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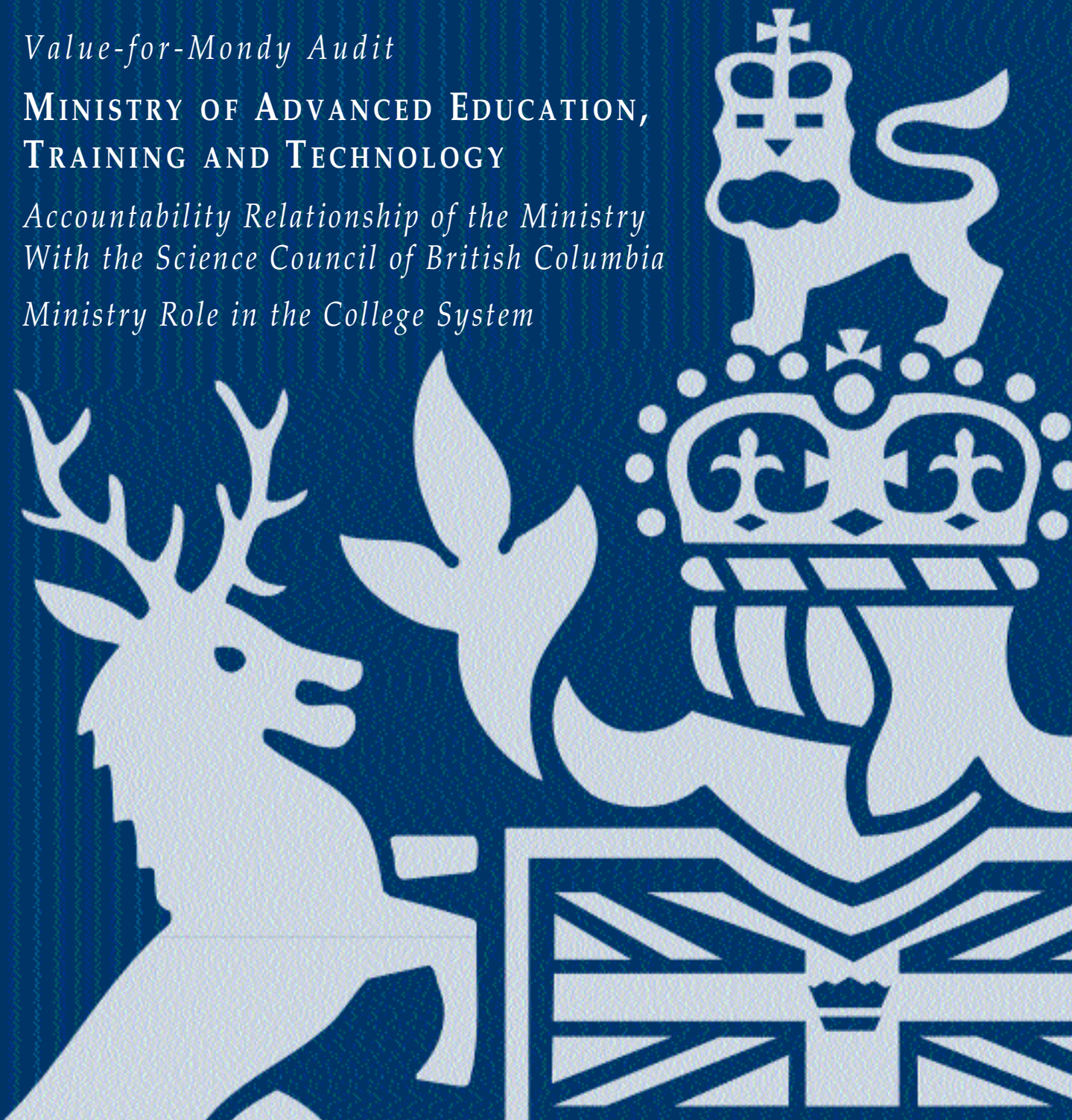
1993/94: REPORT 2

Value-for-Money Audit

MINISTRY OF ADVANCED EDUCATION,
TRAINING AND TECHNOLOGY

*Accountability Relationship of the Ministry
With the Science Council of British Columbia*

Ministry Role in the College System



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The Honourable Joan Sawicki
Speaker of the Legislative Assembly
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Madam:

I have the honour to transmit herewith my Value-for-Money Report on the Accountability Relationship of the Ministry with the Science Council of British Columbia, and the Ministry Role in the College System. Both of these audits were carried out within the former Ministry of Advanced Education, Training and Technology.

George L. Morfitt, FCA
Auditor General

Victoria, British Columbia
November 1993

copy: Mr. E. George MacMinn, Q.C.
Clerk of the Legislative Assembly

Ministry of Advanced Education, Training and Technology

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Overview



This, my second report of 1993/94, contains the results of two value-for-money audits focusing on matters related to education in the province.

Value-for-money audits conducted by my Office examine how resources are managed: how they are acquired and how they are used. We also assess whether legislators and the public have been given an adequate explanation of what has been accomplished with the resources provided to government managers.

We undertake our program of value-for-money auditing on a cyclical basis, selecting for audit significant programs or functions administered by government. By approaching our work in this way, we look to provide members of the Legislative Assembly and the public with assessments of all significant government operations over a reasonable period of time.

I last reported on matters relating to education in my 1988 Annual Report. At that time our focus was the role of the Ministry of Education in public school education from kindergarten to grade 12.

This year, our audits consider different aspects of education: post-secondary education, and science and technology. The first audit examines how the Ministry of Advanced Education, Training and Technology manages its relationship with the Science Council of British Columbia, one of its key partners in the development of science and technology in the province. The second looks at the way in which the ministry plans, coordinates, funds and monitors the system of community colleges in the province.

In the report on our audit of how the ministry performs its role in the college system, we describe the difficulty of measuring and reporting on performance in an educational setting. Our colleges and institutes play a major role in supplying the well-educated and well-trained people needed to provide British Columbia with a sound economic future. In view of the importance of British Columbia's colleges and institutes, and the significant level of investment in them, many people have an interest in knowing



how well the system is doing. But it is not easy to determine how these institutions are doing, what difference they make to their students, whether they are serving their communities well, and whether they are doing this in the most cost-effective way.

Early this year the Canadian Comprehensive Auditing Foundation, a Canadian not-for-profit foundation, published the results of a study undertaken by a panel of British Columbians interested in the performance of our colleges and institutes. After extensive research, the panel proposed an accountability framework for British Columbia colleges and institutes that consists of seven questions that people might legitimately ask of those managing our colleges and college system. The framework is designed so that the answers to these questions would allow people to judge how well the college system is doing.

Several colleges in the province are currently pilot testing this accountability framework with the support of the ministry. I commend these efforts and encourage those with an interest in our colleges and institutes to pursue improved ways of evaluating the effectiveness of these institutions and of providing public accountability for the resources they consume.

After the completion of our audits, but before we had received management's response to our reports, the Premier realigned his Cabinet. In conjunction with this reorganization, responsibility for administering several government programs was shifted. As a result, the responsibility for the government's science and technology programs moved from the Ministry of Advanced Education, Training and Technology to the Ministry of Employment and Investment. Consequently, although our audit looked at the accountability relationship between the Science Council of British Columbia and the Ministry of Advanced Education, Training and Technology, the management response published along with our report is from the Ministry of Employment and Investment.

I am particularly pleased with the results of our work on these audits for two reasons. First, I am convinced that the work of my Office should benefit those who manage government programs as well as the legislators and public to whom my reports are directed. It was gratifying, therefore, that ministry management stated, in their response to our audit which is published following our report, that they can see real benefits resulting from our review of the ministry's management of the college system.

Second, I am very pleased with the results of our audit of the ministry's accountability relationship with the Science Council. We undertake our audits in a way that enables us to provide positive assessments where they are warranted. We are able to provide such positive assessments infrequently, however.

Therefore, it is gratifying to report the results of an audit where we found management's performance exemplary and where we have no need to provide recommendations for operational improvement.



George L. Morfitt, FCA
Auditor General

Victoria, British Columbia
October 29, 1993





Ministry of Advanced Education, Training and Technology

Introduction

This report contains the results of two value-for-money audits conducted in the Ministry of Advanced Education, Training and Technology in 1992/93. We focused on two areas of the ministry: the Universities, Colleges and Institutes Division, and the Science and Technology Division.

The Universities, Colleges and Institutes Division is responsible for planning, funding and coordinating British Columbia's public post-secondary education system. This system comprises four universities, 15 community colleges, four provincial institutes and the Open Learning Agency. We examined the ministry's processes for planning, coordinating, funding and monitoring and reporting on the college component of the system in the first audit in this report.

The Science and Technology Division provides leadership and funding for the province's science and technology policy in partnership with industry, research and educational institutions, and other governments. One of the key partnerships is with the Science Council of British Columbia, and, in the second audit in this report, we reviewed the accountability relationship between the ministry and the Science Council.

The responses of management to our value-for-money audits are published along with our reports. As management, over time, implement the recommendations that arise from our audits, we publish their accounts of progress in our annual report. We believe this keeps legislators and the public informed of the nature, extent and results of remedial actions. We follow up on our audit recommendations directly when we carry out our next audit of the area examined.



Ministry of Advanced Education, Training and Technology

Accountability Relationship With The Science Council of British Columbia

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Ministry of Advanced Education, Training and Technology

Accountability Relationship With The Science Council of British Columbia

An audit of ministry processes for ensuring that funds provided to the Science Council of British Columbia are properly used

Audit Purpose and Scope

We conducted this audit to assess whether the Ministry of Advanced Education, Training and Technology has established and is maintaining an adequate accountability relationship with the Science Council of British Columbia.

Specifically, we assessed whether both parties understand what is to be accomplished by the Science Council, whether those accomplishments are being measured and reported, and whether the relationship is consistent with relevant legislation.

We did not consider the appropriateness of delivering part of the ministry's programs through the Science Council, nor did we audit the Science and Technology Fund (established to provide funding for the ministry's science and technology programs) or the relationships between the ministry and other programs and agencies it deals with.

We based our audit conclusions primarily on the accountability relationship in place for the twelve month period ended August 31, 1992. We also considered any changes in the accountability relationship that had been planned or implemented between August 31, 1992 and February 28, 1993.

Overall Conclusion

The ministry has established and maintains an appropriate accountability relationship with the Science Council of British Columbia. Both parties understand what is to be accomplished by the Science Council, those accomplishments are being measured and reported to the ministry, and the relationship is consistent with relevant legislation.

Key Findings

Both Parties Understand What the Science Council is Expected to Accomplish

The ministry has effectively communicated the government's strategic plans for science and technology, and the Science Council's role, to its own staff and to the Science Council. As a result, both parties have a good understanding of these matters.

In 1987, the government began an exhaustive process, involving the science and technology community, to define its vision and strategic objectives for science and technology in the province. Between 1988 and 1990, a series of documents was published, clearly defining the proposed strategy for developing science and technology in British Columbia and indicating the role played by the Science Council in achieving the strategic objectives.

Both parties are familiar with the strategic planning documents and still have on staff several individuals who helped develop the planning strategy. As well, the relatively small number of staff involved, six in the ministry who deal regularly with the Science Council and 30 in the Science Council itself, and the close day-to-day working relationship between both parties, have simplified communications.

We also found that processes are in place to ensure that the Science Council's final approved budget reflects the ministry's strategic objectives and operating plans for science and technology.

About 90% of the Science Council's annual funding comes from the ministry. The Council independently prepares an annual budget which is then submitted to the ministry for review and approval. Annual budget submissions are revised until the ministry is satisfied that the final budget reflects its strategic objectives and operating plans for science and technology.

The Science Council delivers several science and technology programs, including the ministry-developed Technology B.C. program. The ministry has made clear to the Science Council the specific program objectives and guidelines and the Council's specific responsibilities for that program.

The ministry also funds several programs developed and delivered by the Science Council. In recognition of the Science Council's autonomy, the ministry provides less direction for these programs than for Technology B.C. However, both parties have agreed on what should be accomplished by the Science Council with the funds provided by the ministry for these programs.

Accomplishments are Measured and Reported to the Ministry

The ministry has defined the form, content, and frequency of information it requires from the Science Council to enable it to evaluate whether the Council is meeting the objectives and responsibilities established for each program funded by the ministry, and to evaluate whether the Council's administrative costs, which are also funded by the ministry, are reasonable. The information reporting requirements are being met and we concluded that the information is adequate given the identified objectives, responsibilities, and size of the programs.

For Technology B.C., the ministry receives interim and final reports approximately every six months. These indicate how individual science and technology projects are progressing and how well the program is doing in meeting its overall objectives. The ministry also receives audited financial statements which provide independent assurance as to the use of funds. As well, ministry staff attend Science Council grant committee meetings where they can obtain monitoring information and clarify program issues.

For the remaining programs delivered by the Science Council, the ministry receives information through the Science Council's annual audited financial statements and unaudited interim financial statements. The same information is used by the ministry to monitor the Council's administrative costs.

Periodic comprehensive evaluations of the programs delivered by the Science Council are carried out by independent evaluators, and the ministry has done a good job of defining what these evaluations are intended to do. Program evaluation work is carried out according to a plan established by the ministry. In accordance with the plan, programs are scheduled for evaluation on a strategic basis rather than on a rigid rotation. All significant programs delivered by the Council have been evaluated recently and the results are being used to assess the continuing need for each program and to make improvements.

The ministry and the Science Council have also worked over the past two years to develop program rationales for most of the programs. Work is underway on the others. The rationales provide documented statements of the purpose and measurable outputs of each program and will form the basis against which future evaluations will be performed.

The Relationship is Consistent With Legislation

The *Science and Technology Fund Act* outlines the fund's objectives and stipulates what the money may be used for. The program initiatives funded by the ministry very closely parallel these requirements. The *Science Council Act* outlines the objectives and powers of the Science Council and its financial administration. The Council's mandated objectives complement those of the Science and Technology Fund, and the accountability requirements imposed by the ministry are sensitive to the Council's separate legal entity status defined in the *Science Council Act*. Finally, we found that the accountability relationship adequately addresses the requirements of the *Financial Administration Act* that apply to both organizations.





Developing Science and Technology

Increasing Science and Technology Activities

In 1988, the Government of British Columbia formally recognized that the contribution of science and technology to the provincial economy had to increase if the province was to succeed in today's competitive global economy. At that time, the government found that British Columbia's contribution to research and development, as a percentage of Gross Domestic Product, was the second lowest in Canada and about 30% of the level in Germany and Japan. To help British Columbia move toward a more knowledge-based economy, the government gave the Ministry of Advanced Education, Training and Technology the mandate to provide leadership and direction in this initiative.

To accomplish its mission, the ministry forms partnerships with groups in industry, education, and other governments to gain access to current opportunities in the rapidly changing science and technology sector of the economy. The ministry plays a leadership role in developing and maintaining these relationships through five operational thrusts: research and development, infrastructure, human resource development, public awareness, and special projects. These thrusts were developed through extensive consultations with the science and technology community. The ministry's activities are directed by its Science and Technology

Division which had a staff of 17 and a budget of about \$1.3 million for the year ended March 31, 1993.

Funding Science and Technology Programs

As a vehicle for increasing its financial contribution to science and technology, the provincial government created the Science and Technology Fund in April 1990. Responsibility for administering the Fund was assigned to the Science and Technology Division. Actual expenditure for the first three years to March 31, 1993 was \$123.1 million.

Under the *Science and Technology Fund Act*, the ministry may use the Fund to:

- support research and development;
- promote public awareness of science and technology;
- ensure the availability of the trained personnel and facilities necessary to provide an infrastructure conducive to scientific and technological research;
- support programs to encourage the growth of advanced technology in British Columbia; and
- support major projects leading to greater economic diversification in British Columbia and increased industrial competitiveness.

The ministry groups science and technology activities, paid for through the Fund, into envelopes



which closely parallel the activities provided for in the Act. The envelopes and the planned allocation of total expenditure from the Fund in each are as follows:

- Research and Development (27-35%)
- Infrastructure (25-32%)
- Human Resource Development (7-10%)
- Public Awareness (2-5%)
- Special Projects (25-30%)

Exhibit 1.1

Science and Technology Fund Envelopes

Used by the ministry to determine levels of funding and evaluate progress of activities

Research and Development Envelope:

Activities are designed to stimulate and encourage scientific research and technology development, focusing on innovation and the application of new technologies, products or processes. Funds are used wherever possible to lever money from other sources such as industry and other governments, to magnify the impact and help ensure that the investment is market driven. Actual allocation in the 1993 fiscal year was 43% of the total expenditure from the Fund.

