TO:  Potential CFI JELF Applicants

FROM:  André McDonald, Associate Chair (Research) and the Research Planning Committee (RPC)

DATE:  June 1, 2020

RE:  Department of Mechanical Engineering Internal Adjudication for CFI JELF Competition – February 2021 Submission Intake

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PART I – OVERVIEW

This document has been prepared to provide guidance to faculty members in the Department of Mechanical Engineering who are interested in applying for a Canada Foundation for Innovation (CFI) John R. Evans Leaders Fund (JELF) grant to support the purchase and installation of eligible equipment and other infrastructure. Reference is made to the CFI JELF Guidelines for Completing a Proposal (current to July 2018), the CFI JELF website, and the website of the Research Services Office (RSO) at the University of Alberta. As of the date of this memorandum, the Department of Mechanical Engineering has an allocation limit of $273,000 to support CFI JELF applications.

The University has two (2) distinct streams to secure CFI allocation for your project: (1) through the Department allocation mentioned above and (2) through the University centrally-managed Strategic Priorities allocation. The Associate Chair (Research) and the RPC will work with investigators to take advantage of the centrally-managed Strategic Priorities allocation stream so that the Department can maximize the value and number of equipment assets that will be funded and installed in the Department. Please read here the CFI JELF: Update on Allocation and Internal Process that was issued by the Office of the Vice President (Research). Please contact and speak with André McDonald regarding your strategy if you wish to pursue the centrally-managed Strategic Priorities allocation stream.

PART II – ELIGIBILITY FOR DEPARTMENT ALLOCATION

1. All full-time research-intensive faculty members with primary appointment in the Department of Mechanical Engineering.

2. Projects with a maximum of three (3) principal investigators.

3. Priority will be given to collaborative teams; teams that include investigators from outside the Faculty of Engineering, with the Department of Mechanical Engineering faculty member as the Lead Investigator; and recently hired (new) professors. Applications from teams of early career researchers and established senior professors are highly encouraged.
4. Faculty members who received CFI JELF funding within the last five (5) years will likely not be advanced to competition for a second grant. We know that CFI prefers a record of substantive output from previous investments before investing in additional infrastructure in the same area of research with the same investigator. Exceptions to this exclusion could occur in cases where the research and equipment are clearly different from the previously funded equipment or the investigators wish to create collaborative core infrastructure with multiple principal investigators and Other Users.

PART III – REQUIREMENTS FOR THE INTERNAL DEPARTMENT ADJUDICATION

5. Visit the Feb 2021 RSO Request-To-Apply (RTA) Form as soon as possible.

6. For this internal Department review and adjudication, complete the RSO RTA form, bearing the following important points in mind:

   • Please review the CFI JELF Guidelines for Completing a Proposal. It provides specific information and guidelines for the proposal technical assessment criteria that will be judged by external reviewers at competition. You may wish to include content in the three-page Research or Technology Development Summary that you will attach to the RSO RTA form that addresses each of the assessment criteria (Research or technology development; Researchers; Infrastructure; Institutional commitment and sustainability; Benefits to Canadians).

   • Please refer to the “General Tips for Assessment Criteria Development” document that is included at the end of this memo.

   • For the Institutional commitment and sustainability section, please review the University of Alberta CFI Strategic Research Plan and Priorities document and the Operations and Maintenance Plan document.

   • Please read the instructions that are provided on Pages 1 and 2 of the RSO RTA form, and throughout the form.
• Fill in all the boxes of the RSO RTA form with as much information as you currently have now.

• **You do not need to provide the Faculty Letter of Support and Confirmation of Space Allocation at this stage.** Thus, please do not complete Page 4 at this stage.

• **You do not need to provide Equipment Data Sheets at this stage.**

• A first, preliminary layout sketch will be sufficient at this stage.

• Upload and attach all other required documents.

• In the Submission Comments box, please indicate that this version is for the *Internal Review and Adjudication*.

• When you press “Submit”, you will receive a PDF document.

