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1998-99 Estimates

Report on Plans and Priorities

Canada

The Estimates Documents

The Estimates of the Government of Canada are structured in several parts. Beginning with an overview of total government spending in Part I, the documents become increasingly more specific. Part II outlines spending according to departments, agencies and programs and contains the proposed wording of the conditions governing spending with Parliament will be asked to approve. The previous Part III of the Estimates has been split into two documents: a spring report "*Report on Plans and Priorities*" and a fall report "*Departmental Performance Report"*.

A *Report on Plans and Priorities* provides additional detail on each department and its programs primarily in terms of more strategically oriented planning and results information with a focus on outcomes.

The *Departmental Performance Report* provides a focus on results-based accountability by reporting on accomplishments achieved against the performance expectations and results commitments as set out in the spring *Report on Plans and Priorities*.

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National Research Council Canada

1998-99 Estimates

Report on Plans and Priorities

John Manley
Minister of Industry

TABLE OF CONTENTS

SECTION I: MESSAGES

A. Minister's Message

The Industry Portfolio is …

Atlantic Canada Opportunities Agency
Business Development Bank of Canada*
Canadian Space Agency
Competition Tribunal
Copyright Board Canada
Canada Economic Development for Quebec Regions (formerly the Federal Office of Regional Development (Quebec))
Industry Canada
National Research Council Canada
Natural Sciences and Engineering Research Council of Canada
Social Sciences and Humanities Research Council of Canada
Standards Council of Canada*
Statistics Canada
Western Economic Diversification Canada

**Not required to submit Reports on Plans and Priorities*

A new global economy based on knowledge and innovation is rapidly emerging. Canada has the opportunity to position itself as a world leader in this knowledge-based economy, and the Industry Portfolio plays a key role in the government's strategy to seize this opportunity. Bringing together thirteen departments and agencies responsible for science and technology, regional development, marketplace services and micro-economic policy, the Industry Portfolio is a powerful toolkit to help Canada make a smooth transition to the economy of the 21st Century.

Since the creation of the Industry Portfolio, my priority has been to ensure that the Portfolio focusses on helping Canadian businesses to fulfill their potential to innovate, grow and create jobs. Portfolio members work together and with other partners to narrow Canada's gaps in the areas of innovation, trade, investment, human resources and community economic development, helping to create jobs and wealth in all sectors of the economy and in all regions. Ir
Canadian businesses to position themselves at the forefront o

The Portfolio members' Reports on Plans and Priorities collectively illustrate how the Portfolio is meeting the challenges of the knowledge-based economy through our focus on: promoting innovation through science and technology; encouraging trade and investment; helping small and medium-sized enterprises to grow; promoting economic growth in Canadian communities; improving the coordination of Portfolio communications; realizing the potential of the Portfolio's people; and measuring the Portfolio's performance. The Portfolio is strongly committed to achieving these objectives and has a strong sense of accountability to Canadians for their delivery. We are also committed to measuring the success of our performance and to reporting on our accomplishments in future performance reports.

Working together, we will make a difference to the economic and social fabric of Canada and ensure our success in the global knowledge-based economy.

_____

The Honourable John Manley

B. Message from the Secretary of State (Science, Research and Development)

In the global knowledge-based economy, Canada's future prosperity will be built on a foundation that supports advancements in the fields of science, research and development. The government recognizes the importance of these fields of endeavour and their contribution to innovation, jobs and our quality of life as Canadians. Our future success depends on our ability to innovate as individuals, as communities, and as a nation.

Hard work alone will not guarantee continued success. Our prosperity will depend as much on our ability to generate and use knowledge -- knowledge that largely comes from ongoing science, research and development initiatives. These initiatives are not being undertaken in isolation; government is working harder than ever before with other public and private sector partners. Throughout, government continues to place an emphasis on encouraging both the research to generate new ideas and the development of highly qualified personnel. Through the strategic approach to the support of science, research and development, the government is making its contribution to the evolution of science-based products and services, as well as job creation.

By promoting science, research and development, the government helps fuel the innovation that improves our global competitiveness and stimulates jobs and growth. This Report on Plans and Priorities illustrates how we, in government, are harnessing the benefits of science and technology for the future of all Canadians. These initiatives are helping to create stronger partnerships that lead to better jobs for Canadians, to an improved quality of life, and to increases in the world's stock of knowledge. These initiatives are translating the promise of science, research and development into real opportunities for our future.

The Honourable Ron J. Duhamel

MANAGEMENT REPRESENTATION/DÉCLARATION DE LA DIRECTION Report on Plans and Priorities 1998-99/Rapport sur les plans et les priorités 1998-1999	
I submit, for tabling in Parliament, the 1998-99 Report on Plans and Priorities (RPP) for the National Research Council Canada. To the best of my knowledge, the information: • accurately portrays the corporation's mandate, plans, priorities, strategies, and expected key results of the organization; • is consistent with Treasury Board policy and instructions and the disclosure principles contained in the *Guidelines for Preparing a Report on Plans and Priorities;* • is comprehensive and accurate; and • is based on sound underlying departmental information and management systems. I am satisfied as to the quality assurance processes and procedures used for the RPP's production. The Planning and Reporting Accountability Structure (PRAS) on which this document is based has been approved by Treasury Board Ministers and is the basis for accountability for the results achieved with the resources and authorities provided.	Je soumets, en vue de son dépôt au Parlement, le Rapport sur les plans et les priorités de 1998-1999 du Conseil national de recherches du Canada. À ma connaissance, les renseignements : • Décrivent fidèlement les mandat, plans, priorités, stratégies et résultats clés escomptés de l'organisation. • Sont conformes à la politique et aux instructions du Conseil du Trésor, ainsi qu'aux principes de divulgation de l'information énoncés dans les *Lignes directrices pour la préparation du Rapport sur les plans et les priorités.* • Sont complets et exacts. • Sont fondés sur de bons systèmes d'information et de gestion sous-jacents. Je suis satisfait des méthodes et procédures d'assurance de la qualité qui ont été utilisées pour produire le RPP. Les ministres du Conseil du Trésor ont approuvé la structure de planification, de rapport et de reponsabilisation (SPRR) sur laquelle s'appuie le document et qui sert de fondement à la reddition de comptes sur les résultats obtenus au moyen des ressources et des pouvoirs fournis.
Name / Nom :_____ Date :_____	

SECTION II: DEPARTMENTAL OVERVIEW

A. Mandate

National Research Council Act

NRC is a federal government departmental corporation as stated in Schedule ll of the Financial Administration Act. Its mandate, according to the National Research Council Act, is to undertake, assist or promote scientific and industrial research in different fields of importance to Canada; to investigate standards and methods of measurement; and to work on the standardisation and certification of scientific and technical apparatus and instruments and materials used or usable by Canadian industries.

NRC also has the responsibility for the operation and administration of astronomical observatories established or maintained by the Government of Canada. It is also mandated to provide vital scientific and technological services to the research and industrial communities. The National Research Council Act also empowers NRC to “establish, operate and maintain a national science library” and to “publish, sell and otherwise distribute” scientific and technical information.

Weights and Measures Act

NRC is responsible for primary standards of physical measurements as formally established by the Weights and Measures Act and the National Research Council Act. NRC has a specific mandate relating to “the investigation and determination of standards and methods of measurements including length, volume, weight, mass, capacity, time, heat, light, electricity, magnetism, and the investigation and determination of the physical constants and the fundamental properties of matter”.

Organization and Program Composition

NRC is divided into three business lines which provide a balance between undertaking research and technology development, providing information, technical and financial assistance to industry and the public, and supporting the organization with corporate services.

The first business line, *Research and Technology Innovation* encompasses NRC’s responsibilities for performing research and development in strategic areas. It contributes to wealth generation through support for long term strategic

and precompetitive research which leads to the application of technologies in key economic areas.

The business line is organized to address key technological and industrial areas of the economy where NRC has mandated roles and responsibilities, as well as the critical mass of research and technology competencies needed to have a demonstrated impact on innovation.