Infrastructure Envelope:

Activities are designed to provide physical and institutional infrastructure support conducive to the conduct of scientific and technological research. Partnerships with industry and other levels of government are emphasized. Actual allocation in the 1993 fiscal year was 41%.

Human Resource Development Envelope:

Activities in this envelope are designed to help ensure an adequate supply of trained and creative individuals to meet the needs of a knowledge-based economy. The Fund is being used to provide leadership to increase the quality and quantity of science and technology training in the province at all levels from secondary school to technical institutes, undergraduate, graduate and postgraduate education and in the workplace. Actual allocation in the 1993 fiscal year was 6%.

Public Awareness Envelope:

Activities in this envelope are designed to promote the development and growth of a science and technology culture in the province. Funding will support public awareness programs and encourage use of community-based resources to increase public awareness about science and technology. Actual allocation in the 1993 fiscal year was 3%.

Special Projects Envelope:

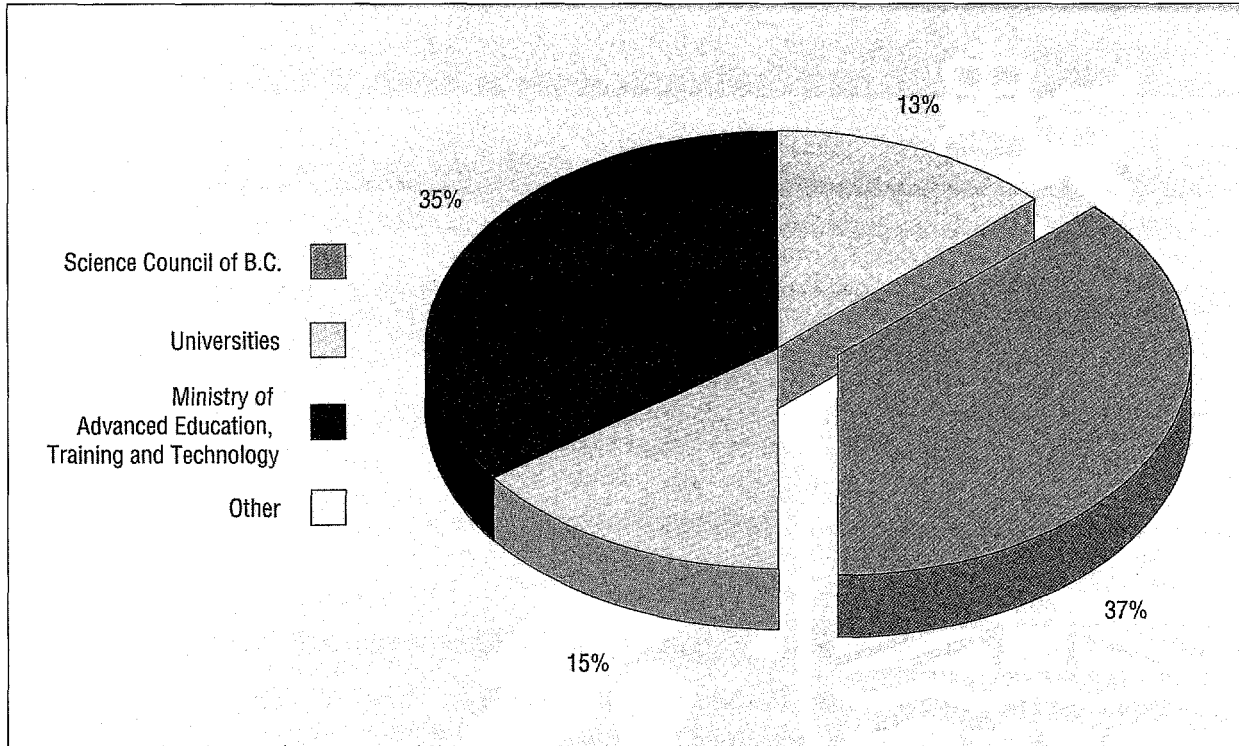
Activities in this envelope are designed to allow the Fund to take advantage of the unique opportunities that arise in science and technology. Projects are usually long term, require extensive resources, and may cross several envelopes. Actual allocation in the 1993 fiscal year was 7%.

Source: Ministry of Advanced Education, Training and Technology

Exhibit 1.2

Science and Technology Fund Distribution for the 1993 Fiscal Year

The major recipients of money from the Science and Technology Fund



Source: Ministry of Advanced Education, Training and Technology

Most of the activities supported by the Fund involve assistance programs developed by the ministry in consultation with the science and technology community. Assistance is available in a variety of forms, including straight grants, scholarships, grants with royalty agreements, awards, and direct expenditure.

Delivering Programs

Delivery of programs is usually achieved through partnerships with organizations in the science and technology community such as the Science

Council of British Columbia. The Science Council was established in June 1978 by the *Science Council Act*. Its primary objective is to encourage the development and application of advanced technology to support economic development in the province. This includes the implementation, administration, and funding of programs, and the organization and management of projects and initiatives.

The Science Council formally consists of the President, 15 Order-In-Council appointed members, all of whom are volunteers with senior positions in industry or academia, and a staff of 30. The

Council uses a network of over 600 volunteers, comprised of highly qualified and well-known people in the science and technology field, to provide expert advice in conducting its work. The Council estimates that these volunteer services are worth about \$1.2 million per year.

The Science Council is a separate legal entity from the ministry, but its mandate and the relationships it has established with the science and technology community make it an important organization for delivering programs on behalf of the ministry. Its activities account for a significant portion of the ministry's annual expenditure on science and technology: about \$12 million or 37% of the total budget for the 1993 fiscal year (Exhibit 1.2). This pays for about 90% of the Science Council's annual operations. The Technology B.C. program, which is

administered by the Council and had budgeted annual expenditure of \$10 million for the fiscal year ended March 31, 1993, is the largest single research and development program sponsored by the ministry.

Given this funding, and the activities it supports, it is important that a good accountability relationship be established and maintained between the two organizations. Our audit examined the key elements of an adequate accountability relationship: strategic direction, performance monitoring, and evaluation of accomplishments. We also looked at whether the accountability relationship was consistent with the requirements of the key related legislation.





Providing Strategic Direction

We expected to find steps taken by both organizations to help ensure that the overall vision and strategic plans, for the programs funded by the ministry and delivered by the Science Council, are communicated and understood by their respective staffs. We also expected the ministry to be taking steps to help ensure that both parties understand what should be accomplished with the funds the ministry gives to the Council.

In some accountability relationships the funding body provides the organization being funded with specific directions about how a program is to be delivered. In the case of the Science Council, however, both parties agree that the Council's autonomy from the ministry is an important aspect of the accountability relationship which must be preserved. As a result, we expected to find less specific direction from the ministry and a greater degree of cooperative decision-making. However, we still expected the Council's budget submissions to closely reflect the ministry's objectives for science and technology.

Conclusion

The government's vision and strategic plans for science and technology have been communicated and are understood by both organizations. In addition, the Science Council's budget submissions closely reflect the ministry's objectives for science and technology. Finally, the

ministry takes steps to ensure that both parties understand what should be accomplished with the funds the ministry gives to the Council.

Findings

Communicating Strategic Plans

The ministry has done a good job of communicating its strategic plans for science and technology to its staff and that of the Science Council. As a result, those individuals have a good understanding of what the ministry is trying to accomplish.

The ministry has been successful at communicating its strategic plans for several reasons. We found clear linkages between the ministry's vision for science and technology in the province, its objectives and operating plans, and the objectives and role of the Science Council. This information is clearly laid out in the ministry publications, *A Framework for Action* and *A 5 Year Plan for Science and Technology: 1990-1995*, both of which are provided to ministry and Council staff. These documents provide the respective staffs with a good understanding of what they are trying to achieve and their organization's role. Several of the staff members who were involved with developing the strategic plans continue to work with their respective organizations, so information is still current with them and they have a good basis for guiding new staff members.



Another reason that communication and understanding of strategic plans has been successful is that the two parties have a close day-to-day working relationship. For example, either the Director or the Assistant Deputy Minister, Science and Technology Division, regularly attends the Science Council's monthly meetings. Division staff have regular telephone contact with Science Council staff and often attend Science Council grant committee meetings. This provides ample opportunity for the two parties to clarify issues as they arise.

Also helping communication is the relatively small number of staff involved: 6 in the ministry who deal regularly with the Science Council, and 30 in the Council.

Ensuring Programs Funded Reflect Strategic Plans

Processes are in place to ensure that the Science Council's final approved budget reflects the ministry's strategic objectives and operating plans for science and technology.

Most of the Science Council's annual funding comes from the Science and Technology Fund. During the year ended March 31, 1992, the Council received \$15.9 million from the Fund and for the year ended March 31, 1993, it was budgeted to receive \$11.8 million. We found that, consistent with the desire of both parties to preserve the autonomy of the Science Council, annual budgets are first prepared by the Council and then submitted to the ministry for review and approval.

The ministry reviews the Science Council's budget submission to ensure that:

- funds are allocated according to certain ministry requirements. For example, the ministry requires that:
 - a 60:40 split be achieved between renewed Technology B.C. projects and new projects,
 - the overall level of funding for the industry-based research and development program not exceed 50% of the total actual cost of research and development,
 - the Science Council not exceed a specified amount, set by the ministry, for administering Technology B.C., and
 - the budget incorporate any specific current-year operating initiatives that the ministry feels should be promoted;
- the budget is in line with available funding; and
- the contents of the budget submissions reflect the strategies outlined in the ministry publications, *A Framework for Action* and *A 5 Year Plan for Science and Technology: 1990-1995*.

Both organizations review and revise the annual budget submissions until the ministry is satisfied that the budget reflects its strategic objectives and operating plans for science and technology. This process is made easier because the requirements of the *Science Council Act*, which provides the mandate for the Council's activities, are closely aligned with the ministry's strategic plans. This

makes it almost certain that the Science Council's budget submissions, aimed at meeting its mandate, will closely reflect the ministry's strategic plans for science and technology.

Establishing Program Objectives

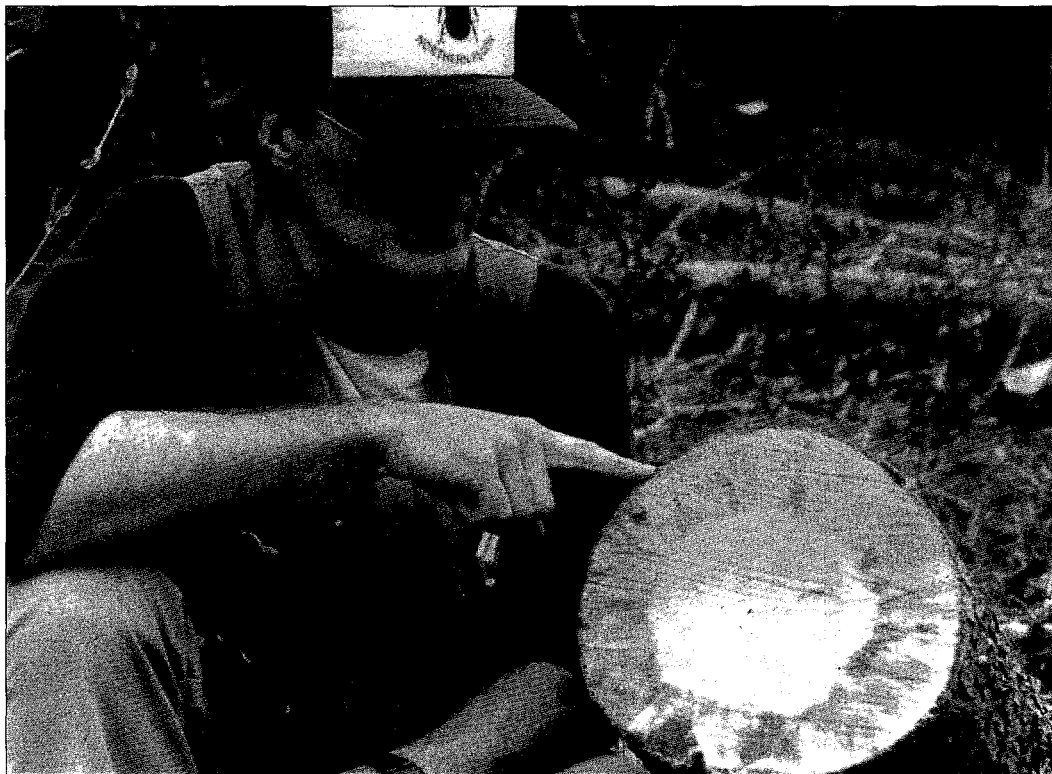
Both parties have a good understanding of what is to be accomplished by the Science Council with the funds provided by the ministry.

The Science Council delivers several science and technology programs. The largest, Technology B.C., is a ministry program (Exhibit 1.3). Its purpose is to provide funding to encourage scientific and technological research in British Columbia in a way that will create greater linkages between research

organizations (particularly universities) and businesses that can apply the findings of the research.

Before 1989, two separate programs were administered by the Science Council with funding from the ministry—the Science and Technology Development Fund (STDF) program and the Assistance Grants for Applied Research (AGAR) program. In 1989, to reduce administrative efforts, the two programs were amalgamated as the STDF-AGAR program. The name was changed in 1991 to Technology B.C.

Specific program objectives and guidelines, and the Science Council's responsibilities as the agent of the ministry for this



Courtesy of Ministry of Advanced Education, Training and Technology

Dr. Steffan Lindgren received Technology B.C. funding for developmental work using synthetic attractants to lure insects away from valuable timber.



program, have been well communicated to the Council. As a result, Council staff have a good understanding of what they are expected to accomplish with the ministry funds for this program.

The ministry has taken several steps to aid both parties in understanding what they are expected to achieve. In conjunction with the merging of the STDF-AGAR programs to form Technology B.C., a document was prepared outlining the program's objectives and specific guidelines for delivery. This document describes the major elements of the new program, including:

- objectives;
- eligibility criteria;
- application and review processes;
- evaluations; and
- project audit requirements.

In addition to Technology B.C., the Science Council also delivers several programs it has developed and operates with funds from the ministry. These programs include the following:

- Strategic Planning for Applied Research and Knowledge (SPARK)
- Graduate Research Engineering and Technology Scholarships (GREAT)

- Market Assessment of Research and Technology (MART)
- Science and Technology Awards for Returning Students (STARS)
- Industrial Post Doctoral Fellowships (IPDF)
- Training and Employment in Science and Technology (TEST)

In recognizing the Science Council's autonomy, the ministry provides much less direction for these programs than for Technology B.C. Nonetheless, the two parties have defined and agreed on what is to be accomplished by the Council with the ministry funds for these programs. The Council determines how the accomplishments will be achieved.

In recent years, the major programs delivered by the Science Council have been evaluated. This has further clarified program objectives and identified measurable performance indicators. The recent development of rationales for several programs delivered by the Council has helped as well, as have the conditional grant contracts negotiated each year between the ministry and the Council.





Exhibit 1.3

Programs Delivered By The Science Council of British Columbia

Funded by the Science and Technology Fund

Technology B.C.

is a program designed to stimulate the development and application of science and technology in the province. The program funds applied research and development projects in various economic sectors and in various eligible technologies. It is not designed to fund basic research. Budgeted expenditure for the 1993 fiscal year was \$10.3 million.

SPARK (Strategic Planning for Applied Research and Knowledge)

is aimed at bringing together the leaders of British Columbia's major economic sectors in a volunteer capacity. Their objective is to identify prospects for the sector, look for opportunities for science and technology in the sector, and recommend measures which will ensure that the opportunities are realized. Budgeted expenditure for the 1993 fiscal year was \$1.2 million.

GREAT (Graduate Research, Engineering and Technology)

supports graduate students studying in the fields of natural or applied science who, as part of their graduate program, collaborate with a British Columbia industrial organization on a substantial research project. The program allows graduate students to receive experience in industrial research as part of their graduate work. Budgeted expenditure for the 1993 fiscal year was \$1.5 million.

MART (Market Assessment of Research and Development)

assists researchers at universities, colleges, institutes and companies to determine the market potential of an innovative product or process under consideration for development or commercialization. Budgeted expenditure for the 1993 fiscal year was \$500,000.

STARS (Science and Technology Awards for Returning Students)

is designed to encourage individuals who are currently working in British Columbia's private sector to pursue graduate degrees in science and engineering. It is also designed to provide mature graduate students with the opportunity to upgrade their industrial research and development skills, to take back to British Columbia industry upon completion of their studies. Budgeted expenditure for the 1993 fiscal year was \$200,000.

