-based research programs in the sciences are well-founded and inculcate the desire in McMaster students to create new knowledge and seek answers to far-reaching questions that challenge our understanding of ourselves, the world, and the universe. One example among many is McMaster's Integrated Science program which uses a trans-disciplinary approach to explore the most fundamental topics in science. Our focus on fundamental research and quantitative analysis provides the scaffolding for a vast range of programs across the university.

## **5. The digital economy**

The digital revolution rests on a number of pillars, from new devices based on nanotechnology to the e-commerce solutions that these devices enable. McMaster is helping to advance this digital frontier and to train the next generation of digital practitioners through programs that bridge science and engineering with links to health and business. We have long-standing research foci in nanotechnology, engineering physics, communications and multimedia, neurotechnology, bioinformatics and information systems. Many of these are linked to undergraduate programs in which students are introduced to, and often taken part in, current research endeavours. Students are also introduced

to emerging trends in “big data” and data analytics (where we have recently established two professorships sponsored by Cisco). In all these endeavours, we bring our interdisciplinary approach and the application of digital culture to solving societal problems.

## **6. Materials and manufacturing – from technology to policy**

The synergistic selection of materials and manufacturing technology in designed structures is an integral part of almost every modern engineering project. McMaster has established clear research strengths in advanced materials and manufacturing, as well as manufacturing policy. These are supported by broadly-based endeavours, such as the Brockhouse Institute for Materials Research, named after McMaster’s Nobel Prize recipient, Bertram Brockhouse, which fosters research and graduate training across all Faculties, to more focused efforts like the new Biointerfaces Institute. The McMaster Institute for Automotive Research and Technology has recently moved to a new \$22-million automotive research facility. Closely linked to this stellar facility is the ArcelorMittal Dofasco Centre for Engineering and Public Policy, the Institute for Manufacturing Policy Analysis and Knowledge Transfer, the Automotive Policy Research Centre and the Managing Innovation and Technology Program. These have spawned opportunities for both experiential learning (e.g. the solar car team) and entrepreneurship.

## **7. Business and economics**

The DeGroot School of Business combines in-class experiences with practical, real-world situations through co-op and internship opportunities for students in the Bachelor of Commerce program, as well as MBA and PhD programs. The Department of Economics, one of the leading economics undergraduate programs in Canada, exposes students to emerging research through the McMaster Experimental Economics Laboratory and the Statistics Canada Research Data Centre (RDC). In addition, programs such as the Master of Engineering Entrepreneurship and Innovation help students create and plan new technology-based business ventures.

## **8. Policy and ethics in a globalized world**

McMaster has particular strength in the development and application of policy in a variety of fields, including social, economic, health and environmental policy. A number of programs build on this strength, such as the PhD program in Health Policy and the Master’s in Engineering and Public Policy. The McMaster Health Forum was launched to engage diverse stakeholders, such as researchers and policymakers, in collective problem-solving to improve health outcomes. McMaster also hosts the Canada Research Chair in Public Policy and Globalization, as well as the Institute on Globalization and the Human Condition, which addresses issues such as conflict and security, governance and citizenship, and environmental sustainability. Building on McMaster’s internationally recognized expertise in legal philosophy and constitutional law, the Faculty of Humanities recently introduced the Justice, Political Philosophy and Law Program, which fosters a sophisticated understanding of the law and legal institutions.

## **9. Human behaviour, culture and society**

McMaster recognizes society’s need to better understand how human behaviour shapes and is shaped by our social interactions and cultural understandings of the world. Through the study of history, political and social institutions, economic exchange, literature, languages, religion, philosophy, art, and popular culture, McMaster researchers engage in foundational research that seeks to understand how societies are and have been organized, and how and when societies and cultures change and develop. McMaster scholarship is internationally-renowned, and ranges from the work on Bertrand Russell and the Dead Sea scrolls to the philosophical foundations of legal institutions and Indigenous knowledge systems. Scholars of human behaviour, culture and society inculcate in their students the desire to create new knowledge, and to seek answers to far-reaching questions that challenge our existing understanding of the world.

