



POSITION PAPER

FOCUSED RESEARCH INVESTMENTS (FRI)
A new research funding opportunity from
Research Nova Scotia



PREAMBLE AND PURPOSE

1. Research Nova Scotia has launched **Focused Research Investments (FRI)**, a new RNS vehicle to support highly focused, collaborative and determined efforts across disciplines to work on the salient Nova Scotia issues of our time, and achieve specific societal outcomes.
2. The FRI model supports research teams driven to be civic actors and participants, devoting their expertise in service of their communities, improving public policy, and/or creating economic opportunity.
3. RNS is seeking FRI where societal outcomes can be connected to research efforts and where clear pathways to societal impact can be defined; where research is an essential component to drive meaningful contributions to the solutions, and; where research efforts would benefit from significant financial resources as well as coordination and integration across groups, disciplines or sectors.
4. This Position Paper was adapted from a consultation paper released in January 2024. It describes the motivation behind the initiative, what inspired it, what FRI will look like, how we will develop and select FRI, and the timeframe for development.

As to the manifold and obvious advantages of more research in the provincial field[:]

The need is great, the opportunities are legion, the potential gains infinite.

Dawson Commission, Nova Scotia, 1944

SUMMARY

5. RNS has launched a new approach for research support in Nova Scotia. We will be making significant investments to support two to three outcomes-driven initiatives that address urgent priorities for Nova Scotia via **Focused Research Investments**. Each selected FRI will be funded from \$5 million to \$20 million over five to seven years.
6. Each FRI will tackle a portfolio of research work, and collaborate closely with partners, end users and/or communities to ensure that the work remains focused on its intended impact.
7. The substantial and dedicated investment from RNS may be used for personnel, equipment, infrastructure, projects and/or operating costs. Once agreement is reached on the intended outcome and portfolio of work required, broad discretion will be provided to the research team to identify the necessary expenditures to complete the research.
8. Selected FRI will establish a research group that will provide targeted, coordinated and sustained attention on an important area of concern and long-term strategic importance to Nova Scotia, and one judged to be under-supported relative to potential impact.
9. Fundamental and applied research from all science disciplines can be part of the proposed solutions. Truly transformative research programs should be multidisciplinary, with many pathways to positive societal impact.
10. The FRI selection process has two parts: an expression of interest (EOI) followed by a full proposal for those EOI teams selected to proceed. The EOI application guidelines describe the requirements and criteria for the first stage in the application. The development from

selected EOI to full proposal will be a collaborative one; RNS will meet with EOI teams to help develop the strongest possible proposals.

FRI IN THE CONTEXT OF RNS

11. Over the last five years, Research Nova Scotia has developed several approaches to supporting research that helps solve provincial challenges. Our mandate is to bring the substantial research capacity of our postsecondary institutions, health research organizations, and the broader research landscape to answer the questions that affect our social, economic, physical and environmental wellbeing. Research, selected carefully and done well, has great potential to make a difference.
12. Our [missions](#)¹ – the outcomes framework that guides RNS activities and direction – describe action-oriented, ambitious goals that will improve Nova Scotia in four key mission areas: the sustainable bio-economy, climate change adaptation and resilience, healthy people and healthcare systems, and improved quality of life for Nova Scotians.
13. This organizing structure gives definition and shape to the outcomes RNS expects to create from its research investments. The framework is flexible and responsive, enabling priorities to emerge as circumstances require. Research supported by the public should benefit the public, whether through immediate solutions to urgent challenges, or paving the way for better decisions and readiness to take on emerging challenges in the future.
14. To align research to priorities, RNS has been both:
 - *Responsive*: outreach by RNS has familiarized the research community with the research strategy and the outcomes framework. RNS then selects among funding options that are most consistent with the provincial interests.
 - *Proactive*: RNS's intentional program helps shape research ideas. RNS is an engaged participant in the research development effort to maximize the potential for societal impact.
19. In November 2022, the RNS [three-year operating plan](#)² referred to “complex, multidisciplinary and multi-sectoral challenges ... that require concerted, decisive and deliberate action to realize.” This is the genesis of FRI, to tackle opportunities or challenges that need sustained, coordinated and secured support to realize their potential. RNS

¹ researchns.ca/our-missions/

² researchns.ca/wp-content/uploads/2023/01/RNS-3-year-Operating-Plan-Final-Jan-2023.pdf

committed in fiscal 2023/24 to developing “a model to pursue large-scale, resource-intensive and audacious missions through focused research efforts”.

