



**2017 Innovation Fund**

**STRIVING FOR GLOBAL LEADERSHIP  
AND REAPING THE BENEFITS**

Call for proposals

February 2016

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## COMPETITION DESCRIPTION

### Context

The success of the Canadian research community rests on its ability to realize the full potential of both its people and its infrastructure. Continued investments in infrastructure, across the full spectrum of research from the most fundamental to the very applied and through to technology development, will help Canada remain at the forefront of exploration and knowledge generation while making substantial and meaningful contributions to generating social, health, environmental and economic benefits and addressing global challenges.

The capability of Canadian researchers to conduct cutting-edge research that is globally competitive has improved dramatically over the past two decades. A number of Canadian research institutions are now routinely ranked among the best in the world in a wide range of research disciplines, where the relative impact of Canadian researchers is significantly above the world average<sup>1</sup>. Canada is now among the best science and technology development nations and is regarded by many as a preferred partner in international collaborative research initiatives. The success of the Canada Excellence Research Chairs Program is one such example.

Other countries have similarly enabled their own advanced research and technology development capabilities through sustained and increasing investments in research and research infrastructure. To remain globally competitive, as well as a destination of choice for some of the best research talent from around the world, it will be necessary for Canadian research institutions to continue to focus on excellence, build on existing strengths and work at the leading-edge.

Canada's research capabilities are, in part, the result of sustained investments in research infrastructure, one of the key elements underlying research excellence. Guided by institutional strategic research plans, the investments made through this Innovation Fund competition will assist research institutions to capitalize on their achievements and improve their standing in the global research enterprise. Given the size of the Canadian research community, this can best be achieved through the establishment of productive research collaborations at the institutional, regional, national and international levels. Such collaborations will improve our ability to generate new ideas, insights and knowledge, as well as support the sustainability of the research infrastructure necessary to operate at the highest levels of research excellence. Key to Canada's continued research and innovation success is enabling our country's institutions and researchers to work together and to collaborate with the best researchers in the world in areas of established and emerging Canadian research strengths.

For its tenth nation-wide research infrastructure competition, the Canada Foundation for Innovation (CFI) encourages eligible institutions and their researchers to craft proposals that focus on excellence, build on research strengths, and incorporate collaboration as a means to ensure the long-term sustainability of the Canadian research enterprise. These elements underpin the key directions of the CFI Strategic Roadmap 2012-17.

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<sup>1</sup>Council of Canadian Academies (2012): The State of Science and Technology in Canada 2012, Expert Panel on the State of Science and Technology in Canada.

## Challenge

The CFI challenges institutions to propose transformative infrastructure projects that will underpin cutting-edge, globally competitive research. Institutions should continue to be guided by their strategic research plans and establish priorities that build on their distinct advantages. Through the 2017 Innovation Fund, the CFI seeks to support promising and innovative research or technology development in areas where Canada currently is, or has the potential to be, competitive on the global stage. The CFI will support initiatives that allow institutions and their researchers to build on established capabilities to accelerate current research and technology development or to enhance emerging strategic priority areas.

Institutions are challenged to increase the competitiveness of the proposed research activities through collaboration with appropriate partners to plan, acquire, develop, operate and maintain infrastructure. Collaborations may be integrated into all facets of the proposed activities; for example, for the conduct of world-class research, the optimal use and sustainability of infrastructure, and knowledge or technology transfer that will generate socioeconomic benefits. The CFI therefore encourages institutions to propose institutional and multi-institutional initiatives that underpin productive research partnerships, enable institutions and their researchers to fully exploit the capabilities and capacity of the research infrastructure and facilities, and drive world-class research. In developing proposals, institutions are also encouraged to engage with potential end users of research or technology development to clearly define the potential benefits for Canadians.

