Canadian Agri-Food Automation and Intelligence Network

2022/23 PROGRAM GUIDE

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1 Introduction

1.1 Strategic Innovation Fund

Creation of ISED Stream 4 Networks

Innovation, Science, and Economic Development Canada (ISED) works with Canadians in all areas of the economy and in all parts of the country to improve conditions for investment, enhance Canada's innovation performance, increase Canada's share of global trade and build a fair, efficient and competitive marketplace.

Within ISED, the Strategic Innovation Fund (SIF) program allocates repayable and non-repayable contributions across all of Canada's industrial and technology sectors. Making sure that Canada is a top destination for businesses to invest, grow and create jobs and prosperity for Canadians is one of the Government's top priorities. SIF's objective is to spur innovation for a better Canada by providing funding for large projects. Overall, the SIF program serves to provide funding investments that are more responsive and focused on results by providing financial support to projects that will improve Canada's innovation performance while providing economic, innovation and public benefits to Canadians. Within SIF there are five Streams, spanning (1) Research, Development and Commercialization; (2) Firm Expansion and Growth; (3) Investment Attraction and Reinvestment; (4) Collaborative Technology Development and Demonstration; and (5) National Ecosystems.

In 2019, two competitions were held under Stream 4 including (1) National Scale Initiatives at the Intersection of Data and Digital Capabilities in the Health and Biosciences and (2) Automation and Digital Technologies in the Agricultural and Agri-food Sector. The Canadian Agri-Food Automation and Intelligence Network Ltd. (CAAIN) was one of two successful applicants in the latter competition.

1.2 CAAIN

CAAIN is a not-for-profit organisation created with federal support to enable the transition to digital and automated technologies in the agri-food industry. CAAIN does this by connecting agri-food businesses of all sizes with academic and not-for-profit research institutions to leverage their skills, capabilities, and resources for impactful research and innovation projects. CAAIN also supports Smart farm validation, demonstration and learning activities.

The Opportunity

It is expected that the world will need to feed approximately 10 billion people by 2050. An emerging middle class in Asia and other developing countries will increase the demand for high value proteins and quality food products. As the globe's arable land base cannot expand much further and water resources are constrained, Canada will be in a unique position to contribute to an estimated 70% increase in global food demand. This increasing demand will be met by bridging the gap between technology providers and traditional resource-oriented industries, resulting in accelerated genetic advances in crops and livestock as well as improved production practices driven by data-based decision making and automation. The world is counting on Canada to find new ways to produce more with less.

A Bold Vision for Canada's Agri-Food Sector

Canada's 2017 Advisory Council on Economic Growth flagged agri-food as a key growth opportunity for the country. The sector which boasts a track record of strong yields by leveraging Canada's abundant

resources is trusted for its consistent delivery of safe, high-quality food and beverage products. The Council challenged this industry to convene private and public stakeholders, set a shared ambition, and clear a path for growth.

A Government of Canada challenge to the sector set a goal of $85 billion in exports by 2025. Meeting this challenge won't be easy. Agri-food faces intense competitive pressures in global and domestic markets, which means that Canada will need leadership in innovation as well as an agile regulatory system and enabling infrastructure to secure its position as a supplier to high value markets. To identify what was needed to meet the challenge, the Government convened Canada's 2018 *Economic Strategy Table for Agri-Food*. Along with four other strategies, this Table flagged the country's need to invest in innovation and boost competitiveness through increased automation and increased data-based decision making.

The Canadian Agri-Food Automation and Intelligence Network (CAAIN)

CAAIN's full application to the Strategic Innovation Fund Stream 4 competition brought together numerous technology and agri-food companies not-for-profit organizations and academic institutions to create new solutions that improve competitiveness, drive growth in both agri-food and technology sectors and create jobs.

CAAIN was created as a stand-alone not-for-profit entity to pursue a greater level of automation and precision in agriculture to drive cost efficiency and productivity. Its objectives include returning premiums to participants by driving innovation, creating jobs, improving competitiveness of the agri-food industry and contributing to growth and diversification of Canada's emerging technology sector.

1.3 Document Scope

This document provides information, guidance, and requirements of the submission process of proposals to the CAAIN Livestock Innovation Competition. Prospective applicants are invited to submit a Project Application Form (PAF) that briefly outlines the proposed activity. PAFs are reviewed by CAAIN and approved applicants are then invited to submit an Expression of Interest (EOI) where more details of the project are required. Teams with exceptional projects will be invited to submit a Full Project Proposal (FPP) that will include a thorough description of project activities and financial details. Submission to the subsequent EOI and FPP stages of the Competition is by invitation only; no unsolicited EOIs or FPPs will be accepted.

2 Program Overview

CAAIN is a platform to pursue agri-food sector precision, productivity, and enhancements within an ecosystem of companies covering value chains from production to primary processing (and a network of smart farms. CAAIN funding will allow these groups to come together to develop research and/or innovation projects or validate emerging technology in an unbiased smart farm environment.

CAAIN draws upon the expertise of its staff and a diverse group of external reviewers. This positions the organisation to evaluate, approve, and support projects featuring transformational technologies with the potential to provide exceptional economic, social and environmental benefits to Canadians from coast to coast to coast.

With the goal to significantly expand business activities and jobs in automation and data-driven technologies, CAAIN will:

- Support research and innovation projects submitted by teams that include at least two small or medium enterprises (SME);
- Catalogue high-level summaries of data and intellectual property needed to leverage and pilot emerging technologies; and,
- Support validation, demonstration and application of new technologies while enhancing relevant postsecondary training.

CAAIN's funding programs follow a **reimbursement** model. Project recipients may be reimbursed for up to 40% of eligible supported project costs. All funded projects are also subject to a 4% administration fee. Terms of funding are found in Section 5 of this guide.