20. RNS launched FRI as the collaboration and funding vehicle to deliver on the November 2022 commitment. Existing programs to organize, coordinate and support research in Nova Scotia will continue.

Why FRI?

21. Nova Scotia can be proud of its research contributions, which improve our society, economy, and environment. The current research support system is necessary – but it is also insufficient.

22. Managing research “means making sure that the science that’s being done makes sense in terms of the goal to which it is supposed to contribute” ([Sarewitz 2016](#))³. Nova Scotia does not have a mechanism to mobilize a comprehensive and dedicated research effort to provide sustained attention to difficult and enduring goals. Sarewitz continues:

In the future, the most valuable science institutions will be closely linked to the people and places whose urgent problems need to be solved; they will cultivate strong lines of accountability to those for whom solutions are important; they will incentivize scientists to care about the problems more than the production of knowledge. They will link research agendas to the quest for improved solutions The science they produce will be of higher quality, because it will have to be.

23. The FRI model will invest in initiatives that embody those characteristics identified by Sarewitz. FRI will complement the current system by focusing efforts in three ways. These ways are detailed immediately below.

24. First, **connecting researchers to Nova Scotia needs**, and to **focus on the pursuit of societal outcomes as the research purpose**.

A. [Flagg and Garg \(2021\)](#)⁴ wrote that the R&D system in the United States:

is largely driven by two goals: profits and prestige. The former motivates industry, which measures success in earnings and shareholder returns. The latter fuels academia, which counts success by publications in high-impact

³ www.thenewatlantis.com/publications/saving-science

⁴ issues.org/decentralized-science-policy-ground-up-flagg-garg/

journals and federal grants. What are the incentives for innovating solutions to local and regional problems without clear profit or prestige drivers?

- B. FRI will be devoted to innovating solutions to Nova Scotia problems, and pursuing Nova Scotia opportunities, even if profit or prestige drivers are absent because this is in the public interest.
- C. In a related observation, the February 2023 [Report of the Advisory Panel on the Federal Research Support System](#)⁵ said: “The greatest gaps of the current [federal research support] system is the ability to respond quickly and in novel ways to emerging societal and economic need”.
- D. The FRI funding model, selection criteria, accountability structure, and other elements of the incentive system are deliberately designed to support just such innovative solutions to Nova Scotia’s societal and economic needs.
- E. FRI will tap into that segment of the private sector that contributes to and derives value from participation in a public research agenda, and into that segment of academia motivated by crafting their research focus to serve their public. FRI are based on convening and collaborating, focused on delivery of public benefits. The objective is societal benefit – what the FRI expects to accomplish – with an emphasis on the salience of the research effort: the relative relevance of the outputs for the decision choices of the end user (industry, community, government service provider, etc.) ([Cash et. al 2003](#))⁶.
- F. Under the objective of societal benefit, research excellence is a condition of support, and will be defined as equally valuing the attributes of credibility, legitimacy and salience.

The [scientific merit review](#)⁷ that each FRI must undergo will ensure that only quality research will be supported. This is an essential component of the professional system of responsible self-regulation in research, promotes scientific credibility, and supports the high standard of good research practices and safeguards its integrity and ethical standards.

- G. FRI must target societal outcomes where research is an essential component, rather than those driven by other elements, such as funding support or policy development.

⁵ ised-isde.canada.ca/site/panel-federal-research-support/en/report-advisory-panel-federal-research-support-system

⁶ dash.harvard.edu/handle/1/32067415

⁷ researchns.ca/funding-policies/

25. Second, forging a **collaborative approach** for those challenges where **coordination is helpful**:

- A. For many research efforts, excessive coordination stifles creativity and opportunity. FRI are for efforts where this isn't the case.

... progress in a field may require the kind of highly focused, collaborative and patient effort across disciplines that has proven difficult to carry out in academia. The challenge will not be to identify such research problems, but rather to identify talented, passionate and fearless individuals who are committed to solve them ([Rubin & O'Shea 2019](#))⁸.

