Canada Foundation for Innovation
Fondation canadienne pour l'innovation

BRIEF TO THE

HOUSE OF COMMONS

STANDING COMMITTEE ON FINANCE

ELIOT A. PHILLIPSON
PRESIDENT AND CEO

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CFI's role in Canadian productivity

Canada's future prosperity is dependent on knowledge-based economic growth and improved productivity that will maintain a high quality of life. The source of this productivity is an expanding pool of scientific, analytical and technical knowledge and expertise to carry out research and to apply it at local, regional and national levels, while having the capacity to gather knowledge and talent from the international sphere.

Knowledge transfer occurs through the mobility of people who undertake research and development (R&D) within organizations, and also collaborative R&D that occurs between different organizations. These talented people depend on capital – research infrastructure and equipment, including advanced computing – to innovate. This leads to new products, services, better policies, cost-savings and ultimately the creation of high-skill jobs.

The Canada Foundation for Innovation (CFI) (www.innovation.ca) contributes to these pools of knowledge and expertise. It was established in 1997 with a mandate to invest in *research infrastructure* that will raise the capacity of Canadian universities, colleges, research hospitals, and non-profit research institutions to compete internationally and enhance research productivity.

Research infrastructure includes facilities, laboratories, equipment, computing capability and networking. This advanced capital helps to attract and retain researchers, to carry out world-class research and technology development in all R&D disciplines, and can be relied on for the training of people in the latest technology. The CFI works in a complementary fashion with agencies and organizations—federal, provincial and local—to support R&D at Canadian institutions.

CFI's new governance provisions

Launched as an alternative service delivery mechanism by the Government of Canada in 1997, the CFI is an independent, non-governmental organization with a Board of Directors numbering fifteen. These Board Directors, in turn, report to fifteen Members—a higher governing body similar to a company's shareholders, but representing the Canadian public. Members and Directors bring a wide range of expertise and perspective to their positions, representing research and innovation interests at higher education institutions, non-profit organizations and industry.

At its regular meetings, the Board of Directors make final decisions on infrastructure projects to be funded based on a rigorous merit review process. It also determines strategic objectives of the CFI in the context of the funding agreement with the federal government. It is responsible for formal evaluations of its programs, the results of which are posted on the CFI website. Members of the CFI meet once per year to provide guidance to the Board, and approve the annual report.

The CFI has negotiated with the federal government and amended its Funding Agreement seven times since its establishment in 1997; these amendments have helped to seize

emerging opportunities and to adapt to new circumstances. The amendments recently made to the Funding Agreement include the following key features:

- Provisions for the Auditor General of Canada to undertake performance and compliance audits with respect to the use of funds received;

- Detailed guidelines on investment, including the nature of external expert advice, policy, strategy and management;

- The CFI Board is to ensure that a Corporate Plan be prepared in addition to the current Annual Report;

Because of its unique status as a foundation entrusted with public money, the CFI attaches paramount importance to operating in an economical, effective and transparent manner, and to communicating its activities and results to a wide audience. It also recognizes its responsibility to deliver programs that focus on Canada's needs and on enabling institutions and their researchers to compete in the global, knowledge-based economy.

Impacts of CFI investments to date

Within Canada, the S&T landscape is being transformed through the collective investment from all stakeholders. Research infrastructure is a critical component of these partnership investments, with the potential to address many of the contemporary R&D challenges. Through its emphasis on strategic planning by institutions, its 40:60 funding formula and its funding programs, the CFI has helped to transform the Canadian research landscape.

Since 1997 the federal government has invested $3.65B in the CFI that, with compounded interest, is expected to grow to approximately $4.85B by 2010. This investment will be leveraged to bring a total of $11B to the R&D enterprise in Canada by 2010.

Collaboration around critical research infrastructure was an important consideration in the design of the CFI programs from the outset, and positive results from this approach are evident today. Through a unique funding partnership, the CFI typically **funds up to 40 percent** of a project's infrastructure costs. The funded institution works with its own resources and its partners—primarily the provincial governments, the private sector and not-for-profit organizations to generate the remaining 60 percent required for these projects.

