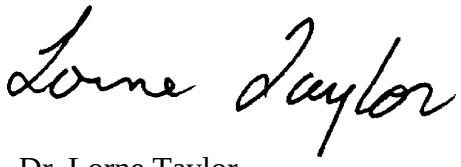
Science, Research and Information Technology

Business Plan 1997-1998 to 1999-2000

Accountability Statement

This Business Plan for the three years commencing April 1, 1997 was prepared under my direction in accordance with the Government Accountability Act and the government's accounting policies. All of the government's policy decisions as at April 10, 1997 with material economic or fiscal implications of which I am aware have been considered in preparing the Business Plan.

The Ministry's priorities outlined in the Business Plan were developed in the context of the government's business and fiscal plans. I am committed to achieving the planned results laid out in this Business Plan.



Dr. Lorne Taylor
Minister Responsible for Science, Research
and Information Technology
April 12, 1997

Vision

The vision of the Ministry Responsible for Science, Research and Information Technology is that "science, research and information technology will contribute to prosperity and quality of life for Albertans".

Introduction

The Science and Research Innovation System includes not only research and development (R&D), but also all components of the dissemination, commercialization, and application of knowledge and technology and consists of three major sub-systems:

1. **Research and Development** - institutions and individuals engaged in R&D that results in creation of new knowledge. The R&D activities of the sub-system occur primarily in universities. Other participants in the sub-system include individual inventors, R&D groups in corporations, and R&D institutes.
2. **Technology Linking** - institutional mechanisms that actively transition ideas, technology and people from the Research Sub-system to the Commercialization/Application sub-system (i.e., Alberta Research Council, TR Labs).
3. **Commercialization/Application** - converts ideas and technologies into outputs of marketable technology-based products and services, thus creating socio-economic benefits for Alberta.

Although government and the universities are major players in the Science and Research Innovation System, especially in the initial stages, the largest role is played by the many companies and organizations in the private sector that convert technology into products and services that produce socio-economic benefits for Albertans.

Science, research and information technology are critical in achieving many of the goals in all three of the Government's core businesses, *people*, *prosperity*, and *preservation*. The primary contribution of science and research is to the government's goals of "Alberta will have a prosperous economy", and "Our businesses will capitalize on research".

The Ministry for Science, Research and Information Technology is composed of two separate agencies, the Alberta Science and Research Authority (ASRA) and the Alberta Research Council (ARC).

ASRA advises the Minister Responsible for Science, Research and Information Technology on policy and priorities to enhance the effective utilization of the Government's investment in science and research. ASRA, whose responsibilities were defined by the Science and Research Authority Act (1995), acts as an advisor and influencer to stimulate science and research and encourage a strong economy. ASRA is composed of a Board of Management of as many as 20 members and is supported by a small secretariat. The Chairman of the Board reports directly to the Minister Responsible for Science, Research and Information Technology.

ARC undertakes technology development and commercialization in co-operation with the private sector. The ARC, which employs approximately 500 staff (following the merger of the Alberta Environmental Centre), was created in 1921 and is established under the authority of the Alberta

Research Council Act. It is composed of a Board of Directors of as many as 15 members. The ARC is managed by a Managing Director and CEO who reports to the Board of Directors. The Chairman of the Board of Directors reports to the Minister Responsible for Science, Research and Information Technology.

Alberta Science and Research Authority - 1997-2000 Business Plan

Mission

The mission of ASRA is to enhance the contribution of science and research to the sustainable prosperity and quality of life of all Albertans.

Core Businesses

The Alberta Science and Research Authority (ASRA) is an independent Board of members of the business and research communities in Alberta, appointed by Cabinet, who promote the accomplishment of the mission for science and research through two core businesses.

- Develop and promote informed and practical recommendations to the Government related to science and research policies and priorities, provincial government investments in science and research, and science and research infrastructure;

- Facilitate the identification, development, and implementation of strategic, high-value, science and research initiatives;

Goals

The over-arching goal for the Alberta Science and Research Authority is to increase the value of the socio-economic benefits to Albertans from science and research investments in Alberta.