The objectives of the 2017 Innovation Fund are to enable institutions and their best researchers to:

- Strive for global leadership by conducting world-class research or technology development activities in areas of strategic institutional priority;
- Enhance research capacity by forging productive partnerships within and among institutions, sectors and disciplines for the effective and sustainable use of the research infrastructure and facilities;
- Generate social, health, environmental and/or economic benefits for Canadians, including better training and improved skills for highly qualified personnel, through appropriate pathways.

Institutions should submit proposals in areas for which they have a proven record of, or a strong potential for, commitment and excellence. Each proposal will need to demonstrate how it meets the standard of excellence for each of the three competition objectives and each associated assessment criterion. The CFI expects that effective collaboration with partners, where appropriate, will strengthen every aspect of a proposal.

## Timeline

Dates	Activity
June 23, 2016	Deadline for the submission of notices of intent (NOI)
October 11, 2016	Deadline for the submission of proposals
November 2016 to February 2017	Expert committee meetings
April 2017	Multidisciplinary assessment committee meetings
May 2017	Special multidisciplinary assessment committee meeting
June 2017	CFI Board decisions

## FUNDS AVAILABLE

### Competition budget

The CFI will invest up to \$425 million in infrastructure costs for funded projects in this competition. The CFI will fund up to 40 percent of a project's eligible infrastructure costs.

### Institutional envelopes

The CFI places an upper limit on the total value of the funding that eligible institutions may request, calculated at 2.75 times the available budget of \$425 million.

- Each institution's envelope is based on its average share of research funding received from the three federal research funding agencies over the period 2011-12 through 2013-14 (most recent available data).
- CFI-eligible institutions have a minimum envelope of \$1.75 million.
- Institutions submitting a single proposal to the competition are exempt from adhering to their institutional envelope.

Please note that institutional envelopes include affiliated research hospitals. See Appendix 1 for the list of institutional envelopes.

At the NOI deadline, institutions are allowed to exceed their institutional envelope by 10 percent. At the time of submission of the proposals, the CFI will ensure that the total value of CFI funding requested by each institution is within its envelope.

### Multi-institutional projects

The CFI encourages institutions to use their envelopes to foster and develop multi-institutional projects. Institutions should manage their envelope strategically and be in a position to support participation in, and active contribution to, collaborative opportunities.

By the NOI deadline and again by the proposal submission deadline, the administrative institution must communicate to the CFI the dollar value of its share of the proposal as well as the names of the other collaborating institutions and the value of each institution's share.

### Operating and maintenance costs

The CFI will contribute to the operating and maintenance (O&M) costs of funded projects through its Infrastructure Operating Fund (IOF). The IOF allocated will be equivalent to 30 percent of the CFI contribution to the capital cost of projects funded under the Innovation Fund.

For multi-institutional projects bringing together three or more CFI-eligible collaborating institutions, either housing part of the infrastructure or sharing envelopes, the applicant may request up to an additional five percent of the CFI award to cover, among others, administrative costs associated with the management and governance of those projects. A justification for these additional funds must be included in the proposal and will be subject to the merit review process.

For all proposals, institutions will need to demonstrate that appropriate O&M resources are, and will continue to be, available in order to capitalize on the full potential of the requested infrastructure. Sustainability is an assessment criterion and an integral part of the review process; its assessment may influence the recommendations of the multidisciplinary assessment committees.

## ELIGIBILITY

### Eligible institutions

Canadian universities, colleges, research hospitals and non-profit research institutions recognized as eligible by the CFI can apply to this competition. An institution wanting to be recognized as eligible must contact the CFI well in advance of the NOI deadline to complete the process.

### Eligible infrastructure projects

An eligible project involves the acquisition or development of research infrastructure to increase research capacity, allowing the pursuit of world-class research. Construction costs to build new space or to renovate existing space (including fitting out existing space) which is essential to house and use the infrastructure effectively, are eligible. To be eligible for funding, in-kind contributions from external partners and cash expenditures by the institution must have taken place on, or after, March 1, 2015. Expenditures are considered incurred when goods are received, services have been rendered or work has been performed.

For this competition, the CFI will only consider proposals whose total project costs are greater than \$750,000.

