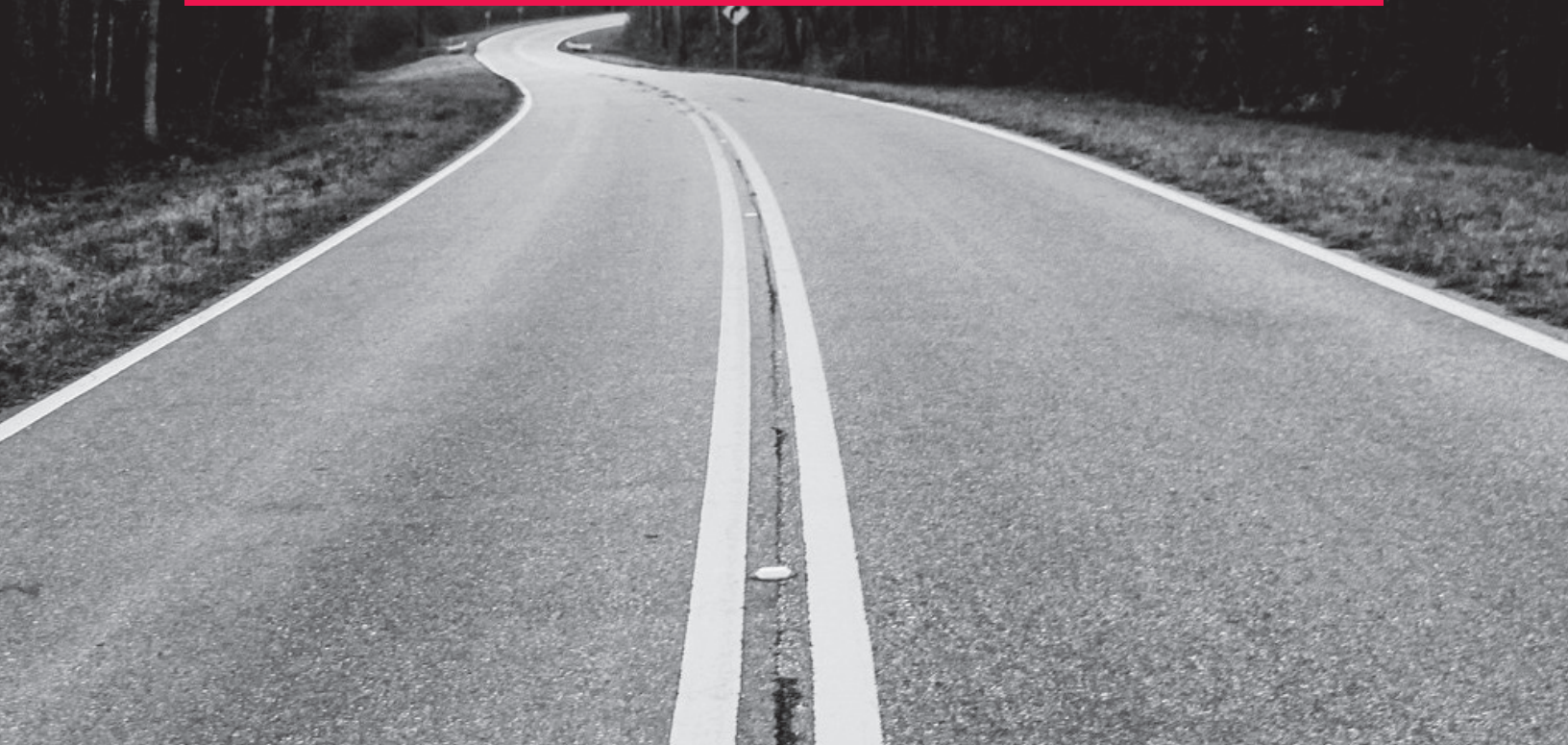


CANADA FOUNDATION FOR INNOVATION

Conversation on the future of research and research infrastructure in Canada: role of the Canada Foundation for Innovation

A discussion paper

November 2018



INNOVATION.CA

What is the Canada Foundation for Innovation?