ASRA achieves this over-arching goal by:

- maximizing the direct contribution of science and technology to diverse social, economic, and environmental goals,
- encouraging an adequate level of investment in science to support future prosperity, and
- fostering the acceptance by Albertans of science and technology as critical to future prosperity.

ASRA plays its role very much in concert with the Government philosophy of “steering”, rather than “rowing” by ensuring that Government investment in science and research is both effective and efficient. ASRA also acts as a catalyst role in influencing the investment and management of R&D funded and performed by the private sector.

A new $5 million Science and Research Fund will be established under the direction of ASRA to help kick-start strategic, high-value science and research initiatives.

Performance Measures

In the long term, ASRA's success will be measured by the degree to which the province achieves the over-arching goal. At present, the framework of intermediate goals that will guide progress toward this over-arching goal is still under development. A major ASRA initiative for 1997/98 will be to formalize a framework of goals and measures progressing toward this over-arching goal.

Strategies and Plans

ASRA has developed a comprehensive set of eight strategies that collectively are designed to achieve the over-arching goal for science and research. ASRA pursues these strategies through a series of task forces commissioned by the Board to develop and promote recommendations relating to issues that advance one or more of the strategies. The discussion that follows lists the initiatives planned by ASRA within the context of the eight strategies.

Strategy 1. Promote the establishment of a policy environment that encourages research and development and the application of technology for the economic and social development of the province.

- The ASRA Board considers the existing policy framework to be adequate for the present. No activities are planned at this time.

Strategy 2 Define key science and technology priorities and approaches to achieve the economic and social objectives of the Government.

- ASRA will identify and promote high impact strategic initiatives for Alberta's Science and Research Innovation System within Research Activity Areas, identified for strong emphasis by the R&D Priority Consultation, completed in 1996/97.

Strategy 3 Encourage the development and implementation of new high-value strategic science and research opportunities.

- Encourage and facilitate the development of strategic R&D initiatives by responding in a timely manner to opportunities that arise and by providing due diligence to evaluate potential investments from the Science and Research Fund.

Strategy 4 Monitor and evaluate all government supported science and research to ensure that it is addressing the key priorities and balances short, medium and long term provincial economic and social needs.

- ASRA will continue to improve the process used to review ministry R&D business plans. Lessons learned from the 1996/97 review will be incorporated into the 1997/98 review.

Strategy 5 **Recommend improved operational and strategic management of science and research activities to minimize duplication, address fragmentation and ensure maximum coordination and collaboration with industry, other provincial governments, and federal departments and agencies.**

- Pursue the implementation of the recommendations in the "Health Research: A Strategic Opportunity for Albertans" Report, in particular the recommendations related to:
  - health care informatics
  - health services research
- Continue to pursue implementation of the recommendations in the report, "Commercialization of Biotechnology in Alberta".
- Deal with the issue of goals and performance measures for science and research.
- Develop practical recommendations to improve the performance of the province's science and research infrastructure by conducting detailed investigations of priority elements of the infrastructure.
- Develop practical strategies to remedy the province's aging science and research infrastructure.

Strategy 6 **Promote an increase in application and commercialization of science and technology-based products, processes, and services for the creation of jobs and wealth.**

- Pursue the implementation of the recommendations of the "Barriers to Technology Commercialization in Alberta" Report.
- Deal with the issue of commercialization and/or application of technologies developed with public investments.

Strategy 7 **Support and encourage excellence in the science and research community and infrastructure in Alberta to attain international excellence.**

- ASRA will continue to work with Advanced Education and Career Development in the development and refinement of key performance indicators for scholarly excellence.