For more information on CFI eligibility guidelines, please refer to the [Policy and program guide](#).

### Infrastructure projects located at national or international research facilities

In cases when the proposed location of an infrastructure project would be a national or international research facility, the institution must consult with the host facility, comply with the facility's established planning and project approval processes, and obtain the approval of the host facility before submitting a NOI. The CFI may seek confirmation from the proposed facility regarding its commitment to host the proposed project.

### Advanced research computing infrastructure

As in past competitions, institutions may submit proposals including advanced research computing infrastructure and related resources to carry out a research or technology development project. However, proposals that focus predominantly on collective and shared advanced research computing infrastructure will not be accepted in this competition as those needs are supported by the on-going Cyberinfrastructure Initiative – Challenge 2.

As a matter of policy, the CFI is convinced that investments in advanced research computing infrastructure are maximized through the sharing of resources. The CFI, therefore, expects that new or additional research computing resources funded through this competition, and costing more than \$100,000, will normally be housed, managed and operated by Compute Canada. Although this is the CFI's preferred approach, it is not intended to be an iron-clad rule. The CFI recognizes that there are instances where, for compelling reasons, research computing infrastructure is best housed, managed and operated by institutions.

The CFI expects all institutions to consult with Compute Canada when planning to request advanced research computing infrastructure. For such cases, please visit [Compute Canada's website](#) for information on the established process to facilitate collaboration with institutions. If, however, an institution chooses not to consult with Compute Canada, the CFI will conclude that the institution is planning to assume full responsibility for the O&M costs of the proposed infrastructure, including the research computing component.

Advanced research computing infrastructure normally includes systems or resources such as:

- Capacity or throughput computing
- Capability computing supporting tightly coupled, fine-grained applications
- Shared memory systems
- Systems supporting very large memory requirements
- High-performance storage
- Long-term storage
- Cloud computing
- Computing using specialized accelerators, including GP-CPU and others
- High-performance visualization systems
- Systems suitable for computational steering and interactive use

Typically, such systems cost more than \$100,000. In each case, advanced research computing infrastructure encompasses both the software and environment needed for a given discipline to effectively utilize these types of infrastructure such as high levels of data security and integrity.

## REVIEW AND DECISION MAKING

### Assessment criteria

The CFI merit review process will be used to evaluate proposals on the basis of the assessment criteria that reflect the competition objectives. Proposals should clearly present the merits and excellence of the proposed project and provide sufficient information to enable reviewers to evaluate the proposal in accordance with the following six criteria:

Objective 1: Strive for global leadership by conducting world-class research or technology development activities in areas of institutional strategic priority.

- **Institutional capacity and track record:** The proposal builds on existing capacity and track record of key investments in people and infrastructure in the area of institutional strategic priority described in the proposal.
- **Research or technology development:** The research or technology development activities are innovative, feasible, have the potential to lead to breakthroughs, and will enhance international competitiveness.
- **Team:** The team is composed of established or emerging leaders and has the expertise and breadth, including relevant collaborations, to conduct the research or technology development activities.

Objective 2: Enhance research capacity by forging productive partnerships within and among institutions, sectors and disciplines for the effective and sustainable use of the research infrastructure and facilities.

- **Infrastructure:** The infrastructure is necessary and appropriate to conduct the research or technology development activities.
- **Sustainability:** The infrastructure is optimally used within and among institutions, sectors and disciplines and is sustainable through tangible and appropriate commitments over its useful life.

Objective 3: Generate social, health, environmental and/or economic benefits for Canadians, including better training and improved skills for highly qualified personnel, through appropriate pathways.

- **Benefits to Canadians:** The research or technology development results will be transferred through appropriate pathways to potential end users and are likely to generate social, health, environmental and/or economic benefits for Canadians.

### Review process

The CFI will first ensure that proposals are eligible and complete. Proposals will then be subject to a three-stage review process as outlined below. The expert review process will be tailored to the nature and complexity of the proposal.