2.1 Benefits of CAAIN Investments

Innovation

Stakeholders across the agri-food value chain must adopt new approaches to meet current and upcoming challenges related to key concerns: changing global demographics and anticipated food shortages, food waste, dwindling natural resources such as water, and a finite amount of viable agricultural land. Some research suggests that these concerns about the agri-food value chain could negatively impact food security, and that this impact could increase by 50 to 90% between 2010 and 2050 without the intervention of technological advancements and dedicated mitigating approaches. CAAIN will mobilize Canadian companies, academic expertise, technology developers, and equipment manufacturers, generating focus around the opportunity to pursue precision, productivity, and enhancements in the agri-food sector. CAAIN will also increase capacity of the innovation ecosystem in the specific areas where agriculture, food, technology development, and advanced manufacturing intersect. The convergence of multiple sectors creates a unique opportunity to drive new growth that would not exist for CAAIN participants on their own. By supporting both technological innovation and connectivity among the different facets dedicated to agriculture CAAIN's efforts will maximize the value-added potential of innovations.

Economic Growth

The agri-food sector is a key contributor to Canada's economy, generating $134.9B of GDP and accounting for 6.8% of Canada's total GDP in 2021. That year, the sector employed 2.1 million Canadians, representing 11.1% of the nation's employment. Improvement in this sector will have a dramatic impact on the country's international competitiveness. Positioning Canada at the forefront of agri-food advancement will help cement our standing as a leading developer of emerging technologies. The application of digital technologies to agriculture is attracting significant investment (approximately $2B USD in 2018), which is anticipated to grow by more than 20% year over year. This level of interest emphasizes how strategic investments in Canada's agricultural industry will strengthen the national economy. Through the successful outcomes of its planned activities, CAAIN will help attract top global talent and create a momentum that will drive investment now and in the future.

Farmers will be positively impacted by greater adoption of digital technologies and processes and will be able to reduce input costs while improving productivity and, by extension, profitability. While these technologies will support farmers' efforts to improve livestock and crop yields, they will also support local and global initiatives focused on sustainability and environmental protection. By strengthening the

Canadian domestic industry, CAAIN will reduce reliance on foreign suppliers, increase our export capabilities to foreign markets, and attract global investments.

Societal Impact and Employment

The use of digital technologies in agriculture will increase production and revenue, but it will also address concerns around food shortages precipitated by a growing global population, climate change, and possible future pandemics. CAAIN integrates sustainability as a key differentiator in the agri-food supply chain. It is expected to result in less food waste through better tracing of inputs. This proposal also addresses employee shortages by using increasingly automated technologies to reduce our reliance on unskilled labour. Optimistic research predicts that digital technologies could be responsible for a 70% increase in yield productivity through a combination of smart farming approaches. CAAIN's programs will ensure new technology can be adopted at its highest potential across Canada in regions where the agri-food industry is prevalent. Supported research and innovation projects are expected to result in direct and indirect employment in the technology and agri-food sectors, and to lead to numerous opportunities for skills training and Science, Technology, Engineering, and Math (STEM)-related co-op or Work-Integrated Learning (WIL) through its diverse membership. CAAIN also recognizes that Equity, Diversity, and Inclusion (EDI) are essential to driving innovation, building strong relationships, and introducing best practices to meet the technology needs of the agri-food sector. Accordingly, the organisation will promote principles of EDI in all hiring practices and training opportunities, including among equity-seeking groups. This will contribute to the creation of a highly skilled workforce of tomorrow, satisfying a significant need as the agri-food-focused technology sector gains momentum.

Environmental Benefits

From an environmental perspective, CAAIN expects to contribute to reducing greenhouse gas emissions by supporting projects leading to decreased agricultural inputs, improved agri-food efficiency and productivity, and automated solutions using less energy. Additional environmental impacts will be derived from broader monitoring and the recognition that market access is greater for primary producers who use farm practices that improve carbon capture and storage, improve oil conservation/reduce soil erosion, preserve biodiversity, and protect and preserve waterways. Changes to existing practices will be driven by the ability to quantify return-on-investment decisions when comparing existing to new practices.

3 Scope of Investment Areas

Within the agri-food sector, significant knowledge barriers exist between technology providers and sector participants. CAAIN is a deliberate step to bridge that divide.

CAAIN's overall objective is to leverage the advantages created by bringing technology-heavy partners together with relationship-rich, industry-embedded partners to increase productivity and enhance value.

CAAIN will achieve this objective by investing in research and innovation projects that:

1. Advance the development, use, and value of automation and robotics in agri-food production.
2. Support the creation of data-based decision-making tools that can be applied to reduce risk and optimise production.
3. Contribute to the implementation of a smart farm platform that: integrates partners; creates the context for validation/testing, and demonstrating technologies; and trains tomorrow's workforce.

To achieve impact, CAAIN is focused on engaging high growth companies, both small and large, and connecting these companies with potential post-secondary and not-for-profit partner institutions to accelerate development of new automation, digital technologies, and smart-farm systems.

3.1 Automated Technologies Ecosystem

CAAIN will mobilize Canadian companies, academic expertise, technology developers, and equipment manufacturers from along the agri-food value chain to create a collaborative ecosystem focused on harnessing big data and artificial intelligence to make informed production decisions and develop platform technologies and critical components such as vision systems, end effectors, autonomous platforms and robotics. CAAIN's role is to engage partners who understand the nature of the production and processing problems most in need of solving, specifically identifying which automation solution sets will yield the greatest return. This will require that we:

- Bring together producers, primary processors, manufacturers, and technology providers to target opportunities for improvement;
- Assess and prioritize areas for optimisation according to potential for automation;
- Identify, evaluate, and rank automation solutions; and
- Develop strategies for deployment of automation solutions.

