

THE FRASER VALLEY HEALTH CENTRE
and
**THE EASTERN FRASER VALLEY CANCER
CENTRE**

BUSINESS CASE
February 8, 2001

Submitted by



Fraser Valley Health Region
BC Cancer Agency
Fraser Valley Regional District
Health Services Group
BC Buildings Corporation

EXECUTIVE SUMMARY

Introduction

The Fraser Valley Health Region and the BC Cancer Agency submitted a proposal to the Ministry of Health in June 2000 to construct two new health care facilities on lands owned by the Regional Hospital District on Marshall Road in Abbotsford, BC. The Fraser Valley Health Centre is a 300-bed acute-care hospital, intended as a replacement for the Matsqui-Sumas-Abbotsford Hospital located in Abbotsford. The Eastern Fraser Valley Cancer Centre is a new facility. Both facilities will provide services to the local health area as well as specialized programming to the residents of the entire Fraser Valley Health Region.

In late June 2000, the FVHR and BCCA received approval and planning funds from the Ministry of Health to proceed with planning for these facilities. This document summarizes the outcome of this planning process and represents the business case to support the project. It addresses the requirements for Capital Project Funding specified by the Ministry of Health and the Ministry of Finance and Corporate Relations.

History of This Project

The Fraser Valley Health Region and the Ministry of Health have been seeking solutions to the health care services shortfall in the Region since 1986. Seven options were developed for renovating the existing MSA Hospital between 1987 and mid-1989. A study completed for the Ministry of Health in April 1990 recommended a new facility on a new site. In July 1990, the Ministry of Health announced approval of a new 300-bed facility on a new site. The Central Fraser Valley Regional Hospital District purchased property for the new hospital on Marshall Road in Abbotsford in March 1991. Planning proceeded through tendering specifications and cost estimates. The project was put on hold in October 1997.

In May 2000, the Ministry of Health requested a review of the MSA Hospital project. The Ministry asked the FVHR to consider the implications of health care regionalization on the previous proposal and to consider how a regional cancer centre might be integrated into the plans for the designated site.

A comprehensive project proposal was submitted to the Ministry of Health in June 2000. The proposal defined the demand for services within the Region and the impact of co-location of cancer services. The proposal also provided a comparison costing of several designs and development options and recommended development on the new site with BCCA. After reviewing this proposal, the Ministry of Health approved funding to complete a business case in support of the proposal.

Development of This Business Case

Under the guidance of a Steering Committee, a Project Team was established to develop the Business Case. Activities undertaken as part of this development process included:

- complete detailed functional programming;
- review relationship of proposed acute care programs with existing and planned regional programs;
- complete an external assessment of proposed programs;
- review and update project costing (from May 2000 proposal submitted to Ministry of Health);
- explore public partnership opportunities;
- review parking capacity.

Summary of Request

The current estimated cost of the project, based on the Facility Program dated January 31, 2001 is as follows:

Item	Estimated Cost \$
A. Land	0
B. Construction	128,178,200
C. Professional Fees	15,548,400
D. Furnishings & Equipment	53,198,000
E. Municipal & Connection Fees	1,589,600
F. Management & Overhead	7,990,600
G. Project Contingency (2%)	1,566,500
H. Payable Goods & Services Tax	2,476,100
I. Total Project Cost	\$210,547,400

A summary of the capital and operating costs for each facility is shown in the following table.

	Capital Costs	Operating Costs
Fraser Valley Health Centre	\$178,213,700	\$83,305,100
Eastern Fraser Valley Cancer Centre	\$ 32,333,700	\$10,551,334

Highlights of Demand

Residents of the Fraser Valley need improved access to health services locally as well as expansion of health care services available in the Region. Although the population of Abbotsford has increased 2.4 times since 1980, the number of acute care beds has remained constant and cancer care has not increased at all. Increased pressure on services provided in Vancouver mean that regional health authorities need to care for more patients within their home region. Currently, averages of only 75% of cases are cared for within the FVHR and this falls well short of the desired goal of 85%. The current Matsqui-Sumas-Abbotsford Hospital is not suitable for expansion and cannot meet the secondary or tertiary acute care service or cancer needs of the growing regional population. Current and projected demographics for the Lower Mainland show that cancer care available in the Region is not adequate to meet the needs of this growing population.

Acute Care Services

The need for a new facility that provides a broader scope of regional services is directly linked to the vision, mission and strategic directions of the Fraser Valley Health Region. The Region is significantly hindered in its ability to achieve its goals and objectives because of the current physical plant at the MSA Hospital site.

Completion of a new acute care facility in 2005 will allow the FVHR to provide the necessary access to quality patient care to the residents of the five local health areas as well as to patients in adjoining regions who wish to seek care closer to their home. The hospital is the critical link to continuing service delivery in this community.

The need for a new acute care hospital in Abbotsford is driven by a number of factors:

- the demand for additional inpatient beds to meet the current and future needs of the region;
- the need for additional outpatient capacity for programs provided to the local community;
- the physical plant does not allow the hospital to provide adequate infection control procedures;
- the need to provide new and expanded services within the Region in order to care for drastically more patients rather than trying to access services through the resources available in other regions, specifically in Vancouver;
- lack of sufficient numbers of inpatient beds results in delays or inability to provide appropriate access to services, such as:
 - increased surgical wait times due to restricted access for surgical cases requiring an inpatient stay;
 - prolonged stays in the emergency room (ER) and delay in care due to back ups in the ER;
 - lack of sufficient regional inpatient psychiatric beds results in, on average, two admitted psychiatric patients per day being held in ER at MSA Hospital and one in Mission Memorial Hospital;
 - frequent shuffling of patients from room to room is necessary - the current average is 80 transfers a day at MSA Hospital.

Cancer Care

Cancer projections for the Fraser Valley show an annual increase of approximately 3.5% in the numbers of new cancer cases in the community. These projections are based on a regression line developed from 10 years of cancer registry data. It is expected that there will be over 13,000 new cases of cancer reported annually in the FVHR by 2012. The number of people living with cancer (prevalent cases) and requiring continued care from the cancer system is also increasing. There is an expected annual increase by 7% of the overall cancer prevalence rates.

A shift in case-mix and its associated changes in fractionation for radiation therapy patients will also contribute to increasing workloads. Consultations become more extensive and take more time as patients live longer with cancer and the range of services they need to access broadens. Further, it can be expected that as the Provincial Surgical Oncology Program is developed, more patients will be accessing cancer centres for a multidisciplinary oncology consultation prior to their surgery.

The two existing cancer centres in the Lower Mainland, Vancouver Cancer Centre and Fraser Valley Cancer Centre, were designed to accommodate 5,000 and 2,500 new patients respectively. Based on new patient registrations alone, both centres are currently working in excess of their design capacity by about 700 new patients in 1999-2000. However, these measures are now considered inadequate because of the number of prevalent cases and the many disease sites for which multiple treatment modalities are required.

Radiation therapy remains a major form of treatment for cancer and access to care is completely dependent on the capacity of BCCA facilities. In the Lower Mainland there are currently eleven radiation therapy machines. A twelfth machine will be in service at the Fraser Valley Cancer Centre (Surrey, BC) in January 2001. However, the growth in demand for treatment services means that by 2004 the Lower Mainland will already have a shortfall of two treatment machines. Together these factors drive the need for

three more treatment machines to be in service by 2004. The demand for radiation therapy alone makes a compelling case for a new centre in Abbotsford.

Medical oncology and chemotherapy workload is growing at a greater rate than any other components of service. Chemotherapy services are provided both within cancer centres and in the community. Projections identify the degree to which future workload might be accommodated in a new cancer centre with a capacity similar to the current Fraser Valley Cancer Centre and the workload that at a minimum will need to be accommodated in the community. The data clearly shows the need for additional comprehensive cancer care facilities in the Fraser Valley. In global terms this means the duplication of the (Surrey) Fraser Valley Cancer Centre, hence, the request for the Eastern Fraser Valley Health Centre services.

As outlined above, there is a need to expand cancer services into the Eastern Fraser Valley. The Cancer Centre requires a host hospital to co-locate in order to provide comprehensive services to patients.

Relationship between Cancer Centre and the Fraser Valley Health Centre

The BC Cancer Agency currently provides comprehensive cancer care services through four regional cancer treatment facilities and through the Communities Oncology Program that is run in partnership with hospitals in the community. The Vancouver Cancer Centre is the only treatment facility that is self sufficient in terms of clinical and operating support services. The cancer centres in Victoria, Kelowna and Surrey have been designed to allow the cancer centre facilities and staffing to be focused on the oncology speciality services while all the support and general clinical functions are provided through a purchased services arrangement with the "host hospital". This model of a "free standing" cancer centre closely linked to a major hospital has proved to be very effective both in this province and many other centres across Canada.

Scope of Services

Fraser Valley Health Centre

The programs and services to be offered in the FVHC were developed through a formal functional programming exercise. The programs and services will serve the needs of the local Abbotsford community as well as house some of the regional programs. The other hospitals in the region will play similar roles by providing standard services to the community and offering some consolidated regional programs. The Regional Clinical Program Plan provides the detail of the organization of services.

The FVHC will support the following programs:

- general surgery and all subspecialty inpatient surgical services including orthopedics, gynecology, ENT, vascular, plastics;
- general surgery and all subspecialty outpatient surgical services including general surgery, orthopedics, gynecology;
- all speciality adult medical services including nephrology (hemodialysis unit), cardiology (no interventional cardiology planned), neurology, gastroenterology, respirology;
- level II obstetrics with a level II nursery;
- emergency medical services;
- psychiatric services;
- pediatric services (inpatient and outpatient);

**Fraser Valley Health Centre
Eastern Fraser Valley Cancer Centre**

- family practice services including geriatric medicine, palliative care, emergency medicine, level I obstetrics, GP pediatrics.

The following table illustrates the inpatient services and programs, proposed bed numbers, assumed occupancies for 2005 for the proposed FVHC site.

**Fraser Valley Health Centre
Bed Summary**

	2005			2015		
General Medical/Surgical (including includes rehab)	132	85	40,953	142	90	46,647
Telemetry	14	85	4,344	16	90	5,256
Surgical Step Down	8	85	2,482	8	85	2,482
Palliative	7	85	2,172	10	90	3,285
Oncology	5	85	1,551	10	90	3,285
ICU/CCU	13	85	4,033	18	85	5,585
Pediatrics	18	60	3,942	18	70	4,599
Obstetrics (including births)	24	61	5,314	28	64	6,541
NICU	7	85	2,172	10	85	3,103
Psychiatry	33	90	10,841	40	90	13,140
TOTAL	261		77,804	300		93,922

Further information about percent occupancy, patient days, and cases is included in the Project Definition Report. The building space summary estimates that 45,693 building gross square metres will be required to support the functional program.

Eastern Fraser Valley Cancer Centre

The Cancer Centre in the Eastern Fraser Valley will provide:

- new patient multidisciplinary consultation and care planning;
- chemotherapy and systemic care;
- access to national and international clinical trials;
- radiation therapy;
- supportive care and pain and symptom management;
- nutritional consultation and support;
- patient and community education in cancer prevention, screening;
- professional education/liaison for community based cancer support and treatment programs.

The estimated workload volumes are shown in the following table.

**Eastern Fraser Valley Cancer Centre
 Workload Volumes**

Lower Mainland	2000	2005	2015
Cancer Frequency (New Cases)			
Area 1	5,008	5,545	7,002
Area 2	4,489	5,303	7,358
Northern Region	802	963	1,340
Total	10,299	11,811	15,700
Radiation Therapy			
Total Cancer Cases	10,299	11,811	15,700
Total Fractions	103,216	129,685	197,820
Accelerators Required (10 hour days)	12	14.4	22
Accelerators Available	11	15	22
▪ Vancouver	7	7	8
▪ Surrey	4	5	5
▪ Abbotsford	0	3	4
▪ Other (to be determined)	0	0	5
Eastern Fraser Valley	2000	2005	2015
New Patient Registrations	0	1,300	2,700
Total Patient Appointments	0	30,000	70,000
Total Chemotherapy Visits	0	3488	7,216
Radiation Therapy Fractions	0	27,000	36,000

Alternatives Considered

There have been many alternatives considered throughout the history of the project, such as:

- expansion versus new construction on the existing site;
- existing site versus new site for construction versus alternative site;
- degrees of reuse of existing design work versus complete new design and development of single building versus multi-building campus (allowing non post disaster spaces to be provided at a more economical level);
- integration of Cancer Centre into the hospital yet providing a distinct environment for cancer patients and their families;
- provision of specific services in a hospital facility, on a hospital site or in the community and analysis of which community this should be in;
- integration of inpatient and outpatient functions versus grouping of ambulatory functions; and
- procurement alternatives for the construction process.

With the facility program now complete, the Project Team has spent some time considering the impact of these requirements on the ultimate design of the overall facility. While some elements of the existing (1997) design may be salvageable, information contained in the best practice review point to alternative building forms as warranting some additional consideration. Major site planning and stacking concepts outlined in the Project Definition report (physical plan review September 14, 2000) have been upheld in a subsequent concept planning session held January 26, 2001. Using this planning model, space for the overall facility can be segmented into at least two separate occupancy groups. While higher unit rates are used for the greater portion of the hospital structure, lower unit rates have been applied against occupancies not requiring this (post-disaster) classification. Gross-up rates for the facility have been established to permit a measure of flexibility as the project proceeds into the next (conceptual and schematic) design phases of development.

The project proposal prepared in June 2000 explains how alternatives have been considered. The need for additional health services is in Abbotsford. Examination of health services being offered in other facilities in the Region have been conducted on one level by Val Gillies. Program value analysis has been conducted on another level by KPMG. Shell space was constructed earlier in Chilliwack and this is one reason that the number of beds needed for FVHR have been reduced. The cancer centre could not be co-located with a hospital on another site.

Project Management and Governance

A project management and governance structure was set up to manage all issues related to scope, schedule and budget. This section of the Business Case describes:

- the Terms of Reference for the Steering Committee;
- the project management structure (roles, reporting relationships, etc.);
- the project schedule;
- the independent monitoring and evaluation process for the project;
- the project approval process;
- relevant legal, technical and policy issues;
- financing sources; and
- a communications strategy.

Costs and Benefits of The Project

The hospital PCOE has been estimated based on information contained in the Facility program which was issued in 'final draft' form at the end of January, 2001.

The PCOE is set up to identify the workload volumes, FTE, salary and benefits, supply and total costs projected for an anticipated opening in 2005. The workload volumes, FTE and total costs are provided for the planned operation of the 2000/01 fiscal year. The total proposed change is provided for each of these categories. The document is sectioned by major clinical, diagnostic and support categories with totals provided for each section. The revenue section identifies the expected revenue changes related to the projected volumes for 2005.

The costs were developed wherever possible by determining the worked hour to volumes. The worked hour to volume relationship was reviewed against the original submission, current operations, other hospital data, and available staffing guidelines. The Ministry of Health provided the initial cost for the renal program. The renal costs have been escalated for the 2000/01 contract cost changes. Overall salaries have been costed at the 2000/01 rates inclusive of contract changes. Benefits were costed at 19.5 percent of salaries. Supplies were costed using the 2000/01 budgeted rate per volume of activity for the individual areas.