### Expert committees

The first stage of review involves the assessment of proposals by expert committees who review small groups of related proposals. Expert committees assess the strengths and weaknesses of the proposals in relation to the six assessment criteria.

At the CFI's discretion, any proposal may involve a face-to-face meeting between the expert committee and project proponents and senior representatives of the participating institutions. These proposals are usually large and complex, typically requesting \$8 million or more from the CFI. Shortly after the submission of the NOIs, the CFI will identify projects likely to require such a meeting and will inform the institutions. Following the submission of proposals, the CFI will provide a confirmation to institutions if a face-to-face meeting is deemed necessary. For those proposals, the CFI expects a more detailed governance and management plan commensurate with the level of complexity of the proposed facility. The CFI may also decide to include large-facility management expertise on its expert committees.

### Multidisciplinary assessment committees

The second stage of review involves the assessment of proposals by multidisciplinary assessment committees (MACs). The MACs will review proposals grouped with others of similar size and/or complexity, on the basis of the three competition objectives:

- Strive for global leadership by conducting world-class research or technology development activities in areas of institutional strategic priority;
- Enhance research capacity by forging productive partnerships within and among institutions, sectors and disciplines for the effective and sustainable use of the research infrastructure and facilities;
- Generate social, health, environmental and/or economic benefits for Canadians, including better training and improved skills for highly qualified personnel, through appropriate pathways.

One or more MACs will exclusively review proposals submitted by small institutions (whose share of research funding received from the three federal research funding agencies is less than one percent).

Following a careful analysis of the results of the expert review, the MACs will be responsible for:

- Identifying proposals that best meet the standards of excellence for the competition and, among these, identifying the ones that best meet the three competition objectives relative to other competing requests; and,
- Establishing the amount that should be awarded to the proposals.

MAC members are chosen for their capacity to assess proposals based on the competition objectives and for their breadth of understanding of the research environment, the niches of innovative excellence in eligible institutions and the breadth of impacts and outcomes from research investments across the entire

landscape of research activity. The MACs that review large-scale proposals will also include expertise in the management of large research facilities.

To assist in the next stage of review, each MAC will have the opportunity to identify up to two proposals that they deem of exceptional merit.

### **Special multidisciplinary assessment committee**

The third stage of review involves a review and integration of the MAC assessments by a Special multidisciplinary assessment committee (S-MAC). The S-MAC is charged with ensuring consistency among the MACs, and in instances where MAC recommendations exceed the available resources, the S-MAC recommends to the CFI Board of Directors the proposals that most effectively support the CFI's mandate, meet the objectives of the competition – striving for global leadership, enhancing research capacity by forging productive partnerships, and generating benefits – and represent the most effective portfolio of investments for Canada.

### **Collaboration with provinces**

To coordinate the review processes and avoid duplication of review efforts, the CFI will share a list of the NOIs submitted and provide expert committee reports along with the names and affiliations of committee members to relevant provincial and territorial funding authorities. Disclosure of the list and committee reports will be made only in accordance with agreements between the CFI and provincial or territorial authorities, as permissible pursuant to the Privacy Act.

In addition, representatives of the relevant provincial or territorial authorities will be invited to participate as observers at the expert review stage and will have the opportunity to submit their respective views on proposals for consideration by the S-MAC.

The CFI encourages institutions to work with relevant provincial and territorial funding authorities as key partners at an early stage in the planning and development of proposals.

### **Funding decisions**

All funding decisions will be made by the CFI Board of Directors at its June 2017 meeting. Following this meeting, the applicant institutions will receive the review materials for their proposals.

## **HOW TO APPLY**

Institutions must use the CFI Awards Management System (CAMS) to prepare and submit the NOI as well as the proposals.

### **Notice of intent**

This competition requires the submission of a NOI in advance of the submission of a proposal. In addition, the CFI requires each institution to submit a list of all NOIs in which the institution participates as lead or collaborator. The NOI submission cover letter is available in the 2017 IF *Guidelines for the submission of a notice of intent and a proposal*.