## **10. The arts and creative expression**

Thinking creatively is at the heart of innovation, and creativity thrives in societies that cultivate imagination. With one of the country’s top university art galleries and a new concert hall, black box theatre and studio art facility all under construction, McMaster scholars and students have multiple opportunities to engage in artistic production and performance. The Multimedia program is distinctive for its emphasis on creative production, including the creation of electro-acoustic music through live coding on laptops, mixed-media art and gaming, and other virtual worlds. The Institute for Music and the Mind involves an exciting collaboration of musical performers and researchers who study the production, effects and nature of their performance. McMaster’s Studio Art program introduces students to forge and printmaking facilities not available at many other universities, and has led the way in the promotion of sustainable art practices. Graduates of McMaster’s many arts programs have made a significant contribution as entrepreneurs and administrators to the development of a thriving creative economy in the city of Hamilton.

## **Programs for Growth**

### **Background**

McMaster University provides the following rationale for these areas of program growth, each of which is aligned with our strategic goals in research and education, as well as with our vision, as articulated in President Deane's letter, *Forward with Integrity*.

In addition to the specific programmatic areas listed below there are several areas of generic growth envisaged. For example, practice-based and professional programs leading to master's degrees enable university graduates to acquire advanced skills, develop competencies through experiential learning and build their professional networks. McMaster has demonstrated strength in this area, which builds the foundation for new offerings as the need arises. These programs enable McMaster, as a research-intensive university, to translate research outputs and knowledge into practical learning that will greatly enhance the competitiveness of Ontario enterprises, and most of our Faculties intend to develop and expand their programming in this area

McMaster is also home to an engaged student population with unparalleled enthusiasm for identifying innovative solutions to emerging social problems. Our goal is to foster and sustain this commitment to entrepreneurship through an expanded range of offerings. In addition to the specific degree programs described below, the development of the new Centre for Student Entrepreneurship will enable students from all disciplines to interact while learning about successful approaches to business creation and development. This will be supported by courses, workshops and experiential learning opportunities that span disciplines and engender collaboration.

#### **1. Health Sciences and the broad determinants of health**

McMaster is committed to providing interdisciplinary perspectives on contemporary issues in health and society, and to building on its demonstrated success in scholarly and educational programs that study the health of individuals and society at large. Strategic growth in the Faculty of Health Sciences will include an expansion of the Bachelor of Health Sciences program. Growth is also planned in the Master of Health Science Education program (which plans to launch a doctoral studies option), the Master's of Global Health, as well as within interdisciplinary engineering programs in biomedicine and health care. The Global Health program is in high demand from students who want to take advantage of McMaster's interdisciplinary strengths in health, policy, and international affairs. The international training components prepare graduates to make a difference to health systems, health policy, and health care across the globe. Other areas of growth will include expanded MD/PhD training and an MD/MSc option, along with new graduate programs in public health, child life studies, and clinical laboratory science. The novel Biomedical Discovery and Commercialization program (Bachelor and Master's degrees) focuses on the rapidly emerging area of biomedical discovery and innovation, offering students with entrepreneurial interests in biochemistry and biomedical sciences an opportunity to engage in a multidisciplinary training program designed to produce career-ready graduates who combine practical research skills with strong business acumen, and develops a paradigm that can be replicated through other inter-Faculty collaborations. McMaster's planned Master's in Public Health program builds on the University's renowned strengths in Health Policy and Health Research Methodology. Notably, the program will be co-located with local public health and primary health care practitioners at McMaster's new Health Campus in Downtown Hamilton, in a collaborative and integrated health learning environment. With a focus on evidence-based policy and practice, graduates will be prepared to tackle the increasingly complex health issues of today's world.