Strategy 8 **Increase public awareness, understanding, and appreciation of the importance of science and research to both the economy and quality of life.**

- ASRA intends to facilitate the science promotion efforts of public and private organizations that enhance the science and innovation culture in Alberta.
- ASRA will continue to publish "Selected Success Stories", a series of stories illustrating the benefits of research in Alberta.

Alberta Research Council (ARC) Business Plan 1997-2000

Mission and Vision

The Alberta Research Council, with its valued customers and partners, will advance the economy of the province by promoting technology development and application, performing applied research and development, and providing expert advice, technical information and infrastructure.

The Alberta Research Council is an internationally recognized technology corporation, a valued and important partner in the emergence of a globally competitive Alberta.

In July, 1996 responsibility for the Alberta Environmental Centre (AEC) was transferred, by an Order in Council, from Alberta Environmental Protection (AEP) to the ARC. The AEC is Alberta's primary facility for conducting research and developing technology related to environmental protection and renewable resource management. The combined facilities, people and expertise of ARC and AEC have greatly enhanced research capabilities within the province, resulting in a world-class team with an added focus on environmental technology advances.

Core Businesses

The ARC has been supporting the economic development of the Province of Alberta for 75 years by promoting technology development and its application. The combined ARC and AEC employs over 475 people and annually works with more than 800 companies ranging from start-up firms to large multi-national corporations. The ARC acts as a catalyst in creating effective partnerships, bringing investor consortia and agencies together with our client companies. ARC is a leader in North America in commercializing technology through joint venture arrangements.

ARC is widely recognized for its capabilities and contributions in six major market sectors of the Alberta economy: biotechnology, information, manufacturing, natural resources, environment and agriculture.

- **Biotechnology** - ARC houses one of the largest process engineering, fermentation, and scale-up facilities in North America, attracting the interest of national and international biotechnology companies, including many Fortune 500 companies. It is internationally renowned for its world class expertise in carbohydrate research.

  ARC's work as the interface between research and industrial application is crucial to ensure that maximum value is added in Alberta to the world-class biotechnology research being conducted at Alberta universities. ARC has a successful track record in bridging the research commercialization gap, evidenced through the biopharmaceutical research originating from the University of Alberta making its way to commercial practice via ARC's strategic alliance with Synsorb Biotech Inc.

- **Information** - ARC is a leader in the development of knowledge-based systems for industry. Specific areas of expertise include: expert systems and neural networks, products and services for distributed systems, learning and collaborative systems, 3-D visualization and interaction, software engineering, and software for manufacturing.

Alberta's information technology companies have received a 'kick-start' through ARC's collaborative work with private sector companies. For instance, Merak Projects Inc., a Calgary based software company, following its joint venture with ARC is now Canada's tenth fastest growing company.

- **Manufacturing** - ARC's manufacturing business provides product, process and equipment development for the manufacturing and energy services sectors. Capabilities and expertise include fluids processing, physical and computations modelling, fluids separation, materials processing, advanced industrial process modelling and automation.

  For example, ARC's leadership in the manufacturing sector has helped Edmonton-based Poly-Pacific Inc. develop a new plastic pellet stripping technology which is being marketed world-wide. The company has found a new use for plastic once destined for Alberta landfills and created 14 new jobs as a result of this development.

- **Natural Resources** - ARC has international expertise in heavy oil and environmental technologies, forest products and pulp and paper. Specific programs include engineered wood products, pulp and paper technology, products and process improvement for energy related industries, monitoring and remediation services and processes for the environmental industry, and energy breakthrough technologies for recovery and upgrading heavy oil and bitumen.

  For instance, a consortium agreement with Forintek Canada Corp. offers delivery of a national engineered wood composites program to Alberta panel product manufacturers. ARC, already regarded as a leader in oriented strandboard development with the best independent pilot plant in North America, has expanded its panel development facilities improving access and providing faster turnaround for clients for medium density fibreboard, overlays, oriented strandboard and large scale pilot runs of all panel products.