Through its investments, CAAIN aims to establish Canada as a global leader in agricultural automation.

3.2 Data-Driven Decision Frameworks

The agri-food sector has yet to fully realize the positive, transformative power of machine learning and artificial intelligence (AI). Data-centric technology providers generally lack sufficient agri-food sector expertise and knowledge to provide solutions that address the industry's problems and leverage its economic opportunities. Conversely, agri-food sector participants do not possess a sufficiently strong technology base in these emerging fields to appreciate or understand how best to take advantage of the innovations and transformative disruptions that AI and sensor technologies can unlock. These include:

- Integrating data streams (computer vision, Internet of Things (IoT), product attributes) and AI machine learning to find problems, alert producers, and suggest solutions; and
- Data framework development including standardized languages, common protocols, and safety requirements to create universal machine data links.

3.3 Smart Farm Platform

Smart farms offer a physical context for the integration and application of new technologies. The platform offers a window to the tangible value that emerging technology can create. CAAIN aims to build a national network of smart farms that is essential for:

- Testing and validating new technologies across Canada's various agroclimatic conditions;
- Creating a context to demonstrate regionally-specific or production type applications; and
- Educating a skilled workforce at the edge of an evolving sector.

The International Organization for Standardization (ISO) defines smart agriculture as the "combination of network connectivity, widespread sensor placement, and sophisticated data analysis techniques [which] now enables 'smart farming' due to large amounts of data generated by IoT devices." In a broad sense, smart agriculture also includes agricultural e-commerce, food-traceability anticounterfeiting, agricultural

information services, and other aspects. An extension of this concept to smart farms entails using IoT technology to employ various sensors, which are placed on equipment, livestock, or in the field, to relay data to a platform (i.e. cloud-based; that is, using WLAN, edge devices, or to the cloud directly), allowing the creation of an information and intelligence system for users including farmers, agri-supply professionals, consultants, and researchers. The three categories that are needed for an operational smart farm include software (e.g., applications, analytics), hardware (e.g., connectivity devices, sensors, wearables), and services (e.g., consulting or subscription management services to transform data information into intelligence). For effective smart agriculture adoption, the first two are necessary, as without connectivity and data collation with some real-time analysis, the method reverts to precision agriculture. Six assets across agricultural environments to be connected on smart farms include soil, plants, livestock, environment, equipment, and people.

Development of a network of smart farms across Canada is expected to facilitate validation of emerging technologies or services, demonstration of regionally-relevant technologies or services to local agricultural producers, and provision of educational opportunities for the next generation of farmers and farm workers.

4 Project Application & Approval Process

4.1 Eligibility

The following criteria are among the elements CAAIN will consider when evaluating whether to advance a proposal to the Expression of Interest stage:

1. Project objectives must be consistent with those of CAAIN and of the ISED Strategic Innovation Stream 4 (https://www.ic.gc.ca/eic/site/125.nsf/eng/00007.html).

2. The project team must include **at least two** small or medium enterprises (SME) incorporated in Canada, at either the federal or provincial level. SMEs are defined by Statistics Canada as businesses with 499 or fewer employees.

3. CAAIN will reimburse projects up to **40%** of the **Total Eligible Supported Expenses**, to a maximum of **$3 Million**.

   CAAIN reimbursement can only flow to entities conducting business in Canada.

4. A financial (cash) contribution must be committed by **at least two SMEs** from the project team. Financial contributions may also come from MNEs (multinational enterprise) or not-for-profit organizations in order to achieve the minimum 60% industry cash contribution (Appendix 1). Contributions from each SME or team member need not be equal.

   Financial contributions from governmental sources (including post-secondary institutions) are **not eligible** for reimbursement by CAAIN.

5. In-kind contributions are **not eligible** for matching funding by CAAIN but are considered to be important indicators of team commitment and likelihood of success. Relevant contributions should be assessed at fair market value.

6. The initiative must be incremental to the regular business of project team member organisations, meaning that:
    a. Financial commitments are distinct from investments that would have otherwise occurred; and
    b. The project is new or would not be undertaken at the same scope or scale without the support of CAAIN funding.
7. All funded projects are required to pay **CAAIN administration fee equal to 4%** of the total eligible supported expenses. These fees will be deducted from each approved claim prior to reimbursement to the Project Lead.
8. All project partners must be academic institutions, not-for-profit organisations, or companies legally entitled to do business in Canada. CAAIN project contributions must flow only to Canadian enterprises. All team members must be working in Canada.
9. Diverse project teams involving multiple stakeholders are encouraged. Project teams may include academic and/or research institutions, not-for-profit organizations, for-profit partners
10. Applicants must demonstrate how their project will provide significant public benefit (economic, employment-related, social, and/or environmental) during development or following completion.

4.2 Competition Timelines

CAAIN will not accept partial, incomplete, or late submissions. Applicants are encouraged to complete their submissions well in advance of the deadline.

The following table shows approximate timelines for CAAIN competitions. Please refer to detailed information provided for individual competitions. Note that CAAIN, at its sole discretion, reserves the right to alter this schedule.

Application Stage	Approximate Schedule
Project Application Form (PAF)	6-8 weeks
Expression of Interest (EOI)	4 weeks
Full Project Proposal (FPP)	8 weeks
Funding Review and Decision	8-10 weeks

4.3 Application Stages

CAAIN's Open Competitions include three stages:

1. The Project Application Form (PAF) outlines the criteria and eligibility requirements, providing applicants and their project partners a clear understanding of the competition's parameters.
2. Applicants who complete and submit a PAF may then be invited to participate in the Expression of Interest (EOI) stage, at which point they will need to provide a simplified financial workbook.
3. Teams proposing exceptional projects are then invited to submit a Full Project Proposal (FPP), which will include a detailed project description and a full financial workbook.