The major volume or size changes included in the PCOE are summarized in the following table:

Summary of Volume Changes			
	2000/01 Budget	2005 Projected	Percent Increase
Beds	204	261	27.9
Patient Days	59,464	77,804	30.8
OR Visits	7,100	11,850	66.9
Emergency Visits	42,000	50,369	19.9
Ambulatory Care Clinic Visits	11,838	22,430	89.5
Laboratory Units	2,768,179	4,375,163	58.0
Medical Imaging Units	2,323,630	3,042,208	30.9
Building Square Meters	18,000	45,693	254.0

The Pre Construction Operating Estimate is summarized as follows:

The total Net Pre Construction Operating Estimate is.....	\$83,305,100
The 2000/01 Operating Budget (before approval of expected 'rollover' requirement) is.....	\$46,400,907
PCOE change.....	\$36,904,193

Non-Financial Outcomes

In addition to financial measurement of costs and benefits, there are non-financial aspects to be taken into account for this project. Although listed as non-financial, many of these items do in fact have an impact on the bottom line. This includes:

- a new facility and equipment will attract care providers to the region. This is a critical part of the delivery of services to residents;
- capacity to do higher volume of cases in the facility. This will reduce wait times for services to the residents. There will be the ability to handle the projected volumes in the program;
- new and expanded programming will facilitate repatriation of patients currently being cared for in other regions;
- ability to integrate new technologies and to continue the inclusion of less invasive techniques into patient care. This will result in reduced hospital stays for inpatient care and increase day care procedures;
- reductions in closed beds due to isolation requirements. Currently with a very limited capacity to isolate in the current facility, isolation requirements result in closure of other beds within the room;
- the project will create work in the community. It is estimated that the construction will produce on average about 10 people per million dollars of construction;
- the new environment created in the new centre will improve the working environment and increase the productivity of staff. The facility will allow operational functioning as expected in the plan;
- it is expected that there will be a reduction in the requirement of transferring up to 80 patients a day and hence, the potential for injuries to staff will be reduced and staff will be better deployed to provide patient care;
- there will be fewer labour issues as a nurse will be less involved in transferring patients and furniture, which is considered a non-nursing duty;
- the increase in the number of single rooms will increase the healing capacity for patients;
- the BCCA statistics indicate that BC has the best statistics for cancer control in Canada. With the new equipment and the ability to address wait times more effectively, the BCCA performance will be benchmarked with other countries for comparison;
- the facility will be built on budget to the functional planning assumptions.

Performance Measures

The Fraser Valley Health Region and BCCA will establish baseline performance indicator information and identify the data collection process.

Fraser Valley Health Centre

There are several areas in particular that will be closely monitored for their outcomes in this project, as follows:

- the ability to reach the repatriation of residents targets of 90% or higher capture of non-surgical cases and 85% of surgical service demand by 2010, increasing to 90% or higher in most services by 2015;
- the ability to reduce ALC patients to 7% by 2005, down from a current level of approximately 12% at the MSA Hospital site. Future targets are 5% by 2010 and 3% by 2015;

**Fraser Valley Health Centre
Eastern Fraser Valley Cancer Centre**

- the ability to consolidate selected elective services for the region at Mission Memorial Hospital and Chilliwack General Hospital;
- the ability to attract and retain staff to provide the specialized services required for the future;
- the effectiveness of the strategies to manage the needs of seniors and the strategies to programming ambulatory care;
- the effectiveness of the psychiatry/mental health program design to ensure a fully integrated community – hospital program. The success of off-site locations and ability to successfully pursue “P3” construction opportunities on the FVHC site for some portion of the psychiatry/mental health ambulatory/outpatient programs.

Eastern Fraser Valley Cancer Centre

The following list of preliminary indicators has been developed to measure the quality of service provided at the new Cancer Centre.

Screening

Effectiveness	% of the population (EFVCC catchment area) at risk, that is screened
Efficiency	turn around time for lab results
Accessibility	wait time for genetic counselling

Treatment

Radiation Therapy

Appropriateness	% compliance to treatment protocols
Efficiency	% utilization of available treatment time
Accessibility	wait time – diagnosis to consultation with Radiation Oncologist <ul style="list-style-type: none">▪ % compliance to less than 2 week wait time standard wait time – ‘ready to treat’ to first treatment appointment <ul style="list-style-type: none">▪ % compliance to less than 2 week wait time standard

Systemic Therapy

Appropriateness	% compliance to treatment protocols
Efficiency	% utilization of available treatment time
Accessibility	wait time – diagnosis to consultation with medical oncologist % compliance to less than 2 week wait time standard wait time – ‘ready to treat’ to first chemo/drug therapy appointment

Rehabilitation

Effectiveness	% of patients with persisting disability following treatment
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Palliation

Effectiveness	% of patients dying in preferred surroundings % of patients dying pain free
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Fraser Valley Health Centre
Eastern Fraser Valley Cancer Centre

Cancer Centre

Appropriateness % compliance to treatment protocols

Efficiency # of fully admitted cases
 # ambulatory visits
 ambulatory visits per worked hour

 % rebooking of appointments

 % utilization of ACU space

Accessibility average distance travelled by patients

Acceptability patient/client satisfaction rates

Research

Effectiveness % of eligible patients enrolled in a clinical trial

Accessibility % of eligible patients offered enrolment in a clinical trial

Education

Competence # of student learning opportunities

 # of students

Risk Management

The responsibility for managing risks rests with the Steering Committee. The Risk Management strategy is based on Ministry of Finance guidelines. For each risk factor, the probability and impact on the project was assessed to classify the degree of risk associated with the project, e.g. low, medium or high risk. A Risk Classification Framework is shown in the following table. The Project Team used this Framework to assess the degree of risk related to this project.

Risk Classification Framework

Area	Factor	Probability 0 - 3	Weighting 0 - 3	Result (Probability Impact)
General Risk	High visibility	3	2	6
	Public concerns/objections	0	0	0
	Environmental factors	1	1	1
	Safety issues	1	1	1
	Size of project	1.5	1.5	2.25
	Legislative changes	2	2	4
Management Risk	Complexity	1.5	1.5	2.25
	Unclear or changing scope	3	1.5	3.5
	New technology	3	3	9
	Project newness	1	1	1
	Project manager experience	.5	3	1.5
	Design team experience	.5	3	1.5
	Contractor experience	.3	5	1.5
	Losing momentum through procedures	2	3	6
	Safety issues	1	3	3
	Aggressive/changing time schedule	2	2	4
Labour productivity drop	1	3	3	
Construction Risk	Availability of skilled trades	2	3	6
	Availability of bondable contractors	2	3	6
	Labour disruptions	3	3	9
	Material/equipment availability	1	3	3

Area	Factor	Probability 0 - 3	Weighting 0 - 3	Result (Probability Impact)
	Weather-related problems	.5	1	.5
Economic Risk	Project funding uncertainty	3	3	9
	Labour cost Increases	3	3	9
	Material/equipment cost increases	3	3	9
	Currency fluctuation	3	3	9
	Project Total	44.8/78	61.5/ 78	111 of a potential of 234 points

Risk Management Strategies

A major part of managing the risk on this project will be undertaken through the Project Management Office. Risk management strategies for specific stages of the project include:

- environmental risk management includes conducting a traffic study, green building, and storm water treatment and other studies as appropriate;
- evaluation, review and approval processes during the engineering and design stages of the project. An evaluation to ensure that the design is reflective of the project objectives and scope and a review that is concerned with regulations, licensing, safety and other standards. In addition, the detailed design phase should include cost management and value analysis techniques;
- procurement risk management strategies including processes and alternatives for contracting design and construction; procurement of property, materials, equipment and land; and assessment of the cost versus quality of the proposals received;
- construction management risk strategies including the need for contract financial management, supervision and inspection, establishing protocols for changes required and the formulation and implementation of recovery plans;
- the post-construction phase should include a formal process that should be set-up to assess the project's completion, conduct appropriate tests to ensure proper functioning and test compliance to ensure all specifications, regulations and contractual agreements have been adhered to. Protocol for unsatisfactory delivery should be established to resolve any disagreements, discrepancies and issues in the most efficient and effective manner to facilitate timely project closure and delivery;
- follow-up includes determining the projects success with regards to the asset built and the costs associated with its construction; all elements of the project's life cycle should be evaluated in order to determine both positive and negative outcomes.

Implementation Plan

A detailed implementation plan was developed which shows the activities and sequencing of the project. The target opening date for the facilities is 2005.

Conclusion

This business case presents compelling rationale to build a new health care centre on a new site in Abbotsford. The combined facility will better accommodate the health care needs of the Fraser Valley Health Region and reduce cancer treatment wait lists for Lower Mainland residents.

The strengths of the project are summarized as follows:

- for the first time in BC, a Cancer Centre is being designed at the same time as a major acute care facility which will result in operational efficiencies and reduce or eliminate many of the problems that occur with add-on facilities;
- the new combined facilities will offer new and expanded health care services in concert with other hospitals in the region;
- the project supports repatriation of patients so that care can be provided 'closer to home';
- the project will provide advanced technologies and information systems in the facility;
- retaining design elements from the previous project design may produce cost and scheduling efficiencies;
- the project procurement methodology that has been proposed will result in open-market competition, and provide opportunities for shorter completion time;
- employing value analysis and a range of other risk management strategies in all phases of the project design mitigates government exposure to risk throughout the duration of the project;
- the Project Team is examining all opportunities to develop a modern facility that meets the present and future regional health needs, including a review of world-wide best practises.

Table of Contents

1.0	INTRODUCTION	1
1.1	History of This Project	1
1.2	Business Case Development	2
1.2.1	Steering Committee and Project Team	2
1.2.2	Detailed Functional Programming	3
1.2.3	Regional Clinical Program Plan	4
1.2.4	External Assessment of Programs	4
1.2.5	Review of Costing	6
1.2.6	Public Private Partnership Opportunities (P3)	7
1.2.7	Parking	7
1.3	Summary of Request	7
1.4	Organization of this Document	8
2.0	DEMAND FOR SERVICES	10
2.1	Fraser Valley Health Centre	10
2.1.1	Demographics	10
2.1.2	Demand for New/Expanded Programs/Services	10
2.1.3	Relevance/Fit with Provincial Policy Goals and the Strategic Plans of the FVHR	11
2.2	Eastern Fraser Valley Cancer Centre	13
2.2.1	Impact of Demographics on the Need for Cancer Services	13
2.2.2	Relationship between Cancer Centre and the Fraser Valley Health Region	14
2.2.3	Relevance/Fit with Provincial Policy Goals and the Strategic Plans of BCCA	15
2.3	Scope of Services	16
2.3.1	Fraser Valley Health Centre	16
2.3.2	Eastern Fraser Valley Cancer Centre	17
2.4	Alternatives Considered	19
2.4.1	Expansion of Existing Site versus New Construction	19
2.4.2	Site Alternatives for New Construction	20
2.4.3	Reuse of Existing Design and Multi-Building Concept	20
2.4.4	Provision of Cancer Services In a Distinct Environment	21
2.4.5	Organization of Programs Across Communities	21
2.4.6	Organization of Inpatient/Outpatient Programs	22
2.4.7	Construction Procurement Alternatives	22
3.0	MANAGEMENT AND GOVERNANCE	23
3.1	Project Governance	23
3.2	Project Management	25

Fraser Valley Health Centre
Eastern Fraser Valley Cancer Centre

3.2.1	Budget Management and Reporting	26
3.2.2	Quality Assurance	26
3.2.3	Contract Management	26
3.2.4	Issues Management	27
3.2.5	Change Order Process	27
3.2.6	Internal Project Communications and Reporting	27
3.3	Project Schedule	27
3.4	Independent Monitoring Process and Evaluation	28
3.5	Approval Process	29
3.6	Legal, Technical and Policy Aspects	29
3.7	Financing Sources	30
3.8	Communications	30
3.8.1	Communications Objectives	30
3.8.2	Positioning Statement	30
3.8.3	Key Messages	31
3.8.4	Secondary Messages	31
3.8.5	Target Audiences	31
3.8.6	Strategies	31
3.8.7	Evaluation of Communication Strategies	32
4.0	COSTS AND BENEFITS – QUANTITATIVE	33
4.1	Methodology for the Development of the Pre Construction Operating Estimate (PCOE)	33
4.1.1	Program/Service Assumptions	33
4.2	PCOE Summary	34
4.3	Capital Cost Summary	42
5.0	COSTS AND BENEFITS – QUALITATIVE	44
5.1	Non-Financial Outcomes	44
6.0	PERFORMANCE MEASURES	45
6.1	Hospital Performance Measures	45
6.2	Canadian Council on Health Services Accreditation	46
6.3	British Columbia Cancer Agency	48
6.4	Ministry of Health	49
6.5	Other	50

7.0	RISK MANAGEMENT	51
7.1	Types of Risks	51
7.2	Quantifying The Degree of Risk / Potential Impact	51
7.3	Critical Time Periods	53
7.4	Risk Management Strategies	54
7.5	Responsibilities For Managing Risk	54
7.6	Reporting	55
7.7	Evaluating How Risks Were Managed	55
8.0	IMPLEMENTATION PLAN	57
8.1	Phase One – Programming	57
8.2	Phase Two – Project Design and Definition	58
8.3	Phase Three – Construction Documents, Tendering and Award	58
8.4	Phase Four – Construction	58
8.5	Phase Five – Commissioning and Project Close Out	59
8.6	Phase Six – Move and Warranty Management	59

List of Exhibits

Exhibit 1 - FVHC - Summary of Request	7
Exhibit 2 - EFVCC - Summary of Request	8
Exhibit 3 - FVHR - Summary of Long Range Plan - Acute Care	12
Exhibit 4 - FVHR - Regional Bed Requirements and Distribution	13
Exhibit 5 - FVHC - Bed Summary	17
Exhibit 6 - EFVCC - Workload Volumes	18
Exhibit 7 - Task Responsibility	24
Exhibit 8 - FVHC and EFVCC - Project Reporting Structure	25
Exhibit 9 - FVHC and EFVCC - Legal, Technical and Policy Aspects	29
Exhibit 10 - FVHC and EFVCC - Target Audiences	30
Exhibit 11 - Evaluation of Communication Strategies	32
Exhibit 12 - Major Volume or Size Changes Included in the PCOE	34

Exhibit 13 - FVHC - Pre Construction Operating Estimate	34
Exhibit 14 - BCCA - Staffing Summary	37
Exhibit 15 - BCCA - EFVCC Facility Summary for Start-Up, Year 1 and Full Capacity	40
Exhibit 16 - BCCA - EFVCC Start-Up Budget Purchased Services from Host Hospital.....	41
Exhibit 17 - Classifying the Degree of Risk for a Project.....	52
Exhibit 18 - Risk Classification Framework	52
Exhibit 19 - Risk Factors - Critical Time Periods.....	53
Exhibit 20 - Risk Assessment	55

Appendices

APPENDIX A - EASTERN FRASER VALLEY CANCER CENTRE PROJECT DEFINITION REPORT (SEPARATE BINDER)

APPENDIX B - KPMG. FRASER VALLEY PROJECT PARAMETERS REVIEW - EXTERNAL ASSESSMENT. OCTOBER 2000

APPENDIX C - COMPARATIVE DATA ON THE OPERATIONAL PARAMENTERS FOR REGIONAL CANCER CENTRES

APPENDIX D - SELECTED ASPECTS OF THE PROPOSAL SUBMITTED TO THE MINISTRY OF HEALTH, JUNE 2000, FOR THE FRASER VALLEY HEALTH CENTRE AND EASTERN FRASER VALLEY CANCER CENTRE, ARE INCLUDED IN THIS APPENDIX

- D(i) - REGIONAL BED CALCULATIONS
- D(ii) - VISION, MISSION AND STRATEGIC DIRECTIONS OF THE FVHR
- D(iii) - CANCER CARE PROJECTION DATA
- D(iv) - HISTORICAL ANALYSIS
- D(v) - SUMMARY ANALYSIS OF SITES

APPENDIX E - CRITERIA AND EVALUATION - REUSE OF EXISTING DESIGN

APPENDIX F - CURRICULUM VITAE OF PROJECT TEAM

APPENDIX G - FACILITY PROGRAM SUMMARY

APPENDIX H - PROJECT OVERVIEW SECTION OF THE FACILITY PROGRAM

1.0 INTRODUCTION

The Fraser Valley Health Region (FVHR) and the BC Cancer Agency (BCCA) submitted a proposal to the Ministry of Health in June 2000 to construct two new health care facilities on lands owned by the Regional Hospital District on Marshall Road in Abbotsford, BC. The Fraser Valley Health Centre is a 300-bed acute-care hospital, intended as a replacement for the Matsqui-Sumas-Abbotsford Hospital (MSA) located in Abbotsford. The Eastern Fraser Valley Cancer Centre is a new facility. Both facilities will provide services to the local health area as well as specialized programming to the residents of the entire Fraser Valley Health Region.