Eight years after its establishment, the CFI has invested in nearly 4,300 projects at 127 universities, colleges, non-profit research institutes and research hospitals in 62 municipalities across Canada. These projects have helped to attract more than 8,000 researchers since the year 2000 – with approximately 20% coming from the U.S. and 17% coming from other countries. More than 34,000 post-doctoral and graduate students in Canada have used state-of-the-art research facilities and equipment supported by the CFI.

This sophisticated research infrastructure requires high-skill management and technical personnel to maximize its use and benefits. Indeed, more than 9,600 technical personnel

have been trained on the use and maintenance of research infrastructure supported by the CFI. These highly skilled personnel—such as those capable in high-performance computing, imagery and robotics— play an important role in maintaining the innovation capacity at Canadian research institutions.

Nearly one-third of the projects that have received CFI funding report that the availability of the research infrastructure has fostered the formation of local or regional technology clusters in a significant or critical way and well over half report that the research infrastructure encouraged financial support from Canadian industry.

Investments made in research infrastructure serve as a beacon of attraction for researchers, helping institutions to build their expertise from abroad and from different sectors. As a result of these investments, established world-class and promising young researchers are being attracted to the facilities at Canadian institutions, young researchers are being trained in leading-edge facilities, the research itself is being transformed by networking and collaboration, and research and technology clusters are emerging. In short, the Canadian capacity for research and development (R&D) is being dramatically enhanced in areas of strategic importance.

CFI's new programs

In order to remain internationally competitive, Canada's R&D enterprise must meet the challenges of the day while anticipating future trends. Advances in research and technology development are only possible when people have the tools they need. To remain at the leading edge, we must rely increasingly on sophisticated infrastructure that can serve the various domains of research and technology development, for example biotechnology, nanotechnology and alternative energies.

In June 2005, the CFI launched a new program architecture for 2006-2010 following extensive discussions with the various stakeholders over the last year. This new approach is meant to address the changing environment as it relates to research infrastructure over the short to medium terms and to meet the following objectives:

1. Enable leading edge research and technology development for the benefit of communities and Canada

2. Provide infrastructure in a changing environment

3. Sustain existing successful and productive infrastructure

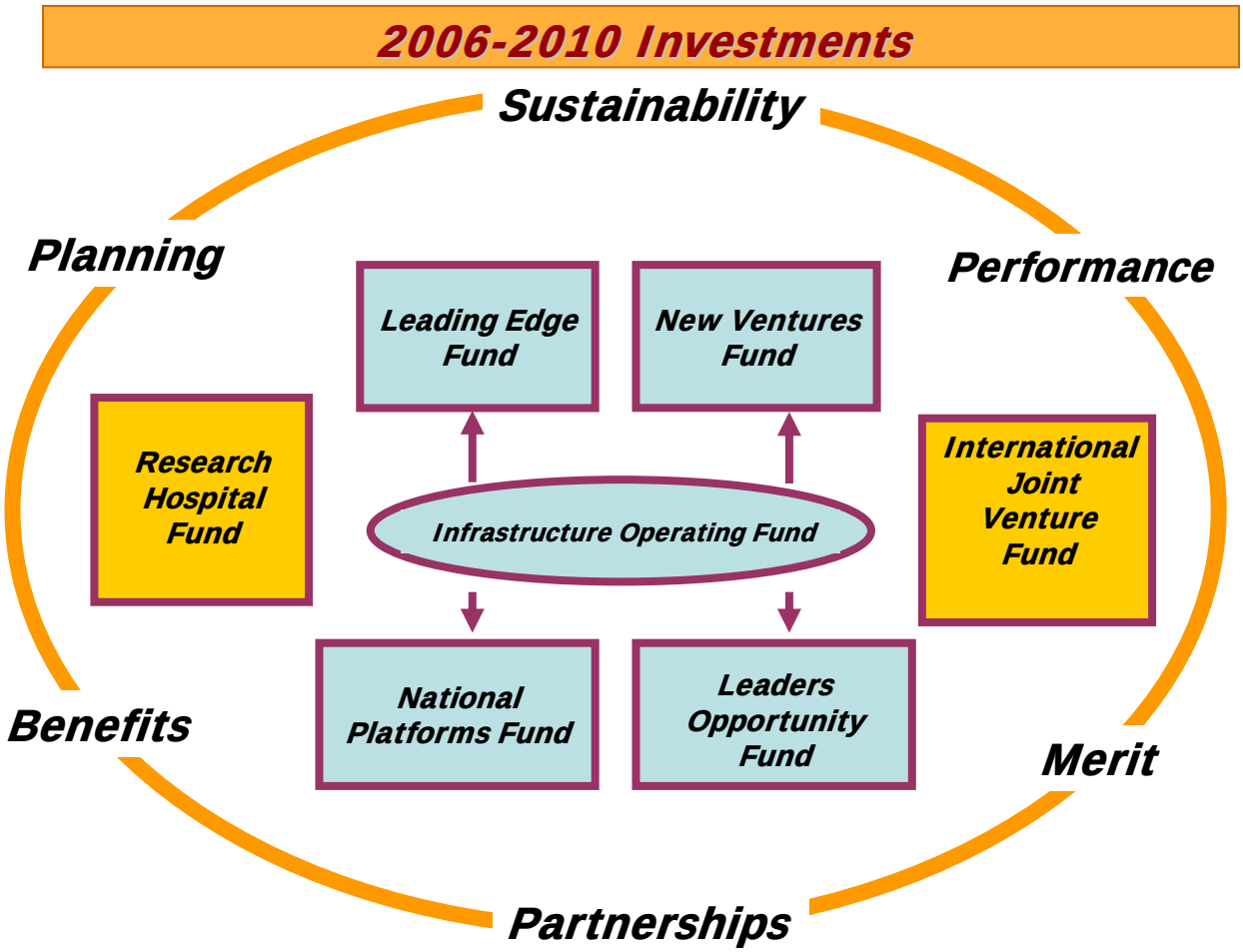
4. Attract and retain the best researchers

5. Create the best training environment for the knowledge society

6. Promote networking, collaboration & multidisciplinarity

7. Foster research planning at all levels

8. Maximize infrastructure investment



- The **Leading Edge Fund** enables institutions to capitalize on already successful and productive activities supported by past CFI investments by securing and enhancing further world-class research or technology development efforts, particularly in select areas of strategic priority where institutions have a competitive advantage. Past performance will be a key element of the assessment of projects.

- The **New Initiatives Fund** supports new infrastructure initiatives in which the CFI has not previously invested and that enable institutions and their partners to develop and enhance their capacity in promising areas of research and technology development, as well as to improve their research competitiveness and international leadership.

- The **National Platforms Fund** provides generic research infrastructure, resources, services, and facilities that serve the needs of many researchers and disciplines, and that require periodic reinvestments because of the nature of the technologies. The Fund is established to deal first with High Performance Computing, but is also applicable in other areas.

- The **Leaders Opportunity Fund** builds on the former New Opportunities, Canada Research Chairs Infrastructure and the Career Awards Funds. It is designed to assist universities to attract excellent faculty to Canadian universities as well as retain the leading researchers in Canada.

- The **Infrastructure Operating Fund** contributes to the incremental operating and maintenance costs associated with projects funded by the CFI to maximize the efficient use of research infrastructure.

The budget available for these five funds for the 2006-2010 period is $750M plus interest. In addition, we will continue to invest in research infrastructure through:

- the **Research Hospital Fund** which helps address the need for further investment in research hospital infrastructure, especially for new and different research space, and;

- the **International Joint Ventures Fund** which supports the establishment of a small number of very high profile research infrastructure projects in Canada to take advantage of extraordinary research opportunities with leading facilities in other countries that will bring significant benefits to Canada.