Note that submissions at the EOI and FPP stages of the competition is by invitation only; no unsolicited EOIs or FPPs will be accepted.

STAGE ONE – Project Application Form (PAF)

The PAF and additional information are available online at www.caain.ca. The PAF outlines eligibility requirements for submission, CAAIN investment criteria, and expectations of project applicants and teams. The PAF also provides the context for CAAIN staff to assist applicants in developing a successful application. A half-page description is requested to allow reviewers to identify projects that align with program goals.

Cost-sharing ratios for eligible supported expense reimbursement will be determined at this stage. These are tied to criteria related to applicants' alignment with specific CAAIN network objectives. The ratios considered range from a base level of 20% reimbursement of eligible project costs by CAAIN (80% of cost contributed by the project team) to a maximum of 40% CAAIN contribution toward eligible costs (60% of cost contributed by the project team).

A completed PAF must be submitted for each potential project. Applicants who submit a fully completed PAF to CAAIN by the deadline and meet the basic criteria for the competition will be contacted with instructions to proceed to the EOI stage. Please note that this is a competitive process. There is no guarantee that applicants who submit their PAFs on time will be invited to move on to the next stage.

Applicants will be notified by e-mail that their submission has been received.

STAGE TWO – Expression of Interest (EOI)

Successful PAF applicants will be emailed an EOI form and a simplified financial workbook that outlines eligibility requirements for the next stage of the competition, as well as an explanation of CAAIN investment processes and expectations of project team applicants. The complete application package must include:

- General applicant information (as provided at the PAF stage);
- A description of the problem(s) or opportunity to be addressed, including a description how the project aligns with CAAIN's priorities and objectives;
- An experimental design and implementation plan, including an explanation of how the work plan will be achieved, demonstrated ability to finance the project, the proposed team's capacity, and the strength of support from partners, where applicable;
- A market value assessment, including a description of the competitive landscape, the opportunity for commercialisation and market adoption of the innovation in Canada, focusing on the solution's value proposition, its alignment with market needs, the plan for knowledge transfer/sharing, and the expected pathway toward commercial deployment; and
- A high-level budget overview, including identification of the expected investment from CAAIN and the collaborating industry contributions
- A simplified financial workbook.

Additional information may include:

- Letters of support from partnering organisations, funding sources, site hosts, etc.; and
- Resumes of senior team members.

Late submissions will not be accepted. Applicants will be notified by e-mail that their documentation has been received.

STAGE THREE – Full Project Proposal (FPP)

Applicants who are invited to this stage will be notified by email and provided the FPP form, example Gantt chart, and a full financial workbook. The complete application package must include:

- A one-page, non-confidential summary of the project (to be published only if the project is approved);
- A description of the problem(s) or opportunity to be addressed by the project;
- A description how the project aligns to CAAIN priorities and objectives;
- A listing of the key project team members and their anticipated contributions;
- A description of the proposed project's major objectives, deliverables, and outcomes;
- A detailed description of the project design and work plan, including milestones, by fiscal year (April 1 to March 31) quarter;
- Details of the expected investment from CAAIN and the required industry contributions;
- Identification of any sub-contractors or consultants involved in the project;
- Strategies for project management, Intellectual Property, data management, commercialisation/knowledge transfer to potential end users;
- Identification of risks and barriers to completion, as well as corresponding measures for mitigating those impediments to success; and
- A declaration of financial commitment to the project.
- A completed Gantt chart
- A full financial workbook

The FPP should clearly and completely communicate the project concept.

Late submissions will not be accepted. Applicants will be notified by e-mail that their documentation has been received.

Following submission of their FPP, applicants may be asked to provide additional information, respond to preliminary reviews, and/or present details of the proposal to CAAIN.

All FPPs and detailed financial workbooks will be reviewed confidentially by CAAIN staff and academic and industry experts, then assessed by CAAIN's Technology and Science Advisory Committee (TSAC). Final funding decisions will be made by CAAIN's Board of Directors.

Details of the evaluation criteria will be communicated to applicants invited to the FPP stage.

Applicants will be notified if, for any reason, the notice of decision is delayed.

Results of the FPP evaluation process will indicate:

1. That the project has been approved;
2. That the project requires modification. This will occur if the project is well aligned with CAAIN's priorities and objectives, but part of the FPP requires reworking or additional details. If a project

requires only minor changes, the applicant will be asked to re-submit the project proposal within **one week** of receiving notice; or

3. That the project has been declined.

CAAIN has sole and unfettered discretion over its funding decisions. This includes but is not limited to the decision to fund or not fund, or the amount, timing, and terms attached to such funding. **All decisions of CAAIN, including but not limited to the decision to fund or not fund, are final, binding on the Applicant, and non-appealable.** CAAIN is not a public body or government agency. It is not an administrative agency, commission, or tribunal, and as such its decisions are not subject to judicial review.

CAAIN receives a large volume of applications for a limited pool of funding. The Applicant acknowledges and agrees that a project proposal may not be selected for funding support even if it meets minimum requirements and/or satisfies other eligibility criteria. CAAIN may decline to evaluate the Application at any time for any reason. CAAIN also has the right, as determined in its sole and absolute discretion, to impose a life-time limit on the number of Applications an Applicant may submit.