The Canada Foundation for Innovation (CFI) makes financial contributions to Canada's universities, colleges, research hospitals and non-profit research organizations to increase their capability to carry out high-quality research.

Research supported by the CFI is helping build communities across Canada. That's because the CFI gives researchers the tools they need to think big and innovate. And a robust innovation system translates into jobs and new enterprises, better health, cleaner environments and, ultimately, vibrant communities. By investing in state-of-the-art facilities and equipment in Canada's universities, colleges, research hospitals and non-profit research institutions, the CFI also helps to attract and retain the world's top talent, to train the next generation of researchers and to support world-class research that strengthens the economy and improves the quality of life for all Canadians.

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Background and objectives

Created by the Government of Canada in 1997, the CFI strives to build the nation's capacity to undertake world-class research and technology development to the benefit of Canadians. Thanks to CFI, investment in state-of-the-art facilities and equipment, universities, colleges, research hospitals and non-profit research institutions are attracting and retaining the world's top talent in creating the environment necessary for discovery, training the next generation of researchers, supporting private-sector innovation and creating high-quality jobs that strengthen Canada's position in today's knowledge economy.

As per our contribution agreements with the government, the CFI's overall objectives are to enhance the capacity of institutions to:

- Increase Canada's capability to carry out important world-class research and technology development;
- Support economic growth and job creation, as well as health and environmental quality through innovation;
- Expand research and job opportunities by providing support through research infrastructure for the development of highly qualified personnel; and,
- Promote productive networks and collaboration among universities, colleges, research hospitals, non-profit research institutions and the private sector in Canada.

The CFI expects that the funding provided will enhance the capacity of institutions to:

- Attract and retain the world's top research talent;
- Train the next generation of researchers;
- Enable researchers to undertake world-class research and technology development that lead to social, economic and environmental benefits for Canada; and,
- Support private-sector innovation and commercialization.

And finally, we want to create an open and stimulating environment that will permit Canadian researchers to pave the way for future innovation through the pursuit of excellence, international outreach, partnerships and networks with business and users in all sectors.

The purpose of this document

In Budget 2018, the Government of Canada announced an investment of \$763 million over five years for research infrastructure. In addition, it proposed to establish permanent funding for the CFI at an ongoing level of \$462 million per year as of 2023–24.

With a new contribution agreement with the Government of Canada for the allocation from Budget 2018 expected in the coming weeks, it's time to have a conversation with the Canadian research community and our key stakeholders on the future of research and research infrastructure in Canada and the CFI's role in supporting institutions to sustain and enhance their research capacity.

Following the CFI's long-established practice of broad consultations, this pan-Canadian conversation will shape how we respond to a new context and to the evolving needs of Canada's research community. This document is meant to inform that discussion.

A new context for CFI

A sustained commitment to the funding of research infrastructure will allow us to better, and more systematically, support institutions in acquiring, operating and maintaining research tools and equipment, as well as developing nationally important research facilities. It will also allow institutions and their funding partners to better plan their infrastructure requirements, be more ambitious in their research trajectories, and produce the knowledge that Canadians need to thrive. Over the next five years, the CFI will transition toward our new funding model to fully capitalize on the predictability and long-term horizon this brings. These changes in the way the Government of Canada invests in research infrastructure through the CFI, as well as increased investment in fundamental research, will provide a significant boost to Canada's research capacity. The significant investments in fundamental research and research infrastructure in Budget 2018 will enable Canada to secure its standing, at a time when other nations are also making significant investments, as pointed out in the 2018 assessment of R&D in Canada conducted by the Council of Canadian Academies¹.

Listening to our stakeholders

At the CFI, we pride ourselves on being a responsive organization — one that listens to Canada's research community. In that spirit, we will convene broad stakeholder discussions over the next few weeks to advance our understanding of your evolving needs, your most pressing challenges and your most promising opportunities. These discussions will help inform program design and delivery and as well as identify emerging opportunities and challenges that may shape or guide future directions for the CFI. The CFI reaches across sectors, disciplines, agencies and research institutions and we will continue to bring a broad range of stakeholders to the table.

