



Cyberinfrastructure Initiative

Research Data Infrastructure

Guidelines for Expert Committees

2017

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Mandate of the Canada Foundation for Innovation

The Government of Canada created the Canada Foundation for Innovation in 1997. It strives to build our nation's capacity to do world-class research and technology development that benefits Canadians. It does this by investing in state-of-the-art research infrastructure. These investments allow Canadian universities, colleges, research hospitals and non-profit research institutions to attract and retain the world's top research talent, train the next generation of researchers, support private-sector innovation and create high-quality jobs that strengthen Canada's position in today's global knowledge-based economy. Additional information is available at Innovation.ca.

Cyberinfrastructure Initiative

Background and context

Today, research across all fields of inquiry is increasingly data intensive. Data is an output of research and its analysis often forms the basis for new research hypotheses. As such, it is a powerful enabler of new scientific insights and drives both discovery and innovation. New research capabilities generate massive amounts of data. Experts, in turn, develop the tools, methods and standards necessary to organize and exploit these digital resources.

It can be difficult to develop tailored, shared and integrated research data infrastructures. This creates challenges for data-intensive research. To address these challenges, researchers must develop tools, methods and standards to effectively organize, access, mine and analyze massive datasets. To do so, partnerships within and, in some cases, across research domains are required so that the shared infrastructure supports a wide range of users. Such partnerships will reduce unnecessary duplication of efforts within and between disciplines.

The CFI's goal is to support research communities in their efforts to devise optimal ways to organize and use research data resources.

The Challenge

The CFI challenged institutions and researchers to come together to form consortia and propose research data infrastructure projects that create tailored, shared and integrated data resources such as databases and data repositories. These resources should be capable of enabling leading-edge research on significant scientific, social and economic questions. Projects submitted should **bring together a community of researchers from across the country** that share similar challenges linked to the availability of research data. Projects should **address an existing or emerging challenge for this community** through the **development of new tools and applications or novel ways of organizing and using research data** that would enhance the community's capacity to conduct leading-edge research.

The entire research data infrastructure component of the initiative is about data-sharing and providing access to any researcher who can exploit and mine the resource to advance knowledge and promote innovation. The projects must be completed within a three-year period. Therefore, the CFI encouraged consortia to embrace an "adopt, adapt and develop" approach and to link to Canadian and international initiatives whenever appropriate. Other Canadian organizations such as CANARIE and Compute Canada are key stakeholders that could provide insights about the existing landscape and highlight potential synergies with research groups having similar data infrastructure requirements. This will promote efficiency, interoperability and rapid implementation. We also encouraged projects that proposed to expand and extend existing Canadian data initiatives.

CFI funding and competition budget

The CFI will invest approximately \$7.5 million in the 2017 Cyberinfrastructure Initiative competition and expects to fund between five and 10 proposals.

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The CFI funds up to 40 percent of a project's total eligible infrastructure costs. Institutions must secure the remaining 60 percent of the required funding. This is typically from provincial governments and other public, private and non-profit organizations.

The CFI will invest approximately \$2.25 million to contribute to the operating and maintenance costs of projects funded in this competition. This funding is through the CFI's Infrastructure Operating Fund. The support allocated is equivalent to 30 percent of the CFI contribution to the capital costs of projects funded under this initiative. Operating and maintenance does not require matching funding.

The CFI merit-review process

The CFI merit-review process for this competition has three stages:

1. Multidisciplinary Assessment Committee review of Notices of Intent (NOI)
2. Expert Committee review
3. Multidisciplinary Assessment Committee review of proposals.

Figure 1 illustrates the process as well as the roles and responsibilities of each committee. This process ensures that proposals are reviewed in a fair, competitive, transparent and in-depth manner. It is tailored to the nature and complexity of the proposals. In the first stage, the Multidisciplinary Assessment Committee (MAC) selected the NOIs that best met the competition objectives (scientific excellence, impact and ongoing relevance, and feasibility) and decided which to invite to submit a proposal.