Execution of Project Funding Agreements

Successful applicants and project partners will be asked to review and execute a Project Funding Agreement (PFA) that will detail all funding terms and conditions. The PFA must be fully executed **before** project activities can proceed and expenses may be incurred for reimbursement. The PFA will include clauses that address elements such as:

- Roles and responsibilities of each participant;
- Costing principles and limits of combined public fund contributions to the project;
- Limits on work outside of Canada;
- Monitoring and reporting (project progress and finances) requirements including the need to maintain proper and accurate accounts for up to seven years after completion of the project;
- Circumstances leading to a request for repayment;
- Disposal of assets acquired during the project;
- The right to audit;
- Confidentiality and conflicts of interest;
- Data management and intellectual property ownership;
- Communications stipulations;
- Compliance with all applicable legislation;
- Indemnification; and
- Other elements and material normally found in research and innovation project agreements.

The Full Project Proposal, Eligible and Ineligible Expenses, and Milestones and Reimbursement will be included as schedules to the Agreement.

4.4 Technology Readiness Levels (TRL)

Many federally supported programs support projects at different stages of development. There are nine Technology Readiness Levels (TRL), with TRL 1 being the least ready for commercialization and TRL 9 being ready to be used in real-life conditions. To be eligible for CAAIN funding all projects must include components between TRL 1 and 7. For this Competition, projects including TRL 8 and 9 components will

only be considered if they are part of a project that also includes TRL from the 1 to 7 range. A description of each TRL is included in Appendix 1, following the cost-sharing ratios descriptions.

5 Terms of Funding

5.1 Funds Available and Cost Sharing

There is no minimum funding request; however, the maximum amount of support from CAAIN available per project is **$3 million CAD**. CAAIN will match contributions toward eligible supported expenses to a maximum of 40% of any one project's eligible supported expenses. See Appendix 1 for funding criteria. Applicants will be informed of their cost-sharing ratio should they be invited to the EOI stage.

CAAIN will match only unencumbered cash contributions to the project for eligible supported expenses. CAAIN will not match:

- Funds provided directly for the proposed project by any government entity;
- Future revenue associated with the outcomes of the project such as tax incentives associated with the project (e.g. Canadian SR&ED credits, https://www.canada.ca/en/revenue-agency/services/scientific-research-experimental-development-tax-incentive-program/overview.html);
- Revenue from sales of the project's end-products; or
- Non-eligible contributions.

However, the presence of these revenue sources may be noted in the application, as the merits of these contributions will be taken into consideration during the evaluation. Applicants must justify the amount of funding requested to CAAIN, whose reviewers may choose to approve the project but award less funding than requested.

For information on eligible supported expenses and costs, please refer to the CAAIN Eligible Expenses and Cost Instructions document available at www.caain.ca and in Appendix 2 of this Program Guide.

Projects approved by CAAIN will be assessed an administration fee of 4% of the total eligible supported expenses. These fees will be deducted from each approved claim prior to reimbursement to the recipient.

Eligible supported expenses will be reimbursed on a quarterly basis when accompanied by supporting documents. Specific details regarding reimbursement of CAAIN's contribution in relation to the project work plan, timing, milestones, deliverables, and reporting will be specified in the Project Funding Agreement.

5.2 Project Term

The maximum length for projects funded through CAAIN is normally **three (3) years** from project commencement. All projects must be completed by **September 30, 2025.**

5.3 Project Commencement

Projects may commence after notification of CAAIN funding approval. However, no reimbursements will be made prior to execution of the Project Funding Agreement (PFA). CAAIN will reimburse only project costs incurred after the date of authorised funding approval. Project-related costs incurred prior to funding approval will be considered out of scope, will not be considered eligible supported project costs,

and will not be reimbursed by CAAIN. In the event that the PFA is not executed, any costs incurred by the applicant will not be reimbursed.

Successful applicants will have **three (3) months** after receiving the notice of project approval to enter into a Project Funding Agreement with CAAIN.

5.4 Reporting Requirements and Performance Management

Funding recipients will be required to report on project outcomes, achievements, and deliverables, including and without limitation, job creation, and technology deployment, as well as environmental, economic, and social benefits. A results-focused organisation, CAAIN uses a performance management framework to monitor and evaluate the outcomes and impacts of its investments. All investment agreements outline the intended outcomes of the project and the corresponding performance indicators (measures) that will be tracked over the course of the project. The Project Team is responsible for reporting on all required indicators to CAAIN by means of quarterly and annual reports. Failure to complete these reports as outlined in the PFA, or through any outcome surveys CAAIN conducts, may also delay reimbursement of eligible supported project costs. Significant delays may result in termination of the PFA.

CAAIN is committed to encouraging widespread knowledge and technology transfer from funded projects to maximize the benefit of our participation. In addition to quarterly written reports and financial reports, CAAIN may require successful applicants to commit to specific activities such as hosting of knowledge-sharing workshops or participation in CAAIN events. CAAIN employs an active project management approach, and over the life of a project will regularly monitor performance and support the Project Team's efforts to achieve its outcomes. Reimbursement of expenses is tied to those outcomes and is dependent on the timely submission of accurate and comprehensive progress, performance, and financial reports. This means when Project Team members incur project costs, their Project Lead is expected to generate a progress report complete with supporting financial documentation (i.e., financial report, invoices, and related explanation) before CAAIN will release funds.

Once projects are completed, CAAIN will continue to monitor performance for an additional period of five years to accurately evaluate the economic, environmental, and social benefits realised for Canadians and the agri-food industry, as well as to allow CAAIN to better understand and communicate the longer-term outcomes of funded projects, commercialisation of the technology innovations, follow-on investment attraction, and the environmental and economic impacts of the network programming to ISED Canada. Depending on the significance or impact of Project outcomes, this reporting period may be extended by up to two additional 2.5-year increments (reporting to 7.5 years and potentially to 10 years after Project completion). This performance monitoring also enables the identification of potential opportunities for future projects to help achieve commercial success or make connections for the benefit of the technology and agri-food sectors.