These technological and industrial areas include biotechnologies, information and telecommunications technologies, manufacturing technologies, and Canada's aerospace, construction and marine industries. In addition, this business line includes NRC's responsibilities to support research in national physical and chemical measurement standards and to manage national science and astronomical facilities. Underpinning this business line is NRC's long-standing commitment to strategic and transformational research in the molecular sciences.

Through the second business line, *Support for Innovation and the National Science and Technology Infrastructure*, NRC develops and diffuses scientific knowledge and technology.

This business line encompasses the organization's assistance to industrial research through its Industrial Research Assistance Program (IRAP) and the Canadian Technology Network (CTN). It also includes NRC's efforts to disseminate scientific, technical and medical information through its Canada Institute for Scientific and Technical Information (CISTI). Finally, this business line includes support of Technology Centres focused on specific areas of importance to Canadian industries.

The third business line, *Program Management*, includes administrative and corporate services functions, with a focus on effective management of NRC's activities and its resources.

B. Objective

To enhance the national capability and to stimulate investment in research and development for the economic and social benefit of Canada.

C. Financial Spending Plan

($ millions)	Forecast Spending 1997-98*	**Planned Spending 1998-99**	Planned Spending 1999-00	Planned Spending 2000-01
Gross Program Spending	491.1	**506.1**	505.1	494.4
Less: Revenue credited to the Vote	-	**-**	-	-
Net Program Spending	491.1	**506.1**	505.1	494.4
Less: Spending of revenues pursuant to the NRC Act	46.8	**50.0**	53.7	59.3
Plus: Cost of services provided by other Departments	9.3	**10.3**	10.4	10.4
Net Cost of the Department	**453.6**	**466.4**	**461.8**	**445.5**

* Reflects best forecast of total planned spending to the end of the fiscal year.

SECTION III: PLANS, PRIORITIES AND STRATEGIES

A. Summary of Key Plans, Priorities and Strategies

NRC is determined to be at the centre of Canada's scientific, technology and industrial innovation. This commitment is entrenched in NRC's *Vision to 2001*, which states that NRC will be a leader in the development of an innovative, knowledge-based economy through science and technology.

For the planning period, NRC will continue to be guided by the strategic directions set out in its *Vision*. Specifically, NRC's priorities over the next three years will be to:

Maintain its dedication to excellence in advancing the frontiers of scientific and technological knowledge in areas relevant to Canada.

In order to play an effective role as Canada's foremost R&D agency, NRC must excel in fields that have been identified as important to the country. NRC will continue to focus on key research areas that are relevant to Canadian industry, identified primarily through its Technology Groups in consultation with external stakeholders, such as advisory boards.

NRC will also be reintroducing peer review as a regular component of its assessment process for its research activities.

A key indicator of the excellence and relevance of NRC's work is its ability to establish effective partnerships and alliances with important international research organizations. NRC will continue to build on its recent efforts to strengthen its international strategy with specific emphasis on building alliances in Asia and Europe.

Carry out focused research, in collaboration with industrial, university, and government partners, to develop and exploit key technologies.

NRC is dedicated to helping enhance the competitiveness of Canadian-based firms by creating opportunities to develop and exploit key technologies as well as by providing a range of innovation assistance and access to vital information to meet a broad range of industrial needs. NRC continues to seek innovative ways to put together strategic alliances with universities and private sector firms of all sizes through such means as consortia and special interest groups.

In 1998-99, NRC will be in the fourth year of a $25 million, five-year agreement with NSERC to jointly support collaborative research to build strong linkages between the private sector and researchers at NRC and in universities.

Provide strategic advice and national leadership to integrate key players in Canada's system of innovation.

NRC is committed to using the inherent power of innovation within Canada's communities and regions to stimulate knowledge-based economic growth across Canada. Regional and community innovation initiatives under way across the country will continue to be implemented and strengthened and will involve all of NRC's business lines to some extent.

In Saskatchewan, NRC and its federal, provincial and local partners will build on the results of a major innovation conference held in November 1997 to develop an action plan for the province. In Manitoba, NRC will continue to work with Western Economic Diversification and the provincial government to establish an integrated Western Canadian medical technologies cluster. In British Columbia, research, technology and innovation system support programs will be developed in accordance with NRC's Innovation Action Plan in such areas as information technology, biosciences and biomedical sciences and fuel cells technologies. These programs will be implemented in co-operation with the provincial government and universities.

Over the past year, NRC has worked with the provincial government in Nova Scotia to look at specific research and technology development opportunities. The provincial government is now developing a science and technology strategy with the support of NRC. This strategy will be completed in several months at which time NRC will work with the provincial government, firms and universities to create specific innovation system support initiatives. In addition, NRC continues to work with the Atlantic Canada Opportunities Agency to identify innovation opportunities across the Atlantic region.

In the National Capital Region, NRC will proceed with implementing initiatives identified in the December 1995 Action Plan, developed with the Ottawa-Carleton Regional Economic Development Corporation and the Ottawa-Carleton Research Institute. NRC is also continuing its efforts to contribute to the supply of highly qualified personnel through initiatives such as O-Vitesse, a program to re-skill engineers and scientists as software engineers in the region.

IRAP and CISTI have long played crucial roles in NRC's strategies to enhance regional and community innovation. They have recently completed strategic planning exercises that will result in their enhanced ability to disseminate information and innovation assistance to firms and other members of Canada's innovation system. In Alberta, IRAP has led NRC's efforts to set up two "virtual innovation centres", one in Edmonton and one in Calgary.

Two Industry Partnership Facilities will be up and running in the next year, both designed to offer start-up companies, small- and medium-sized

enterprises (SMEs), and other research organizations opportunities to situate beside and work with NRC's researchers, as well as use its state-of-the-art equipment. One, in the National Capital Region, is closely linked to the information and telecommunications sector, while the other, in Montreal, is focused on biotechnology research.

Take a more entrepreneurial and innovative approach to managing its activities and transferring knowledge and technology.

NRC recognizes that to reach its full potential as an engine for technology-based growth it will have to become more entrepreneurial in its efforts to ensure that every opportunity is taken to spin-off its technologies and put its knowledge, expertise and facilities to work for the benefit of Canadians. NRC's priority is to instill a spirit of individual and institutional entrepreneurship throughout NRC.

Much of the groundwork of NRC's Entrepreneurship Program will be laid by the beginning of 1998-99. Already in place or under way are new awards and incentives that recognize successful work with industry; training programs on commercialization issues; industrial secondments; support for commercializing NRC technologies such as the NRC-Business Development Bank Strategic Alliance Agreement; and assistance for NRC staff who want to take NRC technologies to market themselves.

Future efforts will focus on broadening the reach of the Entrepreneurship Program to ensure that all NRC staff understand their role in commercializing technology and have the tools and training they need to achieve their goals. This in turn will play a major part in maximizing the commercial benefits of NRC's research.

Two other organization-wide initiatives will dominate NRC's efforts to introduce new and innovative management practices in the next few years. One is the implementation of a competency-based approach to managing its human resources, including hiring, career development, performance management training and development and succession planning.

The other is a project to modernize and integrate NRC's business and information management practices throughout the organization. This initiative is expected to streamline operations, increase reliability and reduce costs.

NRC Expected Results

To assess its performance in achieving the key goals outlined in its V*ision to 2001* and for the planning period covering 1998-99 to 2000-2001, NRC has identified a performance measurement framework that takes an integrated approach to measuring its achievements as an organization. This approach is

based on the four elements of its Vision statement with key measurement indicators identified for each one. ***Section III, Details by Business Line***, will show how each of NRC's business lines contributes to some or all of the Vision elements.

An important focus for NRC in 1998-99 is further refinement and implementation of its performance framework as the basis for planning, managing and reporting on performance. The framework, which was introduced in 1996, provides a common basis for demonstrating the purpose and benefits of the wide variety of NRC programs and activities and their contribution to achieving the NRC vision.

A number of initiatives are underway. A recently completed review of the fall NRC performance report and performance reports at the branch, program and institute levels gave insight into the extent to which NRC has adopted a performance management culture. Strong commitment by senior management to this work is providing clear direction and support to continued improvements in a number of areas. These include development and tools for improved performance measurement, and discussions on the implications of performance measurement to strategic and operational management.

