

The Mitacs logo is positioned in the top left corner. It features the word "Mitacs" in a bold, white, sans-serif font. A small white dot is placed above the letter 'i'. The background of the entire page is a dark blue space filled with numerous small, bright blue and white dots, resembling a starry night sky. A large, light blue curved shape, resembling a partial arc or a stylized 'C', is located in the upper left quadrant, partially overlapping the logo and the starry background. The lower half of the image is dominated by a dense, abstract pattern of thin, light blue and yellow lines that resemble a complex network or a stylized field of tall grasses. The overall aesthetic is futuristic and technological.

**Mitacs**

Joining the Dots:  
**The Role of Mitacs as an  
Innovation Intermediary in Canada**

STEPHEN MILLER MAY 2023

# Joining the Dots: The Role of Mitacs as an Innovation Intermediary in Canada

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## About the author

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Stephen Miller is a Policy Fellow at Mitacs. Founded in 1999, Mitacs builds academic-industry collaborations across Canada, where top talent in Canadian and international post-secondary institutions is brought in to tackle industry challenges. Stephen specializes in researching and understanding innovation and R&D methods, strategies and policies. Based in Vancouver, he has 15 years of experience in economic and policy research consulting in the UK, Belgium and Canada. He has worked with a wide range of organizations including the UK government, the European Commission, and early-stage start-ups.

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**The views expressed in this report are those of the author and may not reflect the views or position of Mitacs.**

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## Acronyms

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AI	Artificial intelligence
BIPOC	Black, Indigenous, and people of colour
BSI	Business Strategy Internship
CCAB	Canadian Council for Aboriginal Business
CEGEP	<i>Collège d'enseignement général et professionnel</i>
CICan	Colleges and Institutes Canada
CRM	Customer Relationship Management
EDI	Equity, diversity, and inclusion
IP	Intellectual property
IRAP	Industrial Research Assistance Program
ISED	Innovation, Science and Economic Development Canada
IU	Internship unit (one IU is equivalent to a four-month “block” of student intern time on a Mitacs-supported project)
KTP	Knowledge Transfer Partnership
MEI	<i>Ministère de l'Économie et de l'Innovation</i>
MoU	Memorandum of Understanding
NFP	Not-for-profit
NRC	National Research Council of Canada
NSERC	Natural Sciences and Engineering Research Council
PSE	Post-secondary education
PSI	Post-secondary institution
R&I	Research and innovation



ROI Return on investment

RSRI *Les regroupements sectoriels de recherche industrielle*

SSHRC Social Sciences and Humanities Research Council

STEM Science, technology, engineering, mathematics

TRL Technology Readiness Level

TTO Technology Transfer Office

## Executive summary

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This report investigates the way in which Mitacs, one of Canada’s largest national innovation intermediaries, acts to support and enable research and innovation (R&I) between universities and businesses. Innovation intermediaries act as transactional agents or “knowledge brokers” between businesses, universities, and other agents of innovation.<sup>1</sup> By performing this mediating service, they act as important catalysts in an innovation ecosystem.

Mitacs is one of Canada’s largest innovation intermediaries. Established in 1999, it uses an industrial internship model to bring together universities, colleges, polytechnics, and CEGEPs (collectively, *academic institutions*) with non-academic partners. These non-academic partners include mainly businesses, but also include not-for-profit (NFP) organizations, municipalities, and hospitals. For the sake of brevity in this report, all of the above are referred to as “industry”. The resulting academic-industry projects aim to deliver new knowledge outcomes with industry-driven innovative applications. A key feature of Mitacs’s intermediary model is its network of Mitacs advisors (who were previously known as Business Development (BD) experts). Distributed across the country and responsible for engaging with both academic institutions and businesses, the Mitacs advisor network acts as Mitacs’s face-to-face touchpoint with its clients.

The aims of this report are twofold. Part 1 “zooms in” to explore how Mitacs works to deliver three universal innovation intermediary functions – creating *linkages* between innovating organizations, delivering supporting *services*, and building *strategic capability* in the innovation ecosystem. These themes were identified as being common to all intermediaries in the first report from this study, [\*Bridging the Gap: The Role of Innovation Intermediaries in Canada\*](#).

Part 1 shows that Mitacs’s function as an innovation intermediary is built on many smaller actions, practices, and patterns of behaviour. Many of these, such as the need to carefully communicate the non-financial incentives to collaboration, might not be immediately obvious to an external observer. Others, such as the importance of setting up good partnership working arrangements in collaborative R&I projects, are perhaps more obvious. As an innovation intermediary, Mitacs operates in a challenging environment and must carefully navigate, manage, or mitigate the many barriers, biases, and norms of behaviour that shape academic-industry relations in Canada.

Part 2 “zooms out” in order to “join the dots” between these individual practice-focused insights. The strategic themes that underpin both Mitacs’s value as an innovation intermediary, and some of its challenges, are highlighted. They are:

**Theme 1: Personal networks, trust, and reputation are critical to Mitacs’s success as an innovation intermediary.** Mitacs’s organizational success hinges on the ability of individual Mitacs advisors to foster positive relationships and to leverage their personal networks, reputation, accumulated trust, and tacit knowledge of their local innovation ecosystems. This theme reflects a line of research in innovation studies around the role of the individual in innovation – and particularly in mediating the transfer and sharing of knowledge. Although Mitacs is a large national organization, its success comes down to individual personal reputation and trust.

**Theme 2: Mitacs’s value is enhanced through coordination and coherence with other innovation support actors.** Mitacs could not function well without the formal and informal support of other innovation actors and organizations, built up over time. This synergy is strongest where Mitacs contributes (directly or indirectly) to meeting the organizational objectives of other innovation support actors, such as college or university research offices. Coordination and coherence are also delivered through complementarity with other innovation funders, such as NSERC. The ability to coordinate and align the interests and efforts of an assortment of innovation stakeholders is important because, by doing so, Mitacs acts as a “system integrator.” This has been progressively built up over time and is not easy to replicate. This integrative function has emerged organically, rather than being the result of a deliberate top-down strategy.

**Theme 3: There is a trade-off between maximizing repeat business from established partnerships, versus new R&I partnership development.** Mitacs has successfully delivered on its IU delivery targets over the years, and – backed by increased funding – has been tasked by Innovation, Science and Economic Development Canada (ISED) and other funders to continue to increase internship numbers. Individual Mitacs advisors therefore face increasing pressure to deliver more student internships within a limited time. These competing pressures can bring Mitacs advisors up a practical time investment limit per project, beyond which the time and effort expended in return for a (potential) application becomes unfeasible. This challenge is largely a product of Mitacs’s success in supporting large numbers of academic-industry projects to date. As of 2022, with room to grow in terms of both maximizing engagement from existing partners and continuing to connect with new industry partners and academics, the choice between repeat business vs. new partnership development does not (yet) seem to be limiting Mitacs’s success. Nevertheless, it is a challenge that Mitacs should be conscious of over the coming years, as the number of projects it supports continues to grow.

## Introduction

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Founded in 1999, Mitacs builds academic-industry collaborations across Canada, where top talent in Canadian and international post-secondary institutions is brought in to tackle industry challenges. The Mitacs business model is based on a strategy to apply one of Canada’s core strengths – the talent and knowledge within its academic community – to an area of weakness; innovation activities in non-academic sectors.

This is the second of two reports in a study to examine how Mitacs, acting as an innovation intermediary, supports innovation by enabling academic-industry research collaboration. The first report, [Bridging the Gap: The Role of Innovation Intermediaries in Canada](#), set out a framework for understanding intermediary practice through three common functions:

1. *Creating and sustaining linkages* between organizations and actors. Innovation intermediaries act to create new connections between actors in an innovation system, and strengthen existing linkages.
2. *Providing specific services*. Following initial client engagement, innovation intermediaries provide hands-on services such as access to testing facilities, financing, portfolio advice, or searching for technology transfer opportunities (among others).
3. Supporting *strategic capability* in the innovation system. Innovation intermediaries can adopt and promote a long-term perspective, supporting the sustainability and long-term prosperity of their innovation systems by supporting the exploitation of new knowledge to generate positive socio-economic impacts.

*Bridging the Gap* also laid out a summary of lessons and good practices, based on existing research into how innovation intermediaries function most effectively, drawing from international lessons and established best practice principles.

This report builds on *Bridging the Gap* by narrowing the focus to one specific innovation intermediary: Mitacs. As a successful not-for-profit innovation intermediary supporting projects in all provinces and territories, Mitacs provides a unique practitioner-based perspective for better understanding the methods and practices intermediary organizations use to support R&D and innovation – with a focus on academic-industry collaboration – under each of the three core functions (linkages, services, and strategic capability). This report answers **five research questions** exploring the role of Mitacs as an innovation intermediary (Table 1). Where relevant, the transferability of success factors is also highlighted.

To understand the value that Mitacs delivers and – just as importantly – the practical limitations, challenges, and issues around innovation intermediation, this report adopts a two-stage “zoom in, zoom out” structure.

Part 1 (zooming in) examines the way in which Mitacs delivers the three core intermediary functions (linkages, services, strategic capability). This section focuses on describing and exploring the functional practices and challenges at hand, such as how Mitacs advisors work to overcome common barriers to academic-industry collaboration (research question 2).



**Table 1: Research questions**

Research question	Innovation intermediary function
<b>PART 1 – Zooming in</b>	
What challenges do Canadian academic institutions and businesses face when connecting with each other?	Creating and sustaining innovation linkages
How does Mitacs overcome these challenges to create the initial academic-industry connections?	
After establishing initial dialogue between partners, how does Mitacs support them to co-develop joint R&I project applications?	Providing specific services to support agents of innovation
How does Mitacs encourage longer-term business innovation outcomes?	Supporting strategic capability in the innovation system
<b>PART 2 – Zooming out</b>	
Considering previous research about the role of innovation intermediaries, what new insights can be made about the value that Mitacs creates?	(Conclusions)

This sets up Part 2 (zooming out) which, after summarizing some of the key findings from Part 1, highlights three themes that emerge from this examination of the Mitacs model, reflecting on the common threads that underpin its varied innovation intermediary practices.

## RESEARCH APPROACH

To answer the research questions, an interview-based qualitative methodology was used, reinforced with insights from previous innovation research, plus Mitacs data where available. Mitacs advisors are ideally placed to provide robust experience-based insights into the dynamics of university-industry R&I collaboration and the role of Mitacs in supporting partnerships. Accordingly, the main body of evidence for this report is from interviews with Mitacs advisors. To add to the robustness of findings, and to counter any organizational systemic bias from interviewees, interviews were also carried out with academic leaders of completed Mitacs-funded projects, and business leaders of Mitacs-funded projects.

34 semi-structured interviews were conducted with:

- 20 Mitacs advisors across eight Canadian provinces (Alberta, British Columbia, Manitoba, Newfoundland and Labrador, Nova Scotia, Ontario, Quebec, and Saskatchewan), directly responsible for covering 15 major population centres, plus their surrounding areas.
- Seven professors specializing in a variety of disciplines (chemistry, economics, engineering, geography, human nutrition, pharmacology, and urban planning) from six Canadian universities in five provinces (Alberta, British Columbia, Ontario, Quebec, and Saskatchewan). All were the academic leads on Mitacs-supported collaborative R&I projects with industry partners.
- Seven business and not-for-profit managers and CEOs, all of whom have acted as leads on Mitacs-supported projects with university or college partners. Interviewees represented seven different industry sectors – chemical manufacturing, civil engineering, construction, education, environmental services, life sciences, and technology services – from four provinces (Alberta, British Columbia, Ontario, and Saskatchewan).

Interviews were carried out from April to June 2022. Interviews were analyzed using a hybrid deductive-inductive coding method. This method is effective because it allows for themes and findings to emerge inductively from qualitative information, but structures these themes within pre-defined categories (deductively). In this study, the categories used to group findings were the three core intermediary functions. All quotes from interviewees are anonymized in this report, and quotes may be edited for the sake of clarity.

## Mitacs’s research and innovation support model

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Before “zooming” in to examine Mitacs R&I support practice in Part 1 of this report, it is useful to provide a brief overview of the Mitacs R&I support model, including its main programs and its project co-funding system.

Mitacs is one of many Canadian innovation intermediary organizations. As outlined in the first report in this series, *Bridging the Gap: The Role of Innovation Intermediaries in Canada*, innovation intermediaries are defined as *organizations that provide a supportive role for collaboration between two or more parties during various stages of the innovation process.*<sup>2</sup> Innovation intermediaries take many forms, from science and technology parks to incubators and accelerators.

Operating on a not-for-profit basis and funded by the government, industry co-funding, and membership dues from universities, Mitacs has a remit to act to support research and innovation for the public good. Its mission is to: “build a world-class, diverse community of innovators through our collaborative model, attracting and deploying top talent to industry, and matching need with expertise to create ambitious solutions to real-world challenges.”<sup>3</sup>

### MITACS SUPPORTS ACADEMIA-INDUSTRY RESEARCH

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Mitacs supports joint research and innovation (R&I) projects between two main client groups:

- Post-secondary institutions (PSIs), consisting mainly of universities, but also including colleges, polytechnics, and CEGEPs in Quebec (*Collège d’enseignement général et professionnel*).
- Non-academic partners, made up mainly by private sector businesses, but also including not-for-profit (NFP) organizations, hospitals, and municipalities.