- B. FRI will select for those research efforts where collaboration and coordination are needed in order to serve the objective of pursuing the societal outcome. This means constituent projects and researchers who wish to both teach and learn – ensuring colleagues in other disciplines and projects benefit from and are guided by findings from their work, and are equally eager to do the same in return. FRI are intended to retain, attract and support the talented, passionate and fearless researchers Nova Scotia needs.
- C. The FRI initiative adopts as a premise that “small labs can be disproportionately effective in a supportive, collaborative environment focused on a small number of challenging, shared goals” ([Rubin & O'Shea 2019](#))⁹.

26. Third, bringing **efficiencies to research support**, enabling researchers to do what they do best with confidence in the clearly defined path to impact:

- A. One perspective published in the journal *Nature* bluntly observed that the research funding system is broken: scientists don't have time for science anymore. Because they are judged on the amount of money they bring to their institutions, writing, reviewing and administering grants absorb their efforts ([Ioannidis 2011](#))¹⁰.
- B. Although this may state the case to the extreme, FRI will provide substantial resources such that a greater proportion of researcher time can and should be devoted to research. The size of the FRI award (\$5 to \$20 million) is designed to be sufficient to underwrite major research activities. Contributing funding from other sources indicates alignment

⁸ doi.org/10.7554/eLife.44826

⁹ doi.org/10.7554/eLife.44826

¹⁰ doi.org/10.1038/477529a

with others' mandates and interests, but the FRI investment is not a match fund for research programs with different ambitions.

- C. The research system often disassociates the support for research infrastructure, people and projects, with separate applications (as well as reporting, assessment, and funding timeframe) for each. In Canada, CFI may support infrastructure, the CRC program for a portion of faculty costs, and the Tri-agencies for projects (plus Mitacs for students, match funders to fill budget gaps, ACENET for high performance computing, etc).¹¹
- D. FRI will focus on the outcome to be achieved. Consequently, much greater discretion will be provided to, and far simpler reporting will be expected of, the research team for expenditure choices. Within the bounds of ensuring appropriate accountability for the use of public funds, FRI will have greater flexibility to devote financial resources to where they are most needed.

SIMILAR INITIATIVES

- 29. FRI draws inspiration from the Janelia Research Campus of the Howard Hughes Medical Institute. Like Janelia, the FRI will “focus on identifying important problems and pursuing answers with long-term commitment rather than emphasizing short-term deliverables” ([Rubin & O’Shea 2019](#))¹². The outcomes delivery horizon needs to match the 5-7 year FRI timeframe, although in every case FRI should be making a longer-term investment in research capacity to continue the pursuit of society’s needs.
- 30. Similar to the concept of the [Focused Research Organization](#)¹³, the FRI will be active in areas that will “benefit society broadly in ways that industry cannot rapidly monetize” and favour research efforts “that require tight coordination and teamwork to create public goods” ([Rodrigues & Marblestone 2020](#))¹⁴ and can elude a purely academic research approach.
- 31. The FRI model is about establishing what we want to accomplish, and building a research portfolio in which to pursue it. It will “require a vision about the direction in which to drive ... not just creating the horizontal (framework) conditions for change” and investing in those “with the confidence and capability to lead and form dynamic partnerships with private and

¹¹ Because of this approach, RNS has received requests for funding for research equipment when no project funds are certain; equally, RNS has been asked for project funds when no equipment funds have yet been secured.

¹² doi.org/10.7554/eLife.44826

¹³ fas.org/publication/focused-research-organizations-a-new-model-for-scientific-research/

¹⁴ uploads.dayoneproject.org/2020/09/09110249/Focused-Research-Organizations-to-Accelerate-Science-Technology-and-Medicine.pdf

third sector partners” ([Mazzucato 2018](#))¹⁵. Those symbiotic partnerships are how we can envision a pathway from research output through to societal outcome.