• Please submit the PDF document, the attachments, and your Canadian Common CV (CCV) for internal review and adjudication by no later than close of business on **Friday, 17 July 2020**.

7. **Checklist**: Do you have all these items ready for submission for internal review?

   • RTA in PDF format
   • Attachments requested in RTA form (PDF format)
   • Canadian Common CV (CCV)

**PART IV – THE INTERNAL DEPARTMENT ADJUDICATION PROCESS**

8. The internal Department of Mechanical Engineering adjudication process for the CFI JELF competition will include the following:

   • All Request-To-Apply (RTA) Forms, attachments, and CCVs shall be submitted to André McDonald at andre.mcdonald@ualberta.ca or andre2@ualberta.ca by the deadline that is indicated below (close of business on **Friday, 17 July 2020**).
The members of the RPC who will review and adjudicate on all the packages that are submitted are: André McDonald, Cagri Ayranci, Jamie Hogan, Mohtada Sadrzadeh, Marc Secanell, and Lexuan Zhong. Other experts from the Department, Faculty, or University may be invited to serve on the Committee as needed.

All packages that are received by the RPC will be reviewed and ranked individually by the members of the RPC. The RPC may, at its discretion, invite applicants to meet with the RPC for the purpose of responding to questions or providing additional information. The members of the RPC will use a CFI JELF Reviewer Assessment Sheet to score the content of the packages and provide constructive feedback. Please see here for the CFI JELF Reviewer Assessment Sheet.

The RPC will meet to discuss each package, produce a package of comments, and decide on the application package(s) that will be supported for recommendation by the Department.

The recommendation of the RPC will be communicated to the Chair of the Department of Mechanical Engineering and the Associate Dean (Research and Internationalization) of the Faculty of Engineering by 31 July 2020. The Faculty will make the final decisions on the applications that will be advanced to the February 2021 competition.

The decision of the Faculty will be communicated to the RSO on or around 4 August 2020.

**PART V – SUBMISSION DEADLINE**

9. The deadline for submission of the Request-To-Apply (RTA) Forms, attachments, and CCVs for internal review and adjudication shall be by the close of business on **Friday, 17 July 2020.**
PART VI – TIMELINE (FOR YOUR INFORMATION)

10. The detailed timelines for the 2020 – 2023 CFI JELF competitions can be found on the RSO website here. A summary of the timeline for the February 15, 2020 submission is provided below:

- **July 17, 2020**: Deadline for faculty members to submit Request-To-Apply (RTA) Forms, attachments, and CCVs to the RPC for review and adjudication;
- **July 28, 2020**: RPC to meet or email to discuss and finalize the list of selected applications to recommend for competition. RPC will provide constructive feedback to applicants;
- **August 4, 2020**: Deadline to submit Request-to-apply form and attachments to RSO;
- **December 11, 2020**: Submission of draft CFI JELF application to Associate Chair (Research) and RPC members for review and constructive comments;
- **December 18, 2020**: Associate Chair (Research) and RPC to return comments to investigators;
- **January 4, 2021**: Submission of draft CFI JELF application to RSO; and
- **February 15, 2021**: Submission of final proposal applications to CFI.
CANADA FOUNDATION FOR INNOVATION (CFI) JOHN R. EVANS LEADERS FUND (JELF)

GENERAL TIPS FOR ASSESSMENT CRITERIA DEVELOPMENT

OVERVIEW

The purpose of this document is to provide general tips for drafting and developing the responses to the assessment criteria in Canada Foundation for Innovation (CFI) John R. Evans Leaders Fund (JELF) applications. These tips were developed based on the experience of the Associate Chair (Research) and the academic members on the Research Planning Committee and Physical Planning Committee, other researchers who have submitted applications recently, and staff who work on the administration of physical spaces for research. Learning and information for the tips that are provided were also sourced from the University of Toronto.¹ Review and use of the tips should be done in conjunction with review of the CFI JELF proposal Guidelines,² with focus on the evaluation criteria that will be used to assess the proposals. These tips may be used as a part of a checklist to confirm that you have addressed all of the items that would be expected from a successful CFI JELF proposal.

