



An Action Plan For Prosperity

Co-chaired by The Honourable John P. Manley, P.C., O.C., and Paul Lucas
October 2010

The *Coalition for Action on Innovation in Canada (CAIC)* aims to forge a consensus across a broad range of stakeholders nationwide by bringing together as many influential voices as possible behind a focused and achievable agenda to position Canada as a world leader in innovation. Leaders from across business sectors and from the academic community are working together to remove the barriers holding Canada back from taking its rightful place as a leader on the world innovation stage.

The Innovation Challenge

Canada has a lot going for it in today's global economy. Our traditional resource base is in high demand. Our population is among the best educated in the world. Canadian communities are beacons of diversity, filled with global citizens. Our public finances are relatively strong. Our tax rates are increasingly attractive. Our markets are open. Our businesses are moving more confidently into a wider range of international markets. As a result, Canadians today enjoy an enviable standard of living and quality of life. But we cannot afford to be complacent. Our future prosperity is threatened on three fronts:

- 1. Global competition.** The global economy is being transformed by the rise of China, India and other emerging markets. This creates opportunities for Canadian exporters and investors. But the continuing spread of information and communications technologies means that high-value knowledge work can be done anywhere. Beyond our traditional role as hewers of wood and drillers of oil, every single Canadian enterprise is faced with a relentlessly intense new level of competition. In this dynamic economic environment, we must seek to understand what we as a country can do better than others, and how we can maintain a competitive edge in everything we do.
- 2. Demographics.** As in other developed nations, Canada's population is aging. The growing proportion of seniors will add to the demand for public services, especially health care. We will be counting on fewer working, taxpaying Canadians to carry the load, and employers will find it increasingly difficult to recruit skilled labour. The only way to avoid a future of slower economic growth and higher taxes is to enable each and every Canadian to create more value and earn more money for each hour of work.
- 3. Productivity.** A prosperous future therefore requires rapid growth in our productivity, the basic measure of how much value each worker creates. Our recent performance leaves much to be desired. Over the past decade, our productivity grew at an annual pace of just 0.7 percent. That is well short of the pace in the United States, and half the pace Canada itself recorded in the previous two decades. If we do not improve this performance dramatically, our potential for economic growth will shrink and our prosperity will suffer.

Canada cannot hope to prosper in the face of increasingly intense global competition, and meet the needs of an aging population, by doing what we always have done. We need to stop taking our prosperity as a given. We need to commit ourselves to a lifetime of learning. We need to create more wealth and make more effective use of the wealth we have. We need to enhance our productivity and unleash the ambitions and potential of our entrepreneurs. We must embrace a future of dynamism and uncertainty. **We must become a nation of innovators.**

Innovation: Creating Value Through Ideas

Innovation is a widely used term that means different things to different people. We define it broadly as encompassing much more than research and invention.

Innovation puts ideas to work. It requires action that creates value. Innovation may enable us to meet new needs in new ways, or to get better at meeting existing needs. It may lead to the development of new products, improve the quality or cost of what we already make, or simply help us work more efficiently. Innovation may both create direct economic value in the marketplace and improve our quality of life in less tangible ways.

Innovation matters everywhere. Innovation drives the ability of the private sector to create wealth in a competitive global economy. Innovation is equally vital in the development and delivery of public services, and within charitable and non-profit organizations in our communities.

Innovation is an attitude. An innovative society is entrepreneurial: it welcomes risk; it learns from failure; it celebrates success.

Building Consensus, Inspiring Action

In October 2009, a national roundtable on innovation brought together a diverse group of innovation leaders in the private sector and academia. Those of us who participated took as our starting point the 2009 report of the *Council of Canadian Academies*, which concluded that the persistent weakness of productivity growth in Canada is actually a business innovation problem — that too many companies adopt strategies that place too little emphasis on innovation.

The roundtable launched a vigorous discussion that led to several clear conclusions. The issue has been thoroughly studied. We know to a great extent what needs to be fixed. Plenty of good ideas already have been put on the table. What has been missing is the impetus to **move from discussion and study to action**.

The result was the launch in the spring of 2010 of the *Coalition for Action on Innovation in Canada*. The circle of roundtable participants has been expanded. We represent diverse perspectives within industry and academia, but we are both thinkers and doers. We are committed to driving innovative behaviour within our own sectors. We are determined to build a broad consensus on what governments can and should do now to move Canada toward the ultimate goal: **transforming Canada into an innovation leader**.