CFI's current funding picture

The world is not standing still. Canada and the CFI must meet the changes in the global environment while anticipating change in the R&D landscape. Leading edge research in the 21st century is critically dependent on having the tools to do the job. The pace at which cutting-edge research infrastructure must be renewed today is radically different than even a decade ago.

Since 1997, the CFI has invested approximately $400 million per year (on an annualized basis)[1] in research infrastructure, an amount equivalent to 27 percent of the combined annual investments made through the three federal research funding agencies (NSERC, SSHRC, and CIHR). Providing both research funding and research infrastructure has helped Canada develop an international reputation for outstanding research and training.

However, as the CFI enters into the 2006-2010 phase of its mandate, the ratio of infrastructure to research funding support will fall to 11 percent, which will not be sufficient to meet future needs and to maintain Canada's international competitiveness. In June of this year the CFI launched its last major competition with decisions in the Fall of 2006. Unless it is known well in advance that additional funding will be available after this last competition, universities and colleges will not be in a position to undertake large infrastructure projects whose planning, design, and construction may span several years.

Therefore, if Canada is to remain competitive in world-class research, the ratio of the CFI infrastructure support to funding agency support should be brought to at least 20 percent.

[1] This excludes funding for the Research Hospital Fund which is not available to universities and colleges.

This ratio would ensure that Canadian research institutions remain competitive with the leading institutions in the world as new technologies become available.

To achieve this 20% ratio and maintain a balance between research funding and infrastructure, the CFI would require an additional $1 billion in funding between now and 2010.

CFI's proposals for future directions

Canada's continuing social and economic prosperity in the 21st century will be increasingly dependent on our ability as a nation to remain internationally competitive in research and innovation. The commitment of the Government of Canada to this agenda has produced a profound transformation across the country that has allowed researchers and research institutions to reach for the highest levels of excellence, to compete with the best from around the world, and to generate new knowledge and ideas that are bringing benefits to Canadians.

During the past year, the CFI has undertaken an extensive consultation process involving research institutions, researchers, government officials, research funding agencies, public policy organizations, and the private sector. This consultation process has informed CFI's thinking regarding several new initiatives that would be developed and implemented in the coming years if additional funding is provided to the Foundation. The initiatives, which would enhance research and development in Canada's universities and colleges and position Canada as a leading scientific and technological nation, would address:

- Canada's international competitiveness through the support of strategic priorities;
- The challenge of knowledge translation and the commercialization of R&D through enhanced university-college-industry-government partnerships;
- The urgent need to develop additional high-quality personnel for the future;
- Canada's role in the world through enhanced international R&D initiatives in developing countries and emerging economies.

Conclusion

As Canada, like all industrialized countries, positions itself to be competitive in the innovation-based economy of the 21st century, it is critically important that commitment to the research agenda of the nation be maintained.

This agenda will ensure the continuing generation of the knowledge that is essential for the innovation pipeline, and the ongoing training of the highly qualified personnel who will transform the new knowledge into products, services, processes and policies that will benefit Canadians. Much like education and health care, investing in knowledge creation is not a "one-time-only" event, but rather an ongoing commitment to the future prosperity of the country.

Canada has made an impressive investment in its research enterprise during the past few years. We owe it to future generations to maintain the commitment.

Appendix 1

Projects Approved by the CFI

(Cumulative to June 29, 2005)