In late June 2000, the FVHR and BCCA received approval and planning funds from the Ministry of Health to proceed with planning for these facilities. This document summarizes the outcome of this planning process and represents the business case to support the project.

This Business Case addresses the requirements for Capital Project Funding specified by the Ministry of Health and the Ministry of Finance and Corporate Relations.¹

1.1 History of This Project

Matsqui-Sumas-Abbotsford Hospital in Abbotsford is the largest of the four acute care hospitals in the Fraser Valley Health Region. About half of the FVHR's residents live in Abbotsford. Although the Region's population has increased 2.4 times since 1980, the complement of acute beds at MSA has remained at 202 during the same period. By 2015, the population of Abbotsford is expected to increase by 31% (35,843), and the Region's population is expected to increase by another 84,012 people (34.5%).² More inpatient, emergency and ambulatory-care capacity is urgently needed to provide local as well as regional services.

The Fraser Valley Health Region and the Ministry of Health have been seeking solutions to the health care services shortfall since 1986. Seven options were developed for renovating the existing MSA Hospital between 1987 and mid-1989. A study completed for the Ministry of Health in April 1990 recommended a new facility on a new site. In July 1990, the Ministry announced approval of a new 300-bed facility on a new site. The Central Fraser Valley Regional Hospital District purchased property for the new hospital on Marshall Road in Abbotsford in March 1991. Planning proceeded through tendering specifications and cost estimates. The project was put on hold in October 1997.

In May 2000, the Ministry of Health requested a review of the MSA Hospital project. The Ministry asked the FVHR to consider the implications of health care regionalization on the previous proposal and to consider how a regional cancer centre might be integrated into the plans for the designated site.

A comprehensive project proposal was submitted to the Ministry of Health in June 2000.³ The proposal provided a review of the 12-year history of the project, defined the demand for services within the

¹ Ministry of Finance and Corporate Relations. Capital Project Business Case. Undated.

² The population data used in this business case is taken from BC Stats population estimates, edition # 25 (PEOPLE 25). These estimates are based on the 1996 census.

³ Fraser Valley Health Region and BC Cancer Agency. New Fraser Valley Health Centre Abbotsford and Fraser Valley Cancer Centre. Proposal submitted to the Minister of Health. June 2000.

Region and the impact of co-location of cancer services. The proposal also provided a comparison costing of several designs and development options⁴ and recommended development on the new site with BCCA. After reviewing this proposal, the Ministry of Health approved planning funding of up to \$1 million to complete a business case in support of the proposal.

1.2 Business Case Development

This section describes the process used to develop the Business Case.

1.2.1 Steering Committee and Project Team

A Steering Committee was struck in August 2000, to guide the development of the Business Case. The Health Services Group, BC Buildings Corporation (HSG/BCBC) was engaged to assist the Fraser Valley Health Region and BC Cancer Agency with the development of the Business Case.

The HSG/BCBC activities included:

- coordinating all activities up to and including submission of the Business Case to the Ministry of Health;
- reviewing and confirming operational demand and program delivery;
- organizing and managing the development of an outline of the facility program and conceptual block planning; and
- coordinating communications on the project.

A Project Team was formed to assist in the development of the Business Case. Core Team members included representatives from the FVHC, BCCA, HSG, BCBC, Architectura, RPG and Stantec Architecture.

The responsibilities of the Project Team were to:

- deliver the project on schedule, on scope and on budget;
- conduct regular information updates with the project team members and others as required;
- report to the Steering Committee at specific milestones;
- report progress against project plan with budget;
- bring forward issues raised by consultants; and
- meet regularly as required.

⁴ The comparison included analysis of previous design and new design proposals levelled year 2000 dollars. The proposal did not include projections of escalation of project costs beyond 2000.

1.2.2 Detailed Functional Programming

Programming for the project has been undertaken as two major blocks of work. The first block, which is represented in the Project Definition Report, was prepared in support of this Business Case. It was produced by The RPG Partnership, in consultation with users and with support from Architectura, Stantec, and BTY (see Appendix A). This report includes the following materials:

- a 'program parameters' report which outlines and reviews the regional demand for services;
- a 'master program' which applies modern space standards to the program areas for both the FVHC and EFVCC in the combined facility;
- a series of functional relationship diagrams that illustrates the relative adjacencies of major program areas contained in the facility;
- project definition report comprised of the above plus, program level estimates for the project; and
- pre construction operating estimates which project operating costs for the new facility upon completion.

This level of detail has allowed the Project Team to consider a range of site configurations sufficiently detailed for quantity surveyors to generate program-level capital estimates for the project.

A second level of detailed facility programming was undertaken between October 2000 and February 2001. The facility program will be used as the basis for conceptual and schematic design phases that follow project approval by Treasury Board.

Several programs are identified for further in-depth analysis to fully define the parameters of services to be provided. These areas have been reviewed in concert with the facility program with funding incorporated into the project. The Project Team was expanded to coordinate information gathered by multi-disciplinary user teams. Coordinated by KPMG, these teams included physicians, nurses, administrative representative(s) and other professionals. These teams will:

- reviewed current literature;
- examine other similar programs in the Province, the nation and internationally;
- analyze technology and biotechnology trends;
- investigate other industries that display areas of potential interest; and
- integrate changes with the facility programming done by the RPG Partnership.

Teams completed their investigations at the end of January 2001. The following programs were investigated:

- critical care areas including cardiac critical care, intensive care units, surgical step-down, telemetry;
- emergency medicine;
- ambulatory care including the wellness/education, outpatient clinics, surgical day-care, medical day-care etc.;
- maternal/child care; and
- medical-surgical inpatient unit design.

The ability of the design to create a healing environment will be explored. In addition, a separate team is reviewing a variety of conceptual models for the facility. The teams will examine the implications of each model on functional ability, costing (both capital and operating) and structural feasibility.

1.2.3 Regional Clinical Program Plan

The FVHR retained a consultant in September 2000 to create a Regional Clinical Program Plan. The intent of the plan was to determine where each of the clinical programs will be located within the Region and address the related space implications in each of the facilities of the region.

No significant changes to the programming of this new facility have resulted from this review.

1.2.4 External Assessment of Programs

1.2.4.1 Fraser Valley Health Care Centre

An external consulting team was hired to:

- complete a high level external review of the capital project parameters providing comment on the robustness of the planning process underlying the parameters;
- identify potential areas for further in-depth review; and
- focus on opportunities to add value to the project.

The full report prepared by KPMG can be found in Appendix B. The findings of the external assessment of programs by KPMG follow.

“Overall the team is satisfied that the proposed size of the new facility will be appropriate to fulfil its role in the regional acute care program. The size of the facility will assist in meeting regional targets of 90% or higher capture of non-surgical and 85% of surgical service demand by 2010, increasing to 90% or higher in most services by 2015. Achieving these targets will hinge upon the recruitment and retention of necessary specialized nursing, technologist and medical personnel.

Opportunities to consolidate selected elective services for the region at Mission Memorial Hospital and Chilliwack General Hospital will be pursued.

Only a small percentage of acute beds will be occupied in the future by alternate level of care (ALC) patients. The region has identified an ALC target of 7% for 2005 down from a current level of approximately 12% at the MSA site. Further targets are 5% by 2010 and 3% by 2015.

The team is supportive of the proposal not to offer specialized pediatric surgery, children's acute psychiatry, very high-risk maternity care, thoracic surgery, neurosurgery, and cardiac surgery in the region. It is important for the region to continue to engage in macro-regional planning with Simon Fraser, South Fraser and the Vancouver/Richmond regions.

There are a number of areas for continued planning and more in-depth review, including a strategy to manage the needs of seniors, manage ALC, and programming ambulatory care.

The psychiatry/mental health program design needs further exploration. The psychiatry/mental health services is intended to continue to be fully integrated community – hospital program.”⁵

1.2.4.2 Eastern Fraser Valley Cancer Centre

The Canadian Association of Provincial Cancer Agencies gathers comparative data on the operational parameters for regional cancer centres. This data (included in Appendix C) shows the BC patterns of practice relative to other Canadian provinces.

Highlights of these comparisons show:

- BC's ratio of new patients to provincial cancer frequency is 0.73 (Canadian range 0.62 - 0.91). This ratio reflects not only patients' ability to access the BC Cancer Agency's services within evidence based standards but also the alternate providers available. (For medical oncology consultation and care, patients may attend a physician in private practice if the speciality is available in their region). The ratio in BC will rise with volume and geographic enhancements such as the opening of the expanded Vancouver Island Cancer Centre and the development of a cancer centre in the Eastern Fraser Valley.
- BC's ratio of radiation therapy new cases to cancer frequency is 0.41 (Canadian range is 0.33 to 0.45). This ratio is a reflection of patient's ability to access radiation oncology consultation and treatment. The benchmark for this ratio is 0.45 and with improved access through system enhancements, BC should reach this standard.

⁵ KPMG. Fraser Valley Project Parameters Review. External Assessment. October 2000.

- BC's ratio of radiation patients per treatment machine is 448 (Canadian range 290-538) BC has the second highest ratio in the country. This is attributable to a combination of operational efficiencies and hours of service.
- Due to the myriad of service options that are available for Systemic Therapy in each of the provinces, comparative data is not well developed. In BC, with the opening of the Cancer Centre for the Southern Interior, approximately 50% of patients who received chemotherapy were seen at the BC Cancer Agency. With impending retirements of community based oncologists and more complex treatments, the Cancer Agency's centres will continue to provide a minimum of 50% of the chemotherapy service requirements in the province.

1.2.5 Review of Costing

The Project Proposal issued in May 2000 addressed the question of what the earlier project (1997) would cost to produce in the year 2000. Certain assumptions were made in the preparation of that proposal.

Planning work undertaken in the development of the Business Case as submitted to the Ministry of Health in October examined space requirements to a higher level of detail than in the May 2000 proposal document. The Facility program has now been used to prepare revised estimates and once again, conventional assumptions have been made for completion of the project five years hence. Reasons for the increase in of total project cost estimates are, generally, as follows.

- The Ministry of Health advised that the number of renal chairs should be increased from 8 chairs in the Project Proposal document to 15 chairs – the cost of this change, including increased area to accommodate the additional chairs has been factored into the business case.
- Equipment requirements have been reassessed and are substantially higher than the costs identified in 1997.
- Costs have been estimated at current prices and have been escalated in this business case, at a rate of 2.25% per annum to the mid-point of construction – this was not the case in the Project Proposal presented in May 2000. The cost of escalation is crucial to successful completion of the project and failure to include this would result in significantly increased financial risk.
- The facility program (final draft January 2001) provides a significantly increased level of detail for all areas of the facility and additional costs have been identified as a result of completion of this study. These costs are in addition to those identified in the Business Case (October 2000), are the result of discussions with Ministry and Treasury Board staff, and are, generally, as follows:
 1. The Project Contingency (based on 2% of the non-construction costs) has been included for the Cancer Centre, this item was excluded in the previous estimate.
 2. Project management fees increased from 2% to 3% to become market-comparable.
 3. A Roof-mounted heliport is now included in the project.
 4. Gross-up factor increased from 1.29 to 1.33 to increase opportunity for innovation in preparation of a master-planning for the site.
 5. Commissioning and move in cost for both the Health and Cancer Centre has been increased from 600,000. to 1.2 million dollars.

1.2.6 Public Private Partnership Opportunities (P3)

Since submission of the Business Case (October 2000), a review of P3 opportunities has been commenced by BCBC. Several functional areas for which funding is not being sought in this Business Case have been programmed for eventual development through public private partnership opportunities. Although identified, but not included in the estimates, the facility program contains detailed requirements for some portion of its ambulatory/outpatient programs as well as regional warehousing, daycare and regional administrative space.

It is anticipated that development of these and other ancillary facilities will be become part of the Master Plan for the site and rezoning opportunities for adjacent properties in the neighbourhood. Approximately two acres of the site will be reserved for this purpose. At this time, only a cursory view of P3 opportunities has been conducted by the project team and material prepared to date has not been included in the business case document (February 2001).

1.2.7 Parking

The design prepared seven years ago required 840 stalls for a 350 bed hospital and up to 1210 stalls for a 500 bed hospital. With the current design now contemplating 300 beds, FVHC alone would now require 725 stalls, EFVCC an additional 175, for a grand total of approximately 900 parking stalls.

When this information was considered during the physical plan review, and later in the master planning session, it was confirmed that if the treed knoll was to remain intact, a maximum of 500 stalls could be accommodated at grade with the remaining cars accommodated in some form of structured parking. Further study of the treed knoll together with an update to the traffic study will need to be undertaken to more accurately determine the number of parking stalls that can be accommodated at grade. Because only the cost of providing non-structured parking is covered under Provincial funding, alternate funding sources for any structured parking will need to be explored in a subsequent phase.

1.3 Summary of Request

A summary of the key information about the request is provided in the following exhibit(s), as requested by the Ministry of Finance and Corporate Relations.

Exhibit 1

**Fraser Valley Health Centre
Summary of Request**

Date:	October, 2000			Location:	Abbotsford
Project Title:	Fraser Valley Health Centre			Start Year:	2005
Local Agency:	Fraser Valley Health Region			Project Sponsor:	Michael Marchbank, CEO
Ministry:	Health			Contact Person:	M. Marchbank, CEO Phone: (604) 556-5082
Total Capital Cost:	\$178,213,700	Operating Cost (annual):	\$83,305,000	E-mail:	michael.marchbank@fvhr.org
Debt Service (annual):	_____				

**Eastern Fraser Valley Cancer Centre
Summary of Request**

Date:	October, 2000			Location:	Abbotsford
Project Title:	Eastern Fraser Valley Cancer Centre			Start Year:	2005
Local Agency:	BC Cancer Agency			Project Sponsor:	Dr. Simon Sutcliffe, CEO
Ministry:	Health			Contact Person:	Dr. Simon Sutcliffe, CEO Phone: (604) 877-6104
Total Capital Cost:	\$32,333,700	Operating Cost (annual):	\$10,551,334	E-mail:	ssutclif@bccancer.bc.ca
Debt Service (annual):	_____				

1.4 Organization of this Document

This document addresses the requirements as described in the “Capital Project Business Case”, a handout provided to the Steering Committee on August 9, 2000 by staff from the Ministry of Finance and Corporate Relations. In addition, the Ministry of Health, Health Authority Capital Plan Requirements⁶ were considered in completing this Business Case. The organization of the document is shown in the table.