Each collaborative research project consists of at least one PSI and one non-academic partner, but many projects have multiple partners working together in a broader consortium. For example, a project awarded Mitacs funding in 2020, *Mine revegetation in the Yukon*, included academic leads from two universities (the University of Alberta and Yukon University), and a wider mining research consortium consisting of seven businesses.<sup>4</sup> Projects with a not-for-profit organization must have a demonstrable economic or productivity orientation. Although Mitacs was founded as a network focusing on mathematics, it now supports projects across all academic disciplines and industry sectors.

#### **Box 1: Key concepts – discovery push, demand pull, academic engagement, and business collaboration**

This report presents findings built on concepts that have emerged from prior research studies into the role of intermediaries and the nature of associational innovation. These concepts include *discovery push, demand pull, academic engagement, and business collaboration*.

*Discovery push* and *demand pull* relate to the strategic orientation of academic institutions, businesses, and individuals that are engaged in innovation. They are defined as follows.

*Discovery push* is about introducing new technologies, products, or services that have perceived value potential, based on the hope or expectation that end users will be interested. Advocates of discovery

push usually believe that their innovation will meet an unmet “invisible” need, i.e., one which end users are not aware of (an “unknown unknown”). Perhaps the best-known example of successful discovery (technology) push is the Apple iPad, which created a previously non-existent market for tablets. Discovery push is often driven by advances in science and technology, such as breakthroughs in materials science, which can lead to *disruptive innovation*. This also means that it can stem from basic and early-stage research of the type carried out in universities.

*Demand pull* is about meeting the identified needs of technology, products, or services end users. It is commonly used to underpin *incremental innovation* and based on market research to identify the “job-to-be-done” by intended customers. Demand pull is often used by businesses in mature markets with well-established demand, such as the combustion engine car market.<sup>5</sup>

These examples of discovery push and demand pull are based on overall patterns of behaviour from academia and from industry. Of course, there are exceptions, such as academic institutions engaged in incremental innovation, or large firms attempting to “push” new market-untested innovations. Discovery push and demand pull offer a useful dichotomy to understand how organizations approach innovation, but they are not mutually exclusive. Indeed, most successful innovations are based on a mix of push and pull factors.

*Academic engagement* is defined as “knowledge-related collaboration by academic researchers with non-academic organizations... [it] represents an important way in which academic knowledge is transferred into the industrial domain; many companies consider it significantly more valuable than licensing university patents.”<sup>6 7</sup> From an intermediary perspective, it is useful to become familiar with the engagement stance taken by universities, polytechnics, colleges, and CEGEPs. For example, some have formal policies encouraging engagement, and some have proactive technology transfer offices which encourage knowledge transfer. The University of Waterloo in Ontario, for example, makes its Intellectual Property (IP) Rights Policy #73 openly available, and uses it to encourage academic engagement by safeguarding the inventor.<sup>8</sup>

*Business collaboration* relates to the propensity for businesses to engage in collaborative R&I with external partners. In general, “Firms that cooperate with external partners are also more likely to reap benefits from research collaboration with universities.”<sup>9</sup> The following are all generally correlated with a stronger likelihood to engage in collaborative innovation: the distance of a business from its nearest academic institution; complementarity between academic research specialisms and industry sector(s)<sup>10</sup>; business size; and signalling (i.e., visibly sharing knowledge to “convince prospective partners... of the opportunities available from engaging in a good R&D project”).<sup>11</sup>

## INTERNS ARE AT THE CORE OF EACH COLLABORATIVE RESEARCH PROJECT

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Each project is supported by one or more student intern from the academic partner institution. Interns can be college students, university undergraduates and recent graduates, master’s students, PhD students or postdocs (i.e., with a recent PhD completion). Under the guidance of a supervisor (usually a professor), and working closely with the industry partner lead, the intern carries out the bulk of the work in each project. Interns are expected to spend at least 50% of their time at the premises of the non-academic partner. During the COVID-19 pandemic, this requirement was relaxed for projects where



the intern was able to meaningfully contribute through remote working. Where this was not possible, projects were suspended until in-person working was once again feasible.

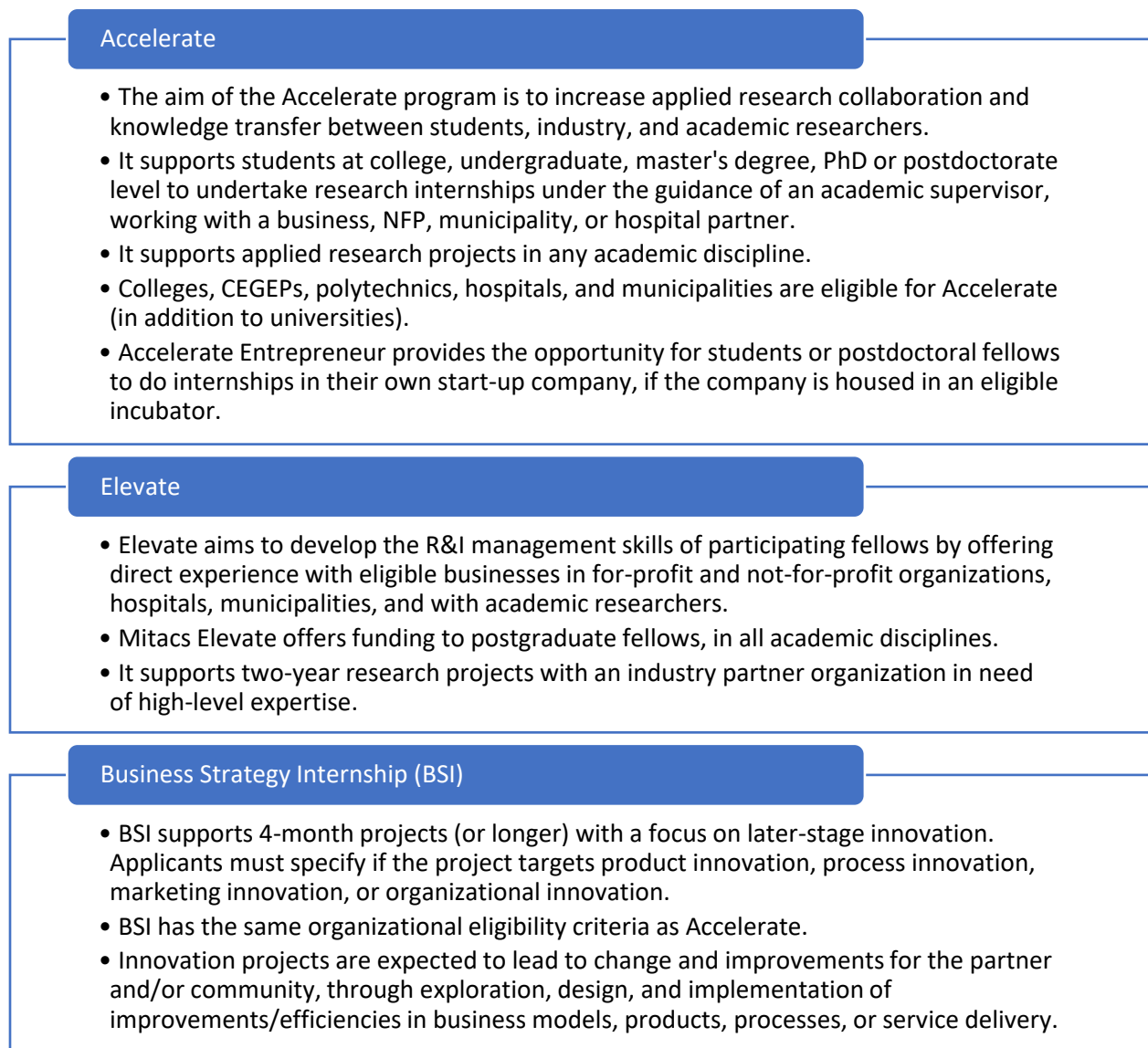
Mitacs maintains a database of supported projects, publicly accessible through its website.<sup>12</sup> It also maintains a database of open projects, dedicated to helping industry partners (generally businesses or not-for-profit organizations) find an academic research partner.<sup>13</sup>

## ACADEMIA-INDUSTRY PARTNERSHIPS ARE SUPPORTED THROUGH A RANGE OF PROGRAMS

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Mitacs offers several different programs, with varying emphases (Figure 1).

**Figure 1: The main domestic Mitacs programs\***



\* Mitacs offers several other internationally focused programs, notably the Globalink program.

Accelerate and Elevate applications are assessed through a peer review process. The purpose of the peer review is to make a judgment on the quality of the proposed research project and may result in recommendations/suggestions to improve elements of the project in order to be approved.

For all programs – there is an emphasis on generating “results of broader applicability”, which broadly translates into the potential for publishable outcomes: “This idea of general applicability of results that could be publishable in a peer-reviewed venue distinguishes a research project from a consulting project... Mitacs does not require that the results of funded projects be published, though it is strongly encouraged.”<sup>14</sup> Note that this requirement does not apply to the BSI program.

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## MITACS ENGAGES WITH R&I PARTNERS THROUGH A CANADA-WIDE NETWORK OF EXPERTS

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Unlike centralized grant funding agencies, Mitacs has an embedded network of experts across Canada that can support clients both at the formative (pre-award) and implementation (post-award) stages of their R&D projects.

Because the main purpose of these experts is to encourage and enable projects, and to secure them through successful applications for Mitacs support, they are collectively known as Mitacs advisors. Most cover one or more academic institutions. Some Mitacs advisors are co-funded by universities, and are therefore directly connected to them. Some focus on specific industry sectors, such as quantum computing or artificial intelligence (AI). Others are co-funded by organizations other than universities, such as Québec International, the economic development agency for the Québec City region.

Mitacs advisors often hold doctorates (PhDs), and so are familiar with both the academic environment and the components of a successful research project plan. These attributes are essential for them to be able to provide effective project application development support, as explored in Part 1 of this report.

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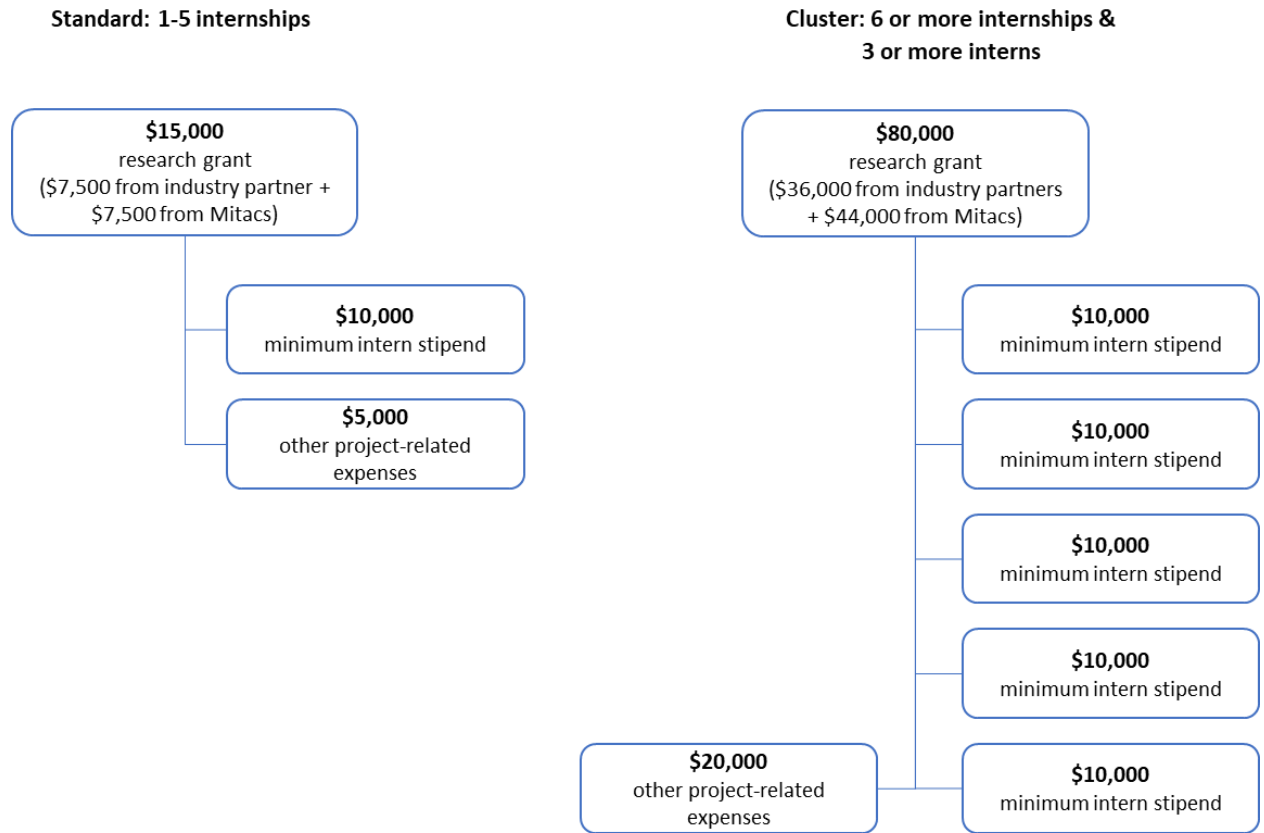
## THE MITACS FUNDING MODEL

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Mitacs is core-funded by a range of government organizations. Its single main public funder is Innovation, Science and Economic Development Canada (ISED), a Canadian federal government department. ISED funds are used to leverage additional provincial and eligible partner funds. As of the financial year-end 2021, Federal government contributions accounted for 43% of Mitacs revenue; ISED has committed to Can\$708M from 2021–2026.<sup>15</sup> Mitacs is also supported through provincial and territorial government and agency co-funding agreements. In Quebec, for example, the *Ministère de l'Économie et de l'Innovation* (MEI) co-funds Mitacs projects.