Institution	Maximum CFI contribution	# of projects
B.C. Cancer Agency	$27,800,000	1
British Columbia Institute of Technology	$764,990	4
Emily Carr Institute of Art and Design	$1,518,032	1
Forintek Canada Corp.	$1,362,000	2
Malaspina University-College	$4,525,744	8
Okanagan University College	$2,177,511	12
Paprican - BC	$2,500,000	1
Provincial Health Services Authority (BC)	$7,336,986	1
Royal Roads University	$325,000	3
Selkirk College	$543,756	1
Simon Fraser University	$27,282,711	81
Thompson Rivers University	$1,058,539	5
University College of the Fraser Valley	$74,992	1
University of British Columbia	$204,004,264	291
University of Northern British Columbia	$4,045,648	20
University of Victoria	$58,189,743	85
Vancouver Aquarium Marine Science Centre	$617,859	1
Vancouver Coastal Health Authority	$12,950,504	2
Total - British Columbia	**$357,078,279**	**520**
Athabasca University	$741,166	6
King's University Collge (The)	$298,708	2
Lethbridge Community College	$716,740	1
Olds College	$1,807,727	4
Southern Alberta Institute of Technology	$406,400	1
TRLabs	$3,727,387	1
University of Alberta	$152,883,999	227
University of Calgary	$82,055,538	152
University of Lethbridge	$3,594,432	13
Total - Alberta	**$246,232,097**	**407**
First Nations University of Canada	$351,924	1
University of Regina	$7,176,988	30
University of Saskatchewan	$52,648,446	104
Total - Saskatchewan	**$60,177,358**	**135**
Brandon University	$1,093,054	8
Red River College of Applied Arts, Science and Tech.	$550,788	1
St. Boniface General Hospital	$1,050,809	2
University of Manitoba	$39,546,180	128
University of Winnipeg	$1,475,176	8
Total - Manitoba	**$43,716,007**	**147**
Algoma University College	$125,000	1
Algonquin College of Applied Arts and Technology	$781,244	1

Baycrest Centre for Geriatric Care	$10,712,000	1
Brock University	$8,846,814	31
Carleton University	$66,961,828	60
Fanshawe College	$369,473	2
Lakehead University	$5,999,804	32
Laurentian University	$4,167,766	30
London Health Sciences Centre	$3,196,857	1
London Regional Cancer Center	$211,500	1
McMaster University	$79,108,890	167
Mount Sinai Hospital	$43,174,966	7
Niagara College	$797,110	1
Nipissing University	$690,000	3
Perimeter Institute for Theoretical Physics	$5,624,892	1
Queen's University	$57,674,329	130
Robarts Research Institute	$4,890,982	3
Royal Military College of Canada	$2,230,009	6
Ryerson University	$4,081,802	37
Sault College	$1,532,535	3
Seneca College	$676,035	2
Sheridan College Institute of Technology & Advanced Learning	$1,584,492	3
Sir Sandford Fleming College	$1,060,487	2
St. Joseph's Health Centre of London	$2,864,000	1
St. Joseph's Hospital (Hamilton)	$11,262,736	2
St. Michael's Hospital	$3,520,595	2
Sunnybrook and Women's College Hlth Sc. Centre	$16,597,506	4
The Hospital for Sick Children	$16,341,234	6
Toronto Rehabilitation Institute	$6,411,000	1
Trent University	$8,942,806	27
University Health Network	$45,088,362	9
University of Guelph	$62,477,646	126
University of Ontario Institute of Technology	$262,109	3
University of Ottawa	$69,402,737	141
University of Toronto	$182,091,424	332
University of Waterloo	$68,515,498	133
University of Western Ontario	$97,158,003	151
University of Windsor	$9,371,129	52
Wilfrid Laurier University	$7,101,914	33
York University	$18,654,130	66
Total - Ontario	**$930,561,644**	**1614**
Bishop's University	$207,416	3
CÉGEP de Chicoutimi	$152,119	1
CÉGEP de La Pocatière	$957,360	2
CÉGEP de l'Abitibi-Témiscamingue	$594,000	1
CÉGEP de Lévis-Lauzon	$1,017,104	2
CÉGEP de Rimouski	$204,000	1
CÉGEP de Saint-Jérôme	$2,103,143	1
CÉGEP de Saint-Hyacinthe	$1,286,360	3
CÉGEP de Trois-Rivières	$1,936,951	4
CÉGEP Vanier College	$140,170	1
Centre Hospitalier de l'Université de Montréal	$9,579,019	2
Collège de Maisonneuve	$558,840	3