FIGURE 1: MERIT-REVIEW PROCESS



Expert Committee review

The second stage of the merit-review process is review by the Expert Committee. We designed this stage to assess the strengths and weaknesses of the proposals relative to the six CFI assessment criteria for this competition.

As an Expert Committee member, the CFI will invite you to discuss the proposal with the rest of the committee at the meeting, which will either take place in person or via teleconference

The CFI tasks these committees with recommending to the Multidisciplinary Assessment Committee (MAC) those proposals that meet the standard of research excellence for the competition. We also task them with recommending the amount that should be awarded to each proposal. The MAC will not consider proposals not recommended by the Expert Committees.

Membership

A Chair and between two and six members typically comprise an Expert Committee. This depends on the number and breadth of proposals in its purview. CFI staff oversee the committee. The Chair usually has a general background in the area of the proposals being assessed by the committee. The members each have specific expertise in the various aspects of the proposals. The Chair ensures that the Expert Committee functions effectively and objectively in accordance with CFI policies. Members of the Expert Committee evaluate the proposals based on how well they meet the assessment criteria.

The CFI expects review committee members to maintain the highest standards of ethics in fulfilling their role. They are appointed as individuals, not as advocates or representatives of their discipline or of any organization. All members must adhere to the CFI’s conflict of interest and confidentiality agreement ([Appendix 2](#)) as well as its guidelines to ensure equity in the merit-review process ([Appendix 3](#)). You will need to agree to this the first time you log into the secured online portal.

Role of CFI staff

The main responsibility of the CFI staff — after selecting and recruiting members of the Expert Committee — is to ensure the integrity of the merit-review process. They do this by guiding the committee through its review of proposals. This involves providing instruction on the CFI review process, policies and procedures, and ensuring consistency in the proposal evaluations. CFI staff assist the Chair by actively engaging in the process. They have good knowledge of the proposals’ content and can help the committee interpret the assessment criteria and scale throughout the review process. They are also responsible — in consultation with the Chair — for drafting the committee reports and coordinating further input and revisions from Expert Committee members.

Timeline and key activities

Table 1 summarizes the key activities of Expert Committee members and the important dates for the 2017 Cyberinfrastructure Initiative competition.

TABLE 1 - TIMELINE AND KEY ACTIVITIES FOR EXPERT COMMITTEE MEMBERS

Date	Activity	Description
October 2017	Logistics	<ul style="list-style-type: none"> Complete and return the committee member information form
October – November 2017	Access Online review portal (review proposals)	<ul style="list-style-type: none"> Activate CFI Awards Management System (CAMS) account Inform CFI of any potential conflicts of interest Review proposals and complete preliminary assessment sheet
One week in advance of meeting	Preliminary Assessment	<ul style="list-style-type: none"> Submit preliminary assessment of proposals to the CFI via email
November – December 2017	Expert Committee meetings to assess proposals	<ul style="list-style-type: none"> Attend meeting in Toronto or participate in teleconference (committee dependent)

Meeting date and travel

Expert Committees reviewing one to two proposals will normally convene by teleconference.

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For in-person meetings, you must complete the committee member information form containing key information to assist the CFI and our travel agency — Carlson Wagonlit Global Travel Centre — in arranging travel arrangements for the meeting. The CFI will pre-pay all bookings made through this agency. This form will be sent to you by email shortly after a date for the meeting has been confirmed. Please complete the form and return it by email to the CFI as early as possible before the meeting. You will be contacted shortly thereafter by a representative of Global Travel with a proposed travel itinerary.

Accessing the review materials

The CFI will send an email to you in mid- to late October to activate your access to the [CFI Awards Management System \(CAMS\)](#). In CAMS, you will find all the information needed to conduct your review on the “Reviewer dashboard.” It also provides basic information on the committee for which you are a reviewer, such as the type of committee (in this case “Expert Review Committee”) and your role on the committee.

To access the review materials, simply click on the committee name to bring you to the “Review and documentation” page. On this page, you will find:

- Relevant reference materials (e.g. *Guidelines for Expert Committees* and the CFI Expert Committee report template)
- Key details about the meeting (e.g. meeting agenda and list of individual assignments, when applicable)
- Project material, including proposals

Note: The proposals will be available shortly after the submission deadline on October 13, 2017.