IPDF (Industrial Post-Doctoral Fellowships)

is an employment assistance program designed to assist British Columbia companies in hiring recent Ph.D. graduates in science and engineering. This is expected to stimulate the growth of British Columbia industry through the application of improved science and technological capabilities, thus contributing to the growth and diversification of the British Columbia economy. Budgeted expenditure for the 1993 fiscal year was \$400,000.

TEST (Training Employment in Science and Technology)

provides employment assistance to British Columbia industrial organizations for the employment and training of recent graduates from post-secondary degree and diploma programs in science, technology, engineering, and related technical support. Budgeted expenditure for the 1993 fiscal year was \$350,000.

Source: Science Council of British Columbia



Monitoring Program Performance

Providing strategic direction and agreeing on what is to be accomplished is not enough. To assist in achieving value for money, we expected that the ministry would receive adequate information to enable it to evaluate whether the Science Council is meeting the objectives and responsibilities established for each program funded by the ministry, and to evaluate whether the Council's administrative costs, also funded by the ministry, are reasonable.

We wanted to ascertain whether the form, content, and frequency of monitoring information required by the ministry from the Science Council had been defined. We also wanted to assess whether the information reporting requirements were being met and whether the information required and received by the ministry was adequate given the identified objectives, responsibilities, and size of the programs.

Conclusion

The ministry has defined the form, content, and frequency of monitoring information required from the Science Council. In addition, the information reporting requirements are being met and the information required is adequate given the identified objectives, responsibilities, and size of the programs.

Findings

Defining Monitoring Information Requirements

The ministry's monitoring information requirements have been defined in conditional grant contracts that cover all the ministry-funded programs delivered by the Science Council.

The recently developed program rationales provide statements of the purpose of each program and measurable outputs. We think this offers the ministry an ideal opportunity to review the monitoring information it requires and to consider whether it should arrange to receive any new information that results from the recently defined measurable performance indicators.

Receipt and Adequacy of Monitoring Information

The information collected and reported to the ministry is in accordance with the ministry's defined information requirements and is adequate given the identified objectives, responsibilities, and size of the programs.

The ministry has several processes that provide it with information for monitoring the Science Council's activities.

At the highest level, the Minister of Advanced Education, Training and Technology formally approves all payments from the ministry to fund Technology B.C. For each competition in this program, a briefing package is

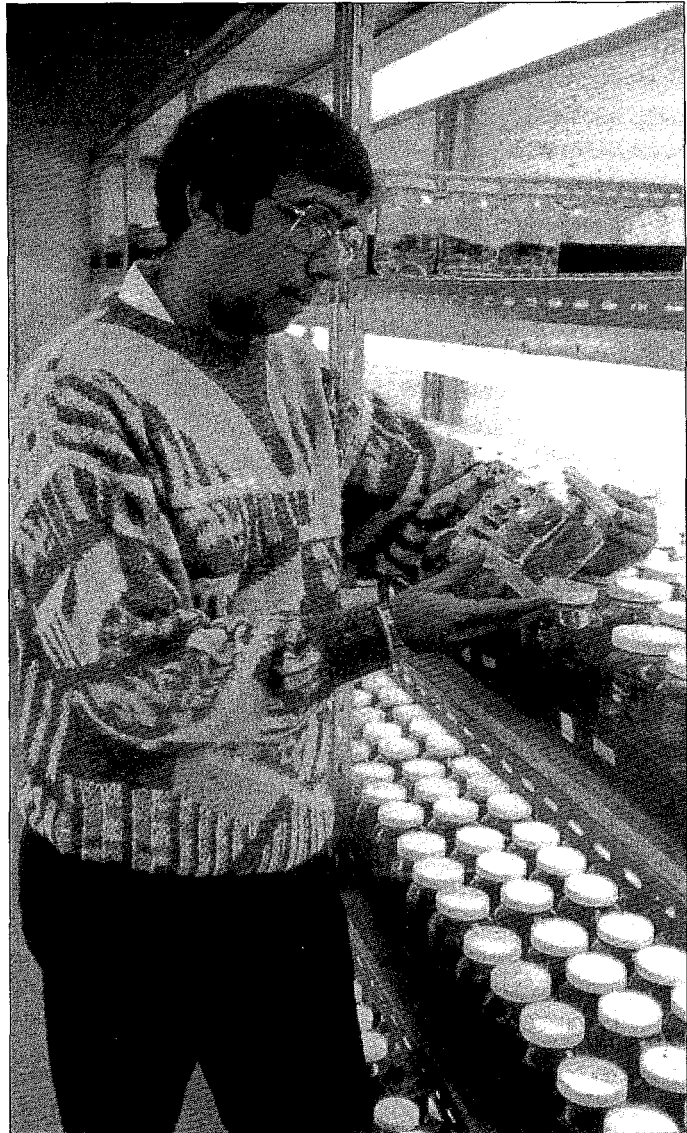


prepared for the Minister, detailing the application review process conducted by the Science Council's peer review committees. A listing of awards given to Science Council and/or committee members is also included aimed at reducing the possibility of conflict of interest. Senior level ministry involvement is also provided by the Assistant Deputy Minister or the Director, Science and Technology Division, one of whom regularly attends monthly Science Council meetings. Ministry staff also often attend grant committee meetings.

The monitoring done by the ministry is not the only monitoring performed. Specific project and overall program monitoring starts at the Science Council. The Council's Awards Officers play a key role in monitoring the use of funds by research recipients. The Council requires the officers to have close contact with the recipients who, in turn, must report to the officers every four months on project progress.

The Awards Officers are expected to review the quarterly reports and make decisions about the continuation of the projects. They must also make site visits to see projects first-hand and prepare checklists to record the status of each project (for example, progress to date, adherence to proposed time schedules, and funds received). The results of the officers' monitoring efforts are summarized periodically by the Science Council for reports to the ministry.

For Technology B.C., the ministry receives interim and final reports approximately every six



Courtesy of Ministry of Advanced Education, Training and Technology

Dr. Kamlesh Patel received Technology B.C. funding to develop tissue culture techniques for producing large quantities of superior plants for use in the agriculture and horticulture industries.

months. These indicate how individual science and technology projects are progressing and how well the program is doing in meeting its overall objectives. The ministry also receives periodic audited financial statements which provide independent assurance as to the use of funds.



For the remaining Science Council programs, the ministry receives information through the Council's annual audited, as well as interim unaudited, financial statements. The ministry also receives interim and final reports aimed at providing it with an indication of the progress being made towards achieving science and technology objectives. Together, these sources of monitoring information give the ministry the details of all Science Council administrative expenses and particulars regarding the use of ministry funding.

The monitoring information the ministry receives for Technology B.C. is significantly more extensive than that provided for the remaining programs. The main reason for this difference is that the expenditure on Technology B.C. is large—normally \$10-12 million per year—whereas total expenditure for the other Science Council programs is usually only about \$4-5 million per year. Individual programs are generally less than \$1 million per year. Because several of the smaller programs involve bursaries and fellowship grants, there is less need

for continuous monitoring. As well, these programs were developed by the Science Council and accordingly are afforded a higher degree of autonomy by the ministry. Nevertheless, the reporting received by the ministry is still reasonable given the size and nature of the programs.

The ministry monitors the Science Council's administrative costs by:

- reviewing and approving the Science Council's budget submission detailing administrative costs;
- establishing fixed dollar amounts within the conditional grant contracts for administrative costs; and
- reviewing the Council's audited financial statements, which provide details of administrative costs, and comparing these with the approved expenditure.

We believe that these processes and the information available are reasonable in relation to the costs involved.





Evaluating Program Accomplishments

In addition to the progress reports made by the Science Council to the ministry, we expected to find that the programs the Council delivers are subject to comprehensive evaluations. We anticipated that these evaluations would assess the effectiveness of the programs, and the results would be used to assess whether the programs ought to continue. We did not expect an evaluation of each program to be conducted annually. This would be too costly and too disruptive to the two organizations and to the individual grant recipients. In addition, many science and technology initiatives extend for several years so little would be gained by frequent evaluations. Instead, we expected evaluations to be conducted every three to five years, depending on the financial size and nature of the program.

We also expected the evaluations to be comprehensive and based on consistent criteria, as well as being backed up by processes for addressing the issues raised in the evaluations so that improvements can be made.

Conclusion

The programs delivered by the Science Council are subject to comprehensive evaluations. The frequency of the evaluations is appropriate, reflecting the financial size and nature of the program. The evaluations assess the effectiveness of the programs, and the results are used to assess

whether the programs ought to continue. The evaluations are also backed up by processes for addressing the issues raised in the evaluations so that improvements can be made.

Findings

Carrying Out Program Evaluations

The actual accomplishments of each ministry funded program delivered by the Science Council are being evaluated.

The ministry has clearly defined its intentions for program evaluations in the *Framework for Action* document. The document describes the scope and purpose of evaluations and indicates that:

- the ministry has overall responsibility for program evaluation;
- the ministry is responsible for preparing a plan and time schedule for evaluating existing programs;
- the Science and Technology Fund, programs and unique projects within programs are possible targets for evaluation;
- the ministry is responsible for developing rationales for existing programs to aid in the evaluation of programs;
- programs are to be scheduled for evaluation on a strategic basis rather than on a rigid rotation; and
- no evaluation will rely exclusively on work done by the delivering agency.



The ministry is responsible for managing the evaluations of the projects and programs carried out under the Science and Technology Fund. We found that the ministry has established program evaluation plans outlining its expected evaluation activities for the period April 1, 1992 to November 1, 1993. The plan is aimed at meeting the requirements outlined in the "Framework" document. We found that actual progress compared favorably with the plan.

In accordance with its program evaluation plans, the ministry has worked along with the Science Council over the past two years to develop program rationales for most of the programs. Work is underway on the others. The rationales, which contain statements of the purpose and measurable outputs for each program, will form the basis against which future evaluations will be performed.

All significant programs delivered by the Science Council have been evaluated recently. The ministry's plans set specific targets for carrying out evaluations on several programs administered by the Science Council. Program evaluations recently completed, in accordance with the plans, include:

- STDF-AGAR
(now Technology B.C.) 1992
- IPDF/TEST 1992
- SPARK 1992
- GREAT 1991

At present, either the ministry or the Science Council can initiate evaluations of grant programs. Notwithstanding which organization does so, joint steering committees are created to provide

direction for each evaluation. On these committees are ministry staff, Science Council staff, and members of the science community. This helps to ensure that the evaluation will address issues important to each organization, and mitigates against any self-serving interests emerging which might occur should only one of the organizations set the terms of reference for the evaluation. Once the evaluation is completed, the steering committee ceases to exist.

We also found that, consistent with the ministry's intentions as outlined in the "Framework" document, both organizations rely on outside program evaluation consultants who must meet certain criteria before they will be accepted. The criteria include such things as having demonstrated consulting experience in the science technology field and a good reputation within the consulting community.

Frequency

The frequency of program evaluations, which are carried out on a three to five-year cycle, except where there are significant program changes, is reasonable.

The ministry and the Science Council work to coordinate the timing of the evaluations within the cycle. Given that projects within a program can extend for several years, we think a three to five-year cycle is reasonable. Evaluations are costly and time consuming for both organizations and they are disruptive to the grant recipients who are already subject to regular monitoring by the Science Council.

Evaluation Completeness

Overall, the evaluations completed cover the key attributes of an effective program.

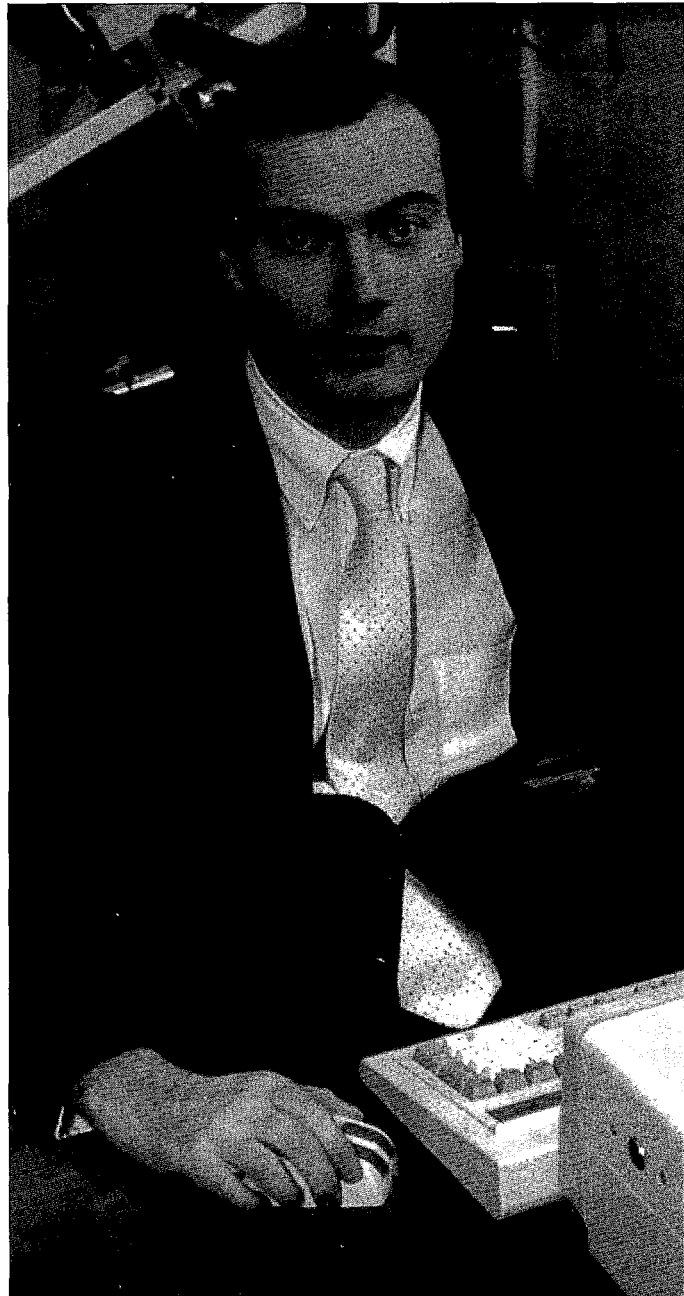
The Canadian Comprehensive Auditing Foundation has defined 12 attributes of effectiveness that can be used to evaluate a program. We found that the evaluations carried out on the programs delivered by the Science Council generally cover the key attributes applicable to this program, including:

- **Relevance**—whether the program continues to make sense in addressing the need for which it was intended;
- **Appropriateness**—whether the program is going about its objectives in the best way;
- **Achievement of Intended Results**—the extent to which program goals have been achieved, whether the goals were challenging, and what is needed to improve;
- **Acceptance**—whether users of the program judge it to be successful;
- **Secondary Impacts**—whether any unintended effects, either positive or negative, occurred; and
- **Costs and Productivity**—whether administrative costs are comparable with other similar programs and are consistent over time.

Using Evaluation Results

Processes are in place to use the evaluation findings to improve the programs or to assess whether the programs should continue.

The primary purpose of a program evaluation is to assess



Dr. Gary Birch received an Industrial Postdoctoral scholarship and Technology B.C. funding to produce technology that will enhance the independence of people with severe physical disabilities.

how effective the program is at achieving its intended objectives. As well, recommendations are often made, aimed at fine tuning the program or changing delivery methods. Benefits of the program,



including unintended effects and secondary impacts, might also be identified and quantified, and the program's purpose might be re-affirmed. It is therefore important that steps be taken following an evaluation to see that the recommendations are addressed and that changes get made to deal with the issues raised.

The two organizations are aware of the key recommendations contained in the evaluations recently completed, and they are dealing with the matters raised. The Science and Technology

Division works with the Science Council informally to see that the various evaluation recommendations get dealt with. The ministry monitors this through its regular contact with the Science Council at the senior management and program staff levels, its control over the budget process, and its review of the Council's annual reports for evidence that action has been taken.





Meeting Legislative Requirements

The key legislation affecting the accountability relationship between the ministry and the Science Council includes: *The Science Council Act*, *The Science and Technology Fund Act*, and the *Financial Administration Act*.

We expected to find that the accountability relationship was consistent with the requirements of these pieces of legislation.

Conclusion

The accountability relationship is consistent with the requirements of the related legislation.

Findings

The Science Council program initiatives funded by the ministry very closely parallel those requirements outlined in the *Science and Technology Fund Act*.