This national conversation will help determine:

- How the CFI's existing suite of funds can be tailored to best meet the needs of the full spectrum of institutions across the country;
- If our funding mechanisms allow institutions to capitalize on emerging trends and future opportunities; and,
- Which key strategic issues of importance to the research community and other CFI stakeholders may require new or revised CFI policies and practices.

¹ Council of Canadian Academies, 2018. Competing in a Global Innovation Economy: The Current State of R&D in Canada. Ottawa (ON): Expert Panel on the State of Science and Technology and Industrial Research and Development in Canada, Council of Canadian Academies.

Building on our more-than-20-year track record, we have a unique opportunity to collectively shape the CFI for the next 20 years, and as CFI stakeholders, your voice is critically important in determining that future.

Thinking of the next two decades, please imagine the context you believe would be propitious to fostering creativity and the adoption of greater globalization, convergence and equity that will promote Canadian innovation.

We know we can count on your support as we seek your advice and insight from this discussion paper.

The conversation framework

Through our recent interactions with the research community, we have identified three major trends that will inform the way the CFI provides research infrastructure support.

Convergence: This happens when a specific and compelling problem requires deep integration of disciplines, knowledge, theories, methods, data and communities. Convergence goes beyond interdisciplinary research by bringing many fields of research together, eliminating silos and creating systematic cohesion and thinking. Convergence can also be understood in an institutional context as universities and colleges build core facilities to better manage and maximize the shared use of their infrastructure, combine their strategic research priorities and research facilities to take on specific challenges and develop partnerships around the world.

Growing imperative for international collaboration: Across the country, Canadian researchers and their institutions increasingly collaborate with the best in the world and engage in global research enterprises. This brings Canadian research expertise and strengths to the global stage and attracts international researchers and research organizations to Canadian institutions.

Equity, diversity and inclusion: The pool of talent within Canada's research community is broadening to include a greater diversity of individuals of varied ages, backgrounds, ethnicities and genders. By providing all qualified Canadians with opportunities to build research careers, succeed in generating new knowledge and contribute to quality of life, we ensure Canadian research meets high standards of excellence and has meaningful impact.

Building on our more-than-twenty-year track record, we have a unique opportunity to collectively shape the CFI for the next twenty years, and as CFI stakeholders, your voice is critically important in determining that future.

Over the next 10 years, advances in technology and research will offer the ability to accelerate the pace of scientific breakthrough to levels we cannot even conceive today. Researchers will use new technologies to leverage vast amounts of data in order to make new discoveries that will fundamentally change how research is conducted. This will constitute a step change in knowledge output. Genomics, quantum technologies, artificial intelligence, renewable/clean energy, neuroscience, economics, and genetics, among others, have already produced benefits to society and continue to hold great promise and raise significant new questions about our understanding of the world.

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Increasingly, this is the case in all areas of research, including the social sciences and humanities. "There is an appetite to engage with data at an accelerated rate among social scientists," according to a recent report produced by SAGE Publishing (the sponsor of Social Science Space)² but unique challenges persist related to such issues as interdisciplinarity, research design training, and access." We believe that social research is already at a turning point where the successful collection and rigorous analysis of complex and highly varied data requires new skills, new collaborations, new research methods and new computational tools. Social scientists and humanists are rising to the challenges posed by big data.

Whatever the future brings will in large part be the result of more collaboration, increasingly massive datasets and more global participation.

In this context, how can we best position Canada to continue to be a leading knowledge-based society in a highly competitive world?

To answer that question, we count on you to share with us any ideas and thoughts for improvement or new directions for the CFI.

Participating in the conversation

CFI staff will meet with as many stakeholders as possible through a series of meetings across the country and a few webinars.

In addition, we invite institutions and key stakeholders to submit written comments by December 14, 2018 to conversation@innovation.ca. Thank you to those who already made important comments and suggestions. Please keep them coming!