Collège Shawinigan	$683,000	2
Concordia University	$22,512,790	43
École Polytechnique de Montréal	$50,207,751	43
HEC Montréal	$2,033,385	6
Institut de tech. agroalimentaire, Campus de La Pocatière	$52,700	1
Institut de tech. agroalimentaire, Campus de Saint-Hyacinthe	$879,597	1
McGill University	$174,874,940	273
Université de Montréal	$141,459,554	227
Université de Sherbrooke	$30,342,656	88
Université du QC École de technologie supérieure	$11,378,234	19
Université du QC INRS	$52,479,919	42
Université du Québec à Chicoutimi	$6,088,478	20
Université du Québec en Outaouais	$2,416,436	10
Université du Québec à Montréal	$11,073,927	47
Université du Québec à Rimouski	$9,366,978	17
Université du Québec à Trois-Rivières	$7,749,175	20
Université du Québec en Abitibi-Témiscamingue	$2,937,798	10
Université du Québec Télé-université	$3,553,982	7
Université Laval	$145,893,549	179
Total - Québec	**$694,721,331**	**1079**
Collège communautaire du Nouveau-Brunswick	$187,338	1
Mount Allison University	$1,598,316	7
St. Thomas University	$324,965	2
Université de Moncton	$2,342,774	15
University of New Brunswick	$11,710,318	60
Total - New Brunswick	**$16,163,711**	**85**
Acadia University	$2,066,370	11
Cape Breton University	$921,839	10
Dalhousie University	$29,098,571	111
GPI Atlantic	$126,000	1
IWK Health Centre	$3,085,852	2
Mount Saint Vincent University	$571,065	7
Nova Scotia Agricultural College	$4,637,151	15
Nova Scotia College of Art and Design	$68,000	1
Nova Scotia Community College	$1,905,000	3
Saint Mary's University	$1,883,524	14
St. Francis Xavier University	$1,637,168	13
Université Sainte-Anne-Collège de l'Acadie	$72,081	1
Total - Nova Scotia	**$46,072,621**	**189**
University of Prince Edward Island	$5,299,434	17
Total - Prince Edward Island	**$5,299,434**	**17**
College of the North Atlantic	$670,060	1
Marine Institute	$350,000	1
Memorial University of Newfoundland	$27,349,290	67
Total - Newfoundland and Labrador	**$28,369,350**	**69**

Total - Province	**$2,428,391,832**	**4262**

A National Ultrahigh-Resolution Electron Microscopy Facility for Nanoscale Materials Research	$7,083,799	1
Canadian Light Source / Centre canadien du rayonnement synchrotron	$56,400,000	1
Canadian Molecular Cytogenetics Platform	$4,512,925	1
High Throughput Macromolecular Crystallography Beamline at the Canadian Light Source	$4,174,285	1
National "System-on-Chip" Research Network / Réseau canadien de recherche du système sur puce	$15,892,932	1
National Core Facility to Monitor Immune Responses in Humans to Vaccines Against Infectious Diseases and Cancer	$5,292,839	1
National Microelectronics and Photonics Testing Collaboratory / Laboratoire national collectif d'essais en microélectronique et en photonique	$9,310,238	1
National Neutron Reflectometer Facility	$985,782	1
National Site Licensing Project / Projet de licences de site nationales	$20,000,000	1
National Solid State Ultrahigh Field NMR Facility / Installation nationale de résonance magnétique nucléaire (RMN) à ultra-haute résolution en phase solide	$4,440,300	1
Research Data Centres / Centre d'accès aux données de recherche	$5,380,089	1
Resonant Elastic and Inelastic Soft X-ray Scattering Beamline at the Canadian Light Source	$3,334,065	1
Soft X-ray Beamline for Microcharacterization of Materials at the Canadian Light Source	$1,681,324	1
Text Analysis Portal for Research (TAPoR) / Portail d'analyse textuelle de recherche (PATeR)	$2,629,223	1
The BioMedical Imaging and Therapy (BMIT) Beamline at the Canadian Light Source	$6,817,376	1
VESPERS (VEry Sensitive Elemental and Structural Probe Employing Radiation from a Synchrotron) at the Canadian Light Source	$1,801,639	1
Total - Canada National Projects	**$149,736,816**	**16**
Total - Infrastructure projects	**$2,578,128,648**	**4278**
Infrastructure Operating Fund – Maximum Allocation *	**$379,328,403**	–
Grand Total	**$2,957,457,051**	**4278**

* This allocation represents 30% of the maximum CFI contribution for projects approved starting July 2001 under the Innovation Fund and the New Opportunities Fund.