Introduction	This introduction describes the history of the project, process taken to develop the Business Case and a summary of project information.
Demand For Services	Describes the demand for services, the scope of services and alternatives considered.
Management and Governance	This section describes the Management and Governance structures for the project, including value analysis and other measures to evaluate the effectiveness of the management of this project, financing sources, and communications.
Costs and Benefits, Quantitative	Includes the Pre Construction Operating Estimates.
Costs and Benefits, Qualitative	Discusses less tangible costs and benefits to the system.
Performance Measures	Describes the expected performance measures that will be used to evaluate the efficiency and effectiveness of the project relative to the intended improvements in patient care.

⁶ Ministry of Health. Health Authority Capital Plan Requirements. January, 2000.

Risk Management	Identifies potential risks associated with the project and identifies critical risk management strategies.
Implementation Plan	Outlines the proposed approach to the project and provides an overview of the workplan and suggested timelines. This section also highlights the additional work that will take place prior to the approval of project funds in order to ensure comprehensiveness of planning and to avoid any unnecessary delays in advancement.

2.0 DEMAND FOR SERVICES

The objective of this project is to build a new 300-bed acute care facility and a Cancer Centre on lands owned by the Fraser Valley Regional Hospital District and by the Province. This section provides information on the following areas:

- demand for services including the relevance and fit with provincial and organizational goals;
- scope of services; and
- alternatives considered.

2.1 Fraser Valley Health Centre

2.1.1 Demographics

Since 1980, the population of Abbotsford has increased 2.4 times to 127,200. For the same period, there has been a growth of about 46% for the regional population (from 132,000 to 243,000). Projections indicate that the regional population will increase by almost 9% (to 267,935) over the next five-year period (2005).

Based on extensive work with the Ministry of Health, an assessment of regional bed requirements indicates the Abbotsford area will need an additional 59 acute care beds by 2004/2005.⁷

2.1.2 Demand for New/Expanded Programs/Services

The growth in population and the increased regional role for the MSA Hospital has surpassed the ability of best utilization practices to influence the demand for acute care beds. As a result there are severe bed shortages in the region.⁸ Presently, there are unacceptable wait times for services offered within the region. In addition, there are long wait times for services not provided by FVHR that residents must access in other regions.

The FVHR is currently providing care to about 75% of the acute care cases for the region.⁹ This means that up to one quarter of the citizens of the area have to travel elsewhere to find the appropriate care. Many of the patients who receive care outside of the region do so because of the lack of access to programs such as nuclear medicine, cerebral angiography, hemodialysis, higher acuity of trauma surgery requiring ICU back-up, etc.

In addition, referral centres that have been providing care to residents of the FVHR are no longer able to accept patients from the region. The patients treated in the other regions are often the most acute patients and tend to have a longer length of stay. Patients that are referred for a specialized treatment are frequently returned to the FVHR earlier and require additional inpatient care. This situation is compounded by the fact that many of these patients who are very ill require private rooms, which are not available at MSA Hospital. Patients may be placed into semi-private accommodation and the

⁷ Fraser Valley Health Region and BC Cancer Agency. New Fraser Valley Health Centre Abbotsford and Fraser Valley Cancer Centre. Proposal submitted to the Minister of Health, June 2000. Appendix D(i): Regional Bed Calculations.

⁸ Ibid.

⁹ Ibid. Page 5.

second bed is closed or the patient is held in the emergency room for extended periods until a bed becomes available.

New programs that will be offered in the FVHC are:

- MRI nuclear medicine;
- full vascular surgery;
- cardiology;
- nephrology/renal; and
- expanded ambulatory programs.

2.1.3 Relevance/Fit with Provincial Policy Goals and the Strategic Plans of the FVHR

The completion of this project will allow the Fraser Valley Health Region to more effectively meet Ministry of Health strategic goals, specifically:

- Goal 2 "British Columbians will have access to health care services within an acceptable time period"
- Goal 3 "British Columbians will have access to health care services within specified geographic distances"
- Goal 4 "British Columbia will have an adequate supply of health care services"
- Goal 6 "The health services system will provide consistently high quality health services that improve health and health outcomes, and satisfy British Columbians' expectations"

The need for a new facility that provides a broader scope of regional services is directly linked to the vision, mission and strategic directions of the Fraser Valley Health Region.¹⁰ The Region is significantly hindered in its ability to achieve its goals and objectives because of the current physical plant at the MSA Hospital site.

Completion of a new acute care facility in 2005 will allow the FVHR to provide the necessary access to quality patient care to the residents of the five local health areas as well as to patients in adjoining regions who wish to seek care closer to their home. The hospital is the critical link to continuing service delivery in this community.

The need for a new acute care hospital in Abbotsford is driven by a number of factors:

- the demand for additional inpatient beds to meet the current and future needs of the region;
- the need for additional outpatient capacity for programs provided to the local community;
- the physical plant does not allow the hospital to provide adequate infection control procedures;
- the need to provide new and expanded services within the Region in order to care for drastically more patients rather than trying to access services through the resources available in other regions, specifically in Vancouver;

¹⁰Ibid. Appendix D(ii): Vision, Mission and Strategic Directions of the FVHR.

- lack of sufficient numbers of inpatient beds results in delays or inability to provide appropriate access to services, such as:
 - increased surgical wait times due to restricted access for surgical cases requiring an inpatient stay;
 - prolonged stays in the emergency room (ER) and delay in care due to back ups in the ER;
 - lack of sufficient regional inpatient psychiatric beds results in, on average, two admitted psychiatric patients per day being held in ER at MSA Hospital and one in Mission Memorial Hospital;
 - frequent shuffling of patients from room to room is necessary - the current average is 80 transfers a day at MSA Hospital. These patient moves are conducted in order to address the need to separate male and female patients or because of infection control issues. This alone has a great impact on staff time, quality of patient care, and leads to potential workplace injuries and poor morale for staff who are inappropriately deployed to carry out this task.

The acute care long term capital plan (LTCP) for the FVHR requires development and increased capacity at each site in the Region. The bed requirements alone indicate a need for additional space outside of the new FVHC.

The following timeline briefly outlines some of the capital expansion that will be required. All sites need to be running at full capacity with additional capital construction in the future in order to meet the needs of the population. Lastly, the relationship between acute care and long term care capacity cannot be understated. In order for utilization rates to continue to fall and quality of care be maintained, the long term care sector must increase its capital and operating capacity to ensure that acute care facilities are delivering acute care services only.¹¹

Exhibit 3

Fraser Valley Health Region
Summary of Long Range Capital Plan – Acute Care

Year	Capital Project
2001 - 2004	Implement plan to evolve programs based on the Regional Clinical Program Plan. Will include renovations at both Mission Memorial Hospital and Chilliwack General Hospital.
2005	New 300 bed acute care facility opened in Abbotsford.
2006 - 2010	Assess need to expand physical plant of Mission Memorial Hospital based on actual population growth and advancements in technology. Continue with redevelopment of Chilliwack General Hospital to replace aged buildings and ensure adequate regional bed numbers.

¹¹ Ibid. page 7.

Bed projections were developed for the FVHR based on extensive work with the Ministry of Health. The following table illustrates the bed capacity required at the new hospital and the distribution of the beds within the FVHR.¹²

Exhibit 4

**Fraser Valley Health Region
Regional Bed Requirements and Distribution**

	2005	2010	2015
Regional Bed Requirements	462	511	569
Proposed Bed Allocator			
Mission Memorial Hospital Site	52	52	52+
Fraser Canyon Hospital Site	16	16	16+
Chilliwack General Hospital Site	133	161 ¹³	161+
MSA General Hospital Site (presently 202)	261	282	340 ¹⁴

2.2 Eastern Fraser Valley Cancer Centre

2.2.1 Impact of Demographics on the Need for Cancer Services

The British Columbia Cancer Agency attempts to optimize patient access to services and provide its services based on a provincial network of services, rather than by local health region planning. Services are currently provided through a Communities Oncology Network and through regional cancer centres located in Vancouver, Surrey, Victoria and Kelowna. There are some delays in access to care in the Lower Mainland.¹⁵ On average, half or 50% of new patient consultations receive service within the standard two-week waiting period. At this time, there are approximately 650 patients waiting for radiation therapy.

Cancer projections for the Lower Mainland show an annual increase of approximately 3% in the numbers of new cancer cases in the community. For the Fraser Valley, the percentage is closer to 3.5%. These projections are based on a regression line developed from 10 years of cancer registry data. It is expected that there will be over 13,000 new cases of cancer reported annually in the FVHR by 2012.¹⁶ The number of people living with cancer (prevalent cases) and requiring continued care

¹² Ibid. page 8.

¹³ Assumes opening 28-bed unit at CGH by 2010.

¹⁴ New hospital will be built to 300-bed capacity. Capacity will need to be developed on other sites in the Region to make up the outstanding 40-beds.

¹⁵ Fraser Valley Health Region and BC Cancer Agency. New Fraser Valley Health Centre Abbotsford and Fraser Valley Cancer Centre. Proposal for submission to the Minister of Health. June 2000. page 8.

¹⁶ Ibid. Appendix D(iii): Cancer Projection Data.

from the cancer system is also increasing. There is an expected annual increase by 7% of the overall cancer prevalence rates.

A shift in case-mix and its associated changes in fractionation for radiation therapy patients will also contribute to increasing workloads. Consultations become more extensive and take more time as patients live longer with cancer and the range of services they need to access broadens. Further, it can be expected that as the Provincial Surgical Oncology Program is developed, more patients will be accessing cancer centres for a multidisciplinary oncology consultation prior to their surgery.

The two existing cancer centres in the Lower Mainland, Vancouver Cancer Centre and Fraser Valley Cancer Centre, were designed to accommodate 5,000 and 2,500 new patients respectively. Based on new patient registrations alone, both centres are currently working in excess of their design capacity by about 700 new patients in 1999-2000.¹⁷ However, these measures are now considered inadequate because of the number of prevalent cases and the many disease sites for which multiple treatment modalities are required. The Agency is currently working on a more effective method for quantifying workload projections.

Radiation therapy remains a major form of treatment for cancer and access to care is completely dependent on the capacity of BCCA facilities. In the Lower Mainland there are currently eleven radiation therapy machines. A twelfth machine will be in service at the Fraser Valley Cancer Centre (Surrey, BC) in January 2001. However, the growth in demand for treatment services means that by 2004 the Lower Mainland will already have a shortfall of two treatment machines. Together these factors drive the need for three more treatment machines to be in service by 2004. The demand for radiation therapy alone makes a compelling case for a new centre in Abbotsford.

Medical oncology and chemotherapy workload is growing at a greater rate than any other components of service.¹⁸ Chemotherapy services are provided both within cancer centres and in the community. Projections identify the degree to which future workload might be accommodated in a new cancer centre with a capacity similar to the current Fraser Valley Cancer Centre and the workload that at a minimum will need to be accommodated in the community.¹⁹ The data clearly shows the need for additional comprehensive cancer care facilities in the Fraser Valley. In global terms this means the duplication of the (Surrey) Fraser Valley Cancer Centre, hence, the request for the Eastern Fraser Valley Health Centre services.

As outlined above, there is a need to expand cancer services into the Eastern Fraser Valley. The Cancer Centre requires a host hospital to co-locate in order to provide comprehensive services to patients. The following outlines the nature of the relationship between the Cancer Centre and the host hospital.

2.2.2 Relationship between Cancer Centre and the Fraser Valley Health Region

The BC Cancer Agency currently provides comprehensive cancer care services through four regional cancer treatment facilities and through the Communities Oncology Program that is run in partnership with hospitals in the community. The Vancouver Cancer Centre is the only treatment facility that is self

¹⁷ Ibid. page 9.

¹⁸ Ibid. page 10.

¹⁹ Ibid.

sufficient in terms of clinical and operating support services. The cancer centres in Victoria, Kelowna and Surrey have been designed to allow the cancer centre facilities and staffing to be focused on the oncology speciality services while all the support and general clinical functions are provided through a purchased services arrangement with the "host hospital". This model of a "free standing" cancer centre closely linked to a major hospital has proved to be very effective both in this province and many other centres across Canada.

2.2.3 Relevance/Fit with Provincial Policy Goals and the Strategic Plans of BCCA

A key program objective in the Ministry of Health's Performance Plan²⁰ is to address the availability and timeliness of cancer care. This objective supports the Ministry of Health Goal 2, that "British Columbians will have access to health care services within an acceptable time period". The performance measures are established and include wait time standards and actual wait times reported for oncology cancer treatment.

The British Columbia Cancer Agency has a provincial mandate to provide population based cancer control services for the residents of British Columbia. The mission of the Agency is threefold:

- to reduce the incidence of cancer;
- to reduce the mortality of people with cancer; and
- to improve the quality of life of those living with cancer.

BCCA supports the objective to provide all British Columbians with access to a high quality of cancer care as close to their homes as possible. The Agency's programs and services are provided in cooperation with its many partners. The programs and services include prevention, early detection, diagnosis and treatment, supportive care, rehabilitation, palliative care, education, research and support for community programs. Given the demand for cancer care in the Province, the development of the Eastern Fraser Valley Cancer Centre means that the BCCA can more effectively meet the needs of British Columbians as well as the need for residents of the Fraser Valley.

²⁰ Ministry of Health and Ministry Responsible for Seniors. Performance Plan 2000/2001. British Columbia. April, 2000.

2.3 Scope of Services

2.3.1 Fraser Valley Health Centre

The programs and services to be offered in the FVHC were developed through a formal functional programming exercise. The programs and services will serve the needs of the local Abbotsford community as well as house some of the regional programs. The other hospitals in the region will play similar roles by providing standard services to the community and offering some consolidated regional programs. The Regional Clinical Program Plan provides the detail of the organization of services.

The FVHC will support the following programs:

- general surgery and all subspecialty inpatient surgical services including orthopedics, gynecology, ENT, vascular, plastics;
- general surgery and all subspecialty outpatient surgical services including general surgery, orthopedics, gynecology;
- all specialty adult medical services including nephrology (hemodialysis unit), cardiology (no interventional cardiology planned), neurology, gastroenterology, respirology;
- level II obstetrics with a level II nursery;
- emergency medical services;
- psychiatric services;
- pediatric services (inpatient and outpatient);
- family practice services including geriatric medicine, palliative care, emergency medicine, level I obstetrics, GP pediatrics.

The following table illustrates the inpatient services and programs, proposed bed numbers, assumed occupancies for 2005 for the proposed FVHC site.²¹

²¹ The RPG Partnership. Fraser Valley Health Centre/Eastern Fraser Valley Cancer Centre. Program Definition Report, Program Parameters. August, 2000. Page 1.27.

Fraser Valley Health Centre
 Bed Summary

	2005			2015		
General Medical/Surgical (including rehab)	132	85	40,953	142	90	46,647
Telemetry	14	85	4,344	16	90	5,256
Surgical Step Down	8	85	2,482	8	85	2,482
Palliative	7	85	2,172	10	90	3,285
Oncology	5	85	1,551	10	90	3,285
ICU/CCU	13	85	4,033	18	85	5,585
Pediatrics	18	60	3,942	18	70	4,599
Obstetrics (including births)	24	61	5,314	28	64	6,541
NICU	7	85	2,172	10	85	3,103
Psychiatry	33	90	10,841	40	90	13,140
TOTAL	261		77,804	300		93,922

Further information about percent occupancy, patient days, and cases is included in the Project Definition Report. The building space summary estimates that 45,693 building gross square metres will be required to support the facility program.

