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OFFICE OF THE
Auditor General
of British Columbia

**A Review of the
Fast Ferry Project:
Governance and Risk
Management**

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A review of the fast ferry project: governance and risk management

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auditor general's comments



This is my fifth report to the Legislative Assembly for 1999/2000.

In mid-1994 the provincial government announced the construction of three fast car ferries for the British Columbia Ferry Corporation. By early 1999, considerable public attention was focused on the fast ferry project because it was seriously behind schedule and over budget. At that time I decided to examine the governance and risk management of the fast ferry project.

In some ways, this review was unusual for my Office. Rarely have we examined a program that is so much in the public eye, and one where others have recently examined and reported publicly on aspects of the program. However, although much information about the project had become public, it was still incomplete, and I therefore felt my Office could serve to fill important gaps in the public record.

Managing risk by employing established governance and project management principles and practices is at the center of discussion now taking place in the public sector. My Office has examined and reported previously on governance matters and on managing large public-sector capital projects. That experience provided us with a sound basis for reviewing this particular project.

Issues of risk and control are at the heart of any organization's success. Organizations that are governed and managed well accept risks knowingly, mitigate risks where appropriate, and endeavour to be prepared for the unknown. Because those in governance play a key role in an organization's success, considerable attention has been paid in recent years to developing principles and practices of good governance. This advice is intended to assist and guide those with governance responsibilities in exercising their duties.

Large capital projects have long been recognized to have significant inherent risks. They involve large sums and are challenging to manage, as they often are complex, involve new technologies, and require different skills than are used in normal business operations. Consequently,

project management techniques for large capital projects have been the subject of considerable study, and principles have been developed to assist those responsible for such projects.

These concepts have been brought to the attention of government in the past. My Office has issued a study on governance in Crown corporations that set out governance practices that others have found useful, and identified opportunities to improve Crown corporation governance in this province. We have also reported several times on the way government administers large capital projects, and have described in those reports the principles of good project management. Perhaps the most thorough evaluation of project management practices in this province was conducted by the Inquiry Commissioner into the Coquihalla and related highway projects. The Commissioner's report was critical of the management practices used on that capital project and offered concrete recommendations for improvement.

I am disappointed that government has chosen not to heed the prudent, practical advice that is available to it on how best to oversee undertakings such as the fast ferry project. Given that government is often forced to make decisions in the face of uncertainty, these concepts of governance and project management offer valuable insights into how to improve the chances of success and manage the risk of failure.

The report that follows provides much information on the past and present of the fast ferry project. I believe there are two lessons for the future.

The first lesson is about governance. The governance structure was complex, with many people and groups involved. Ultimately, however, it failed to safeguard those directly involved and other stakeholders. The decision to undertake the fast ferry project was not properly supported, and people were not informed when things began to go wrong.

Our review confirmed the findings of many studies on public sector governance, and of special reports like the "B.C. Hydro-IPC Review" (1997): it is imperative that assigned responsibilities be clear, and that those assigned a responsibility be allowed to carry out that responsibility without encumbrances or interference.

The second lesson is regarding project management. Construction of the fast ferries started before the scope, schedule and budget for the ships was firmly established. Indeed, these critical elements of ship construction were not managed in a disciplined way throughout the project. It seems self-evident, at least in hindsight, that first-rate project management techniques that mitigate risk are essential on any project of this magnitude. Having to carry out a project in a hurry is not an excuse to ignore good project management. On the contrary, a rush project—with many important steps being taken simultaneously—needs the highest level of project management to be successful.

Additionally, the principles of project management are most needed, and most valuable, at the genesis of a project. A clear recognition of how scope, budget and schedule interrelate, together with appropriately precise estimates of these three elements, are essential to sorting out potentially successful projects from superficially attractive ideas that have little potential for practical success.

This review involved a large number of agencies and other stakeholders, all of whom provided us with the information and explanations required to complete our review. We would note that the requirements for ensuring fairness to named individuals prolonged our work.

George L. Morfitt, FCA
Auditor General

Victoria, British Columbia
October 1999



highlights

In June 1994 the provincial government announced, as part of a 10-year capital plan for the British Columbia Ferry Corporation, the construction of three fast car ferries at a total cost of \$210 million. By building the ferries in British Columbia, the government hoped to meet BC Ferries' operational needs and, at the same time, revitalize the province's shipbuilding industry through the future export of aluminum fast ferries.

In January 1999, the government ordered two reviews of the fast ferry project: one dealt with the cost of the project and the other with technical aspects of the first ship. These reviews disclosed that the overall cost for the project would be substantially more than initially announced, and that the first ship was well-built but would not meet all of the performance specifications established at the outset of the project.

Purpose of Our Review

The purpose of our review was to assess whether the provincial government and its appointees exercised appropriate governance over the fast ferry project, and whether they appropriately examined and managed the risks surrounding the development of the project and the design and construction of the ships. In particular, we set out to determine whether the decision to undertake the project was properly supported, the project was managed well, and the project objectives are likely to be achieved.

Capital projects are not the only major business issues dealt with by BC Ferries' board and staff and other participants mentioned in this report. Nor was the fast ferry project the only capital project carried out by BC Ferries over the last five years. Our review did not examine, and this report does not comment on, these other important aspects of the work of providing ferry service to British Columbians.

The findings and conclusions included in this report are based on evidence available up to June 30, 1999. We performed the review in accordance with our Office's professional standards. These standards require us to carry out such tests and procedures as we consider necessary to obtain sufficient evidence to support our conclusions. In gathering this evidence we reviewed documents relating to the project produced by BC Ferries, its subsidiary, Catamaran Ferries

International (CFI), the Crown Corporations Secretariat, Treasury Board staff, and other agencies and interested parties. We also interviewed current and past senior management of both BC Ferries and CFI, current and past board members of both corporations, and other individuals who were involved with the fast ferry project.

Our Conclusions and Key Findings

Overall, we concluded that there have been significant breakdowns in both governance and risk management on the fast ferry project. In particular, we have the following key findings:

The decision to build fast ferries was not supported by sufficient information and analysis to demonstrate that the ferries would meet either BC Ferries' needs or the government's public policy goals in a cost-effective manner

The request to proceed with construction of fast ferries was made before there was sufficient information and analysis to demonstrate clearly that they were the best way to meet BC Ferries' needs. There were significant risks inherent in their construction and operation, but neither the board nor cabinet was provided with sufficient information about these risks. For example, the proposal presented to cabinet did not identify that the cost estimate included was optimistic (the risk of not meeting it was high), and that a slight increase in capital or operating costs would make fast ferries financially less attractive than conventional vessels.

In addition, there was no evaluation of the likelihood that an important public policy goal—rejuvenating the British Columbia shipbuilding industry through the export of aluminum ferries—could realistically be achieved.

In a draft 10-year capital plan of early 1994, BC Ferries' management identified fast car ferries as a concept needing further extensive analysis, and recommended carrying out route trials using a leased ferry. If the analysis proved positive, the corporation would then consider constructing two fast ferries, starting in 1996/1997. However, in March 1994, BC Ferries was directed to turn over further development of its capital plan to the Crown Corporations Secretariat. In the course of that development, the plan was significantly altered. For example, the new plan called for bypassing trials and constructing three fast ferries immediately. In our opinion,

the governance role of BC Ferries' board was compromised by its loss of control over its capital plan. Furthermore, because of the minister's timetable for having the plan approved by cabinet, the board was unable to give the plan sufficient consideration. The decision to proceed with fast ferries was, we believe, more a ministerial directive than a board decision.

An unrealistic timetable led to a rushed process: opportunities for re-evaluation were not taken, and reasonable project management practices were not applied

When the fast ferry project was announced in June 1994, cabinet's approval was contingent on there being opportunities for re-examining the proposal once better information was available and before significant expenditures and commitments had been made. However, we found that in practice, although several opportunities for re-examination arose, they were not taken.

Public announcement of the fast ferry project included a timetable of construction that called for completion of three ships in a little over three years—a schedule ambitious even for experienced fast ferry builders. The government's public commitment to this timetable led to many important steps in design and construction being rushed, and to reasonable project management controls being inconsistently applied.

In particular, the start of construction was premature: it began before drawings were sufficiently complete, before contracts had been agreed to with shipbuilders and before a realistic budget and schedule had been set. Major changes were made to the scope of the project, but the budget was never adjusted to reflect these changes or the schedule delays. Not systematically considering the effects of changes in costs, schedule and scope was a fundamental failing in project management.

The total cost for the project has risen to an estimated \$463 million (much higher than either the original \$210 million projected or the later increase to \$262 million approved by Treasury Board) and delivery of the ships is substantially behind the announced schedule. The three ferries were to be delivered between April 1996 and October 1997. In fact, the first one was not formally turned over to BC Ferries until March of this year, and the projected delivery dates for the second and third are fall of 1999 and summer of 2000.

Lack of information was a key characteristic of governance failures during the fast ferry project

Governance is the system of responsibilities and accountabilities set up to direct, monitor and report on the carrying out of corporate and government policy. While the governance process should have ensured that decision-makers at both BC Ferries and CFI received reliable, relevant and timely information, this did not happen—for the BC Ferries and CFI boards in particular. Members of both boards recognized they needed better information and tried to obtain it (for example, the CFI board tried repeatedly to obtain a reliable budget from its chief executive officer). However, in our opinion, the boards were not sufficiently forceful in ensuring they received the information they needed.

In one case, we found that the actions of BC Ferries' board actually worked against its need for more information. In setting up CFI initially, BC Ferries' board appointed to the CFI board three outside directors with specialized expertise relevant to the shipbuilding project. This initial board, and especially its three outside members, actively tried to obtain up-to-date cost and performance information. Such information was exactly what the BC Ferries board stated it wanted to receive from CFI. However, less than a year after being appointed, the CFI board members were asked to resign.

A major error of both the BC Ferries board and the second CFI board was to allow the same person to be the chief executive officer of the two corporations, and to lead the construction project. Thus, from late 1997 on, a single person had to serve the different interests of one company that was buying ferries in order to operate them, and another company that was building and selling them. Serving in these two capacities put that person in a position of being able to report on the project without there being an independent check on the information provided. If the boards had resolved this matter, we believe the financial difficulties of the project would have been detected sooner.

The fast ferries are unlikely to meet the major service expectations set when the project began, and their cost will further impair BC Ferries' financial health

Only after all three fast ferries are in full operation will their service delivery capability be known precisely. However, current information indicates that the expectations for travel time, carrying capacity and costs will not be met. In particular, capital and operating costs will be much higher than originally projected. The financial effects on BC Ferries will be significant.

BC Ferries' board and management have attempted for many years to have the government adopt a financial framework that would allow the corporation to make long-term financial plans to fund both its operating losses and its future capital expenditures—plans based on clear policies and commitments. So far these efforts have been without success. Given the deteriorating financial situation of BC Ferries—in part the result of the fast ferry project—the need for such a framework is now urgent.

In our opinion, the main cause of the problems of the fast ferry project lies in governance

For governance to be effective, all those assigned responsibility must have clearly defined roles and the opportunity to carry out those roles. In our opinion, lack of these key features was the main cause of the problems arising in the fast ferry project (detailed in our report, following). We commented in our November 1996 "Study of Crown Corporations Governance" that improvements in governance are needed in British Columbia's Crown corporations. The fast ferry project illustrates how much still needs to be done in this area.



we have three general recommendations

Recommendation 1: Governance

We recommend that the Province commit to putting the principles and practices of good governance in place for its Crown corporations—including, specifically, allowing Crown corporation boards to function effectively within their mandates.

The conditions that led to this general recommendation are discussed in “Chapter 2: Governance issues lie at the heart of most of the problems with the fast ferry project.”

Principles of Good Governance

Our 1996 study is only one of a number of reports and studies that have shown a high degree of consensus as to good governance practices.¹ One Canadian authority² summarized the main principles succinctly, when it said governing bodies should:

- be composed of people with the necessary knowledge, ability and commitment to fulfill their obligations;
- understand their purposes and whose interests they represent;
- understand the objectives and strategies of the organizations they govern;
- understand what constitutes reasonable information for good governance and obtain it;
- once informed, be prepared to act to ensure that the organization’s objectives are met and that performance is satisfactory; and
- fulfill their accountability obligations to those whose interests they represent by reporting on their organization’s effectiveness.

Two of the guidelines developed by the federal Treasury Board Secretariat (which, in turn, built on guidelines adopted by the Toronto Stock Exchange) are also particularly appropriate:

- the board of directors should ensure that the board can function independently; and
- in recognition of the importance of the position of CEO (chief executive officer), the board of directors of every Crown corporation should periodically assess the CEO’s position and evaluate the CEO’s performance.

¹For example:

- “The Report of the Committee on Corporate Governance”, London Stock Exchange et al., 1998, England.
- “Guidelines for Corporate Governance in Crown Corporations”, 1996, Government of Canada.
- “Corporate Governance: A Framework for Public Sector Bodies”, Chartered Institute of Public Finance and Accountancy, 1995, England.
- “Principles of Effective Governance”, CCAF-FCIV Inc., 1994, Canada.
- “Where Were the Directors: Guidelines for Improved Corporate Governance in Canada”, Toronto Stock Exchange, 1994, Canada.
- “The King Report on Corporate Governance”, Institute of Directors in Southern Africa, 1994, South Africa.
- “Guidelines for Corporate Directors in Canada”, Institute of Corporate Directors, 1992, Canada.

²CCAF-FCVI Inc., a Canadian research and educational foundation.

Recommendation 2: Project Management

We recommend that the Province require that proven project management practices be used on all significant capital projects.

This general recommendation arises from the findings discussed in “Chapter 3: Poor analysis at the beginning of the project, and excessive emphasis on haste throughout, significantly increased the risk of problems occurring.”

Good Project Management Practices

Frameworks for good project management are available in both the private and public sectors. For example, the Treasury Board of Canada has comprehensive policies, guidelines and requirements for managing capital projects undertaken by federal departments and Crown corporations. In the private sector, many companies have developed project management frameworks, and specialize in their application. Groups such as the Project Management Institute are also a source of project management principles and methods. Although these prescriptions come from a variety of sources, there is agreement on the fundamental principles.

The principles of good project management for large public sector capital projects were laid out in the 1987 “Report of the Commissioner Inquiry into the Coquihalla and Related Highway Projects.”

Particularly applicable to the fast ferry project are that report’s recommendations that there be:

- a disciplined evaluation process for new capital projects of financial significance, including the development of rigorously-prepared business cases, before a project is approved;
- periodic project cost estimates based on most probable costs, including all associated works required to make the project complete;
- rigorous project control procedures documenting formally approved scope, schedule and budget parameters; and
- a requirement that all project managers provide timely and accurate cost-reporting.

Recommendation 3: Framework of Expectations for BC Ferries

We recommend that the Province give BC Ferries clear, integrated, consistent and long-term direction on its performance expectations and then hold BC Ferries’ board and, through it, management responsible for meeting those expectations.

This recommendation responds to what we saw as the most fundamental issue discussed in “Chapter 4: Fast ferries will increase BC Ferries’ economic challenges, and may not achieve the public policy goals set for them.”