B. Details by Program and Business Line

NRC is divided into three business lines which provide a balance between undertaking research and technology development, providing information, technical and financial assistance to industry and the public, and supporting the organization with corporate services.

1. Research and Technology Innovation

The Research and Technology Innovation business line includes NRC's research programs, technology development initiatives, management of national science and engineering facilities, along with its research and technology collaborations with firms, universities and public institutions.

This business line is a portfolio of programs, facilities and services in strategic technologies, targetted at key industries and areas of research which are all critical for Canada's ability to become an innovative society and economy. These are:

- *Biotechnologies:* Biotechnology is strategically important to key sectors of the economy, including health, agriculture, food, resources, and the environment. NRC's many strengths in biotechnology position it to serve and interact with major university partners and industrial sectors in the field.

- *Information and Telecommunications Technologies (ITT)*: The convergence of the multibillion dollar information and telecommunications sector with the global marketplace has created an environment where risks and rewards are great. NRC's ITT Group has brought together a broad range of complementary technical capabilities to help firms reduce the risks and costs of working on the next generation of communications and information technology hardware and software.

- *Manufacturing Technologies*: Globalization, trade agreements, and other external pressures present challenges and opportunities for this important sector that magnify the importance of new technologies. Indeed, national surveys suggest that the Canadian firms that use advanced manufacturing technologies account for most manufactured goods and outperform their sector in market share and labour productivity gains. With its expertise in advanced materials, software systems, intelligent production systems, industrial lasers, process technologies, sensors, and control systems in a number of its institutes, NRC constitutes one of Canada's largest collections of research activities focused on advanced manufacturing.

The Research and Technology Innovation business line also focuses on key industries which are critical to Canada's economy. They include:

- *Construction*: Construction is one of Canada's largest industries and a critical asset underpinning the international competitiveness of the country's economy. NRC is the national technology focus for cost-effective generic technology solutions, a vehicle for effective linkages to domestic and international research, technical standards and professional organizations, and a national coordinating mechanism for construction technology.

- *Aerospace*: As Canada's foremost aeronautical research establishment, NRC provides R&D support to the operations of the Canadian aerospace industry which faces exacting design, performance and safety requirements and an increasingly competitive global market. Competencies include: aerodynamics; structures, materials and propulsion; flight dynamics and flight systems integration.

- *Ocean Engineering and Marine Industries*: NRC, through its recognized competencies in the physical and numerical modeling of hydrodynamic processes, plays an important niche role in Canada's ocean engineering and research systems. It provides R&D support to various industrial sectors within the ocean industry: ocean resources, marine manufacturing and marine transportation.

Finally, NRC provides critical support to key areas of research and technology development which underpin Canada's innovation systems. These include NRC's responsibilities for research in national measurement standards and supporting Canada's national calibration system, as well as its role in managing national astronomical facilities. As a national S&T organization with a mandate for research, NRC knows the importance of long term strategic investments in leading edge research which is linked to Canada's technological and innovation needs. It recognizes that incremental innovation is often based on transformational research and research methods. While all elements of the business line support these efforts, NRC has established a program with specific responsibilities for integrating NRC's competencies in the area of molecular sciences.

Planned Spending

($ millions)	Forecast Spending [1] 1997-98	**Planned Spending 1998-99**	Planned Spending 1999-2000	Planned Spending 2000-01
Net Business Line Spending:				
Research and Technology Innovation	246.2	**250.1**	250.6	234.4

[1] Reflects the transfer of $2.6M for the technology centres from Research and Technology Innovation to Support for Innovation and the National Science and Technology Infrastructure.

Objective

To achieve sustained knowledge-based economic and social growth in Canada through research, technology and innovation in key areas.

External Factors Influencing the Business Line

In recent years, and as part of the development of NRC's Vision to 2001, the Research and Technology Innovation business line has undergone significant review and adjustment to align it with NRC's strategic directions. NRC's focus on being a leader in helping Canada develop a more innovative, knowledge-based economy has meant that strategic choices were required in NRC's research activities to ensure that it pursued only those areas where it could make a difference.

At the same time, NRC has developed a performance framework that shifts away from the traditional emphasis on measuring activities to measuring results and impacts. Against this backdrop, NRC has developed a program framework for its Research and Technology Innovation business line that recognizes that it must be dynamic, flexible, responsive and entrepreneurial with world-class scientific and technological competencies that link to other key players in the innovation system.

A key part of the framework is a focus on key technology domains and their impact on Canada's economy. A technology group structure provides a more integrated and flexible approach to supporting the multi-disciplinary and cross-sectoral nature of innovation in Canada. This portfolio structure has also provided NRC with the framework for refocussing its research programs and establishing new priorities.

Key Plans and Strategies

Excellence in areas of S&T knowledge critical to Canada

- Effective partnerships and alliances with important international research organizations is a key indicator of the excellence and relevance of NRC's work. NRC will continue to build on its recent efforts to strengthen its international strategy which has resulted in research cooperation in France, the Netherlands, Japan, Korea and Singapore. In the coming years, particular emphasis will be placed on proceeding with initiatives in Singapore and other nations that lead to cooperative research and technology development in collaboration with Canadian industrial partners to broaden their access to international markets.

- NRC has recently reintroduced peer review as a mechanism to assess the scientific quality and relevance of NRC research. Early experience with its

use at the Institute for Aerospace Research has shown peer review to be an effective mechanism, well received by managers and research staff. NRC will continue to utilize peer review results as an important performance indicator, with reviews scheduled for Herzberg Institute of Astrophysics and the Institute for National Measurement Standards in 1998-99, and with all NRC research institutes being reviewed over a five year period.

Client focused R&D to develop/exploit technology

- NRC will continue to pursue research collaborations with key industrial, university and government partners so that NRC's impact reaches into the key technological areas and across the most important industrial sectors of the Canadian economy. NRC's Technology Group structure is firmly entrenched as a basis for planning, and this approach will continue to underpin setting of priorities and long term strategic research directions.

  The objectives of NRC's Biotechnology Group are to: develop new knowledge through increased relevant and excellent scientific and technical output; generate new economic activity and increase the economic impact through technology; increase services and research collaboration with industry; and contribute to the development of highly qualified personnel that can respond to the new knowledge-based economy.

  NRC's ITT Group's focus is on filling critical deficiencies in the national system of innovation, and on working in a complementary way with other R&D organizations in Canada. The Group has set specific goals for itself in terms of outreach and influence, direct impact on industrial activity, and the establishment and maintenance of core competencies.

  NRC's Manufacturing Technologies Group has identified and will focus on three interrelated and interdependent technology innovation areas with the greatest potential for new wealth creation opportunities: design, modeling and simulation technologies; process and development technologies; and monitoring and control technologies.

- An important aspect of NRC's work is taking the initiative to bring together experts from industry, government and academia to undertake collaborative R&D to solve pressing economic problems through science and technology. Building on the success it has had with other consortia and special interest groups, NRC's Manufacturing Technologies Group will be working with six leading-edge plastics suppliers on pre-competitive research aimed at replacing chlorinated fluorocarbons as blowing agents to make foams, following up on award-winning research at the Industrial Materials Institute and the Institute for Chemical Process and Environmental Technology.

- In 1998-99, NRC will be in the fourth year of a $25 million, five-year agreement with NSERC to jointly support collaborative research that build strong three-way linkages between the private sector and researchers in NRC institutes and universities. Through the first three competitions of the NRC-NSERC Research Partnership Program, 42 projects have been approved for a total commitment of $15.5 million shared 50:50 by NRC and NSERC, mostly for three-year projects. NRC will continue to focus on projects that capitalize on complementary R&D relevant to NRC research priorities.

Leadership and support to the Canadian system of innovation

NRC's research institutes will continue to be a focal point for NRC's efforts to help develop Canada's system of innovation.

- NRC will continue to work with its partners, Western Economic Diversification and the Manitoba government, to establish an integrated Western Canadian medical technologies cluster around NRC's Institute for Biodiagnostics and the local infrastructure. The cluster will be based on next-generation medical, instrument and information technologies, in view of creating a new Canadian manufacturing technology base to support domestic and international health markets.