At the project level, this public funding is used to leverage a co-funding contribution from the industry partner. This is normally on a 50:50 basis, though during the COVID-19 pandemic, Mitacs was able to temporarily offer a higher ratio of 3:1 co-funding for small and medium-sized enterprises (SMEs). The minimum standard partner contribution per internship unit is Can\$7,500, though this is discounted slightly (from 50% to 45%) for larger projects (Figure 2).

Figure 2: The Mitacs project funding model (amounts in Canadian dollars)



## Part 1: Zooming in – how does Mitacs function as an innovation intermediary?

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### Creating and strengthening academic-industry linkages

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#### BARRIERS TO ACADEMIC-INDUSTRY COLLABORATION

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##### Key takeaways

—In terms of the barriers facing academics: Professors are often poorly incentivized by Canadian university or college policies to engage in research collaboration with industry parties. Even when they do so, consultancy is an alternative option that can be more appealing. The advantage of involving an intern is that the intern can then write the resulting research paper(s). The motivation to engage with industry is usually a personal choice, and/or undertaken (through Mitacs) for the benefit of students.

—Tri-Agency funding can also be a preferred funding option due to its perceived prestige. It is important to highlight that Tri-Agency funding and Mitacs co-funding have different rationales and serve different purposes in an academic’s research agenda.

—In terms of the barriers facing businesses or NFP organizations: Many universities are seen to be difficult to access and engage with. Industry leaders interested in university collaboration face initial barriers in terms of knowing how to access the “black box” of a university, and locate specific expertise that is complementary to their R&I needs.

—There is also a “cultural divide” between academia and industry. This is apparent, for example, through different working practices and organizational norms, and differing expectations regarding the nature and outcomes of collaboration.

Academics and industry leaders face barriers when it comes to collaborative research and innovation. This stems in part from their fundamental interest in different stages of the innovation continuum. Traditionally, universities – the main knowledge generating institutions in most economies – focus on the early stages in the innovation continuum (discovery and invention) and focus their resources on related activities. At the other end of the innovation continuum, profit-oriented businesses are more interested in committing resources to the later stages in the continuum, when a product, technology, or service has more obvious market and scale-up potential.

Barriers to university-industry collaboration have long been a focus in international innovation research studies, though there have been relatively few Canadian studies on the topic in recent years. A 2012 study by the Munk School of Global Affairs and Public Policy, University of Toronto highlighted that the Canadian innovation system has “weak linkages between the knowledge generation process in institutions of higher education and the capacity of private firms to adapt the knowledge being



generated for commercial purposes.”<sup>16</sup> According to this report, challenges to academic-industry knowledge transfer in Canada include:

- A “cultural divide” between academia and industry, including different timelines (some businesses may feel that universities lack a sense of urgency), and different rationales underpinning R&D.
- Lack of absorptive capacity on the industry side – as evidenced by low business expenditure in research and development in Canada. Larger firms (of more than 1,000 employees) are more likely to collaborate with universities.
- Collaboration varies by sector. Some academic disciplines are more given to collaboration, such as natural sciences and engineering.
- There are generally weak academic-industry technology transfer mechanisms. University technology transfer offices (TTOs) may be under-resourced or inefficient. They are not always well integrated into their parent universities, and may be seen as an “auxiliary structure”.<sup>17</sup>

*Academic evaluation frameworks do not always incentivize collaborative research with businesses or NFP organizations*

A first obstacle facing academics considering R&I collaboration with industry is the lack of formal institutional incentives that might encourage them to reach out to non-academic partners for collaborative R&D. The evaluation process for university-based academics typically focuses on three areas: teaching, research, and service. Academic engagement with industry often falls under service, the definition of which tends to vary between institutions. Furthermore, “what is and is not acceptable as ‘service’ is often nebulous and left to the discretion of internal committees.”<sup>18</sup>

Although collaboration can also contribute to the “research” criterion via resulting publications, this may not be immediately recognized by all professors. Institutional incentive frameworks differ greatly between individual Canadian PSE institutions, and – like the other barriers identified in this report – academics across Canada will have different (often faculty-specific) experiences. Some academic institutions are more proactive than others when it comes to aligning their incentive structures with a third mission (Box 2).

Furthermore, the effectiveness of institutional incentives is not only determined by the type of activity in question (i.e., academic-industry collaboration), but also the specific grant or funding source. In the words of one professor:

*I don't get a teaching release. I don't get the money. I get some funding from Mitacs, as you know... the evaluation committee of faculty does not consider Mitacs equivalent... even to a publication.*

Academic interviewee #3

**Box 2: Universities and the third mission**

Since the 1990s, universities have increasingly worked to generate positive impacts for their societies and economies. This includes commercializing and capturing the financial benefits of new discoveries and technologies, particularly through university-industry collaboration and technology transfer. This evolution from traditional “ivory towers” to more outwardly engaged entrepreneurial institutions is known as the “third mission” of universities (the first and second missions are education and research).

The pressure on academics to direct their research toward third mission impact remains a point of lively debate in Canada, and around the world.<sup>19</sup> The conversation can be even more intense when it comes to the commercialization of research outcomes (something that is very much part of the third mission), and when academic-industry knowledge transfer is promoted as a solution to Canada’s limited business R&D activity.

University professors are not necessarily entrepreneurs or innovators. Some of the friction between advocates of more traditional open research, and those who support “academic capitalism,” stems from the need to manage the conflicting pressures on academics who want to conduct open and exploratory (usually basic) research whilst avoiding an overtly market-oriented agenda. This is an ongoing challenge for intermediaries like Mitacs.

As part of the core university orientation toward traditional grant-funded academic research, it is perhaps unsurprising that most professors consider Tri-Agency funding to be more prestigious than Mitacs support. Of course, it is rarely an either/or decision, because the choice of funder is not mutually exclusive. Mitacs funds a different type of activity compared to, for example, an NSERC Discovery Grant.<sup>20</sup>

*NSERC is in and of itself extremely competitive. Whereas Mitacs is not. We fund slightly different aspects of work being done.*

Mitacs advisor interviewee #11

The easier accessibility of Mitacs funding is also a (positive) differentiating factor when it comes to the professors’ choice of funding. And an advantage of involving an intern is that the intern can then write the resulting research paper(s) – though this model also applies to Tri-Agency funded projects, which take on research assistants to carry out day-to-day research tasks.

*The decision to collaborate with industry or NFP organizations is often driven by personal values or specific research interests*

Where academics are not formally incentivized to create new connections with industry, the decision to do so can be based on personal values and a desire to apply the outcomes of their research to real-world situations (i.e., discovery push). Motivations for academic engagement are a mix of the personal and the practical, as expressed by academics themselves (Figure 3).

**Figure 3: Academic drivers of collaborative research with external (industry and NFP) organizations**

An interest in translating the outcomes of research into applied “real world” solutions

*I’m always interested in translation. And so, apart from doing the basic research, I really like having it translated to a practical construct. And so working with organizations and companies to get it to that level, and supporting them, is one of my modus operandi.*

Academic interviewee #7

The need for industry data, equipment, or complementary expertise to enable cutting-edge academic research

*They [the industry partner] have biomarkers expertise and that’s something that we would like to develop... So again, that’s why we collaborated with the [partner], to develop that.*

Academic interviewee #1

A personal interest in developing potentially commercializable project research outcomes

*We do research to address certain problems. Sometimes those research topics result in intellectual property, which we would always try to commercialize.*

Academic interviewee #6

The personal desire to proactively support students’ career development, and/or secure funding or stipends for students

*I wanted to be able to support some students in the lab, and the research that they were doing. So [collaboration] was more of a practical pathway.*

Academic interviewee #5

*Businesses which lack a formal R&I stance can struggle to make the internal case for external research collaboration with academia*

Businesses which adopt an open innovation stance, recognizing that innovation can be better enabled through opening up the process to external inputs, are more likely to look outwards for research collaboration opportunities.<sup>21</sup> Businesses without an established innovation stance – including those that do not identify any benefits from research – may not recognize the opportunities that can stem from engagement with professors:

*So sometimes some of the companies here are quite traditional. Their business model is not necessarily [based] on innovation. Or if it is, then they try to do it in-house. Sometimes they struggle... Often what I find as a barrier is that companies don’t necessarily have the staff, they don’t necessarily have the research capacity or the managers[.]*

Mitacs advisor interviewee #17

In organizationally siloed businesses, it can be the case that a particular team lead, such as a Chief Technology Officer, identifies a business case for external research collaboration, but might struggle to convince other senior decision-makers with different interests, such as finance directors.

*Collaborative engagement varies between academic disciplines and industries*

This research highlights the general perception among Mitacs advisors that more technology-intensive industries – usually those based on science, technology, engineering, and mathematics (STEM)

disciplines, often with higher R&D intensity – are often the ones that drive collaborative R&I with academia.<sup>22</sup> At the same time, however, Mitacs advisors who were specifically asked about this topic have an inclusive attitude toward supporting academic-industry research projects in non-STEM areas, such as the social sciences, humanities, education, and the creative sector.

*As an organization, the natural thing to do is have STEM-type projects, but that's not all that we can support. We can support broader non-STEM projects as well.*

Mitacs advisor interviewee #8

In Canada, official statistics show that manufacturing-sector companies are most likely to engage in R&D, with 47% undertaking this on either an in-house or outsourced basis (2019 data).<sup>23</sup> So there is some evidence to infer that businesses and NFP organizations that are not STEM-focused generally find it more difficult to make the case for collaborative research with PSE institutions.

Collaboration is also determined by the benefits that an industry partner would expect to derive from working with a partner from a particular academic discipline:

*It's kind of like the advisors who work in fine arts versus the STEM disciplines. It's a much harder push because fine arts deliverables don't typically align on a balance sheet for a company, as an ROI that they want to fund.*

Mitacs advisor interviewee #6

### *Some businesses or NFP organizations can be reluctant to collaborate with PSIs because of real or perceived risks*

From the industry or NFP organizational perspective, one of the most common factors preventing engagement with academic institutions is, simply, a lack of appreciation or misaligned expectations around the potential benefits of collaboration. This can lead to unexpected difficulties and, for businesses that have engaged in collaborative research with PSE institutions, potentially negative perceptions of the value of joint R&I. This can be the case where businesses approach academic institutions and find that the outcomes were not as planned.

*[Some businesses have] already worked with the universities and been burned in the past. Because oftentimes they have... lost some pretty big political capital or serious time and limitations, because they expected that university to provide consultant-level work. But that's not the role or nature of university collaborations.*

Mitacs advisor interviewee #7

For certain groups, including underrepresented communities and some not-for-profit organizations, there are also barriers around trust, and the ability to engage with businesses, universities, or colleges in a meaningful way for mutual benefit. From the academic side, for example, there are challenges to engagement with Indigenous Peoples; it has been noted that traditional top-down “helicopter” research, lacking a co-creative element, can foster disenchantment and reluctance to positively engage in future projects.<sup>24</sup> From a business perspective, research by the Canadian Council for Aboriginal Businesses (CCAB) has noted that “unconscious bias and prejudice against Aboriginal peoples make corporate Canada hesitant to work with Aboriginal businesses.”<sup>25</sup>



*Some businesses or NFP organizations find it difficult to know where and how to find the optimal academic partner*

Business leaders interested in academic collaboration face another initial barrier in terms of knowing how to access the “black box” of an academic institution, which can be seen as impenetrable:

*Sometimes it's not knowing where to go. A company might know, OK, we need help with formulation, but they won't know whether they should go to the chemistry department or chemical engineering. Or actually, [if] neither of those departments is the right fit, and they should be going to the School of Biomedical Engineering.*

Mitacs advisor interviewee #4

Here, again, there is variation between Canadian colleges and universities. Some are more proactive in signposting routes to collaboration or partnership for interested businesses. The University of British Columbia in Vancouver, for example, has a prominent University-Industry Liaison Office website, signposting various routes to action for interested industry visitors.<sup>26</sup>

This finding reflects the fact that, from the perspective of an academic institution that is trying to engage with external economic actors and commercialize its knowledge, optimizing its internal factors – culture, policy, and organization – is the key to success: “Changes in policy and organization at a university need to take [government agencies, firms, and other regional players] and their connections to the university under consideration.”<sup>27</sup>

*Mitacs advisors see a real “cultural divide” between businesses and academic institutions in Canada*

One of the key challenges that Mitacs faces in establishing linkages is the need to overcome or reconcile the differing priorities of academics and industry or NFP leaders. Mitacs advisors perceive that the “cultural divide” between academia and industry, as highlighted by the 2012 Munk School of Global Affairs and Public Policy, University of Toronto study, remains a strong barrier to establishing new collaborative academic-industry research relationships. This has several different angles.