Public Policy and Private Action

Canada has a strong record of public investment in research, primarily through post-secondary institutions but also in government labs. Where we are falling behind other countries is in the private sector. We often fail to recognize and develop the commercial potential of our academic discoveries. Businesses are doing too little research of their own and are failing to invest sufficiently in new, productivity-enhancing technology. Inventors who launch new companies find both venture capital and entrepreneurial expertise in short supply. Too many small companies stay small. Too many companies that succeed in growing sell out quickly, with their intellectual property, the juiciest fruits of invention, snapped up and often moved offshore. The result is a business community with far too few innovative companies that qualify as global champions.

As leaders in business and academia, we recognize our own responsibilities. We must do whatever we can within our enterprises and institutions. We must set an example for the country. We must do better at moving ideas out of labs and into the marketplace, at connecting inventors with investors, at modernizing our processes, at helping Canadians to acquire the skills they need to take risks and succeed as entrepreneurs and innovators. We must energize. We must inspire. We must act.

At the same time, public policy matters. What governments do, or don't do, has a powerful impact on how and where businesses choose to invest. Tax rates, regulatory approval processes, intellectual property rules, competition policy, restrictions on foreign ownership, government procurement practices: the list of public policies that affect business decisions is vast.

It is inevitable, therefore, that much of what others have recommended and what we highlight in our recommendations focuses on what governments can do to enable a more innovative economy. We do not believe, however, that governments can close the innovation gap simply by throwing more money at the problem. Most of our recommendations for government action focus on removing obstacles to innovation, or on realigning existing resources to get a bigger bang for the same buck. Innovation in public policy is vital if we want to drive more innovation by private enterprise.

What We Recommend

The October 2009 roundtable identified seven key themes for action on innovation: improving tax policy; nurturing start-ups; strengthening business-academic links; building the innovation talent pool; reshaping framework policies; developing innovation clusters; and ensuring effective ongoing advocacy for innovation.

The Coalition established a multi-sector team of 50 leaders from business, academia and supporting organizations to focus on these seven themes, and challenged participants to put forward a maximum of three key actions for each one. We quickly found a high degree of consensus, with some key recommendations being advanced by more than one team. In many cases, governments have already taken positive action to address the issues identified by coalition participants; what is needed is a more concerted focus to build on the work that has already been done. The resulting recommendations fell into two categories: actions that business, academia and governments could take quickly and at low cost; and actions that would have a profound impact on research and business investment but would have significant fiscal consequences.

Here we present first a list of 10 priority items that we believe Canadians can begin to put in place within the next 12 months. We also offer a handful of other measures that governments should consider but that require further discussion and decisions about spending or tax trade-offs. Taken together, we believe that the measures we are recommending would make a real difference in putting our country firmly on track toward an innovative and prosperous future.

Ten Steps Toward a More Innovative Canada

Reform tax support for research and development.

As pointed out by the Council of Canadian Academies, Canada is unique in its high degree of reliance on tax-based incentives to support research and development, primarily through the Scientific Research and Experimental Development (SRED) tax credit.

The current system of tax credits is a powerful tool, but is inconsistently applied across industries and sizes of companies. Three key issues have been identified: the lack of refundability except for enterprises that meet the narrow definition of “Canadian-Controlled Private Corporations” (CCPCs) makes the credits useless to unprofitable, publicly traded companies; the definition of eligible research is restrictive and excludes much innovation-related investment; and the administration of the program by the Canada Revenue Agency is often adversarial and unpredictable.

The federal government should launch an immediate and thorough review of the SRED criteria, definitions and administration to make the credits more broadly, consistently and predictably accessible. The review should benchmark other OECD countries to ensure that Canada’s system produces the best possible results for the tax dollars invested. Among other options, the government could consider a refundable wage credit for R&D workers rather than the non-refundable SRED. While simply expanding access to SRED credits could have a significant fiscal cost, the government could reset the level of the credit to ensure that any reforms are fiscally neutral.

Expand the pool of risk capital.