The *Science Council Act* sets out the objectives of the Science Council. They include:

- encouraging development and application of advanced technology to meet the needs of industry in the province;
- making recommendations to the government on the acquisition, development, and dissemination of scientific, technological, and scholarly knowledge to promote the industrial, economic, and social development of the province;

- advising the government on implementation of science policy;
- gathering and organizing information on scientific research;
- making recommendations to the government on the establishment and awarding of fellowships, exhibitions, bursaries, grants, and prizes to encourage development of improved technology and retention of skilled research personnel in the province; and
- evaluating research and development proposals and making recommendations to the government on the funding of these proposals.

These mandated objectives complement those of the Science and Technology Fund. Also, the established accountability requirements are sensitive to the Science Council's separate legal entity status defined in the *Science Council Act*. As a result, there is a high degree of joint cooperation between the ministry and the Council to define what the Council is expected to accomplish.

Finally, the *Financial Administration Act* includes sections that apply to both organizations. These cover numerous financial issues such as restrictions on where the Science Council may invest its money. We found that the accountability relationship adequately addresses these requirements.





Ministry Response

We are very pleased with the overall and detailed conclusions of the Auditor General's Report on the accountability relationship with the Science Council of British Columbia that states "the ministry . . . has established and maintains an appropriate accountability relationship with the Science Council of British Columbia. Both parties understand what is to be accomplished by the Science Council, those accomplishments are being measured and reported to the ministry, and the relationship is consistent with relevant legislation."

The Ministry is also pleased that the review of the relationship found that the Ministry and/or the Science Council has:

- done a good job communicating its strategic plans for science and technology, and the Science Council's role in that plan, because of clear linkages between the Ministry's vision for science and technology in the province, its objectives and operating plans, and the objectives and role of the Science Council;*
- processes in place to ensure that the Science Council's final approved budget reflects the Ministry's*

strategic objectives and operating plans for science and technology;

- communicated well specific program objectives and guidelines and the Science Council's responsibilities as the agent of the Ministry;*
- worked closely and cooperatively with the Science Council on independent evaluations and there are processes in place to address issues raised in the evaluations so that improvements can be made; and*
- met all legislative requirements of the related legislation (the Science Council Act, the Science and Technology Fund Act, and the Financial Administration Act).*

The Ministry appreciates the Auditor General's review of the accountability relationship between the Science Council and the Ministry. Confirmation that our present activity has met or exceeded expectations is welcome recognition of the efforts that staff in the Ministry and Science Council have placed on a good and cooperative relationship. The Ministry will continue to ensure that an effective relationship is maintained.

**Ministry of Advanced Education, Training and Technology*****Ministry Role in the
College System*****Contents**

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Ministry of Advanced Education, Training and Technology

Ministry Role in the College System

An audit of the ministry's processes for planning, coordinating, funding, monitoring, and reporting on the college system

Audit Purpose and Scope

The Ministry of Advanced Education, Training and Technology, though not directly responsible for the operations of colleges, performs an essential role in the college system. In our audit we examined that role, assessing whether the ministry is:

- providing appropriate planning and coordination for the college system;
- funding the colleges' operations in a way that encourages the achievement of ministry goals; and
- monitoring and reporting on the performance of the college system in a way that provides good accountability.

Our audit focused on the ministry's processes in place in the fiscal year ended March 31, 1993. We did not audit the operations of the colleges themselves, nor did we audit the ministry's management of the capital funding of colleges.

Our examination was performed in accordance with the value-for-money auditing standards recommended by the Canadian Institute of Chartered Accountants, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

Overall Conclusion

Planning and coordinating are essential to the success of the college system, which functions in an environment where funds are scarce and demand is increasing. It is through its planning and coordinating activities that the ministry establishes its goals and objectives for the college system. The ministry must take the lead in this area because service delivery is indirect: colleges deliver programs; the ministry pays for them.

The ministry has specified eight high-level goals for the college system: accessibility, efficiency, quality, responsiveness, comprehensiveness, occupational and economic development, social development, and accountability. It has laid out clear operational objectives for achieving two of these goals—accessibility and efficiency—but does not have such clearly defined objectives for its other goals.

The ministry's formal planning and coordinating processes are also focused on accessibility and efficiency. Its processes for negotiating enrollment levels in college programs, and for approving new college programs, are appropriately designed and managed to support these two goals. Coordinating processes which are less directly related to accessibility and efficiency, such as examining ongoing college programs to see that they continue to be suitable, are less consistent. However, the ministry carries out its work in a context where ministry and college staff are in frequent communication, share a common perspective, and often work together on common problems. This to some extent compensates for a lack of formal process. It also gives the ministry an effective means of responding to new challenges faced by the college system.

The ministry's funding methods appropriately encourage its goals of accessibility and efficiency. The level of encouragement given to its other goals is less clear. In particular, funding does not directly address the goal of quality, as there is no link between a college's funding and what its students learn or how they benefit from college.

This is disquieting, but not unexpected: few jurisdictions in North America have been able to find effective ways of linking college funding to performance. One reason is the difficulty of defining and measuring quality. The British Columbia college system is in the forefront of collecting information on two important measures of college system achievement—how colleges contribute to their students' success in work and further education, and how students progress through the college system. However, as is the case in many jurisdictions, the ministry does not collect information on another important measure of achievement—what students have learned by attending college.

The ministry's reporting processes focus on information related to the goals of accessibility and efficiency, with little information related to other goals. As a result they are unable to give the public and legislature an adequate understanding of the overall performance of the college system.



Key Findings

Planning and Coordinating

Planning and coordinating means setting goals and objectives for the college system, then seeing that these goals and objectives are appropriately expressed in colleges' plans and programs. As well, planning and coordinating involves keeping these goals, objectives, plans, and programs up to date, by anticipating and responding to changes in and around the college system.

The ministry has developed a set of high-level goals for the system—accessibility, efficiency, quality, responsiveness, comprehensiveness, occupational and economic development, social development, and accountability—which are, at least in broad terms, understood within the college system. It has laid out clear operational objectives for achieving its goals of accessibility and efficiency. Other ministry goals do not have such clearly defined objectives. While there is, in everyday activities, a significant congruence of goals and objectives between the ministry and colleges, the lack of clear operational objectives makes it difficult for colleges to know precisely what they should do in support of the goals.

As well as developing high-level plans for the system, the ministry encourages colleges to develop their own plans, consistent with the ministry's. It recently had each college prepare a formal three-year plan and submit it for ministry review. The colleges and the ministry found that the process was useful but needed some improvements, which the ministry is currently designing.

The ministry's yearly funding negotiations with colleges are another way it ensures that each college's plans are consistent with its own, and that the programs offered are acceptable to the ministry. This examination of programs is supplemented by a well-developed approval process for new programs. The review of ongoing programs, by contrast, lacks consistent criteria for how, when and how often to evaluate programs. However, this less rigorous review of ongoing programs should be seen in context: ministry staff, through frequent contact with the colleges, monitor the continuing appropriateness of college programs. As well, colleges, in response to constrained funding, have discontinued many programs they consider to be of lower priority or effectiveness.

The ministry and colleges share a willingness to cooperate in anticipating and responding to change. This close relationship with the colleges allows the ministry to draw on the strengths of the entire college system. It makes frequent use of ad hoc groups and task forces, which draw together ministry staff, participants

from the colleges, and other affected parties to make recommendations on a range of matters, including strategic issues.

This cooperative approach within the college system also promotes efficiency; in particular, by encouraging numerous transfer arrangements among colleges, institutes, and universities. These arrangements let students continue their studies at another institution without having to repeat courses, thus allowing the transfer students to graduate without delay, and freeing spaces for other students.

Funding

The allocation of funding to colleges is one of the ministry's most important tools for encouraging the achievement of its goals for the system.

Efficiency is one of the two goals most clearly encouraged. The ministry's funding decisions center around determining how many student spaces, in specific programs, colleges can offer, and then calculating funding based on the number and mix of student spaces. In these processes the ministry focuses on utilization—that is, being efficient by making full use of available seats in college programs.

This concentration on utilization has been effective. Utilization targets set by the ministry, in combination with restrained dollars, have encouraged colleges to drop programs with low utilization, thus increasing efficiency. Most programs, in most colleges, now have high utilization rates. Some even have utilization rates over 100%, accommodating more students than the ministry funded.

The ministry has also used its funding processes effectively to encourage accessibility. Funding for additional student spaces is carefully allocated among colleges and programs to carry out the government's objectives of increasing the total student spaces available, especially in academic programs, and in regions where demand is highest.

However, there are only limited linkages between the ministry's funding processes and its other goals, especially its goal of quality. Quality is not a component of the funding calculation, although the ministry does consider any information on quality available to it, in deciding whether a program should continue to be funded. The funds a college receives are not contingent on showing how much its students have learned in its programs, how satisfied they are, or how successful they are as a result of those programs. This is disquieting but not unexpected: few jurisdictions in North America have established effective ways of linking college funding to performance.

The ministry is essentially a buyer of education services for citizens, however, and in our opinion, a prudent buyer should pay for quality—educational results—as well as process and quantity. For this reason, we believe the ministry should examine ways to link its funding of colleges in part to the quality of the educational activities funded.

Monitoring

Monitoring the performance of the post-secondary education system is a difficult task, but an extremely important one. Given the scarcity of resources and the range of services contending for those resources, public decision-makers need to know what mix of services produces the most public benefit. Monitoring of results is also important if the college system is to maintain credibility with its public.

The ministry receives some information on both college activities and the results of these activities. However, what students actually learn at college is not directly measured by, or reported to, the ministry. This is not unusual in post-secondary education, because how much a student has learned as a result of a college's efforts is hard to measure. Although measuring student learning is technically difficult, a few jurisdictions do gather such information; most, however, appear to rely on the colleges, as does the ministry, or other bodies, to gauge the adequacy of student learning.

The British Columbia college system is, however, in the forefront in gauging indirectly the quality of the education the ministry is funding. The colleges, with support from the ministry, collect and publish information on the outcomes of college education—that is, what changes occur in students' lives as a result of their education. Through yearly surveys of graduates, the ministry and colleges collect information on the short-term effects colleges have on their students' success in the workplace and in further education. The ministry and colleges also support a database that allows researchers to look for success factors affecting how students enter into and progress through the post-secondary system.

Although the ministry is not closely involved in the internal operations of colleges, it does collect information about several specific aspects of these operations. Not only does it track enrollment and utilization in college programs, it also collects information on instructional staff and other educational resources. As well, using financial information from the colleges, the ministry produces an analysis and comparison of college expenditures. While this cost information is sufficient for the ministry's oversight role, without interpretation it cannot be used

to make comparisons between colleges. This weakens the ministry's ability to monitor and report on the cost-effectiveness of the college system as a whole.

Accountability

Colleges have a statutory responsibility to report to the ministry on their performance, and the ministry has a responsibility to report to the legislature and the public. We found that the documents used for this reporting, such as college annual reports, gave little information on the effects of colleges' efforts. One exception is the ministry's annual reports, which provide information from the yearly survey of graduates. The ministry is also encouraging colleges to adopt a common accountability framework, which could strengthen colleges' examination and reporting of their activities.



The College System and the Ministry

The College System

The public post-secondary education system of British Columbia includes 15 community

colleges (Exhibit 2.1). They offer a comprehensive range of educational programs and services to their local communities, as well

Exhibit 2.1

B.C. Community Colleges

Their location, operating grants, and enrollment

College (and region primarily served)	Provincial operating grant 1992/93 (\$ million)	Full-time equivalent enrollment 1992/93
University-Colleges:		
Cariboo College (Kamloops, South Cariboo)	29	4,174
Fraser Valley College (East Fraser Valley)	17	2,565
Malaspina College (Central Vancouver Island)	28	4,197
Okanagan College (Okanagan)	32	4,750
Urban Colleges:		
Camosun College (Greater Victoria)	29	4,662
Capilano College (North Shore)	21	4,169
Douglas College (New Westminster, Maple Ridge, Haney)	28	4,671
Kwantlen College (Richmond, Langley, Surrey)	28	5,003
Vancouver Community College (Vancouver)	61	10,127
Smaller Colleges:		
East Kootenay Community College (East Kootenay)	8	1,131
College of New Caledonia (Central Interior)	18	2,586
North Island College (North Vancouver Island)	10	1,396
Northern Lights Community College (Peace River)	10	1,041
Northwest Community College (North Coast)	10	1,148
Selkirk College (West Kootenay)	15	1,849
Total	344	53,469

Note: Because colleges have many part-time students, and because many full-time courses are of short duration, college enrollments are usually measured in full-time equivalent students (FTEs). College operating grants include all FTE-related grants, non-formula support grants, sponsored EIC tuition, and equipment replacement grants.

Source: Ministry of Advanced Education, Training and Technology - Budget and Analysis Branch



as some unique or specialized programs that attract students from throughout the province.

Colleges receive most of their operating funds from the Ministry of Advanced Education, Training and Technology. The ministry provides these operating funds to support several broad categories of college programs: career/technical, vocational, foundation, and academic. Career/technical programs ready students for employment in a wide range of business, health, manufacturing and resource occupations which require a technical certificate or diploma. Vocational programs prepare students for employment in office, health, service, construction and trades fields at both the pre-employment and occupational upgrading level. Foundation programs are primarily intended to prepare the non-high school graduate for entering college level programs, upgrading basic employment skills, or improving life skills. Academic programs provide more general education and lead to university transfer credit or an undergraduate degree.

Until recently, academic programs in colleges have usually been of two years' duration, and have not resulted in a degree from the college. Bachelor degrees obtained through colleges rather than universities are a recent British Columbia innovation, unique in Canada. In response to demand for increased post-secondary access in the province, three colleges—Cariboo, Okanagan, and Malaspina—became “university-colleges” in 1989. A fourth, Fraser Valley, has since joined them. While continuing

their previous range of programs, these colleges developed agreements with the province's universities to allow their students to study for degrees issued by the universities in association with the university-colleges.

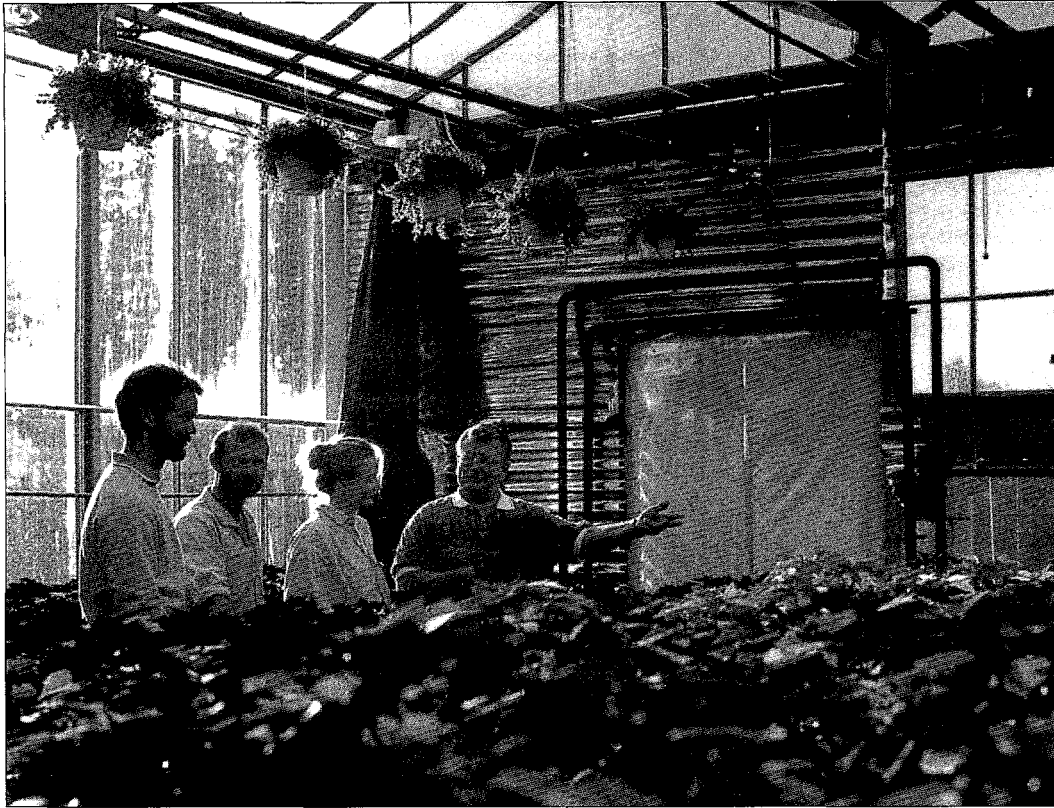
Another innovation was introduced in 1992. Changes to the *College and Institute Act* now allow colleges to issue associate degrees, documenting that students have successfully completed a structured two-year program.