2.3.2 Eastern Fraser Valley Cancer Centre

The Cancer Centre in the Eastern Fraser Valley will provide:

- new patient multidisciplinary consultation and care planning;
- chemotherapy and systemic care;
- access to national and international clinical trials;
- radiation therapy;
- supportive care and pain and symptom management;
- nutritional consultation and support;
- patient and community education in cancer prevention, screening;
- professional education/liaison for community based cancer support and treatment programs.

Eastern Fraser Valley Cancer Centre
 Workload Volumes

Lower Mainland	2000	2005	2015
Cancer Frequency (New Cases)			
Area 1 ²²	5,008	5,545	7,002
Area 2 ²³	4,489	5,303	7,358
Northern Region ²⁴	802	963	1,340
Total	10,299	11,811	15,700
Radiation Therapy			
Total Cancer Cases	10,299	11,811	15,700
Total Fractions	103,216	129,685	197,820
Accelerators Required (10 hour days)	12	14.4	22
Accelerators Available	11	15	22
▪ Vancouver	7	7	8
▪ Surrey	4	5	5
▪ Abbotsford	0	3	4
▪ Other (to be determined)	0	0	5
Eastern Fraser Valley	2000	2005	2015
New Patient Registrations	0	1,300	2,700
Total Patient Appointments	0	30,000	70,000
Total Chemotherapy Visits	0	3480	7,216
Radiation Therapy Fractions	0	27,000	36,000

²² Area 1 includes Vancouver, Burnaby, Richmond, North Shore, Coast Garibaldi.

²³ Area 2 includes Fraser Valley, South Fraser, Simon Fraser Health Regions.

²⁴ Northern Region includes Peace-Liard, Northern Interior and Northwest Interior.

2.4 Alternatives Considered

There have been many alternatives considered throughout the history of the project, such as:

- expansion versus new construction on the existing site;
- existing site versus new site²⁵ for construction versus alternative site;
- degrees of reuse of existing design work versus complete new design and development of single building versus multi building campus (allowing non post disaster spaces to be provided at a more economical level);
- integration of Cancer Centre into the hospital yet providing a distinct environment for cancer patients and their families;
- provision of specific services in a hospital facility, on a hospital site or in the community and analysis of which community this should be in;
- integration of inpatient and outpatient functions versus grouping of ambulatory functions; and
- procurement alternatives for the construction process.

A brief discussion on each of these considerations is provided below.

2.4.1 Expansion of Existing Site versus New Construction

Potential solutions to the problems associated with the MSA Hospital facility and its ability to support local, regional, and cancer programs were considered in the context of the criteria discussed in Appendix D (iv), and evaluated as a low, medium or high fit. The following options were identified as preferred options over the past 12 years:

Option 1: Maintaining the status quo: Retain the existing structures; continue maintenance on an as needed basis. Do upgrades as permitted within the structure. This was ranked low.

Option 2: Building an 80 bed addition to the current structure: Construct a new expansion onto the existing structure to the west. Upgrades to existing building only in renovated areas. Renovations cannot upgrade existing structures to current standards. This was ranked generally as low-medium.

Option 3: Renovation of existing building and 3 part addition: Construct 3 new expansions to the existing structure to the west, east (after demolition of the 1952 building) and some in fill construction. Upgrades to existing building only in renovated area. Expansion and renovations cannot upgrade existing to current standards as new structures are limited by the physical state of the existing structure. This was ranked generally as low-medium.

Option 4: Construction of a new building on the existing site: Construct a new free-standing structure west of the existing building. Major services over 3 levels (2 levels optimal), new parking structure. Displacement of existing 150 ECU Beds. This was ranked as medium.

Option 5: Construction of a new building on a new site: Construct a new free-standing structure, with expansion capability based on 1993 functional program. This was ranked high.

²⁵ New site in this instance refers to the property owned by the Regional Hospital District on Marshall Road in Abbotsford.

2.4.2 Site Alternatives for New Construction

In examining new construction options, the question of site was raised. When the hospital administration began looking for a new site, a study was undertaken to look at what property was available to accommodate the new hospital. The project requires a centrally located site of about 18-25 acres. Three possible options were identified:

- Existing Hospital Property;
- Marshall Road Site;
- McKenzie and King Roads Site.

A summary analysis of the sites is included in the Appendix D(v). As a result of the study, it was concluded that the existing hospital site was not feasible and that of the other two options, the Marshall Road site was the best fit. As the MSA site will provide a type of regional referral for high acuity cases, it is extremely important that there be functional access from Highway #1 and other major feeder arteries. The Marshall Road site provides this level of access.

At this time it is not believed that there is another centrally located piece of land of adequate size in the Abbotsford area that can easily be acquired. For the reasons stated above, it is recommended that new construction proceed on the Marshall Road site.

2.4.3 Reuse of Existing Design and Multi-Building Concept

The following options have been identified and evaluated as potential solutions in the context of the criteria and evaluation described in Appendix F.

Option 1 - Build Original Design and Renovate Once Complete (No BCCA)

This option is based on a 1992 Facility Program. It is a facility that is designed for 300 beds with expansion capable to 400 beds. The site and building design considers potential changes in the high tech medical spaces. The design did not consider the BCCA or the FVHR program requirements with respect to Site Planning, Building Functional or Operational Planning or the design of the Building Systems. Construction of the current design will require updating the design to the current BC Building Code, departmental planning and specification of products and systems. Renovations to the new structure can be very disruptive and costly.

This option appears very attractive at first glance, but it must be noted that it fails to meet one of the nine key requirements of the project, that being to include the development of a cancer centre on this site. It also assumes spending a large amount of capital dollars (not accounted for in this document) on renovations to the interior of the building to accommodate program changes due to regionalization.

Option 2 - Building Original Design and Attach a Cancer Centre

The design for the Hospital, BCCA and FVHR program requirements, current BC Building Code and specification of products and systems would be implemented within the current design configuration. There would be operational and functional compromises in the planning for patients, visitors and staff. The free-standing BCCA structure would displace space currently planned for on-grade parking, thus requiring construction of a parking structure. This option essentially fits a cancer centre on the site without taking into account the functional relationships between the acute care services and the cancer services. It will result in long distances between cancer services and acute services that are regularly accessed by the cancer patient, and inefficient provision of services to the cancer centre.

Option 3 - Redesign, Add Less Costly Building for Some Services and Attach BCCA

The design would be retained including the major planning and building stacking concepts. The Hospital, BCCA and FVHR revised and new program requirements would be implemented. Design of the structure would be completely reworked. The hospital space would be split into Two Occupancy groups. The requirements for building construction can be reduced in space not required to be a Group B Division 2 classification for occupancy. The building area/footprint on site would be reduced permitting the BCCA to become a connected structure to the hospital. Functional and operational relationships can be improved substantially over Option 2. Provision of a parking structure is required. This option rates very closely to Option 4: Complete Redesign, but differs in two areas: reuse of existing design and project schedule. With all other variables being close to equal, and with the functionality of the programs not differing greatly, it makes sense to reuse whatever work is applicable and shorten the length of time to completion.

Option 4 - Complete Redesign (includes Cancer Centre and less costly building for some services):

Complete reprogramming and redesign. This option is the “start from scratch” option that assumes that all work to date is a sunk cost and it is better to begin again. While this may have some appeal in light of the changes that have occurred since 1997, it fails to recognize that most of the conceptual design work that is already complete is very applicable to the new programming. It therefore increases the project planning and design costs and the time to completion.

Recommendation

The recommended solution is Option 3: Redesign, Add Less Costly Building for Some Services and Attach BCCA.

2.4.4 Provision of Cancer Services In a Distinct Environment

There was consideration given to complete integration of the Cancer Program into the hospital environment. Based on extensive discussion, it was agreed that the special circumstance of cancer patients and their families, as well as the fact that, on many of their visits, cancer patients come into the cancer centre, receive their therapy and leave without having to access hospital services, it was not essential that cancer services be integrated into the acute care hospital. This means that a separate patient flow can be achieved with some separation of service. The Cancer Centre still relies heavily on the host hospital for contracted services in many other areas.

2.4.5 Organization of Programs Across Communities

Consideration of appropriate locations of programs was undertaken at the individual program level through the functional programming process as well as at the regional level through the development of the draft Regional Clinical Program Plan.²⁶

²⁶ DRAFT 1 of the Regional Clinical Program Plan (acute services only) is undergoing phase II of consultation with the Regional Medical Staff and planning is underway to gain community input into the plan. The document is therefore not included as part of this submission.

2.4.6 Organization of Inpatient/Outpatient Programs

Discussions were undertaken at the facility as well as the program level to look at the integration or separation of inpatient programs with their outpatient counterparts (i.e. maternity inpatient to co-locate with outpatient services in maternal care). Due to the operational efficiencies and physical environment impacts, it has been agreed that ambulatory services should be provided out of a central space with sub units that may create somewhat distinct areas for their programming.

2.4.7 Construction Procurement Alternatives

The original project plan for the new acute hospital was to proceed with a single stipulated sum contract. However, this approach may expose the Fraser Valley Health Region and Government to significant risk, since it will only be possible to contract with very large companies due to the project size and complexity.

It is now proposed that the redesigned acute hospital project use a form of construction management to facilitate sequential tendering of project components. This will enable smaller contractors to work on the project and also provide an opportunity for local contractors and suppliers to bid on parts of the work. By pre-qualifying trade contractors and suppliers, and with sequential tendering, opportunities arise through which the schedule can be shortened when compared to the standard stipulated sum tender approach.

The pre-qualification and tendering process will be managed through the Project Team by the construction management firm. In addition to expediting the project schedule, a Construction Management form of contract offers other advantages:

- the Construction Manager becomes part of the Project Team and participates as a partner in the development of the design and coordination of the construction and commissioning processes;
- the Construction Manager is selected by an interview process rather than a bidding process, thereby eliminating inexperienced or inappropriate General Contractors; and
- the Fraser Valley Health Region and British Columbia Cancer Agency have greater control and influence over the management of the project process.

However, since a Construction Management form of contract often has up to 60 individual contract packages, competent and professional project management and administration expertise is essential. Since the Deloitte Consulting Report calls for more rigorous attention to project cost control, performance measurement and tracking, it is critical that the project include the services of independent professional Project Management professionals to form a Project Management Office function. Further discussion and detail to this end is provided in the next section of the Business Case.

3.0 MANAGEMENT AND GOVERNANCE

A project of this magnitude is extremely complex and requires a well developed governance and project management organization and monitoring/audit function to ensure the project is delivered on time, within the budget and with an uncompromised level of quality. The proposed project management controls and structures will be consistent with the capital plan requirements of the Ministry of Health and the capital project requirements of the Ministry of Finance and Corporate Relations. In anticipation of upcoming project phases, BCBC/HSG has undertaken an examination of project delivery options employed on other similar projects recently completed or in progress elsewhere in North America. This information will be used by the Project Steering Committee to help refine the management structure for the Project.

3.1 Project Governance

The project will be governed by a Project Steering Committee and build on the relationships and work accomplished during the development of this Business Case. The Steering Committee will include representatives from the FVHC and BCCA as well as the funders, the Regional Hospital District and the Ministry of Health. The project management function will also be integrated into this group. The responsibilities of the Steering Committee include:

- manage all issues related to scope, schedule and budget;
- advise respective governing bodies of project status;
- provide direction to the Project Management Office;
- monitor the project to ensure project objectives are being met;
- approve past stages and propose for approval next stages to the governing bodies;
- communicate Board and Ministry decisions which have a bearing on the project;
- resolve issues which cannot be resolved within project groups;
- audit and approve presentation of document/project;
- facilitate removal of barriers and obstacles within sphere of influence; and
- ensure compliance with all statutory requirements.

Responsibilities for specific areas of the project plan will be assigned to specific team members through the Project Management Office. The composition of various teams will be reviewed and updated from time to time by the Steering Committee as appropriate.

The following matrix describes the secondary and primary responsibility of Treasury Board, Ministry of Health, FVRD, FVHR, BCCA, BCBC/HSG and the City of Abbotsford.

Exhibit 7

Task Responsibility

3.2 Project Management

The proposed project is unique due to its substantial size and complexity, and because it is a building not a large civil project as so many large capital projects tend to be. Consequently, when considering a project management model for a project of this size one needs to consider how other successful capital projects have been managed and adopt a similar model. Experience indicates that one common characteristic of large successful capital projects is that a comprehensive, multidisciplinary project management team led by an experienced project manager is a key part of the implementation strategy. The project management team usually works in one office and is often located on, or adjacent to, the construction site. Clearly defined roles and responsibilities for the project management team are necessary, with individual responsibility assigned for budget management, schedule management, quality control, contract management, communications and information management, etc.

It is recommended that a Project Management Office (PMO) be established and continue throughout the life of the project. This PMO would include a team of individuals responsible for the timelines, including critical path and task schedules; management of work in progress; budget management and reporting; quality control; issues management; change order process; and internal project communications. Each element of project management is discussed briefly below and followed by a suggested project management structure.

FVHR/FVRHD and BCCA are the Owners of the project and are ultimately responsible for planning and completion of the new facility under terms of a MOU that has been drafted. These organizations, together with representatives from the MoH are active members of the Project Steering Committee to which the Project Manager reports.

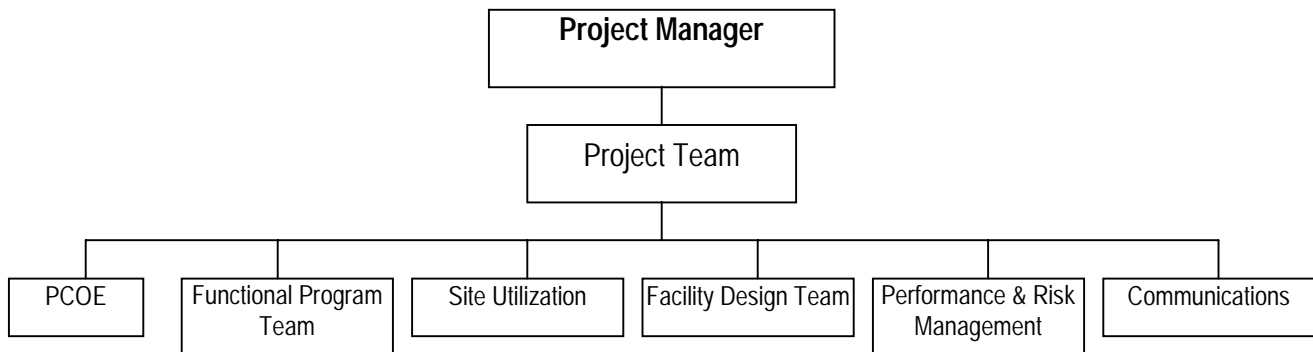
A best practices study is currently underway to outline various means of delivering this facility. Examination of a number of relevant projects in Canada and the US is being undertaken to gain from their experiences. An independent project management organization may be involved to scrutinize procedures.

The PMO will facilitate teams of resources to accomplish project tasks. These teams will deliver the project elements and the PMO will coordinate their integration and ensure acceptable completion.

Specific tasks in the project plan will be assigned to team members, shown in the following exhibit.

Exhibit 8

Fraser Valley Health Centre and Eastern Fraser Valley Cancer Centre Project Reporting Structure



Curriculum vitae for the current project team members can be found in Appendix F.

3.2.1 Budget Management and Reporting

There is always the concern about construction cost or cost overrun particularly due to the fluctuations in the Canadian dollar and/or inflation which impacts the cost of equipment and other costs. Management and financial controls include:

- financial controls in regards to payments, holdbacks;
- management controls in regards to documentation requirements, timing requirements, compliance with legislation;
- independent reviews including consultants reviews and recommendations; and
- maintaining contingencies.