While there are thousands of technology companies in Canada, the vast majority are small businesses. Roughly 200 companies headquartered in Canada account for the vast majority of private sector R&D spending. This group of companies represents the future of business innovation in Canada, yet the base is extremely fragile. One major impediment to growth is a persistent shortage of risk capital through the funding cycle, from seed capital through the venture stage to mature growth. The result is that better-funded foreign companies often become acquirers of financially weak Canadian counterparts, even where Canadian enterprises have the better and more innovative intellectual property.

Building a larger pool of risk capital in Canada is essential if we are to create and grow tomorrow's successful enterprises. One approach that is gaining favour in Canada and other jurisdictions is the establishment of government-sponsored co-investment funds that invest in innovative companies alongside private-sector investors. Such funds act as magnets for new seed and early-stage investment by investing in emerging companies at the same time and on the same terms as angel investors and venture capital funds. Typically, co-investment funds follow the screening and due diligence processes of qualified private investors, ensuring market-based investment decisions.

Of course, the co-investment model can only succeed in cases where private investors are ready and willing to take the first step. Banks and pension funds once were significant providers of risk capital, but over the past 10 years these institutions have largely withdrawn from funding technology companies in Canada. Financial institutions need to rebuild their management talent in this sphere – drawing where possible on established entrepreneurs with operational experience – and allocate a small but significant portion of their assets to long-term investment in technology- and knowledge-based companies.

Adopt the world's strongest intellectual property regime.

A robust climate for innovation is only possible if Canada's regulatory processes encourage the development and launch of innovative products and if our laws ensure that inventors and those who invest in their ideas can fairly reap the rewards of their work. Canada should aim for a reputation as the best place in the world in which to research, develop and bring to market new products and processes. To achieve that goal, it is imperative that Canada seize current opportunities to improve its protection of intellectual property and thereby create a more attractive environment for investment in innovation.

Beyond legal and regulatory changes, businesses need consistent, timely and relevant treatment of intellectual property developed at post-secondary institutions. IP policies at institutions and granting agencies, including those dealing with disclosure and licensing, must facilitate collaborative research and encourage innovation. The business and academic sectors should launch a national dialogue aimed at creating a clear and consistent framework for IP agreements between individual companies and institutions.

Strengthen business-academic links.

Canadian businesses and educational institutions engage in a wide variety of cooperative ventures, but their efforts to collaborate often have been stymied by barriers ranging from "hard" issues of funding and intellectual property ownership to less tangible considerations such as differences in expectations, culture and behaviour between academia and the private sector.

Several mechanisms for bringing academic researchers and companies together already exist, such as the Strategy for Partnerships and Innovation at the Natural Sciences and Engineering Research Council, the Networks of Centres of Excellence and the College and Community Innovation programs of the three major granting councils. We need to learn from and build on these successes. In particular, business and academia should consider a pilot program that would identify up to 25 partnerships that would be nurtured through access to top coaches and other support. This will require careful program design but could be done at minimal additional public expense by leveraging the resources of Canada's established small-business incubators and the assistance of retired executives from the private sector. The goal should be to build a portfolio of success stories that would inspire and motivate further innovation.

Tap private-sector expertise when spending public money.

The federal government alone spends billions of dollars annually to support research and innovation through granting councils, agencies, direct grants and tax expenditures. In recent years the government has sought to increase private-sector representation at the granting council level – an excellent example being the Private Sector Advisory Board established by the Networks of Centres of Excellence Secretariat. We strongly endorse this approach and encourage more members of the business community, as well as retired executives, to volunteer their time and expertise in support of these activities.

At the same time, we recommend that governments also take advantage of private sector experience and knowledge in developing new research and innovation initiatives, choosing among priorities in public spending and evaluating the effectiveness of existing programs.

This would ensure that lessons learned in the marketplace would feed back into the government decision-making process, enabling public resources to be spent more effectively over time, especially as they support the commercialization of publicly funded discoveries. While respecting the government's authority and accountability for public expenditures and the integrity of the peer review process, such a mechanism will be effective only if private-sector advisors have real clout.

Speed adoption of innovative products and services.

Canadian companies cannot hope to succeed in the 21st century global economy by relying on 20th century technology. Yet Canada ranks only middle of the pack by OECD standards in business investment in new machinery and equipment as a share of GDP. Larger companies that compete internationally tend to be the leaders in adopting new productivity-enhancing technologies. Smaller firms and those facing less intense competition are often slower to invest in new equipment and processes, including advanced information and communications technologies (ICTs) that would allow them to seize new business opportunities. Selective tax incentives to improve private-sector uptake of ICTs would clearly help, but cannot be the only solution. Even more important is heightened private sector recognition of the need and potential for productivity improvement – and, conversely, of the dangers of being left behind as global markets become increasingly integrated, driving new products, services, processes and business models.

