

Office of the National Science Advisor
Overview of comments received on the Major Science Investments discussion paper
July 25, 2005

Background

The discussion paper, “A Framework for the Evaluation, Funding and Oversight of Canadian Major Science Investments,” was distributed in early February 2005 to the Deputy Ministers of Science-based Departments and Agencies (SBDAs), Presidents of the Funding Agencies and Councils, and to the broader Canadian scientific community. The National Science Advisor requested that comments be submitted to his office by May 15, 2005. To date seventy-one responses have been received: thirteen from federal departments, twenty-three from universities, twenty from other organizations and fifteen from individuals. A list of submissions can be found in Annex I. Overall the paper was viewed positively and the National Science Advisor was applauded for tackling such an important issue. Comments are divided into the following themes:

- the definition and scope of major science investments (MSIs);
- the need for national science and technology priorities;
- governance and management of the framework;
- funding model; and
- project selection.

Definition and Scope of Major Science Investments

The most frequent comment, made by twenty-four respondents, was in support of broadening the definition of MSIs to include distributed networks and less-traditional investments particularly in the health and social sciences. Although the discussion paper referenced these elements, it was felt that the examples provided were too strongly focused on physics and astronomy. The only dissenting voices were the Canadian Institute for Neutron Scattering, the Coalition for Canadian Astronomy, and the National Research Council who felt that the definition should encompass capital-intensive investments only. There were also requests to include participation in international projects as potential MSIs if the project met the appropriate funding thresholds.

There were only five comments regarding the \$100 M barrier. Health Canada and the Coalition for Canadian Astronomy were supportive, the University of Victoria thought the threshold was too low and the Council for Health Research considered that it was arbitrary and lacked sufficient rationale. The Social Sciences and Humanities Research Council argued that the threshold should be flexible since the extent to which an expenditure represents a major perturbation in the investment profile is very much field dependent. There were good arguments put forth to consider other criteria in addition to the sum lifetime cost of the project including the breakdown of operational versus capital funds and peak annual funding requirements. As well, seven respondents specifically mentioned that the reference to 3% of Canadian funding dedicated to MSIs was misleading, potentially inaccurate and detrimental to the argument for such a framework.

Need for National Science and Technology Priorities

The second most frequent comment from respondents was the need to place this process in the context of a clearly articulated, integrated national science and technology policy and priority-setting exercise for Canadian science. It will only be through a thorough analysis of national research priorities that strategic decisions can be made regarding MSIs. There were strong messages, particularly from the university community, that funding for MSIs should not adversely impact existing resource levels for granting councils or other research support such as CRCs and Indirect Costs of Research.

Governance and Management of the Framework

Overall, respondents expressed the view that the relationship between the proposed new governance structures and existing government processes should be clarified. For example, the following questions were raised:

- *How would recommendations from the Major Science Investment Panel (MSIP) be implemented?*
- *What would be the relationship to Cabinet and the MC process?*
- *How would a lead agency be selected and what roles or responsibilities would it play in moving a proposal forward?*
- *How would the role of the MSIP fit in with the future of CFI?*
- *What would be the precise role of the granting councils?*
- *What is the role of the National Science Advisor as an advocate relative to his role as a leader/manager of the process?*

Several respondents stated that the proposed process must have clear, strong links to existing government mechanisms in order to be effective.

Most comments on the governance structure centered on the MSIP's role and composition. Two respondents stated that the panel should be placed under the tri-council umbrella to ensure that existing expertise in the evaluation and prioritization of scientific proposals is effectively used. Three others recommended that proposals should first be vetted by the appropriate granting council before being championed to the MSIP or an equivalent body. The TRIUMF Board incorporated this pre-evaluative stage into a detailed alternative model. Proposals that are approved at the granting council level would then be championed to a high-level standing committee. This committee contrasts with the MSIP in that it would be chaired by an appropriate minister (currently this would fall to the Minister of Industry) and therefore has natural ministerial oversight. The TRIUMF Board recommended this model because a proposal would be examined in more depth before reaching the decision-making level and the model places a greater emphasis on securing government support for the best science rather than concentrating on prioritization within a specified funding envelope.

Regardless of the exact role of the MSIP within the framework of government, it was generally noted that the panel lacked sufficient scientific representation. It was suggested that the current composition could be bolstered by either adding leading national and

international scientists or structuring a standing scientific committee to advise the panel. Others also recommended that leading Canadians from outside the research community should be incorporated to provide a challenge function. Finally, the need for provincial engagement and consultation was raised. Given that funding for MSIs is often contingent on financing from provincial sources, it was suggested that regional representation be considered for the MSIP. Questions were also raised regarding member selection and rotation.