Guiding the discussion

We are particularly interested in your thoughts on:

1. **Convergence** as a dynamic of research and research management;
2. **International** cooperation and collaboration;
3. The role of the CFI in supporting **smaller universities, colleges and cégeps** in Canada's research enterprise;
4. **Core facilities and regional platforms**;
5. **Equity, diversity and inclusion** as they relate to research infrastructure; and,
6. Any other topics that you consider important and relevant to the work of the CFI.

To stimulate and guide the conversation around these topics, the following sections present what we believe to be key issues and questions related to each.

2 Metzler, K., Kim, D. A., Allum, N., & Denman, A. (2016). Who is doing computational social science? Trends in big data research (White paper). London, UK: SAGE Publishing. doi: 10.4135/wp160926. Retrieved from <https://us.sagepub.com/sites/default/files/compsocsci.pdf>.

1 Convergence

The convergence of disciplines and areas of research, where scientists, engineers and scholars must work together, is increasingly seen as the way to solve pressing challenges facing society such as energy, water, climate, food and health. Convergence research was born of the need to bring multiple disciplines together to find solutions that more and more often lie at the interfaces.

CFI defines convergence as research aimed at a specific and compelling problem requiring the deep integration of disciplines, knowledge, theories, methods, data and communities. Merging ideas, approaches and technologies from widely diverse fields of knowledge at a high level of integration is a crucial strategy for solving complex problems and addressing complex intellectual questions.

Convergence can also be understood as research institutions joining forces to better manage and maximize the shared use of their infrastructure, combine strategic research priorities and research facilities to take on specific challenges, develop partnerships around the world, and increase the competitiveness of their research activities.

In the last two decades, convergence technologies such as Internet of things, medical imaging technologies (e.g., PET/CT scan), augmented and virtual reality technologies, wearable health devices, 3D printers, autonomous vehicles and drones/robots have led to groundbreaking and disruptive innovations. These developments are supported by private-sector firms and have shaped the evolution of different research fields to attain a high level of prominence. Convergence research required and produced a new generation of research infrastructure that significantly advanced research, modified the way of doing science, brought new possibilities that had been just theoretical and enabled research teams either to confirm or to refute their theories. The years to come will be as revolutionary as the past 20 years in terms of producing cutting-edge research infrastructure that will more quickly allow researchers to advance knowledge.

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During the last few years, we have seen institutions taking concrete steps to support convergence research from their degree programs to cross faculty appointments, to centres and institutes that bring together researchers from across departments and faculties.

Convergence research hubs — often called “discovery districts” — have also been established. These are designed to inspire innovative startups, drive the transfer of new technologies and accelerate the translation of research into socioeconomic benefits.

The higher education system has been adapting its organizational structures to make sure they are set up in the most effective ways to wrestle with the real challenges and opportunities offered to them.

How the CFI supports convergence

The CFI has many of the appropriate structures, policies and mechanisms in place to fully support the emergence of convergence research. In particular, our mandate allows us to support projects

that bring together teams of experts from a broad range of disciplines. Moreover, CFI projects are intrinsically convergent and the majority of research teams (especially those presented to us through the Innovation Fund) include researchers from diverse and complementary disciplines. Our merit-review process is robust and particularly well-suited to the assessment of convergence research. Still, there are some potential improvements to consider. Providing shared laboratory space could be an opportunity for the CFI to facilitate interactions among researchers from different disciplines or sectors. In this sense, we believe the development of shared space in its broadest sense (especially co-location of researchers from different disciplines, institutions, sectors) should be considered. Developing core facilities, either at the institutional or regional level, where researchers from different backgrounds rub shoulders, is also positive for convergence research.

Questions to consider

1. Do your intended research objectives lend themselves to convergence research? Please provide examples of convergence in your own research programs.
2. Would you say that you are carrying out convergence research at this time?
3. What would be the main characteristics of a fund, or funds, designed to support convergence research?
4. To what extent should convergence be used as a criterion for making funding decisions?
5. How can space (new or renovated) act as a catalyst for convergence research?
6. What is required to enable convergence research beyond academic institutional boundaries and to create and enhance partnerships with business and all sectors?
7. How can research infrastructure, through regional facilities, institutional core facilities or individual laboratories better facilitate convergence research?
8. Apart from providing research infrastructure and space, what additional role can the CFI play to better support convergence research?