Governments, too, can spur innovation by becoming early adopters of innovative products and services. Unfortunately, government purchasing processes generally discourage new and smaller ventures, and policies are biased against unproven products. By contrast, the United Kingdom has since 2008 required each government department to establish an *Innovation Procurement Plan* setting out how it will embed innovation procurement within its purchasing practices and make use of innovative procurement mechanisms. The U.K. also uses a tool known as *Forward Commitment Procurement*, in which the government identifies an unmet need and agrees to purchase products or services that do not yet exist, thereby stimulating suppliers to come up with ways to meet that need at an agreed cost. Through its *Small Business Research Initiative*, the U.K. engages a broad range of companies in competitions for ideas on meeting specific needs that lead to short-term development contracts.

Governments in Canada must become partners in innovation by giving innovative new products and services, particularly those developed in Canada, a trial platform and helping them to achieve the scale and stature needed to penetrate global markets. In its 2010 budget, the federal government announced \$40 million for a two-year pilot program through which federal departments and agencies will adopt and demonstrate the use of innovative technologies developed by small and medium-sized enterprises. Further steps toward innovation in government procurement would stimulate innovation in the private sector in ways that would reduce costs to taxpayers and improve the quality of public services.

Launch a National Learning and Innovation Initiative.

Developing the skills, talent and innovation capacity of individual Canadians is the best way to promote long-term sustainable economic growth. While education is a provincial jurisdiction, improved learning outcomes are a national imperative. Canada has a strong record in ensuring access to basic education for all, and one of the best in the world in terms of participation at the post-secondary level – yet too many children fail to complete high school, and too many young people lack the literacy and numeracy skills required to function in the workplace.

The federal, provincial and territorial governments should agree on ambitious goals for learning that could include: a 90 percent high-school graduation rate with tracked programs to age 21 for the remaining 10 percent; expanding post-secondary enrolment in science, engineering and business education programs; ensuring that all researchers and inventors have access to people with the entrepreneurial skills and commerce competencies needed to drive successful commercialization; and increasing per capita graduation rates at the Master's and Ph.D. levels to match or exceed those in the United States. Governments should harmonize learning and innovation investments across

the federal-provincial divide and benchmark their investments in learning and innovation systems against the best in the world.

At the same time, the private sector must take more responsibility for work-based skills training and lifelong education. According to the Conference Board of Canada, Canadian employers are notably low investors in workplace training programs. Our education system compares unfavourably with that of many European countries in its heavy emphasis on school-acquired knowledge at the expense of workplace skills development. In coming years demographic trends will demand that Canadian companies make better use of older workers – which implies an increasing need for continued and innovative on-the-job training.

Seek out the best and brightest

To innovate and prosper within a competitive global economy, Canada must continue to grow as a champion of diversity, aiming to be a country in which people from all nations can live, learn and work together.

Both directly and in partnership with industry, academic institutions already recruit aggressively abroad for undergraduate and graduate students. However, some other countries, Australia being a notable example, do a better job. These efforts should be reinforced by federal and provincial support for overseas marketing and recruitment and in making it easier for foreign students to obtain visas, work permits and health care while studying in Canada.

Through the Canada Excellence Research Chairs program, the federal government has taken important steps to attract the world's top researchers in four priority areas: environmental sciences and technologies, natural resources and energy, health and related life sciences and information and communication technologies. The research conducted by these global leaders will both spur innovation in Canada and help to make our country a magnet for high-potential students from around the world. To ensure that Canada reaps the full benefit of this initiative, the federal government should continue to expand opportunities for foreign students to obtain permanent immigrant status after graduation. Other provincial governments should consider adopting the very effective British Columbia model of providing standard per-student grants for international graduate students.

Nurture and strengthen innovation clusters

Strong and growing clusters of interrelated industries and institutions are a driving force behind innovation and rising productivity. There is no single or simple recipe for creating and developing innovative clusters; some emerge from local networks of small- and medium-sized firms, while others rely on a keystone company or post-secondary institution that acts as an anchor by spinning off new businesses and attracting investment. A strong business and research environment, a plentiful supply of specialized labour and a range of government policies all are important. But local factors play key roles in cluster development, and framework policies therefore must be flexible.