In addition there will be growth in the Faculty of Social Sciences social gerontology and health studies programs, where students will develop highly specialized skills and knowledge in the study of health and aging.

#### **2. Fostering robust societies**

Building on the above, we have identified both opportunities and needs for graduates who can address a range of critical societal issues and challenges. These range from the need to assist people with disabilities such as autism, to enabling community support within disadvantaged populations. Some of these programs will also be focused on the diversity of cultures in our midst. Students in these programs will be exposed to societal issues through experiential learning, both within and beyond the classroom, and provided with capabilities in critical thinking and adapting to change. These programs will also foster a greater social good through integrated education, co-op and internship opportunities, and research. Examples include a new degree-completion program in Health and Community Studies (a collaboration among the Faculties of Health Sciences and Social Sciences and Mohawk College) that is scheduled to begin in 2015; a new honours degree in Indigenous studies; a new Bachelor of Applied Science program in Autism and Early Childhood Education (in collaboration with Mohawk); and a PhD in Labour Studies. The latter will open more doors for part-time students to complete a PhD that hones their research and analytical capabilities, while they remain employed. The Faculty of Social Sciences will also expand its capacity for graduates to translate academic knowledge and analytical abilities into professional practice and community-based research in areas such as social work and

health, aging and society. In addition, an interdisciplinary Master's degree in the general area of "big data" will be developed. The Institute for Globalization and the Human Condition, a flagship educational and research initiative brings together a number of active interdisciplinary research projects. Also, the highly successful Master's in Global Health led by our Faculty of Health Sciences will be expanded and complemented by a new doctoral program. This program will continue to expand our already robust suite of international partnerships. Our recently introduced Master in International Relations program has been a tremendous success. The Faculties of Humanities and Social Sciences are collaborating to offer a new degree in global development and peace studies, which will offer undergraduates an enriched learning experience, including opportunities to engage with global organizations and communities through field work.

### **3. Business and Economics**

The DeGroote School of Business is committed to developing new diploma and master's programs, along with integrating more professional designations into the MBA program. In addition the school is developing an MSc in Commerce as a research degree designed to feed Commerce graduates into the PhD program. The Faculty of Health Sciences and the DeGroote School of Business are committed to partnering in the development of new health professional management programs to address the gap in creative health management expertise. In addition, the School of Business and the Faculty of Engineering will position new joint professional Master's degrees and research partnerships that will create a unique synergistic environment, combining business and commercialization skills with a strong foundation of technical expertise.

### **4. Science and Engineering**

The Faculty of Science has proposed a Master's in Financial Mathematics and is exploring professional Master's degrees in Genetic and Genomic Analysis; Environmental Monitoring; Nutrition, Activity and Health; and Biomechanics and Ergonomics. The Faculty sees a tremendous opportunity to translate research outcomes into practical, advanced training for Science graduates. The Faculty of Engineering is developing a new undergraduate degree in Industrial and Systems Engineering with the intention of later creating graduate offerings in this area. This will address the changing global economy, and the nascent "Internet of everything", which is causing organizations of all types to find ways to provide digital solutions in an increasingly digitally infused economy. As noted above, the Faculty of Health Sciences is committed to growth and differentiation in its professional programs, partly through collaboration with the Faculty of Engineering. Two programs already mentioned will impact this area as well. The interdisciplinary Master's degree in the general area of "big data" noted above will involve both the Faculties of Science and Engineering. In addition, we note the new joint professional Master's degrees and research partnerships between Business and Engineering referred to in the previous section.

### **5. Communications and Culture**

A new PhD in Cultural Studies, Communication and Multimedia will build on two successful Humanities Master of Arts programs to involve students in interdisciplinary, community-engaged research projects and hone their skills in analyzing the impact of media and digital communication on the world. The Faculty of Humanities is working with Mohawk College to create a combined university undergraduate degree and college diploma that will provide students with internship experiences and the technical skills in the field of professional communication and public relations.