¹ University of Toronto, Office of the Vice President, Research and Innovation, Tips: CFI Innovation Fund, 2016.
ASSESSMENT CRITERION: RESEARCH OR TECHNOLOGY DEVELOPMENT

Criterion Standard: The research or technology development activities are innovative, feasible and meet international standards.

Tips:

In this assessment criterion, you are to describe the proposed research or technology development activities conducted in an area of institutional priority and demonstrate the innovativeness and feasibility of the proposed activities by positioning them within the international context, describing the proposed approach. It is important to bear in mind that the proposed equipment should be viewed as a tool to pursue innovative, novel research activities within a feasible and clearly defined research program. Thus, it is important to make a strong case for the scientific research program, highlighting the proposed equipment as the tool(s) that will enable you to meet the objectives of the research or technology development. The following structure may be one way to present your response to the assessment criterion.

Introduction and Research Impetus for Proposed Equipment

- Start with a brief outline of the overall vision of the research or technology development program: what is the high-level goal of the related past, current, and proposed research or technology development? Provide a concise summary of the proposed project for a general, non-specialist audience.

- Describe the short- and long-term objectives of the research or technology development program and the role the requested equipment will play to accomplish these objectives. The role may align with foundational or applied research. Discuss how the equipment will enable innovative research, how it is essential to build upon previous successes of the applicant(s) and their collaborator user(s), and how it aligns with institutional priorities and strategic research directions.

- Ensure that you integrate language from the evaluation criteria that addresses key evaluation points. For example, try to include words such as “innovative”, “international context”, “collaborations”, “sustainable”, “skills and training”.
• Write with a view to engage a general scientific audience who may not necessarily be experts in your field of research.

• Consider using phrases such as:
  o “The proposed program will generate innovative research and technology development outcomes for. . .”
  o “The work will lead to breakthroughs in [Y] by . . .”
  o “The equipment will bring together the key strengths of . . .”
  o “Our project will take research in [Z] to the next level by . . .”
  o “Our program will develop novel technological advancements in [Q] by ....”
  o “The research and technology development programs will strategically direct and accelerate development of…”
  o “To tackle these research gaps, the objectives of our research and technology development program are…”
  o “Our research team is uniquely positioned to make transferable and internationally disruptive advances in…”
  o If this is true, could state: “No research group in Canada or internationally has the collective equipment and expertise to make these contributions and advances.”
  o “The requested equipment will be unique to Canada in that…”

Detailed Research Program, Feasibility, and Expected Outcomes

• Discuss the current state of knowledge and the pressing questions the proposed research or technology development is intended to address. Consider including citations of relevant research papers, patents, published industry reports, and consultant reports, to name a few.
• Discuss the present research opportunity and how you will exploit it. Demonstrate the high potential for innovative work in this field. Explain why it is necessary to undertake this research or technology development now. Explain applied uses for the proposed research or technology development. Is Canada or the world lacking the technology or research outcomes that you proposed?

• Describe the specific and detailed research or technology development program, strategies, and key activities, including methodological approaches and procedures for data collection and analysis. Justify the selected approaches/methodology and address any anticipated challenges as well as strategies for meeting such challenges.

• Include key figures to present or summarize the research or technology development program, strategies, and key activities. Figures can also be used to show that you done work in the area of the research program. Consider simple figures that a non-expert reviewer can understand.

• Briefly address the uniqueness of the research or technology development.
  
  o Consider:
    
    ▪ How does the research or equipment use compare to what is done locally in Alberta, Canada, or internationally?
    
    ▪ What distinguishes the proposed project from others in the research area that are on-going in Alberta, Canada, or internationally? Use the distinguishing factors to show that the proposed research or technology development program will fill gaps in the current state of research.
    