- Building on the results of a major innovation conference held in November 1997 in Saskatoon, NRC and the Government of Saskatchewan will release an action plan for innovation for the province in 1998. It is expected that the plan will lay the groundwork for ongoing, sustainable innovation related activities involving key members of the innovation community in Saskatchewan, including NRC's Plant Biotechnology Institute, IRAP and CISTI.

- Increasingly, NRC's world-class researchers are working directly with Canadian firms to help them improve their competitive positions through enhanced technical capabilities and marketability. Two major initiatives - Industry Partnership Facilities - will be up and running in the next year, both designed to offer start-up companies, SMEs, and other research organizations opportunities to situate beside and work with NRC's researchers, as well as use its state-of-the-art equipment. A 23,000 square foot facility in Ottawa will house firms specializing in information and telecommunications technology. Another, 35,000 square foot facility in Montreal will accommodate partners and firms specializing in biotechnology. Both of these research sectors are considered vital to the regional, provincial and Canadian economies. NRC's other program areas, IRAP and CISTI will support the initiatives and participating clients, as will NRC's Entrepreneurship Program.

- A key contribution NRC makes to Canada's innovation system is by adding to the supply of highly qualified personnel. One of the best examples in recent years of an innovative approach to this issue is O-Vitesse, a pilot program launched with the support of NRC's ITT Group and the Regional Innovation Forum for Ottawa-Carleton to re-skill engineers and scientists as software engineers. Based on the success of this initiative, NRC is looking into the use of this model for similar programs in other centres across the country.

- NRC's Institute for Research in Construction is moving forward on the transition to objective-based building codes – as opposed to prescriptive codes – a new approach that will provide the construction industry with easy-to-use, flexible requirements based on objectives such as health and safety, and will bolster innovation. A specific initiative under way is the development of a performance-based national technical guide for urban infrastructure to facilitate the evaluation, adoption and implementation of acceptable technologies. Using as a model the National Building Code, the guide will be driven by functional requirements and will provide decision making tools, leading to best practice results for the design, construction, maintenance and rehabilitation of urban infrastructure. The guide, which is being developed with the support of Canada Economic Development for Quebec Regions, provincial and municipal governments, is expected to be completed within five years.

Entrepreneurial initiatives to develop and transfer knowledge and technology

- NRC has made significant progress on its goal to spin off more of its promising technologies and promote the creation of start-up companies. In 1996-97 alone, NRC spun off four companies. Readying promising technologies to be spun off to the private sector will continue to be a high priority of the Research and Technology Innovation business line in the coming years.

- As part of NRC's efforts to further refine and implement its performance framework, the Research and Technology business line has begun a special project on improved performance measurement, management and reporting at the research institute level. This work, together with similar efforts in other areas, will contribute to improved measurement capability and utilization through NRC.

Expected Results

The expected results for the Research and Technology Innovation Business Line are summarized in the following table:

NRC Vision Element	Performance Indicator
Excellence in areas of S&T knowledge critical to Canada	• Peer recognition of excellence • Research advances and new research methods attributed to NRC • Influence, recognition in international S&T • Investment, use of scientific facilities
Client focused R&D to develop/exploit technology	• Economic growth and technological innovation by NRC clients and partners • Collaborations & partnerships with industry • Partner R&D investments • Quality services and support to firms
Leadership, support to Canadian system of innovation	• Identification and implementation of key linkages with government, industry • Use and impacts of codes and standards • Contributions to highly qualified personnel
Entrepreneurial initiatives to develop, transfer NRC knowledge and technology	• Technology incubators, patents, licences • Spin-offs and start-ups

2. Support for Innovation and the National Science and Technology Infrastructure

The Support for Innovation and the National Science and Technology Infrastructure Business Line includes the following:

Innovation Assistance to Firms – NRC, through the Industrial Research Assistance Program (IRAP), helps Canadian companies, primarily small- and medium-sized enterprises (SMEs), develop and exploit technologies by providing knowledge-based innovation assistance and access to relevant resources. This support, which encompasses technical advisory services as well as cost-risk shared innovation financing, is tailored to clients' needs, helping them meet the challenges of a changing and competitive economy.

A proven, long term government success story in alternative service delivery is IRAP's unique national network of Industrial Technology Advisors (ITAs) who deliver the program. Located in some 90 communities across Canada, ITAs work out of 140 technology related organizations, such as universities, colleges, provincial research organizations and specialized technology centres. Under contribution agreements with NRC, these organizations participate directly as IRAP Network Members to help deliver the program. These federal-provincial-private sector partnerships allow the program to achieve a greater reach and impact on Canadian SMEs.

IRAP also offers access for Canadian SME's to a comprehensive package of services through the Canadian Technology Network. CTN serves Canadian SMEs by providing easy access to the services of over 850 member organizations – services such as management, financial and marketing support.

The CTN provides enhanced opportunities for its network members to communicate and collaborate with each other and clients. It has allowed IRAP to better develop the breadth of its own network and to maintain mutually beneficial relations with its network of delivery partners. IRAP has primary responsibility for implementing the CTN in co-operation with Industry Canada.

Scientific and Technical Information - NRC is mandated to operate a national science library and to publish and sell scientific and technical information. The Canada Institute for Scientific and Technical Information (CISTI) plays an essential role in Canada's science and technology infrastructure as a world leader in disseminating scientific, technical and medical information as an integral component of Canada's innovative knowledge-based economy. CISTI, which operates a world-class document delivery service, is also Canada's largest publisher of scientific journals.

Technology Development and Transfer - NRC supports a limited number of technology centres in specific areas of the Canadian economy. These include

the Centre for Surface Transportation Technology (CSTT), the Canadian Hydraulics Centre (CHC), the Centre for Fluid Power Technology (CFPT), and the Thermal Technology Centre (TTC). These Centres make important contributions to Canada's science and technology infrastructure, although their contributions are in areas that are not fully aligned with NRC's new strategic directions. The Technology Centres are therefore pursuing business plans that would see them fully recover their operating costs over 3-5 years.

Planned Spending

($ millions)	Forecast Spending [1] 1997-98	**Planned Spending 1998-99**	Planned Spending 1999-2000	Planned Spending 2000-01
Net Business Line Spending:				
Support for Innovation and the National Science and Technology Infrastructure	128.4	**152.0**	146.5	146.4

1. Reflects the transfer of $2.6M for the technology centres from Research and Technology Innovation to Support for Innovation and the National Science and Technology Infrastructure.

Objective

To improve the innovative capability of Canadian firms through the provision of integrated and coordinated technological and financial assistance, information and access to other relevant resources.

To stimulate wealth creation for Canada through technological assistance, information and access to other relevant resources.

External Factors Influencing the Business Line

The federal Science and Technology Strategy recognizes that a stronger national innovation system must be established to enhance Canadians' abilities to gain and share knowledge and information. This recognition is based on the understanding that science and technology are critical to the health and well being of Canadians, and the country's ability to create sustainable employment and economic growth.

The S&T Strategy also specifically identifies small- and medium-sized enterprises as a key focus. SMEs are generally considered the most dynamic segment of the Canadian economy and the most significant net creator of new jobs. They are no longer just small suppliers to large firms. Increasingly, they are competing on their own in global markets, drawing from an expanding knowledge base.

SMEs are also increasingly recognizing the need to innovate to compete. One of their potential advantages over larger firms is a nimbleness and ability to respond more quickly to new market opportunities. Technological innovation requires information, resources and capabilities that many SMEs lack. As SMEs are a major client base of this business line, this represents an opportunity for IRAP and CTN to help stimulate and facilitate innovation in these firms to make them more competitive.

At the same time, the information environment in general is changing rapidly and profoundly. The past decade has seen the proliferation of new information technologies, a multitude of information channels, and the use of multimedia techniques. Increasingly, firms and governments depend on information to make effective and timely decisions. Consequently, the atmosphere that information providers such as CISTI must contend with has become more globally competitive, dynamic and challenging.