A key point raised by several respondents was that the mechanism described in the paper focused on the approval of MSIs; however, it does not address operating fund renewal or the decommissioning of existing MSIs. To ensure a lifecycle approach to funding MSIs, mechanisms must be incorporated within the governance structure to deal with these issues.

Funding Model

Several respondents thought that the funding model needed clarification. The following questions were raised:

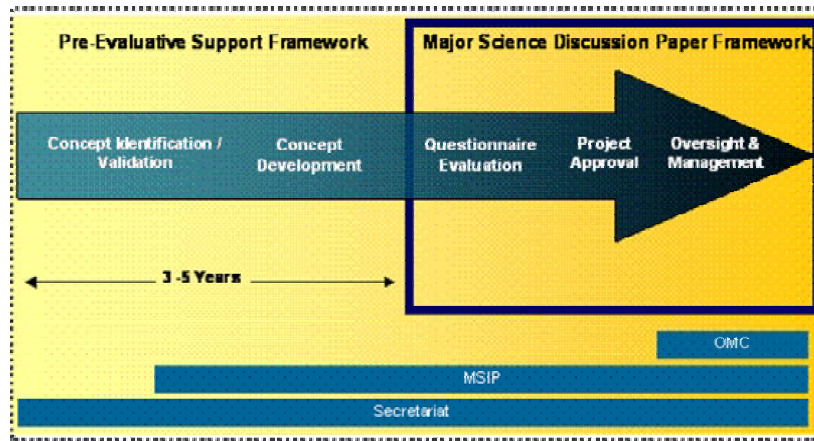
- *Where will money come from?*
- *Will all successful proposals go through the Cabinet process?*
- *Will decisions be binding on the granting councils?*
- *How will operating funds be approved and where will they come from?*
- *How will proposal development be funded?*
- *Will there be a pool of new money for the MSIP from which to fund projects?*

Most correspondents argued that without an injection of new money and/or a clear map of where funding would come from, the process would be in danger of becoming just another layer of bureaucracy and might raise unattainable expectations.

Project Selection

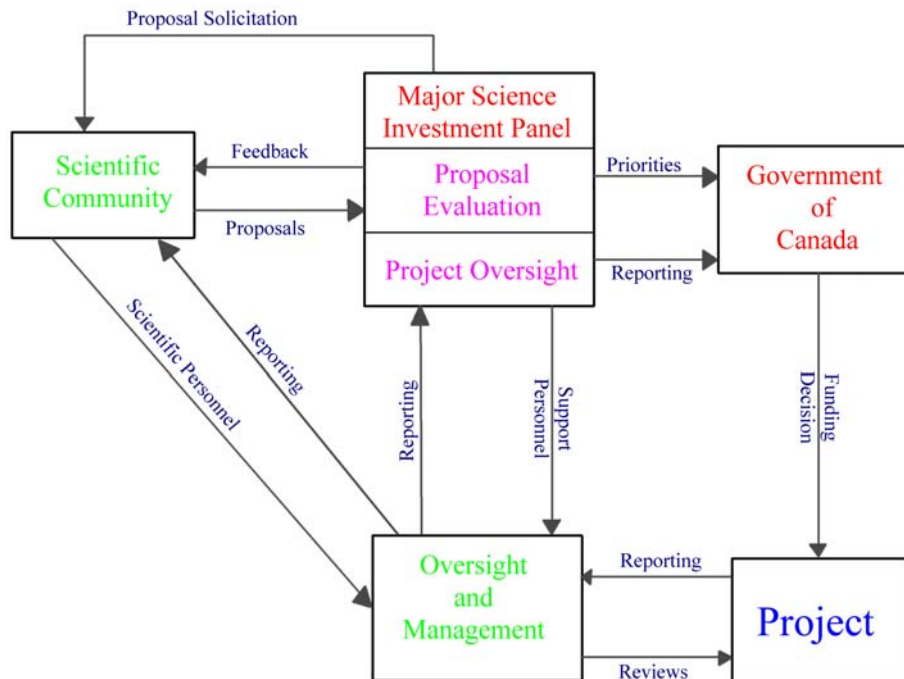
The majority of respondents who commented on the project selection process thought that there should be a multi-stage approval process where successful first-round applicants would be supported to develop final proposals. The secretariat should be structured and supported such that it can play a value-added role in the proposal development process. Figure 1 contains an interesting schematic suggested by the University of Calgary on how the infrastructure proposed in the framework could be leveraged across the pre-evaluative stage.