2

International collaboration

Scientific research is by nature a collaborative activity and one that is increasingly without borders. In Canada, the share of publications authored with at least one international collaborator increased from 41 percent between 2003 and 2008 to 46 percent between 2009 and 2014, a trend also observed in the top 20 publishing countries. Access to high quality, leading and/or unique research tools and facilities often underpins international collaborations. The CFI's investments to date show that over half of all CFI-funded projects engage in international collaboration directly related to CFI-funded infrastructure. This is occurring in all types of institutions, all sizes of projects and all disciplines. The motivation behind most collaboration comes from researchers seeking out the best talent, institutions and facilities to complement their research, wherever they may be. Institutions strategically use Canadian investments in research infrastructure, at both the project and facility level, to increase the global reach of their researchers and advance Canadian interests as a whole.

As other countries increase their internationalization efforts, collaboration opportunities between nations require, more than ever, a strategic, focused and coordinated approach. These opportunities are driven by overarching research needs and goals:

- Some facilities, particularly in the physical sciences (e.g., high-energy physics, particle physics) are so large, complex and/or costly that they require international pooling of both capital and operating resources.
- Other infrastructure needs may require more modest investment but are inherently international in scope as they respond to global challenges and necessitate collaboration with nations involved in the studies.
- Many research endeavours demand a diversity of perspectives and the combined skills, data and efforts of the world's best scientists.

An international, cooperative approach not only improves the quality of research, but also its efficiency and economy of scale. It avoids duplication of efforts and investments, can lead to better alignment with the needs of the scientific community and increases the ability to leverage funds at all levels. As a result, the internationalization of research and innovation is becoming a priority for all actors around the globe.

How the CFI supports international collaboration

The CFI has a long history of supporting international collaboration efforts through investments spanning all types and ranges of infrastructure. The examples that follow illustrate the variety of opportunities as well as the flexibility afforded to date by CFI's funding architecture to engage Canadians in international endeavours. They also demonstrate how domestic investments have bolstered Canadian leadership globally.

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Global challenges inherently international in scope, including:

- International development projects, such as the Life Histories, Health and HIV/AIDS Data Laboratory at a Canadian university in partnership with researchers from Kenya and Malawi funded through the John R. Evans Leaders Fund (JELF) in 2007. Another example is a 2017 JELF project for implementing a platform for the isolation of antibodies against emerging pathogens circulating in Africa and South America in collaboration with researchers in Africa and Europe, as well as North and South America.

Complex, costly and large research endeavours such as:

- Large-scale, single-sited facilities located abroad, such as the latest detector upgrades for ATLAS at CERN's Large Hadron Collider, for which \$30 million of CFI support was provided to nine Canadian universities through the 2017 Innovation Fund competition. This constitutes the Canadian contribution to the \$235 million initiative funded by CERN. Another example is CFI's \$4.5 million contribution through the 2015 Innovation Fund competition for the SPIRou near-infrared Spectro-Polarimeter being installed on the Canada-France-Hawaii Telescope, which attracted matching contributions from three Canadian provinces and four other countries.
- Single-site facilities located in Canada, such as the CCGS *Amundsen* research icebreaker and Sudbury's SNOLAB, both of which were initially funded as CFI capital projects and are now supported through the CFI's Major Science Initiatives (MSI) Fund, as well as government supported facilities such as TRIUMF. SNOLAB's recent attraction of US\$30 million from the United States Department of Energy in support of a new dark matter detector to be sited in Sudbury is a prime example of how such facilities in Canada are attracting foreign investment.
- Rare and timely opportunities, such as a project led by a Canadian university to develop one of four instruments that will board the SMILE satellite mission. The project was funded through the 2017 Innovation Fund competition and is a collaboration with the Chinese, American and European solar-terrestrial research communities.
- Providing researcher access to facilities outside Canada, such as the \$15 million contribution made in 2002 to support Canadian participation at the Spallation Neutron Source in the United States.