Firstly, academics and industry leaders have different working practices and organizational norms. Whereas business (and, often, NFP organization) activities are heavily shaped by cost and efficiency considerations, as well as expected return on investment (ROI), academics – who do not work for profit-oriented organizations – are often under less pressure to deliver projects quickly:

*The mentalities are so different, you know. Business oriented people, these guys have timelines, they have clear objectives, and they need to go, go, go. Academics... don't necessarily work on hours per week the way businesses are used to, but more on deliverables.*

Mitacs advisor interviewee #1

Secondly, and in relation to the above, academics are motivated by different expected outcomes than are businesses. For academics, new knowledge production is its own reward. For business or NFP leaders, the application of that new knowledge (and its impacts) may be the priority:

*I think on the academic side, the endpoint deliverable is less interesting to them because they're going to try and publish everything along the way. But for the industrial partner, the endpoint deliverable is the carrot.*

Mitacs advisor interviewee #6

Thirdly, academics tend to use different terms and modes of language to describe research projects and technical subject matter. Although there is certainly common ground in terminology, business leaders can be more direct and less elaborate in their use of language:

*They both speak English, but the business language versus the academic language tends to be very different.*

Mitacs advisor interviewee #8

**To summarize this section**, an understanding of barriers is essential to framing the linkage-building function offered by Mitacs. The barriers identified imply that the university-industry innovation ecosystem is somewhat fragmented, and that R&I collaboration is subject to attitudinal or practical challenges from both the industry and the academic sides. This is corroborated by previous research, and implies there is still work to be done by innovation policymakers and stakeholders in Canada.

## MITACS AS AN INTERMEDIARY — BUILDING ACADEMIC-INDUSTRY LINKAGES

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### Key takeaways

—The Mitacs advisor model is based on active outreach, aiming to stimulate interest from the non-academic partner. Personal relationships are key. This differentiates Mitacs from many other innovation institutions, which can be passive and lack face-to-face dialogue.

—The broad value proposition of the Mitacs support model (research, innovation, talent) is an advantage, enabling (frank) communication of incentives tailored to the interests of different actors. Small businesses, for example, may be more interested in the co-funding and access to PSI lab facilities to enable financially unviable R&D. Large businesses can place greater value in the access to new talent.

—A large portion of the time, partners are already in contact before they engage with Mitacs. “Matchmaking” partnerships from scratch is not the most common starting point for supported academic-industry projects. Instead, Mitacs usually acts to mobilize latent interest or to revitalize an existing “weak” connection between an academic (or PSE institution) and an industry lead.

—For incoming interest from businesses or NFP organizations, Mitacs advisors provide a signposting service to the PSE institution, or to alternative institutions with more relevant specializations.

—Mitacs advisors coordinate with other ecosystem actors, notably university and college research offices. This can make their work more efficient in terms of reducing time and effort, by aligning their project development activities with those of the research offices. However, the depth and efficiency of the relationship vary considerably across PSE institutions, depending on their size and capacity.

As noted in the first report from this study, *Bridging the Gap*, the value of successful innovation intermediaries lies in their ability to enable or accelerate innovation processes which would otherwise stall or fail. By supporting client organizations along the innovation continuum, intermediaries help to “bridge the gap” between ideas and outcomes. It is this gap where innovation intermediaries can help to reduce uncertainty and risk, and promote success for positive societal and economic impacts.

**Barriers such as the cultural divide, and hesitancy from some businesses to engage in academic research collaboration, cannot always be overcome without the support that an innovation intermediary can provide.**

A first way to do this is by bringing innovation actors together – creating or strengthening linkages – to make collaborative research and innovation a reality. The barriers identified above, such as the cultural divide, and hesitancy from some businesses to engage in academic research collaboration, cannot always be overcome without the support that an innovation intermediary can provide. Mitacs advisors develop academic-industry linkages by performing two main roles.

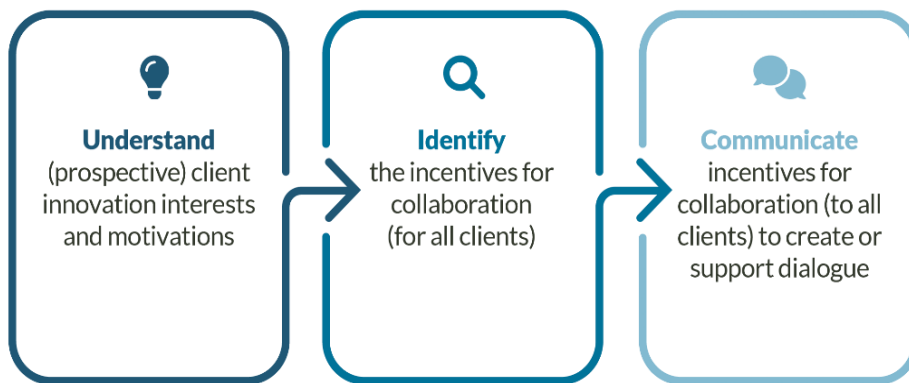
**Generating leads:** Mitacs advisors generate new “business” by encouraging leads: initial submissions of interest for collaborative academic-industry research projects. Where a project idea comes in from the industry side, but there is no identified academic partner, the lead is typically recorded as an open project in the Mitacs project database. However, if the project lead is based on a pre-existing academic-industry partnership – as is the case with many returning Mitacs clients – it will progress to application development (see below section 2, “Services”). Leads are generated through engagement with both academics from universities,

colleges, polytechnics, and CEGEPs; and with leaders in businesses, NFP organizations, municipalities, and hospitals.

**Matchmaking:** Where either an academic or an industry lead has expressed an R&D need or interest (i.e., a new project lead) but has no collaborative partner, Mitacs can attempt to match them with a complementary partner. In this way, it acts as an intermediary to create an entirely new connection between previously separate R&I actors.

In delivering both roles, Mitacs advisors continually aim to identify real or potential barriers to academic-industry collaboration and to tailor and communicate genuine incentives to overcome or circumvent doubt, hesitation, or practical limitations where possible (Figure 4).

**Figure 4: Typical intermediary steps in creating/renewing linkages**



Source: author

## Generating leads

Mitacs advisors build, capture, and mobilize interest in collaboration from academia, on the one hand, and from businesses, NFP organizations, and municipalities on the other. In this regard, Mitacs’s practice as an innovation intermediary seeks to capture and leverage both “discovery push” (generally from the academic side) and “demand pull” from the industry side (Box 1). In other words, the Mitacs innovation intermediation model is not based solely on reactive “supply side” support; it actively looks to identify potential interest and stimulate demand for industry-beneficial R&I.

**The Mitacs model is not based solely on reactive “supply side” support; it actively looks to identify potential interest and stimulate demand for industry-beneficial R&I.**

*Mitacs advisors embed themselves in local academic networks, and make use of tacit knowledge and personal connections*

To create opportunities for lead generation, Mitacs advisors engage in personal networking, searching for and following up on opportunities to generate new projects. Network connections are built up on both the academic and non-academic sides. Relationships with academics are often initiated by calling or emailing identified professors or researchers in academic departments to set up initial discussions. These conversations provide Mitacs advisors with opportunities to understand individual research interests, potential complementarities with industrial R&D, and specific barriers to collaboration. They also serve as the first step in establishing new longer-term relationships, in which the Mitacs advisor

typically encourages the academic to contact them if they have a future research idea which might lead to a collaborative project with industry. In this way, a “pipeline” of future leads is initiated. This contribution to developing longer-term R&I activity is further explored in the following section on *strategic capability*.

Although they require an upfront investment in time, Mitacs advisors report that these one-to-one conversations are the single best way to generate leads from PSE institutions. Other information resources, such as institutional profile pages for individual academics, can be of some use for an initial understanding of research interests and industry collaboration potential, but in the words of one interviewee:

*I would say it's almost impossible to figure out what professors are working on, like what projects are out there, without directly having conversations with people.*

Mitacs advisor interviewee #13

In Canada, this conversation-based engagement helps to differentiate Mitacs from the Tri-Agency funders and many other centralized (as opposed to network-based) innovation support organizations.

*Platforms offered by industry associations, regional development agencies and other network-based actors support lead generation*

In parallel with efforts to develop connections with academia, Mitacs advisors scan for and monitor industry-side R&I-relevant news, and often reach out to business leaders via introductory emails. Although the COVID-19 pandemic temporarily put a stop to face-to-face meetings and events, the value of in-person engagement remains high. Typical face-to-face fora include industry networking events, conferences, trade fairs, and PSI-organized career days.

*This is very much a contact sport. As I say, you have to be out there as much as possible. And the more collisions you have with other people, the more you find out about what's going on, and more opportunity you have to create an engagement.*

Mitacs advisor interviewee #9

Interviewees described how personal connections with industry associations, incubators, accelerators, and other network-based organizations are also leveraged to encourage referrals, to generate leads, and as platforms to promote Mitacs funding calls. These relationships are often informal (i.e., they are not underpinned by written agreements), and individual Mitacs advisors can be invited to present as part of a business support-oriented agenda.

*Incubators invite me to present a lot... it's all informal, depending on how proactive they are in offering help to their clients.*

Mitacs advisor interviewee #16

There are particularly strong synergies between the Accelerate Entrepreneur program (which supports student entrepreneurs) and incubator-organized lead generation, because the involvement of an approved incubator is a conditionality for this specific Mitacs program.<sup>28</sup>

*To generate leads effectively, initial conversations must be tailored, responsive, and relevant to the specific needs or concerns of the academic or industry leader*

Innovation intermediaries typically develop linkages through three successive stages (Figure 4 above). The lead generation process is an exercise in reflexive communication, during which the Mitacs advisor will seek to understand the potential client's interests and ambitions; then to identify and communicate the most relevant incentives. In addition to exploring the feasibility of the project idea, a parallel goal is to identify and overcome doubts or hesitation about academic-industry research collaboration and the mechanics of Mitacs support, through frank and open dialogue. With this framework in mind, Mitacs advisors "sell" by encouraging academics or industry leaders with potentially suitable project ideas to take the next step toward project finalization through developing a project plan, and to submit this via a formal application for co-funding.

A first step in the process is listening to, and deeply understanding, the preferences and research objectives of academics or industry leaders:

*I try to give the opportunity for the company or the client to speak first so I can see what it is that they're looking for, right. Because each stakeholder has really different... needs and wants.*

Mitacs advisor interviewee #14

The flexibility of the Mitacs academic-industry support model, and its value offer to both sides of the partnership, can be an asset to Mitacs advisors in these conversations, provided they ensure they are explaining the value proposition in terms of the highest value interests of individual clients.

Typically, for academics, the main incentive is the expectation of publishable research findings, though there are also others such as the possibility of establishing or reinforcing a relationship with an external partner. For businesses, the main incentive is the generation of commercially relevant outcomes. These outcomes typically come up in early discussion at this stage, but they are fully explored and finalized in project plans prior to application for Mitacs support. For this reason, mutually beneficial end-project outcomes are further discussed in the following section exploring *services*.

*When I talk to an academic partner... I alter my messaging somewhat within that group, depending on their interests. I also [adapt] my messaging when I talk to businesses.*

Mitacs advisor interviewee #7

*99% of the company people I deal with don't want to do research as defined by universities and granting agencies, so I... use the term innovation. And I would describe what the boundaries are around what we consider to be innovation.*

Mitacs advisor interviewee #9

*Co-funding support is not necessarily the most important incentive for collaboration*

It might be obvious to assume that the co-funding offered by Mitacs is the main incentive for academic-industry partners seeking support. However, a key finding from interviews is that the co-funding is not necessarily the most important incentive either for professors, or for business or NFP leaders. But its attractiveness varies depending on the profile of the partner, and the additionality it offers to their



situation (Box 3). On the academic side, as already explored in this report, professors may find the non-monetary benefits of Mitacs support – such as access to industry applications – to be of greatest value.

**Box 3: Balancing the effects of policy support – additionality, crowding out, and leveraging**

*Additionality* is a concept commonly used in policy design and evaluation. It refers to the effect that a policy instrument or invention has, over and above the “no policy” scenario (i.e., what would have happened anyway). In other words, additionality refers to the *net positive effect* of a policy or a specific policy instrument.

The benefits of additionality are often used to support the case for publicly funded R&D support instruments. In the case of Mitacs support to academic-industry partnership, additionality is achieved when Mitacs support enables a research project to take place when it would otherwise not have happened.