Key Plans and Strategies

Client focused R&D to develop/exploit technology
Leadership, support to Canadian system of innovation
Entrepreneurial initiatives to develop, transfer NRC knowledge and technology

Innovation Assistance to Firms

IRAP's Strategic Plan (1996-2001) reinforces its commitment to improving the innovation capability of Canadian SMEs through technology. In the coming years, IRAP will clearly focus on innovation in SMEs. IRAP expects to enhance service to its clients by providing more holistic innovation assistance to SMEs, including better linking clients to other business services that are well provided for by other agencies and the private sector. IRAP also plans to be better able to help government laboratories, universities, research institutions and NRC's own institutes to transfer technologies to SMEs.

IRAP's Strategic Plan - 16 Strategies

In the planning period ending in 2000-2001, IRAP will:

- focus on innovation-oriented SMEs
- foster a holistic approach to innovation
- operate a national network of qualified, knowledgeable and experienced ITAs
- provide clients with access to relevant and up-to-date information and technology and maintain effective linkages to do so
- share in the risk of technology development
- promote the use and development of technical personnel as agents of technical change in the firm
- bring awareness of the capabilities of other players in the Canadian innovation system to SMEs
- foster continuous self-assessment and technology benchmarking in SMEs and provide related services to clients
- promote partnerships
- align IRAP's internal management and support systems with its strategic and operational objectives and provide adequate support, recognition and development for IRAP staff
- foster strategic technology planning in clients
- provide a technology awareness function for IRAP clients
- promote the engagement of young technical personnel by SMEs
- bring IRAP's knowledge of SME innovation needs to other players in the Canadian innovation system
- exploit the potential of electronic media and tools for the maximum benefit of IRAP clients, and
- organize seminars, fora and other innovation training opportunities for SMEs.

IRAP will continue to deliver CTN in accordance with its original mandate, namely to provide networking support, co-ordination and communication infrastructure to organizations delivering innovation-related information and services to SMEs in Canada.

For the planning period ending in 2000-2001, CTN has identified the following operational objectives:

- to foster an environment where all the member organizations come together to help SMEs through the sharing of information and collaboration in the delivery of services;

- to recruit as members of the CTN, the appropriate organizations to meet identified needs of SMEs and engender their collective ownership through member participation in the operation of the network; and

- to effectively manage all internal and external communications.

Achievement of CTN Objectives

The CTN will:

- foster an integrated approach to client service by assisting member organizations to develop and enhance their capability to work together;
- define SME needs and fill service gaps in membership. Member organizations will also be asked to assist in the setting of quality standards and encouraged to deliver services to these standards;
- provide networking opportunities to ensure that CTN members have comprehensive awareness of innovation services available to SMEs;
- exploit the potential of electronic media and tools for the maximum benefit of CTN members and clients including, to the extent financially possible, access to an electronic communication infrastructure for CTN members and their client base;
- maintain and share client contact and service information;
- promote membership services and raise awareness of activities;
- assure effective client feedback; and
- develop and improve access to international S&T resources.

Scientific and Technical Information

In the planning period ending in 2000 – 2001, CISTI will increase business in publishing and document delivery services which will be largely self-funded by increased revenues by the end of the period. CISTI's major strategic directions in the planning period include:

- Positioning its collection as a national resource. The CISTI scientific, technical and medical information (STM) resource is unique in Canada and among the finest in the world. CISTI will retain its position through ongoing investment that counters the annual 10% escalation in costs of STM information and by the strategic addition of new sources as STM evolves.

- Collaborating with NRC institutes and branches to contribute to Canada's innovation system. For NRC's community-based initiatives, CISTI's existing NRC Information Centres across the country are natural service points for regional information delivery and local outreach.

- Exploiting the growing document delivery market. CISTI's revenue from document delivery services is expanding rapidly with the U.S. market growing at the fastest rate. The revenue from international markets is expected to result in an improving revenue/cost ratio and will contribute necessary investment funds to enhance service to Canadians.

- Leading the technology revolution in scientific publishing. To ensure that NRC Research Press is a leader in the new world of electronic scientific publishing, CISTI will continue to invest in electronic publishing technologies and expertise.

- Developing a world-competitive information infrastructure. NRC has provided desktop access to the collection and other resources for its staff through the "virtual library" which is available across NRC through the NRC Intranet. CISTI is expanding and refining the system, and exploiting the potential savings and added functionality.

CISTI – Specific Initiatives – Planning Period to 2001

Initiatives that will receive particular attention include:

Collaboration with Carleton University - CISTI is currently negotiating with Carleton University to develop a new service agreement that will provide Carleton faculty and graduate students with enhanced access to CISTI's on-site services and document delivery. The objective is to provide Carleton researchers with an alternative source of scientific, medical, technical, and related information, thereby allowing the University to achieve financial savings by reducing their serial collection substantially. The planning period is expected to take a year, with implementation targeted for September 1998.

Role in the Canadian health information system - CISTI, through the Advisory Board for CISTI Subcommittee on Health Sciences Information, has recognized the importance of participating in the development of a health information system for Canada. Through collaboration with Health Canada and the various health library groups, including the Association of Canadian Medical Colleges, the Canadian Hospital Library Association, Association pour l'avancement des sciences et des techniques de la documentation - section santé, and the Medical Research Council, CISTI is playing a role in coordinating the participation of health libraries in a Canadian health information system.

NRC Information Centres - CISTI is extending its support to the Canadian innovation system through the development of NRC Information Centres (NICs) at NRC Innovation Centres across the country. These NICs will provide information services to local SMEs in collaboration with the IRAP network.

BiblioNet - CISTI is developing a new, Web-based product that provides a one-stop source for end users to worldwide information on telecommunications and information technology. Access to databases, standards, publications, industry news, Internet sites, and more is readily available, as well as services for online searching and current awareness. This is a new product for CISTI which has strong market potential.

Technology Centres

NRC's Technology Centres have substantial potential for full cost recovery or are suitable for alternative program delivery methods. The Centre for Fluid Power Technology will be spun off in 1998. As each of the other Centres evolves, NRC intends to review various operating alternatives, including possible transfer to the private sector, if appropriate.

Expected Results

The expected results for the Support for Innovation and the National Science and Technology Infrastructure Business Line for the planning period 1998-99 to 2000-2001 are summarized in the following table:

NRC Vision Element	Performance Indicator
Client focused R&D to develop/exploit technology	• Impacts of IRAP assistance to firms • Partner R&D investments • Technical, commercial success of partners • Quality services and support to firms
Leadership, support to Canadian system of innovation	• Identification and implementation of key linkages with government, industry • Influence of IRAP/CISTI networks • NRC influence on industry/government innovation strategies, policies • Contributions to highly qualified personnel
Entrepreneurial initiatives to develop, transfer NRC knowledge and technology	• Introduction of improved management tools, systems

3. Program Management

The Program Management business line provides a range of management and administrative services designed to support NRC's performance as a dynamic, entrepreneurial organization that maximizes opportunities to transfer knowledge and technology. This range of services includes executive support, which encompasses policy, program and support for the co-ordination and direction of NRC's operations and its governing Council.

It also comprises program administration activities, which reinforce the effective and efficient management of NRC's resources through its specialization in finance and information management; human resources services; administrative services and property management; and corporate services.

Planned Spending

($ millions)	Forecast Spending 1997-98	**Planned Spending 1998-99**	Planned Spending 1999-2000	Planned Spending 2000-01
Net Business Line Spending:				
Program Management	69.7	**54.1**	54.3	54.3

Objective

To provide efficient, client-focused services which enhance NRC's effectiveness as an integrated, dynamic science and technology organization.

External Factors Influencing the Business Line

NRC must accept the challenges of a knowledge-based economy as Canada moves into the 21st century. NRC's *Vision to 2001* calls on the organization to redouble its efforts to become more efficient and businesslike, with the aim of introducing innovative and entrepreneurial practices and policies where they can be beneficial to the organization. This is critical to ensure that NRC's major business lines, Research and Technology Innovation and Support for Innovation and the National Science and Technology Infrastructure, are effectively supported in their efforts to pursue more innovative approaches to carrying out their programs and services.