The size of this project means that extensive budget management will be required to ensure a full appreciation of project implications as decisions are made. The PMO will be responsible for tracking, forecasting and reporting on the budget. The PMO will provide regular updates to the project members and the Steering Committee. The PMO will also be responsible for highlighting budget issues early in the process so that they be resolved and the project risk managed.

3.2.2 Quality Assurance

Quality control will be a key function of the PMO throughout the life of the project. The PMO will participate in the design phases and ensure that the outcomes contribute to the project objectives. The PMO will play a lead role in the value analysis process, working with the funding agencies to achieve the best value for the building life cycle. Throughout construction, the PMO will provide ongoing management of materials and workmanship and ensure that any deficiencies are dealt with in an expedient way.

In addition to required VA sessions, the Steering Committee will undertake to improve integration and operational efficiency of the EFVCC and FVHC through a visioning and review process. This will take place at various milestones through the life cycle of the project. The first of these reviews is scheduled for March, 2001.

3.2.3 Contract Management

Regardless of the procurement method for construction, there will be a significant amount of contract management required on this project. Processes will be established for reviewing and signing contracts, receiving contracted service, assigning responsibility for co-ordinating service contracts, and for maintaining the quality of contracted services. Formal contracts for services to be provided will delineate, at minimum, the following:

- scope of services to be provided;
- qualifications of personnel;
- accountabilities of the firms;
- scheduling commitment and length of contract;
- description of physical facilities and/or equipment to provide the service;
- reporting relationships;

- requirement of the service to comply with legislated and accepted (de facto) standards, regulatory processes and codes;
- requirement that the contractor's policies and processes for the delivery of the service not be in conflict with organizational policies and/or processes;
- financial arrangements;
- liability insurance; and
- licensure and/or registration status of the service, if applicable.

3.2.4 Issues Management

A key element in ensuring the schedule is met, is to have a well-defined and effective issues management process. Issues management will be a key responsibility of the PMO. Issues management includes the following:

- risk identification and monitoring for escalation;
- conflict management;
- risk mitigation strategies such as obtaining insurance, contracts; and
- taking corrective action by revising scopes as required and other remedies.

Web based technologies allow for management and tracking of issues on-line and provide the necessary tools to ensure follow up.

3.2.5 Change Order Process

There will be change orders throughout the life of this project and the successful completion of the project on time, within budget and with the required quality will be dependant on the ability to assess and make decisions on change orders very quickly. The Project Team will require clear guidelines from the Steering Committee on their authority to approve change orders.

3.2.6 Internal Project Communications and Reporting

The PMO will ensure that there is a comprehensive communication process within the project and with the two Owner organizations. The Owner's will manage the external project communication process.

Organized and predictable reporting mechanisms are a critical part of project communications. The PMO will ensure that reporting on progress, delays, issues and dependencies will take place in a timely and reliable manner. The following types of reports may be used: milestone tracking, objective and scope tracking, regular budget reports, master project schedules, schedules, cash flow and regular status reports. Milestone charts that will be used include start and completion dates for the major deliverables, key internal and external reporting requirements, etc. Milestone charts will identify the timing of approval required at each phase.

3.3 Project Schedule

An overall project schedule is provided in Section 8 of this document. This timeline will be expanded into a detailed schedule for the project when the funding is approved. This detailed schedule will be managed by dedicated resources and reported on to the Project Team level, the Steering Committee and the governing and funding agencies (throughout the process).

The goal is to deliver in the least time and within the limits of the resources allocated for the project. Factors that affect the time and costs for this project are:

- Project Management – financial, obtaining information, timely decision making;
- Construction Management – tendering and management of the construction;
- Approvals – provincial and municipal;
- Design – extent of reprogramming, reuse of existing, delivery of documentation.

3.4 Independent Monitoring Process and Evaluation

There are several evaluation techniques for this project as described below:

- project management structure that includes a Project Manager to co-ordinate all aspects of the project work to ensure comprehensiveness and fit between the various parties and activities. This project management approach will include a number of techniques to evaluate and mitigate risk. A key aspect is the documentation procedure and the evaluation of this documentation by the Project Team and the Steering Committee;
- establishment of a Steering Committee and a Project Team charged with the responsibility to put in place appropriate evaluation processes and to report these processes to the respective Boards and Treasury Board through, at a minimum, a monthly report;
- the project management will follow the policies for conducting value analysis (VA) on provincially funded capital projects as described by the Capital Division, Treasury Board staff, Ministry of Finance and Corporate Relations;
- program VA undertaken by independent consultants and by the Ministry of Health staff to review the programs proposed to ensure fit for the community, region and between adjacent regions;
- functional programming and value analysis are combined to provide a comprehensive assessment of the facility requirements;
- independent quantity surveying and cost estimates at key stages;
- use of a risk management approach as described in Section 6 of this business case;
- VA conducted through a design charette or gaming process;
- VA conducted at the schematic design, design development and working drawings stage of the project;
- the Green Guidelines²⁷ will also be reviewed as part of each VA and individual checklist items will be considered where applicable and appropriate, as additional Standards Value Analysis Proposals (VAPs);²⁸
- earned value management – where the work is monitored against what was done;
- planning for a post implementation review; as described in this document under Performance Indicators and as directed by Treasury Board;
- web monitoring and communications strategy to ensure ongoing input, quality assessment; and

²⁷ Capital Division, Treasury Board Staff, Ministry of Finance and Corporate Relations, Province of British Columbia. Green Guidelines. June 2000 Edition.

²⁸ Capital Division, Treasury Board Staff, Ministry of Finance and Corporate Relations. Standard Value Analysis Proposals, Provincially Funded Facilities. June 2000 Edition.

- finally, Treasury Board may reserve the right to appoint a Value Analysis consultant or prescribe a process to be undertaken for evaluation.

3.5 Approval Process

There will be various approval processes in place throughout the course of the project. Overall project approvals will be the responsibility of the Steering Committee. Government approvals will take place in accordance with the Capital Project processes and value analysis. Approvals of a more specific nature in the project will be managed through the Project Management Office and reported at regular intervals throughout the project.

3.6 Legal, Technical and Policy Aspects

The following describes the legal, technical and policy aspects that impact the project. These are limited and are described below.

Exhibit 9

Fraser Valley Health Centre and Eastern Fraser Valley Cancer Centre Legal, Technical and Policy Aspects

Legislative Requirements	The project will comply with all of the relevant legislation for the hospital and cancer services. Of note is the Hospital Act requirement that there be provision for educational facilities in the hospital.
Labour Issues	The project will create an opportunity for employment of a number of workers at about 10 people per million dollars of construction costs. The pre construction operating estimates show an estimated increase in number of full time equivalents from the MSA Hospital site to the new FVHC/EFVHC of 515.84 (current numbers show an increase from 649.12 to 1,002.72 FTEs). The contractors on the project will be bondable and professional staff will be expected to adhere to the professional standards and codes of conduct. Also, this initiative will require a labour force possessing a relatively high standard of technical qualification and performance. We are assuming that the Fair Wage policy will be in effect.
Aboriginal Affairs	The land is clear of aboriginal land claims.
Green Field Project	The project is relatively unfettered with pre-existing site conditions that could limit the range of development opportunities that are available to the Province.
Gender/Equity Considerations	Not applicable.
Federal/Provincial Relations	Not applicable.
Health Impacts	<p>There will be an increase of 57 acute care beds and an increase of 16,273 patient days.</p> <p>Regional impact – the construction of the new FVHR will allow the Region to provide the necessary access to quality patient care for the residents of the five local health areas as well as to patients in adjoining regions who wish to seek care closer to their home.</p>
Building Code Implications	The construction will comply with Building Code requirements and all other applicable building guidelines.

3.7 Financing Sources

The Cancer Centre will be financed totally by the Ministry of Health (100%). The hospital construction will be financed in part by the Ministry of Health (60%) and by the Fraser Valley Regional Hospital District (FVRHD) (40%), approval in principle to support this project was provided at a meeting of the FVRHD on January 30, 2001. The financing for the structured parking on the site requires further discussion. The Hospital Foundation will also participate in funding portions of the equipment costs for the Health Centre. Other private sector participation may be discussed to develop additional on site services. Full disclosure and discussion with government will be part of the decision making process to this end.

3.8 Communications

The purpose of the Communications Plan is to ensure that the public and key stakeholders understand the concept of the new facility, the rationale for its site and design, and the reasons for the 10-year delay in approval of the project.

Ministries / Agencies Affected:

- Fraser Valley Health Region
- BC Cancer Agency
- Fraser Valley Regional Hospital District
- City of Abbotsford
- Ministry of Health
- BC Buildings Corporation
- Health Services Group
- Ministry of Finance and Corporate Relations (Capital Division)
- Hospital Employees Union, BC Nurses Union and other unions

3.8.1 Communications Objectives

The communications objectives are to ensure that target audiences understand and support the proposed Fraser Valley Health Centre/BC Cancer Agency project, are aware of the planning and cost efficiencies offered by the partners, and believe that the project will be delivered on time and on budget.

3.8.2 Positioning Statement

The following describes the positioning statement as discussed at the Steering Committee meeting:

- while the need for a new hospital in Abbotsford had been recognized for some time, the new realities of health care regionalization in BC required reassessment of plans to update the existing MSA Hospital hospital;
- the project now being proposed for the Fraser Valley Health Centre/Eastern Fraser Valley Cancer Centre takes into account changes in patient volumes, space and equipment needs and operating budget;
- planning a hospital and cancer centre together is new for BC;
- the stakeholders will ensure an innovative, affordable facility, delivered on time and on budget, that meets the Region's needs in the coming years.

3.8.3 Key Messages

- health care renewal is about making best use of health care dollars. To ensure full accountability to taxpayers, the Ministry of Health could not act on the MSA Hospital project until it had reassessed the project in light of the changes brought about by regionalization of health care;
- a review committee representing key stakeholders including the Ministry, the FVHR and the BC Cancer Agency determined that building the FVHC/EFVCC on a new site is the best option.

3.8.4 Secondary Messages

- the current proposal involves planning and development procedures that will ensure best value for the taxpayer's health-care dollar;
- the new facility will benefit from the most advanced technologies;
- the new facility will increase availability of key health services in the communities.

3.8.5 Target Audiences

There are both internal and external audiences who must be given information about this project.

Exhibit 10

**Fraser Valley Health Centre and Eastern Fraser Valley Cancer Centre
 Target Audiences**

Internal	External
MOH staff	Health authorities
FVHR board and staff	Industry associations
BCCA board and staff	Health-care service providers / associations
FVRHD board and staff	Advocacy groups
MFCR, Capital Division staff	Unions
BCBC/HSG staff	City and regional governments
	Non-profit organizations
	Media
	MLAs
	General public

3.8.6 Strategies

Three types of strategies are proposed:

- targeted information;
- ongoing communications;
- visual identity.

3.8.6.1 Targeted Information

Some target audiences (e.g., MOH, FVHR, BCCA, FVRHD, BCBC staff) will require overview information; some (e.g., Minister of Health, senior staff or partners, new HSG staff) will require more detailed information; others such as industry groups will be interested only in the next steps.

3.8.6.2 Ongoing Communications

A steady flow of information to the public and key stakeholders will keep them informed of progress. This creates a sense that the project partners are accountable within the stated time frame. HSG will ensure coordination of information among stakeholder organizations.

3.8.6.3 Visual Identity

- recommend use of FVHR, BCCA, FVRHD, BCBC and HSG logos on all print materials;
- communications materials;
- project announcement;
- event: speakers, photo opportunity;
- materials: speaking notes, media release, fact sheet, article, media liaison, interviews;
- sustaining activities;
- select media spokesperson;
- establish media liaison: local media, major Vancouver media;
- progress bulletins: internal - regular, consistent update distributed to BCBC, BCCA, FVRH, FVRHD, MOH, external - regular, consistent update to media, key stakeholders;
- project milestones: opportunities to create greater awareness;
- project visuals, photo opportunities for demonstrating construction efficiencies;
- budget;
- design and production of bulletin (including banner);
- other contracted services as needed;
- evaluation.

3.8.7 Evaluation of Communication Strategies

The following table provides examples of evaluation activities that will be undertaken.

Exhibit 11

**Fraser Valley Health Centre and Eastern Fraser Valley Cancer Centre
 Evaluation of Communication Strategies**

Activity	Responsibility
Monitor and evaluate media coverage	HSG/MOH/FVHR/BCCA
Use HSG website and communication network for Q/A and feedback	HSG
Monitor stakeholder/industry publications	HSG/MOH/FVHR/BCCA
Correspondence – respond to feedback from public, industry, stakeholders	HSG/MOH/FVHR/BCCA

4.0 COSTS AND BENEFITS – QUANTITATIVE

4.1 Methodology for the Development of the Pre-construction Operating Estimate (PCOE)

The hospital PCOE is estimated based on phase 1 programming decisions. It is anticipated that the PCOE amount will need to be adjusted based on the final facility programming decisions.

The PCOE is set up to identify the workload volumes, FTE, salary and benefits, supply and total costs projected for an anticipated opening in 2005. The workload volumes, FTE and total costs are provided for the planned operation of the 2000/01 fiscal year. The total proposed change is provided for each of these categories. The document is sectioned by major clinical, diagnostic and support categories with totals provided for each section. The revenue section identifies the expected revenue changes related to the projected volumes for 2005.

The costs were developed wherever possible by determining the worked hour to volumes. The worked hour to volume relationship was reviewed against the original submission, current operations, other hospital data, and available staffing guidelines. The Ministry of Health provided the initial cost for the renal program. The renal costs have been escalated for the 2000/01 contract cost changes. Overall salaries have been costed at the 2000/01 rates inclusive of contract changes. Benefits were costed at 19.5 percent of salaries. Supplies were costed using the 2000/01 budgeted rate per volume of activity for the individual areas.

Although a start-up PCOE has been identified for the EFVCC this activity has not yet been completed for the FVHC.

4.1.1 Program/Service Assumptions

Volumes for the program and service functions identified in the PCOE are estimated on projected service needs at 2005 and not on service capacities.

The self-sufficiency rate used for all volume projections is 85%. The current self-sufficiency level, with the exception of surgery, is assumed to be 75%. Surgery is 63.4%.

- only programs and services relating directly to the function of the new facility have been included in the PCOE;
- two additional telemetry and six additional surgical step down beds have been included at eight worked hours per patient day. The telemetry beds are required to manage the volumes and surgical step down beds are required to manage complex surgical cases such as vascular surgery;
- five beds have been identified to manage surgical cancer cases. The number of cancer beds may change based on the results of the Okanagan-Similkameen study;²⁹
- the Operating Room (OR) inpatient and surgical day care cases are based on a self-sufficiency rate of 85%. The current rate for the region is 63.4%. Therefore, OR volumes for 2005 have been

²⁹ The Okanagan-Similkameen Health Region is currently working on two years of operational data to determine the impact of the Southern Interior Cancer Centre (CCSI) on Kelowna General Hospital. It is anticipated that the assumptions used for the Cancer Clinic volumes in the current PCOE will need to be adjusted based on this study.

estimated at 11,850 cases. The result is projected 4,450 inpatient cases and 7,400 surgical day care cases;

- the projected births for 2005 at MSA Hospital are 1,800 with a projected average length of stay (ALOS) of 2.93 days per birth. The 2.93 ALOS allows for antepartum and postpartum cases with complications. The patient days are projected to be 5,274;
- endoscopy cases are currently done in the OR suite and are reported as outpatient cases. In the new facility these cases are planned, along with minor surgery cases, to be done in a separate area in ambulatory care. The projected combined cases are 6,885;
- new programs included in the PCOE are vascular surgery, pacemaker implants, renal dialysis, nuclear medicine and MRI imaging;
- the admitting service in the new facility will be decentralized to the clinical program areas. For the purposes of the PCOE the admitting costs have been shown as a constant over the time frame.