The flip side to additionality is the risk of *crowding out*. Crowding out occurs when public funds are used to substitute for private sector spending. In this case, there is no net positive effect; only a substitution of the funding source from private to public. In the context of R&I support, crowding out occurs when, “eligible firms simply substitute R&D investments they originally planned to undertake with the public financial resources made available (crowding out), undermining the argument for “additional” effects of public aid.”<sup>29</sup>

Mitacs support to R&I is designed to promote additionality in several ways.

- First, as explored in this section, lead generation focuses on encouraging latent R&I interest, mainly from the industry side, to operationalize aspirational R&I project ideas which would otherwise not see the light of day.
- Secondly, one of the conditionalities that governs the approval of Mitacs support is that industry partners have not already received funding support from federal or provincial funds that exceed a certain percentage of their overall income.
- Third, Mitacs reports on new program participants each year. Seeking new program participants should, in principle, help to prevent overreliance on a limited number of returning businesses.

For businesses and NFP organizations, the co-funding is always an incentive. But its importance often varies in proportion to the size of the organization. For micro-enterprises (of nine employees or fewer) – including start-ups – and small businesses (of 10–49 employees), the monetary value of a Mitacs co-funded intern is a strong incentive to undertake R&I collaboration with academia, because it accounts for a higher share of their more limited R&I spending budget.

*Oh, the funding is critical. If you looked at our website, you can see we’re a small operation and... we do more research than companies ten times our size.*

Business interviewee #2

In contrast, for large businesses with large R&D budgets, the co-funding is less important in relation to some of the intangible benefits of academic-industry collaboration; particularly access to highly driven new graduates and postgraduates.

*For small start-up companies, money is hugely important because they never have enough funding. But as you start to get up to medium-sized companies and larger companies, they want the IP. They want access to the talent. They know they need to involve top skill levels and create a pipeline of talent that comes into the organization.*

Mitacs advisor interviewee #9

### *For all industry partners, the intern-based model is a valued incentive*

The value of the intern is twofold. First, they can bring new skills to an industry partner organization. In this way, supported by an academic supervisor, they are a conduit for the academic expertise that the industry partner is tapping into. Second, they focus on the R&I project through one dedicated person, who – unlike the industry partner stakeholders – are not easily distracted by routine day-to-day business demands.

*Bringing in an intern just makes things so much better. I think it enhances our projects... It's a cost-effective resource. We get a lot of juice per squeeze.*

Business interviewee #4

As noted above, the talent development aspect is also important, both for large and small businesses, and for NFP organizations. The desire to establish a talent recruitment pipeline also incentivizes repeat applications.

*While many organizations start off with the hook [that] we provide some funding for projects, they find out that the establishment of relationships that give them access to top talent is actually [the] most valuable thing we do. And the money, over time, actually becomes secondary.*

Mitacs advisor interviewee #9

### Matchmaking

Firms, individuals, and academic institutions often contact each other and establish new connections, with no intermediary involvement. But even in these cases, innovation intermediaries can be approached by collaborative partners seeking support in the innovation process.

A key finding of this study is that, despite the general attention in the literature given to analyzing the role of intermediaries in creating entirely new projects – a large portion of academic-industry projects supported by Mitacs form from a pre-existing relationship between a professor and a business or NFP leader. However, these projects often still build off the relationships Mitacs advisors have built with professors – helping socialize the opportunities Mitacs projects can offer and the benefits that can come from collaboration with industry.

For projects without existing academic-industry relationships, Mitacs acts as the “matchmaker”, i.e., identifying a complementary pairing, and introducing the prospective partners to each other for the first time. This may include actively scheduling a first virtual or in-person meeting. Because the Mitacs model is oriented toward industry-led projects, most new “unmatched” project leads come from the industry side. In other words, they reflect a research interest from a business, NFP organization, or municipality that does not have an academic research partner lined up.

*Many project leads from industry can be tentatively matched very quickly, by drawing from advisors’ immediate knowledge of localized academic networks*

In many cases, after a research lead comes in from industry, a mutually complementary partner can be suggested by the advisor in the same conversation, by relying on their familiarity with the local academic network and their tacit knowledge of individual professors’ research interests. Probable complementarities between non-academic partner research needs, and academic research specialisms, are made intuitively and instantly in many cases. Because each advisor usually focuses on 1–3 local universities or colleges, there is a tendency to look for localized academic matches first. So there is a clear trend toward localized projects.

*Companies tend to want local connections with local students and local universities. That’s true for start-ups, and it’s also true for the multinationals.*

Mitacs advisor interviewee #17

If a potential academic partner can be quickly identified in this way, the Mitacs advisor will typically either set up a video call between the two parties, for a first conversation to assess the viability of a research partnership (this falls under the services function).

It has long been established that geographical proximity is correlated with better regional or local innovation performance.<sup>30</sup> Public PSIs also usually have a remit to act for the public good. So this tendency for Mitacs-supported businesses to prioritize local PSI partnerships can be quite credibly seen to reflect the importance of a co-located supply of public and semi-public goods to enable innovation in a region or local area. Dan Breznitz of the Munk School of Global Affairs and Public Policy, University of Toronto, refers to this as “collaborative-public space”.<sup>31</sup>

*Where matchmaking is more challenging, matches can be sought from partners over greater distances – sometime across provinces or territories*

Project leads which cannot be quickly matched are typically logged in the Mitacs open project database. This is a publicly available resource which any academic leader can use to search for matches.<sup>32</sup> It is often the case that these “open” projects lack suitable matches in the local area – perhaps because they demand a rare or more specialized research focus from the academic side – or because they focus on a specific environment (e.g., for ecological research projects) or a specific community group.

Open projects are circulated to all Mitacs advisor team members on a regular basis, so that the collective knowledge of the advisor network can be used for matchmaking. One of the limitations in a project between distanced partners, of course, is that the intern will usually be unable to carry out any research work at the industry partner’s location.

**To summarize this section,** Mitacs delivers a linkage-building function by using a range of strategies and practices. Some of these, such as the attendance at networking events, are about identifying interest to

generate leads. Other practices, such as the tailored communication of incentives, are about overcoming some of the barriers identified in the previous section.

Building linkages is not the whole story, though. It is a necessary first step, before innovation processes – the research, experimentation and development that leads to an innovative product, service, or technology – can take place. Innovation intermediaries also work to deliver services to enable these processes, as the following section moves on to examine for Mitacs.

## Services – developing and supporting projects

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### Key takeaways

—The Mitacs service, in terms of support to clients, focuses on the pre-award stage, in order to finalize the project application. Post-award support, while heavy on the back end, is more limited for the client, covering administration and finance processes.

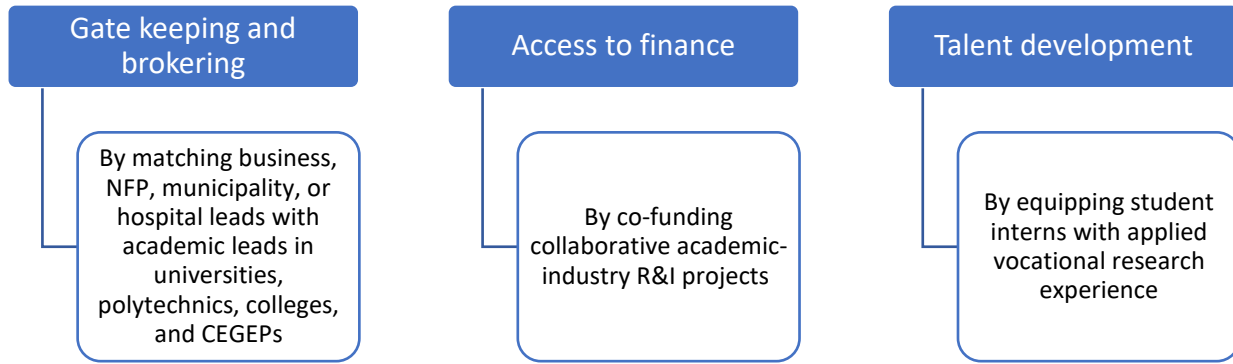
—Mitacs’s role is limited to a facilitator, and it does not have any exclusive influence over the project or the productivity of the relationships involved. Some arrangements, such as ownership of the resulting IP, are not mediated by Mitacs but by the academic and industry partners themselves.

- Mitacs advisors do not provide detailed advice or guidance on projects as subject matter experts. This would be impossible, given that Mitacs supports projects across all academic disciplines and industry sectors. Mitacs advisors do, however, advise on the structure and logical presentation of applications to ensure their success in peer review assessment, as well as ensuring their eligibility and administrative fitness. This is not something that all innovation funders can offer, although advisory services are quite a common service offered by innovation intermediaries.
- Mitacs advisors support partners in the definition and agreement of clear expectations, timelines, and project parameters. End-project outcomes need to be tailored to appeal to both sides. Directly commercializable outcomes are desirable for the industry partner, but often not feasible in the immediate term due to a need for further (post-project) work.
- Service delivery is based on discussions and would be difficult to automate. Mitacs’s ability to perform this service at its current scale is the result of long-term investments to develop its personnel and its network.

After the initial connection between clients has been established, innovation intermediaries typically play an ongoing role “at the table” to accelerate the transformation of knowledge and ideas into impactful innovation. Working with or supporting their clients, innovation intermediaries co-create solutions to overcome innovation challenges. Typical intermediary services include access to testing facilities, financing, portfolio advice, or searching for technology transfer opportunities.

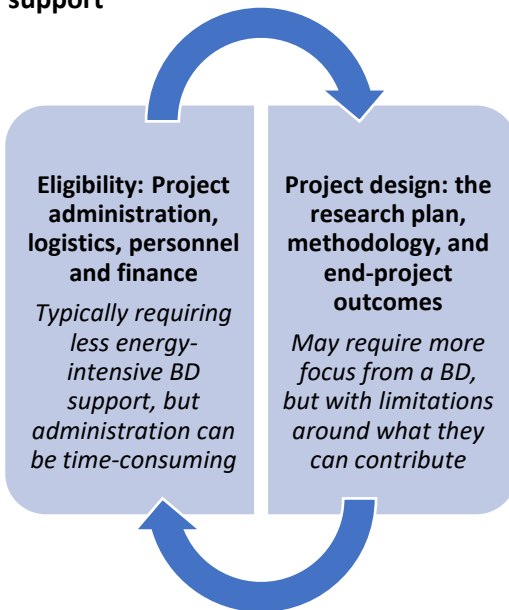
Mitacs delivers three innovation intermediary services from the typology developed in the first report in this study (*Bridging the Gap*) (Figure 5).

**Figure 5: Mitacs’s service offer to academia and industry clients**



For Mitacs, the specific service in terms of developing innovative activity through its advisor network centres on developing the various elements of the project plan. This service is geared toward finalizing successful project applications. Therefore, the Mitacs service offer concentrates on the pre-award stage. Post-award support focuses more on administration and finance processes, which – while critical to project success – does not usually require similarly intensive dialogue.

**Figure 6: The two elements of project support**



Mitacs advisors provide support to develop two distinct elements of each project (Figure 6).

*As intermediaries, Mitacs advisors offer “light touch” support to project development, focusing on critical sticking points*

Although approaches differ between individuals, Mitacs advisors generally adopt a minimalist approach to supporting project development. This is partly a necessity given the demands on their time, but also reflects the fact that they are supporting intermediaries, not the project owners:

*I also tell them they own this relationship now beyond just my tasks. I don’t try to protect and say, “no, you gotta go through me.” What I do is try to act as a trusted resource.*

Mitacs advisor interviewee #7

Although Mitacs advisors always have a direct role in supporting application development for the Accelerate and Elevate programs (BSI applications can be submitted directly by the partners, without advisor review), this is often limited to checking that projects meet the eligibility criteria, and that basic administrative arrangements are in place. This type of support is routine, but can be time intensive.

Where partners find it difficult to agree on substantive project elements such as agreement on the methodological approach, there can be more demand for the Mitacs advisor’s time to support them in developing key elements of the research plan. However, advisors do not act as subject matter experts. Rather, drawing from their academic expertise and familiarity with the structure of research proposals,



they may adopt a peer reviewer's perspective, looking for a logical and progressive structure in the project proposal.

*As advisors, we aren't subject matter experts, so we don't really offer much support in terms of creating the research project itself. We can help with the development of the application. So, you know, we have a good idea of what reviewers are looking for, so we can ask for clarity on things or expansion on certain things.*

Mitacs advisor interviewee #5

*[Thanks to my experience in academia and now at Mitacs] I'm really able to help people through that process of how to write something up. I can just help them understand[...] I can kind of tell your third line there, that's actually not an objective; it's a deliverable. So then I suggest that they put that into the deliverables section.*

Mitacs advisor interviewee #17

Furthermore, there is a practical limit to how much time and attention each project application can be afforded. For more established Mitacs advisors, who have a large number of incoming leads or project applications from their established academic and industry networks, there is less time available to support the development of each project.