Providing Ferry Services Through a Crown Corporation

The idea of using Crown corporations to deliver publicly-provided services of a commercial nature is sound. Properly applied, such an administrative mechanism can be more cost-effective than direct service by government because it gives more room for the application of business practices. However, BC Ferries has not been allowed to apply these practices in an organized and consistent way.

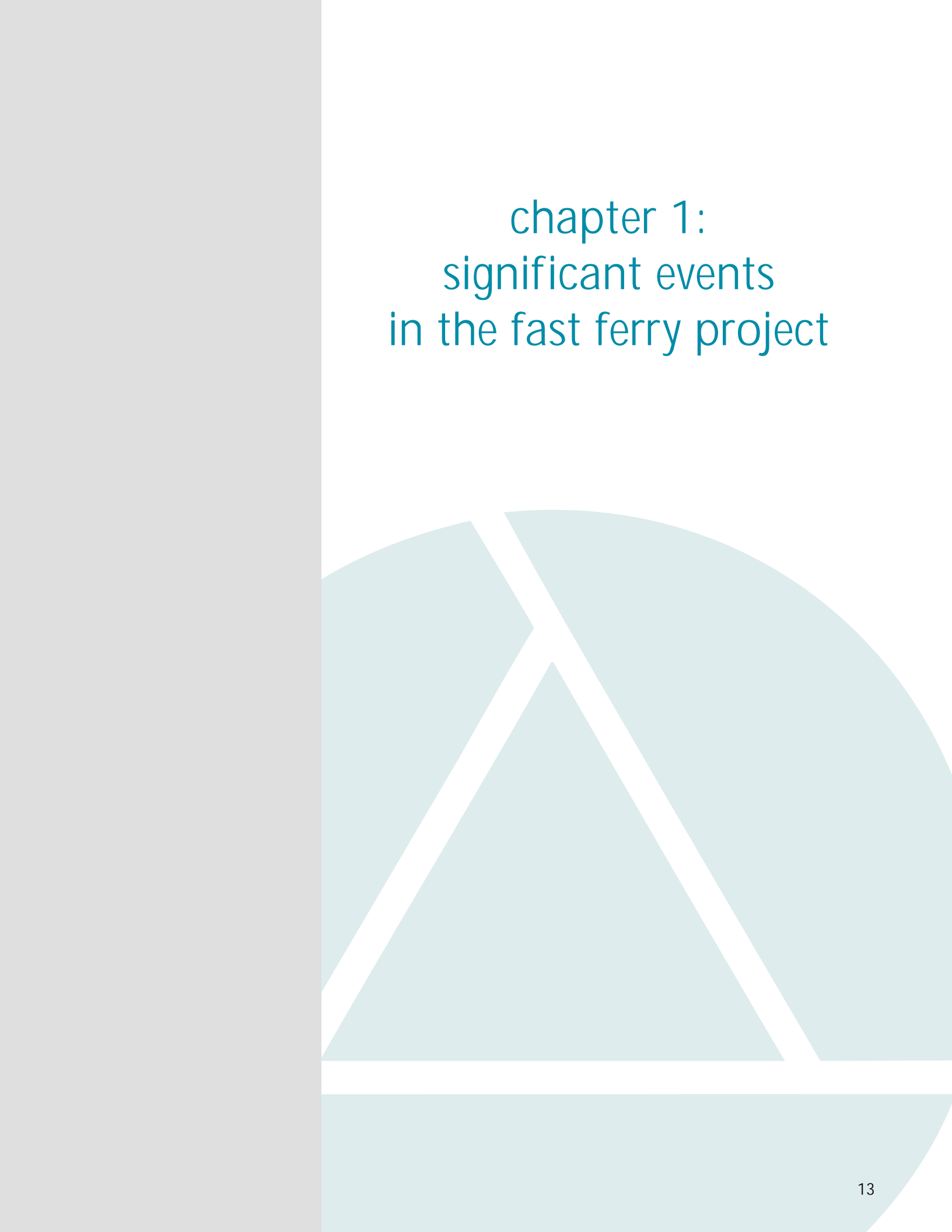
The Act setting up BC Ferries provides for cabinet, not the corporation’s board, to make most key decisions, including approving route additions or deletions, approving fares, tolls and other charges, and approving corporate borrowings. Also, since capital plans need cabinet approval and capital budgets need Treasury Board approval, construction of ferries or terminals is also ultimately a government decision. In short, the corporation does not have control over most significant decisions that affect its financial and operating performance.

Most key business decisions are made outside BC Ferries (and, at times, contrary to BC Ferries’ advice), by elected officials who also have responsibility for many other important areas of government. As a result, decisions about BC Ferries’ business are often ad hoc and lack consistency. For example, decisions about fares have not always been integrated with decisions about subsidies, routes, capital expenditures, or service levels.

This means that the government is unlikely to get the benefits of a Crown corporation approach—a serious disadvantage, given that BC Ferries operates an essential part of the province’s transportation system, and is vital to the social and financial well-being of many Vancouver Island and other coastal communities.

In 1981, the Select Standing Committee on Crown Corporations of the Legislative Assembly carried out a review of BC Ferries. Its report noted: “The future effectiveness of the ferry system would seem to require that the directors have somewhat greater control over these important aspects of their business. ...[The] present division of responsibilities between the Lieutenant-Governor in Council and the board creates a situation in which the clarity of the board’s mandate to plan, develop, and operate the ferry system is clouded.” In our opinion, the committee’s comments are still valid today.





chapter 1:
significant events
in the fast ferry project

significant events in the fast ferry project

In this chapter we lay out the key events that have occurred during the fast ferry project. As well, we have summarized the key events in Exhibit 1, and the main participants in these events in Exhibit 2. In the three chapters following we discuss the implications of these events.

The fast ferry project began as part of a comprehensive review of mid-island transportation issues coordinated by the Crown Corporations Secretariat

Early in 1992, a plan by BC Ferries to develop Duke Point as its primary mid-Vancouver Island terminal was deferred by the Province until there could be a comprehensive review of cross-strait traffic flows. In late 1992, the Crown Corporations Secretariat (CCS), in conjunction with BC Ferries and the Ministry of Transportation and Highways, began this review. Called the Mid Island Transportation Strategy, its goals were to:

- provide an acceptable level of ferry service at an acceptable cost;
- relieve terminal congestion at Nanaimo;
- divert commercial vehicles and dangerous cargo from the Departure Bay terminal;
- coordinate planning among the agencies providing transportation services;
- provide an adequate level of transportation services at the lowest level of negative social impacts; and
- coordinate with other major transportation initiatives.

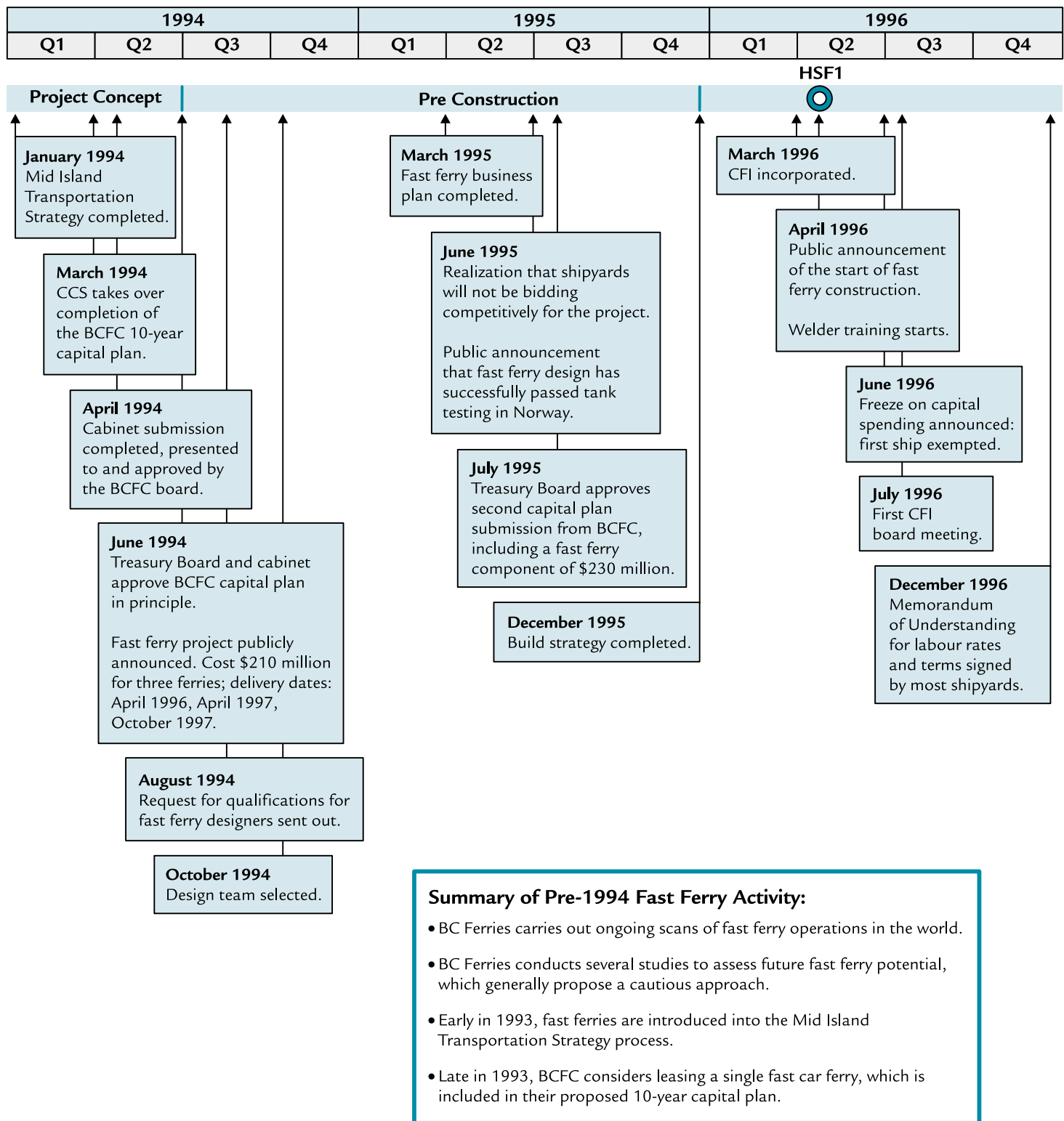
Four basic strategies for locating primary mid-island ferry terminals were considered. These ranged from continuing to use Departure Bay for both the Horseshoe Bay and mid-island routes, to closing Departure Bay and replacing it with two new terminals.

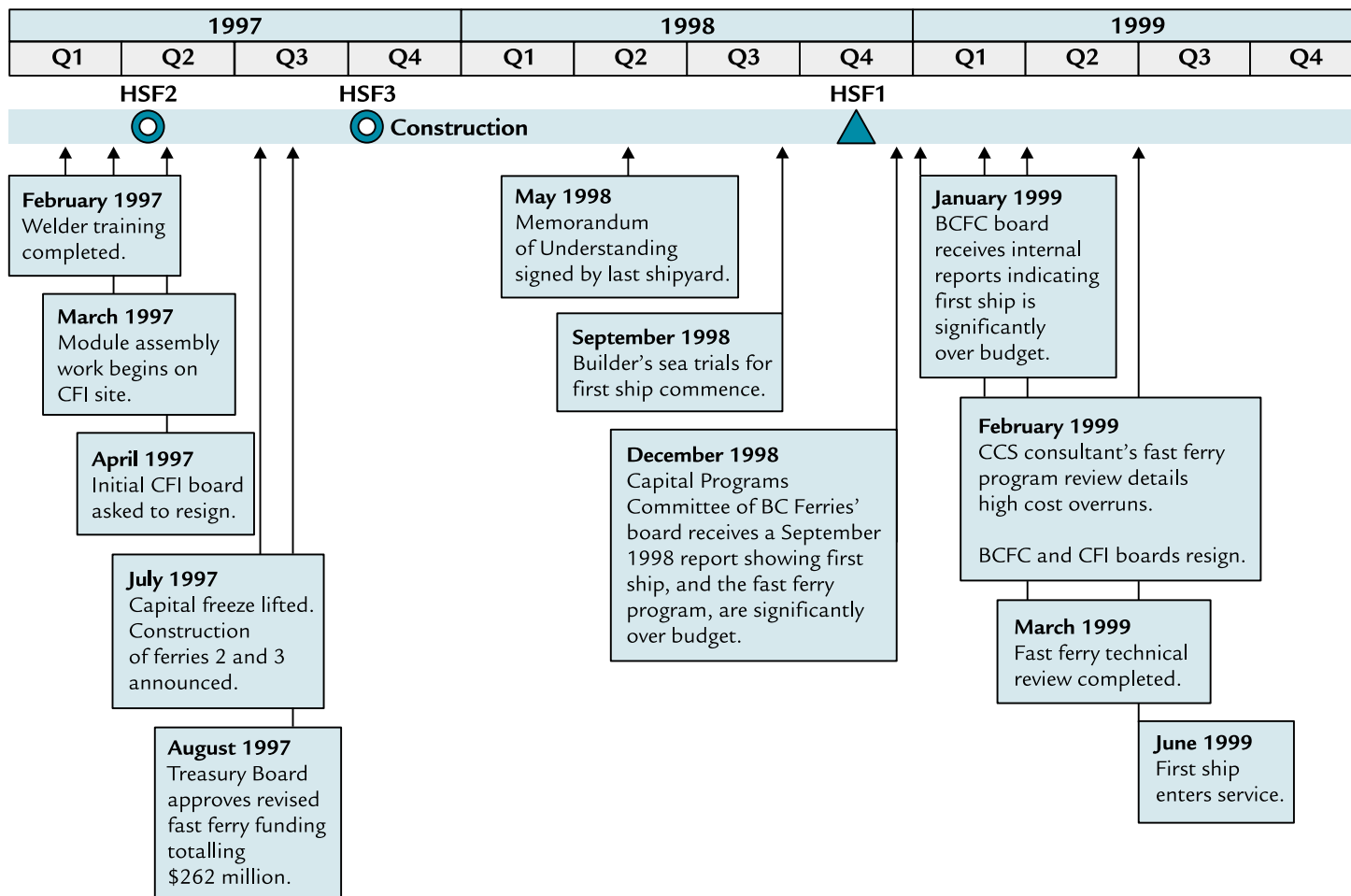
Scenarios were developed for different combinations of terminal locations, access roads and schedules. Included in each scenario were ways to manage demand, such as charging higher fares during peak usage, restricting commercial vehicles on some routes, or instituting vehicle reservation systems.