- **Environment** - the combined people, know-how and facilities of the ARC and the Alberta Environmental Centre will result in one of the strongest environmental technology organizations in Canada. Specific expertise includes pollution control, land reclamation and sustainable renewable resource management.

  Development of native grass varieties for use in restoring high elevation disturbed sites is expected to play a role in allowing industrial, and oil and gas operations in sensitive ecosystems.

- **Agriculture** - The AEC has established world class research facilities and expertise for conducting research and developing technology related to pest management, toxicology of environmental pollutants, and the impact of industrial (including agriculture and food) activities on air, water and land resources essential to sustainable agriculture.

  AEC's work is expected to reduce the use of pesticides by 15-25 per cent over the next 10 to 15 years in Alberta through effective ecological and biological approaches to pest management, and save Alberta farmers millions of dollars in lost revenues.

Corporate Business Goals, Performance Measures and Targets

The success of ARC is measured by the success of its partners and benefit to society. ARC's partners create economic impact through the generation of new sales and jobs. A 1996 performance audit of representative client companies, determined ARC's investment to impact ratio to exceed 5 - more than $5 of economic impact was created for each $1 invested by the government in ARC. The ARC is also a catalyst for increasing private sector R&D investments in targeted high-risk technology developments. The ratio of private sector R&D investment to core grant is about 0.8. In addition, ARC's work, especially in the environmental area, yields social or indirect benefits, which contribute to the quality of life of Albertans.

Another survey measured ARC's clients' satisfaction rating on a number of relevant criteria. Over 85 per cent of ARC's clients are satisfied or very satisfied with the corporation's performance.

The ARC will continue to increase its impact on the economy of the province through the following goals, performance measures and targets.

ARC: Business Goals, Performance Measures and Targets

Business Goals	1995/96	1996/97	1997/98	1998/99	1999/2000
Economic Impact ($M)	90*	103	116	128	141
Job Creation (direct jobs)	700	800	900	1000	1100
R&D Funding from Private Sector ($M)	15.7	16.2	20.4	23.4	26.7
Government Investment ($M)	20.3	19.2	19.2	19.2	19.2
Ratio of Private R&D/Gov't Investment $	0.8	0.8	1.1	1.2	1.4
Mission Effectiveness (Econ. Impact/Gov't Funds)	4.5	5.4	6.0	6.7	7.4
Customer Satisfaction, % satisfied or very satisfied	85%	—-	—-	—-	100%

* It is estimated that approximately $10 million of provincial corporate and personal tax revenue derives from ARC's partners and clients in 1995/96.

Key Strategies

The Alberta Research Council will achieve its goals and targets through the following key strategies:

- **Development of our human resources and intellectual capital** - the strength of ARC is in its people. Skills at creating, acquiring and transferring knowledge to the benefit of ARC customers will continually be enhanced. Human resource strategies include: maintain the number of employees at approximately the same level to provide leading edge core competencies and expertise in key areas; enhance technical and marketing skills through intensified training, coaching and mentoring

practices; encourage spin out of staff and technologies to private sector ventures; aggressive recruitment of the best and brightest new talent; increase use of leading edge external professional and technical services to augment in-house resources; and enhance the image of ARC as the premier organization for obtaining technology focussed entrepreneurial work experience.

- **Market focus** on technology development and commercialization initiatives to increase economic impact in the province in six sectors: biotechnology, information, manufacturing, natural resources, environment and agriculture. Environment and agriculture have been added as new sectors to ensure that the province achieves socio-economic benefits from the increased capability resulting from the AEC/ARC merger.

- Encourage **private sector R&D** investments in targeted technology development to keep pace with Alberta's international competitors and to generate economic impact and jobs in the province.

- **Effectiveness and efficiency** in delivering programs and activities will be achieved through the following strategies: increase focus on customers and value provided; improve project selection and management through the implementation of a staged-gating process; reduce corporate overheads; and increase financial leverage on government grants.