4.2 PCOE Summary

The major volume or size changes included in the PCOE are summarized in the following table:

Exhibit 12

Major Volume or Size Changes Included in the PCOE

Summary of Volume Changes			
	2000/01 Budget	2005 Projected	Percent Increase
Beds	204	261	27.9
Patient Days	59,464	77,804	30.8
OR Visits	7,100	11,850	66.9
Emergency Visits	42,000	50,369	19.9
Ambulatory Care Clinic Visits	11,838	22,430	89.5
Laboratory Units	2,768,179	4,375,163	58.0
Medical Imaging Units	2,323,630	3,042,208	30.9
Building Square Meters	18,000	45,693	254.0

The Pre Construction Operating Estimate is summarized as follows:

The total Net Pre Construction Operating Estimate is \$83,305,100

The 2000/01 Operating Budget (before approval of expected 'rollover'
requirement is..... \$46,400,907

PCOE change..... \$36,904,193

Fraser Valley Health Centre Pre Construction Operating Estimate

Fraser Valley Health Centre Pre Construction Operating Estimate

BC Cancer Agency - Eastern Fraser Valley Cancer Centre (EFVCC) Staffing

BC Cancer Agency - Eastern Fraser Valley Cancer Centre (EFVCC) Staffing

BC Cancer Agency - Eastern Fraser Valley Cancer Centre (EFVCC) Staffing

BC Cancer Agency - Eastern Fraser Valley Cancer Centre (EFVCC)
Facility Summary
For Start-Up, Year 1 and Full Capacity

BC Cancer Agency - Eastern Fraser Valley Cancer Centre
Startup Budget - Purchased Services From Host Hospital

4.3 Capital Cost Summary

INTRODUCTION

The Pre-schematic Design Estimate is intended to provide a realistic assessment of the direct and indirect construction cost of the New Fraser Valley Health Centre and Eastern Fraser Valley Cancer Centre.

Estimated costs are based on the Functional Space Requirements Report, dated September 2000, prepared by the RPG Partnership, and the Functional Relationship Diagrams prepared by Architectura in association with Stantec Architects.

The estimate does not represent the low bid price that will be submitted at the time of tendering. Our estimate represents a fair and reasonable value (average) based on the program information and analysis of the previous project cost for the Health Centre and Kelowna Cancer Centre project.

Appropriate unit rates have been used in conjunction with the planned program areas to arrive at an estimated cost for the overall construction cost.

Site requirements have been costed based on a combination of the previous site plan and the proposed site development.

AREAS

The gross floor area of the building as per Facility program document are as follows:

- Fraser Valley Health Centre 45,693 m²
- Eastern Fraser Valley Cancer Centre 7,110 m²

ESCALATION AND PRICING

The estimate has been priced at current rates taking into account the size and nature of the project. The unit rates utilized are considered competitive for a project of this type bid under a stipulated lump sum form of tender in an open market with a minimum of five (5) bids and constructed within a normal time frame.

- The escalation allowance is based on a two and one quarter percent (2.25%) per annum rate, compounded to the midpoint of the anticipated construction schedule.

The schedule is based on the following assumptions:

- Design and Documentation 18 months
- Construction (forty two months – escalation taken to midpoint) 21 months

In the event that the above schedule alters, the escalation allowance should be adjusted accordingly.

SCOPE

The following items are specifically excluded from the estimate:

- Land acquisition costs
- Legal costs
- Contaminated soils review

Taxes – The estimate includes the Provincial Sales Tax (PST) where applicable. The Federal Goods and Services Tax (GST) is included as the Payable amount for Health Care Projects.

CONTINGENCIES

A design contingency of 5% has been included in the construction estimate to cover program modifications, unknown or unique design requirements due to the complexity of the building and site conditions.

A construction contingency of 2% has been included in the estimate to cover orders during construction.

An Escalation contingency of 7.5% has been included to cover inflation based on the schedule and rates noted in Section No. 4.

1553 and Project Cost Summary/Construction Cost Estimate

5.0 COSTS AND BENEFITS – QUALITATIVE

5.1 Non-Financial Outcomes

In addition to financial measurement of costs and benefits, there are non-financial aspects to be taken into account for this project. Although listed as non-financial, many of these items do in fact have an impact on the bottom line. This includes:

- a new facility and equipment will attract care providers to the region. This is a critical part of the delivery of services to residents;
- capacity to do higher volume of cases in the facility. This will reduce wait times for services to the residents. There will be the ability to handle the projected volumes in the program;
- new and expanded programming will facilitate repatriation of patients currently being cared for in other regions;
- ability to integrate new technologies and to continue the inclusion of less invasive techniques into patient care. This will result in reduced hospital stays for inpatient care and increase day care procedures;
- reductions in closed beds due to isolation requirements. Currently with a very limited capacity to isolate in the current facility, isolation requirements result in closure of other beds within the room;
- the project will create work in the community. It is estimated that the construction will produce on average about 10 people per million dollars of construction;
- the new environment created in the new centre will improve the working environment and increase the productivity of staff. The facility will allow operational functioning as expected in the plan;
- it is expected that there will be a reduction in the requirement of transferring up to 80 patients a day and hence, the potential for injuries to staff will be reduced and staff will be better deployed to provide patient care;
- there will be fewer labour issues as a nurse will be less involved in transferring patients and furniture, which is considered a non-nursing duty;
- the increase in the number of single rooms will increase the healing capacity for patients;
- the BCCA statistics indicate that BC has the best statistics for cancer control in Canada. With the new equipment and the ability to address wait times more effectively, the BCCA performance will be benchmarked with other countries for comparison;
- the facility will be built on budget to the functional planning assumptions.

6.0 PERFORMANCE MEASURES

The objective of this section is to identify quantitative performance measures against which the outcomes of the expenditure will be measured in future years.

Performance measures can be used in two ways:

- to compare performance of the facility with other facilities or health authorities, and
- to compare changes in performance over time within the facility.

Benchmarking helps the organization to discover and understand new ideas and methods to improve processes and practices and to identify aggressive, yet achievable future performance targets. The following factors need to be taken into consideration when analyzing performance results either between health authorities or between years of performance in the Region:

- population growth and ageing;
- trends in need for care;
- continued improvement in inpatient utilization;
- increased patient intensity;
- increased self sufficiency or interdependence on other regions for services;
- availability of community resources and supports; and
- delays in the ability to transfer patients who require care elsewhere.

The Fraser Valley Health Region and BCCA will establish baseline performance indicator information and identify the data collection process. The MOH currently conducts regular Peer Group Comparisons and this information is shared with the health authorities.

6.1 Hospital Performance Measures

The following measures can be used to benchmark performance between health authorities:

- standardized separation rate/1000 population;
- standardized patient day rate/1000 population;
- alternate level of care days/1000 population;
- average length of stay;
- referral patterns – are residents leaving to seek services that are not offered in the Region? How many are leaving etc? Is the region receiving patients from other regions and for what reasons?
- cost – what is the current cost per weighted case?³⁰

The following measures can be used to benchmark performance within a facility:

- standardized separation rate/1000 population;
- standardized patient day rate/1000 population;
- alternate level of care days/1000 population;
- average length of stay;

³⁰ Ministry of Health. Health Authority Capital Plan Requirements. January 2000.

- infection control rates;
- ratio of daycare (ambulatory) spaces to inpatient spaces;
- changes in waitlist;
- bed occupancy;
- patient moves in a 24 hour period;
- number of people on surgical waiting list;
- percentage of elective surgery performed as day surgery;
- percentage of elective surgery admission on day of procedure;
- elective surgical waiting time;
- percentage of elective surgery cancellations;
- percentage of cases that are day surgery;
- number of patients on waiting lists per speciality;
- cancellation rates for day surgery;
- surgical site infections;
- post-surgical complication rate;
- equipment failures;
- mortality;
- morbidity;
- re-admission rate;
- surgical volume.

There are several areas in particular that will be closely monitored for their outcomes in this project, as follows:

- the ability to reach the repatriation of residents targets of 90% or higher capture of non-surgical cases and 85% of surgical service demand by 2010, increasing to 90% or higher in most services by 2015;
- the ability to reduce ALC patients to 7% by 2005, down from a current level of approximately 12% at the MSA Hospital site. Future targets are 5% by 2010 and 3% by 2015;
- the ability to consolidate selected elective services for the region at Mission Memorial Hospital and Chilliwack General Hospital;
- the ability to attract and retain staff to provide the specialized services required for the future;
- the effectiveness of the strategies to manage the needs of seniors and the strategies to programming ambulatory care;
- the effectiveness of the psychiatry/mental health program design to ensure a fully integrated community – hospital program. The success of off-site locations and ability to successfully pursue “P3” construction opportunities on the FVHC site for some portion of the psychiatry/mental health ambulatory/outpatient programs.

6.2 Canadian Council on Health Services Accreditation

The Canadian Council on Health Services Accreditation (CCHSA) is the national accreditation organization for health services in Canada. Although participation in the accreditation process is voluntary, both the Fraser Valley Health Region and the British Columbia Cancer Agency have participated in ongoing accreditation processes.

CCHSA introduced the Client-Centred Accreditation Program in 1995 that included the principles of quality improvement into the accreditation standards and the survey process. As part of this focus on quality improvement, health service organizations must develop and monitor performance indicators as part of their efforts to improve the quality of their care and service. The development of organization wide performance indicators brings a coordinated approach to measurement and provides the mechanism that allows organizations to focus their quality improvement activities and to monitor the effects of implementing one or

more changes to their processes.³¹ Quality has been described according to eight dimensions: effectiveness, appropriateness, efficiency, accessibility, acceptability, safety, competence, and continuity. These dimensions are described below.³²

- Effectiveness:** Care/service interventions or actions achieve the desired results.
- Appropriateness:** Care/services are relevant to the patient/client's needs and based on established standards.
- Efficiency:** Achieving the desired results with the most cost-effective use of resources.
- Accessibility:** The ability of the patient/client to obtain care/service at the right place and at the right time, based on respective needs.
- Acceptability:** All care/services provided meet the expectations of the patient/client, community, providers, and paying organizations, recognizing that there may be conflicting or competing interests between stakeholders, and that the needs of the patient/client are paramount.
- Competence:** An individual's knowledge and skills are appropriate to the care/services being provided.
- Safety:** Potential risks of an intervention or the environment are avoided or minimized.
- Continuity:** The ability to provide uninterrupted, co-ordinated care/service across programs, practitioners, organizations, and levels of care/service, over time.

In addition to these performance measures, the Canadian Council on Health Services Accreditation has identified the following broad performance indicators which will be used to evaluate performance of accredited facilities by 2001 according to the "AIM" (achieving improved measurement) standards:

- Responsiveness – including availability, accessibility, timeliness, continuity, equity;
- System Competency – appropriateness, health outcomes, caring, adverse occurrences, efficiency, legitimacy;
- Communication – courtesy & respect, consistency, confidentiality, integrity;
- Quality of Worklife – decision latitude, role clarity, co-worker/supervisor support, learning environment.

³¹ Canadian Council on Health Services Accreditation. A Guide to the Development and Use of Performance Indicators. Pg. 1.

³² Ibid, Glossary

6.3 British Columbia Cancer Agency

The Mission of the BC Cancer Agency is to:

- reduce the incidence of cancer;
- reduce mortality from cancer;
- improve the quality of life for those living with cancer.

Cancer is a significant health problem to all British Columbians. It represents the #1 cause of death and one out of three persons can be expected to develop cancer sometime in their life. In 1997, more than one in four deaths in BC were due to cancer. We can expect the burden of cancer to increase because of the ageing of the population.³³ The BC Cancer Agency reports to the community on its activities through an annual report card.³⁴ This is a progress report on the status of cancer in the Province of British Columbia.

In 1996, there were 15,617 new cases of cancer in BC. It is expected that the number of cases will increase by 2-3% or about 400 additional cases annually. There are four main cancer types that account for about 57% of all new cases in 1996. These are: prostate cancer, lung cancer, female breast cancer, and colorectal cancer.

The following list of preliminary indicators has been developed to measure the quality of service provided at the new Cancer Centre:

Screening

Effectiveness	% of the population (EFVCC catchment area) at risk, that is screened
Efficiency	turn around time for lab results
Accessibility	wait time for genetic counselling

Treatment

Radiation Therapy

Appropriateness	% compliance to treatment protocols
Efficiency	% utilization of available treatment time
Accessibility	wait time – diagnosis to consultation with Radiation Oncologist <ul style="list-style-type: none">▪ % compliance to less than 2 week wait time standard wait time – ‘ready to treat’ to first treatment appointment <ul style="list-style-type: none">▪ % compliance to less than 2 week wait time standard

Systemic Therapy

Appropriateness	% compliance to treatment protocols
Efficiency	% utilization of available treatment time
Accessibility	wait time – diagnosis to consultation with medical oncologist % compliance to less than 2 week wait time standard wait time – ‘ready to treat’ to first chemo/drug therapy appointment

Rehabilitation

Effectiveness	% of patients with persisting disability following treatment
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³³ Ibid, pg. 3.

³⁴ BC Cancer Agency. A report Card. March 1999.

Palliation

Effectiveness % of patients dying in preferred surroundings
 % of patients dying pain free

Cancer Centre

Appropriateness % compliance to treatment protocols

Efficiency # of fully admitted cases
 # ambulatory visits
 ambulatory visits per worked hour
 % rebooking of appointments

 % utilization of ACU space
 average distance travelled by patients

Accessibility

Acceptability patient/client satisfaction rates

Research

Effectiveness % of eligible patients enrolled in a clinical trial

Accessibility % of eligible patients offered enrolment in a clinical trial

Education

Competence # of student learning opportunities

of students

Financial Indicators

The following outlines some of the financial indicators that will be used to evaluate the outcome of the project:

- project completed on time and within budget;
- ability to operationalize facility within the estimated operating budget to deliver the identified programming; and
- ability to spend higher proportion of capital renovation projects on program related changes in other facilities in the region.

6.4 Ministry of Health

The Ministry has established a Performance Indicators Working Group to develop a set of high level Provincial performance indicators, which will be used to monitor Health Authority accountability to the Ministry of Health.³⁵

A key program objective in the Ministry of Health's Performance Plan³⁶ is to address the availability and timeliness of cancer care. This objective supports the Ministry of Health Goal 2, that "British Columbian's will have access to health care services within an acceptable time period". The performance measures are established and include wait time standards and actual wait times reported for surgical oncology cancer treatment.

³⁵ Health Systems Update. Canadian College of Health Service Executives, 1999 – 2000, 7th edition.

³⁶ Performance Plan 2000/2001. Ministry of Health and Ministry Responsible for Seniors. British Columbia. April, 2000.

6.5 Other

In addition to these performance measures, Section 3, Management and Governance, lists several independent monitoring processes that will be used in evaluation of the process.

7.0 RISK MANAGEMENT

The Risk Management component includes two separate but inter-related activities – risk assessment and risk management strategies. The identification and management of potential and actual risks includes the following steps:

1. Identify all risks associated with the project;
2. Quantify the degree of risk or the potential impact of each risk;
3. Identify critical time periods when the risk is likely to occur;
4. Select appropriate strategies to address risk when it becomes visible;
5. Establish responsibilities for managing risk;
6. Use appropriate channels to report risk experienced and action taken;
7. Evaluate how effectively potential or actual risks were managed.