The strategies were compared using a multiple-accounts analysis, which examined their financial effect on the Province, their potential for long-term sustainable economic development,

Exhibit 1

Fast Ferry Program–Timeline of Significant Events and Dates





Legend:

- BCFC - British Columbia Ferry Corporation
- CCS - Crown Corporations Secretariat
- CFI - Catamaran Ferries International
- HSF - High-speed ferry

Target delivery dates, as at June 29, 1994
 Actual ship completion date

Source: Compiled by the Office of the Auditor General of British Columbia

Exhibit 2

Fast Ferry Program—Timeline of Key Officials

Year	1993	1994	1995	1996	1997	1998	1999 - up to June
BC Ferry Corporation							
Minister Responsible	1	2	Glen Clark, Employment and Investment	Dan Miller, Employment and Investment	Dan Miller, Energy, Mines and Northern Development	Dan Miller, Energy, Mines and Northern Development	Gordon Wilson, Minister for Aboriginal Affairs and BC Ferries
Chair of the Board		Maureen Headley			Curtis Eaton		Michael Francis
President and CEO	Frank Rhodes	Mike Martin (Acting)	Frank Rhodes			Tom Ward	3 Bob Lingwood
Vice President, Engineering and New Construction			Tom Ward			Ellis Meads	
Catamaran Ferries International							
Chair of the Board				Lucille Johnstone		Jack Munro	Graham Clarke
CFI President and CEO					Tom Ward	3	Bob Lingwood 4
General Manager					Andy Hamilton	John Wells	Gavin ⁴ Cooper
Crown Corporations Secretariat							
Minister Responsible	Glen Clark, Finance and Corporate Relations	Glen Clark, Employment and Investment			Dan Miller, Employment and Investment		Andrew Petter, Advanced Education Training & Technology, Intergovernmental Relations
Senior Official (Deputy Minister or Equal)	Bob Williams	Frank Rhodes	Doug Allen		Lawrie McFarlane		Don Avison

Notes:

- 1 Glen Clark, Finance and Corporate Relations, to March 10, 1993.
- 2 Art Charbonneau, Transportation and Highways, March 10, 1993 - September 15, 1993.
- 3 Phillip Halkett served in these positions from January 17 - February 5, 1999.
- 4 Gavin Cooper was the acting General Manager of CFI from March - June 1999, and was appointed President and General Manager on June 9, 1999.
- 5 Blair Redlin was the acting Deputy Minister from July 18 - October 5, 1994.

Source: Compiled by the Office of the Auditor General of British Columbia

and their effects on safety, ferry customers, nearby communities and the environment.

Fast ferries were not at first an integral part of the strategies. From early 1993 on, however, the use of high-speed, car-carrying ferries was an option in each of the strategies. The final strategy report, released in January 1994, did not support or oppose the use of fast ferries, but observed that:

- each alternative more or less met objectives, but in different ways and with complex balances between their costs and benefits;
- any decision on acquiring fast ferries would need to weigh the advantages and disadvantages of the ships for specific routes and specific transportation objectives;
- use of fast ferries did not influence the choice of mid-island terminal locations;
- for the length of the routes under consideration, fast ferries produced relatively small operating cost savings; and
- it was not financially attractive to replace existing, usable conventional vessels with high-speed car-carrying ferries on mid-island routes at that time.

In February 1994, BC Ferries' board endorsed the Mid Island Transportation Strategy report, and recommended that Duke Point be developed into a terminal. It instructed staff to prepare a cabinet submission to seek approval for this decision. It was planned that this submission would go to cabinet at the end of March.

During this time, BC Ferries was developing a 10-year capital plan

While the Mid Island Transportation Strategy was going on, BC Ferries was developing a 10-year capital plan at the request of the provincial government. The capital plan was not guided by a strategic plan, which the corporation had not completed at that time. But, as a February 1994 draft indicated, it did incorporate three continuing concerns of the corporation: replacing the oldest vessels in the fleet, especially those on the northern run; incrementally adding capacity to meet growth in demand; and cautiously exploring the practical value of fast ferries within the BC Ferries system. As well, the draft suggested developing a new ferry terminal at Duke Point.

BC Ferries had researched fast ferry possibilities, and proposed a cautious approach

For several years BC Ferries had monitored fast ferry technology in use elsewhere in the world, and had consultants evaluate whether the technology could offer the corporation any benefits. The information it received suggested that fast ferries might have value in specific situations, but that the technological risks argued for caution until more was known.

BC Ferries' management presented a working draft (not yet reviewed by the board) of the corporation's capital plan at a February 1994 meeting attended by the minister responsible, the board chair, and the deputy minister of the Ministry of Employment and Investment. In the presentation, fast ferries were identified by BC Ferries' management as requiring further extensive analysis. As part of this analysis, management proposed carrying out two different trials of fast ferry technology prior to making a final decision. (If the trials received a positive assessment, consideration would then be given to constructing two fast car-ferries, starting in 1996/1997.) In contrast, a consultant to the minister's office attending the meeting then made a presentation that argued for the early introduction of fast car-ferries.

BC Ferries lost control of the development of its capital plan

In late March 1994 the Crown Corporations Secretariat was instructed by its minister to take over the completion of BC Ferries' cabinet submission on implementing the Mid Island Transportation Strategy. (At this time, the minister in charge of the Crown Corporations Secretariat was also the minister responsible for BC Ferries.) The secretariat did so, and also expanded the submission into a cabinet submission on BC Ferries' 10-year capital plan. This marked the end of BC Ferries' development of the capital plan, except for providing technical information to the secretariat on request. On April 14, 1994 the minister and a representative from the secretariat presented the capital plan to the BC Ferries board. The board endorsed the plan on April 28 and it was presented to Treasury Board on May 17. Despite its truncated role in developing the capital plan, BC Ferries remained responsible for achieving the results promised in it.

Changes by the Crown Corporations Secretariat to BC Ferries' plan were significant

The final capital plan was significantly different from the draft BC Ferries had prepared. Instead of leasing a fast ferry for trials, the new plan called for bypassing trials and immediately beginning construction of three fast ferries. In addition, the highway costs related to Duke Point were now to be BC Ferries' rather than the Ministry of Transportation and Highways' responsibility. For the corporation to stay within capital expenditure limits, several projects previously considered essential, such as replacement of one of the northern ferries, had to be deferred to later years. The other major change to the plan was the addition of public policy goals in the form of a proposal that fast ferry construction could be used to revitalize the province's shipbuilding industry through the export of aluminum fast ferries.

The 10-year plan was approved by Treasury Board, with certain conditions

In the request to cabinet for approval of the 10-year capital plan, there were several references to risks:

- “The principal concern ...is the ability of fast car ferries to achieve the projected cost and performance levels given the limited experience with such vessels...”;
- “...benefits have yet to be demonstrated on vessels the size required for conversion of Route 2 [the Horseshoe Bay to Departure Bay route]...”;
- “...there is...some doubt about the longevity of fast ferries...”;
- “...the ability of the fast ferries to meet projected operating cost savings remains a point of contention...”;
- “...[there is] the current lack of an entity in British Columbia in a position to produce large, fast car ferries...”.

The proposal was examined by Treasury Board—a committee of cabinet. Treasury Board staff expressed several concerns. One was that the technology was not proven for vessels of the size proposed. Another was that if crossing-time goals were not achieved, system capacity and operating costs would suffer. And a third was that, with the lack of local facilities and expertise, it would likely cost more to build fast ferries than conventional ferries. Treasury Board staff recommended that the plan not be approved until additional details were provided, and that the fast ferry option be deferred until BC Ferries could “demonstrate that the technology has been proven and the risks to the province are minimized.”

In early June 1994, Treasury Board approved, in principle, BC Ferries' 10-year capital plan. One of the conditions of the approval was that "BCFC is required to submit specific vessel replacement/acquisition and terminal upgrade proposals to Treasury Board, in the context of route or strategic plans."

After the announcement, work started within BC Ferries

The public announcement of the 10-year capital plan was made on June 29, 1994, at a Vancouver shipyard. An important part of the announcement was the decision to proceed immediately with the construction of three fast ferries at a cost of \$70 million each. The analysis done to support this cost estimate was limited: at the time of the announcement, the dimensions and even the type of ship (single hull or catamaran) had not been determined.

In August 1994, BC Ferries assigned its newly-appointed senior vice-president of engineering and new construction to assemble a project team and lead the construction of the fast ferries. Also in August, BC Ferries sent out a request for qualifications to selected high-speed vessel designers. The request stated that the proposed ships must have:

- capability to carry 200 to 240 auto equivalent (AEQ) units³;
- capacity for up to 800 passengers;
- the ability to operate at terminals that handle other ferry types and routes;
- the ability to be adapted to fit existing berths, with a maximum beam (width) no greater than 27.1 metres;
- multiple load and discharge lanes at either end;
- fuel capacity for approximately 400 miles;
- a cruising speed in the range of 37 knots when the engines are operating at 90% of their manufacturer's recommended continuous power rating; and
- the ability to unload and load in 20–25 minutes.

After it had examined the designers' proposals, BC Ferries contracted with International Catamaran Designs Pty. Ltd. (INCAT), an Australian design firm, and Robert Allan, a British Columbia naval architect, for the design of the fast ferries.

³An AEQ (automobile equivalent) is a standard unit of deck space and weight for a vehicle using a ferry. It is based on the average length, width and weight of automobiles carried by a ferry operator. For example, BC Ferries' standard AEQ is 5.33 metres long by 2.6 metres wide and weighs 1.8 tonnes. In other parts of the world, where smaller vehicles are common, AEQs are smaller. Thus, a European or Australian ship described as carrying 250 AEQs would have less capacity than a ship carrying 250 BC Ferries-standard AEQs.

Early in the design process, the specifications were changed at the request of BC Ferries to increase the vehicle capacity to 250 and the passenger capacity to 1,000.

When the design was sufficiently advanced, a series of tank tests were conducted, using a scale model, to confirm the ship's projected performance characteristics. The tests were completed successfully in June 1995.

Industry's interest and capability were not what had been hoped for

The public announcement of the project indicated that the fast ferries would be built in British Columbia, and that doing so would meet several public policy goals: creating jobs, revitalizing BC's shipbuilding industry, and giving that industry the opportunity to compete in the fast ferry export market.

Once the project began, extensive discussions were held with the province's shipbuilding industry to determine what interest there was in the project, and to pre-qualify potential bidders for construction. It had been expected that the private sector would construct the three fast ferries on a fixed-price contract, although it was recognized that BC Ferries might have to share the risks associated with building large ships from aluminum. It was also expected that one particular yard would be the lead builder, subcontracting part of the work to other firms. However, the yard was unwilling to take on the lead role. And, although the fast ferry project team worked on a bid package, in anticipation of the competitive tendering of construction work, the package was never issued.

As a result, in order for the government to continue with the project and build the ships in British Columbia, it had to move to cost-plus contracts, accept a substantial amount of the risk and take on the role of project manager. Also, by June 1995, the project team realized that none of the shipyards had facilities suitable for the entire ferry construction process. The acquisition by BC Ferries of a site for the final assembly appeared to be the best solution.

CFI was set up to manage the construction process

BC Ferries decided that the project could best be managed through a separate organization and, in December 1995, its board approved the establishment of a wholly-owned subsidiary for this purpose. Catamaran Ferries International Inc. (CFI) was incorporated in March 1996 to "carry out

overall project management activities, leading and directing the development of the build strategy and build schedule.” A board of directors was appointed in May 1996.

By the time CFI took over management of the project, the BC Ferries’ project team had already:

- identified the main construction contractors;
- determined the building strategy (which was to build modules at a number of shipyards and have them assembled in a CFI-owned building by employees of another contractor, with the work coordinated by CFI);
- contracted for the delivery of engines, water-jets and aluminum for the ferries and structural steel for the fast ferry assembly building;
- determined the basic design features of the ferries, including physical dimensions, carrying capacities, propulsion units and performance requirements;
- commenced some detailed engineering; and
- organized a training program, through a joint venture of the shipyards and shipyard unions, to teach shipyard workers how to work with aluminum. Training programs were brought from Australia, where they had been used successfully, and delivered through community colleges and shipyards in British Columbia.

All major capital projects, including fast ferries, were reassessed by government, and the fast ferry project emerged unchanged

Soon after the start of construction in 1996, the government announced a freeze on all capital expenditures by ministries and Crown corporations, pending a review of their cost-effectiveness. Work on the first ferry was allowed to continue, on the argument that the Province had commitments to the shipyards. In 1997, work on the second and third vessels was also approved to proceed.

The CFI board was replaced

In April 1997, the CFI board was asked to resign. A new board was appointed, by BC Ferries’ board, made up of members of the parent board and the chief executive officer of CFI.

There were difficulties in keeping the project on track

In August 1997, Treasury Board approved a second revised budget for the fast ferry program. The total was \$262 million, up from the announced budget of \$210 million in 1994 and up from the increase to \$230 million approved in 1995 (see Exhibit 6 on page 56).

Despite the new budget, there were indications that costs were still climbing and the schedule was slipping. Labour productivity at some shipyards was considerably less than expected and the detailed design drawings were not always as complete as needed, leading to delays and rework. As a result, the announced launch dates kept being pushed back.

No contract had been signed with the shipyards for the construction of the ships when the work began. To get the project going in 1996, the parties had agreed to labour and overhead rates. A memorandum of understanding incorporating these rates was eventually signed by CFI and most of the shipyards in December 1996; the remaining yard, the largest one, signed in May 1998.

To make room in the CFI assembly building for the modules of the second ship, the first ship was launched in June 1998. It was not complete at this stage, and fitting-out work in its interior continued after it was launched.

News of cost increases led to resignations and investigations

In March 1998, the CFI board became concerned that expenditures were exceeding the budget. Over the following months it asked for more information from its chief executive officer, but the information provided was delayed and misleading. Specifically, the costs incurred to date for the construction of the first ferry were understated.

When BC Ferries' board became aware of the extent of cost overruns, it asked for and accepted the resignation of the chief executive officer of BC Ferries and CFI effective January 19, 1999. Shortly after, the Crown Corporations Secretariat commissioned a study of the costs and cost management of the project. This study, released in February 1999, determined that the real cost of the project far exceeded the approved budget. When the study was released, the newly-appointed minister responsible for BC Ferries accepted the resignations of the boards of both CFI and BC Ferries.

The Crown Corporations Secretariat also commissioned an external study on the first vessel's construction and performance. This study was released in March 1999. It established that the vessel is well-built. However, the vessel is overweight and has a maximum speed below that needed to achieve the original objectives set for the project.



chapter 2:
governance issues lie
at the heart of most
of the problems
with the fast ferry project

governance issues lie at the heart of most of the problems with the fast ferry project

It is evident from the narrative of events in the previous chapter that there are issues of concern about the governance of the fast ferry project. In this chapter we will further discuss these issues, which fall into three main areas:

- the difficulties faced by the boards of BC Ferries and CFI in carrying out their duties;
- weaknesses in the information and analysis supporting major decisions; and
- weaknesses in accountability reporting to the Legislative Assembly and the public.

The Crown Corporations Secretariat's involvement in BC Ferries' 10-year plan development was not appropriate

When it was established, the Crown Corporations Secretariat was assigned the following duties:

- to provide guidelines and procedures for strategic and business plans;
- to advise Treasury Board on submissions, business plans, capital budgets and capital projects;
- to provide independent advice to Crown corporation boards and the ministers responsible; and
- to participate in special projects as directed by cabinet.

Also, at the time the fast ferry program began, the secretariat had a mandate to ensure that Crown corporations promoted the economic and social policies of government.