Key Plans and Strategies

Excellence in Areas of S&T Knowledge Critical to Canada

- Through a number of formal and informal mechanisms, corporate management will identify major opportunities for investments in S&T areas critical to Canada. One such mechanism is NRC's Major Initiatives Committee which makes strategic contributions for the purchase of capital equipment in selected areas of research and determines priorities for the construction or upgrading of facilities to meet research needs or safety standards. Technology forecasting and other strategic studies are used to identify key areas in consultation with research partners and clients.

Leadership, Support to Canadian System of Innovation

- NRC will continue to chair the S&T Management Committee for the Industry Portfolio (S&T MCIP) contributing a leadership and catalyst role, building synergy and strength, and a sense of identity within the Industry Portfolio on S&T issues, moving forward on the integrated approach to Canadian innovation defined in the Industry Portfolio S&T Action Plan (March 1996).

  The S&T MCIP activities include co-ordination and consultation on horizontal issues in science and technology affecting the Industry Portfolio. The S&T MCIP serves as a forum to develop views on and approaches to major S&T policy and program initiatives, and serves as a clearing house for information on new research, best practices and policy development. The S&T MCIP also has responsibility for assisting in identifying and carrying out initiatives respecting the Industry Portfolio Strategic Plan and Workplan, as directed by the Portfolio Heads. In this regard, NRC will lead Portfolio thinking on building local capabilities for innovation and the work of the Portfolio Evaluation and Performance Subcommittee. NRC will also contribute to the Portfolio's efforts in S&T and youth.

- NRC will continue to expand local community innovation initiatives in the next few years. Through its long-standing presence in communities across the country, NRC is strongly positioned to play an integral role in bringing local innovation systems together into a national system of innovation. These strategies are developed in co-operation with community innovation leaders, and are based on a clear and shared understanding of each community's technology needs, and an appreciation of how NRC's competencies might add value and fit into the local innovation system.

  To date, local innovation initiatives are in various phases of development in seven provinces. In the next three years, each community initiative will be assessed as to the achievement of goals and the impact of the strategy. Community feedback will be provided by local advisory groups of key

individuals and organizations from firms, governments, universities and financial and public institutions. Annual reports will be prepared for each NRC community innovation action plan. Other community action plans will be scheduled for review as they are implemented and move into the operational phase.

- The Regional Innovation Systems Network (RISN), a joint initiative of SSHRC, NSERC, and NRC, will focus on regional innovation through the creation of a national network, made up of five regional networks, to create linkages among one hundred or so university researchers and their partners, give researchers the forum to share ideas and research results, and provide effective interaction between the community and Industry Portfolio policy makers.

  The three agencies will jointly provide $200,000 a year for three years to fund networking activities. This project is one of the 49 initiatives described in *Science and Technology for the New Century*, the Industry Portfolio S&T Action Plan (March 1996).

- NRC will continue to provide value-added services in the area of intellectual property management to other government organizations on a cost recovery basis.

Entrepreneurial initiatives to develop, transfer NRC knowledge and technology

- Over the planning period, NRC will continue to be responsible for developing and implementing entrepreneurial policies and practices aimed at encouraging more spin-offs based on NRC-developed technologies. It will also continue to take a businesslike and entrepreneurial approach to its overall activities by continually streamlining internal practices and identifying innovative administrative approaches that result in NRC's increased operating efficiency and effectiveness.

- Much of the groundwork of the Entrepreneurship Program will have been laid by the beginning of 1998-99. New awards and incentives that recognize successful work with industry, such as the new Industrial Partnership Award, have been introduced. New training programs on commercialization issues have been presented. Industrial secondments and internal NRC assignments are underway. Support for commercializing NRC technologies, such as the new NRC-Business Development Bank Strategic Alliance Agreement, is in place. Help for NRC staff who want to take NRC technologies to market themselves, such as through the Entrepreneurship Leave Program, is available.

- NRC is developing a competency approach to human resources management, a system of managing and developing an organization's human resources based on a set of defined employee competencies. This approach is used in areas such as hiring, career development, performance management training and development, and succession planning. The competency framework will provide NRC with the human resource management systems it needs to continue to be a leading-edge organization in a century in which NRC's most valued assets will be human and intellectual resources.

  NRC will also commence the process of developing and implementing a gender-free classification system pursuant to the requirement of the Canadian Human Rights Act. During FY 1996/97, NRC worked to develop a system applicable to its computer systems officers, information officers, and librarians, which received Canadian Human Rights Commission approval. The larger system, to be capable of classifying all types of NRC jobs, will be developed taking into account the content of this system and the draft Public Service Universal Classification System.

  Both of the above major initiatives are scheduled for completion by the Year 2000.

- NRC is implementing the SAP software solution as a replacement for the majority of its business systems. This project will modernize and integrate business and information management practices throughout the organization. The system will streamline NRC's operations, reduce costs and deliver more timely, reliable information. The new system is designed to deliver high-quality information vital to good operational and strategic decisions.

  Modules for finance, project management, fixed assets management, human resources, and sales and distribution will be put in place at different stages, up to April 1999. As part of this process, NRC is presently negotiating the terms and conditions with the contractors to outsource the technical operations of the SAP applications along with some minor legacy systems.

- In 1997, the Administrative Services and Property Management Branch of NRC, in consultation with the City of Ottawa, the National Capital Commission (NCC), the City of Gloucester, and the Regional Municipal of Ottawa Carleton (RMOC), prepared a preliminary plan for the development of NRC's Montreal Road research complex, an area spanning some 400 acres. A proposed development plan, which has been prepared, provides guiding principles for future development and an implementation strategy to ensure that NRC optimizes the use of its real property.

Expected Results

The expected results for the Program Management business line for the planning period 1998-99 to 2000-2001 are summarized in the following table.

NRC Vision Element	Performance Indicator
Excellence in areas of S&T knowledge critical to Canada	• Identification and investment in S&T areas critical to Canadian needs
Leadership, support to Canadian system of innovation	• Identification and implementation of key linkages with government, industry • Progress of regional initiatives • NRC influence on industry/government innovation strategies, policies
Entrepreneurial initiatives to develop, transfer NRC knowledge and technology	• Introduction of improved management tools, systems • Introduction of entrepreneurial policies, practices

SECTION IV: SUPPLEMENTARY INFORMATION

Table 1: Spending Authorities – Ministry Summary Part II of the Estimates

Personnel Information

Table 2: Organization Structure and Responsibility for Planned Spending by Business Line for 1998-99
Table 2.1: Planned Full Time Equivalents (FTEs) by Business Line
Table 2.2: Details of FTE Requirements

Capital Projects Information

Table 3.1: Capital Spending by Business Line
Table 3.2: Capital Projects by Business Line

Additional Financial Information

Table 4: Agency Summary of Standard Objects of Expenditure
Table 5: Program Resources by Business Line for the Estimates Year
Table 6: Details of Transfer Payments by Business Line
Table 7: Details of Revenue by Business Line
Table 8: Net Cost of Program for 1998-99

Other Information

Table 9: Acts Administered in Whole or in Part by the National Research Council
Table 10: References

Industry

Table 1: Spending Authorities - Ministry Summary Part II of the Estimates

Vote	($ millions)	**1998-99 Main Estimates**	1997-98 Main Estimates
	National Research Council of Canada		
70	Operating expenditures	**219.9**	224.5
75	Capital expenditures	**34.8**	44.8
80	Grants and contributions	**136.4**	127.7
(S)	Spending of revenues pursuant to 5.1(e) of the *National Research Council Act*	**50.0**	40.1
(S)	Contributions to employee benefit plans	**31.0**	25.3
	Total Agency	**472.1**	462.4

Personnel Information

Table 2: Organization Structure and Responsibility for Planned Spending by Business Line for 1998-99