### *Mitacs advisors support academic-industry partners to agree on complementary and mutually beneficial project outcomes*

The single biggest challenge impeding the development of projects is that academics and businesses are fundamentally motivated by different outcomes. Even though many relationships are already formed, this may not move forward to active cooperation unless there is clear benefit to both sides. Academics are primarily motivated to conduct new research in order to produce new knowledge, and to publish this. The business case from the industry side, on the other hand, is usually driven by one key outcome: commercial advantage. Not all collaborative R&I projects lead to commercializable outcomes for the industry partner. At the very least, however, businesses typically seek to improve their innovative performance.

*I make sure everyone gets something out of the project as well. Because usually we'll start from a need from the company, but we need to be sure that on the academic side, it is interesting as well. But sometimes that also involves changing the project a bit, or maybe expanding its scope from what the company had in mind initially.*

Mitacs advisor interviewee #2

Because of this, project success is more assured when there are early definition and agreement on the value proposition for all partners. Expectations need to be clearly set; end-project outcomes need to be tailored to appeal to both sides. This might require a degree of compromise or flexibility, as well as a willingness from partners to find the overlap between research outcomes and business outcomes.

**Project success is more assured when there are early definition and agreement on the value proposition for all partners.**

### *Reaching consensus on intellectual property (IP) ownership can be a challenge*

IP ownership arrangements can be challenging. Academic institutions and businesses can have different IP management priorities, with the former being keen to publish results, and the latter more interested in protecting new IP and using it to gain a competitive advantage. Mitacs takes no position on IP ownership, leaving it to the partners to come to agreement on ownership. However, Mitacs can facilitate IP discussions with any Canadian academic institution, especially for projects where all parties agree on the scope but ownership of the IP is an issue.

*[Sometimes, in the past,] the university wanted the IP or wanted to be compensated for the IP. And almost all companies absolutely refuse to do that.*

Mitacs advisor interviewee #9

In general, the IP agreement ensures the freedom of the academic partner to publish new research papers covering methodological breakthroughs that result from the project. Typically, these research outputs will be stripped of data from the industry side to safeguard the competitive advantage of the industry partner. And the industry partner will usually acquire any resulting patentable or commercially advantageous IP.

*We obviously have the university's interest, the students' interests, and the research program's interests in mind, so we usually come to an agreement that's beneficial to everyone.*

Mitacs advisor interviewee #7

Social science-based projects, particularly if they have NFP partners, are less likely to face the same IP ownership challenges as those faced by STEM project partners. Social science project outcomes are less likely to be patentable.

### *Establishing good partnership working arrangements improves the prospects of project success*

When it comes to establishing a successful academic-industry collaborative partnership, research studies have highlighted the importance of establishing joint ownership and behavioural best practices. Good project management has been advocated as an effective means of overcoming the academic-industry cultural divide, with universal good practice norms such as clear objective setting, good communication between partners, and robust monitoring.<sup>33</sup> Establishing joint leadership of R&D projects can be a particular challenge for an innovation intermediary. A benefit of successfully integrating joint collaborative leadership is the “hybridization” of practices from university and industry, to mutual advantage. However, this requires early agreement on the shared goals of knowledge production.<sup>34</sup>

*Then we can start working on potential budget, and scale up. And then the key thing is... to start mapping out the project that we can put into our proposal... And so there's a lot of that translating sometimes, and also even encouraging them to adopt certain best practices for collaborating together.*

Mitacs advisor interviewee #7

*PSE institutional research offices or industry liaison offices also support project development, but their level of involvement varies between institutions*

The support provided by PSI research offices for the development of a Mitacs project application varies considerably; a point corroborated by academic interviewees. Mitacs advisors also note the differing remits of grant officers, who tend to focus on Tri-Agency funding, and industry liaison officers, who (should) have more of an interest in promoting academic engagement with businesses.

*What we can do is help facilitate introductions to the research office, who would then take over that conversation [re. IP ownership] and help facilitate it... usually we just loop in the research office, who then discusses it with the company. And then in the background, the research office discusses things with the academic supervisor to see what they want to do.*

Mitacs advisor interviewee #5

**Box 4: A spotlight on colleges**

Academics based in colleges, polytechnics, and CEGEPs (*college institutions* collectively) face different challenges from universities in setting up collaborative research with external industry partners. For example, where university professors often have a percentage of their salaried time dedicated to research (including Mitacs-supported R&I partnerships), college tutors with a teaching focus often do not have any such dedicated time written into their contracts. Colleges are also smaller and generally less well known than universities, which can lead to businesses prioritizing collaboration with the larger, better-known universities.

Despite these obstacles, colleges, polytechnics, and CEGEPs are well equipped to develop applied research solutions with near-immediate applications, given their strong focus on applied research over basic research. This includes, for example, co-developing solutions to regional or community-based challenges. The federal government has recognized the value potential of college-industry R&I collaboration; in April 2022 it awarded Can\$46.9 million over two years for 74 grants to support applied research partnerships between colleges, polytechnics, CEGEPs, and SMEs.<sup>35</sup>

College institutions usually have an Office of Applied Research that performs functions equivalent to a university's industry liaison office. For example, College of the North Atlantic in Newfoundland and Labrador has an Office of Applied Research and Innovation that, "serves as the College's main point of contact for industry, community groups and government interested in applied research collaborations focused on solving real-world problems."<sup>36</sup> One of the key advantages to industry leaders interested in R&I collaboration with colleges is that offices of applied research often waive ownership of resulting IP, unlike their university equivalents.

Mitacs programs were not originally open to college institutions. In 2018, the Accelerate program was opened up to college institutions, followed by BSI in 2020-21, and Elevate in 2021. Mitacs also signed a Memorandum of Understanding (MoU) with Colleges and Institutes Canada (CICan) in 2020, for up to 1,000 internships over 5 years. The BSI program, in the words of one Mitacs advisor, also "better aligns with the applied research activities that take place within the college system", given that it has a focus on late-Technology Readiness Level (TRL) innovation activities (Mitacs advisor interviewee #20). Mitacs is also making changes to program cost rules, to better enable college tutors to "buy out" their teaching time with Mitacs project funding.

**To summarize this section**, the service that Mitacs offers is all about building a successful project plan. This plan is then captured in an application. Several different elements must come together to enable a project application to come together (and if not successful, it may need to be revised and resubmitted). In practice, Mitacs advisors deliver these elements – from joint agreement on beneficial outcomes, to liaison with research offices – in parallel. Service delivery must be responsive to client needs; it is often iterative and non-linear.

## Strategic capability – fostering longer-term innovation

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Key takeaways
—The non-competitive nature of Mitacs support, which is based on an inclusive assessment process, encourages long-term relationships by encouraging repeat business from academics, businesses, and

NFP organizations. Once they understand the application process, it is easier for them to develop and submit additional applications. Project applications can be framed as the first of a potentially longer-term multi-year relationship, or a larger research program (especially for large firms).

—Mitacs makes periodic thematic calls for projects in high-priority areas, including in Industry 4.0 technologies such as quantum science and AI. These calls are effective in generating applications to a deadline, though it is difficult to quantify their additionality effects (i.e., enabling projects which could not otherwise have happened).

—Mitacs also aims to encourage inclusive innovation by issuing targeted calls to Indigenous-owned businesses via its Indigenous Pathways thematic call. Although interviewed Mitacs advisors are universally supportive of enabling R&I for marginalized or underrepresented groups from the industry side, there are both challenges and advantages in supporting them.

Unlike linkages and services, which are about day-to-day or month-to-month (short- or medium-term) activities, *strategic capability* is about the long-term, cumulative influence that intermediaries have over the innovation trajectories of their networked ecosystems.<sup>37</sup>

Innovation intermediaries such as Mitacs typically act in two main ways to shape the longer-term strategic innovation performance of their networks; by acting as long-term strategic assets in their innovation ecosystems, and by engaging with emerging technologies. Mitacs was established in 1999 as a Canadian Network of Centres of Excellence and has had more than two decades to establish a presence in Canada. It became a national not-for-profit organization in 2011. It builds strategic capability in several ways.

*Mitacs's non-competitive assessment process is an asset to long-term relationship development, encouraging scaled-up projects and repeat applications*

Mitacs has a non-competitive application assessment process. All Accelerate and Elevate project applications go through a peer review process and are awarded funding if they meet certain quality criteria, including a contribution to expanding the knowledge base in the given discipline. For the Business Strategy Internship (BSI) program, there is no peer review process.

The main limitations to program delivery are therefore funding availability, demand from partners, and internal Mitacs capacity. Finding a balance between these constraints while seeking to maximize reach is a continual task facing Mitacs and its funding partners. This model, and the federal commitment to funding Mitacs activity, is generally advantageous to developing long-term relationship with innovating actors in Canada.

Firstly, because each project must be leveraged through a funding contribution from the industry side, Mitacs looks to develop and formalize relationships with large corporations that have talent recruitment and R&D needs. This helps to secure leveraged industry contributions in a proactive manner (i.e., in advance of the projects starting), often within specific sectors. For example, in April 2022, Mitacs signed a three-year Research Collaboration Agreement with Veyond Metaverse, a medical technology company, to develop medical haptic technology.<sup>38</sup> Partnerships or memoranda of understanding (MoUs) have also been signed with various non-corporate partner organizations such as Innovate BC, a regional development agency.<sup>39</sup>

Secondly, Mitacs is in a position to be able to encourage the scaling up of individual projects. In conversations to convert leads into concrete applications, advisors have an incentive to encourage projects to scale up in size. This can be either in terms of the number of interns involved, or the length of involvement per intern.

*So we always encourage applicants to think a little bit bigger... sometimes we have conversations with companies that are only thinking about a Can\$30,000 project, but then we encourage them to think a lot bigger... because we have that flexibility.*

Mitacs advisor interviewee #14

Scaling up individual projects in this way delivers obvious “economies of effort” for individual Mitacs advisors, because the development, finalization and submission of a project application can be quite time consuming. This approach is also logical in that longer projects are more likely to deliver more substantial and commercially significant outcomes for the industry partner.

*You have a conversation. The company wants to start with the smaller project. And then based on these results... well, maybe we'll do a second, bigger one in a year.*

Mitacs advisor interviewee #2

*I typically don't like to fund anything that is less than a year... I've just found that it's just not worth the prof[essor]'s time to write a proposal for less than a year, especially if it's just the one student... And then for the company, typically you can't produce IP in that amount of time, or anything significant enough to patent.*

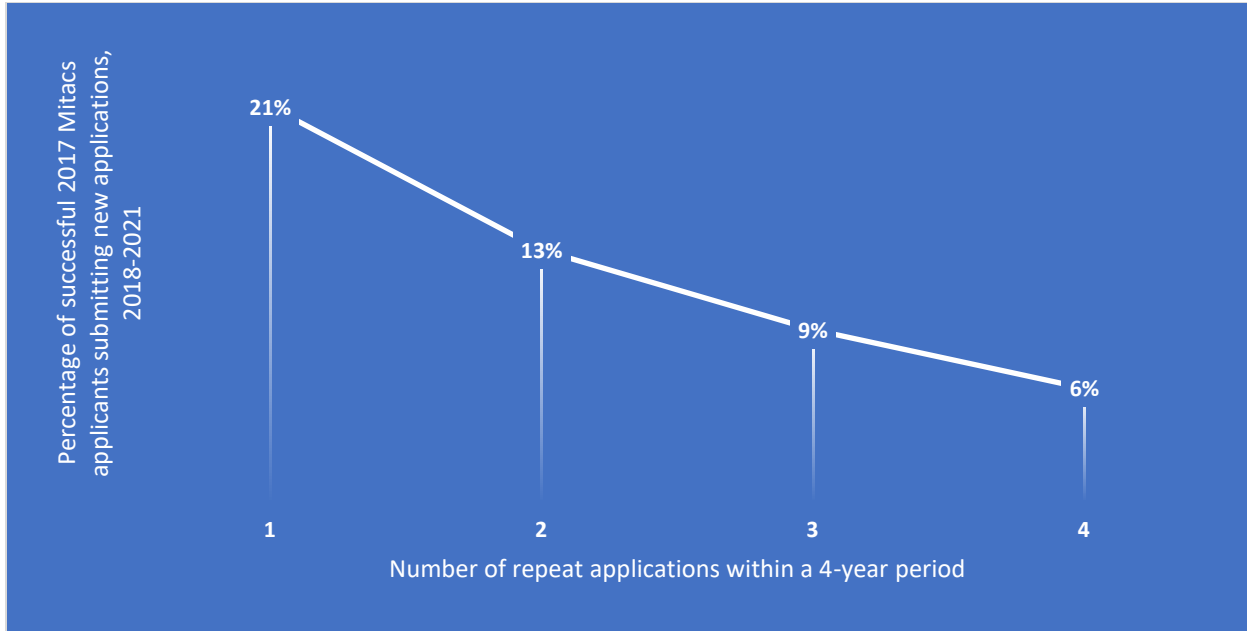
Mitacs advisor interviewee #6

**So-called “champion professors” become more familiar with the Mitacs project development and support model. Often working closely with their institutional research offices, they drive repeat applications.**

Thirdly, long-term relationships can be developed by encouraging partners to submit repeat applications from one year to the next, perhaps as part of a program-based (i.e., long-term multi-project-based R&I initiative) approach to academic-industry research collaboration. After an academic or an industry partner has been through the application process once, it is easier for them to develop and submit applications over successive subsequent years. On the academic side, so-called “champion professors” become more familiar with the Mitacs project development and support model. Often working closely with their institutional research offices, they drive repeat applications.