6 Further Assistance

Current information and news about CAAIN's funding programs can be found at: www.caain.ca.

Inquiries on CAAIN programs may be directed to: info@caain.ca.

7 Appendices

Appendix 1: Available Cost-Sharing Ratios

For approved CAAIN projects, cost sharing ratios will be contingent on cooperation and coordination factors between applicants and alignment with CAAIN network objectives. The ratios considered range from 20% reimbursement of eligible supported project costs by CAAIN (80% of cost is contributed by participating organizations) to a maximum of 40% contribution toward eligible supported project costs (60% of cost is contributed by participating organizations).

Criterion	CAAIN Contribution
The proposed project meets basic eligibility requirements as published in the Program Guide, will be consistent with TRL stages 1 to 7 as described below, demonstrates expanded collaboration, and is likely to result in significant benefit for Canada	20%
Project team members agree to provide a high-level summary of datasets generated during the project for publication in the CAAIN data catalogue	10%
Project team members agree to contribute a high-level summary of Foreground IP generated to the CAAIN IP catalogue	10%
MAXIMUM CONTRIBUTION FROM CAAIN	**40%**

Technology Readiness Levels (TRLs)

Many federally-funded programs support projects at different stages of development. These are represented by nine technology readiness levels, with 1 being the least advanced, or ready for commercial use, and 9 being already used in real-life conditions. To be eligible for CAAIN funding all projects should fall between **TRLs 1 and 7**.

Technology Readiness Level	Description
TRL 1—Basic principles observed and reported	Lowest level of technology readiness. Scientific research begins to be translated into applied R&D. Examples might include paper studies of a technology's basic properties.
TRL 2—Technology concept and/or application formulated	Invention begins. Once basic principles are observed, practical applications can be invented. Applications are speculative, and there may be no proof or detailed analysis to support the assumptions.
TRL 3—Analytical and experimental critical function and/or characteristic proof of concept	Active R&D is initiated. This includes analytical studies and laboratory studies to physically validate the analytical predictions of separate elements of the technology.
TRL 4—Product and/or process validation in laboratory environment	Basic technological products and/or processes are tested to establish that they will work.

Technology Readiness Level	Description
TRL 5—Product and/or process validation in relevant environment	Reliability of product and/or process innovation increases significantly. The basic products and/or processes are integrated so they can be tested in a simulated environment.
TRL 6—Product and/or process prototype demonstration in a relevant environment	Prototypes are tested in a relevant environment. Represents a major step up in a technology's demonstrated readiness. Examples include testing a prototype in a simulated operational environment.
TRL 7—Product and/or process prototype demonstration in an operational environment	Prototype near or at planned operational system and requires demonstration of an actual prototype in an operational environment (e.g., in a vehicle).
TRL 8—Actual product and/or process completed and qualified through test and demonstration	Innovation has been proven to work in its final form and under expected conditions. In almost all cases, this TRL represents the end of true system development.
TRL 9—Actual product and/or process proven successful	Actual application of the product and/or process innovation in its final form or function.

Benefits to Canadians

Applications will be assessed on a competitive basis to identify those projects that will provide strong benefits as outlined below, and that also best demonstrate a commitment to further developing the technology for potential commercialization or research purposes.

- *Research and Innovation Benefits*
  The proposed project's expected contribution towards the enhancement or development of new industrial or technological innovations. Assessment factors may include potential spillover benefits, creation of new knowledge or intellectual property, patents filed, impact on productivity of the new technology, and number of journal publications.

- *Economic Benefits*
  The proposed project's forecasted impact on the growth of Canadian farms, firms, clusters and supply chains, as well as its expected benefits for Canada's workforce. Assessment factors may include number of new businesses and/or jobs created, the resulting number of high-paying jobs, and project-related revenue growth.

- *Public and Social Benefits*
  The project's expected contribution to the broader public good, including inclusive business and hiring practices, such as gender balance, investment in skills and training, and environmental best practices. Assessment will consider the degree to which the applicant demonstrates that the project is expected to generate social, environmental, health, security, or other benefits to Canada. Assessment factors may include project-related environmental benefits, investment in local communities, and project-related impact on Indigenous communities. Potential impacts could include:
    - Development of highly qualified personnel
    - Investment in STEM-related co-op or WIL programs

- Promotion of EDI in hiring, training processes and business practices
- Integration of technology access in remote and under-represented regions, including First Nations lands
- Reduction of greenhouse gas emissions
- Improvement of soil conservation
- Preservation of biodiversity
- Protection and preservation of waterways
- Improvement of the health and security of Canadians
- Improvement in animal health and/or welfare
- Improvement in food safety

Data- and IP-Sharing

CAAIN strongly encourages the sharing of data and IP between project partners and CAAIN to contribute to the sustainability and value of the network to its members. Applications will be assessed on a competitive basis to identify those projects that will provide strong collaboration and resource-sharing potential among CAAIN members.

CAAIN will develop a Data Catalogue for the exclusive use of members. CAAIN members may enter into data sharing arrangements as many innovations benefit from aggregation of data from multiple sources.

To aid SMEs and large businesses in maximizing the value of the IP they help develop, CAAIN will also create an IP Catalogue for all foreground IP resulting from CAAIN investments. CAAIN may also assist in developing project-based connections of its network members by identifying potential foreground IP and additional partners that could add value to the CAAIN network or benefit from more formal access to such intellectual property.

Appendix 2: Guidelines for Eligible and Ineligible Costs for Ultimate Recipients of CAAIN Funding

1. Eligible Costs

Eligible Costs incurred and paid by the Project Lead are those which are necessary to carry out the approved project activities. These costs are generally non-recurring and incremental to the ordinary business activities of the Project Lead. Eligible Costs shall be reasonable, such that the nature and the amounts do not exceed what an ordinary prudent person would conduct in a similar business context and can be directly attributable to the completion of the Approved Project Activities included in the Project Funding Agreement. These costs must be determined in accordance with the Project Lead's cost accounting practices as accepted by CAAIN and the Minister of Innovation Science and Economic Development (ISED) and applied consistently over time. The cost accounting system should clearly establish an audit trail that supports all costs claimed.