32. The [Bouchard report](#)¹⁶ argued for the need for “a more agile mechanism for answering emerging needs and opportunities”. This is not an argument to *replace* the system we have; it is acknowledging that the system is incomplete. “Mission-driven priorities will depend crucially on established expertise and breakthroughs generated by investigator-initiated research”. The FRI build on the decades of work, supported by many public and private funders.
33. The [Canada First Research Excellence Fund](#)¹⁷ (CFREF) has some similarities to FRI: the CFREF supports research programs that align with Canada’s science, technology and innovation (ST&I) priorities, which are functionally similar to the mission areas of RNS; the objectives of ST&I bear resemblance to the 16 RNS missions; and funds can support personnel, facilities and projects.
34. Where they diverge is that the FRI approach:
 - A. overtly emphasizes societal outcomes over research excellence and locates those outcomes explicitly in Nova Scotia;
 - B. favours integration of those outcomes as a design feature, rather than highlight knowledge mobilization or commercialization activities;
 - C. considers the training component very much as a secondary or incidental objective, and;
 - D. opens the opportunity beyond Tri-agency eligible institutions.
35. The [New Frontiers in Research Fund \(NFRF\) Transformation stream](#)¹⁸ is designed to support large-scale, Canadian-led interdisciplinary research projects that address a major challenge with the potential to realize real and lasting change. FRI are similar in size and ambition, but do not share the NFRF consideration of proposals that lead to scientific breakthrough absent a social, economic, environmental or health impact. As with all Tri-agency opportunities, applicants must be at a Canadian institution holding full eligibility with one of the agencies; FRI is broader (see below, Development and Selection). FRI will pursue a more collaborative

¹⁵ doi.org/10.1093/icc/dty034

¹⁶ ised-isde.canada.ca/site/panel-federal-research-support/en/report-advisory-panel-federal-research-support-system

¹⁷ www.cfref-apogee.gc.ca/program-programme/competitions-concours/2022/apply-demande-eng.aspx#1

¹⁸ www.sshrc-crsh.gc.ca/funding-financement/nfrf-fnfr/transformation/2024/competition-concours-eng.aspx

development process and more rapid review.

36. The [Networks of Centres of Excellence \(NCE\) program](#)¹⁹, which is being wound down, had similar broad program objectives to FRI: “to mobilize Canada's research talent in the academic, private, public, and not-for-profit sectors and apply it to the task of developing the economy and improving the quality of life of the Canadian population”. The governance structure to deliver some FRI could mirror that of an NCE network (an entity separate from but hosted by an academic institution).

DESIGN OF FRI

37. FRI will comprise a discrete, defined and dedicated team of researchers, collaborators and end users who are committed to solving a complicated issue requiring focused research efforts. These teams will be funded for at least five years and not more than seven years, at a funding level not less than \$5 million and not more than \$20 million per team.
38. FRI combine research expertise with the industry, community and public sector partners that need it, working together to solve complicated issues that are timely, high priority, and require dedicated effort to untangle. Each FRI will pursue a clear, outcomes-driven portfolio of activities with deliberate focus on real-world impact.
39. FRI will provide the means and space to ask hard questions, try multiple solutions, and fully integrate the research effort with the needs of Nova Scotians. Although this is patient funding to support complex challenges, demonstrating impact within the funding window is necessary.
40. The FRI model highlights five elements:
 - A. **Specified outcome:** there is or are specified outcome(s) from the research efforts, where clear pathways to societal impact can be defined.
 - B. **Research-driven:** it is research that can contribute meaningfully to the solution (i.e. not a policy, evaluation or resourcing issue). There are many potential problems – the [SDGs](#)²⁰ alone suggest 17 societal and technological goals with 169 sub-targets; the challenge is to fracture these broad problem areas into a series of research efforts that consider the salient issues in Nova Scotia to address them.