Research undertakings that combine a breadth of skills, expertise and data from many nations. This includes internationally distributed networks of facilities such as:

- The Canadian node of the Structural Genomics Consortium, which was funded through the CFI's Leading Edge Fund in 2012.
- SuperDARN, a global network of space-weather radars, five of which form the Canadian node, which received funding from the CFI for capital investment as well as operational support through the MSI Fund.
- A CFI-funded project that undertook the cross-cultural study of literary networks in a global context, integrating new image-processing techniques with social network analysis to examine how different cultural epochs are characterized by unique networks of intellectual exchange. In this particular project, a combined approach of visual language processing and network modelling allowed the researchers to study the preprint textual heritages so far resistant to large-scale data analysis as well as develop a new model of global comparative literature that preserves a sense of the world's cultural differences.

Questions to consider

1. What are some examples of important international collaborations that further your institution's strategic priorities?
2. While our data show that CFI funds have been used to support international collaboration, is the CFI sufficiently contributing to the internationalization of research?
3. Should the CFI be a stronger enabler of international collaboration around infrastructure? If so, how?
4. What are the key barriers and obstacles faced by Canadian institutions and researchers in successfully engaging in international collaborations? Do you have examples of recent missed opportunities for international collaborations, and if so, what were the barriers to participation?
5. What would be the main characteristics of a fund, or funds, designed to support international collaboration (consider scope, size, etc.)?
6. Do you know of other funding opportunities or mechanisms in Canada or abroad with which CFI could partner (within the limits of our mandate) to increase the likelihood of success for international projects?

3

The role of the CFI in supporting smaller universities, colleges and cégeps in Canada's research and development enterprise

Canada's research and development enterprise involves researchers and scholars from a wide range of institutions. In this research ecosystem, small universities, colleges and cégeps play a critical role.

In line with the approach used by the Canada Research Chairs program, the CFI defines smaller institutions as those that receive less than one percent of the total federal granting agency research funding. "Smaller," therefore, is only indicative of relative share of research funding and does not reflect the quality of research undertaken at these institutions, nor the impact of this funding nor the impact of these institutions on their students, local communities and regions.

The CFI has recognized over 140 smaller institutions as eligible to apply for, receive and manage CFI funding, and over the past 20 years has provided research infrastructure funding to over 100 of them, including colleges, cégeps, universities and not-for-profit research institutions. In examining this portfolio of funding, the CFI has observed a diversity of research strategies employed by these smaller institutions. Notably, some have developed specific niches of expertise to better compete on a national scale. In addition, multi-institutional projects and collaboration among institutions have been a central pillar for the CFI's major competitions. There are many benefits of these collaborations among institutions of all sizes. In the case of smaller institutions, they have resulted in the attraction of additional funding compared to institutions that have not collaborated with other institutions.

Challenges for colleges, cégeps and smaller universities

The CFI recognizes that colleges, cégeps and smaller universities face unique challenges in building and maintaining their research capacity. The diversity of funding opportunities and growing complexity of research administration has limited the ability of some small institutions to compete successfully for research funds. Even though smaller institutions have access to CFI's funding mechanisms such as JELF, they still face challenges in attracting and retaining leading researchers.

"Smaller" is only indicative of relative share of research funding and does not reflect the quality of research undertaken at these institutions, nor the impact of this funding nor the impact of these institutions on their students, local communities and regions.

The level of funding as well as the funding structure to deliver these funds could play an important role in the way smaller universities, colleges and cégeps enhance their research capacity. As part of this conversation, we would like to hear from smaller institutions to gain a deeper understanding of the role these institutions play in Canada's research enterprise and the unique challenges they face. This will allow us to consider these factors in designing and implementing our funding mechanisms. With this knowledge, the CFI may be able to align its funding mechanisms and activities to maximize their impact and ensure a holistic approach to enhancing Canada's capacity for innovation.