For more information on how to use the CFI reviewer portal, please consult our [website](#).

Assessment criteria

The CFI review process is different from other funding agencies in that it is a structured merit-review process. Each proposal is evaluated based on six assessment criteria that reflect the competition objectives. Each criterion is attributed a standard of excellence against which the proposals are compared (see table 2). In other words, instead of a global score or rating, proposals are assessed on how well they meet each criterion standard.

As a reviewer, you must assess the degree to which the proposal meets each standard and substantiate your assessment by commenting on the strengths and weaknesses of the proposal. The information provided in the proposal should be the sole information source on which you base your evaluation. It is incumbent upon the applicants to demonstrate in the proposal how the project satisfies the requirements outlined under each criterion.

Note: For each criterion, applicants were instructed to address a number of aspects in their proposal (refer to Appendix 4). These aspects correspond to the set of instructions provided under each criterion. While some aspects are optional, failure to address all of the aspects that apply to the proposal within each of the criterion should be treated as a weakness and assessed as such.

TABLE 2 – ASSESSMENT CRITERIA AND STANDARDS

Assessment Criteria	Criterion standards
Research	Once completed, the research data infrastructure will enable research activities that are timely, innovative and at the leading edge internationally.
Research data infrastructure	The research data infrastructure is necessary and appropriate to conduct the proposed research activities and builds, when appropriate, on existing national or international data resources. The scope and requirements of the project are clearly defined and it can be commissioned within 36 months.
Scientific expertise	The scientific experts are established or emerging leaders in the relevant research domains and have the necessary expertise and relevant collaborations to guide the development of and/or to exploit the research data infrastructure.
Technical expertise	The technical experts have the required expertise to efficiently design and build the research data infrastructure.
Sustainability and maintaining relevance	A compelling plan for the long-term management of the data is in place to ensure ongoing relevance of the infrastructure. The proposal presents a credible plan addressing the long-term financial sustainability of the research data infrastructure.
Benefits to Canadians	The research activities enabled by the infrastructure have the potential to lead to significant tangible benefits for society, health, the economy and/or the environment. The use of the research data infrastructure will be maximized by adopting best practices in accessibility, interoperability and generalizability.

CFI assessment scale

Each Notice of Intent and proposal will be assessed on the degree to which it meets the competition objectives. Each objective is assessed using the scale shown in Figure 1. Committee members must base their conclusions on the information provided within the Notice of Intent and proposal.

FIGURE 2: CFI ASSESSMENT SCALE

The proposal...

	Significantly exceeds the criterion
	Satisfies the criterion
	Satisfies the criterion with only a few minor weaknesses
	Partially satisfies the criterion with some significant weaknesses
	Does not satisfy the criterion due to major weaknesses

Preliminary assessment

As an Expert Committee member, you must read all of the proposals under your committee's purview in order to engage fully in the discussion with the other members at the meeting. Depending on the number of proposals to be discussed, you may also be assigned three to five proposals for an in-depth review. As lead reviewer, you must be prepared to provide a short overview of each assigned proposal to highlight the strengths and weaknesses relative to the review criteria. The appropriateness of the budget and cost estimates should be part of your preliminary assessment.

You are asked to provide your preliminary assessments to the CFI approximately one week in advance of the committee meeting. CFI staff will collate the preliminary assessments from the committee members to share with the chair in preparing for the meeting. Although you are not required to provide your written comments to the CFI, we do greatly appreciate your notes to assist us in drafting the committee reports. Should you wish to use the CFI report template to record your own ratings and notes, we have provided this document in CAMS for your use.

At the meeting

At the meeting, the Chair and CFI staff will make introductory remarks and explain the CFI merit-review process. Thereafter, each proposal will be discussed in turn, allowing approximately 45 minutes per proposal. If one or more reviewers have been assigned as lead reviewers of a proposal, they will in turn share their preliminary assessment of the proposal before the rest of the committee shares theirs. This step will be followed by a general discussion among the entire committee.