¹⁹ www.nce-rce.gc.ca/Programs-Programmes/NCE-RCE/Index_eng.asp

²⁰ sdgs.un.org/goals

- C. **Coordination:** the proposed program of work benefits from significant coordination and integration across groups, disciplines or sectors to ensure ongoing feedback and salience of the research. The selected organizational mechanism is appropriate to ensure that the required collaborations work and that the research program will be delivered;
 - D. **Broad societal value:** the research will be applicable in different ways and for different end user groups. This is neither a commercial opportunity for proprietary R&D nor an evidence-gathering activity to develop a specific policy or support an advocacy position;
 - E. **Fit for purpose:** the issue is relevant and urgent for Nova Scotia, and appropriate for the FRI approach. The work can be accomplished with the budget and resources anticipated, and the right team is here or can be assembled to get the job done.
41. The management and governance of each FRI must have the competence to manage its activities, be capable of committing to deploy resources and develop and adhere to business plans, and identify appropriate means to hold itself to account to achieve its objectives.
 42. RNS will select FRI that offer the potential to accomplish substantial progress toward one or more of our [missions](#)²¹. Beyond this restriction, FRI uses a collaborative model in issue selection: identifying the challenges that exemplify the five elements above will require engagement, and will require a team of researchers committed to working in this way. FRI integrates problem definition with the plan of attack on that same problem.
 43. FRI programs of research may include both fundamental (discovery) research to answer foundational questions as well as applied research to find uses for the knowledge being generated. If fundamental research is needed to achieve the outcome, then fundamental research will be supported. To do so requires the discipline to articulate how and why those fundamental questions are essential.
 44. Proposals from all research disciplines are eligible, and successful FRI will likely include a mix.
 45. FRI will incorporate those who will make use of the research – end users and beneficiaries – in the design and ongoing implementation of the research portfolios. As with all RNS-funded research, knowledge mobilization as discrete activity is replaced by integration and collaboration throughout the project.

²¹ researchns.ca/our-missions/

46. Proposed FRI may take on different forms. An FRI may take the form of an organization, institute, lab, dedicated research team, collaboration, network of institutions, or consortium. As a structure, the FRI could be:
- A. created as a time-limited project for the purpose of pursuing the outcome (after which the structure will disappear), or be established as an ongoing concern;
 - B. built on an existing organization, set up from scratch, or spun out from an existing research institution;
 - C. based within an existing research institution such as a postsecondary institution, or created as a standalone.
47. We do not presuppose the most efficient organization to deliver the FRI vision: this is driven by what makes most sense to realize the FRI's designated outcomes, and the organization's ability to manage its operations effectively and responsibly.
48. If housed within a PSE, that institution must develop a model that gives the FRI authority over its resources and decision-making relevant to the intended FRI operations and activities, for the duration of the FRI grant.
49. The research system requires improvements to address equity, diversity, inclusion and accessibility (EDIA). FRI offer an opportunity to address marginalized, historically excluded, and racialized communities, groups and individuals through two pathways:
- A. Who participates in research: RNS expects teams will represent the diversity in research talent in Nova Scotia.
 - B. What research is pursued: teams may propose outcomes important to, and determined by, EDIA-deserving communities. Or, within the outcome defined by the FRI, teams may develop component research projects that tackle the exclusion of EDIA-deserving communities from existing research efforts, as an essential means to achieve the societal outcome.
50. FRI will adhere to [RNS funding policies](#)²², including those addressing Eligible Research Expenses and Indirect Costs. Salary and benefit costs for FRI personnel are eligible expenses, except where already employed by a primary organization. PSE may propose to house an independent non-profit, providing some services as an in-kind contribution (e.g.

²² researchns.ca/funding-policies/

use of facilities); personnel could be seconded on a part or full time basis to the independent FRI entity in which case associated personnel costs are eligible. Funding cannot be used for teaching release/faculty buy-out.

51. RNS anticipates further policy development to complement or support the federal Policy on Sensitive Technology Research and Affiliations of Concern, and to support the vision of [open science](#), to make “scientific inputs, outputs and processes freely available to all with minimal restrictions”²³. FRI will be required to adhere to RNS policies approved by the RNS Board of Directors where applicable and appropriate.
52. Each FRI will include a program of work that tackles multiple facets of its challenge, with resources available for people, equipment, facilities, operating and project costs necessary to pursue its outcomes. RNS expects applicants to budget adequately for business, financial, project and other administrative or management functions.
53. There is no target or minimum requirement for partner funding. However, given that the FRI focus is explicitly on societal needs, partner funding (cash or in-kind), and certainly partner or uptake organization participation, are compelling value indicators of the societal outcome the FRI intends to serve.
54. FRI require definition around the societal outcome, after which the research program is designed to suit. This does not mean discovery on demand, where the research function is held to account for the successful application of research outputs to realize societal outcomes. FRI research remains consistent with the [OECD approach](#)²⁴: it is fundamentally an act of discovery, which is novel, creative, uncertain, systematic and transferable.
55. The FRI model openly welcomes ambitious proposals that incorporate research activities alongside complementary pursuits. For example, an FRI may be a companion to a partner-supported R&D capacity dedicated to solving that partner’s research or analytical needs. As long as the public investment in the FRI continues to pursue the publicly defined outcome, there can be a free flow of expertise and equipment between the two activity areas. Housing these functions together can both improve the flow of research outputs to application, but innovation challenges encountered by the R&D activity can be parsed into broader research questions suited for the FRI.