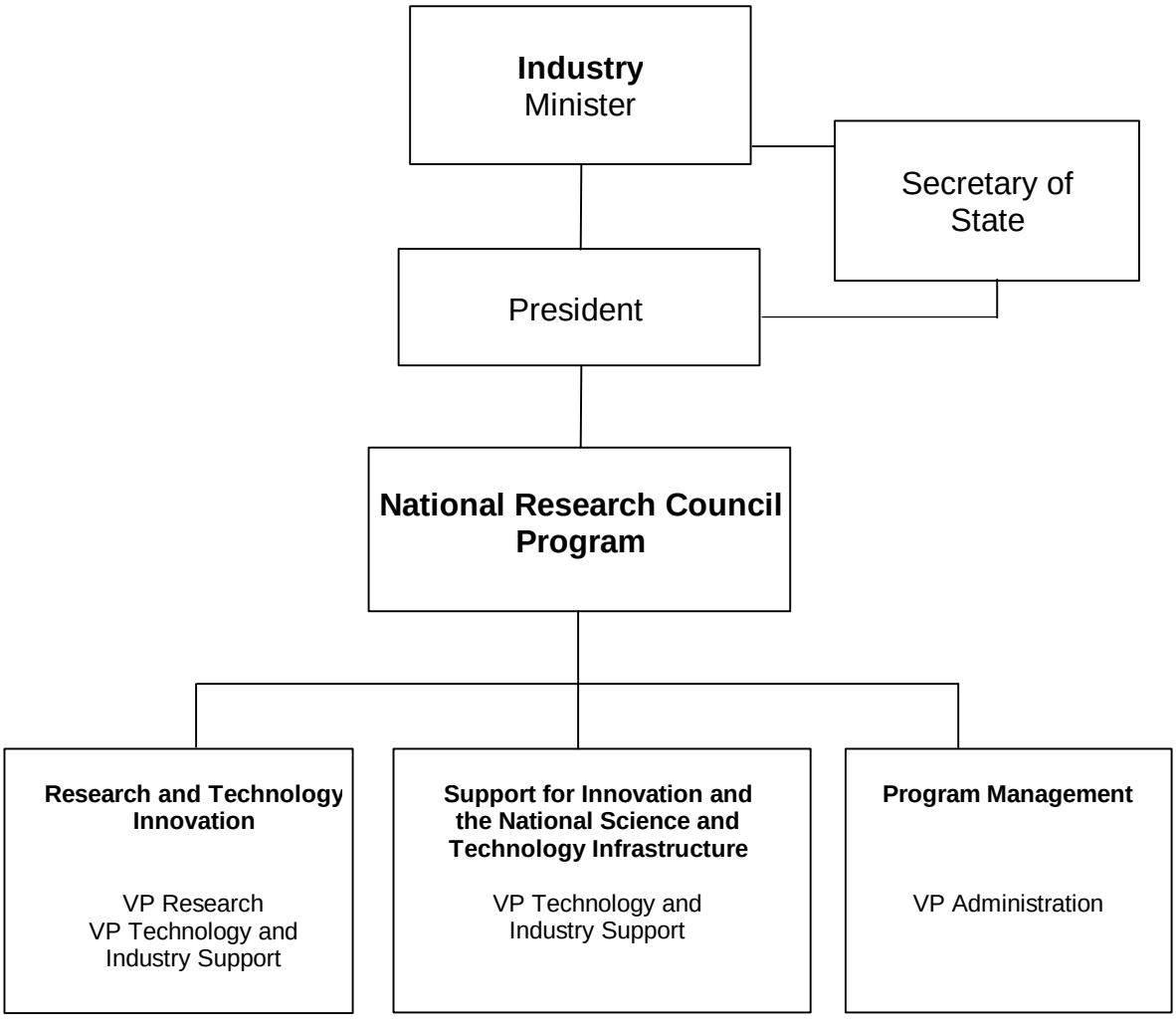

Table 2: Responsibility for Planned Spending by Business Line for 1998-99

($ millions)	Business Lines			**Total**
	Research and Technology Innovation [1 & 2]	Support for Innovation and the National Science and Technology Infrastructure [2]	Program Management [3]	
Organization				
Research Institutes	274.2			**274.2**
Industrial Research Assistance Program		136.0		**136.0**
Scientific and Technical Information		31.9		**31.9**
Technology Centres		8.7		**8.7**
Corporate Branches			46.0	**46.0**
Executive Offices			9.2	**9.2**
Total	**274.2**	**176.6**	**55.2**	**506.1**

[1] VP Research
[2] VP Technology and Industry Support
[3] VP Administration

Note: Due to rounding, figures may not add to total shown

Table 2.1: Planned Full Time Equivalents (FTEs) by Business Line

	Forecast 1997-98	**Planned 1998-99**	Planned 1999-00	Planned 2000-01
Business Lines/Activities				
Research and Technology Innovation	2,005	**2,002**	2,028	2,028
Support for Innovation and the National Science and Technology Infrastructure	451	**387**	392	392
Program Management	554	**543**	549	549
Total	3,010	**2,932**	2,969	2,969

Table 2.2: Details of FTE Requirements

	Forecast 1997-98	**Planned 1998-99**	Planned 1999-00	Planned 2000-01
Salary Ranges				
<30,000	645	**629**	637	637
30,000 - 40,000	575	**561**	568	568
40,000 - 50,000	551	**537**	544	544
50,000 - 60,000	487	**474**	480	480
60,000 - 70,000	333	**324**	328	328
70,000 - 80,000	287	**279**	283	283
>80,000	132	**128**	129	129
Total	3,010	**2,932**	2,969	2,969

Capital Projects Information

Table 3.1: Capital Spending by Business Line

($ millions)	Forecast Spending 1997-98 [1]	**Planned Spending 1998-99** [1]	Planned Spending 1999-00	Planned Spending 2000-01
Research and Technology Innovation	40.5	**29.4**	29.4	29.4
Support for Innovation and the National Science and Technology Infrastructure	1.6	**0.0**	0.0	0.0
Program Management	12.2	**9.7**	5.4	5.4
Total	54.3	**39.1**	34.8	34.8

[1] Includes capital expenditures under "Spending of Revenue pursuant to the NRC Act"

Table 3.2: Capital Projects by Business Line

($ millions)	Currently Estimated Total Cost	Forecast Spending to March 31, 1998	**Planned Spending 1998-99**	Planned Spending 1999-00	Planned Spending 2000-01	Future Years' Requirements
Research and Technology Innovation						
Advanced Systems Research Aircraft (S-EPA)	7.2	7.2				
Spin Pit Testing of Turbine Engine Components (DA)	1.2	1.2				
Functionally Graded Materials for Aeroframe and Aero-Gas Turbine Engines (DA)	1.1	1.1				
Stereolithography Apparatus (DA)	0.9	0.9				
CNC Router (DA)	0.7	0.7				
Gene Discovery Facility (DA)	1.3	1.3				
Marine Dynamic Test Facility (S - EPA)	2.8	2.8				
Intraoperative MRI (DA)	1.1	1.1				
Dry Etching System (DA)	0.5	0.5				
Canadian Netshape Forming Innovation Centre (DA)	1.9	1.9				
Advanced Thermoforming Technology (DA)	0.5	0.5				
High Resolution NMR Facility (DA)			**1.2**			
Current Generator Project (DA)	0.7	0.7				
Glow Discharge Mass Spectrometer (DA)	1.2	1.2				
Montreal Centre of Excellence for Site Rehabilitation (DA)	1.4	0.7	**0.5**	0.2		
Housing Innovation Facility (DA)	0.8	0.2	**0.6**			
Industry Partnership Facility (S - EPA)	6.4	3.7	**2.7**			
Biotechnology Research Institute Small Laboratory Extension (DA)	1.0	1.0				
Upgrade to Institute of Biological Sciences - Sussex Drive Laboratories (DA)	1.1	0.5	**0.6**			
Steacie Institute for Molecular Sciences - Chemical Biology Laboratory (DA)	1.7	1.3	**0.4**			
Link from the Biotechnology Research Institute to the Industry Partnership Facility (S - EPA) [1]	7.8	3.5	**4.3**			
Support for Innovation and the National Science and Technology Infrastructure						
Electronic CISTI (DA)	1.8	0.6	**0.7**	0.5		
Program Management						
Renovate M-27, Exterior and Interior (DA)	0.7	0.7				
Renovate M-13, Exterior and Interior (DA)	1.0	1.0				
Integrated Enterprise Business System (S - EPA)	19.0	9.5	**9.5**			
Sprinkler System in Building U-61(DA)	0.6	0.4	**0.2**			

[1] Includes $2.7M from Canada Economic Development for Quebec Regions

Class of Estimates

Substantive Estimate (S) – This estimate is one of sufficiently high quality and reliability so as to warrant Treasury Board approval as a cost objective for the project phase under consideration. It is based on detailed system and component design and takes into account all project objectives and deliverables. It replaces the classes of estimates formerly referred to as Class A or B.