2. Affiliated Persons Clause

Affiliated Persons are to be understood and treated as defined in the *Income Tax Act,* which includes but is not limited to; two or more entities that have similar ownership personnel; or entities that have a working business relationship.

In the case of Eligible Costs for goods or services incurred and paid with an Affiliated Person, the amount of the costs incurred and paid must:

i. not exceed their Fair Market Value;
ii. in the case of a good or service for which there is no Fair Market Value, the amount must not exceed the Fair Market Value of Similar Goods; or
iii. in the case of a good or service for which there is neither a Fair Market Value nor Similar Goods, the amount must not exceed the sum of the applicable Direct Costs with Indirect Costs (Overhead) at the rate stipulated by this Agreement**,** plus 5% profit.

**Note: Project Leads must self-identify any related parties or Affiliated Persons who will be contracted to provide goods or perform services for completion of Approved Project Activities. For wholly owned subsidiaries of the Project Leads completing Approved Project Activities, its Eligible Supported Costs incurred and paid will be claimed by the Project Lead on their behalf and costs are to be treated as if the wholly owned subsidiary is the Project Lead.*

3. Reporting Responsibility

The Project Lead is responsible for providing financial records, costing methods, management estimates and legitimate business causes to support the claimed costs to the satisfaction of CAAIN and ISED.

4. Eligible Cost Activities

Eligible Costs will generally include expenditures related to the following activities:

i. Industrial research, including activities related to the discovery of new knowledge that aim to support the development of new technology-driven products, processes, or services at early-stage technology readiness levels (TRLs) 1-7; and

ii. Large-scale technology demonstration, including the advancement and development of new technologies into product-specific applications at mid-to-late-stage technology readiness levels.

Projects should cover a broad range of TRLs to support the development and growth of innovation ecosystems through activities from research to commercialization.

5. Eligible Cost Categories

Eligible Cost categories of Approved Project Activities may include the following:

A. **Direct Labour:** The portion of gross wages or salaries incurred and paid by the Project Lead for eligible activities which can be specifically identified and measured as having been performed for Approved Project Activities and which is so identified and measured consistently by the Ultimate Recipient's cost accounting system. The cost accounting system should clearly indicate the allocation of an employee's hours worked on the Approved Project Activities.

B. **Subcontractors and Consultants:** The costs of subcontracts or consultants incurred and paid for work or services performed by an external third party or affiliate (except a wholly owned subsidiary), which can be specifically identified and measured as having been incurred and paid for the Approved Project Activities. The Project Lead cannot be a Recipient and a Subcontractor on the same Approved Project.

   The Indirect Cost (Overhead) rate calculation for Project Leads does not apply to bona fide Subcontractors and Consultants.

   ** In the case of Recipients with high Subcontractors and Consultants costs or low Direct Labour costs: Indirect Costs (Overhead) thresholds calculated to a maximum of 5% on eligible Subcontractors and Consultants costs, but no more than 15% of total Eligible Costs may apply. Such thresholds would be calculated for each Recipient and each individual Eligible Project if more than one Eligible Project is selected for a Project Lead.*

C. **Direct Materials & Supplies:** The cost of materials which are incurred and paid and can be specifically identified and measured as having been processed, manufactured, and used in the performance of the Approved Project Activities, which are measured consistently by the Project Lead's cost accounting system.

   i. Materials purchased solely for the Approved Project Activities shall be at the net laid down cost to the Project Lead, net of any sale taxes and after any discounts offered by the suppliers.

   ii. Materials issued from the Project Lead's general stocks shall be measured in accordance with the material pricing method consistently used by the Project Lead.

   Direct Materials may include, but are not limited to, items such as circuit boards, cables and metals, or any raw material that is consumed during Approved Project Activities.

D. **Equipment:** The capital cost of Equipment, which is incurred and paid and can be specifically identified as having been purchased for Approved Project Activities and measured consistently by the Project Lead's costing system. Significant Equipment required to complete the Approved Project Activities should be detailed in the Project Funding Agreement. Common scenarios of equipment-related costs are:

   i. If the Project Lead builds the equipment themselves, the costs are allocated to the appropriate cost categories (Direct Material, Direct Labour, etc.);

   ii. If the equipment is built by a third party, the costs are allocated to the Equipment category if readily identifiable, otherwise the equipment could be reported in the Subcontractors category; and

   iii. If the Project Lead purchases equipment outright, the costs are allocated to the Equipment category.

   Capital equipment acquired under the Agreement will be subject to CAAIN and ISED approval for disposal and repayment may be triggered if sold.

   Equipment costs may include but are not limited to, the purchase of equipment necessary for the Approved Project Activities, costs to alter or modernize existing equipment, costs to bring equipment into working order, and shipping costs.

E. **IP & Other Direct Costs:** Eligible direct costs not falling within the categories of direct cost mentioned above, but which are incurred and paid, and can be specifically identified and measured as having been incurred and paid by the Project Lead for Approved Project Activities and which are so identified and measured consistently by the Project Lead's costing system.

F. **Travel and Outreach Costs:** Eligible direct costs incurred and paid by the Project Lead that are directly related to Approved Project Activities. Travel expenses must be appropriate, and reasonable. Travel costs may be claimed, to the maximum allowance, as per the conditions in the national joint council directive or treasury board policies

   The Project Lead's travel policy may be required for review by CAAIN and ISED during the claim process.