²³ science.gc.ca/site/science/en/office-chief-science-advisor/open-science/roadmap-open-science#8

²⁴ www.oecd.org/innovation/frascati-manual-2015-9789264239012-en.htm

RESEARCH FREEDOM

56. The [Bonn Declaration on Freedom of Scientific Research](#)²⁵ (2021) was signed by all EU member states and Canada has [endorsed its principles](#)²⁶. It opens with “The freedom of scientific research is a universal right and public good.” As a concept, it:

encompasses the right to freely define research questions, choose and develop theories, gather empirical material and employ sound academic research methods, to question accepted wisdom and bring forward new ideas. It entails the right to share, disseminate and publish the results thereof openly.

57. The FRI model supports researchers driven to be civic actors and participants, devoting their expertise in service of their communities. We are collectively defining the outcomes we desire, turning these challenges into concrete problems, investing in groups who will shape those into research questions whose answers we need, and enriching the freedom of the researchers to pursue their craft in this shared pursuit.

58. In short, the FRI model creates the societal destination, and then depends on all the principles in the Bonn Declaration – starting with the right to freely define the research questions – to pursue the most efficient direction. FRI funding provides the security of tenure to enable tenacious pursuit.

59. The Bonn Declaration addresses the interplay between researchers and society:

We therefore consider a healthy equilibrium between bottom-up and top-down research and innovation policy approaches necessary; this is in line with the freedom of scientific research, in particular with respect to an effective contribution of scientific research to wider policy goals.²⁷

60. FRI are designed to promote this healthy equilibrium: the definition around wider policy goals coupled with significant freedom accorded to the researcher to pursue the work as they see fit, talk openly about the results, and disseminate them as widely as possible in accordance with the principles of open science.

²⁵ www.bmbf.de/bmbf/shareddocs/downloads/files/_drp-efr-bonner_erklaerung_en_with-signatures_maerz_2021.pdf?__blob=publicationFile&v=1

²⁶ data.consilium.europa.eu/doc/document/ST-1356-2021-INIT/en/pdf#:~:text=All%2027%20EU%20Member%20States,have%20signed%20the%20Bonn%20Declaration.

²⁷ www.bmbf.de/bmbf/shareddocs/downloads/files/_drp-efr-bonner_erklaerung_en_with-signatures_maerz_2021.pdf?__blob=publicationFile&v=1

DEVELOPMENT AND SELECTION

61. The application for an FRI includes two steps: and expression of interest (EOI), and for those selected, a full proposal.
62. The EOI deadline is 29 April 2024. The EOI step is adjudicative: RNS will select EOIs to proceed to full proposal based on fit, potential, suitability and expected impact. Information on the EOI selected to submit full proposals will be made public, to encourage further discussions and foster potential collaborations.
63. The full proposal requirements are under development, and will likely include how the FRI proposes to achieve the mission(s); 5-7 year business plan; program of research work; proposed team and science and program leadership; budget (including equipment, personnel); secured or proposed partners and collaborators.
64. Unlike traditional funding approaches, RNS will work alongside the EOI teams to co-create applications that propose strong, ambitious and focused programs that will make meaningful progress toward the missions and the improvement of Nova Scotia. In the development from EOI to proposal, applicant teams can continue to refine their objectives and partnerships, engage with communities, and adjust budget priorities. The proposal, however developed from the EOI, must remain faithful to the core elements of the EOI that led to its selection.
65. Proposals will be evaluated on their relevance to Nova Scotia's priorities, approach to achieving progress on RNS's missions, proposed program of work, methodology, suitability of the team, capacity to deliver and the expected benefit to Nova Scotia. This is an indicative list; the required elements will be provided when the invitations to submit a proposal are provided to selected EOI. All proposals must meet scientific merit standards, assessed through an independent science merit review panel.
66. RNS will negotiate a funding agreement with each FRI. RNS will function as a secretariat and program oversight body. FRI leadership will maintain close contact with RNS to monitor progress and solve problems as the program of work takes place.

For more information visit www.researchns.ca/FRI.