For each proposal, the discussion will focus on the criteria where there are significant discrepancies among the assigned members' assessments. Following the discussion, the committee must reach a consensus opinion on the degree to which the proposal satisfies the criterion standards, as well as formulate an overall assessment of the strengths and weaknesses of the project. The comments and assessments need to be well aligned; members of CFI staff may intervene if there is a "disconnect" between the assessment and the comments.

Committee reports

A three- to five-page report is required for each proposal reviewed by the Expert Committee. The report includes a consensus assessment of each criterion substantiated by comments on the strengths and weaknesses. Furthermore, reports should also contain the committee's assessment of the budget, including identification of items that should be removed or that are not adequately justified in view of the planned research activities. Similarly, the committee should review adequacy of the cost estimates. A funding recommendation is also required in the report. The CFI will ask the committee to establish the amount by which the project's budget should be reduced should they suggest not funding part of the infrastructure.

Committee reports are normally drafted by CFI staff shortly after the meeting, and finalized in consultation with the Chair, with input and revisions from members when required

Funding decisions

The CFI Board of Directors will make the final decision on funding for each proposal at its March 2018 meeting. Following this meeting, the applicant institutions will receive the funding decisions, Expert Committee reports and MAC reports for their proposals, including committee memberships.

Official languages

The CFI offers its services in both of Canada's official languages: French and English. Committees must ensure that all proposals in either official language receive a full and detailed evaluation. The CFI should be advised if a committee member is assigned an application in an official language that he or she does not understand. Typically, committee deliberations will be conducted in English.

Collaboration with provinces

To coordinate the review processes and avoid duplication of review efforts, the CFI will provide 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 Committee review stage.

Appendix 1 - Definitions

Research domain

For the purposes of the Cyberinfrastructure Initiative, a research domain is defined as a multi-disciplinary area of research, or a group of areas of research that face common data challenges that can be addressed by the development of tailored, shared and integrated research data infrastructures.

Scientific experts

Scientific experts are subject matter experts who will be involved from the early stage of the project in defining the research questions and the data requirements, based on gaps and opportunities identified by a broader research community. They will both serve as advisors during the development of the research data infrastructure and be the end users once it is fully operational. Consequently, their engagement throughout the project will be critical to the success of the endeavour.

Technical experts

Technical experts are software developers, business analysts, data specialists, etc., who will be involved in the day-to-day development of the research data infrastructure. They are well aware of technical solutions and are not necessarily experts in the scientific area that will benefit from the research data infrastructure.

Appendix 2 – Conflict of Interest Policy

The Canada Foundation for Innovation (CFI) must meet the highest ethical and integrity standards in all that it does in order to continue to merit the trust and confidence of the research community, the government and the public. CFI review committee members, external reviewers and observers must meet the highest standards of ethical behaviour to maintain and enhance public confidence in CFI's ability to act in the public's best interest and for the long-term public good. Where a conflict arises between private and public interests, review committee members, external reviewers and observers will be expected to take the necessary measures to ensure that the public interest is protected.

Definition

A conflict of interest is a conflict between a person's duties and responsibilities with regard to the review process, and that person's private, professional, business or public interests. There may be a real, perceived or potential conflict of interest when the review committee member, external reviewer or observer:

- Would receive professional or personal benefit resulting from the funding opportunity or proposal being reviewed;
- Has a professional or personal relationship with a candidate or the applicant institution;
- Has a direct or indirect financial interest in a funding opportunity or proposal being reviewed.

A conflict of interest may be deemed to exist or perceived as such when review committee members, external reviewers or observers:

- Are a relative or close friend, or have a personal relationship with the candidates;
- Are in a position to gain or lose financially/materially from the funding of the proposal;
- Have had long-standing scientific or personal differences with the candidates;
- Are currently affiliated with the candidates' institutions, organizations or companies — including research hospitals and research institutes;
- Are closely professionally affiliated with the candidates, as a result of having in the last six years:
 - Frequent and regular interactions with the candidates in the course of their duties at their department, institution, organization or company;
 - Been a supervisor or a trainee of the candidates;
 - Collaborated, published or shared funding with the candidates, or have plans to do so in the immediate future;
 - Been employed by the applicant institution;
 - Feel for any reason unable to provide an impartial review of the proposal.