Questions to consider

1. What are the challenges faced by researchers at a small institution with respect to accessing leading-edge research infrastructures to conduct research?
2. How can CFI better address the specific needs and challenges of smaller institutions as they relate to research infrastructure?
3. From a smaller institution's perspective, what are the advantages and/or challenges stemming from collaborative, multi-institutional projects? How can smaller institutions best contribute to these endeavours?
4. Should the CFI do more to facilitate inter-institutional collaboration with smaller institutions?
5. Do the current CFI funding architecture and merit-review processes appropriately support the research infrastructure needs of smaller universities, colleges and cégeps? Do you have suggestions on how these might be changed to better support smaller institutions?

4

Core facilities and regional platforms

As research moves increasingly toward convergence, a rapidly growing number of institutions have implemented core facilities and developed formal designation and supporting policies. Core facilities have proven to enable institutions to attract, retain and train top researchers from around the globe and to foster collaborations among the academic, private, public and non-profit sectors. In addition, by promoting shared and common management of similar or complementary research facilities, whether located together or distributed, core facilities offer the potential to increase effectiveness and efficiency with the realization of significant benefits such as:

- Increased use of the infrastructure and broader access to state-of-the-art services, facilities, technologies and expertise offered by co-locating research infrastructure, or by centralizing its management and operation;
- The strategic development of proposals, with a focus on opportunities and areas of greater need while avoiding duplication of infrastructure;
- A better use of resources through economies of scale and cost savings, reduced duplication of efforts, and the consolidation of in-house maintenance capabilities;
- Enhanced training and greater availability of skilled operators to help ensure optimal use of the infrastructure;
- The promotion of convergent collaborations;
- Enhanced attraction and capacity to work with external users, including the ability to charge user fees;
- An improved capacity to sustain the research infrastructure over its useful lifetime.

What has the CFI done in the last two years?

Past CFI-led consultations, including one conducted in 2015, demonstrated the importance of core facilities to the research community. In response, the CFI has taken several actions to more effectively promote core facilities at CFI-funded institutions, including:

- Broadening the definition of eligible infrastructure for JELF to allow for the acquisition, upgrading or replacement of “workhorse” infrastructure that supports larger groups of researchers;
- Broadening the definition of services eligible for support through the Infrastructure Operating Fund (e.g., electricity, security, cleaning) to include expenses that directly support CFI-funded infrastructure, regardless of whether the space essential to house and use it was originally funded by the CFI;

Core facilities have proven to enable institutions to attract, retain and train top researchers from around the globe and to foster collaborations among the academic, private, public and non-profit sectors.

- Strengthening existing resources and developing new ones to better assist institutions to increase the visibility of core facilities to potential users through the Research Facilities Navigator, and communicating good practices on CFI's website, Innovation.ca, for managing CFI-funded infrastructure through core facilities.

Looking to the future, the CFI is interested in understanding the priority institutions place on core facilities, as well as the potential role of the CFI in helping institutions overcome any challenges they face in effectively managing and sustaining them.

Questions to consider

1. From your perspective, tell us about your experience with core facilities, both at the institutional and regional levels.
2. Is the development and support of core facilities an institutional priority? If so, what steps is your institution taking to develop and support core facilities? What are the major challenges to establish and effectively operate core facilities?
3. How can CFI better address the needs of researchers in connection with the development of institutional core facilities and regional platforms?
4. Is the development and support of core facilities an important area for CFI to provide additional support? To what extent should CFI prioritize support of core facilities?
5. What are the most effective ways the CFI could support core facilities (e.g., funding architecture, eligibility of projects and infrastructure, application processes and forms, assessment criteria) and improve their sustainability? What other policies, processes or practices could the CFI adopt to more effectively support research excellence through core facilities?
6. Should the CFI take on a greater role to support the networking of core facilities across the country?
7. What are the differences between establishing and operating regional core facilities in collaboration with other institutions or organizations and doing so within your institution? How do regional core facilities present different challenges to institutions? Is there a higher priority for institutions to develop and operate core facilities at the institutional level or at the regional level? Why or why not?