Figure 1: Staged time-line for the development of MSIs¹



As previously mentioned some respondents were supportive of proposals first being vetted through the appropriate council or agency and then championed to the panel. An alternative flow chart to the one contained in Annex A of the discussion paper appears in Figure 2.

Figure 2: Modified Flow Chart²



¹ Source: Dennis Salahub, Vice President (Research and International), University of Calgary, 2005.

² Source: Dominic Ryan, President, Canadian Institute for Neutron Scattering

While several specific modifications were suggested for Appendices B and C, there were a number of themes reiterated by multiple respondents. In addition to a peer review of scientific merit, a separate review of the project's budget, management structure and operation was called for. The "Leyman Reviews" of the US Department of Energy were held up as a useful model. It was also mentioned that the Canadian Academies of Science could play a potential role in the scientific peer review, although this is not their mandate.

Risk was also commented on a number of times. It was argued that the definition of risk needed to be more clearly defined and should include for example an assessment of the public reaction, as well as a separation between scientific risk, financial risk and external risk. Other comments included:

- a more absolute rating system to ensure comparison across years;
- a greater emphasis on peer review;
- impact assessment should include the opportunity costs of funding big science at the expense of small science;
- to what extent the facility/resource/initiative is required for progress in the specific field;
- the extent to which this investment is necessary for an acceptable return on previous capital investments;
- a need to weigh excellence and strategic relevance;
- an analysis of the international significance and novelty of the project;
- an evaluation of the ICT and network requirements;
- an analysis of linkages to other MSI;
- the inclusion of a human resources strategy;
- the development of a standardized proposal and budget framework; and
- results should be reported in a matrix of merit versus readiness.

Overall Assessment and Proposed Next Steps

Judging by the volume and tone of the responses received there is strong support for the development of an MSI framework. The benefits would include greater transparency, improved efficiency and effectiveness of decision making, and greater scientific, financial and project planning rigour. These elements were clearly identified as requiring improvement in the Auditor General's Report³.

However, a number of issues and suggested changes highlighted in this overview need to be resolved. In order to address these issues more effectively, a working group comprised of senior advisors from Federal research agencies has been formed to review the comments in greater depth and to draft a second version that better reflects the input received.

³ Auditor General of Canada, *Report of the Auditor General of Canada*, December 2000.

The Presidents of Research Councils and Agencies as well as several of the correspondents recommended that a workshop be held for a review the framework before submitting it to government for consideration. This workshop will be held on October 3rd in Ottawa. The working group will report to the National Science Advisor who in turn will review the second draft of the framework with the Science Deputy Ministers' Committee and the Committee of Presidents of Research Councils and Agencies.

Time Frame

July	Drafting of 2 nd version
August	Review of 2 nd version by Science Deputy Ministers and Presidents of Councils and Agencies
September	Distribution of 2 nd version to Science Community
October 3 rd	Workshop - Ottawa
October	Drafting of final report and review by Science Deputies and Presidents
November	Submission of final report for consideration by government

