



UNIVERSITY OF
TORONTO

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Introduction

The recent climate change accord in Paris promises to mark the beginning of a new era of multilateralism and international cooperation. It also highlights the potential of Canadian leadership in tackling the toughest challenges of the 21st century. For our country to lead successfully, we will need to redouble our search for innovative solutions, ensure public policy is grounded in the latest research and evidence, and harness the talent of all Canadians.

Universities are key partners in helping the Government achieve its ambitious goals of growing the economy, reinvesting in key infrastructure, strengthening the middle class and creating opportunities for all citizens. Research-intensive universities in particular are essential in today's global and knowledge-based economy, and play an out-sized role in contributing to our prosperity and quality of life. New discoveries and innovations made by our scholars are laying the groundwork for paradigm-shifting technologies and policies that will improve Canadian productivity and wellbeing. Our institutions act as anchors for high-value R&D clusters, attracting new business and investment and helping to diversify the economic base of communities. Research-intensive universities are also educating the most-talented and entrepreneurial members of our work force, exactly those individuals Canada needs in order to capitalize on the emerging opportunities of the new global economy.

The University of Toronto recommends the Government of Canada continue to support and grow universities' ability to deliver these benefits by:

- Reinvesting in the **Granting Councils** and **Research Support Fund** to drive growth in basic research.
- Creating a dedicated stream of funding for **Research and Innovation Infrastructure**.
- Renewing Canada's internationalization agenda through an **International Exchanges Fund** for young researchers and entrepreneurs, and through a **Global Partnerships Fund** to support strategic international research collaborations.

Improving Productivity

Canadians enjoy an enviable quality of life, with Canada ranked as one of the best places in the world to live by Harvard's Social Progress Index and the OECD's Better Life Index. However, many economists have warned that our future prosperity is at risk if we do not improve our productivity performance.

For decades Canada has struggled with poor productivity growth. A recent report by the Conference Board of Canada found that, had Canadian productivity growth matched the United States' between 1988 and 2008, Canadians would have an additional \$7,500 in personal disposable income and corporate profits would be 40% higher. A primary reason for this

weakness is our poor performance in innovation, the development of new technology and production methods to boost our competitiveness.

This is where universities can play a pivotal role. Universities are an integral part of the innovation landscape and eager partners in the task of fostering the people and ideas that will allow Canada to lead in the decades ahead. Universities drive the dynamism and resilience of local economies, while providing an important stabilizing force.

At the University of Toronto more than 60 researchers are focusing their efforts on developing “green” cities, through their work on topics related to water, energy, building materials and the management of natural resources. For example, Professor Elizabeth Edwards is developing techniques to harness eco-friendly enzymes to replace fossil fuels to make plastics and industrial chemicals. Towards this end Professor Edwards established the Industrial Biocatalysis Network with \$5 million from the Natural Sciences and Engineering Research Council Strategic Network Grants program. Through the new Network, researchers from U of T and its academic and industry partners will work together to find enzymes that can convert renewable resources from traditional sectors— such as agricultural and forestry waste – into new materials in support of green manufacturing.

U of T welcomes the Government’s focus on strengthening fundamental research and the recognition of the importance of science as emphasized in the recently released ministerial mandate letters. The creation of Canada Research Chairs in sustainable technologies is also a positive initiative.

To support basic research in Canada, we believe a meaningful reinvestment in the Granting Councils is needed. The Granting Councils, comprised of the CIHR (Canadian Institutes of Health Research), NSERC (Natural Sciences and Engineering Research Council), and SSHRC (Social Sciences and Humanities Research Council), are the bedrock of Canadian research, but their budgets have declined in real terms since the financial crisis. Competition for basic research grants is intense, and success rates have fallen across many core funding programs, resulting in diminished potential of our most highly skilled talent. Similarly, the Research Support Fund, which assists universities with the institutional costs of research, has not kept pace with the growth of Canadian research capacity. As a result, a growing burden of costs associated with externally funded research has been borne by universities’ increasingly strained operating budgets.

- The University of Toronto recommends the Government of Canada support basic research through a reinvestment in the **Granting Councils**, returning their budgets to at least 2007-08 inflation-adjusted levels over four years.