College Governance

Colleges operate under the *College and Institute Act*. The Act is clear that the board of a college “shall manage, administer and control the property, revenue, expenditure, business and other affairs of the institution and . . . manage . . . the educational or training programs offered at the institution.” In other words, the ministry is not responsible for the operation of colleges.

However, several important powers do fall to the minister, powers administered in most cases through the ministry. The minister appoints all members of college boards and, equally importantly, controls funding. Other important powers of the minister include the right to:

- approve or deny a college's request to introduce or drop a program;
- monitor post-secondary education or training conducted with financial support from the government;
- require colleges to submit annual budget proposals;



Courtesy of Ministry of Advanced Education, Training and Technology

- require a college to “plan for and evaluate its programs and operations on an ongoing basis and, on the request of the minister, . . . report on these matters in a form the minister directs”; and
- require colleges to submit an annual report (the Act also requires that the minister “make an annual report . . . to the Legislature about the state of post secondary education and training in the Province.”)

The ministry interacts with colleges mainly through its Universities, Colleges and Institutes Division which, in 1992/93, consisted of 50 full-time staff and 12 full-time contractors. The assistant deputy minister, his six directors and associated staff

are responsible for the administration of operating grants (\$998 million in 1992/93), capital debt servicing (\$152 million), and capital construction projects (\$305 million), for the whole post-secondary system—fifteen colleges, four universities, and four institutes.

On most issues the ministry has adopted a partnership or cooperative approach to leading the college system. It is apparent that both the government and the colleges firmly believe that colleges should be as autonomous as possible if they are to be effective educational institutions, responsive to the needs of their region.





Planning and Coordinating

Planning and coordinating are essential to the success of the college system, which operates in an environment where funds are scarce and demand is increasing—an environment in which those who deliver college programs must know where to concentrate their efforts.

The ministry must take the lead in planning and coordinating because service delivery is indirect: colleges deliver programs, and the ministry pays for them. In such a relationship, the ministry must be able to define clearly what it wants done in exchange for its funding. Furthermore, because decision-making is dispersed, the college system can only operate coherently if the direction for the system is clear to all.

Finally, a system with so many stakeholders (such as students, local communities, the legislature, and employers) needs proper accountability if it is to keep their trust and support. Accountability needs clear statements of direction. Stakeholders can better judge how well the system is doing if they know what it is attempting to do.

The ministry carries out several planning and coordinating activities. Our audit examined the ministry's methods for:

- detecting important changes in the college environment and developing responses to these changes;
- setting and communicating goals and objectives for the college system;

- reviewing college goals and objectives;
- reviewing college programs; and
- encouraging efficiency.

Conclusion

The ministry has documented its goals for the college system, but for many of these goals has not defined the operational objectives through which it expects to achieve them. While there is significant congruence of goals and objectives between the colleges and the ministry, nevertheless this lack of definition makes it difficult for colleges to understand what they are expected to do in furtherance of these goals.

The ministry has appropriate processes for responding to changes in the college system, for encouraging efficiency through planning and coordination, and for approving new college programs. However, its processes for reviewing college plans and ongoing college programs need improvement before the ministry can rely on them for assurance that college activities conform to ministry expectations.

Responsiveness

Conclusion on Responsiveness

The ministry's method of responding to change is an appropriate use of the strengths of the system. The ministry draws on expertise within the colleges and among its own staff, and develops conclusions and recommendations in a cooperative manner.

Processes Used in Responding to Change

The ministry relies on the expertise and experience of both ministry and college staff to assist it in identifying and responding to significant changes.

Ministry staff are encouraged to be leaders within their areas of responsibility. Staff can initiate studies and program reviews, which are then usually carried out by joint ministry and college task forces. Staff often serve as ministry representatives on joint committees. Through such contacts, they learn of potential problems or key issues confronting the college system.

College staff are equally communicative. They willingly bring issues to the ministry's attention. Opportunities for doing so are plentiful, since joint task forces and joint committees are the norm in the college system.

Joint task forces are usually set up to address specific issues. They may review the demand for services, as did studies on child care, literacy, and adult basic education. They may also examine organizational issues, as did the task forces on governance within colleges and on the mandate of university-colleges.

Sometimes these cooperative groups are used to address wider strategic questions. A recent example is the B.C. Human Resources Development Project (BCHRD project), initiated by the ministry in 1991 to develop a framework for post-secondary education for the next 20-30 years. The project had wide involvement from post-secondary institutions, the ministry, and other stakeholders. The ministry is now developing a discussion paper on how to implement the conclusions in the project's report.



Courtesy of Ministry of Advanced Education, Training and Technology



Exhibit 2.2

Ministry Goals For the College System

The ministry's formally-stated goals for the college system

Broad purposes of the system

Goal: Occupational and economic development

"the system ... will contribute to the process of economic renewal and development within the Province"(1)

Goal: Social development

"the system will enhance the cultural, social, and recreational life of the Province"(1); "significant role played by the system . . . in developing knowledgeable, community-spirited individuals and a harmonious society"(2)

Who the system serves

Goal: Accessibility

"the system will seek to increase access and equity of access to post-secondary opportunities for British Columbians" (1)

Desired system characteristics

Goal: Quality

"the system will provide students with high-quality education and training relevant to their diverse and changing needs as well as to those of society" (1)

Goal: Comprehensiveness

"the system will be comprehensive by providing a variety of programs to meet the need for individual development as well as the societal need for an educated and well-trained population"(1)

Goal: Efficiency

"the system will make effective and efficient use of all resources" (1); "ensure that . . . there is . . . good value for public expenditures" (2)

Goal: Responsiveness

"a system that can both respond to change and anticipate and prepare for change" (2)

Goal: Accountability

"the system will be accountable to the public . . . for the provision of education in an educationally and fiscally responsible manner" (1)

Source:

(1) Mission, Goals, and Objectives 1986-1991: Integrated Five-Year Planning for the British Columbia College and Institute System

(2) Ministry Plan, July 1991 - Partners for the Future



Setting Goals and Objectives for the College System

Our audit considered how well the ministry defines and communicates its goals and objectives for the college system. "Goals" are non-quantitative statements of general intent, aim, or desire. They are made operational—translated into concrete actions and processes—through "objectives"—quantitative statements of future expectations, usually with an indication of when they should be achieved.

Conclusion on Setting Goals and Objectives

The ministry has documented its goals for the college system, but has not defined its operational objectives for achieving all of these goals.

Setting Goals for the System

The clearest documentation of the ministry's goals for the college system is its 1986 document *Mission, Goals, and Objectives 1986-1991*, which set out seven goals: accessibility, comprehensiveness, quality, occupational and economic development, social development, efficiency, and accountability. A later document, the *Ministry Plan, July 1991 - Partners for the Future*, is less concise because it discusses goals for all parts of the ministry's mission, not just for the college system. However, the seven goals in the 1986 document can also be found in the 1991 document, along with an eighth goal—responsiveness (Exhibit 2.2).

We concluded that the goals stated in the above documents are still the ministry's goals for the

system, and that they are, at least in broad terms, understood within the system. For example, the BCHRD project, which had support from the ministry and wide participation by colleges and other stakeholders, included similar goals in its report.

Specifying Objectives for the System

Goals have to be translated into more specific form—into objectives stating how much of what should be done, by when—before they can effectively guide the system. We looked for clear statements of the ministry's objectives related to each of its goals, but were unable to find them for all goals.

The clearest statement of the ministry's objectives for the college system was made through its "Access for All" initiative. The initiative derived from a public task force study, which led to a ministry submission to the provincial cabinet and then to a public announcement in April 1989. It included commitments to add 15,000 more student spaces to academic programs in universities and colleges over six years, and to establish university-colleges.

Although an election in 1991 resulted in a change of government, the 1992/93 allocation of funding followed the original plan laid out in the Access for All initiative. The 1993/94 allocation, however, reflects a change in direction, described in the ministry's latest (1991/92) *Annual Report*: "The ministry will pay increased attention to the needs of British Columbians requiring adult basic education, training in English as a second

Exhibit 2.3

Ministry Objectives

The ministry's operational objectives, as deduced from ministry documents and actions

Goal	Related objectives
Occupational and economic development	<p>Access for All included more access to career and vocational programs.</p> <p>Access for All called for an increase in access to academic programs, but was unclear about whether this was to serve the goal of occupational and economic development, or the goal of social development.</p>
Social development	<p>Access for All included more access for disadvantaged groups.</p> <p>Access for All called for an increase in access to academic programs, but was unclear about whether this is to serve the goal of occupational and economic development, or the goal of social development.</p>
Accessibility	<p>Access for All called for 15,000 more academic seats, more non-academic seats, development of university-colleges, and more access for disadvantaged and First Nations people.</p> <p>Funding letters from the minister to college boards (1993/94) call for further growth in access, even though funding per seat is reduced from the previous year.</p>
Quality	<p>Funding letters from the minister to college boards (1992/93) call for quality to be maintained at previous levels.</p>
Comprehensiveness	<p>Not apparent.</p>
Efficiency	<p>Access for All included two efficiency objectives: founding of the B.C. Council on Admissions & Transfer; and development of a shared electronic library.</p> <p>Program profile and funding process focuses on higher utilization as both a goal and a measure of success.</p>
Responsiveness	<p>Not apparent.</p>
Accountability	<p>Funding letters from the minister to college boards (1993/94) call for action on a common accountability framework.</p>

Source: Developed based on information from the Ministry of Advanced Education, Training and Technology



language, and technical and trades training and education.”

In the Access for All initiative, accessibility was clearly the favored goal, and specific objectives were laid out. Objectives were also stated for the goal of efficiency, including the formation of the B.C. Council on Admissions and Transfer to facilitate transfer among institutions, and a proposal for a shared electronic library.

For other ministry goals for the college system, however, the new initiative did not set clear objectives. For example, it gave mixed messages on the goal of occupational and economic development. Growth was directed towards academic programs rather than to the programs most directly related to this goal, vocational and career/technical. This appears to be contrary to other ministry statements. The *Ministry Plan, July 1991*, for example, focuses on the need for technical training and more education in science as key

to the province's economic development.

Other ministry activities reinforce the messages given in the Access for All initiative. The ministry's annual funding processes were used to achieve the ministry's accessibility objectives in the Access for All initiative, discussed above. Also, these processes focus on colleges' ability to maintain and increase their utilization (how well they fill the seats available in their programs). As we discuss in the next section, this is a measure of efficiency. Its prominence in the funding process signals clearly that efficiency is an important objective.

Every year, the minister writes a letter to each college board, telling them how much funding their institution will receive. These letters sometimes set out more specific objectives than are already embodied in the funding. The minister's letters for 1992/93 emphasized that quality had to be maintained at the previous year's



Courtesy of Ministry of Advanced Education, Training and Technology



levels. The 1993/94 letters stated specific objectives for both accessibility and accountability.

Exhibit 2.3 summarizes the ministry objectives we were able to deduce. The word “deduce” is significant, as we were unable to find a complete statement of current objectives. Colleges have the same problem. In order to carry out ministry objectives of increasing service in certain areas with limited funds, they need to know clearly what can be downgraded, as well as what to emphasize. The information sources we discussed above, such as the Access for All initiative, focus mainly on incremental additions to the system, but are silent on what can be set aside or reduced.

Knowing what the objectives are—that is, knowing how goals are to be put into operation—is essential when goals are at cross purposes. For example, one aspect of accessibility is local service delivery. This favors more, and smaller, colleges. On the other hand, efficiency—also an important goal—favors larger colleges. When total funds are fixed, any inefficiencies reduce the number of college spaces available in the province, even though increasing that total is another important aspect of accessibility. It is hard for colleges to act when both accessibility and efficiency have priority, unless the tradeoffs between them and within them are explicitly addressed.

Recommendation 1: The ministry should develop operational objectives for all its stated goals for the system, setting

out its quantitative and qualitative expectations for the achievement of these goals.

Reviewing College Goals and Objectives

British Columbia governments have consistently seen colleges not as isolated institutions, but as part of a system designed to achieve provincial goals. To act as part of this coordinated system, each college needs to know whether its own goals and objectives are supported by the ministry and are consistent with those of the ministry, and of other colleges. The ministry is responsible for seeing that this consistency exists. Our audit examined how the ministry does this.

Conclusion on Reviewing College Goals and Objectives

The ministry has acceptable processes for ensuring that college goals and objectives, as embodied in annual funding requests, are consistent with ministry goals and objectives. Although there are weaknesses in the ministry's process for seeing that longer-term college plans correspond with ministry goals and objectives, the ministry is currently working on improvements to that process.

Review Processes

The ministry ensures that a college's direction is consistent with its own by reviewing and approving college “program profiles” and three-year plans.

A program profile is an annual listing of the programs, and the number of student spaces in those programs, that a college plans to offer. Ministry staff scrutinize the



proposed profile and discuss it with college staff. Adjustments are made if necessary, and an approved profile is produced. This process allows the ministry to review and approve each college's plans for adding, expanding, or deleting programs. It provides an opportunity for the colleges and the ministry to exchange views, and to coordinate the planning of different institutions. It also links planning to funding: the approved profile is the basis for calculating the college's operating funding.

This annual review is supplemented by a review of college three-year plans. In 1989, the ministry began requiring colleges to develop formal three-year plans, which are updated each year. The ministry provided planning guidelines, and was to formally approve and sign off the college plans, seek the funding necessary to implement them, and review them annually. Between 1989 and 1992, it received plans from each college and commented, to varying degrees, on each of them.

Before starting another cycle of plans and reviews, the ministry assessed the effectiveness of its process. It found that colleges were committed to the planning process, believing that it was an "excellent exercise in consultative, bottom-up planning." However, colleges were concerned about what they perceived as a lack of response to their three-year plans, particularly to key strategic issues they had raised. The review concluded that the ministry's response to college plans was not

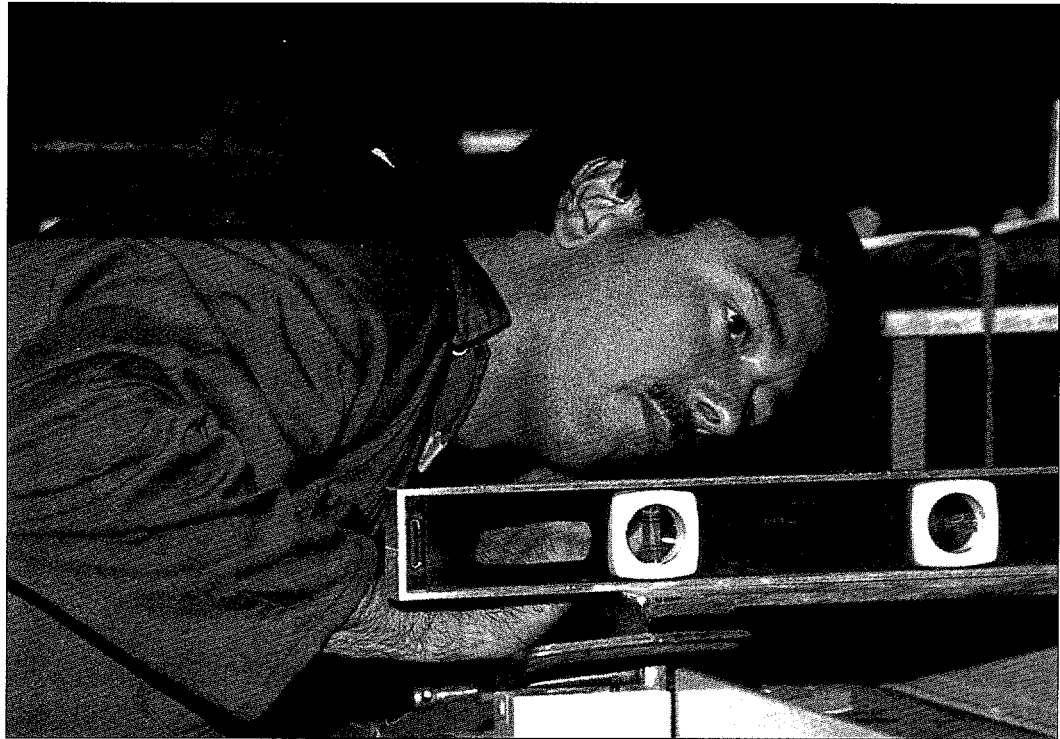
always coordinated and the amount of feedback provided to colleges on key strategic issues was generally limited.

The review also found that colleges wanted more information about the ministry's own priorities. Colleges asked the ministry to tell them "where the post-secondary system should be going, and how it intends to get there when resources, capacity and energies are limited [P]riorities must be stated in a meaningful way."