Appendix 2

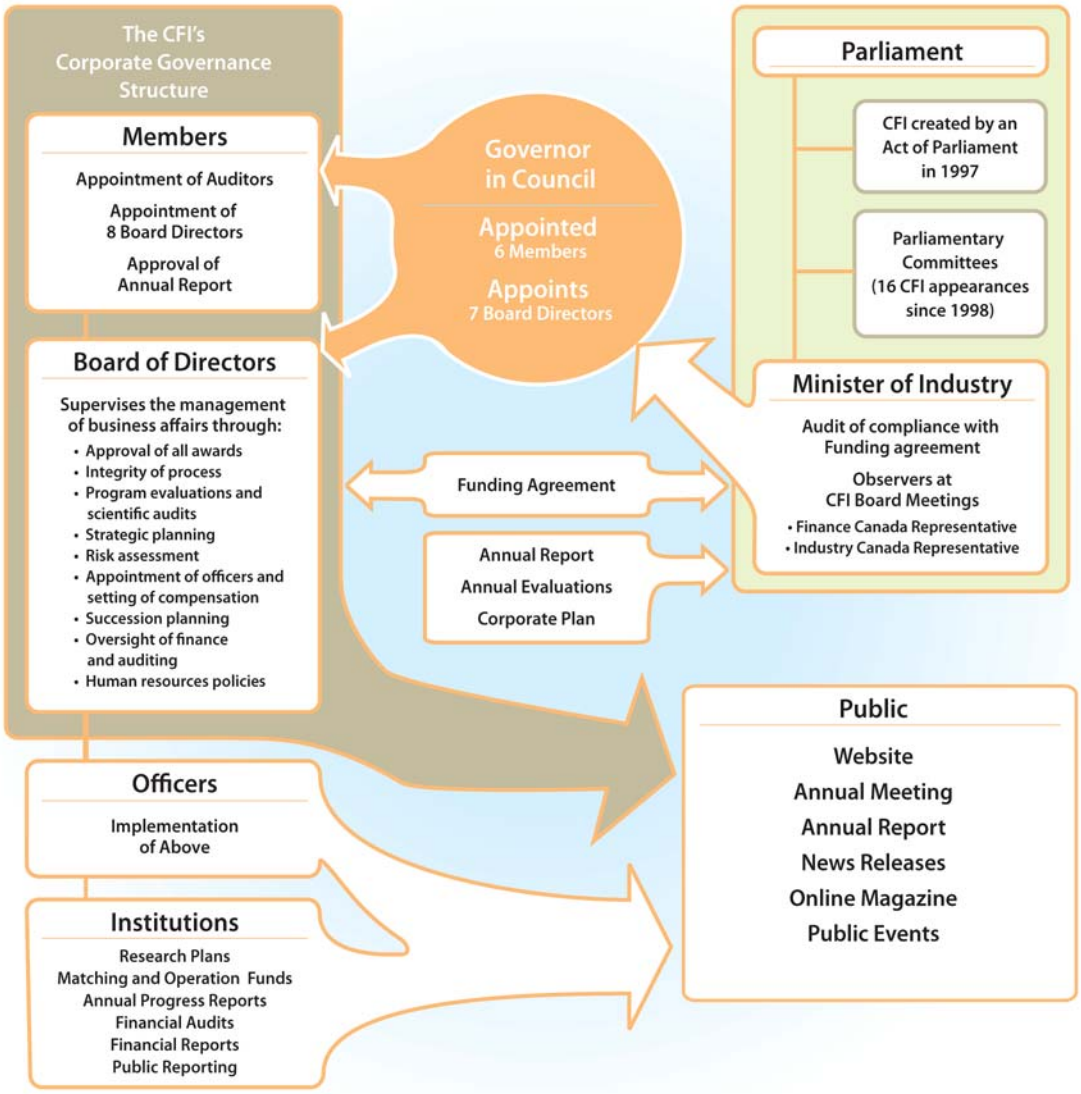
CFI Investments in Canadian Municipalities