In our opinion, by taking over responsibility for developing BC Ferries' 10-year capital plan the secretariat put itself in a position of conflict by reviewing and advising on a plan that it had prepared—becoming more a promoter of the fast ferry concept than an independent advisor. Furthermore, it did not exercise sufficient care in carrying out the role it had taken on. For example, in determining the budget for fast ferries, BC Ferries' preliminary estimate of \$80 million per ship was changed to \$70 million by the secretariat, on the basis of a written recommendation by a consultant that the corporation's figure was "overly conservative."

Also, the secretariat should have exercised more care in carrying out its own responsibility of ensuring that Crown

corporations promoted the economic and social policies of government. To do so, it should have ensured that the public policy goals for the project, and their funding mechanism, had been identified. It should also have ensured that systems were in place to track their progress, that performance targets were in place, and that all the anticipated costs were identified and budgeted for. Some of these things were done poorly; some were not done at all.

BC Ferries' board was pressed into a hurried decision

At the April 14, 1994 meeting of BC Ferries' board, the minister and a representative from the Crown Corporations Secretariat presented to the board, for review, a draft of the submission to cabinet on BC Ferries' 10-year capital plan. The minister advised the board that tight time frames were in place, and that the submission would probably be made to cabinet within two weeks.

The draft had not been reviewed by the board's planning committee, or approved by that committee for presentation to the board. On April 26 board members were provided with a revised draft. This corrected an error in the April 14 draft, and included a specific recommendation on fast ferries. On April 28 the planning committee met to review the cabinet submission for the first time. Less than an hour before the meeting began, the secretariat sent the planning committee a new version of the submission which showed that spending on fast ferries and Duke Point would take place over four rather than five years, and would be \$9 million higher than in the April 14 document. After discussion, the committee recommended that the revised submission be endorsed by the board.

An indication of the hurried nature of the decision-making process is given by a financial planning report that the planning committee also reviewed at its April 28 meeting. That report still reflected BC Ferries' original capital plan proposal to lease a fast ferry for service trials before considering building new ones.

When, on April 28, BC Ferries' board endorsed the submission of the proposal to cabinet, some members noted that the document originated from outside BC Ferries. They expressed concern that those developing the proposal were not accountable to the board, and that the board had not had the time to test the assumptions or ask the questions that needed to be asked.

We recognize that the board was placed in an awkward situation. On the one hand, the board's handbook states that

directors have an obligation to act in the best interests of the corporation and to exercise the care, diligence and skill of a reasonably prudent person. On the other hand, some board members believed that a board has a duty to follow the wishes of the minister without necessarily carrying out the normal level of scrutiny.

In our opinion, it was reasonable for board members to regard the decision to proceed with fast ferries, and to proceed in the manner followed, as more of a ministerial directive than a board decision.

There were several indications, prior to the board's approval, of the minister's strong support for the project and of the direction he wanted BC Ferries to take. For example:

- he instructed the Crown Corporations Secretariat to take control of the 10-year capital plan development, resulting in a proposal that was substantially different from what BC Ferries' staff had been developing;
- he took an active role in presenting the 10-year capital plan to the BC Ferries board at its April 14, 1994 meeting, and emphasized his desire for the board to reach a decision within a short period; and
- his ministerial assistant worked with consultants to develop a proposal for selecting fast ferry designers in March 1994, before either the BC Ferries board or cabinet had approved the project.

Subsequent to the board's initial approval of the fast ferry project, the minister continued to show strong interest in the project. For example, he attended the board meeting in August 1994 when the board was told that a former CCS consultant on the fast ferry proposal had been appointed as senior vice-president for engineering and construction of the corporation, with responsibility for the fast ferry project. (The CFI board was later informed that the person appointed was the minister's choice.)

Although we agree that the minister has a right to provide guidance to the corporation on behalf of the beneficial owners—the public of British Columbia—we do not believe that this releases the board from its own obligations. In our view, the board should have endorsed the plan only after full investigation. If the minister's guidance was determined to be inconsistent with the board's assessment after such a review, the board should then have addressed its concerns to the minister.

Opportunities for careful re-evaluation of the project were not taken

Treasury Board's approval of fast ferries in 1994 was approval in principle only, and BC Ferries was expected to later submit more specific proposals for approval. Such staged approval is standard good practice for large projects, and offers opportunities to re-examine the desirability of a project once more information has been assembled, and before significant expenditures have been made.

There were several opportunities for such re-examination by senior decision-makers: when budget approval for \$230 million was given in July 1995; when the budget was increased to \$262 million in August 1997; and between June 1996 and May 1997, when the second and third ferries were examined as part of a government-wide capital freeze. The project emerged from each of these examinations unchanged (except for budget increases). However, in our opinion, none of these re-approvals was supported by reasonable levels of information and analysis. For example, the second and third fast ferries were released from the capital freeze even though the documented reasons given for doing so did not address the requirements set by cabinet when initiating the capital freeze.

BC Ferries' board repeatedly tried to obtain more information as the project progressed

BC Ferries' board tried to fulfill its monitoring role during the project. For example, in June 1994 it requested additional background material on fast ferries, as its members began to recognize the significance of the project. In August 1995 the capital programs committee of the board called for management to provide a quarterly report on each capital project, detailing the financial position. In January and February 1997 the same committee and the board expressed dissatisfaction with cost reports that lacked detailed information, and reiterated their expectation that CFI would give the BC Ferries board regular progress reports. In January 1998 the BC Ferries board again noted that CFI should be reporting to it more regularly.

CFI's board had difficulty getting management to complete plans and to provide needed information

CFI's board also had concerns about the lack of information provided to it. For example, when the CFI board held its inaugural meeting in July 1996, board members were told by the chief executive officer of BC Ferries that the corporation wanted them to "function as a commercial board,

supervising management, exercising due diligence over its programs and initiatives and driving it to fulfilment of its mandate.” A board member at that meeting then asked for but never did receive a copy of the business plan for the project.

This set a pattern: members of the board consistently asked for the kinds of information an effective board needs, and their requests were consistently ignored or only partly met. Over the first 10 months of its operations, the board:

- asked repeatedly for a full budget;
- stressed on several occasions the need for a contract between CFI and BC Ferries;
- asked to receive regular reporting against an approved budget, showing both forecast costs to complete, and variances;
- asked for a construction schedule;
- pointed out that the original budget was for a different type of ferry, and questioned both that budget and the latest changes to it;
- stressed the need for a risk analysis of the current scope of the project; and
- noted that forecast costs continued to rise, and that the scope of the program had increased without an increase in budget.

When the CFI board was first established, it had three outside directors and four with a close relationship with BC Ferries—three managers and the corporation’s legal counsel. Members of the board, especially the outside directors, realized there were many uncertainties they needed to resolve if they were to appropriately oversee the project. They sought answers to such questions as: What is the real budget? Where is the business plan? What are the risks to the taxpayers from this project? In our view, they were trying to carry out their duty to oversee in a way that meets current expectations in governance, but their efforts were frustrated.

In March 1997, the chief executive officer of BC Ferries assured the CFI board that they would be provided with a complete budget by the time of their April board meeting. However, later in March the executive committee of the BC Ferries board accepted its chief executive officer’s proposal that the members of the CFI board be replaced with members drawn from BC Ferries’ board. In April 1997, all members of the CFI board resigned and the board was reconstituted with new members drawn from the BC Ferries board, and CFI’s chief executive officer.

With the membership change, the board's emphasis on certain corporate issues also changed. The new board was able to resolve some outstanding production issues and give additional attention to marketing issues. However, like the original board, it did not receive the information it needed to properly oversee the fast ferry project. For example, although the need for a strategic business plan was emphasized by the original board, it was not able to complete one by April 1997. The new board pursued development of a strategic plan until February 1998, when the plan was deferred indefinitely so attention could be focused on proposals for alternative approaches to the financing, construction and ownership of the ships. The strategic plan was never completed. In December 1998, the audit committee of CFI's board, now aware of the potential extent of the cost overruns, noted that the lack of a strategic plan was "a significant shortcoming."

The second board, like the initial board, was unsuccessful in obtaining a final budget for the fast ferries from CFI's chief executive officer.

The reasons given for replacing the first CFI board do not hold up to scrutiny

When the original CFI board members were replaced in April 1997, the chief executive officer of BC Ferries provided three reasons for the change:

- the BC Ferries board wanted to be represented on the CFI board so that the parent board could fulfill its accountability obligations more directly;
- a report on governance problems in a BC Hydro subsidiary supported the change; and
- the Office of the Auditor General's review of corporate governance supported the change.

Making such a wholesale change to give BC Ferries' board representation on the CFI board appears to be a misunderstanding of good practice. Representation from the parent board is necessary, but so is an appropriate mix of directors. For example, one of the Toronto Stock Exchange's guidelines is that a majority of a board's members should be independent of management and free from any relationship that could interfere with their ability to act in the best interests of the corporation.

The composition of the original CFI board was marginal with respect to this guideline: three of the seven directors were executives of BC Ferries or CFI and one was BC Ferries' legal counsel. The risk in such a mix is that the majority of members

would have been in a difficult position to make independent decisions because they also had a responsibility to consider BC Ferries' interests, which could be different from CFI's. The directors who were unconnected with BC Ferries recognized this problem and, in the February 1997 minutes, noted that while CFI was expected to be independent, in fact it was not.

On the second CFI board, all directors were either CFI management or had a significant business relationship, as parent company directors, with CFI. This clearly did not meet the intent of the Toronto Stock Exchange guideline, and also created the awkward accountability relationship of having board members account to themselves for their performance.

The parent board could have fulfilled its desire for representation by replacing some of the management staff on CFI's board with BC Ferries board members. In this way, the parent board would have been more directly involved in the subsidiary, and CFI would have continued to benefit from the knowledge and independence of directors who were unconnected with BC Ferries.

Ironically, this argument had been raised and dismissed earlier in CFI's history. In May 1996, a BC Ferries director suggested that a member of the parent board should also sit on the board of the subsidiary. The chief executive officer of BC Ferries responded that this might confuse the reporting relationship while providing no ongoing benefit.

The suggestion by BC Ferries' chief executive officer that a report on governance problems in a BC Hydro subsidiary supported the change also appears to be a misunderstanding of that report. In fact, the report⁴ suggested the opposite. Noting that all of the directors of the subsidiary were either directors or senior officers of BC Hydro, the report concluded that the resulting lack of an independent perspective had contributed to the company's failure to obtain or follow independent financial and legal advice. It called directors from outside the organization an integral part of the system of checks and balances on the activities and decisions of insiders, and said their role in asking questions and exercising independent judgment was critical to the success of a corporation.

Finally, our Office's 1996 Crown corporations governance study contained nothing that could be construed as supporting the change in the CFI board composition. In fact, we criticized wholesale changes that leave boards without continuity of membership.

⁴ "BC Hydro-IPC Review", March 1997

Both BC Ferries' and CFI's boards suffered from a lack of information

Internally, CFI had figures that indicated cost overruns on the first ferry as early as February 1998. However, the BC Ferries and CFI boards were not well informed as to how the project was exceeding its budget. One reason was that the cost summary reports provided to them did not give an accurate picture of management's forecasts (see Exhibit 3).

Two other reports were prepared monthly. One was a technical report focusing on shipbuilding-related issues, such as delays in delivery of components—costs were never mentioned. The other was a monthly financial overview of costs incurred to date, contracts awarded and payments made. These two separate reports, on the progress of construction and on the cost of construction, had few links between them. However, the financial report did show the percentage of the budget expended and the percentage of work completed. Interested readers could have compared these percentages: a comparison that consistently indicated that money was being spent much faster than work was progressing. This information was not highlighted in the report, and we found no evidence that this signal was passed on to decision-makers.

A BC Ferries internal audit in November 1997 found that management was not giving the CFI board forecasts of costs to complete the project, and recommended that future reports include such information, but little change resulted. Initially,

Exhibit 3

Comparison of Actual Costs on the First Fast Ferry and Costs Reported to the CFI Board

(\$ Million)

Cost summary report to end of	Costs to date reported to board	Actual costs to date	Management forecast of final cost (not reported to board)
February, 1998	72.6	72.6	91.0
March, 1998	83.7	83.7	91.0
June, 1998	82.1	88.1	99.3
August, 1998	86.3	97.9	107.4
September, 1998	92.6	104.6	107.4

Source: CFI financial reports

CFI management committed to providing cost forecasts, and the draft of a report to CFI's board for February 1998 included a "forecast" column (see Exhibit 3). However, the chief executive officer did not allow this column to be included in copies of the report ultimately given to the board. He also directed financial staff to exclude forecast information from future reports. As well, from mid-1998 on, he ordered costs to be allocated in a way that, in our opinion, misled the CFI board about the cost of the first ferry.

While the CFI board was not informed that this was being done, we believe that a careful review of the information supplied would have given it some indication of problems. For example, the board was told that spending on the first ship to March 31, 1998, was \$83.7 million. Subsequently, it was told that spending on the first ship to June 30, 1998, was \$82.1 million. In other words, during three months of continued work on the ship, the total spent had apparently gone down by \$1.6 million. No directors questioned this anomaly. The board did not actively deal with management's failure to provide forecast information until November 1998.

Clearly, neither the BC Ferries board nor CFI's second board were well-served by their joint chief executive officer. However, in our opinion they should have been more forceful in demanding detailed and credible cost information. Board members should have been alerted to the likelihood of cost overruns by, if nothing else, the significant changes made in the project's scope and the frequent extensions of the construction schedule.

Central agencies also had difficulty in obtaining information

Staff of central agencies tried to inform senior decision-makers of their concerns about the information available on the fast ferry program. For example, Treasury Board staff pointed out signs of cost overruns in both the 1996/97 and 1997/98 capital budget submissions.

In August 1997, when it became aware that budgeted costs were increasing, Treasury Board staff asked for monthly reports on progress. The reports were received for the period August 1997 to March 1998, but then, without explanation, stopped coming. Each of the monthly reports showed costs as being within budget. However, in October 1997, members of Treasury Board staff visited the work site and noted that construction appeared to be behind schedule. This information was reported to the Secretary to Treasury Board and the Minister of Finance and Corporate Relations.

When, in January 1998, Treasury Board staff was advised that a report on the fast ferry completion schedule was being prepared for CFI's board, they requested a copy. It was not provided. And again, in October 1998, Treasury Board staff requested an update from CFI, but was informed that CFI staff could not release information to anyone without the specific approval of their chief executive officer.

After CFI had started construction of the first fast ferry, the Crown Corporations Secretariat decided to monitor the fast ferry program and asked to be provided with monthly reports on construction progress and on budget status. Although reports were asked for in 1996, this monthly reporting only started in August 1997 and, as with reports to Treasury Board staff, continued only to March 1998.

The chief executive officer for CFI and BC Ferries was in a position of conflict during important periods of the project

We believe that one key reason the chief executive officer for CFI and BC Ferries was able to not keep his boards adequately informed was that he was placed in positions of conflict during important periods of the project.