The need for clear ministry priorities is not a new issue. A study done for the ministry in 1988, and a follow-up study done by the colleges in 1991, called for government to prepare a plan for the education system that would articulate its goals, objectives, and priorities rather than be just a list of what is desirable. The BCHRD project's report also called for improvements: "It is no longer realistic to expect institutions to . . . accommodate shifting priorities on an annual, or less-than-annual, basis."

The ministry is searching for better ways to communicate government priorities to colleges. Possibilities include a joint planning council and some form of multi-year budgeting. The ministry is also planning to use the information from its review of three-year planning to improve the planning process.

Recommendation 2: The ministry should continue to search for practical methods of conveying to colleges the priority assigned to each of the ministry's goals and objectives for the system.



Courtesy of Ministry of Advanced Education, Training and Technology

Reviewing College Programs

Our audit reviewed how the ministry ensures that college programs meet ministry goals and objectives for the college system.

Conclusion on Reviewing College Programs

The ministry has appropriate processes for ensuring that new college programs meet ministry expectations. However, its processes for reviewing ongoing programs are not as well developed, lacking consistent criteria for how, when, and how often to evaluate programs. As a result, the ministry has inadequate assurance that ongoing programs continue to be both needed and effective.

Review of New Programs

The ministry has a clearly defined process for giving educational approval of new programs. Colleges must submit a detailed application for each new

program proposed, including information regarding demand for the program, how it will be delivered, and what it will cost. Applications are reviewed at several levels in the ministry before educational approval is granted or denied. This educational approval is kept separate from funding approval, so that a proposal is first assessed on its educational merits. Educational approval does not guarantee funding approval, which is determined during the annual program profile and funding process.

Review of Ongoing Programs

The ministry examines ongoing programs as part of its regular coordination and funding activities. The in-depth review of programs occurs on an ad hoc basis.

Ongoing programs are reviewed as part of the ministry's annual examination of each



college's program profile. The pattern of review varies: different staff emphasize different kinds of information, such as the history of utilization of the program, other indicators of student demand, and indicators of program quality. This less rigorous review, in comparison to that for new programs, should be seen in context: in response to constrained funding, colleges have discontinued many programs they considered to be of lower priority.

The ministry's staff includes program coordinators, who focus their attention on particular groups of programs. These coordinators sit on joint ministry-college specialist committees, and have frequent contact with program specialists in the colleges. They maintain a watch on the continuing appropriateness of the programs they are responsible for, making use of the information they gather from their contacts.

Sometimes the ministry conducts in-depth reviews of programs or groups of programs, prompted by concerns noted during the regular scrutiny described above. Unlike that regular scrutiny, which focuses on programs in individual colleges, in-depth reviews look province-wide at the demand for services or the effectiveness with which they are delivered. Recent examples include a review of a group of health and social service programs and a review of criminal justice programs.

However, the criteria used in these reviews vary: one review may treat student demand as crucial, another may focus on whether graduates successfully

find jobs. How often, and in what circumstances, in-depth reviews are performed also vary. Another problem with these reviews is that there is no consistent method for deciding on implementation of recommendations.

Improvements Planned

The ministry is considering having a joint ministry-college group examine the process used for reviewing ongoing programs. We support this intent, and believe it could be extended by having such a joint body take over responsibility for carrying out program reviews. This would be consistent with the ministry's cooperative approach and the colleges' prime responsibility for program delivery. It may also have an advantage in efficiency, since much of the information the ministry considers in doing these reviews is already gathered and collated by the colleges.

Before transferring the task of review to such a joint body, the ministry would have to specify what expectations a program should meet, how reviews should be carried out, and how a college would certify to the ministry that its programs meet ministry requirements.

Recommendation 3: The major responsibility for carrying out the review of new and ongoing programs should be shifted to a joint body with college and ministry representation.

Efficiency Through Planning and Coordinating

Our audit considered whether the ministry's methods for planning and coordinating



encourage the college system to operate efficiently.

Conclusion on Efficiency Through Planning and Coordinating

It is mainly in its funding processes that the ministry focuses its attention on efficiency. However, two coordination activities—articulation, and program review—also contribute to efficiency.

Articulation

The ministry supports the B.C. Council on Admissions and Transfer, a quasi-independent body reporting to the minister but made up of representatives from colleges, universities, and institutes. It was established as part of the Access for All initiative, to encourage articulation among the institutions. "Articulation" includes a range of methods of encouraging institutions to act as part of a coordinated system. One of these methods is "transfer", the granting of credit by one institution for programs or courses (at present, mainly in academic programs) completed at another.

Transfer arrangements are an efficient way to expand educational

opportunities. Students can complete their studies without repeating courses. Transfers free student spaces at the originating institution and help transferring students graduate without unnecessary delay.

Program Review

In-depth reviews of programs, when conducted, can also promote efficiency within colleges. For example, one review examined a program offered by a number of colleges. The colleges varied in how they offered the program: some required less than a year for completion, some more than two years. The review concluded that a maximum program length be set, sufficient for the level of training needed in the field served. Changes were then made in funding to encourage colleges to keep within the maximum length. Where colleges did so, students now enter the work force as soon as possible, and colleges serve the maximum number of students while still giving appropriate levels of training.





Funding

From its inception, the British Columbia college system has had its funding controlled by the provincial government. Most college operating funds come directly from the ministry. Even the second-largest source of funds—student fees—is government-controlled, since college fee schedules must be approved by the minister.

As a result, the way in which college funding is allocated has very important effects, deliberate and inadvertent, on what colleges do. We examined how well the ministry's funding methods have encouraged the achievement of each of the ministry's goals and objectives for the college system.

Conclusion

The ministry's funding methods appropriately encourage its goals of accessibility and efficiency. The links between the ministry's funding methods and its other goals, such as occupational and economic development, are less clear. In particular, the funding methods do not directly address quality: there is no link between a college's funding and what its students learn or how they benefit from college. This is not unusual in that defining and measuring quality is difficult; few jurisdictions have established effective ways of linking college funding to performance.

However, we believe the ministry should examine ways to link its funding of colleges in part to the quality of the educational

activities funded. The ministry is essentially a buyer of education services for citizens and, in our opinion, a prudent buyer should pay for quality - educational results - as well as process and quantity.

In this section of the report we describe how the ministry funds college operations, and we examine how well these funding methods encourage achievement of each of the ministry's goals.

How the Ministry Funds College Operations

As discussed earlier, each year the ministry reviews, negotiates, and approves a program profile for each college. This profile is treated as a contractual obligation of the college, in exchange for funding. Once the fiscal year is complete, the college must submit audited reports on the number of full-time equivalent (FTE) students it served during the year, to establish that it has met its contractual obligations. Information from these reports, assembled into a province-wide report on utilization, is widely circulated, and extensively used by ministry staff.

The approved program profile results in an agreed allocation of FTE student spaces, not in an allocation of dollars. The ministry makes this separation in order to focus program discussions on educational needs rather than their financial consequences, and to encourage institutions to allocate their resources as effectively as possible.



The translation into dollars happens at a later stage in the annual funding cycle, with the use of a funding formula. This formula was developed in the early 1980s, and has been modified by a joint ministry-college committee several times since. It calculates a college's funding program by program. For each program the formula has three elements. The first relates to direct instructional costs, and is the same per student for all colleges offering the program. The second relates to the administrative and support costs associated with providing direct instruction. The third provides for broader, college-wide, support costs such as physical plant, maintenance, libraries, and student services. These latter two funding elements vary among colleges because of size and location.

The amounts calculated program by program are then totaled to determine a college's funding. The amounts calculated for each program are not part of the contractual agreement. A college is expected to deliver the agreed program profile, but is under no obligation to spend the calculated amount on a particular program. If it can deliver a program for less than the formula amount; it is free to use the savings to enhance other programs. A ministry description of the funding system makes this clear: "The approved program profile is a contract between the Province and the college. The college is to deliver a specific level of service (FTEs) based on the overall allocation provided by the Ministry.... There is no requirement that the college spend funds in accordance with the allocation per

program, but there is an onus on the college to deliver its funded FTEs."

Besides its formula funding, each college receives varying amounts of non-formula funding to cover special situations. For example, colleges may receive extra funding for the start-up costs of a new program or new campus.

Encouraging Accessibility

The funding system has been effective in encouraging accessibility. Using the program profile, the ministry can direct new student spaces to specific colleges and programs. This method was used to carry out the Access for All initiative, thus adding more total spaces to the system (especially in academic programs), responding to demand in rapidly growing regions, and directing more services to particular disadvantaged groups.

Encouraging Efficiency

College efficiency has two aspects: organization and utilization. Organizational efficiency measures how well a college has organized its available resources (instructors, classrooms, etc.) to offer the maximum number of student spaces in its programs. Utilization efficiency measures how those student spaces are used.

The funding formula encourages organizational efficiency in two ways. It focuses attention on the core educational activity—the teaching of students in a specific program—which, as the biggest cost, is the area where efficiency is most important. Also, it funds direct instructional costs of a program uniformly across the province, sending the message that

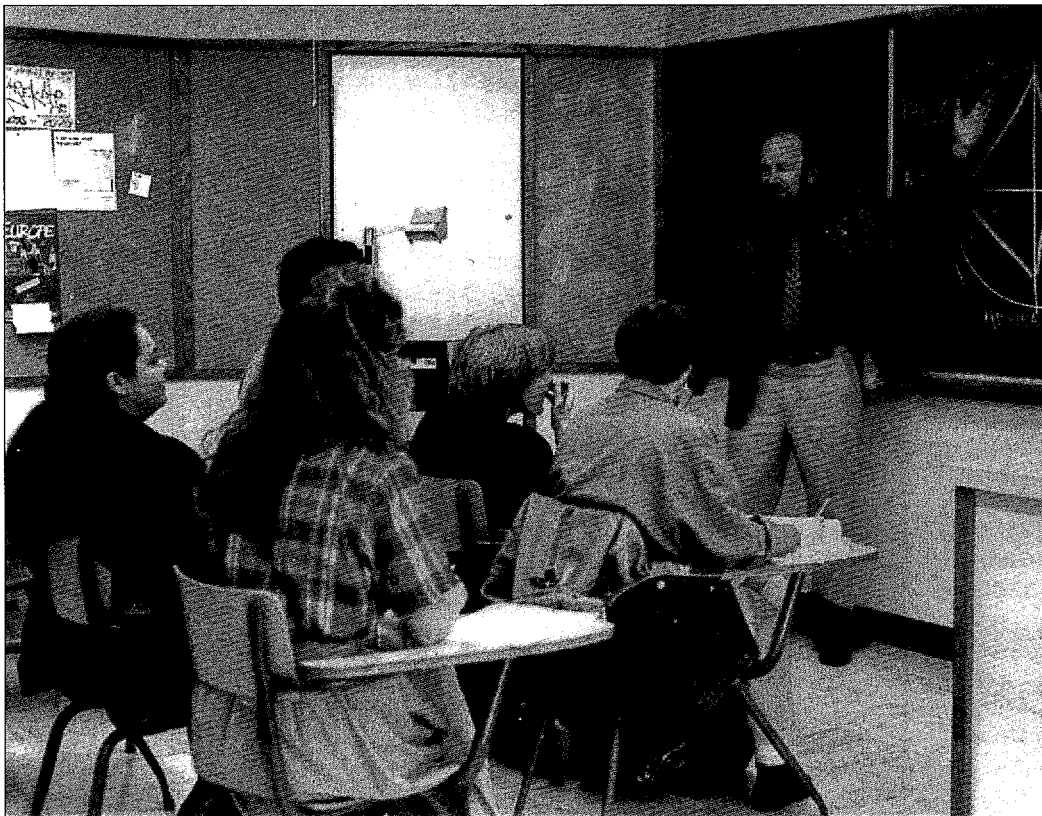
the ministry expects all colleges to be efficient in the way they organize their resources.

The ministry focuses its attention primarily on utilization efficiency as a measure of college performance. This concentration on utilization has been effective. Ministry statistics show that its funding to colleges, in constant dollars per FTE, has declined since 1981/82. Utilization targets, in tandem with restrained dollars, have encouraged colleges to drop programs with low utilization, and thus increase efficiency. Most programs, in most colleges, now have high utilization rates. Some colleges even have utilization rates over 100%, accommodating more students than the ministry funded. However, the funding system does not give them any special rewards for this achievement.

Encouraging Quality and Accountability

The funding system pays for seats in college programs, rather than for what students learn while occupying those seats. There are no direct links between the funding system and the ministry goals of quality and accountability. In a 1991 college-sponsored funding study, the ministry commented: "While work is underway on graduate and student attainment indicators they are not an integral component of the funding process." This is not unexpected. Defining and measuring quality is a difficult task; few jurisdictions have established effective ways to link funding to performance.

The minister's 1992/93 funding letters to college boards,



Courtesy of Ministry of Advanced Education, Training and Technology



however, specified that the government's expectations included "maintaining the quality of services to students at levels similar to those of 1991/2." Also, although measures of what students have learned in programs (or how they have benefited from them) are not a component of the funding calculation, they can still influence the program profile negotiations. When possible, in recommending whether a program should continue to be funded, ministry staff consider any available information they have on quality, such as student and employer satisfaction surveys and the results of external evaluations or accreditation reviews.

We believe that a direct link between quality and funding would have several benefits. It would signal that quality and accountability for quality are core values that the ministry is willing to pay for, just as it currently signals the importance of accessibility and efficiency. It would also allow the ministry to "close the loop" and evaluate the effect of its own activities. Many parts of the college system believe quality is driven by resources, and fear that ministry efforts toward efficiency can harm quality. If the ministry can demonstrate that quality will not be sacrificed to efficiency, it may alleviate these concerns.

The idea of strengthening the links between funding and quality is not new; at least one American state has had such a link for more than a decade. Similar ideas have been discussed in the British Columbia system. The report of the BCHRD urges that "methods of

funding institutions be revised to increase the proportion of funding that is assigned to the attainment of specific objectives and outcomes consistent with institutional mandates and roles."

Recommendation 4: The ministry should examine ways to link its funding of colleges in part to the quality of the educational activities funded.

Encouraging Responsiveness

The funding formula, which is designed to fund the delivery of existing programs and organizational structures, does not encourage colleges to change them. The funding system does not directly encourage responsiveness and, in many ways, it encourages stability—in a sense the obverse of responsiveness.

The majority of college operating grants are for delivery of programs currently in place. Activities such as institutional research and long-term planning, which aid colleges to responsively determine their future program delivery, are not explicitly funded. However, the program profile process allows colleges to shift FTEs from one program to another, in response to changing needs. To aid these shifts, the ministry helps with startup costs in the first year of a new program, and, on a case-by-case basis, may pay for costs related to shutting down an old program.

On the other hand, although it is not emphasized in the ministry's formal statements, stability is widely recognized as an implicit goal of the system. In the 1991 study mentioned above, most



colleges stated that they thought stability was the first goal of the college system, and the ministry commented, "In a downturn, stability tends to take on more importance. Generally efficiency and stability are the key."

The funding process has several traits that support stability. For example, proposed improvements in the formula have not been implemented where they could have resulted in major changes to the relative funding allocation among colleges. Non-formula grants are often used to supply funding stability to small or multi-campus institutions that do not meet the economy-of-scale criteria used in developing the funding formula.

The BCHARD project report suggests a useful concept: stability as a needed transitional value in order to achieve responsiveness. It states: "Appeals for change are . . . sometimes seen as threats to the level of institutional stability that is necessary to ensure quality performance. . . . We must provide the stability and predictability that will encourage change for greater responsiveness."

The BCHARD project's approach may result in a reconciliation of the ministry's formally stated goal of responsiveness and the system's implicit bias towards stability. However, at present the funding system does not appropriately encourage responsiveness.

Recommendation 5: The ministry should examine whether its stated goal of responsiveness is sufficiently supported by its

present funding methods, and modify those methods as necessary.

Encouraging Comprehensiveness, Occupational and Economic Development, and Social Development

The program profile process is the tool used to allocate existing and new student spaces in order to achieve government and college objectives. It has been effective in directing new spaces to specific areas related to social development, such as increased access for literacy training and increased access for First Nations people. Similarly, it has been used to direct funding to specialized programs of province-wide economic value. However, there are instances where the funding system can hamper the achievement of the goals of comprehensiveness, occupational and economic development, and social development. The ministry has alleviated this, somewhat, through adjustments in the funding formula.