5

Equity, diversity and inclusion

The CFI continues to engage in the national dialogue on equity, diversity and inclusion (EDI) in the research enterprise. While we have always aimed to live the principles of EDI, we are making a more concerted effort to clearly integrate them into our practices, policies and funds. To this end, we recently published an EDI statement which will guide and frame our future activities.

The CFI's statement on equity, diversity and inclusion

The CFI is committed to the principles of equity, diversity and inclusion. In all our activities, we recognize that a breadth of perspectives, skills and experiences contributes to excellence in research.

Equity: We aim to ensure all CFI-eligible institutions have the opportunity to access and benefit from CFI programs and CFI-funded infrastructure through our well-established, fair and impartial practices.

Diversity: We value attributes that allow institutions and their researchers — from any background and from anywhere — to succeed. This includes individual attributes such as gender, language, culture and career stage; institutional attributes such as size, type and location; and attributes that encompass the full spectrum of research, from basic to applied and across all disciplines.

Inclusion: Our culture encourages collaboration, partnership and engagement among diverse groups of people, institutions and areas of research to maximize the potential of Canada's research ecosystem.

We believe that nurturing an equitable, diverse and inclusive culture is the responsibility of every member of the research ecosystem, including funders, institutions, researchers, experts and reviewers.

Applying EDI principles to how the CFI operates

Because the CFI invests in state-of-the-art infrastructure and facilities at Canadian institutions, and not in individuals per se, applying EDI principles can be challenging. The CFI encourages diversity in research teams and other infrastructure users. It also strives to adapt its funding architecture to meet the research infrastructure needs of a range of Canadian research institutions and research communities and to maintain a fair and unbiased merit-review process based on well-established, international standards.

We believe that nurturing an equitable, diverse and inclusive culture is the responsibility of every member of the research ecosystem, including funders, institutions, researchers, experts and reviewers.

In addition, the CFI recognizes that most institutions have taken steps to advance their commitment to an EDI agenda, including implementation of institutional EDI action plans and the establishment of EDI indicators and targets.

We would like to know how we can support your institution in upholding EDI principles and progressing toward meeting your EDI goals. As well, we are seeking actionable suggestions on changes to the CFI merit-review process and guidelines to avoid any real or perceived biases and barriers in order to support our EDI commitments.

Questions to consider

1. How can the CFI assist your institution in advancing the EDI objectives in your strategic research plan and meeting your EDI targets?
2. For the projects you have submitted to the CFI, do you see any immediate barriers or challenges that have hindered you from diversifying the composition of research teams, based on gender, career stage, institutional size or research disciplines, etc.?
3. What incentives would be appropriate for the CFI to offer to encourage greater diversity of research teams, based on individual, institutional or research discipline attributes? Are there successful practices employed by other funding organizations to support the diversification of research teams that you think the CFI could adopt?
4. Is the current CFI funding architecture suitable for supporting the infrastructure needs of all research disciplines, including the social sciences and humanities? If not, can you suggest how CFI funding mechanisms or competition objectives be changed to improve equity, diversity and inclusion?
5. Do you think there are any perceived biases in the CFI's processes (e.g., guidelines to competitions, merit-review process)? If so, suggest approaches the CFI could adopt to avoid them.
6. What steps can the CFI take to further diversify its base of expert reviewers and review committees? Are there tools or other practices currently employed by funding (or other) organizations to assist in the recruitment of reviewers with different attributes and perspectives that would be useful for the CFI to consider?

In conclusion

We trust this discussion paper will help stimulate our pan-Canadian conversation on the future of research and research infrastructure in Canada. We look forward to engaging with you over the next few months and listening to your ideas, suggestions and advice. Your feedback and input are invaluable and will enable the CFI to continue to design and deliver funding mechanisms that are well-aligned and responsive to the needs and priorities of the Canadian research community. This is also an opportunity for you to provide insight on strategic issues of importance to the research community and other CFI stakeholders in both the short- and long term. Finally, it allows us to continually evolve and refine forward-looking policies and practices. Thank you in advance for your continued interest and collaboration, and your participation in this national conversation.