Mitacs’s application data over a five-year period, from 2017–2021, shed light on the success of this long-term engagement with industry partners. Of the industry partners that submitted successful projects (all Mitacs programs) in 2017, half (50%) submitted at least one further application in the following four years (2018–2021). Of these, one in five (21%) submitted one application. Just over one in 20 (6%) submitted four more applications over this period, i.e., one or more applications per year (Figure 7).

**Figure 7: Repeat application rates from industry partners supported by Mitacs, 2017–2021**



Source: Mitacs program data

### *R&I in emerging technologies can be encouraged through thematic calls, but the selection of themes can be a challenge*

Mitacs also seeks to encourage academic-industry research collaboration that focuses on emerging technologies. At the time of writing, recent calls have targeted artificial intelligence (AI), biomanufacturing, or quantum computing. Thematic calls under the Elevate program come with a higher total project budget (Can\$80,000 instead of the usual Can\$60,000), as a further incentive for engagement.

There are three specific challenges around the use of thematic calls. The first challenge reflects one of best practice “balancing acts” faced by innovation intermediaries that has been highlighted in previous research: the need for intermediaries to 1) respond to “demand pull,” in order to remain complementary to (and not become disembedded from) their industry clients, whilst simultaneously 2) seeking to positively influence long-term R&I trends, and so position their clients and partners to be able to pivot where necessary, and engage with emerging innovation and technology trends in the longer term. This balance can be difficult to achieve, and in Mitacs’s case, it means the careful selection of appropriate themes that reflect both policy priorities and industry trends.

The second challenge is the fact that additionality through thematic calls is seen more as a product of the deadline and funding, rather than the actual theme. Thematic calls are perceived by interviewed Mitacs advisors to be genuinely effective in terms of generating applications. However, this is not always seen to be the result of a desire to develop new cutting-edge projects in specific technology areas, but more a benefit of the higher level of funding and a fixed application deadline (as opposed to Accelerate, which is an open call).

*The moment you put a team around something, and a deadline, all of a sudden all the people showed up... I think it's a marketing slash human behaviour perspective here more than an actual thing, but it works. It works. So I think it makes sense to have thematic calls.*



Mitacs advisor interviewee #8

The third and final challenge is that, for thematic calls in specialized areas, there is a potentially limited supply of both professors and interns from the academic side.

*We can push for a given sector a lot. But at some point, the universities are saturated as well. So we can bring a thousand projects in AI, but if a university only has like two prof[essor]s that are willing to do... generic AI projects, we can't match that many interns. So at some point we'll have to make sure that the academic community can handle all of the projects we are bringing to them.*

Mitacs advisor interviewee #2

*Mitacs encourages inclusive innovation, but engagement with marginalized or underrepresented groups comes with its own set of challenges and opportunities*

As part of the broader reconciliation agenda in Canada, and in the context of efforts to decolonize, Mitacs also seeks to build strategic capability in the national innovation ecosystem by actively supporting Indigenous-owned businesses and NFP organizations through its programs. It also supports Indigenous academics and interns. Mitacs's 2021 Strategic Plan highlights a broader commitment to equity, diversity, and inclusion (EDI), including underrepresented or marginalized groups.

Mitacs has an ongoing Indigenous Pathways call that leads to Accelerate or Elevate.<sup>40</sup> To be eligible, the partner organization must be 50%+ owned by an individual that self-identifies as Indigenous, or the selected intern must self-identify as Indigenous. The co-funding rate for industry partners is discounted to 25%.

Among interviewed Mitacs advisors, there is near-universal support for inclusive innovation in principle. Some advisors make a conscious additional effort to engage with underrepresented or marginalized groups, but this is largely down to personal choice:

*I find that I seek out those people deliberately, but I don't think that's necessarily true of most advisors... And what I think the problem is, is that people perceive not-for-profits and marginalized groups and smaller faculties to not have money, so they don't talk to them. But if you talk to them, these are often the same groups that don't have other opportunities.*

Mitacs advisor interviewee #13

At the same time, interviews reveal a tension between the desire to support Indigenous-owned or marginalized partners, and the time constraints imposed by having to focus on delivery. Some Mitacs advisors see advantages in that these groups may have few other R&I funding options (quote above). Others perceive that the effort required to bring industry partners up to a state of application readiness can be prohibitive:

*I don't have the bandwidth for [intensive ongoing support] anymore, and I think most of us don't. Of the marginalized smaller organizations, it's always great to have a really fun conversation with them about the cool stuff that they're doing or interested in. But it rarely converts into numbers.*

This study has not uncovered a common approach to intermediary practice when it comes to inclusive innovation and EDI. The Indigenous Pathways call is internally perceived as valuable; but Mitacs has not (yet) embedded a universal approach to mediating R&I partnerships through shared advisor practice.

**To summarize this section:** Mitacs delivers the third common innovation intermediary function – delivering strategic capability – in three clear ways. As a long-term asset in Canada’s innovation ecosystem, it is in a position to foster “repeat business” with PSE institutions and with industry and NFP organizations. This is enabled by its “open by default” funding model. It also seeks to improve the future-facing orientation of R&I projects by encouraging activity in certain technology areas, even if the choice of themes is open to debate. And it seeks to build inclusive and equitable innovation activity through its Indigenous Pathways call, and a shared appreciation of the importance of EDI, even if this is approached in a rather heterogenous way by individual Mitacs advisors.

## Part 2: Zooming out – insights and emerging themes

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Part 1 of this report “zoomed in” to explore in detail how Mitacs delivers its core innovation intermediary functions, acting through its network of Mitacs advisors. Drawing from the insights of advisors, professors, and business or NFP organization leaders, the ways in which Mitacs delivers the three core intermediary functions – *creating and sustaining linkages*, *providing specific services*, and *supporting strategic capability* – was laid out.

In Part 2, the objective is to adopt a helicopter view of research findings (to zoom out), and to highlight and explore the defining characteristics of the Mitacs model in light of established lessons in innovation intermediation. This is important because only by “joining the dots” between these multiple and sometimes fragmented findings, can the strategic themes that underpin both Mitacs’s value as an innovation intermediary – and challenges in its model of operation – be highlighted.

## IN SUMMARY — KEY INSIGHTS ACROSS THE THREE INTERMEDIARY FUNCTIONS

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Before drawing out the key themes, it is helpful to bring together the key findings from Part 1.

### Creating and sustaining linkages

In terms of the *barriers* that impede academic-industry collaboration, the findings of this study corroborate some of the findings of the 2012 Munk School of Global Affairs and Public Policy, University of Toronto report examining university-industry knowledge transfer, particularly the existence and effect of a “cultural divide”.<sup>41</sup> Mitacs advisors also perceive that, in general, non-STEM industries and academic disciplines face additional barriers to academic-industry collaboration because IP outcomes may not be as easily patentable. This perception is likely influenced by Mitacs’s industry demand-pull-oriented setup. However, advisors did not identify firm size or absorptive capacity to be notable barriers to engagement, perhaps because one of the benefits of an intern-based model is that it delivers additional research capacity for smaller businesses.

Other barriers stem from the *strategic orientation* of PSE institutions, particularly how they incentivize (or fail to incentivize) collaboration with industry. The lack of clear routes to collaboration can also make it more difficult for industry leaders to engage PSE institutions. On the industry side, a major challenge to collaborating with PSE institutions can stem from the *lack of a formalized and/or open collaborative R&D stance*. This reflects the findings of recent research asserting that the collaborative tendencies of businesses are a more significant determining factor of academic-industry collaboration than the research excellence of universities.<sup>42</sup>

Mitacs works to *overcome, circumvent, or mitigate* the barriers to R&I collaboration by offering incentives to academics and industry leaders alike. The Mitacs model allows its advisors to appeal to the interests, and mitigate the concerns, of various potential partners. Although the funding is an obvious incentive, this differs across firm sizes. For small organizations, including NFP organizations, the funding has *greater value*. In contrast, large businesses are more likely to value the talent development benefits of a Mitacs-supported R&I collaboration with academia.

A key finding is that *Mitacs usually acts to strengthen or re-establish existing relationships* between academic and industry leaders. Only a minority of projects (estimated at 5–20%) are formed from bringing together new partners for the first time. This is largely because Mitacs advisor lead generation efforts naturally identify businesses that are already signalling openness to research collaboration (i.e., visibly sharing knowledge to “convince prospective partners... of the opportunities available from engaging in a good R&D project”).<sup>43</sup>

When Mitacs creates entirely new academic-industry connections, Mitacs advisors’ tacit knowledge of their local innovation systems, and their intimate familiarity with the research interests of local

academic actors, is critical to the fast and intuitive “matching” of research leads from industry. This fact – along with the Mitacs requirement for interns to spend half of their time at the industry partner location – means that there is a *tendency to set up localized R&I partnerships* over more distanced or cross-provincial matches. The latter are more common where a local match cannot be suggested. Acting through its Mitacs advisors, Mitacs fosters localized academic-industrial collaboration networks, which could arguably be seen as a form of collaborative-public space.

### Delivering innovation intermediation services

In terms of offering an *innovation intermediary service*, Mitacs serves to mediate the development of R&I projects. This begins with an initial conversation between partners and follows an iterative path to full project planning and the submission of an application for Mitacs support. There is some post-award support in the form of administrative oversight from a Mitacs grant officer.

In providing this project development function, Mitacs delivers three innovation intermediary services from the typology developed in the first report in this study (*Bridging the Gap*):

- Gatekeeping and brokering: By matching business, NFP, municipality, or hospital leads with academic leads in universities, polytechnics, colleges, and CEGEPs.
- Talent development: By equipping student interns with applied vocational research experience.
- Access to finance: By co-funding collaborative academic-industry R&I projects.

In providing project development guidance, Mitacs advisors make it clear that *the academic-industry partners are responsible for the success of the relationship* at all times. Advisors review Accelerate and Elevate project applications, and their role focuses by default on eligibility and administrative fitness. This includes, for example, making sure that all supporting documentation is provided, and that project finance planning is aligned with Mitacs rules. While Mitacs advisors also frequently mediate conversations between partners to agree on the more substantive elements of project design – such as methodological approach or expected results – they do not act as subject matter experts, and often provide suggestions as a “critical friend”. *Mitacs advisors make efforts to set clear boundaries and expectations around their supporting role*. Furthermore, the time and energy available for advisors to provide intensive support to individual project development is limited.

There are some common challenges in project development, not least of which is the need to agree on mutually beneficial project outcomes, that *satisfy both academic research interests and industry-side commercial goals*. The *use and ownership of IP outcomes* is also a common sticking point, which occasionally leads to failure to reach agreement and project cancellation.

### Developing strategic capability in the innovation system

In terms of developing *strategic capability*, *Mitacs acts in line with innovation intermediary norms* identified through previous research.<sup>44</sup> Firstly, it acts to support long-term innovation activity in its ecosystem (i.e., Canada) by funding many of its clients on a recurring basis.

In doing so, Mitacs’s ability to act as a long-term innovation enabler is facilitated by its non-competitive funding model, which enables many projects to be scaled up and/or planned on a multi-year basis. Mitacs data from 2017-21 indicate a *50% return rate from industry partners*, with just over 1 in 20 (6%) submitting applications every year. On the academic side, so-called “champion professors” also develop repeat applications.

Mitacs also incentivizes its advisors to encourage repeat business, to be better able to meet the organizational delivery targets set by its primary funder, Innovation, Science and Economic Development Canada (ISED). Partnership agreements or MoUs with corporate partners help to cement these relationships.

Secondly, and in addition to fostering long-term innovation activity, Mitacs seeks to *prioritize R&I in specific emerging technology areas* through thematic calls. Although perceived as valuable in terms of generating R&I projects – particularly for doctoral (PhD) students under the Elevate program – the thematic focus is sometimes perceived to be of less influence than the higher funding on offer in these calls.

Thirdly, although Mitacs seeks to foster inclusive innovation through program calls – notably its Indigenous Pathways call – this comes with its own set of challenges and opportunities. Although interviewed advisors are supportive of inclusive innovation in principle, the practice often comes down to personal experience, and perceptions around the feasibility of “onboarding” harder-to-reach groups.

**Mitacs data from 2017-21 indicate a 50% return rate from industry partners, with just over 1 in 20 (6%) submitting applications every year.**

## JOINING THE DOTS — WHAT UNDERPINS MITACS’S VALUE AS AN INNOVATION INTERMEDIARY?

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By tying together some of the common threads running through these functions, three high-level themes stand out. These themes highlight key aspects of Mitacs’s performance as an intermediary.