The funding process focuses on utilization as a primary measure of performance. Programs that, by their nature, have comparatively low utilization, may be penalized by this focus. Some vocational and career-technical programs, for example, are single-entry programs, in which a group of students enter together and progress through a program for up to two years. Each step in the program depends on mastering the previous step, so dropouts cannot be replaced by new students part way through the program. Any dropout reduces the utilization for that program.



In contrast, academic programs are usually divided into terms or semesters and have frequent entry points. Early dropouts can often be replaced from a waiting list. Enrollment is not as limited by work space: if 35 students sign up for a course planned for 30, they can often be accommodated at little extra financial cost.

All of this means that utilization as a measure tends to favor academic programs over the vocational and career-technical programs so important to the goal of occupational and economic development. This can work against the goal of comprehensiveness.

The ministry has to some extent mitigated this through

several technical changes in the formulas for funding vocational and career-technical programs. Also, ministry policy may have an effect: although the Access for All initiative gave greater emphasis to academic programs than to other programs, this balance is now being adjusted (see the previous section, on Planning and Coordinating).

Recommendation 6: The ministry, working in consultation with the colleges, should examine its funding processes to see whether the relative encouragement they give to academic and non-academic programs corresponds with current policy and the stated goals of the system.





Monitoring

During our audit we reviewed how well the ministry measures the achievements of the college system against the ministry's goals and objectives for the system, and how well it responds to the information so obtained.

Conclusion

The ministry appropriately collects and responds to information on two important measures of college system achievement: how colleges contribute to their students' success in work and further education; and how students progress through the college system. However, as is the case in many jurisdictions, it receives little information on another important measure of achievement: what students have learned by attending college. This is not unexpected given the difficulty of defining and measuring achievement in post-secondary education. Despite this, we believe this information is essential if decision-makers are to know whether scarce resources are being spent in a way that produces the most public good.

The information the ministry collects on college resources, costs, and internal processes is sufficient for the ministry's oversight role. However, without interpretation, the information cannot be used to make comparisons between colleges. This weakens the ministry's ability to examine and report on the cost-effectiveness of the college system as a whole.

The Difficulty of Monitoring

Measuring achievement in post-secondary education is a difficult task for several reasons:

- Deciding what achievements to measure is difficult because there is little consensus on priorities among the purposes of education.
- Colleges offer a wide range of programs, each with different measures of achievement.
- Many colleges strive to open their programs to everybody with a desire to learn, so definitions of achievement must be useful for students at different levels of past achievement.
- Defining the elements of the education process precisely enough that they can be objectively measured is technically complex.
- Modifying or replacing existing information systems in order to better measure achievement can be costly.

Why Monitoring Is Important

Despite the cost and difficulty, monitoring of college achievements is essential. With scarce resources and a range of contending services, public decision-makers need to know what mix of services produces the most public benefit. Similar information is essential for good accountability: significant amounts of public funds are being given to quasi-autonomous institutions in exchange for desired

results, so the results need to be reported. Furthermore, the "products" of education are intangible and multi-dimensional (social, economic, personal); without monitoring it is difficult to judge whether the desired results have been attained.

Measures of results are also essential for successful management of the college system. Without such measures, the private, personal-interaction nature of classroom teaching tends to move the system toward circular assurance, where defining goals, delivering service, and judging results are all done by the same person, group, or institution.

Finally, a public education system needs to measure and report its achievements to maintain credibility with its public. A system that espouses, in its teaching, values such as openness and objectivity should demonstrate those values in its own activities.

Accountability Framework

The British Columbia college system has recognized the need for measuring and reporting on its achievements. In an effort to improve monitoring and accountability, it has recently developed an accountability framework, defining what information colleges need to gather and report. The purpose of the framework is to:

- allow college administrators to explain college performance and plans to their boards, in a fair, complete, and relevant way;

- provide a basis for college accountability to the ministry, the legislature, and the public; and
- provide an internal tool for colleges, to focus their thinking and discussions.

The framework was the work of a task force of college, institute, and government representatives, supported by a research team and with some technical assistance from the Canadian Comprehensive Auditing Foundation and the Office of the Auditor General of British Columbia.

The task force's report, entitled *Reporting on Effectiveness in Colleges and Institutes: A Proposed Accountability Framework for the British Columbia Public System*, was issued this spring. Copies have been sent to colleges, governments, and other stakeholders across Canada. Several British Columbia colleges and institutions are preparing to pilot the framework; the ministry is helping to fund the pilots. Further, the minister's 1993/94 funding letters to college boards strongly encourage them to adopt a common accountability framework in the near future.

What Can Be Monitored

Results have two parts: outputs and outcomes (Exhibit 2.4). "Outputs" are what processes directly produce and what the producing organization has most influence over. For example, an important output of a college is the knowledge, skills, and attitudes its students have acquired by going to



college. "Outcomes" are the net effects of the processes in the outside world. An important outcome of many college programs is that graduates of the program are successful in the work force—they are hired, kept on, or promoted because of what they learned at college.

Monitoring College Resources

Resources include the funds that the ministry provides and the educational resources (such as instructors, classrooms, and libraries) that colleges purchase with these funds (Exhibit 2.4).

The ministry monitors colleges' use of funds in three ways. First, because the *College*

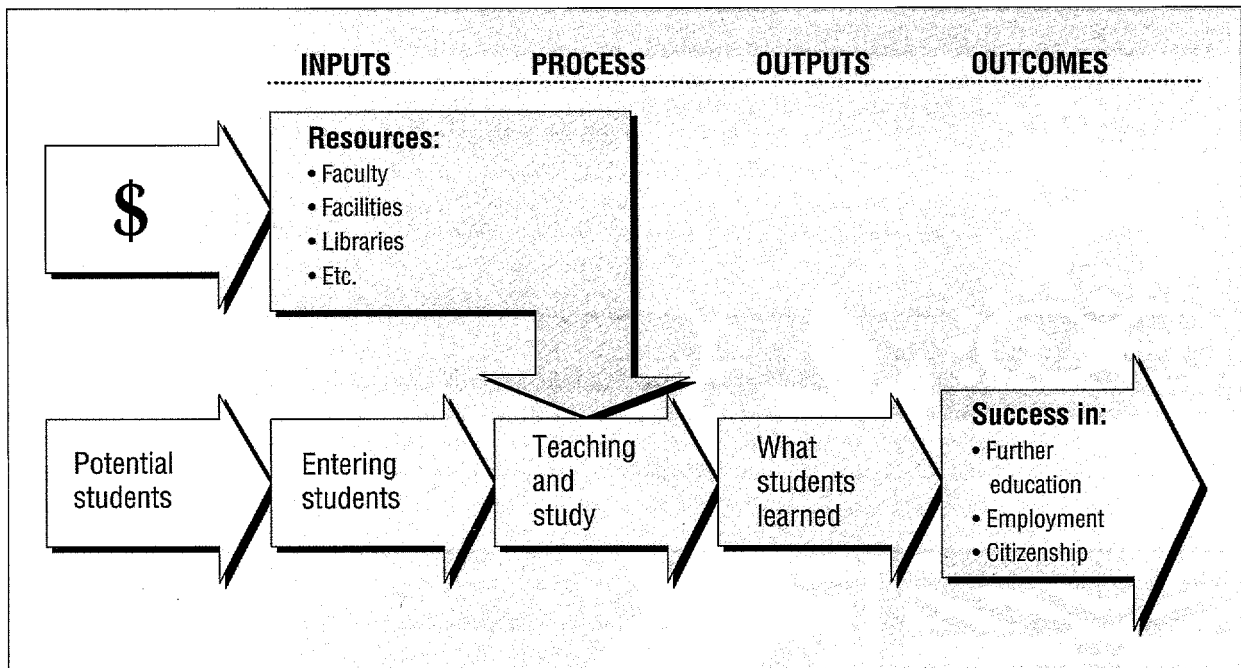
and Institute Act specifies that colleges cannot incur deficits without ministry approval, the ministry reviews each college's audited financial statements to see that it did not overspend.

Second, colleges must supply financial information in a format that allows the ministry to produce an analysis and comparison of expenditures. This information is used mainly by colleges, although ministry staff also use it. The ministry considers this information to be a useful starting point for analysis by college specialists, but without interpretation it cannot be used to make comparisons between colleges. This weakens the

Exhibit 2.4

Potential Monitoring Points for Measuring System Achievements

Indicators that can be used to measure system achievements



Source: Prepared from a review of literature on educational evaluation



ministry's ability to examine and report on the cost-effectiveness of the system. The ministry is currently improving its system for collecting this financial information.

Finally, as discussed earlier, the ministry collects detailed information on program utilization, which is a measure of how many student places colleges were able to generate using their funds, and how many of these student places they were able to fill.

The ministry collects and publishes statistical information on college instructors, the most important educational resource. This includes information such as age, gender, and level of education, but not qualitative information such as instructor evaluations. The ministry also collects information on classrooms, including their utilization rates, as part of its capital funding process. It does not collect information on other educational assets such as college libraries.

The ministry's limited role in directly examining educational resources and cost information is consistent with its decision to leave colleges responsible for their own internal operations. However, we think the limited information it gathers weakens the ministry's ability to monitor, and account for, the relation between the system's inputs and its achievements—that is, its cost-effectiveness.

Recommendation 7: The ministry should ensure that colleges collect and report information on resources expended and results obtained, in a form that allows colleges to compare

their own programs against the best practices in similar programs at other colleges.

Examining College Processes

Having appropriate resources does not guarantee that a college will achieve its intended results. To determine this, the ministry must also see if the college has effective processes for making use of these resources.

Colleges are complex entities, so examining their processes is not a simple task. Two methods are commonly used to overcome this complexity: institutional evaluations, and monitoring of information on student progress through the college system.

Institutional Evaluations

Institutional evaluations are wide-ranging periodic examinations conducted by and for colleges. Their primary purpose is to find ways of improving and renewing a college using its existing resources. Reporting to the public and the ministry is secondary.

An institutional evaluation has three parts. The first is a series of program reviews, entailing examinations by a college of its educational programs or support systems. The expectation is that each college will examine all its significant programs or support systems over a five-year cycle.

In the second part of the evaluation, done every five years, each college does a college-wide self-study, which may build on the results of the program reviews. A team of college staff decides the focus and method of the self-study, manages the study, and reports its



findings and recommendations to the college.

The third part of the evaluation is an external review by a team of experts from other colleges in British Columbia and elsewhere. These individuals validate the self-study and comment on the quality control processes of the college. A provincial steering committee, which chooses the external review team and sets standards for the internal self-study, also reviews the reports of the self-study and the external team. The ministry's role in institutional evaluations is limited to having a representative on the steering committee to make sure the evaluation is occurring in each college and is as rigorous and consistent as possible.

We believe the ministry's limited involvement in institutional evaluations is appropriate, and avoids the risk that more intensive scrutiny would have a chilling effect on the colleges' willingness to frankly examine their own activities as part of an internal process of renewal and improvement.

Monitoring Student Flows

The ministry and the colleges have together developed, and are continuing to improve, a useful system for gauging the performance of the college system by examining student flows through that system.

"Flow" information is used to examine how students move through the post-secondary education system, from enrollment to course completion. It includes information on how long students

spend in each stage of their education, how many complete a program, and how many leave a college before completing their program.

Monitoring how students move through the college system is important. One reason is efficiency. All else being equal, it is better if a student achieves his or her desired educational goal in the shortest time possible, thus freeing college resources to serve other students.

More subtly, measures of student flow can indicate problems within the colleges. For example, a high dropout rate may signal problems in the selection or counseling of students or in the appropriateness of teaching methods. A discussion paper of the B.C. Council on Admissions and Transfer commented that the "obstinacy of attrition statistics . . . raises fundamental questions about the relevance and adequacy of some prevailing instructional and institutional structures and styles."

Interpretation of information on student flows requires some care. It is important to know student intentions before reaching conclusions. For example, some students enter university-transfer programs intending to stay only a year, or only to take certain courses. For such students, non-completion of the two-year university transfer program is not a failure. Also, one way that colleges strive toward the goal of accessibility is to accept students who might not be able to enter highly selective institutions—students who have a higher chance



Courtesy of Ministry of Advanced Education, Training and Technology

of failing to complete their programs. In such a situation, a relatively high dropout rate does not necessarily indicate an unsuccessful program.

The ministry collects and releases information on student flows, publishing, for example, statistics that give a snapshot of enrollment in each college. It also supports the Link File, an information partnership created in 1987 to foster research on the flow of students into and through the post-secondary education system. Partners in the Link File include the post-secondary institutions, the ministry, and the Ministry of Education. The B.C. Council on Admissions and Transfer, and other groups, conduct studies on student flows using information from the Link File.

Monitoring Learning

The ministry does not receive direct information on the learning outputs of the system it funds; that is, measures of how much students have learned—knowledge, skills, and attitudes—as a result of attending college. These are important, but hard to measure.

To be most useful, learning output measures should focus on value-added, or differential learning—how much the student has learned *as a result of the college's efforts*. This is not a minor detail: students are often working or taking other training while in college, so new knowledge and skills do not necessarily result from the college's efforts. Also, for younger students, the process of maturing may contribute



significantly to their knowledge, skills, and attitudes during the time they are in college.

Measuring differential learning adds to an already difficult task, requiring measurement of what a student knows both before and after college. A common, but second-best, choice is to measure what a student knows after college. This is a confusing mixture of what the college contributed, what the student already knew, and what the student learned while in college but not as a result of college. One risk of this approach is that it can encourage institutions to admit students to a program only if they already have high levels of achievement. Doing this would be contrary to the ministry's goal of accessibility.

A few programs, such as for apprenticeship leading to national certifications, have external examinations of what students have learned. For most programs, however, the judgment of whether student learning is sufficient takes place in the institution, and the ministry receives no direct information about what students have learned from college.

We believe the ministry should know how well students have improved their knowledge, skills, and attitudes as a result of the college activities it funds. Although evaluating student learning is technically difficult, a few other jurisdictions have had success in collecting measures of student learning. What is needed is an integrated approach to collecting such information and using it as an important management tool in the college

system. The BCHRD project makes a similar point:

"Competencies gained or augmented through education or training . . . should be a measure of success of our learning institutions [T]esting and evaluation for competency should be utilized more extensively."

Measuring learning is important even though information is collected on student success after college (discussed below), since that success can be affected by outside events. For example, an industry slump may mean that few graduates of a program get jobs in their field on graduation, even though the program had prepared them well.

Recommendation 8: The ministry should develop methods for determining that the college programs it funds contribute appropriately to the knowledge, skills, and attitudes of students completing those programs.

Monitoring Success After College

How graduates later apply what they gained at college is an important part of any examination of colleges' achievement. Colleges can affect the lives of their students in at least three important areas: further education; employment; and citizenship (Exhibit 2.4).

The ministry does not collect or receive information on how college education contributes to citizenship; that is, to social development. However, in concert with the colleges it has placed British Columbia in the forefront of examining the short-term effects of colleges on their students'



success in the work place and in further education.

Employment

British Columbia colleges survey their recent graduates each year to find out how well college prepared them for the work force. This College Student Outcomes survey is another example of colleges and the ministry working together cooperatively. Each college carries out its own survey, using a common survey method. The ministry funds the work of a joint committee that compiles, analyzes, and publishes the province-wide results.

Currently, the survey covers students who have recently completed a career or vocational program, or who recently completed at least some academic studies but did not return to the college within a year. Its focus, therefore, is to look at the immediate benefits of college education, rather than the long-term effects.

The survey asks graduates about job placement (are they employed, and, if they are career or vocational graduates, are they employed in a training-related job), about transfers into further studies, and about satisfaction with their studies. The province-wide survey report summarizes this information, and also presents related information from a federal survey of graduates.

One limitation of the survey information is the difficulty of getting enough responses to allow detailed analysis. The limited information means that conclusions are reported only for

the province as a whole, not for individual colleges. Also, career and technical programs are reported as broad groups, making trends in specific programs hard to discern. The joint committee that manages the survey is examining ways to increase the response rate cost-effectively, so that more detailed information can be derived from the survey.

Another source of information on student success in employment is the Client Survey Project, whose results were reported in 1992. This survey was commissioned by the ministry as part of its support for the BCHRD project. Done in cooperation with the Ministry of Education, the survey collected information on the aspirations and expectations of high school graduates, first-year post-secondary students, apprentices, employers, and college students in Adult Basic Education and English as a Second Language programs.

Further Education

The ministry has two sources of information on college graduates pursuing further education: the Link File and the College Student Outcomes survey. The Link File provides one measure related to how colleges contribute to their students' success in further education: students' Grade Point Averages in the institution where they are continuing their education. Also, the College Student Outcomes survey indicates the percentage of academic students who have moved on to further education.