    ▪ If similar projects or equipment use exist in Canada, how is this proposed project, program, or equipment use different from them?
  
  o Consider using phrases such as:
    
    ▪ “No research group in Canada or internationally has the equipment to make these contributions and advances.”
    
    ▪ “We are currently the only team in the world investigating [Y]…”
“We are currently the only team in Canada investigating [Y]…”

“Although research in the field of [X] has been done before, this would be the first time that…”

- Clearly link the research activities to the requested equipment. Then, ensure that you discuss how the requested equipment will be used.

  o Consider using phrases such as:

    ▪ “The requested equipment will enable research on…”
    ▪ “The [equipment Y] will measure…”

- Clearly link the research activities to the expertise of the team member(s) and users.

  o Consider using phrases such as:

    ▪ “Team Leader [Z] showed that…”
    ▪ “Preliminary work by [Team Member Z] on…”
    ▪ “To study [X], [Team Member Z] and [Users PQR] will…”

- Establish clearly throughout this assessment criterion on research or technology development that the equipment will be essential to achieve the objectives of the proposed research or technology development program.

- Set realistic timelines for research activities and outcomes. If knowledge transfer to end users and commercialization is part of the technology development program, establish a clear transfer and commercialization path and ensure that the timeline is credible.

- Describe the ways in which this research or technology development program is well-rounded and/or takes a multi-faceted approach.

- If applicable and possible, describe how concepts and activities related to equity, diversity, and inclusion are integrated into the research or technology development program and proposed use of the equipment.
ASSESSMENT CRITERION: RESEARCHERS

Criterion Standard: The researchers demonstrate excellence and leadership at a level appropriate for the stage of their career. The researchers have the expertise or relevant collaborations to conduct the research or technology development activities.

Tips:

This assessment criterion requires that you describe the researchers’ track record, including scientific and technical expertise relevant to conduct the proposed activities and describe the collaborators’ and partners’ contributions essential to the success of the proposed activities. Do not simply list the generic accomplishments of the researchers, collaborators, or partners. Describe expertise relevant to the proposed research or technology development activities, as was described in the assessment criterion on the research or technology development program.

- Focus on the skills and accomplishments that the team members bring to the research project that are essential to its success. Explain why the team members and users are optimal users of the infrastructure.

- One option is to provide a paragraph for each of the team members, outlining their expertise and accomplishments. Focus on expertise and accomplishments that are relevant to the objectives of the research program, equipment use, and training. You can consider combining the relevant expertise of the users into one paragraph.
  - Consider language such as:
    - “Other Users will collaborate directly with team members in the proposed research project or use the equipment for relevant projects. Our complement of team members and other users will create research frameworks that bring together diverse experts. Some team members and users already have ongoing collaborations on CFI-supported equipment.”

- As it relates to accomplishments, if you have received previous CFI award(s) and wish to highlight your relevant expertise on the equipment, you should include the equipment and the CFI project number.
For example, “The team has received more than $Y from the CFI for supporting equipment in research related to robotics (CFI #1234, 5678).”

- Describe team members’ excellence and international standing. Briefly link their areas of expertise to specific research activities in the proposed research or technology development project or program.

- Discuss the team’s previous experience using the requested equipment or equipment that is similar to the requested equipment. Cite your previous publications as evidence of the experience. This is very important. Your application will likely be disadvantaged if your request for equipment cannot show some evidence of direct research experience that relate to the equipment or direct use of the equipment or similar equipment.

- Demonstrate that the team combines diverse expertise to cover the entire scope and breadth of the research or technology development program. This will include the different application areas, research approaches, and technical disciplines.

- Describe team members’ experience in knowledge mobilization, technology transfer, and commercialization. Knowledge mobilization and technology transfer may be important for those projects in which the research outcomes will be applied.

- Briefly outline any relevant collaborations. Be specific and name collaborators within and outside the University (other researchers, industry, public sector networks, etc.) and describe the degrees of collaboration (informal exchanges, co-authorship, formal signed agreements, etc.). These may also be collaborations between team members and users or among the users with the equipment.