Federal and provincial governments should align their existing policies and spending to support the development of both regional and local clusters. Universities, colleges, polytechnics and research institutions should work to align their research and training efforts to meet the needs of existing and potential local clusters. Established players in the private sector should assist cluster development by offering advice and guidance to new start-ups, supporting the entry and growth of related firms into an area and consistently communicating their needs to local post-secondary institutions and research centres. All three sectors should form a national network to share know-how and best practices on how to improve cluster competitiveness and reinforce cluster development. Canada already has a number of excellent local cluster organizations. We need to look for opportunities to share best practices both across Canada and internationally.

Ensure ongoing advocacy for innovation

Innovation must reflect an ongoing commitment and effort by individuals and organizations in every sector of society. Government policy should support innovation and avoid creating barriers to creative behaviour, but innovation will be driven in the end by what researchers discover and what businesses do with their discoveries.

The Coalition for Action on Innovation has brought together a diverse group of leaders from the private sector and academia. We have tried not to duplicate the many studies of innovation that others have conducted in the past, but rather to focus on what might be done most effectively in the short term to act on the wise thoughts of others.

As a Coalition, we are inherently a temporary group, but the issues surrounding innovation will be enduring no matter how much action our recommendations may spur. Our final near-term recommendation therefore is that governments, business and academia should collaborate in the establishment of an independent advocacy body with the single mandate of encouraging innovation by Canadian business. Our intent is not to duplicate capabilities that already exist, but to keep the attention of the private sector focused squarely on productivity and innovation, drawing on research and analysis from The Conference Board of Canada, the C.D. Howe Institute, the federal Science, Technology and Innovation Council and other groups; an interim step, and possible alternative, would be to mandate an existing organization with this responsibility.

Regardless of how it is structured, the independent advocacy body must have the capacity to conduct or commission cross-country, sector-by-sector benchmarking of Canadian business to global best practices, as suggested by Kevin Lynch, former Clerk of the Privy Council and now Vice Chair of BMO Financial Group. In his words, “Canada is a market-based economy, and the vast majority of productivity gains must come from business.”

Fiscal Priorities for Driving Innovation

Tax policy has a clear impact on business investment decisions, and targeted tax relief therefore is an obvious tool for stimulating greater private-sector investment in innovation. However, the recent global recession has tipped federal and provincial governments back into deficit, and any recommendations for stimulating innovation through either tax cuts or new public spending must take this reality into account. Measures with a significant impact either in reducing tax revenue or increasing spending may either have to wait until governments return to surplus or be matched with offsetting tax increases or spending cuts in other areas.

As fiscal conditions allow or as fiscal trade-offs are identified, there are three specific measures that would provide powerful stimulus for greater innovation in Canada: tax relief for investors aimed at increasing the flow of capital to innovative companies; tax relief for individuals aimed at increasing the supply of talent; and increased financial support for research institutions targeted at greater commercialization of discoveries.

Access to capital for innovative firms. To succeed in the highly competitive global economy, Canada must create a steady stream of new and more innovative companies. Through the tax system, governments can help to facilitate the growth of next-generation startups by expanding the supply of private risk capital. British Columbia, for example, offers investors a 30% refundable tax credit for investing in innovative businesses, an approach that appears to have had a significant impact in encouraging individual and angel investors to put their own capital at risk. The federal government and other provinces should assess the costs and benefits of this approach and consider expanding it nationally.

Another way to compensate for the serious shortage of risk capital would be to apply the flow-through share model that has been in place for almost 30 years in the energy and minerals sectors. The flow-through share program was originally designed to promote mining and oil and gas exploration and development by allowing junior companies that are in a non-taxable position to transfer their resource expense deductions to investors. In 1996, the program was extended so as to promote investment in the renewable energy and energy conservation industries. By any measure, the program has been a success: it has helped make Canada a global leader in resource financing, and a 2007 study by Natural Resources Canada found that every \$1 of government expenditure via the flow-through credit resulted in \$2.60 of incremental activity. To stimulate investment in innovative startups and leverage Canada’s world-class scientific and knowledge expertise, the federal government should consider applying the flow-through share model to research-based companies outside the energy sector.