Indicative Estimate (I) – This is a low quality order of magnitude estimate that is not sufficiently accurate to warrant Treasury Board approval as a cost objective. It replaces the classes of estimates formerly referred to as C or D.

Preliminary Project Approval (PPA) – This defines Treasury Board's authority to initiate a project in terms of its intended operational requirement, including approval of, and expenditure authorization for, the objectives of the project definition phase. Sponsoring departments are to submit for PPA when the project's complete scope has been examined and costed, normally to the indicative level, and when the cost of the project definition phase has been estimated to the substantive level.

Effective Project Approval (EPA) – Treasury Board's approval of, and expenditure authorization for, the objectives of the project implementation phase. Sponsoring departments are to submit for EPA only when the scope of the overall project has been defined and when the estimates have been refined to the substantive level.

Delegated Authority (DA) – Projects for which Treasury Board has delegated authority to the Department.

Additional Financial Information

Table 4: Agency Summary of Standard Objects of Expenditure

($ millions)	Planned Spending 1997-98	**Planned Spending 1998-99**	Planned Spending 1999-00	Planned Spending 2000-01
Personnel				
Salaries and wages	148.6	**147.4**	148.4	148.4
Contributions to employee benefit plan	25.3	**31.0**	31.2	31.2
	173.8	**178.3**	179.6	179.6
Goods and services				
Transportation and Communications	14.7	**11.8**	11.8	11.6
Information	1.9	**1.5**	1.4	1.4
Other Professional and special services	18.6	**14.2**	14.2	13.9
Rentals	4.2	**3.7**	3.7	3.6
Repair and upkeep	13.4	**9.7**	9.7	9.5
Utilities, Materials and Supplies	27.5	**23.1**	23.0	22.6
Other subsidies and payments	8.5	**6.6**	6.6	6.5
Construction and acquisition of machinery and equipment	2.1	**2.1**	2.1	2.1
Total operating	90.7	**72.6**	72.4	71.2
Capital	47.1	**34.8**	34.8	34.8
Transfer Payments **- Voted**	132.8	**170.4**	164.6	149.5
Gross budgetary expenditures	444.3	**456.1**	451.4	435.1
Add:				
Spending of revenues pursuant to the NRC Act	46.8	**50.0**	53.7	59.3
Total budgetary expenditure	491.1	**506.1**	505.1	494.4

Note: Due to rounding, figures may not add to total shown

Table 5: Program Resources by Business Line for the Estimates Year

($ millions)

	Budgetary								
	FTE	Operating	Capital	Grants and Contributions	Gross Voted	Statutory Items *	Gross Planned Spending	Less: Revenue Credited to the Vote	Net Planned Spending
Research and Technology Innovation	2,002	180.0	29.4	40.6	250.1	24.2	274.2	0.0	274.2
Support for Innovation and the National Science and Technology Infrastructure	387	27.4	0.0	124.6	152.0	24.6	176.6	0.0	176.6
Program Management	543	43.5	5.4	5.2	54.1	1.1	55.2	0.0	55.2
Total	**2,932**	**250.9**	**34.8**	**170.4**	**456.1**	**50.0**	**506.1**	**0.0**	**506.1**

* Does not include contributions to employee benefit plans which are allocated in the operating expenditures.

Note: Due to rounding, figures may not add to total shown

Table 6: Details of Transfer Payments by Business Line

($ dollars)	Forecast Spending 1997-98	**Planned Spending 1998-99**	Planned Spending 1999-00	Planned Spending 2000-01
Grants				
Program Management				
International Affiliations	956,000	**956,000**	956,000	956,000
Grants to municipalities in accordance with the Municipal Grants Act	4,240,000	**4,240,000**	4,240,000	4,240,000
Total Grants	5,196,000	**5,196,000**	5,196,000	5,196,000
Contributions				
Research and Technology Innovation				
Contributions to extramural performers under the Biotechnology Research Program	15,000	**15,000**	15,000	15,000
Particle Physics and Astronomy Research Council of the United Kingdom in support of the James Clerk Maxwell Telescope	1,138,000	**1,151,000**	1,020,000	1,020,000
Canada's share of the costs of the Canada-France-Hawaii Telescope Corporation	3,253,000	**3,253,000**	3,253,000	3,253,000
Universities of Alberta, British Columbia, Simon Fraser and Victoria in support of the TRIUMF Project	32,954,000	**35,000,000**	34,318,000	19,277,000
National Science Foundation of the United States in support of the Gemini Telescopes	1,200,000	**1,200,000**	1,200,000	1,200,000
Support for Innovation and the National Science and Technology Infrastructure				
Contributions to Canadian firms to develop, adapt and exploit technology (IRAP) [1]	69,109,000	**108,608,000**	103,567,000	103,567,000
Contributions to organizations to provide technological and research assistance to Canadian industry (IRAP) [1]	19,885,000	**16,000,000**	16,000,000	16,000,000
Total Contributions	127,554,000	**165,227,000**	159,373,000	144,332,000
Total Grants and Contributions	132,750,000	**170,423,000**	164,569,000	149,528,000

[1] Industrial Research Assistance Program

Table 7: Details of Revenue by Business Line

Spending of revenues pursuant to 5.1(e) of the *National Research Council Act* ($ millions)	Forecast Revenue 1997-98	**Planned Revenue 1998-99**	Planned Revenue 1999-00	Planned Revenue 2000-01
Research and Technology Innovation				
Fee for Service	10.7	**12.1**	12.9	14.1
Rentals	0.6	**0.4**	0.4	0.4
Royalties	1.6	**2.6**	4.6	6.6
Contracting In	8.9	**4.8**	3.8	3.8
Publications	5.1	**4.0**	2.7	2.8
Other	0.7	**0.3**	0.2	0.2
Support for Innovation and the National Science and Technology Infrastructure				
Fee for Service	9.2	**12.1**	13.4	14.2
Contracting In		**2.7**	3.0	3.2
Publications	6.0	**9.8**	10.9	12.3
Other				
Program Management				
Fee for Service	0.7	**0.4**	0.4	0.4
Rentals	0.4	**0.2**	0.2	0.2
Publications				
Other	2.9	**0.5**	1.1	1.1
Total	46.8	**50.0**	53.7	59.3

Note: Due to rounding, figures may not add to total shown

Table 8: Net Cost of Program for 1998-99

($ millions)	**Total**
Gross Planned Spending	**506.1**
Plus:	
Services Received without Charge	
Employer's share of health and unemployment insurance premiums paid by Treasury Board	**9.7**
Employee compensation under Workers Compensation Acts paid by Human Resources Development Canada	**0.4**
Accomodation - PWGSC	**0.1**
Cost of Legal services provided by the Department of Justice Canada	**0.1**
	10.3
Total Cost of Program	**516.4**
Less:	
Spending of revenues pursuant to the NRC Act	**50.0**
1998-99 Net Cost of Program	**466.4**
1997-98 Estimated Net Cost of Program	**453.6**

Other Information

Table 9: Acts Administered in Whole or in Part by the National Research Council

The National Research Council is responsible for administering the *National Research Council Act*. The latest revision to the NRC Act is R.S.C. 1985, c. N-15 (never amended).

NRC has responsibility for calibration and certification of standards of measurement under the *Weights and Measures Act*, and also provides technical support to the Canadian Commission on Building and Fire Codes.

The *Atomic Energy Control Act* makes provision for the Atomic Energy Control Board to establish a granting program through NRC, but this possibility is not currently a practice.

Table 10: References

NRC Annual Report 1996 – 1997

NRC Performance Report 1996 – 1997