- Discuss both current and recent collaborations among the team members, and briefly describe successful projects completed as a team, if any. State how this proposed program of research will build on prior/existing collaborations and will enhance synergy among team members.

- Collaborations must add real strength. Focus on quality, not quantity. Explain how all collaborations will contribute to the success of the proposed research or technology development program.
Consider including a paragraph on Equity, Diversity, and Inclusion (EDI). Show that EDI has been considered when creating the team (if more than one applicant).

- Consider the following phrase:
  - “Composition of the team and other users was designed to create a welcoming, diverse, inclusive, and collaborative research environment to achieve objectives.”

- Consider discussing diversity in gender, race, cognitive approach, academic rank, geography, and English/French language, if applicable. See Department document on “Equity, Diversity, and Inclusion - Examples and Specific Guidelines” on the Intranet in the Academic Research Resource Centre.
ASSESSMENT CRITERION: INFRASTRUCTURE

Criterion Standard: The infrastructure is necessary and appropriate to conduct the research or technology development activities.

Tips:

In this assessment criterion, you will be asked to describe each item and justify its need to conduct the proposed activities. You are also to explain why existing infrastructure within the institution and the region cannot be used to conduct the proposed activities. It is very important to make the case that the requested infrastructure is essential for the proposed research or technology development.

- For ease of review and as required by CFI, for construction or renovation, provide a description of the space including its location, size and nature.

- For ease of review and as required by CFI, use the item number, quantity, cost and location found in the Cost of individual items table. Provide a cost breakdown for any grouping of items.

- You may consider dedicating a paragraph to each equipment item or grouping of items.
  - Consider the following possible structure:
    - Item 1: Name ($PRICE). Description content here. (see tips below)
    - Item 1: Name (Z components, $PRICE). Description content here. (see tips below)

- The tips below relate to the description content for each item of equipment or grouping of items.

- Discuss the infrastructure in more detail than in previous sections. Justify and present a clear rationale for each item: describe what it is, what it does, why it is needed, and how it will be used. Refer and relate back to specific research or technology development activities.
• If necessary, group the items together by lab/facility, category, or function in the proposed research or technology development program, and clearly label each item using the item numbers found in the Cost of Individual Items table.

• Demonstrate that the requested infrastructure is absolutely essential for the proposed research or technology development and will position the team to achieve scientific innovation.

• Make a strong case for appropriateness of the requested infrastructure. Demonstrate that the best tool for the task has been selected and that the equipment is ideal for the research or technology development described.

• Specify the location for each major equipment item. For equipment that may be installed in different locations, explain how different facilities/laboratories will be integrated and how communication between them will be maintained.

• Explain how the requested infrastructure will be incorporated into existing facilities and how it will augment the existing capabilities of the team.

• In cases in which the applicant(s) has/have previously received a CFI award/CFI awards, describe the value that will be added by an additional award.

• Explain why your equipment needs cannot be met elsewhere.

• Make the case for the uniqueness of the equipment or the establishment of a unique research or technology development capability at the University of Alberta, in Edmonton, in Alberta, or in Canada. Note that the equipment itself does not have to be unique. The research or technology development can be the unique feature.

• If the equipment is not unique in the University of Alberta, Edmonton, Alberta, or Canada, then a persuasive case must be made as to why existing equipment cannot be used. Briefly describe similar infrastructure available locally and describe why it is not accessible or appropriate/adequate for the proposed research or technology development project.
• Indicate if the requested equipment will complement other equipment available locally and how it will fill a gap in existing facilities.