He had had an important role in developing the concept of the project: for example, his estimate of \$70 million per ship was the basis of the announced budget. From August 1994 on, he was in charge of delivering the concept he had helped to develop—initially as senior vice-president of the engineering and construction division of BC Ferries and then as chief executive officer and board member of CFI. In October 1997, when he was made chief executive officer of BC Ferries, he was not required to relinquish his responsibilities as chief executive officer of CFI, and continued to lead the fast ferry construction. Thus, he now represented both the constructor and the future owner and operator of the fast ferries.

As chief executive officer of both BC Ferries and CFI, he was in the position of reporting to his boards on the adequacy of his own performance in managing the project and, implicitly, of his role in defining the project and developing its budget and timetable.

Having one person hold all these positions meant that there was no proper segregation of duties.

Both the BC Ferries and CFI boards had difficulty in dealing appropriately with their chief executive officer not keeping them informed

In a Crown corporation, the chief executive officer often has more access to the shareholder representatives and related agencies than the board does, so the board must rely heavily on the chief executive officer. A chief executive officer's responsibility is to "lead the management team in *implementing the corporate strategy set by the board, and to provide timely and relevant information to the board* to assist it in defining that strategy and assessing its implementation" ("BC Hydro-IPC Review," March 1997 [our emphasis]).

What happens if the board is not satisfied with its chief executive officer? Little, if it has no authority to replace him or her. Responsibility for hiring and firing chief executive officers in Crown corporations is ambiguous. For example, while BC Ferries' legislation gives the board the authority to hire and fire the chief executive officer, in practice it can be the minister responsible who does so—of the last three chief executive officers for BC Ferries, only one was selected initially by the board. The first CFI board was advised by the BC Ferries chief executive officer that it had no authority to replace its own chief executive officer. It did not even control his remuneration, since he was paid not by CFI but by BC Ferries, initially as its vice-president and later as its chief executive officer.

The BC Ferries board was aware of the issues arising from the chief executive officer's anomalous position: inadequate information, improper segregation of duties and, possibly, overload of responsibility. It discussed its concerns with him on several occasions, but never set a firm date to resolve some of the major conflicts by finding a new chief executive officer for CFI.

Accountability reporting to the Legislative Assembly and public was inadequate

We examined BC Ferries' annual reports for the fiscal years 1996, 1997 and 1998, and media releases for the same period, to assess the quality of information provided about the fast ferry program. We looked for information on how well the project was succeeding in meeting both BC Ferries' operational needs and the government's public policy goals.

On the first question, we found that, overall, annual reports and media releases provided almost no useful information on the costs or achievements of the fast ferry program as it affected BC Ferries' operations.

On the second question, we found that information was provided about spending directed toward some, but probably not all, public policy goals. However, there was no discussion of whether these goals were being achieved.

The annual reports disclosed the costs of training and shipyard upgrades. However, we do not believe that these are the only public policy costs that should be disclosed. For example, in 1994, BC Ferries was taking a cautious approach to fast ferries and proposing to carry out trials using a leased ship. If the trials were successful, construction was to start at the earliest in the third year of the capital plan. It was a government decision to start fast ferry construction sooner, before the vessels had been tried in British Columbia. To the extent that such a decision was made by government to achieve public policy goals, it would not be unreasonable to treat any extra costs resulting from the decision as public policy costs, and to disclose how these costs are being funded.

The form of disclosure of the public policy costs did not give readers a clear picture of their nature. Annual reports called spending on training and shipyard upgrades an "investment" but did not say how this investment would be funded or what share was due from government. In fact, the financial statements showed \$10 million of these costs had been written off as an expense (thus increasing the corporation's operating loss), because there was no certainty that the amount was recoverable from the provincial government.

Although, in our opinion, this form of reporting is confusing to the reader, we cannot conclude it is unacceptable, as BC had no formal rules for how public policy costs should be reported. Some other jurisdictions have developed such rules. For example, one Australian state's legislation is quite comprehensive, and requires public disclosure of:

- the government objective the corporation is to perform;
- the costing and funding related to that objective; and
- the government's contribution to the Crown corporation for performing the public policy objective.

The public policy benefits of the project were also presented in a piecemeal way. The only benefit reported on was person-years of employment, for which media releases gave a number of different estimates, but no indication of the

permanence of this employment beyond the completion of the three ships.

One reason for this lack of reporting on the achievement of public policy goals is the lack of any clear statement of how this achievement was to be measured. We found no evidence that measures of success had been defined for the major public policy goal—rejuvenating British Columbia’s shipbuilding industry. For example, there was no indication of how long the industry would have to be self-supporting before it could be deemed to be revitalized. In fact, at the inception of the project, the only measure of performance available was a single projection of expected person-years of employment.

A systemic approach to improving governance is needed

Governance is the system of structures, responsibilities and accountabilities used for directing, controlling, monitoring and reporting on the implementation of corporate and government policy. In the public sector, governance relations are typically laid out in a legislated framework. There are more complexities to governance in a Crown corporation than in the private sector, in particular the existence of many governance agents and shareholder representatives. To fulfill their obligations, those involved need to understand their roles and authorities and operate in a prudent manner in an environment that allows them to exercise the level of care necessary.

In looking back over the governance issues discussed in this chapter, we note that in most cases problems were not isolated individual failings. We believe that the problems on this project indicate that governance of Crown corporations needs overall re-examination. Accordingly, we are not including in this report recommendations for correcting specific shortcomings. Instead, following on from our 1996 report on Crown corporation governance, we again urge government to consider implementing a comprehensive governance framework.

“Comprehensive governance framework” may sound theoretical, but is in reality well grounded in common-sense ideas such as “choose the right person for the job,” “let the managers manage,” and “do the job right and you only do it once.” The key concept behind the framework is clear responsibility and authority: people work most effectively, and can best demonstrate and account for their effectiveness, when their duties and powers are clearly laid out and do not duplicate or overlap those of others. This makes it easier for responsible bodies to obtain the information they need and

to carry out their duties, and makes it easier to see—and demonstrate—performance, and so makes accountability reporting better.

Clear responsibility allows people to focus their effort and skills, so that work is well done. It also allows work to be assigned to those whose skills, judgment and experience are best suited to the particular job at hand.

Good management takes time and effort. To those in a hurry, due process may be perceived as an obstacle to decision-making. However, it is a necessary element of good governance and good decision-making. Having the right people with the right responsibilities is merely the first step. There also needs to be a willingness to let the governance process work as expected—for example, to allow board members to carry out their duties in the way they determine is necessary.

We recommend that the Province commit to putting the principles and practices of good governance in place for its Crown corporations—including, specifically, allowing Crown corporation boards to function effectively within their mandates.

Principles of Good Governance

Our 1996 study is only one of a number of reports and studies that have shown a high degree of consensus as to good governance practices.⁵ One Canadian authority⁶ summarized the main principles succinctly, when it said governing bodies should:

- be composed of people with the necessary knowledge, ability and commitment to fulfill their obligations;
- understand their purposes and whose interests they represent;
- understand the objectives and strategies of the organizations they govern;
- understand what constitutes reasonable information for good governance and obtain it;
- once informed, be prepared to act to ensure that the organization's objectives are met and that performance is satisfactory; and
- fulfill their accountability obligations to those whose interests they represent by reporting on their organization's effectiveness.

Two of the guidelines developed by the federal Treasury Board Secretariat (which, in turn, built on guidelines adopted by the Toronto Stock Exchange) are also particularly appropriate:

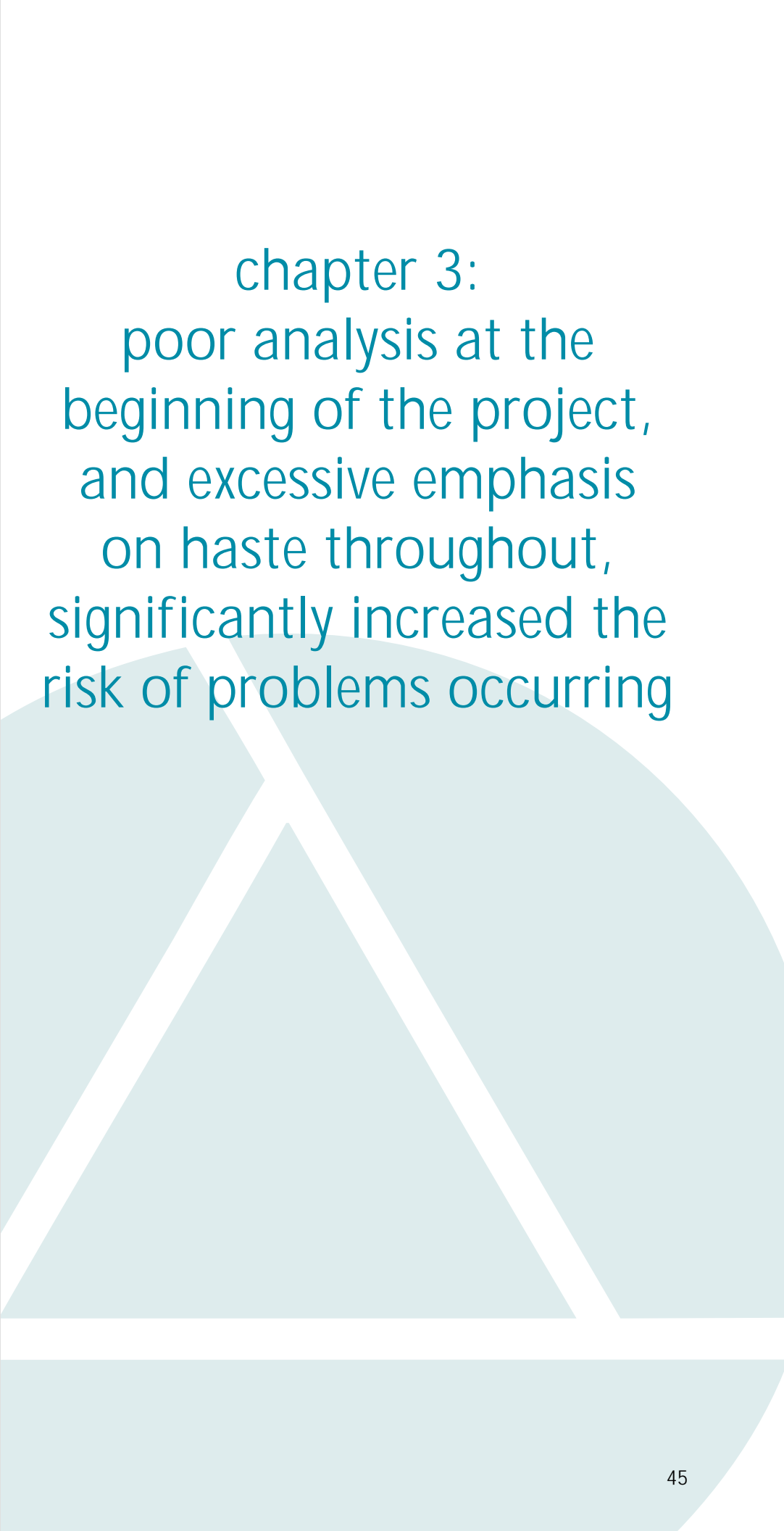
- the board of directors should ensure that the board can function independently; and
- in recognition of the importance of the position of CEO (chief executive officer), the board of directors of every Crown corporation should periodically assess the CEO's position and evaluate the CEO's performance.

⁵For example:

- "The Report of the Committee on Corporate Governance", London Stock Exchange et al., 1998, England.
- "Guidelines for Corporate Governance in Crown Corporations", 1996, Government of Canada.
- "Corporate Governance: A Framework for Public Sector Bodies", Chartered Institute of Public Finance and Accountancy, 1995, England.
- "Principles of Effective Governance", CCAF-FCIV Inc., 1994, Canada.
- "Where Were the Directors: Guidelines for Improved Corporate Governance in Canada", Toronto Stock Exchange, 1994, Canada.
- "The King Report on Corporate Governance", Institute of Directors in Southern Africa, 1994, South Africa.
- "Guidelines for Corporate Directors in Canada", Institute of Corporate Directors, 1992, Canada.

⁶CCAF-FCVI Inc., a Canadian research and educational foundation.





chapter 3:
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beginning of the project,
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poor analysis at the beginning of the project, and excessive emphasis on haste throughout, significantly increased the risk of problems occurring

In this chapter, we examine how well the risks inherent in a project of this magnitude and complexity were managed. We look both at what analysis of risks and benefits was carried out before the project was announced, and at how risk was managed during the design and construction of the ferries.

Although no business case was prepared, the problems to be solved were, in general, adequately demonstrated

It is a required practice in most organizations, including BC Ferries, to prepare a business case before deciding whether to carry out a project. A business case shows that there is a problem to be solved or an opportunity to be grasped, lays out a number of solutions, and identifies which solution offers the most benefit at the least cost. For the fast ferry project, no business case was prepared.

(A business case differs from a business plan. A business case answers the “what” question, identifying the best solution from among competing alternatives. A business *plan* answers the “how”, “who”, “when” and “where” questions, laying out in detail how to implement the solution.)

In the absence of such a case, we looked elsewhere for answers to the two major questions it would have answered:

- Were the problems to be solved adequately demonstrated, and were they defined in such a way that the project’s success in meeting them could be determined?
- Was the chosen solution supported by sufficient information and analysis?

We found that the problems to be solved were, in general, adequately demonstrated. The need to relieve traffic congestion was shown, as was the need to eventually replace aging ships (although we found no analysis of the best timing of the replacements). And, the poor condition of the shipbuilding industry was well known. However, in our opinion there were several weaknesses in the support provided for the solution chosen.

Fast ferries were not shown to be the best way to meet the identified needs

We found that, during the period when fast ferries moved from being one possible way of meeting BC Ferries' business needs to being an announced program, insufficient analysis was carried out on alternatives to fast ferries. For example, demand management techniques, such as charging a premium for high-demand runs, had been considered as part of the Mid Island Transportation Strategy but disappeared from consideration thereafter. Also, the introduction of the new Duke Point to Tsawwassen route and of higher fares on busy days of the week had been decided on during the time when the fast ferry project was being developed. It would have been prudent to determine whether together they might have alleviated the Departure Bay/Horseshoe Bay capacity and congestion problems without requiring further immediate action.

Both the Mid Island Transportation Strategy and BC Ferries' analysis had shown that a conventional steel ship solution was a contender. This option, however, was not further examined in detail before the fast ferry choice was made. A subsequent analysis by BC Ferries, made about one year after the decision to proceed, indicated that the net present value (a measure of the costs and revenues of a project over its lifetime) of using conventional steel ships was close to that of using fast ferries. And, in fact, the slight superiority of fast ferries in the analysis was dependent on questionable assumptions, discussed further below, about their cost and performance.