6. Demonstration Activities

Eligible Costs

a. Direct labour of staff required to demonstrate the technology at a specific event

b. Travel costs to known, or trusted events with large or significant audiences. This can provide a large amount of data on consumer acceptance of new technologies (e.g., transportation/mileage, meals, accommodations)

c. Onsite costs (e.g., registration and setup fees, space and A/V rental –if used specifically for the demonstration, and incremental to the project)

d. Demonstration materials for attendees

Ineligible Costs

a. Operation and maintenance costs of equipment (e.g., autonomous tractors, robotics) at the demonstration site-overhead costs-covered through the overhead provision

b. Catering/refreshments

c. Advertisement of the demonstration event

7. Indirect Costs (Overhead)

Indirect Costs (Overhead) are those which, though necessarily having been incurred and paid by the Project Lead for the general conduct of the business, cannot be identified and measured as directly applicable to the carrying out of the Approved Project Activities.

Indirect Costs (Overhead) may include, but are not limited to:

(a) Indirect materials and supplies including but not limited to, supplies of low-value, high-usage and consumable items, such as paintbrushes and safety supplies, which meet the definition of Direct Material costs but for which it is commercially unreasonable, in the context of the activities of the Approved Project, to account for their costs in the manner prescribed for Direct Costs. Costs such as stationery, office supplies, postage and other necessary administration and management expenses, small tools, such as ladders, drills, paint sprayer, and general inventory build-up;

(b) Indirect labour, Project Administration Fees, and administrative support, including but not limited to the remuneration of executive and corporate officers, general office wages and salaries, clerical expenses, HR, Accounting/Finance staff, overtime premiums, bonuses, all types of benefits paid by employers (e.g., CPP, EI, fringe benefits, medical and dental benefits, pension benefits and other taxable benefits).

Administration costs spent on the following activities are considered indirect costs:

i. Review and approval of documents,
ii. Oversight,
iii. Quality review,
iv. Strategic guidance,
v. Participation in all-staff meetings,
vi. Professional development,
vii. Performance reviews and any costs associated with interactions with government including application,

viii. Claims and preparation of all reports to CAAIN
ix. Amendment, and
x. Audit and reporting communications.

Notwithstanding the above, Indirect Costs (Overhead) will not include those Direct Labour costs described in Section 5.A.

(c) Indirect building costs including, but not limited to, snowplowing costs, public utilities expenses of a general nature including but not limited to, power, HVAC, lighting, and the operation and maintenance of general assets and facilities;

(d) Expenses such as property taxes, equipment rental and building (not covered as part of direct costs) and depreciation costs;

(e) Indirect equipment costs including, but not limited to, maintenance of assets, office equipment, office furniture, etc.; and

(f) Other indirect costs including, but not limited to, training, conference registration and travel (unless for demonstration), daily commutes, unreasonable modes of transportation, general software and licenses, and travel insurance.

Indirect Costs (Overhead) thresholds of 55% on eligible direct labour but no more than 15% of total Eligible Costs will apply for each Ultimate Recipient (and for each individual Eligible Project if more than one Eligible Project is selected for an Ultimate Recipient).

** In the case of Recipients with high Subcontractors and Consultants costs or low Direct Labour costs: Indirect Costs (Overhead) thresholds calculated to a maximum of 5% on eligible Subcontractors and Consultants costs, but no more than 15% of total Eligible Costs may apply. Such thresholds would be calculated for each Project Lead and each individual Eligible Project if more than one Eligible Project is selected for a Project Lead).*

8. Ineligible Costs

Ineligible Costs incurred and paid by the Project Lead are not eligible for reimbursement by CAAIN, regardless of whether they are reasonably and properly incurred and paid in the carrying out of the Approved Project Activities.

Ineligible Costs include:

(a) Any form of interest paid or payable on invested capital, bonds, debentures, bank or other loans together with related bond discounts and finance charges; the interest portion of the lease cost that is attributable to cost of borrowing regardless of types of lease;
(b) Legal, accounting and consulting fees in connection with financial reorganization (including the set-up of new not-for-profit organizations), security issues, capital stock issues, obtaining of licenses, establishment, and management of agreements with Ultimate Recipients and prosecution of claims against CAAIN and the Minister. Such legal costs associated with developing the agreement template and in connection with obtaining patents or other statutory protection for Approved Project intellectual property

are considered eligible;

(c) Losses on investments, bad debts and expenses for the collection charges;
(d) Losses on other projects or contracts;
(e) Federal and provincial income taxes, goods and services taxes, value added taxes, excess profit taxes or surtaxes and/or special expenses in connection with those taxes, except duty taxes paid for importing is Eligible Cost.
(f) Provisions for contingencies;
(g) Premiums for life insurance on the lives of officers and/or directors where proceeds accrue to the Recipient;
(h) Amortization of unrealized appreciation of assets;
(i) Depreciation of assets paid for by the Minister;
(j) Fines and penalties;
(k) Expenses and depreciation of excess facilities;
(l) Unreasonable compensation for officers and employees;
(m) Product development or improvement expenses not associated with the work being performed under the Approved Project Activities;
(n) Advertising, except reasonable advertising of an industrial or institutional character placed in trade, technical or professional journals for the dissemination of information for the industry or institution;
(o) Entertainment expenses (including but not limited to, catering, alcohol, non-travel expenses);
(p) Donations and/or sponsorships
(q) Dues and other memberships
(r) extraordinary or abnormal fees for professional advice in regard to technical, administrative or accounting matters, unless approval from CAAIN and ISED is obtained;
(s) Selling, marketing and promotional expenses associated with the products or services, or both being developed under the Project Funding Agreement;
(t) In-kind costs; and
(u) Recruiting fees