• If applicable, include a description of the renovation required to accommodate installation and operation of equipment. Consider the following:
  
  o Specify location and total space floor area where the equipment will be installed and operated.

  o Specify any utilities or other building services that will be available in the space(s) for use by the equipment. Some utilities may include compressed air (specify pressure), chilled or hot water, steam (specify temperature and pressure), and electrical power (specify voltage and current).

  o Indicate what will be included in the renovations for which costs to the project will be incurred. Consider if the renovations will include any of the following activities:
    
    ▪ General or building materials
    
    ▪ Installation of devices or research or building appurtenances (e.g., ductwork, fans, controls for ventilation and fire protection; fixed benches; upgrades to an existing building systems; fire rating upgrades, fire alarms, detectors to meet new Building and Fire Code requirements; connections to existing building services; gas supply control panels; wall openings)

    ▪ Minor upgrades to the building (e.g., floor structural shoring, installation of electrical power conduits, breakers, transformers)

    ▪ Engineering and architectural consulting and labour from the trades

• If proposals are going forward in similar areas at the University of Alberta or if similar proposals were recently funded, demonstrate that the other proposals do not overlap with yours. You will need to work with the Research Services Office (RSO) to confirm if similar proposals are moving forward or if similar recent proposals were successfully funded.
ASSESSMENT CRITERION: INSTITUTIONAL COMMITMENT AND SUSTAINABILITY

Criterion Standard: The infrastructure is optimally used and sustainable through tangible and appropriate commitments over its useful life.

Tips:

This criterion must present a management plan that addresses the optimal use (e.g., user access and level of use), and the operation and maintenance (O&M) of the infrastructure. You will need to provide detailed information on O&M costs and revenue sources, including institutional commitment. The following structure may be one way to present your response to the assessment criterion.

Access and User Management Plan

- Describe the responsibilities of the team members in the management of the equipment.

- Outline roles and responsibilities for implementation (e.g., initial planning, design, renovations, installation) and operations (e.g., guidelines for user fees, access, scheduling, training). If you already have professional management support in your current lab, mention how these resources will be used to implement, operate, and manage the proposed equipment.

- Highlight team members’ experience managing equipment.

- Demonstrate that the equipment will be fully used through access by internal and external users, by diverse collaborative research, and/or by strong partnerships.

- Explain how the equipment will enable research across several disciplines or will create research or technology development opportunities outside of the original research program.

- Provide an access plan that describes how the requested equipment will be made accessible to other Canadian researchers. Be careful to specify that non-collaborators will have access only when the equipment is not in use by your team. It is best to prioritize the proposed research or technology development program.
• Access and user management may include or touch on the following:
  
  o Scheduling system for access to team members and users.
  
  o Arranging equipment training for HQP and new users.
  
  o Managing safety protocols and data sheets.
  
  o Generating quotes and invoices for equipment user fees.
  
  o If needed, integrating the equipment use into the University of Alberta’s financial and safety system.

**Operation and Maintenance Plan**

• Include the expected lifespan of the equipment.
  
  o Consider a reputable source to produce reasonable estimates for expected lifespan of the equipment. For example, see [J. Baldwin, et al., An Update on Depreciation Rates for the Canadian Productivity Accounts (Catalogue no. 15-206-X), Statistics Canada, Ottawa, ON, 2015].

• Provide a reasonable and justifiable annual budget for the costs of supplies, maintenance, personnel, a contingency fund, among other things. Include a breakdown of costs or a rationale for these estimates. Include quotation numbers, in parenthesis, from suppliers or vendors, if available.
  
  o Consider reputable sources to use to generate the estimates.
    
    ▪ Cost of technician or administrative staff time is based on salary scales. You may contact Bryan Rapati or Engineering Human Resources for information. You will need to know how many hours of service are required for your research in order to estimate costs.
For estimates of supplies and maintenance and repair costs, you may wish to consider replacement asset values (RAV) and base your estimates on RAVs.³

Consider this text and adjust as needed: “For larger equipment, supplies, maintenance, and repair costs are a percent of replacement asset value (RAV). For equipment <10 years old, RAV is the original base capital cost. Percent of RAV ranges from 1% to 6%.⁴ Given that the requested equipment will not be used for industry production, where machine use is uninterrupted for extended periods, damage requiring maintenance and repair will be low. We use 1% of RAV to estimate cost of supplies, maintenance, and repair in Years 3 to 5. Those costs are not incurred in Year 1, and 0.5% of RAV will be used for Year 2. From experience of team members, we assume that 15% of costs will be for repair supplies and 85% for maintenance and repair.”