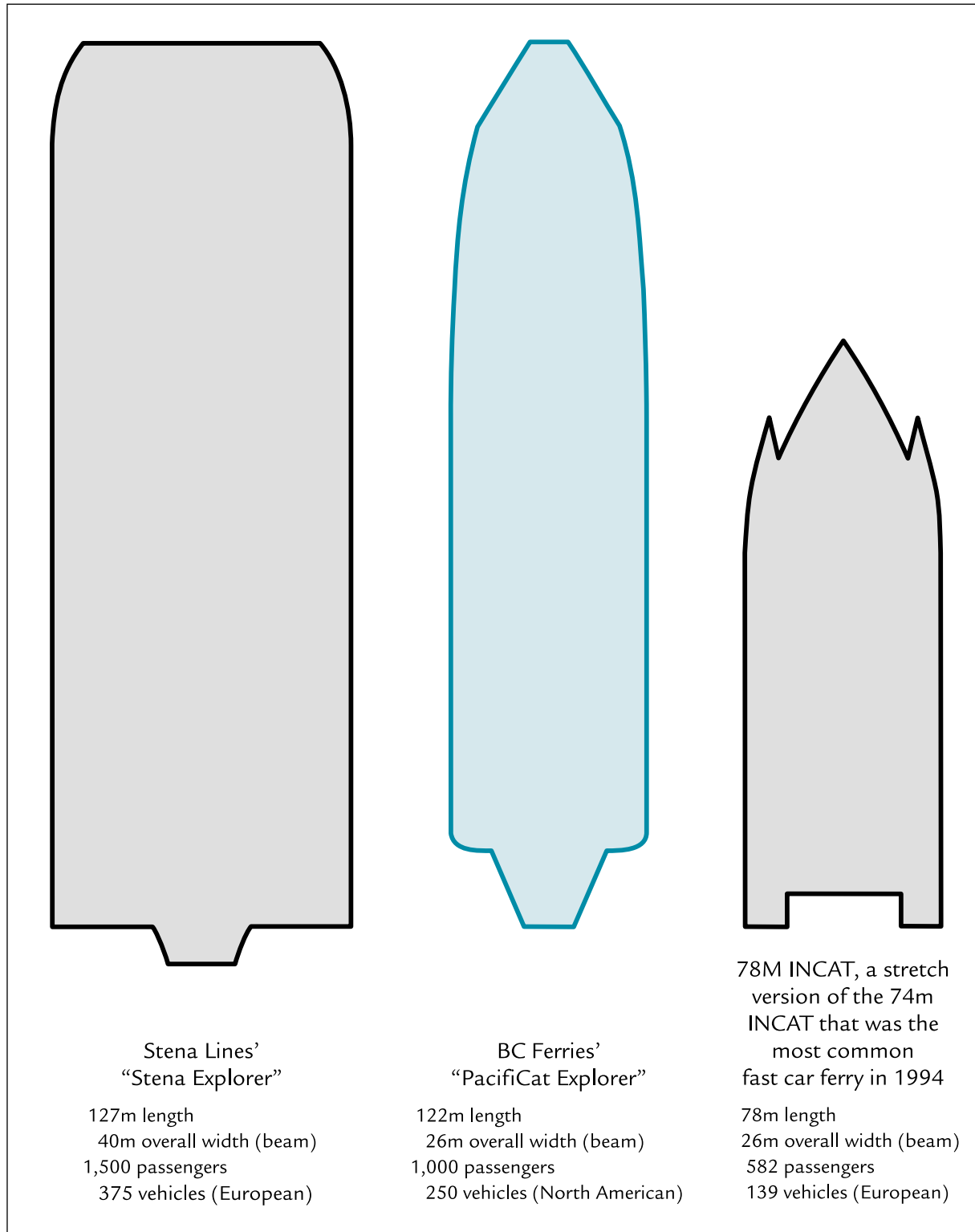
The risks inherent in the fast ferry project were never adequately examined

In normal good practice, a risk analysis would have been carried out to support a business case before a decision to proceed was made, and that analysis would have been revisited at each milestone in the project. This did not happen. A document was prepared to support the decision to proceed, but it contained insufficient analysis of the major risks and their implications to justify proceeding.

In particular, no analysis was done of the potential effects on costs and performance of a significant shift: from a typical fast car ferry design to a design tailored to BC Ferries' operational approach (see Exhibit 4). The decision to modify the ferry design to fit existing berths, rather than modify the berths to fit the ferries, had significant effects on the ships (such as increased cost, increased weight and lower speed) that were not

Exhibit 4

BC Ferries' Car-carrying Catamarans Differ From Other Fast Ferries



Source: Compiled by the Office of the Auditor General of British Columbia

fully examined at the time. The decision also added considerable complexity to the design and construction of the ships.

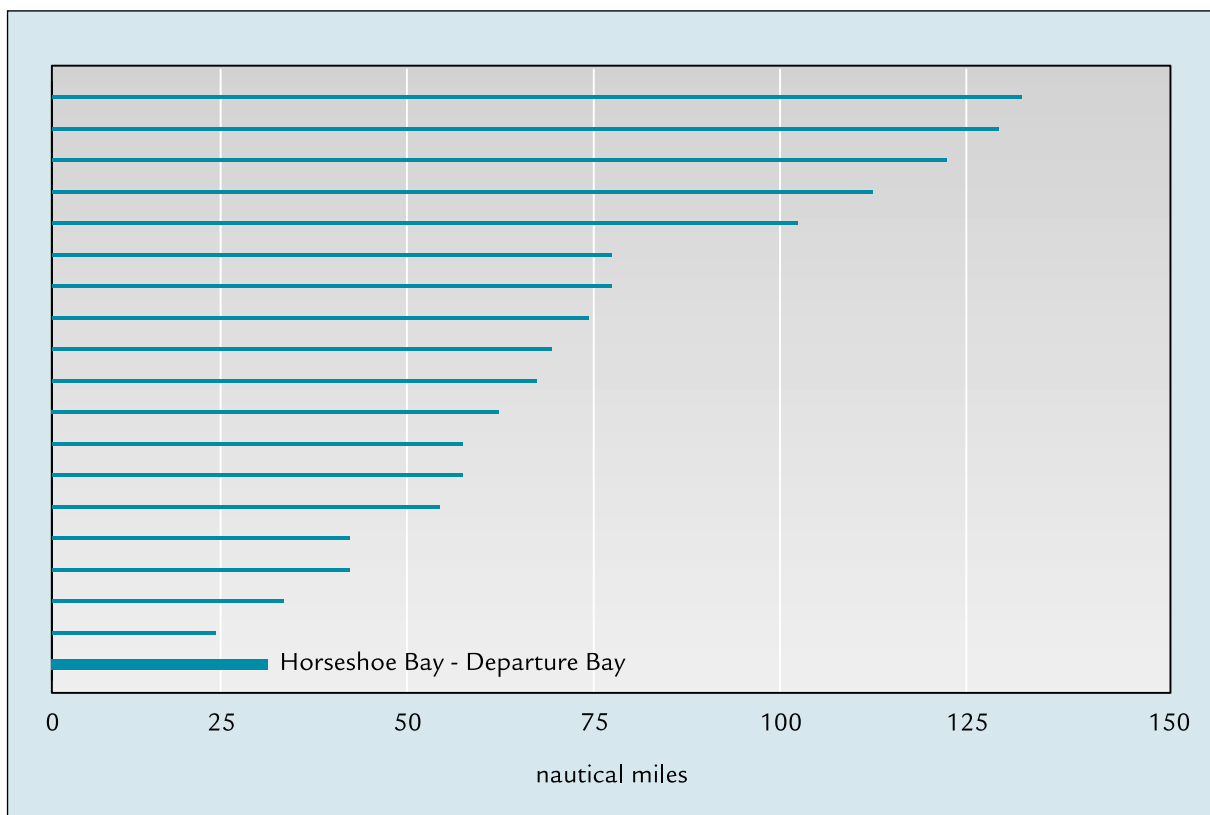
Good risk analysis is especially necessary when there are indications that a proposal is pushing the limits of important constraints. Even very early in the project it was known that the fast ferry proposal was pushing the limits in important areas:

- **Cost:** as noted above, the economic advantage of fast ferries was not marked, and would be negated by relatively small cost increases—increases that were likely, given the extensive scope changes made as the ferry design was developed.
- **Distance:** the speed of fast ferries only pays off if the ferry route is long enough for speed to translate into meaningful time savings. The Horseshoe Bay-Departure Bay route was known to be very short for a fast ferry. In fact, there was only one shorter fast car-ferry route in the world at the time (see Exhibit 5).

Exhibit 5

Length of World Fast Car-ferry Routes, 1995

The Horseshoe Bay-Departure Bay fast car-ferry route is among the shortest in the world



Source: Compiled by the Office of the Auditor General of British Columbia

- Power: the ferries required power levels at or beyond the maximum available from diesel engines at the time (and there was a decision made not to use higher-power gas turbine engines).
- Schedule: The announced schedule of less than two years to complete the first ship, with the next two ships being similarly fast-tracked, was very optimistic.

The likelihood that fast aluminum ferries could be built cost-effectively in British Columbia was not demonstrated

At the time the fast ferry project was being considered, the shipbuilding industry in Canada had been in decline for several decades. By world standards it was small and undercapitalized, focused on Canada's domestic market and dominated by government work. The shipbuilding industry in British Columbia had followed the national pattern of decline, and had become dependent on BC Ferries for its survival.

Construction of the two Spirit-class ferries in the early 1990s demonstrated that the province no longer had individual shipyards with the financial capability to build large steel ships. A few yards could build smaller steel ferries, but larger projects could only be handled by setting up a management company to allocate construction work among a number of yards.

The fast ferry project went ahead based on the following key assumptions about the British Columbia shipbuilding industry:

- Commercial risks would be the same as for any other large ship construction contract, except for the conversion to aluminum and the investment in new facilities.
- Shipyards would be willing to invest in converting existing facilities for aluminum construction.
- Local shipbuilders would bid competitively and take on the normal business risks.
- At least two shipyards would have the capacity and interest to bid on the project.

Subsequent discussion between the fast ferry project team and shipbuilders indicated that none of these assumptions was valid for this particular project.

The weak state of the industry was used to support the need for its rejuvenation. However, little attention was paid to the reasons for this state. If British Columbia shipyards could not on their own deliver large conventional ships, it does not

on the face of it appear likely they could deliver equally costly and more complex ships using a technology with which they had no experience.

The likelihood of exporting British Columbia-built fast ferries was not demonstrated

Published information, as well as studies carried out for BC Ferries, showed that although the world high-speed ferry market had potential, there were significant business risks. Some of the risks facing high-speed ferry builders were apparent in 1994; others came to light during the project. For example:

- In building three large fast ferries for the Stena shipping company, the Finnish builder Finnyards experienced substantial technical problems. Deliveries were late, so the first unit missed the 1995 tourist season. The option for a fourth ship did not materialize.
- Stena also placed an order for two fast ferries with Westamarin, a Norwegian shipyard. The first ship was delivered in 1997, one year late as a result of production problems. The yard went bankrupt, and a new owner acquired it. The second ship was cancelled, even though it was 25% complete.
- The Seacontainers shipping company rejected a ship built by the Australian shipyard Austal because it did not meet its design speed. The ship was subsequently sold (in 1995) to another operator at a discount, after modifications.

No analysis was carried out on the likely costs and benefits of focussing British Columbia's shipbuilding industry on the export of aluminum fast ferries. Nor was there an analysis of the likelihood that the industry would be competitive on price in world markets. Roughly half the cost of a ship is materials and half is labour, overhead and profit. It was known at the time the project was announced that Canadian yards had some price disadvantage in obtaining equipment and machinery, and that the aluminum for the fast ferries would have to be bought offshore. Thus, any competitive edge would have to be obtained through lower labour or overhead costs, or lower profits. Canadian wage rates for shipyard workers were known to be higher than those in most competing countries, and there were indications that the Canadian industry's productivity was not sufficient to compensate for the wage disparity. However, we found no examination of how these factor costs would affect the potential for exporting fast ferries from British Columbia.

And notably, no examination was made of whether British Columbia (or Canada) would be willing to compensate for any cost disadvantages by providing an ongoing export subsidy, as most fast ferry-exporting nations—including Italy, Finland, Norway, Sweden and Australia—have done. An Australian government study estimated that their nation’s 5% (between 1996 and 1999) nominal rate of subsidy on the value of the completed ship amounted to an effective rate of assistance of 12.5%. (The difference reflects the fact that part of the cost of a ship is materials and equipment bought on the world market. The subsidy is targeted at the labour component, the main local value added.) The study also made clear that during the period 1985 to 1991, when Australia’s fast ferry industry was developing, it received an effective subsidy exceeding 50% of the unassisted value added⁷, plus support in research and development, marketing, export financing and staff training.

In our opinion, failing to adequately examine these three issues—effects of focussing the industry on aluminum ships, likelihood of being competitive, and need for subsidy—meant that the government could not demonstrate that the project it was proposing had a reasonable likelihood of success.

The ability to manage risk during the building of the ships hinged on good project management

Complex capital projects are subject to a large number of risks. Well-established methodologies have been developed to help to manage these risks and so allow the projects to be carried out cost-effectively. These methodologies are usually referred to collectively as project management. Good practice in project management is well-known and well-documented.

The three basic parameters of project management control are schedule, budget and scope (the last is also called specifications, or performance, or the deliverable). The three are intimately related, so that changing one often requires changes to one or both of the others. For example, budget reductions often require giving up a project feature or accepting later delivery.

Good project management allows decision-makers to make informed choices among options. Good project management also ensures that decisions are made when required, by those in an appropriate position to do so. For example, if decision-makers are informed between the design

⁷Unassisted value added is a measure of the value that international markets would put on the work done in shipyards. In general, it is calculated as the labour content added by the shipyards, less the amount of the subsidy.

and construction stages that costs will be significantly higher than originally expected, they can then choose to:

- cancel the project, if the benefits expected are no longer worth the costs expected;
- reduce the costs of the project by, for instance, changing the scope and accepting lower performance; or
- decide that the project is still worthwhile, and accept the higher costs.

In the case of the fast ferry project, none of the three factors—schedule, budget or scope—was well managed. This led to higher-than-expected costs and lower-than-expected performance. It also led to embarrassment, as announced launch dates were missed, announced budgets were exceeded, and performance problems attracted widespread media attention.

The costs announced were not well supported

The announced cost for the three fast ferries was \$70 million each, for ships capable of carrying 240 cars and 800 passengers. The cost estimate supporting this was prepared in a very short time, with little analysis. It was based on an Australian design for a ship carrying up to 214 automobile equivalents (using BC Ferries' standard measure) and 800 passengers, with cars loading and unloading from one deck only and with internal ramps used to reach a second car deck. The Australian ship also had plainer finishes and simpler services than were proposed for the British Columbia ships.



Courtesy: Catamaran Ferries International Inc.

Powerful water-jets drive the fast ferries

The estimate did not reflect the risks associated with a first attempt at a complex capital project using new technology. Also, it did not include project costs, such as for training, that were not part of construction but necessary for its successful completion. The estimate's major deficiency was a lack of recognition that making substantial changes to a proven design would inevitably result in significantly higher costs.

Before the project announcement, both the Crown Corporations Secretariat and BC Ferries had received indications from their advisors that each ship would likely cost more than the announced \$70 million. An analysis prepared after the project was approved concluded that fast ferries at \$72.5 million each had a better net present value (that is, were overall more economical) than new conventional ships on the Departure Bay to Horseshoe Bay route. But, the analysis also showed that the advantage was small enough that if fast ferries cost more than \$78 million each to build, conventional ships would have been more economical.