  This strategy meets the expectations of ARC's customers and partners to receive the highest value for their work with ARC. ARC is committed to increase financial leverage on government funds through improved project selection (risk/reward analysis) and investment and management practices (gating). The new corporate model and other efficiency measures introduced in 1996 have reduced ARC's overhead cost by about 10% compared to 1995/96. ARC's current facilities consolidation program has increased its space utilization efficiency by 30% and saved the government about $2 million per year of facilities costs.

- Develop **Innovative Strategic Partnerships and Alliances** that will enhance ARC's capabilities and effectiveness in accessing, developing, financing and commercializing technology regionally and internationally by bringing together external investors, financing partners and entrepreneurs; lead to the creation of new spin off businesses through strategic partnerships; create major new business opportunities for ARC and Alberta companies by sourcing applicable technologies world-wide and, adapting and applying these to the needs of local companies; and strengthen Alberta's international competitiveness by creating foreign market opportunities for Alberta companies.

  It is important to also develop innovative strategic alliances and partnerships with potential breakthrough impacts for the province and return on investment. For example, ARC is currently seeking a partnership with a private sector company to create a unique GMP (Good Manufacturing Practices) capability for human health biopharmaceuticals using ARC's large scale fermentation piloting facilities.

- Develop **new initiatives** that will have significant university and industry involvement (bridging the gap), promote synergy among the components of Alberta and Canada's science and technology infrastructure, and bring major benefits to Alberta. ARC has the capability to catalyze industry/ARC/ government/university partnerships in the following two areas: *(1)* **Sustainable Fibre Utilization:** Stimulate the continued development of a sustainable fibre utilization industry in Alberta through support to the forest industry. *(2)* **Agri-Food Technology:** Increase the competitiveness of

Alberta's agricultural industries by working in partnership with industry to foster research and development and commercialization of innovative technologies, and by focussing on value-added products in agri-food and non-food applications, and environmental technology for sustainable development and animal health care products. This work will be carried out in collaboration with and funding from the newly established Agri-Food and Fibre Value-Added Initiative.

Science, Research and Information Technology
Ministry Consolidated Income Statement

(thousands of dollars)

	Comparable 1992-93 Actual	Comparable 1993-94 Actual	Comparable 1994-95 Actual	Comparable 1995-96 Actual	Comparable 1996-97 Forecast	1997-98 Estimates	1998-99 Target	1999-2000 Target
REVENUE								
Minister's Office	-	-	-	-	-	-	-	-
Alberta Science and Research Authority	-	-	-	-	-	-	-	-
Science and Research Fund	-	-	-	-	-	5,000	5,000	5,000
Alberta Research Council	50,347	46,244	39,656	36,459	47,704	49,124	55,451	61,072
Consolidation Adjustments	(26,555)	(23,220)	(21,333)	(20,322)	(23,766)	(27,938)	(30,072)	(31,572)
Consolidated Revenue	23,792	23,024	18,323	16,137	23,938	26,186	30,379	34,500
EXPENSE								
Program								
Voted								
Minister's Office	-	-	270	234	250	250	250	250
Alberta Science and Research Authority	26,857	23,538	21,609	20,681	25,247	29,446	31,586	33,086
Statutory								
Science and Research Fund	-	-	-	-	-	5,000	5,000	5,000
Alberta Research Council	47,273	45,516	40,481	37,863	47,229	48,861	55,339	60,906
Consolidation Adjustments	(26,555)	(23,220)	(21,333)	(20,322)	(23,766)	(27,938)	(30,072)	(31,572)
Consolidated Expense	47,575	45,834	41,027	38,456	48,960	55,619	62,103	67,670
GAIN (LOSS) ON DISPOSAL OF CAPITAL ASSETS	-	-	(730)	(1,313)	-	-	-	-
NET REVENUE (EXPENSE)	(23,783)	(22,810)	(23,434)	(23,632)	(25,022)	(29,433)	(31,724)	(33,170)