Other sources may include your experience, verbal conversations with suppliers and machine shops, online information from vendors’ or suppliers’ web sites, or established trade or academic norms.

- Describe the basic operations associated with the equipment. For example, explain the implementation plan, the usage policy, the day-to-day oversight and operation of the equipment, the required training, need for experimental or other technical assistance.

- Outline the basic service needs of the equipment and list any necessary supplies.

- Describe the plans for safety and any necessary permits and safety training.

- List the staff who will be performing or overseeing the operations and maintenance (e.g., lab manager, lab technician, research assistants) and describe their roles and responsibilities. Include their anticipated salaries. You may contact Bryan Rapati or Engineering Human Resources for information.

⁴ Supra (cite the article above)
• Provide information about who will be performing general equipment repair and/or technical support. This could include a technician from the Machine Shop, a postdoctoral fellow (PDF), or a vendor representative.

• Include information on warranties or service contracts and describe how repairs will be funded after a warranty ends. Mention if service contracts are transferable if equipment is upgraded.

• Outline the process for determining equipment upgrades (e.g., who will make this decision, when they will meet).

• Describe the location where the equipment will be housed and, if applicable, describe how the equipment will be integrated into existing facilities. Mention valuable security and safety features that are already in place.

• Describe the needed security and/or safety systems and provide their estimated costs.

• If applicable, include a timeline for the development of prototypes and the deployment of newly built equipment.

Revenue Generation (Funding) Plan

• Outline the sources of support. Discuss both Infrastructure Operating Funding (IOF) funding and long-term sustainability through other sources.

• Describe plans for cost-recovery through user fees.
  
  o If possible, include the expected number of users and the anticipated revenues.

  o Note if the user fees will generate a surplus, and describe how this surplus will be used after IOF funding comes to an end.

  o Mention team members who have experience generating and managing user access and fees.
• Discuss how additional operating and maintenance costs will be covered by operating grants or external grants. Include the total estimated value of these grants and/or describe researchers’ track record in securing such funding.

• Describe institutional commitments for start-up funds, maintenance of space, technical personnel salaries, service contracts, upgrades, or other costs.

• Discuss funding that have been or will be secured through support from industry partners or revenues that will come from licensing agreements, if any.
ASSESSMENT CRITERION: BENEFITS TO CANADIANS

Criterion Standard: The research or technology development results will be transferred through appropriate pathways to potential end users and are likely to generate social, health, environmental and/or economic benefits to Canadians, including better training and improved skills for highly qualified personnel.

Tips:

In this criterion, you are expected to describe briefly the potential socio-economic benefits, including better training and improved skills for highly qualified personnel and delineate the knowledge mobilization plan and/or technology transfer pathways, including partnerships with end users.

- Consider beginning the response by referring to or referencing what the government deems to be social, health, environmental and/or economic benefits to Canadians. Sources to check include:
  - Government of Canada Economic Strategy Tables or other federal economic strategic priority guidelines.
  - Government of Alberta research innovation framework or strategic priority guidelines (e.g., as of 2019, Alberta Research and Innovation Framework, ARIF)
  - Government of Alberta budget.
  - Conference Board of Canada reports.

- Align your research and technology development project or program with the target areas to show benefit to Canada and Canadians.

- Be concrete and show how the proposed research or technology development program, enabled by the requested equipment, will bring about benefits. The description must also address the impact of the new work that will be made possible by the equipment.

- The benefits should be tangible, concrete, and feasible. Avoid overstatements or generalizations.
o For example, you would not want to say, “Our research will provide health benefits to all Canadians.” Rather, you would want to state, “Partners A and B have had input into our research plans. This research will produce output X by [a specific time]; this research output will be used by A and B to produce benefits Y and Z for Canadian society.”