Tax relief for recruiting and developing talent. Innovative companies are driven by innovative people, and Canada needs to compete globally to attract and retain talent. The most immediate step should be to reverse the

policy that creates a tax liability for employees the moment they exercise stock options, which undermines the value of this tool for both employers and employees. Governments also should consider tax breaks for individuals or companies aimed at attracting highly talented people from abroad. Quebec, for example, currently offers a five-year provincial tax holiday for foreign researchers and managers who are recruited by a company in Canada to work on an innovation project in the province.

Tax relief also should be considered as a means of enabling more young people in Canada to connect with the world of business. Canadian students gain valuable experience through a wide variety of opportunities such as internships, practicums, work-study programs and co-operative education. Governments should encourage more businesses to hire students for all forms of co-operative education through a grant or tax credit worth 50 percent of salaries, wages and benefits for a student's first work term or co-op placement.

Increased support for indirect costs of research. The federal government introduced the Indirect Costs Program in 2003 to help post-secondary institutions cover some of the overhead costs of research. On average, this covered indirect costs equal to 21.9% of direct research costs. Other countries, notably the United States, provide more extensive support of indirect costs, including the funding of much more robust industry liaison and technology transfer offices. Until this discrepancy is remedied, Canadian post-secondary institutions are unlikely to commercialize discoveries to the same degree as their counterparts in the United States. Canada should aim to boost funding of indirect costs to 40% of direct research costs. An important step would be to raise the level of funding for research programs that entail partnerships between business and academia. Such programs typically require more administrative support than other kinds of research and are unlikely to be pursued as vigorously unless post-secondary institutions have access to appropriate funding.

The Time For Action Is Now

The innovation challenge Canada faces is complex. No single policy change will suffice. Even the array of recommendations we have made will not by themselves solve the entire problem.

But our recommendations are practical. Many of them can be put in place quickly. They deserve and should be able to attract broad support across all sectors of society. They can produce measurable results. Individually and taken together, they would make a real difference.

In public policy as in business, we must be prepared to take risks. We must accept that some of the ideas we try will not produce the results we hope. We must be prepared to learn from our mistakes and adapt our approaches accordingly. But we believe that each of these recommendations would move us in the right direction, and that it makes no sense to wait. **The time for action is now.**

Coalition for Action on Innovation in Canada - List of Members

Greg Aasen	Glen Hodgson	David Naylor*
Michele Austin	Sriram Iyer	Martha Piper
Suzanne Benoit	David Johnston*	John Plant
Tom Brzustowski	Wilf Keller	Ken Putt
Lorne Burns	Kevin Keough	Carol Reynolds
Arthur Carty	Veronica Lacey	Jonathan Rhone
David Castle	Pierre Lapointe	Joseph Rotman
Adam Chowaniec	Paul Lavoie	Brad Sakich
Iain Christie	Mark J. Lievonon	Michelle Savoie
Paul Clark	Lynda Leonard	Bonnie Schmidt
Marcel Côté	Paul Lucas (Co-Chair)	Vicky J. Sharpe
Elizabeth Dowdeswell	John Manley (Co-Chair)	Kevin Stolarick
Morgan Elliott	Preston Manning	David Strangway
Karimah Es Sabar	Timothy McGuillicuddy	Ilse Treurnicht
Jim Fletcher	Donald McInnes	Mike Volker
Suzanne Fortier	Tim Meyer	John D. Williams
Anne Golden	Jim Milway	Russell Williams
Peter Harder	David Mitchell	David Wolfe
Michael Hayden	Arnold Naimark	

Members identified in **bold** served as team champions

* David Johnston and David Naylor devoted time and energy to the Coalition but were required to withdraw prior to completion of the report due to other commitments.

“The Coalition for Action on Innovation in Canada is an exciting and well-timed project that began with the National Innovation Roundtable in October 2009. Building knowledge, talent, and innovation is the core mission of the University of Waterloo and so I was pleased to take on the role of champion of the Building the Innovation Talent Pool team from April 14 to September 30, 2010. I have read the report and enthusiastically endorse its recommendations. My hope is that the work of the Coalition will be used to help better develop Canada’s number one resource in the 21st century – its talented citizens.”

David Johnston
President
University of Waterloo
September 27, 2010