## Theme 1: Personal networks, trust, and reputation are critical to Mitacs's success as an innovation intermediary

The Canada-wide Mitacs advisor network is the single most significant differentiator between Mitacs and other innovation support organizations in Canada, such as the Tri-Agencies. In Canada, only the National Research Council of Canada Industrial Research Assistance Program (NRC IRAP) exceeds this network-based support structure in size.<sup>45</sup> IRAP uses a network of over 250 Industrial Technology Advisors to provide innovation advisory services to SMEs. The main difference between the two programs is Mitacs's focus on academic-industry collaboration and the provision of internship opportunities.

At the organizational level, this network is not easy to replicate. It is a product of expansion and long-term investment over decades. But just as importantly, each Mitacs advisor relies on their own personal network. *Mitacs's organizational success hinges on the ability of individual advisors to foster positive relationships and to leverage their personal networks, reputation, accumulated trust, and tacit knowledge of their local innovation ecosystems.* These networks are the result of individual professional engagement and networking efforts over (often many) years.

This theme reflects a line of research in innovation studies around the role of the individual in innovation – and particularly in mediating the transfer and sharing of knowledge.<sup>46</sup> The agents of innovation include both businesses and individuals.<sup>47</sup> Although the unit of analysis is usually the organization (whether a university, business, or other), innovation transactions take place between individuals. For example, although Mitacs is a large national organization, most academic or industry leads only have contact with two Mitacs representatives over the entire lifespan of a collaborative project: the pre-award advisor and the post-award grant manager.

Personal reputation and the trust it engenders are vitally important to the success of an intermediary. This is implicitly valued by Mitacs advisors, with a number emphasizing that they are motivated by the desire to build reputation:

*It's in establishing a strong and wide network of relationships and contacts... So, managing those relationships, having strong, long-lasting relationships to the point that people call you. That, to me, is success as an advisor.*

Mitacs advisor interviewee #8

The obvious challenge associated with this theme is that, when an advisor leaves Mitacs, their personal connections, accumulated individual trust with academics and industry leads, and their tacit knowledge is lost to the organization. New Mitacs advisors may need some time to develop the same level of embeddedness and reputation. Of course, this risk can be (and is) mitigated through a hiring policy which targets prospective new advisors who are already well connected. Among the 20 Mitacs advisors interviewed for this study, several had held previous positions in regional development agencies, business associations, or other innovation intermediary organizations. Some of this risk can also be mitigated through the use of Customer Relationship Management (CRM) systems that maintain a record of interactions with academics and industry-side clients.

## Theme 2: Mitacs's value is enhanced through coordination and coherence with other innovation support actors

As an innovation intermediary originating from a university network, now supporting clients from both academia and industry, Mitacs depends on close cooperation and coordination with PSIs – including colleges as well as universities – and innovation stakeholder agencies. It is well embedded in the innovation ecosystem and complements the work of other actors by aligning with their interests. The Mitacs model also relies on established co-funding and supportive relationships from universities, colleges, business, and other innovation stakeholders. This has been progressively built up over time. Again, this is unique in Canada and is not easily replicable. *Mitacs could not function well without the formal and informal support of other innovation actors and organizations, built up over time. This synergy is strongest where Mitacs contributes (directly or indirectly) to meeting the organizational objectives of other innovation support actors.*

For example, although (as already noted) academic research offices do not always support Mitacs applications, they do sometimes work well with individual Mitacs advisors to support professors seeking Mitacs project support.

*In terms of lead generation, we like it when an institution is a well-oiled machine in terms of delivering... projects. Because that means I have to work a little bit less hard, and it also means that the university really endorses our programs and is supportive of them.*

Mitacs advisor interviewee #14

In this scenario, the PSE institution research offices, academic-industry liaison offices, and/or technology transfer offices are probably incentivized to support academic engagement because the resulting R&I collaboration helps them to fulfil their institution's third mission objectives. The objectives of Mitacs and the objectives of the research office are clearly aligned.

As well as acting in sync with other organizations such as PSE institution research offices, *coordination and coherence is also delivered through complementarity with other innovation funders.* The terms and conditions for beneficiaries of Mitacs support programs prevent the “stacking” of different grants to contribute to the same costs. However, Mitacs has coordinated agreements with some other support bodies to enable closer complementarity between support schemes. For example, this includes the [NSERC Alliance-Mitacs Accelerate grants](#). There is a similar agreement between Mitacs and RSRI (*Les regroupements sectoriels de recherche industrielle* – the Industrial Research Sectoral Groups) in Quebec. A full list of partner organizations with which Mitacs has co-funded advisor positions is provided in Annex I.



**The ability to coordinate and align the interests and efforts of an assortment of innovation stakeholders is important because, by doing so, Mitacs acts as a “system integrator.”**

The ability to coordinate and align the interests and efforts of an assortment of innovation stakeholders is important because, by doing so, Mitacs acts as a “system integrator.” In other words, it has “the ability to bring together different actors around common problem formulations.”<sup>48</sup> The term “system integrator” has been used in Sweden’s innovation policy to describe a deliberate approach by Research and Technology Organizations (RTOs – a type of innovation intermediary) to coordinate and

align actors to seek solutions to broad societal challenges.<sup>49</sup> However, based on the findings in this study and the deliberate coordination and coherence that Mitacs delivers, the term could also reasonably apply to Mitacs in the context of innovation. The key difference is that this integration and semi-formal coordination are not formally part of Mitacs’s 2021 strategy. Rather than emerging as the result of a deliberate top-down policy approach, as in Sweden, Mitacs’s system integration has emerged organically as it seeks to deliver its core mission (i.e., to support academic-industry collaboration). Another difference is that Mitacs does not follow a mission-driven approach to enabling innovation (i.e., focusing on one or more complex “grand challenge” such as climate change).<sup>50</sup> As this report has noted, it covers all disciplines, and its thematic prioritization is limited to periodic calls within priority technology and sectoral areas.

A key challenge associated with this need to synergize, particularly with other funders, is *the need to maintain additionality* in terms of the net positive effect of Mitacs programs, and to *avoid crowding out*. Much of the research into the additionality of R&I support has fallen within the field of policy evaluation and has focused on the effectiveness of R&I tax credits or R&I subsidies to firms. Mitacs support is a form of subsidy (in that it literally subsidizes the salary costs for R&I projects), and a number of studies have asserted that R&I subsidies appear to offer greater additionality to high quality projects.<sup>51</sup> If this is true, it is also fair to argue that the project development service offered by Mitacs complements its co-funding, thus increasing the additionality of its overall service.

### Theme 3: There is a trade-off between maximizing repeat business from established partnerships, versus new R&I partnership development

Establishing new partnerships and successful project applications can be time intensive for Mitacs advisors, academics, and industry leaders alike. It takes some time for academics and industry leads to become familiar with the process of defining joint projects and developing high quality applications for Mitacs support. There is a learning curve, and the process demands an upfront investment in time and energy from partners and Mitacs advisors. This is a key reason why Mitacs advisors value “champion professors” who know the Mitacs system and lead year-on-year project applications, as well as returning industry applicants. Mitacs also seeks repeat business on the industry side, consolidating relationships through partnership agreements and MoUs.

Mitacs has successfully delivered on its IU delivery targets over the years, and – backed by increased funding – has been tasked by ISED and other funders to continue to increase internship numbers. Individual advisors therefore face increasing pressure to deliver more student internships within a limited time. *These competing pressures can bring Mitacs advisors up against a practical time*

*investment limit per project, beyond which the time and effort expended in return for a (potential) application becomes unfeasible.*

*I try to go for the lowest hanging fruit possible, right... And so if I know that it's gonna take me six months to get one internship unit for this remote random business, that is proof that I'm probably gonna have to educate and train and make [them] understand what research is... I wouldn't do it.*

Mitacs advisor interviewee #8

*I wanted to free myself up to go do actual outreach and try to saturate the market. Like, go to everybody, get the people that might not be engaged... [but we can't] do that all that much right now because [we have immediate] targets.*

Mitacs advisor interviewee #15

The need to continuously build and maintain networks is also a common challenge for innovation intermediaries.<sup>52</sup> Thinking about how this dynamic might play out at scale and over time; an incentive structure that is overly focused on IU delivery numbers could— if not managed well — lead to a future scenario in which Mitacs advisors choose to prioritize “low hanging fruit” by pushing for repeat projects from a limited pool of engaged businesses, rather than directing their efforts to service new industry clients who would benefit from R&I support. Under this scenario, *those at greatest risk of under-engagement would be businesses and NFP organizations from underrepresented or marginalized cohorts, such as remote and rural businesses, or BIPOC-owned firms (including those owned by Indigenous Peoples in Canada).* These industry actors can require higher levels of support, including potential matchmaking with academic partners, to reach the point at which they are ready to undertake collaborative R&I with a PSE institution.

This challenge is largely a product of Mitacs’s success in supporting large numbers of academic-industry projects to date. Perhaps surprisingly, there is little public research that specifically addresses how R&I subsidy programs can adapt to better engage with a wider cross-section of businesses. On the other hand, the need to assess and engage with the demand side (recipients of R&I support) is a universal challenge for innovation policymakers tasked with designing R&I subsidy programs. Low demand from the intended beneficiaries of innovation support programs is a common problem in developed economies, and it has been argued that innovation policy in Canada is overly focused on the supply side, with a lack of provision for stimulating innovation demand.<sup>53</sup>

**The need to assess and engage with the demand side (recipients of R&I support) is a universal challenge for policymakers tasked with designing R&I subsidy programs.**

As of 2022, with room to grow in terms of both maximizing engagement from existing partners *and* continuing to connect with new industry partners and academics, the choice between repeat business vs. new partnership development does not (yet) seem to be limiting Mitacs’s success. Nevertheless, it is a challenge that Mitacs should be conscious of over the coming years, as the number of projects it supports continues to grow. This potential challenge also touches on the question of additionality vs.

crowding out, as discussed above. The solution might lie in a reconfiguration of the Mitacs advisor function, a revision of IU targets, the design of new programs, or perhaps with thematic calls that specifically target hard-to-reach businesses or NFP organizations.

## Conclusions

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Mitacs operates as an innovation intermediary through a model that, on the surface, is fairly straightforward: it uses an industry internship model to co-fund academic-industry collaborative research projects.

This report answers five research questions exploring the role of Mitacs as an innovation intermediary (Table 1), using the three universal functions of innovation intermediaries as a structural framework. In Part 1 of this report, new insights are drawn from the shared views and experiences of the Mitacs advisors who act as the main touchpoint between Mitacs and its clients, as well as the views of a selection of academics and business/NFP organization leaders themselves.

It seems clear that Mitacs's function as an innovation intermediary is built on many smaller actions, practices, and patterns of behaviour. Many of these, such as the need to carefully communicate the non-financial incentives to collaboration, might not be immediately obvious to an external observer. Others, such as the importance of good partnership working arrangements in collaborative projects, are perhaps more obvious. As an innovation intermediary, Mitacs operates in a challenging environment and must carefully navigate, manage, or mitigate the many barriers, biases, and norms of behaviour that shape academic-industry relations in Canada.

Part 2 of this report identifies and highlights a few of the common threads that underpin these varied intermediary practices. The three themes that emerge – (1) the critical importance of personal networks, (2) the enabling value of coordination and coherence with other innovation support actors, and (3) the balance between repeat business and new partnership development – highlight some of the intangible factors that underpin a successful intermediary, such as trust and reputation. They also raise some interesting questions about the additionality of R&I subsidy programs, the future of Mitacs, and some of the wider innovation policy challenges facing Canada today.

Annex I: Partner organizations with which Mitacs has co-funded advisor positions

- Atlantic Colleges Atlantic
- Brock University
- Canada Foundation for Innovation
- Carleton University
- Centech
- Colleges Ontario
- Concordia University
- Connexion Laurentides
- Continuums
- Dalhousie University
- eCampusOntario – Lakehead U
- École de technologie supérieure (ÉTS)
- ERAC Gaspésie
- Innovate BC
- L'Association pour le développement de la recherche et de l'innovation du Québec (ADRIQ)
- Lambton College
- McGill University
- McMaster University
- Natural Sciences and Engineering Research Council
- Northern Alberta Institute of Technology (NAIT)
- Plateforme d'innovation numérique et quantique (PINQ)
- Polytechnique Montréal
- Prompt
- Quantum Algorithm Institute
- Québec International
- Queen's University
- Red River College
- Ryerson University
- Saskatchewan Polytechnic
- Social Sciences and Humanities Research Council
- Southern Ontario Smart Computing Innovation Platform (SOSCIP)
- Université de Moncton
- Université de Montréal
- Université de Sherbrooke
- Université du Québec à Chicoutimi (UQAC)
- Université du Québec à Montréal (UQAM)
- Université du Québec à Rimouski (UQAR)
- Université du Québec à Trois-Rivières (UQTR)

- Université du Québec en Abitibi-Témiscamingue (UQAT)
- University of Alberta
- University of British Columbia Okanagan
- University of Calgary
- University of Guelph
- University of Lethbridge
- University of Manitoba
- University of Ottawa
- University of Regina
- University of Toronto Engineering
- University of Waterloo
- VMware
- Western University
- York University

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