Citizenship

"Citizenship" is a convenient label for a range of social and cultural benefits of education—what the ministry in its goal statements calls "social development". Citizenship benefits are an important requirement in today's complex world. With the increasing complexity of social, cultural and ethical questions, the college system is confronted with the challenge of helping citizens meet continuing and changing individual and societal needs. Indicators of citizenship considered in the literature on post-secondary education, and to some extent examined elsewhere, include measures of activities such as voting, holding office, or involvement in voluntary organizations. Other measures look at attitudes related to citizenship: for example, does attendance at college make students less biased, more tolerant of their fellow citizens, and more likely to seek peaceful resolution of disputes?

Citizenship benefits are especially important in a publicly-

funded educational system. If most of the benefits of college education accrue directly to the student, there is an argument for letting the student pay for that education. On the other hand, if colleges help us become a more civil, a more democratic, a more participative society, that is a powerful argument for their continued public support.

Currently, the ministry does not collect or receive information on how college education contributes to citizenship. Defining and measuring citizenship benefits is a technically difficult task. Nonetheless, we believe it is important to know how well the publicly funded education system is meeting its goal of social development.

Recommendation 9: The ministry should explore ways of monitoring the citizenship benefits of college education, as a measure of how well the system is meeting the ministry's goal of social development.





Accountability

Our audit examined how well the ministry reports on college system performance to legislators and other stakeholders.

Conclusion

The public and legislature do not receive adequate information on the performance of the college system. However, the ministry is encouraging colleges to adopt a common accountability framework that could help give the public and legislature the information they need.

Current State of Accountability Reporting

Accountability is a keystone of democracy. The consent of the governed is only meaningful if the governed know what they consented to.

Achieving accountability is not easy. It depends first on achieving good monitoring; institutions cannot report what they do not know. Furthermore, the natural tendency of institutions is to report on effort—because they know and are proud of how much effort they put into the job—rather than accomplishment, which can take a long time to achieve, and which can be affected by forces outside their control.

The ministry can fulfill part of its accountability responsibility by ensuring that colleges report appropriately to their stakeholders. We found that most college accountability documents give some information about their mission statements, plans, and objectives. However, there is little

information on student outputs or outcomes, or on whether outcomes are achieved at reasonable cost. We conclude, therefore, that the ministry cannot at this stage rely on college reporting to meet stakeholders' needs for college system accountability.

Ministry annual reports give information about its mission statement, plans, and objectives, but little on student outputs, or the cost of producing them. However, they do include useful outcome information from the College Student Outcomes survey. The latest ministry annual report (1991/92) goes further, and discusses the Link File, the BCHRD project, and ministry activities in evaluating performance. It also gives a projection of ministry plans for the near future.

The college accountability framework discussed in our Monitoring section can also help to improve reporting. Colleges who organize their information collecting around the framework will have a complete and consistent format for their reporting. Further, we believe the ministry can both promote college adoption of the framework and improve its own reporting by structuring that reporting around the framework.

Recommendation 10: The ministry should make use of the college accountability framework in structuring its own system-wide reporting.





Ministry Response

The Ministry of Skills, Training and Labour (formerly the Ministry of Advanced Education, Training and Technology) welcomes the Auditor General's report on its Value-for-Money Audit of College Operations.

At the outset the Ministry would like to commend your office for the manner in which the audit was undertaken and for the quality of the work. The Ministry thinks the Value-for-Money audit was done very professionally and we can see real benefits resulting from the review.

In order to put the Value-for-Money Audit in perspective, College Operations is a subset of the Universities, Colleges and Institutes (U.C.I.) Division of the Ministry. The U.C.I. Division provides leadership, coordination and funding for the Advanced Education System which consists of four universities, 15 community colleges, four provincial institutes and the Open Learning Agency. For the period under review, the 1992/93 fiscal year, the total budget for the System was \$1,163,686,600 including Program Management, Advanced Education Programs, University Matching and Capital Debt Services (1992/93 Estimates). During the 1992/93 fiscal year the staff involved in the management and administration of this entire budget consisted of fifty (50) full time equivalent staff and twelve (12) contractors who were subsequently converted to full time equivalents as a result of the Korbin Commission review of the public service. The budget for the College Operations subset is approximately \$344,000,000, or slightly under 30% of the total Divisional operation.

The Ministry's interpretation of the Value-for-Money Audit Report is

that the taxpayers of British Columbia are receiving good value from the College Operations segment of the Ministry. It is also recognized that with additional resources the Ministry could undertake a number of further activities, some of which have been outlined in the report. Furthermore, the Ministry is pleased to note that the audit report indicates we should carry out an expanded role with none of our current activities curtailed or deleted.

The Ministry strongly believes that the colleges of British Columbia and College Operations segment of the Ministry are the best in Canada and are among the best in North America. This point is substantiated by the findings of a recent study conducted by the Canadian Federation of Independent Business which found that 86.3% of employers were very satisfied with the graduates of B.C. colleges. This is the highest satisfaction level in Canada with the national average being 54.1%. In addition both the colleges and this Ministry are working at the leading edge of accountability issues through their heavy and direct involvement in the development of a college Accountability Framework. This work is being undertaken in conjunction with the Canadian Comprehensive Auditing Foundation.

Planning and Coordinating

The audit report notes that the Ministry has specified eight high-level goals for the college system and has laid out clear operational objectives for two of these goals (accessibility and efficiency) which is taken to conclude that clear operational objectives are not laid out for the remaining six of these goals (quality, responsiveness, comprehensiveness,



occupational and economic development, social development and accountability).

While the Ministry agrees that more detail can be provided with respect to these goals, it is important to note the communication process we already undertake. Many consultations do occur with colleges to more fully define our goals. In addition, letters and speeches by the Minister, Deputy Minister and Assistant Deputy Ministers are further means frequently used to specify operational objectives. Nonetheless, the Ministry agrees that more should be done to ensure greater clarity for each of our goals. To this end the Ministry is currently undertaking a renewed strategic planning exercise with a view to providing more guidance to the college system.

Ongoing Program Review

The audit report contrasts the rigorous approval process for new programs with the less consistent review of ongoing programs. While the Ministry agrees in principle that a more formal, rigorous and consistent review of ongoing programs should take place there are over 300 different programs taught within the colleges of the province. To conduct the type of review of ongoing programs that is done for new programs would require, even on a three or four year rotational basis, significant resources that are beyond those available to the Ministry. The report correctly points out that the Ministry constantly monitors the appropriateness of programs from a provincial perspective while colleges, in response to constrained funding, student demand and employer satisfaction, conduct their own reviews of ongoing programs.

Funding and Quality

The audit report is complimentary of the Ministry's

funding processes however, it does note that quality is not a component of the funding calculation. The Ministry believes that the quality of education a student receives is important and uses the College Outcomes Survey as an indirect assessment. However, the Ministry has faced significant difficulty in finding the resources or developing the methodology to fully incorporate quantitative measures of quality into the funding equation. Our research indicates that there are no other jurisdictions in Canada employing methodology to measure and generate such factors. Those methodologies employed in the United States are either very similar in approach to the College Outcomes Survey or produce extremely controversial and inconclusive results.

The resources issue is simply that if the methodology were available to quantify student quality information, our very crude estimate is that it would require significant resources beyond our present levels to develop, implement and utilize properly.

Measures of Student Learning

The report also notes that what students learn is not directly measured by, or reported to, the Ministry. Once again the Ministry is faced with issues of methodology and resources. There are very, very few jurisdictions that gather and utilize this information. An economical way of performing this task is not known. Those that have gathered such information have found the resources required to do so are significant. The Ministry is confident that our current level of resources would not allow us to perform this task and adequately discharge our other responsibilities. Further, as noted earlier, the Canadian Federation of Independent Business found employers in British Columbia to be very satisfied with the graduates of our system. Faced with competing



priorities for our available resources, the Ministry is reluctant to make change without evidence that improvement is needed.

Accountability

In addition to encouraging the colleges to adopt a common accountability framework, the Ministry and the Council of Chief Executive Officers (College Presidents) recently agreed to embark on a project leading to the development of a Ministry accountability framework.

This framework will be coordinated with the college accountability framework to assist the Ministry in reporting on the effectiveness of the college system.

We are pleased to have the opportunity to respond to this Value-for-Money audit report. The Ministry found the review to be a good exercise, the results of which will prove of definite assistance in improving and developing future ministry monitoring, planning and communication activities.



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Value-for-Money Audits Completed to Date

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Regulatory Process for Special
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1993/94: Report 2

Ministry of Advanced Education,
Training and Technology:

Accountability Relationship
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Science Council of British
Columbia

Ministry Role in the College
System

1993 Annual Report

Ministry of Government
Services:

British Columbia Archives
and Records Service

Ministry of Energy, Mines and
Petroleum Resources:

Natural Gas Royalty Revenue:
Follow-up

Ministry of Attorney General:

Licensing and Control of
Public Gaming: Follow-up

1992 Annual Report

Ministry of the Attorney
General:

Family Maintenance
Enforcement Program

Ministry of Environment, Lands
and Parks:

Purchase of Environmental
Laboratory Services

Ministry of Social Services:

Programs for Independence

Residential Services

Managing Professional
Resources

Ministry of Forests:

Human Resource Needs and
Allocation

British Columbia Year of Music

Crown Societies

1991 Annual Report

Ministry of Forests:

Monitoring of Forest Roads

Monitoring of Timber
Harvesting

Monitoring of Major
Licensees' Silviculture
Activities

Ministry of Transportation and
Highways:

Highway Planning

Protecting Roads and Bridges

Monitoring of Maintenance
Contractors

Minor Capital Construction
and Rehabilitation Projects



The Industrial Incentive Fund:
An Audit of the Loans Process

1990 Annual Report

Ministry of Transportation and
Highways:

Road and Bridge Maintenance

Major Capital Projects

Development Approvals

Gravel Management

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Services, Facilities and
Attractions Signs

Annual Report

Privatization:

Monitoring Environmental
Laboratory Services

British Columbia Enterprise
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Land

Accountability of Crown
Corporations to the Legislative
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The Lottery Fund: An Audit of
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Reporting the Results of
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1989 Annual Report

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The Process

Early Initiatives

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Ministry of Health:

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the Legislative Assembly

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Ministry of Education:

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Ministry of Energy, Mines and
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Organization Structure

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Petroleum Resources Division

Mineral Resources Division,
Engineering and Inspection
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Government Purchasing

Ministry of Attorney General:

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Legal Services Branch

Management of Buildings and
Office Accommodation

Management of the Financial
Function

1986 Annual Report

Ministry of Lands, Parks and
Housing:



Crown Land Administration
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1985 Annual Report

Ministry of Agriculture and
 Food:

Strategic Direction and
 Accountability
 Financial Assistance
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 Financial Management and
 Control

Ministry Annual Reports

1982 Annual Report

Review of Internal Audit in the
 Government of British Columbia
 Expenditure Review (Travel
 Expenses)

1981 Annual Report

Ministry of Environment:

Waste Management Program
 Financial Management and
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Ministry of Forests:

Financial Management and
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Ministry of Health:

Financial Management and
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1980 Annual Report

Ministry of Human Resources:

Income Assistance Program
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Ministry of Education:

Financial Management and
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Ministry of Finance:

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Ministry of Lands, Parks and
 Housing:

Financial Management and
 Control



Appendix B

Office of the Auditor General: Audit Objectives and Methodology

Audit work performed by the Office of the Auditor General falls into three broad categories:

- Financial statement auditing;
- Value-for-money auditing; and
- Compliance-with-authorities auditing.

Each of these categories has certain objectives that are expected to be achieved, and each employs a particular methodology to reach those objectives. The following is a brief outline of the objectives and methodology applied by the Office for value-for-money auditing.

Value-for-Money Auditing

Purpose of Value-for-Money Audits

Value-for-money audits look at how organizations have given attention to value for money—to economy, efficiency and effectiveness.

The concept of value-for-money auditing is based on two principles. The first is that public business should be conducted in a way that makes the best possible use of public funds. The second is that people who conduct public business should be held accountable for the prudent and effective management of the resources entrusted to them.

The Nature of Value-for-Money Audits

A value-for-money audit has been defined as:

... the independent, objective assessment of the fairness of management's representations on performance, or the assessment of management systems and practices, against criteria, reported to a governing body or others with similar responsibilities.

This definition recognizes that there are two primary forms of reporting used in value-for-money auditing. The first—referred to as attestation reporting—is the provision of audit opinions on reports that contain representations by management on matters of economy, efficiency and effectiveness.

The second—referred to as direct reporting—is the provision of more than just auditor's opinions. In the absence of representations by management on matters of economy, efficiency and effectiveness, auditors, to fulfill their mandates, gather essential information with respect to management's regard for value for money and include it in their own reports along with their opinions. In effect, the audit report becomes a partial substitute for information that might otherwise be provided by management on how they have discharged their essential value-for-money responsibilities.

The attestation reporting approach to value-for-money auditing has not been used yet in



British Columbia because the organizations we audit have not been providing comprehensive management representations on their value-for-money performance. Indeed, until recently, the management representations approach to value for money was not practicable. The need to account for the prudent use of taxpayers' money had not been recognized as a significant issue and, consequently, there was neither legislation nor established tradition that required public sector managers to report on a systematic basis as to whether they had spent taxpayers' money wisely. In addition, there was no generally accepted way of reporting on the value-for-money aspects of performance.

Recently, however, considerable effort has been devoted to developing acceptable frameworks to underlie management reports on value-for-money performance, and public sector organizations have begun to explore ways of reporting on value-for-money performance through management representations. We believe that management representations and attestation reporting are the preferred way of meeting accountability responsibilities and are actively encouraging the use of this model in the British Columbia public sector.

Presently, though, all of our value-for-money audits are conducted using the direct reporting model, therefore, the description that follows explains that model.

Our value-for-money audits are not designed to question government policies. Nor do they assess program effectiveness. The *Auditor General Act* directs the Auditor General to assess whether the programs implemented to achieve government policies are being administered economically and efficiently. Our value-for-money audits also evaluate whether members of the Legislative Assembly and the public are provided with appropriate accountability information about government programs.

When undertaking value-for-money audits, auditors can look either at results, to determine whether value for money is actually achieved, or at managements' processes, to determine whether those processes should ensure that value is received for money spent.

Neither approach alone can answer all the legitimate questions of legislators and the public, particularly if problems are found during the audit. If the auditor assesses results and finds value for money has not been achieved, the natural questions are "Why did this happen?" and "How can we prevent it from happening in future?" These are questions that can only be answered by looking at the process. On the other hand, if the auditor looks at the process and finds weaknesses, the question that arises is "Do these weaknesses result in less than best value being achieved?" This can only be answered by looking at results.



We try, therefore, to combine both approaches wherever we can. However, as acceptable results information and criteria are often not available, our value-for-money audit work frequently concentrates on managements' processes for achieving value for money.

We seek to provide fair, independent assessments of the quality of government administration. We conduct our audits in a way that enables us to provide positive assessments where they are warranted. Where we cannot provide such assessments, we report the reasons for our reservations. Throughout our audits, we look for opportunities to improve government administration.

Audit Selection

We select for audit either programs or functions administered by a specific ministry or public body, or cross-government programs or functions that apply to many government entities. There are a large number of such programs and functions throughout government. We examine the larger and more significant ones on a cyclical basis.

We believe that value-for-money audits conducted using the direct reporting approach should be undertaken on a five- to six-year cycle so that members of the Legislative Assembly and the public receive assessments of all significant government operations over a reasonable time period. Because of limited resources, we have not been able to achieve this schedule.

Our Audit Process

We carry out these audits in accordance with the value-for-money auditing standards established by the Canadian Institute of Chartered Accountants.

One of these standards requires that the "person or persons carrying out the examination possess the knowledge and competence necessary to fulfill the requirements of the particular audit." In order to meet this standard, we employ professionals with training and experience in a variety of fields. These professionals are engaged full-time in the conduct of value-for-money audits. In addition, we often supplement the knowledge and competence of our own staff by engaging one or more consultants, who have expertise in the subject of that particular audit, to be part of the audit team.

As value-for-money audits, like all audits, involve a comparison of actual performance against a standard of performance, the CICA prescribes standards as to the setting of appropriate performance standards or audit criteria. In establishing the criteria, we do not demand theoretical perfection from public sector managers. Rather, we seek to reflect what we believe to be the reasonable expectations of legislators and the public. The CICA standards also cover the nature and extent of evidence that should be obtained to support the content of the auditor's report, and, as well, address the reporting of the results of the audit.