Note: The CFI reserves the right to resolve areas of uncertainty and to determine if a conflict exists.

Appendix 3 - Equity in the merit-review process

Merit review by nature is a subjective process. Bias may manifest in several ways. It could be based on a school of thought, fundamental versus applied or translational research, areas of research, sub-disciplines or approaches (including emerging ones), size or reputation of a participating institution, age, language, personal factors, or gender of the applicant. To sensitize reviewers to unconscious biases they may hold, CFI cautions members against any judgment of an application based on such factors, and asks them to constantly guard against the possibility of implicit bias influencing the decision-making process. This is essential in order to ensure that all participants in the merit-review process have the same base knowledge of the processes and policies in order to conduct effective and fair merit review.

Appendix 4 – Assessment criteria – instructions to applicants

Research

Once completed, the research data infrastructure will enable research activities that are timely, innovative and at the leading edge internationally.

- Explain how the proposed research data infrastructure will improve how research data is organized, accessed or used. Describe how you identified these improvements and determined they are a priority right now. Who else from the broader research community helped to determine these improvements?
- Describe the research that the proposed research data infrastructure will allow the community to do. Demonstrate how the research is innovative, feasible and at the leading edge internationally.

Research data infrastructure

The research data infrastructure is necessary and appropriate to enable the proposed research activities and, if applicable, builds on existing national or international data research infrastructure(s). The scope and requirements of the project are clearly defined and the proposed research data infrastructure can be commissioned within 36 months.

- Describe the research data infrastructure you're proposing. If applicable, explain how it uses or builds on existing national or international analytical tools, or data management methods and standards.
- Explain how the community will be able to do the research they have planned once the proposed research data infrastructure is operational.
- Describe each item you're requesting. Justify why it is needed to develop the research data infrastructure you're proposing. Reference the relevant item number from the "Cost of individual items" table. If you have grouped items together, provide a cost breakdown and justification for each individual item. If you are requesting construction or renovation, provide a description of the space, including its location, size and nature. Provide a detailed cost breakdown, timeline, and floor plans in a separate document as part of the finance module.
- Provide a clear timeline for how the research data infrastructure will be developed.

Scientific expertise

The scientific experts are established or emerging leaders in the relevant research domains and have the necessary expertise to guide the development of and exploit the research data infrastructure.

- Outline each scientific expert's track record. Include their most significant contributions and relevant measures of output.
- Highlight how each scientific expert will contribute to developing the proposed research data infrastructure. Describe how they will use the research data infrastructure once it's operational.
- Explain how the scientific experts will engage the broader research community throughout the development of the proposed research data infrastructure.

Technical expertise

The technical experts have the required expertise to efficiently design and build the research data infrastructure.

- Describe each technical expert's most significant contributions related to developing research data infrastructure. Examples could include, among others: research data infrastructure product development or adaptation; computation methodologies and algorithms for problem-solving; development of databases to support research.
- Highlight how each technical expert will contribute to developing the proposed research data infrastructure.

Sustainability and maintaining relevance

A compelling plan for the long-term management of the data is in place to ensure ongoing relevance of the infrastructure. The proposal presents a credible plan addressing the long-term financial sustainability of the research data infrastructure.

- Describe how you will keep the proposed research data infrastructure relevant and useful. Include plans for the long-term management of data.
- Describe your long-term financial and management plans for the proposed research data infrastructure. How will you make sure it is sustainably operated?

Benefits to Canadians

The research activities enabled by the infrastructure have the potential to lead to significant tangible benefits for society, health, the economy and/or the environment. The use of the research data infrastructure will be maximized by adopting best practices in accessibility, interoperability and generalizability.

- Describe how researchers will access the proposed research data infrastructure once it is operational. How will you maximize its use? If applicable, explain how you will use the research data infrastructure to leverage other existing national or international data resources. How will these other data resources make the proposed research data infrastructure more useful?
- Describe potential socio-economic benefits of the research made possible by the research data infrastructure. This could include training highly qualified personnel.