The NOIs will be used to assist the CFI in planning the review process, to recruit committee members, and to identify potential eligibility issues for the infrastructure items requested. Therefore, the NOI should contain accurate information about the infrastructure and its users, the proposed research or technology development and the expected outcomes. A list of the NOIs received will be published on the CFI's website to encourage institutions that have similar proposals to consider potential collaborations or joint

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initiatives, where appropriate, to ensure the effectiveness and efficiency of the infrastructure. To further this objective, the CFI may draw attention to possible overlaps and synergies between institutions.

The submission deadline for the NOI is June 23, 2016.

### **Proposal**

The CFI will require an updated list of all proposals in which the institution participates as an administrative or collaborating institution. The proposal submission cover letter is available in the 2017 IF *Guidelines for the submission of a notice of intent and a proposal*.

The submission deadline for proposals is October 11, 2016.

### **PUBLIC ANNOUNCEMENT**

The CFI makes national funding announcements related to infrastructure associated with its Innovation Fund. In most cases, these announcements are organized in collaboration with an institution. Public announcements provide institutions, their researchers and partners, along with government representatives, the media and the CFI, opportunities to highlight the research and technology development enabled by CFI-funded infrastructure in their communities. Following each national CFI funding announcement, institutions are encouraged to work with local and national media to promote the benefits and impacts of this research and technology development to Canadians.

## APPENDIX 1

## Envelopes by institution

Institution	Envelope
University of Toronto (and affiliated hospitals)	\$173,600,000
University of British Columbia (and affiliated hospitals)	\$118,400,000
McGill University (and affiliated hospitals)	\$105,900,000
University of Alberta (and affiliated hospitals)	\$67,800,000
Université de Montréal (and affiliated hospitals)	\$67,300,000
Université Laval (and affiliated hospitals)	\$51,900,000
University of Ottawa (and affiliated hospitals)	\$48,500,000
McMaster University (and affiliated hospitals)	\$48,400,000
University of Calgary (and affiliated hospitals)	\$44,000,000
Western University (and affiliated hospitals)	\$41,300,000
University of Waterloo	\$36,500,000
Queen's University (and affiliated hospitals)	\$30,100,000
Dalhousie University (and affiliated hospitals)	\$29,400,000
Simon Fraser University	\$28,300,000
University of Manitoba (and affiliated hospitals)	\$26,900,000
Université de Sherbrooke (and affiliated hospitals)	\$23,800,000
University of Victoria	\$19,500,000
University of Saskatchewan (and affiliated hospitals)	\$17,700,000
University of Guelph	\$17,500,000
York University	\$16,600,000
École Polytechnique de Montréal	\$14,300,000
Concordia University	\$12,700,000
Carleton University	\$11,700,000
Université du Québec à Montréal*	\$11,200,000
Memorial University of Newfoundland (and affiliated hospital)*	\$10,600,000
Institut national de la recherche scientifique*	\$8,800,000
Ryerson University*	\$8,200,000
University of New Brunswick*	\$7,800,000
University of Windsor*	\$7,000,000
École de technologie supérieure*	\$4,600,000
University of Regina*	\$4,200,000
Wilfrid Laurier University*	\$3,500,000
University of Lethbridge*	\$3,500,000
Lakehead University*	\$3,400,000
Université du Québec à Trois-Rivières*	\$3,100,000
Trent University*	\$3,100,000
Brock University*	\$3,100,000
Laurentian University*	\$2,900,000
University of Ontario Institute of Technology*	\$2,800,000
Université du Québec à Rimouski*	\$2,700,000
Université du Québec à Chicoutimi*	\$2,600,000
Saint Mary's University*	\$2,100,000
University of Northern British Columbia*	\$1,900,000
All other CFI-eligible institutions*	\$1,750,000

\*Small institution (share of research funding received from the three federal research funding agencies is less than one percent)



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