A realistic budget and firm control on scope changes were never established

Good practice in managing a project's budget is to break down the work to be done into component parts, estimate what each part should cost, and accumulate this information in a structured way. The goal is twofold: to manage the cost of each part, and to track the total cost of the project.

None of this happened on the fast ferry project. No such detailed budget was developed, even though by 1996 design drawings were sufficient to produce detailed cost estimates. As a result, estimates of the cost of the project were never based on solid analysis. For example, it was not until actual costs began to accrue that the inadequacy of the original budgets for piping and electrical systems became apparent.

Lack of such a costing base may be one reason why cost estimates have varied erratically during the project (see Exhibit 6).

Problems caused by poor cost management have been made worse by weaknesses in the management of changes to the scope of the project. Changes are inevitable: suppliers develop new products, designers find better ways to build the structure, owners' representatives ask for improvements. Scope management is usually about tradeoffs: judging whether a change is worthwhile often hinges on analysis of whether the expected performance improvement is worth the

Exhibit 6

Major Cost Components of the Fast Ferry Program

(\$ Millions)

	Program announcement (June 1994)	Fast ferry business plan (March 1995)	Treasury Board approved budget (July 1995)	Treasury Board approved budget (August 1997)	Crown Corporations Secretariat review of costs (February 1999)	BC Ferries budget (May 1999)
Builders' costs (labour, materials, services, yard engineering, overhead)	210	210.5	195.0	222.9	359.4	366.0
Owner's costs (design and supervision)				6.7	7.1	11.8
Subtotal:						
Cost of ship construction	210	210.5	195.0	229.6	366.5	377.8
Dock modifications		1.8	5.0		6.2	6.2
Other system modifications		0.5			2.3	2.3
Major spare parts					5.4	5.4
Aluminum inventory ¹						1.8
Interest during construction		7.0			24.1	26.5
	210	219.8	200.0	229.6	404.5	420.0
Costs related to build strategy or public policy ¹ :						
CFI capital assets		10.0	see below	20.1	23.8	24.6
CFI corporate capital tax					1.1	1.7
Industry development				11.6	12.2	12.4
Marketing				1.0	3.6	3.9
		10.0	30.0 ²	32.7	40.7	42.6
Total	210	229.8	230.0	262.3	445.2	462.6

¹ Some portion of these costs may be recoverable through the sale of CFI.
² Described as "program infrastructure."

Source: Compiled by the Office of the Auditor General of British Columbia

expected cost of the change. Unfortunately, without good cost information, scope decisions in the fast ferry project were often made without sufficient understanding about their cost implications.

Scope management was also made more difficult by the failure of BC Ferries and CFI to implement an organized way of evaluating and approving scope changes. Standard practice is to identify responsibility for reviewing and approving

changes, and to have these approvals formally documented. The documentation is necessary because a scope change may affect many participants in the project, such as equipment suppliers, shipyards and inspection agencies. The need for such a formal system of scope management was recognized, and is described well in the contract between BC Ferries and CFI. However, it was never fully implemented, and BC Ferries on occasion bypassed CFI and gave change orders directly to shipyards or suppliers.

The schedule announced for the project was not realistic

We found no evidence of any analysis that supported fast-tracking of construction. A schedule of 16 months—from announcement of the project to completion of the first ferry—was optimistic, even for experienced aluminum ship constructors. For example, one of the companies submitting proposals for the design of the fast ferries estimated that construction time alone would be 12–18 months, while three others said 21 months. These estimates did not include the time required to design the vessel or the time the British Columbia industry would need to retrain its work force before starting to build large aluminum ships.

The schedule, like the budget, had not been subjected to the “reality check” of being matched to a detailed, step-by-step and piece-by-piece implementation plan—not at the time the decision was made or at any time thereafter. Its success relied on many untested but critical assumptions, such as:

- the BC shipbuilding industry was ready to accept the project and a fair share of the related risks (see above);
- there would be a calm labour environment during the project;
- BC Ferries and the shipbuilding industry had the management skills to carry out such a project; and
- the project would not face significant start-up problems.

An overriding concern with meeting the unrealistic schedule meant that work was rushed and sometimes done out of sequence

In our opinion, one of the foremost weaknesses in the project was the lack of any realistic analysis and management of the project’s schedule. Throughout the project there existed a common understanding that announced delivery dates, although clearly unrealistic, should be met if at all possible (see Exhibit 7). As a result, rather than being an orderly process, the project became a pell-mell rush. Pressure of time forced staff to act as expeditors rather than project managers.

Exhibit 7

The Projected Completion Dates Changed Repeatedly

	Projected Completion Dates ¹																			
	1996				1997				1998				1999				2000			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
BC Ferries capital programs committee, August 1994	1				2			3												
Fast ferry business plan, March 1995		1				2		3												
BC Ferries long term capital plan, April 1996 ²					1								2				3			
BC Ferries news release, July 1997 ³								1			2					3				
BC Ferries quarterly financial status report, March 1998										1					2	3				
BC Ferries quarterly financial status report, December 1998															2				3	
Projected delivery dates as at June, 1999																2				3
Completion date of first ship ⁴												1								
▽ Ship number																				

Notes:

- ¹ Completion date is the date when the ship is substantially finished, ready for delivery to the customer for final trials and crew training.
- ² Treasury Board imposed a capital freeze in 1996 which affected the projected delivery dates for ships 2 and 3. Ship 1 was allowed to proceed.
- ³ News release relating to the announcement of government approval allowing the construction of fast ferries 2 and 3.
- ⁴ Ship 1 was completed in November, 1998 and delivered in March of 1999.

Source: Compiled by the Office of the Auditor General of British Columbia

For example, construction work was started before important terms of the construction contracts had been agreed on, and well before the contracts were signed.

An orderly staging of work was not always followed. Two sequencing decisions, in particular, had unfortunate effects on the project:

- The design and designer were chosen before the operational needs for the ships were clearly defined.
- Construction was started before working drawings were sufficiently complete.

The designer and design were chosen before BC Ferries' operational needs were fully defined

The rush to choose a designer and a design was such that a request for qualifications was drafted before the project was approved by cabinet, and before BC Ferries was actively involved in the project. The request was issued to selected high-speed ship designers worldwide less than two months after the announcement, before the operational requirements of the fast ferries were adequately developed with input from BC Ferries.

BC Ferries' limited involvement in the preparation of the request may be the reason why the requirement for the ships to be compatible with BC Ferries' approach to loading and unloading (and the implications this had for the ships' design) was not well defined until later in the design stage. This lack of definition is important because, at that time, most of the fast ferries designed or built in the world were:

- smaller than the size BC Ferries wanted;
- too wide for BC Ferries' berths;
- not geared to the fast loading and unloading essential for BC Ferries; and
- single-deck ships (or had a second car deck reached by internal ramps), although all BC Ferries' major terminals use double-deck vehicle loading and discharging.

Good practice before selecting a designer or design is to establish the selection criteria setting out how choices would be made among competing proposals. For the fast ferry project, we did not find a clear set of selection criteria. We were therefore unable to determine how successfully criteria would have been met by the designer and design chosen. We did note that the selection process did not explore several options that could have led to a more cost-effective project:

- Some of the firms bidding (and a naval architect advising BC Ferries) suggested that BC Ferries should not just look for a designer, but rather consider some form of design-build approach in which proponents offer both a design and an organization willing to build it. Such a design-build approach could have offered BC Ferries a wider range of choices for cost-effective construction.
- Several firms proposed monohulls (single-hull ships), and the naval architect advising BC Ferries suggested that monohulls might be most easily designed to fit BC Ferries' loading systems. The selection panel rejected monohulls on the assumption that savings in construction costs for monohulls would be offset by lower power requirements, and thus lower fuel costs, for catamarans.
- One firm suggested that the most cost-effective way to achieve the desired travel-time savings was to build a ship with a slightly lower top speed, but one optimized for rapid loading and unloading. The selection panel chose not to examine this option.

Construction was started before detailed engineering work was sufficiently complete

Substantial completion of detailed engineering work is an important decision point for any project. For the first time, the project team has sufficiently detailed information on the physical requirements of the project that they can develop good predictions of cost and completion time. Having such detailed analysis available allows decision-makers to decide if the project is still worth doing and, if they feel it is, to make any changes in design or in schedule needed to bring costs or performance in line.

At the time construction started in the fast ferry project, detailed engineering work was not finished. This meant that there was no review of the viability of the project using more accurate project cost information than was available at the time of earlier decisions to proceed.

Lack of engineering drawings slowed work and increased costs

The most significant issue in all phases of the first ferry's construction was that engineering drawings were not always completed in advance of need. (Building without engineering drawings is sometimes done in shipbuilding, but only when the yard is very familiar with the technology being used and the work being done is not critical to the ship's performance.)

Construction began in July 1996, though engineering design work had only begun in January. Production soon overtook engineering.

Efforts to minimize engineering costs during the early phases of the project ultimately increased overall project costs. At the start of the project, senior management at both BC Ferries and CFI believed that only limited engineering resources would be required to meet CFI's obligations to provide detailed engineering drawings. To supplement CFI's engineering resources, some production design work had to be contracted out. In certain cases this worked well; in others it led to mistakes that required the reworking of designs by CFI. INCAT provided assistance to engineering staff at CFI. However, for budget reasons, the INCAT staff member on site was sent back to Australia at a time when his input was required for timely and accurate production of design drawings. The decision was later reversed, and he returned for several more months.

Lack of timely and accurate design information resulted in shortages of material at the shipyards, inefficient use of labour, and significant work to correct errors. For example, the original layout of the fire suppression system conflicted with structural elements of the ferry, and the system had to be changed after it was installed. As a result, it had to be flushed clean on three occasions, a task that took time and further increased costs.

Many purchase orders were issued with poor definitions of the required work because engineering information was incomplete. As a result, contractors claimed "extras" for engineering problems they found, and CFI could not enforce contract provisions intended to control costs.

The initial weight estimate was optimistic

The performance of fast ferries is greatly affected by weight. A 1999 report commissioned by the Crown Corporation Secretariat concluded that the first ferry is approximately 50 tonnes over the desired maximum weight. This is one reason why its speed at full load is expected to be closer to 33 knots than the desired 37 knots, and its engines will have to be run at higher power levels than planned. A large portion of the weight increase is attributed to structural items that were not shown in preliminary structural drawings and were omitted from initial weight estimates.

Despite its importance, the weight management function was not provided sufficient resources until mid-1997, and

weight monitoring of material and equipment going on the first ferry was not implemented until February 1998.

CFI assumed most of the risk in the contracts

The Province had directed that the fast ferries be built in British Columbia. BC Ferries found several shipyards willing to participate in the construction. However, it could not find a shipyard or group of shipyards willing to participate on a fixed-price contract basis—the best option from a buyer’s point of view. Nor did CFI and the shipyards have sufficient information to negotiate effective cost-plus agreements—the second-best option. As a result, CFI assumed most of the risk of construction.

Fixed-price contracts, which limit risk for the purchaser, were not used for major fabrication contracts on the project

In most cases, purchasers prefer fixed-price contracts because it is clear from the outset what the price will be, and the contractor bears the risk of costs exceeding the contract price. BC Ferries was able to negotiate fixed-price contracts for the major materials used in the ferries, including aluminum, engines and water-jets.

The project team had less success in arranging fixed-price contracts for labour, which accounted for about half of the construction cost. The major contract for labour was a memorandum of understanding between CFI and the yards carrying out the fabrication and assembly of the major aluminum alloy components of the ferries. The preamble of this agreement described CFI’s difficult situation: “The Province has directed that the ferries be built in British Columbia,” and “Certain industry members informed the [Ferry] Corporation they were unwilling to build the ferries as a consortium, or to participate in any fixed-price competitive bidding process.”

Managing cost-plus contracts has proved difficult

Paying for work actually done, while including incentives for efficiency and disincentives for poor productivity, is next best to fixed-price in terms of minimizing risk to the purchaser. This form of “cost-plus” contract was used by CFI for most of the fabrication work done on the first ship. The agreement paid contractors on the basis of hours worked on the project. The hourly rate was the sum of four components: a blended labour rate that included pay and benefits; a rate that covered the contractor’s overhead costs; a company profit for each hour;



Courtesy: Catamaran Ferries International Inc.

The first fast ferry began owner's sea trials in November 1998

and an amount for consumable supplies used in fabrication. The agreement set out target hours for each shipyard and provided for bonuses when actual hours were below the target and penalties when actual hours exceeded the target.

Lack of complete drawings hindered CFI and the yards in determining the base amount of work needed. As a result, the amount of work estimated was not the amount actually done.

The major cost overruns on construction of the first ferry occurred in aluminum fabrication. It is not clear how much this was due to lower-than-expected productivity and how much to changes in the scope of work required. For example, debate over this question was one of the factors that delayed signing of the memorandum of understanding by one shipyard. (The memorandum provided that where rework was required due to errors in specifications or drawings, the target and bonus hour calculations would be reviewed.)

Other parts of the agreement transferred risks disproportionately to CFI by requiring it to provide working drawings of construction details such as fabrication procedures, welding details and weld sequencing. Normally, shipyards produce their own construction details. By taking on this responsibility, CFI was subject to claims from fabricators for extra costs when documentation was not of the standard required. Also, this extra work further compounded the engineering bottleneck in CFI. In fact, no time had been allocated in the initial schedule for the production of such construction details.

Time and materials contracts increased costs

Time and materials contracts require the purchaser to pay for all work done and all materials used by the contractor. The purchaser bears all the risk. Such contracts were used for the outfitting of the first ship, and resulted in several significant cost overruns. Their use could be traced back to the priority given to getting the first ferry launched and delivered.

The agreement with the shipyards anticipated that CFI would tender contracts for outfitting work such as piping, electrical, and insulation installation. However, because complete engineering drawings and specifications were often not available, contractors were unwilling to commit to a fixed-price contract. The solution was to bundle piping, electrical and other outfitting work into “work packs” and issue these to subcontractors without bidding. Controlling the cost of this work proved difficult because CFI estimates of the work requirements were too low and contractors were able to justify billing for additional scope. Schedule delays were minimized by this approach, but at a financial cost.

Also, because engineering drawings were not available when work started, contractors and suppliers were often directed to make changes after they had begun their work. This, naturally, resulted in additional costs. For example, CFI management chose to have small pipes installed without the guidance of detailed installation drawings because the engineering resources needed to produce such drawings were not available. This practice is not unusual in the shipbuilding industry but, in the case of the first ferry, it resulted in engineering problems that required substantial rework.

Systematic use of project management techniques is needed on all significant capital projects

It is not uncommon to hear of major projects that have suffered problems with overrun budgets, unmet deadlines, and performance that did not meet original expectations. These failures can generally be traced to poor project management. An example in BC is the construction of the Coquihalla highway in the 1980s. Problems on that project were so significant that a public inquiry was carried out. The report of the inquiry commissioner, Douglas L. MacKay, discussed extensively why good project management was essential, and what happened when it was lacking. What was learned through the Coquihalla inquiry is an effective summary of the risks faced by any large government capital project unless it is properly managed.