Annex 1: Responses to Discussion Paper

Responses to Big Science Discussion Paper			
Submission #	Date	Organization	Author
Government Departments			
1	17/Mar/05	AAFC	Leonard Edwards, DM
2	19/Apr/05	CFIA	Richard Fadden, President
3	22/Feb/05	CSA	David Kendall, DG, Space Science
4	25/Mar/05	CSA	Marc Garneau, President
5	12/May/05	Environment Canada	Karen Brown, Assistant DM
6	30/Mar/05	DFO	Larry Murray, DM
7	11/Apr/05	Health Canada	Hélène Gosselin, Associate DM
8	22/Feb/05	Health Canada	Morris Rosenberg
9	13/May/05	Ontario Ministry of Economic Development and Trade	Don Black, DM
10	13/May/05	NRC	Pierre Coulombe, President
11	11/Mar/05	NRCan	George Anderson, DM
Granting Agencies			
12	10/Mar/05	CIHR	Alan Bernstein, President
13	06/Jul/05	SSHRC	Janet Halliwell, Vice-President
Universities			
14	09/May/05	Bishop's University	J. Rittenhouse, Vice-Principal
15	11/May/05	Concordia University	Truong Vo-Van, Vice-Provost, Research
16	25/May/05	Dalhousie University	Ron O'Dor, Professor
17	25/May/05	G10 Vice-Presidents (Research)	R Gary Kachanoski (University of Alberta)
18	15/May/05	Laurentian University	Dr. Lietter Vasseur, Associate VP Research
19	02/May/05	McGill University	Jacques Hurtubise, Interim V.P. Research
20	10/May/05	McMaster University	Peter George, President and Vice-Chancellor
21	11/May/05	Mount St. Vincent University	Sheila Brown, President
22	13/May/05	Queen's University	Kerry Rowe, VP Research
23	09/May/05	Simon Fraser University	Colin Jones
24	01/Jun/05	Université du Québec à Montréal	Michel Jébrak, Vice-Recteur
25	13/May/05	Université de Sherbrooke	Pierre Labossière, Vice recteur à la recherche
26	15/May/05	University of British Columbia	David Dolphin, VP Research (Acting)
27	09/May/05	University of Calgary	Dennis Salahub, Vice President (Research & International)
28	10/May/05	University of Manitoba	Grant M Hatch, Acting Associate Dean (Research)
29	31/Mar/05	University of New Brunswick	Gregory Kealey, VP (Research)
30	13/May/05	University of PEI	Kathrine Schultz, VP Research
31	05/May/05	University of Saskatchewan	Steven Franklin
32	18/May/05	University of Toronto	John Challis, V.P. Research
33	16/May/05	University of Victoria	David Turpin, President
34	16/May/05	University of Western Ontario	Ted Hewitt, V.P. Research and Inter
35	13/May/05	University of Waterloo, Institute for Quantum Computing	Raymond Laflamme, Director IQC
36	12/May/05	York University	Gordon G Shepherd, Director
Other Organizations			
37	7/Jun/05	Association of Universities and Colleges of Canada	Claire Morris, President and CEO
38	05/May/05	Bechtel Corporation	O. Bedair
39	12/May/05	Canadian Asso. of Physicists	Mike Morrow, President
40	12/May/05	Canadian Astronomical Society	James E Hesser, President
41	12/May/05	Coalition for Canadian Astronomy	Gretchen Harris, Pekka Sinervo, Michael Jolliffe
42	11/May/05	Canadian Institute for Neutron Scattering	Dominic Ryan, President
43	29/Apr/05	Canadian Light Source Inc.	William Thomlinson, Exec. Director
44	30/Mar/05	Canarie	Andrew Bjerring, President and CEO
45	10/May/05	Council for Health Research in Canada	Deborah Gordon-El-Bihbety, President and CEO
46	13/May/05	C3.ca	
47	12/May/05	Institute of Particle Physics	William Trischuk, Director
48	25/Feb/05	Netera	Ken Hewitt, President
49	21/Feb/05	Oak Ridge National Laboratory	Thomas Mason
50	11/May/05	Partnership Group for Science and Engineering	Dr. Simon Hanmer, Chair
51	12/May/05	Perimeter Institute for Theoretical Physics	Howard Burton, Executive Director
52	24/May/05	Prime Minister's Advisory Council on Science and Technology	Jacquelyn Thayer Scott, Deputy Chair
53	01/Jun/05	Sudbury Neutrino Observatory Institute	SNO Institute Board
54	14/May/05	Sudbury Neutrino Observatory Institute	Art McDonald, Director
55	18/May/05	TRIUMF	Alan Shotter
56	28/Apr/05	United Kingdom	Sir David King, UK Science Advisor

Responses to Big Science Discussion Paper			
Submission #	Date	Organization	Author
Individual Responses			
57	04/May/05	Alan Manson, Professor	University of Saskatchewan
58	15-May-05	Alexander Jablonski - Academia and Research Institution Liaison	Canadian Space Agency
59	26-May-05	Bjarni Tryggvason, Astronaut	Canadian Space Agency
60	9-Mar-05	D.D. Johnson- Professor Emeritus	University of Saskatchewan
61	11-Apr-05	Denis Rancourt- Professor	University of Ottawa
62	15/May/05	Donald Weaver	Dalhousie University
63	01/Mar/05	George Kalmus, UK	ACOT
64	09/May/05	James R Drummond- Researcher	University of Toronto
65	13/May/05	John G Spray	University of New Brunswick
66	30/Apr/05	K.W. Putt, Past President, Engineering Institute of Canada	K.W. Putt Consulting Inc.
67	02/May/05	Mary Anne White, Director, Institute for Research in Materials	Dalhousie University
68	03/Mar/05	Murray McLaughlin, President and CEO	Foragen Technologies
69	28/Feb/05	Dr. Philip Hultin, Associate Professor	University of Manitoba
70	12/Apr/05	RA Savidge, Professor	University of New Brunswick
71	27/May/05	Stephan Dupre	Former ACST member