- The University of Toronto also recommends the Government invest in the **Research Support Fund**, moving toward supporting a minimum floor for institutions of 25% of direct research costs over four years.

Improving Infrastructure

Modern infrastructure is essential for Canada's competitiveness and long-term prosperity. Many Canadian communities face infrastructure deficits that demand the Government's attention to ensure people and goods can continue to move. The Government has committed to rebuilding Canada for the new century, and we believe this presents a timely opportunity to invest in infrastructure to promote economic growth strategically by targeting research and innovation infrastructure. In addition, these investments will support other key priorities, including entrepreneurship, green technology and energy efficiency.

While the Canada Foundation for Innovation (CFI) does much to support the equipment and lab construction costs for specific teams of researchers, universities still face significant challenges to expand and modernize their science and teaching buildings. These major infrastructure projects encompass costs beyond the programs of individual scientists and research teams and the existing CFI program.

An example where the need for major research infrastructure investment was addressed is through the Knowledge Infrastructure Program (KIP). In 2009 the Governments of Canada and Ontario invested \$11 million through KIP to transform the top floor of U of T's Mining Building from an unused attic into an innovation suite that supports joint research with industry partners. This space now houses graduate student lab space and an interdisciplinary research institute that supports a key sector for Canada. This project also won a Canadian Green Building Award in recognition of the project's advanced sustainability and energy efficiency methods.

Universities are excellent partners in managing major public infrastructure projects. The Federal Government can play a significant role in supporting major new infrastructure at Canada's universities.

- The University of Toronto recommends the Government create a new stream of dedicated funding to support major **Research and Innovation Infrastructure**.

Leveraging International Opportunities

Just as Canada was founded on trade and immigration, our future prosperity will depend on the flow of goods, people and ideas across our border. Universities are excellent conduits through

which to attract the world's most talented individuals and to forge new, high-value partnerships with global thought leaders.

The University of Toronto hosts more than 14,000 international students from every corner of the globe. Many of these students choose to stay in Canada after graduation, integrating into the labour market and contributing to the economic and social fabric of our communities. Those students who return home after their studies bring with them lifelong connections that bind them to Canada.

Dr. Samah El-Tantawy exemplifies the potential of our international students. Originally from Egypt, her research on artificial intelligence led to the development of a smart traffic light control system that adjusts to traffic patterns in real time. This innovation has the potential to reduce average delay in intersections by 40% compared to traditional pre-timed traffic signals, saving motorists, municipalities and taxpayers time and money. To commercialize this success, El-Tantawy founded the spin-off company Pragmatek Transport Innovations in 2013.

We also believe that young Canadians can have transformative experiences by learning from peers and mentors abroad. Other countries have new approaches to research and development, and offer different perspectives on how to extract economic benefit from discoveries. Early international experience for our young entrepreneurs and researchers instils a more sophisticated understanding of foreign milieus, which over the longer term will allow these individuals to operate more effectively in a global business environment.

- The University of Toronto recommends the Government support the mobility of young researchers and entrepreneurs by funding **International Exchanges** through which they can diversify their skills, build new contacts, and develop new avenues to commercialize their work.

In addition to our internationalized student body, U of T's researchers similarly have a very global outlook. More than 45% of the academic papers written by our researchers include at least one international co-author. Our researchers have active partnerships in 950 municipalities around the world.

The Government of Canada is addressing the need for renewed global partnerships in their trade and investment policies. Global research networks and international collaborations can support these goals. Research excellence is key to Canada's attractiveness to outside partners, but so too is its ability to react nimbly to seize opportunities as they arise. Unfortunately, researchers seeking operating funds to establish new partnerships are often constrained by the timelines of the Granting Councils' award cycle.

- The University of Toronto encourages the Government to establish a **Global Partnerships Fund** within the Granting Councils. This new program, with an expedited peer review process, would help ensure that Canadian researchers secure the most promising international opportunities in areas of strategic importance to Canada.

Conclusion

Universities provide Canadian youth with the tools to seize opportunities unimagined by earlier generations. With support from the Federal Government, universities also lead in the creation of knowledge that is critical to our national R&D capacity and which will guarantee our future prosperity. Our country will face unforeseen challenges in the year ahead, but universities stand ready as partners to help Canada thrive.