Municipality	Maximum CFI Contribution *	# of projects
Abbottsford	$74,992	1
Antigonish	$1,637,168	13
Athabasca	$741,166	6
Bathurst	$187,338	1
Brandon	$1,093,054	8
Burnaby	$28,047,701	85
Calgary	$82,461,938	153
Cape Breton Regional District	$921,839	10
Castlegar	$543,756	1
Charlottetown	$5,299,434	17
Edmonton	$156,910,094	230
Fredericton	$12,035,283	62
Gatineau	$2,416,436	10
Glenhaven	$126,000	1
Guelph	$62,477,646	126
Halifax	$36,612,012	138
Hamilton	$100,084,648	171
Kamloops	$1,058,539	5
Kelowna	$518,988	7
Kingston	$85,107,508	138
La Pocatière	$1,010,060	3
Lethbridge	$4,311,172	14
Lévis	$1,017,104	2
London	$113,159,560	162
Moncton	$2,342,774	15
Montréal	$434,491,538	666
Nanaimo	$4,525,744	8
North Bay	$690,000	3
Oakville	$1,584,492	3
Olds	$1,807,727	4
Oshawa	$262,109	3
Ottawa	$161,586,109	204
Peterborough	$10,003,293	29
Pointe-de-L'Église	$72,081	1
Prince George	$4,045,648	20
Québec	$201,927,450	228
Regina	$7,528,912	31
Rimouski	$9,570,978	18

Rouyn-Noranda	$3,531,798	11
Sackville	$1,598,316	7
Saguenay (Includes Chicoutimi-Jonquière)	$6,240,597	21
Saint-Jérôme	$2,103,143	1
Saint-Hyacinthe	$2,165,957	4
Saskatoon	$115,865,822	106
Sault Ste. Marie	$1,657,535	4
Shawinigan	$683,000	2
Sherbrooke	$30,550,072	91
St. John's	$27,699,290	68
St. Catherines	$8,846,814	31
Stephenville	$670,060	1
Sudbury	$4,167,766	30
Thunder Bay	$5,999,804	32
Toronto	$347,349,054	467
Trois-Rivières	$9,686,126	24
Truro	$4,637,151	15
Vancouver	$271,769,443	308
Victoria	$58,514,743	88
Waterloo (Includes Kitchener)	$81,242,304	167
Welland	$797,110	1
Windsor	$9,371,129	52
Winnipeg	$42,622,953	139
Wolfville	$2,066,370	11
62 Municipalities	**$2,578,128,648**	**4278**

*** Does not include the Infrastructure Operating Fund (IOF)**

Appendix 3


The CFI's Corporate Governance Structure
Members
Appointment of Auditors
Appointment of 8 Board Directors
Approval of Annual Report
Board of Directors
Supervises the management of business affairs through:
• Approval of all awards
• Integrity of process
• Program evaluations and scientific audits
• Strategic planning
• Risk assessment
• Appointment of officers and setting of compensation
• Succession planning
• Oversight of finance and auditing
• Human resources policies
Officers
Implementation of Above
Institutions
Research Plans
Matching and Operation Funds
Annual Progress Reports
Financial Audits
Financial Reports
Public Reporting
Governor in Council
Appointed
6 Members
Appoints
7 Board Directors
Funding Agreement
Annual Report
Annual Evaluations
Corporate Plan
Parliament
CFI created by an Act of Parliament in 1997
Parliamentary Committees (16 CFI appearances since 1998)
Minister of Industry
Audit of compliance with Funding agreement
Observers at CFI Board Meetings
• Finance Canada Representative
• Industry Canada Representative
Public
Website
Annual Meeting
Annual Report
News Releases
Online Magazine
Public Events