- Describe the benefits of training HQP. State how this research or technology development program will create excellent opportunities to train HQP in state-of-the-art techniques and will provide trainees with skills and knowledge needed for the workforce. Include evidence of shortages of skilled personnel in particular sectors.

- For training and improved skills for highly qualified personnel, show that use of the equipment and the research or technology development training is needed in Canada to support the argument for the benefits that materialize.

  o Consider consulting Statistics Canada and Conference Board of Canada publications to find labor data that point to a need for skills or trainees in the area of your research or technology development. They will also provide you with data to cite. Be concrete and quantify.


  o Consider phrases such as:

    ▪ “Labour market data for 2018 indicate that Canadian employment in [Z] increased by [Y]%."

    ▪ “In professional, scientific, and technical services it increased by [X]%. Strength of the current labour market in the [Z] sector, coupled with similarly strong growth in the market for professional, scientific, and technical services, suggests strong demand and need for research,
professional, and technical trainees with experiential skills on the requested equipment.”

- Provide examples of companies that have hired your graduates in recent years and/or examples of start-ups created by graduates/trainees. If applicable, describe how industrial partnerships will create employment paths for HQP.

- Address knowledge mobilization and technology transfer.
  
  o Consider phrases such as:
    
    ▪ “Our team is solidly poised to mobilize knowledge and transfer technology.”
    
    ▪ “We are supported by the UofA technology transfer unit, TEC Edmonton. We have published [Z]+ scientific articles, filed [Y] patents, engaged over [##] technology transfer partners, and secured $[XY] for research and technology transfer in the last 5 years.”

- To support case for technology transfer, identify end-users, including organizations or companies with which the applicants have already worked. Think outside the university and academia.

- Highlight the team’s proven technology transfer or commercialization record and discuss the applicants’ experience establishing companies, filing patents, and licensing technologies.

- If your research or technology development project or program will result in knowledge or technology transfer or commercialization activities in Canada, explain how it will accomplish any of the following:
  
  o Create jobs for HQPs or others.
  
  o Create a start-up company or companies.
  
  o Build new partnerships and collaborations.
  
  o Create awareness and build stature of Canada or Alberta in a specific area.
o Improve Canadians’ quality of life.

o Affect the economy and/or society.

o Have a positive effect on human health.

o Have a positive impact on the environment.

o Guide or inform industry or government policy.

o Guide or inform industry practice.

• If the project has a low potential for commercialization or industrial spin-off, emphasize how this research will enhance or restore Canada’s position as a leader and innovator in a particular scientific field and how it will allow Canada to participate in major international scientific initiatives or global activities.

• Be concrete and show how the proposed research or technology development program, enabled by the requested equipment, will bring about benefits. The description must also address the impact of the new work that will be made possible by the equipment.

• The benefits should be tangible, concrete, and feasible. Avoid overstatements or generalizations.

  o For example, you would not want to say, “Our research will provide health benefits to all Canadians.” Rather, you would want to state, “Partners A and B have had input into our research plans. This research will produce output X by [a specific time]; this research output will be used by A and B to produce benefits Y and Z for Canadian society.”

  o For economic benefits, cite figures for the value of particular industries or sectors of the economy. If possible, list the numbers of people employed and the contribution of this sector to Canada’s GDP.

  o For economic benefits, if possible, include figures for projected growth of this sector. State how this program of research will allow Canada to capture part of this expanding market.
If applicable, state how any IP will attract licensing agreements, create Canadian-based spin-off companies, or create jobs for Canadian HQP.

- Specify expected timeframes over which benefit(s) to Canada will be realized. Is it 1 year, 2 years, 5 years, 10 years? Link it to the R&D timeline of the major activities and milestones. Be concrete and quantify.

- Benefits are not just economic, but may also include quality of life, social, health and environmental benefits. Economic impact can be wealth generation or cost savings.