Of course, good project management is more than just avoiding problems; it also provides ways of getting the highest return from the effort and money invested. In an orderly fashion, it makes clear the choices available to the owners of the project, while still allowing project managers to manage and to develop creative and cost-effective solutions.

Project management techniques are well known in some parts of the provincial government. For example, in previous performance audits we found that these techniques had been actively adopted by the Ministry of Transportation and Highways, in part as a consequence of its experience with the Coquihalla project. We believe every significant government capital project should receive high quality project management.

We recommend that the Province require that proven project management practices be used on all significant capital projects.

Good Project Management Practices

Prescriptions for good project management are available in both the private and public sectors. For example, the Treasury Board of Canada has comprehensive policies, guidelines and requirements for managing capital projects undertaken by federal departments and Crown corporations. In the private sector, many companies have developed project management guides, and specialize in their application. Groups such as the Project Management Institute are also a source of project management principles and methods. Although these prescriptions come from a variety of sources, there is agreement on the fundamental principles.

The principles of good project management for large public sector capital projects were ably laid out in Commissioner MacKay's 1987 "Report of the Commissioner Inquiry into the Coquihalla and Related Highway Projects" referred to above. Particularly applicable to the fast ferry project are that report's recommendations that there be:

- a disciplined evaluation process for new capital projects of financial significance, including the development of rigorously-prepared business cases, prior to approval of a project;
- periodic project cost estimates based on most probable costs, including all associated works required to make the project complete;
- rigorous project control procedures documenting formally approved scope, schedule and budget parameters; and
- a requirement that all project managers provide timely and accurate cost-reporting.



chapter 4:
fast ferries will increase
BC Ferries' economic
challenges, and may
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The previous chapters of this report focused on the processes used for governing and managing the fast ferry project. In this chapter we look at the results achieved—results ranging from the quality of the ships produced to their impact on BC Ferries' financial condition.

The first ship is of good construction

Naval architects John J. McMullen Associates Inc. (JJMA), hired by the Crown Corporations Secretariat to assess the condition and expected performance characteristics of the first ship, concluded that it is “a fine ship, one of which any owner should be proud...of good quality throughout.”

Operational expectations are unlikely to be met

The JJMA assessment did not examine the degree to which the fast ferries will serve the needs for which they were designed. Many changes in the design of the ships had occurred since the original announcement in 1994. The project was supposed to produce three ships carrying a maximum of 1,000 passengers and 250 vehicles each, and provide an hour-and-a-half trip time (that is, the time between the start of one



Courtesy: Catamaran Ferries International Inc.

The extended bow of the fast ferry allows it to use existing BC Ferries docks

trip and the start of the next trip in the opposite direction). BC Ferries currently expects the fast ferries to carry a maximum of 967 passengers and fewer than 250 vehicles each and, most importantly, only provide a scheduled hour-and-forty-minute trip time. As a result, once fast ferries are in full service the maximum annual carrying capacity of the route may be reduced. The customer benefit of faster travel, and thus the potential for charging a premium fare for that benefit, will also be reduced from original expectations. In addition, our analysis suggests that, at peak periods, fast ferry customers will be more likely to have a one-sailing or longer wait than is the case with the present conventional service.

These projections, it should be noted, assume that the fast ferries will be as reliable in service as conventional ferries. In reality, until all three ships are in full operation, it will be difficult to know what their reliability will be, since they are a new design, and will also be operating at higher power levels than planned. Nevertheless, some reliability-related issues are already apparent.

Water-jets: Water-jets can draw in foreign objects such as floating pieces of wood. Because the fast ferries are not equipped with a means of removing this debris while in service, it is likely that if a ship ingests debris, service delays or cancellations will result. The frequency of debris incidents will not be known until the fast ferries have seen at least one full year of service.

Engines: The required maintenance for the fast ferries' high-speed diesel engines includes overhaul and rebuilding at defined intervals. Rebuilding will take several weeks and, as there will be 12 engines in use (four engines in each of three ships), it must be scheduled carefully. To prevent ships being out of service during engine rebuilds, BC Ferries has purchased two spare engines. However, when two engines are being rebuilt at the same time, there will be no other spare available if a major problem arises with one of the engines in service. The corporation is currently examining whether to purchase more spare engines, at about \$2.4 million each, to have as backups.

Hulls: High-speed ships of welded aluminum typically develop minor cracks from wear and tear or metal fatigue. For example, part of normal night duties for one aluminum ferry operator is to inspect for structural cracks and repair any that are found. At this time, it is not known whether BC Ferries' ships will require similar levels of maintenance.

Fast ferries are likely to adversely affect the financial viability of the Departure Bay to Horseshoe Bay route

Although final costs will not be known until full operations begin, it is clear that fast ferries will cost significantly more to build and to operate than was planned. The 1994 announcement described three ships with a total building cost of \$210 million and slightly higher operating costs than conventional ships. Building cost has turned out to be much higher than planned (see Exhibit 6), and the current estimate is that fast ferries will cost significantly more to operate than the conventional ships they will replace (see Exhibit 8).

The higher construction cost will increase BC Ferries' annual cost of financing its ships. Also affecting this annual cost will be the expected life of the ships. Car-carrying, aluminum, high-speed ferries have been in use for less than 10 years, making it difficult to determine their useful lives. The corporation is currently assuming a 35-year life span for fast ferries, compared to 40 years for its conventional steel ships.

BC Ferries rates the Departure Bay to Horseshoe Bay service as the most profitable of the three profitable routes in its system. Once fast ferries begin full operations, however, the route will likely become unprofitable (barring significant revenue increases). The ships that currently provide service on the route have a direct operating cost of \$24 per vehicle carried, and it is estimated that fast ferries will have a direct operating cost of \$31 per vehicle carried. However, once interest on capital, terminal costs and overhead costs are included, the total operating cost for the fast ferries will

Exhibit 8

Annual Direct Operating Cost of Ferries from Departure Bay to Horseshoe Bay

	Conventional ferries 1998 actual	Fast ferries 1999 estimate
Fuel	7.2	15.2
Crew	17.2	15.8
Maintenance	5.4	5.5
Other	1.8	3.7
Total	<u>\$31.6 million</u>	<u>\$40.2 million</u>
Direct operating cost per vehicle	<u>\$24</u>	<u>\$31</u>

Source: Data obtained from BC Ferries

be about \$81 per vehicle carried, compared with \$51 for the existing conventional ships.

Fuel: It was always expected that fuel cost would be higher for fast ferries than conventional ships. However, the level of extra cost was underestimated; current indications are that the annual fuel cost of fast ferries will be twice that of the existing service. One reason is the greater weight of the ships. The heavier a fast ferry, the more fuel is required to move it through the water and the harder its engines will have to work. The JJMA report concluded that the first ferry is approximately 50 tonnes above the weight that was originally calculated as being the maximum tolerable for the desired performance.

Crew: Although the fast ferries are licensed to sail with a crew of 23, BC Ferries' current plan is for 26-person crews at all times. The conventional ships they replace have a crew license of 34 and at peak times carry a crew of 36. The corporation expects crewing costs to be slightly lower than for conventional ships (\$15.8 million vs. \$17.2 million). Originally, crew costs were expected to be significantly lower for fast ferries, but projected savings have since been decreased by increased overtime because of schedule changes needed to accommodate the new ships, and by premium pay rates. BC Ferries and its unions are currently in negotiations to determine whether or not crews on fast ferries will be paid premium rates similar to those paid on Spirit-class ships, and whether overtime can be minimized through an 'hours of work' agreement.

Maintenance: Fast ferries require more stringent maintenance than conventional ships. On the other hand, aluminum construction may reduce corrosion problems. Overall, BC Ferries expects maintenance costs for fast ferries to be only slightly higher than for its current ships.

Improvements to project management have been made

At March 31 this year, there was still more than \$90 million to be spent on the fast ferry project. This is still a major capital project; one that requires good project management. We were, therefore, pleased to note a number of changes that have the potential to improve the level of management oversight of the project.

The boards and management of BC Ferries and CFI are now separate and distinct from each other. Specific senior management responsibility for the fast ferry project has been assigned within BC Ferries, and additional project management resources have been assigned to monitor CFI and to represent BC Ferries' interest.

As well, CFI appears now to have appropriate project management practices in place to prepare cost forecasts and schedules. Building methods have been revised to improve efficiency, and engineering work is substantially complete, with changes to design being controlled and matched to the production schedule. Contracts are now based on detailed engineering and on experience gained building the first ferry. Overall, CFI expects construction to be completed with fewer labour hours and lower costs than were required for the first ferry. The extent to which improvements are achieved will depend on how effectively the above-noted changes are implemented and maintained.

Fast ferries have adversely affected BC Ferries' ability to renew its fleet

One of the objectives of the 10-year capital plan approved by cabinet for BC Ferries in June 1994 was to replace and upgrade the corporation's aging assets. When fast ferries were approved in 1994, they accounted for nearly 41% of the total 10-year budget for ship construction. At the time, the average age of BC Ferries' fleet was 24 years and the intention was to bring the average age down through gradual fleet replacement. Now, five years into the plan, the average age of the fleet is 26 years, and fast ferry costs are expected to use up 72% of the original capital budget for ship construction.

At present, only one public policy goal—providing person-years of employment—has been met

The main public policy goals when the project was announced were: providing employment, revitalizing the shipbuilding industry, and developing a technology that could be sold on world markets.

During the project, the shipyards received assistance in the form of upgrades to their yards, new or expanded buildings, and specialized aluminum cutting and welding equipment. In addition, an extensive skills-upgrading program was carried out. Approximately 350 welders received training and, of these, some 250 welders have been qualified to the international standards required for high-speed aluminum craft.

As a result of the fast ferry project, the industry has acquired over three years of experience in building fast aluminum ferries, and provided shipbuilding jobs and indirect employment. This objective was the most tangible and easiest

to estimate. However, the permanence of employment for these workers in building fast aluminum craft in British Columbia is not assured.

Know-how in fast ferry construction technology was brought in from offshore. However, the transfer of skills in the design of large fast aluminum ferries may not be complete. A technical transfer agreement with the Australian design firm was never signed, and the British Columbia naval architect that was teamed up with the firm left the project in 1997 and had little involvement thereafter. Some of the skills accumulated through construction of the fast ferries may stay in the industry, but will likely disperse in the near future if no new orders for work are received.

So, although it is clear that the shipbuilding industry was assisted in several significant ways, it is not clear whether that assistance alone was enough to make the industry self-sufficient and internationally competitive.

The marketing division of CFI has been active in trying to sell built-in-British Columbia fast ferries. However, the results to date are not altogether promising. CFI has no orders for new fast ferries.

CFI's market analysis indicates that British Columbia is currently not in a strong competitive position in the world market, with several significant structural barriers to overcome:

- British Columbia shipyards have higher labour costs, and lower productivity, than their main competitors in Australia, Spain and Italy. Since about half of ship costs are labour-related, the British Columbia industry will have difficulty being competitive on price.
- Government financial assistance is one of the keys to export potential in the world market. Canadian shipyards do not receive the government subsidies and financing assistance that other fast-ferry builders in the world receive.
- It is doubtful that the design for the three fast ferries is reusable, given its specialized nature (i.e., a double-deck, drive-through design is not required on most routes in the world). Since, as mentioned earlier, there is some evidence that design capability was not effectively transferred to British Columbia, new designs may have to be purchased from offshore firms. This would limit the province's ability to compete in building custom ships.

Except for the design issues, these barriers existed at the time the decision to proceed with fast ferry construction was made in 1994.

When CFI was first set up, the aim was to privatize it at the end of the project, thus recouping some or all of the public policy costs incurred. The sale of the company, we believe, could be considered a test of whether the industry has developed the capability to compete in a world fast-ferry market, and is prepared to accept the business risks. However, the government has so far not been successful in selling CFI to private-sector interests.

Fast ferries have highlighted BC Ferries' need for a consistent framework of government expectations

BC Ferries' financial situation has worsened in recent years. Although it has historically operated at a small loss, requiring contributions from the provincial government, recent results show that losses are increasing and may continue to do so. For example, its net loss for the year ended March 31, 1999 was over \$114 million, compared to \$59 million in the prior year. Forty-eight million dollars of the 1999 loss resulted from writing down the cost of the fast ferries to their net recoverable value.

The fast ferry project is only one contributor to BC Ferries' current financial condition, but it serves to illustrate why a framework that clearly sets out government's policy goals and expectations is necessary. BC Ferries has extensively researched ways of closing the gap between costs and revenues and becoming financially sustainable. For a decade, BC Ferries' board and senior management have recognized and communicated to government that the corporation needs a financial framework—that is, an integrated set of government decisions to ensure that the corporation's revenues, including subsidies, are sufficient to cover its operating and capital costs. In the absence of such a framework, decisions on fares, schedules and subsidies will likely continue to be made in a fragmented and ineffective way.

We recommend that the Province give BC Ferries clear, integrated, consistent and long-term direction on its performance expectations and then hold BC Ferries' board and, through it, management responsible for meeting those expectations.

Providing Ferry Services Through a Crown Corporation

The idea of using Crown corporations to deliver publicly-provided services of a commercial nature is sound. Properly applied, such an administrative mechanism can be more cost-effective than direct service by government because it gives more room for the application of business practices. However, BC Ferries has not been allowed to apply these practices in an organized and consistent way.

The Act setting up BC Ferries provides for cabinet, not the corporation's board, to make most key decisions, including approving route additions or deletions, approving fares, tolls and other charges, and approving corporate borrowings. Also, since capital plans need cabinet approval and capital budgets need Treasury Board approval, construction of ferries or terminals is also ultimately a government decision. In short, the corporation does not have control over most significant decisions that affect its financial and operating performance.

Most key business decisions are made outside BC Ferries (and, at times, contrary to BC Ferries' advice), by elected officials who also have responsibility for many other important areas of government. As a result, decisions about BC Ferries' business are often ad hoc and lack consistency. For example, decisions about fares have not always been integrated with decisions about subsidies, routes, capital expenditures, or service levels.

This means that the government is unlikely to get the benefits of a Crown corporation approach—a serious disadvantage, given that BC Ferries operates an essential part of the province's transportation system, and is vital to the social and financial well-being of many Vancouver Island and other coastal communities.

In 1981, the Select Standing Committee on Crown Corporations of the Legislative Assembly carried out a review of BC Ferries. Its report noted: "The future effectiveness of the ferry system would seem to require that the directors have somewhat greater control over these important aspects of their business. ...[The] present division of responsibilities between the Lieutenant-Governor in Council and the board creates a situation in which the clarity of the board's mandate to plan, develop, and operate the ferry system is clouded." In our opinion, the committee's comments are still valid today.



appendix



appendix

Office of the Auditor General: 1999/2000 Reports Issued to Date

Report 1

1999 Follow-up of Performance Audits/Reviews

Report 2

Report on Government Financial Accountability
for the 1997/98 Fiscal Year

Report 3

Maintaining Human Capital in the British Columbia
Public Service: The Role of Training and Development

Report 4

Managing the Woodlot Licence Program

Report 5

A Review of the Fast Ferry Project:
Governance and Risk Management



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