7.1 Types of Risks

A recent review of the Capital Management Process within the BC Government ³⁷ proposed a risk framework with four types of risk:

- General Risk;
- Project Management Risk;
- Construction Risk;
- Economic Risk.

General Risk includes factors such as project visibility, public or environmental concerns, safety, etc.

Project Management Risk may be related to the scope or complexity of the project, experience of the project team or degree of innovation (e.g. has this type of project ever been done before?).

Construction Risk may include impact of labour disruption, natural occurrences such as inclement weather, etc.

Economic Risk is concerned with factors that affect the economic viability of the project – cost increases or possible withdrawal of funding.

7.2 Quantifying The Degree of Risk / Potential Impact

The recent review of the capital management process suggested a potential framework for assessing risk. The risk framework is based on:

- the **probability** of individual factors becoming a problem; and
- the **extent of the impact** on the project.

³⁷ Adapted from “Capital Management Process Review For The Government Of British Columbia”, Final Report, April 2000, Deloitte Consulting.

For each risk factor, the probability and impact on the project are assessed to classify the degree of risk associated with the project, e.g. low, medium or high risk.

Exhibit 17

Classifying the Degree of Risk For a Project

Value	0	1	2	3
PROBABILITY OF BECOMING A PROBLEM	No chance	Low	Medium	High
Weighting or impact on project	None	Low	Medium	Significant

Levels of risk would be associated with specific values calculated once the risk assessment was completed. The level of risk acceptable for the project would be determined at the same time.

A Risk Classification Framework is shown in the following table. The Project Team used this Framework to assess the degree of risk related to this project.

Exhibit 18

Risk Classification Framework

Area	Factor	Probability 0 - 3	Weighting 0 - 3	Result (Probability Impact)
General Risk	High visibility	3	2	6
	Public concerns/objections	0	0	0
	Environmental factors	1	1	1
	Safety issues	1	1	1
	Size of project	1.5	1.5	2.25
	Legislative changes	2	2	4
Management Risk	Complexity	1.5	1.5	2.25
	Unclear or changing scope	3	1.5	3.5
	New technology	3	3	9
	Project newness	1	1	1
	Project manager experience	.5	3	1.5
	Design team experience	.5	3	1.5
	Contractor experience	.3	5	1.5
	Losing momentum through procedures	2	3	6
	Safety issues	1	3	3
Aggressive/changing time schedule	2	2	4	
Labour productivity drop	1	3	3	
Construction Risk	Availability of skilled trades	2	3	6
	Availability of bondable contractors	2	3	6
	Labour disruptions	3	3	9
	Material/equipment availability	1	3	3
	Weather-related problems	.5	1	.5
Economic Risk	Project funding uncertainty	3	3	9
	Labour cost Increases	3	3	9
	Material/equipment cost increases	3	3	9
	Currency fluctuation	3	3	9
	Project Total	44.8/78	61.5/ 78	111 of a potential of 234 points

7.3 Critical Time Periods

Not all risk factors will be applicable in all stages of the project. The classification of the risk may also differ during different stages of the project. The following table can be used as a monitoring tool to identify stages where specific risks are expected to or are more likely to occur. This critical time period worksheet could be used on a regular basis along with the Risk Classification Framework.

Exhibit 19

Risk Factors - Critical Time Periods

Project Stage	Project Concept	Project Planning	Engineering & Design	Procurement Construction	Post Construction
Factor High visibility Public concerns / objections Environmental factors Safety issues Legislative changes Complexity Unclear or changing scope New technology Project newness Project manager experience Design team experience Contractor experience Slow schedule Aggressive/changing time schedule Size of project Labour productivity drop Availability of bondable contractors Availability of skilled trades Labour disruptions Material/equipment availability Weather-related problems Project funding uncertainty Labour cost increases Material/equipment cost increases Currency fluctuation Project Total					

7.4 Risk Management Strategies

Risk management includes project management strategies, management and financial controls, documentation reporting processes and issues (risk) management planning. The proposed strategies for these are described below. The suggested independent monitoring controls are consistent with the current social capital process in place and according to the most recent capital plan requirements of the Ministry of Health. In addition, it is expected that the Ministry of Finance will put in place processes as suggested by the Deloitte report and by engaging an external consultant to conduct a review.

A major part of managing the risk on this project will be undertaken through the Project Management Office. See section 2.5.2 for more detail.

Other risk management strategies for specific stages of the project include:

- environmental risk management includes conducting a traffic study, green building, and storm water treatment and other studies as appropriate;
- evaluation, review and approval processes during the engineering and design stages of the project. An evaluation to ensure that the design is reflective of the project objectives and scope and a review that is concerned with regulations, licensing, safety and other standards. In addition, the detailed design phase should include cost management and value analysis techniques;
- procurement risk management strategies including processes and alternatives for contracting design and construction; procurement of property, materials, equipment and land; and assessment of the cost versus quality of the proposals received;
- construction management risk strategies including the need for contract financial management, supervision and inspection, establishing protocols for changes required and the formulation and implementation of recovery plans;
- the post-construction phase should include a formal process that should be set-up to assess the project's completion, conduct appropriate tests to ensure proper functioning and test compliance to ensure all specifications, regulations and contractual agreements have been adhered to. Protocol for unsatisfactory delivery should be established to resolve any disagreements, discrepancies and issues in the most efficient and effective manner to facilitate timely project closure and delivery;
- follow-up includes determining the projects success with regards to the asset built and the costs associated with its construction; all elements of the project's life cycle should be evaluated in order to determine both positive and negative outcomes.

Other processes that could influence the management of this project include the Ministry Performance Indicators Working Group. This Group will set high level Provincial performance indicators, which will be used to monitor Health Authority accountability to the Ministry of Health.³⁸

7.5 Responsibilities For Managing Risk

The responsibility for managing risks rests with the Steering Committee.

³⁸ Health Systems Update, Canadian College of Health Service Executives, 1999 – 2000, 7th edition.

7.6 Reporting

The Steering Committee will use the appropriate channels to report any risk experienced and action taken as required by the respective Boards and governing bodies and as described in the Deloitte report and as required by Treasury Board.

7.7 Evaluating How Risks Were Managed

The Steering Committee will commit to a process to evaluate how effectively potential or actual risks were managed during the course of the project. The following provides a narrative overview of the risks associated with this project.

Exhibit 20

Risk Assessment

General Risk	
High visibility	There may be significant public concern if this project is not approved
Public concerns / objections	
Environmental factors	
Safety issues	
Legislative issues	
Project Management Risk	
Complexity	This is a low risk
Scope	Unclear, changing
New Technology	This is a high risk as there will be nothing new introduced as this project will be similar to others, e.g., the Victoria Cancer Centre
Project uniqueness	This is a low risk as there are already 7 hospitals which are having major renovations or buildings, e.g., Surrey Memorial, West Coast
Project Management experience	BCBC has considerable project management experience, e.g., built Kelowna and Victoria Cancer Centre
Project Team/Contractor experience	Part of the Business Case includes a request for funds to put in place an outside consultant to review process, etc.
Schedule	There will be a prudent adherence to the schedule with a contingency plan; Victoria Cancer Centre built by BCBC was ahead of schedule by one month
Construction Risk	
Availability of Skilled Trades	
Labour Disruptions	
Material/Equipment Availability	
Weather-related Problems	

Financial/Management Risk

Project funding uncertainty	N/A
Cost sharing	N/A
Labour cost increases management and timely approval	Fair wages; there is risk due to dollar fluctuations and inflation which will be mitigated as much as possible by project
Material/equipment cost increases	
Currency/ interest rate fluctuations	There are currency fluctuations related to equipment purchases however, his risk is perceived as low (?), for the duration of the project as based on experience with building three other Cancer Centres

8.0 IMPLEMENTATION PLAN

The implementation plan has been structured to divide development of the project into a number of phases. At the end of each phase, information and assumptions can be reviewed and the plan adjusted. It is expected that the implementation plan will evolve as more information is gathered.

The previous design scheme for MSA hospital advanced to completion of working drawings and specifications in 1997 at which time, work was suspended. Approximately seven years have now passed since functional programming of the facility was last considered and it was determined that an examination of the program was essential to outline requirements for the combined FVHC and EFVCC facilities. Additionally, this would assist in a detailed assessment of the suitability of the previous MSA design scheme for reuse.

8.1 Phase One – Programming

The first of three programming exercises, the Program Parameters Report, examined the full range of programs to be offered by FVHC and EFVCC. Once reviewed and approved, this report became the base for further, more detailed information contained in the Master Program. Findings contained in the Program Parameters report were reviewed by an outside consultant team to ensure that a Regional perspective is maintained throughout the planning phase of the project.

The second planning exercise, the Master Program, applied space standards to the program areas outlined in the Program Parameters Report. On completion of the Master Program, findings contained in this report were supplemented through implementation of a Physical Plan Review. This process involved a series of high-level modelling sessions with staff focus groups to confirm program adjacencies and, ultimately, to propose a range of total facility configuration options.

The Physical Plan review, together with the Master program were then used by Quantity Surveyors to generate program-level estimates of the total project cost. Estimates generated in this phase were based only on program areas outlined in the Program and industry-standard assumptions were employed for this early phase of project development. Initial findings indicated a project substantially larger than earlier contemplated in the Project Proposal (May 2000). A program review resulted in paring back program areas and related estimates of cost prior to their inclusion in the Business Case document (October 2000).

First draft of the facility program has now been completed and some adjustments to program areas have been made. Revisions to the total project cost have been implemented and these are included in this Business Case (January 2001). An assessment of the measure of reuse of the previous design still needs to be conducted and this will assist in determining the consultant team for the project but will have minimal impact on total project cost.

Phase One also involved cataloguing and review of industry-wide 'best practices' in terms of benchmarking clinical services, current facility design and innovation in the provision of future services. Particular attention has been focused on facility flexibility and adaptability to future technological and program change.

In anticipation of upcoming project phases, BCBC/HSG has undertaken an examination of project delivery options employed on other similar projects recently completed or in progress elsewhere in North America. This information will be used by the Project Steering Committee to help refine the management structure for the Project.

8.2 Phase Two – Project Design and Definition

The product of this phase is completion of the Design Development Report. The Design Development Report will contain all necessary design information sufficiently detailed for accurate project pricing. BCBC and MFCR standards for completion of the DDR will be followed.

This phase commences with formal engagement of the full consulting team required for the project. It is expected that this team will have been established during Phase One to permit commencement of schematic design work as soon as government approval to proceed with Phase Two has been provided. A conventional facility design process, paralleled with effective value analysis review, is contemplated. Construction consultants will be engaged to provide guidance to the design team in their determination of materials and methods of construction. Segmenting the project into smaller contracts will be examined in detail during this phase. At completion of schematic design, any deviation from stipulated sum procurement methodology will be submitted to Ministry of Finance for review and approval. A parallel process of determining the most suitable and cost-effective method of acquiring equipment and of providing interior finishes and fit-out will be undertaken by the project team. Because most of this equipment is subject to fluctuations of the Canadian dollar against other currencies, effective means of mitigating this risk will be examined. The City of Abbotsford will be involved in review and approval of the project and many of the major hurdles to achieving this approval were addressed by the Project Team during development of the previous design scheme.

8.3 Phase Three – Construction Documents, Tendering and Award

Once the project scope has been fully articulated in the Design Development Report, it is anticipated that the project will be carefully segmented into components. Multiple contracts will be prepared with a range of contractors all reporting through the Construction Manager to the Project Team. These contracts will be carefully defined to ensure clarity of scope. Work will be tendered and awarded sequentially to maximize benefit to government and to suit local construction industry capacity. It is not yet known what method of procurement will best accomplish this goal, but it is likely that a form of construction management may yield the greatest overall benefit. State-of-the-art technology will be employed in the dissemination of information and in the management of project cost reporting. It is anticipated that a project web site will be established to aid in the distribution of up-to-date project information among project consultants, construction consultants, government and the public. Finishes, fitments and equipment will be procured as part of this overall management process based on principles and procedures established in Phase Two.

8.4 Phase Four – Construction

Once approval has been received to commence construction, a construction office will be established and regular progress meetings will be conducted to ensure that work, both on and off site, is carefully scheduled to maximize efficiency. A construction management firm will be selected during Phase Three and site superintendents from that firm will manage on-site work as it progresses. Sequential tendering of the work, site meetings and progress claims for all contracts will be managed through this firm. Decisions on quality, pace and progress of the work will be the responsibility of the Project Team through the Project Manager. Scheduling of the work, together with budget reviews, will be managed on a week-to-week basis to ensure that all aspects of the project are receiving due consideration. The Project Team, as required under the new Budget Transparency Act, would provide regular communication of progress.

8.5 Phase Five – Commissioning and Project Close Out

In preparation for project completion, a detailed completion plan will be prepared. This will include scheduling all work needed to ease the transition of services from the existing hospital into the new facility. At the appropriate time, consultants will be engaged to lead the Project Team through commissioning of the project. This work will involve coordination of equipment specialists to ensure that medical equipment is received and installed properly, as well as a contingent of construction commissioning professionals to ensure that all building components are performing in accordance with specified standards.

As contracts are declared substantially complete, the Project Team will manage builders' lien and deficiency holdbacks. Project close-out will involve reconciliation of contracts to the total project budget. Savings and extras will be tracked as the project proceeds with regular status reports being rolled into a clear final accounting of the project cost.

8.6 Phase Six – Move and Warranty Management

As the project approaches completion, a detailed move plan, prepared in an earlier phase (after extensive consultation with the owners) will outline the best sequence to get the new facility into full operation. The Construction Manager through the Project Team will manage any warranty issues. It is anticipated that a post-occupancy audit will be conducted to verify that performance measures established at the outset of the project have been met.

These six phases of the project are shown on the attached Gantt Charts.

APPENDIX A

**FRASER VALLEY HEALTH CENTRE /
EASTERN FRASER VALLEY CANCER CENTRE
PROJECT DEFINITION REPORT**

See Project Definition Report.

**KPMG CONSULTING SERVICES
FRASER VALLEY PROJECT PARAMETERS REVIEW
EXTERNAL ASSESSMENT**

APPENDIX C

**OPERATIONAL PARAMETERS FOR
REGIONAL CANCER CENTRES**

Patients Receiving Chemotherapy

Location	1996/97	1997/98	1998/99
Vancouver Centre	4,859	5,031	5,336
Vancouver Island Centre	1,895	2,030	2,227
Fraser Valley Centre	1,400	1,768	2,242
Centre for the Southern Interior	n/a	n/a	1,041
Communities Oncology	8,919	9,474	9,026
Province of BC*	15,425	16,601	17,620
% Increase over previous year	6%	8%	6%

*The total patients receiving chemotherapy in the Province of BC is defined as "one patient receiving one or more chemotherapy treatment in a financial year". Therefore, there is overlap reflected in the individual location figures as patients may be seen and treated in more than one cancer centre or community hospital during a single year.

APPENDIX D

**SELECTED ASPECTS OF THE PROPOSAL SUBMITTED TO THE MINISTRY OF HEALTH, JUNE 2000, FOR
THE FRASER VALLEY HEALTH CENTRE AND EASTERN FRASER VALLEY CANCER CENTRE, ARE
INCLUDED IN THIS APPENDIX**

APPENDIX D(i)
REGIONAL BED CALCULATIONS

VISION, MISSION AND STRATEGIC DIRECTIONS OF FVHR

APPENDIX D(iii)
CANCER PROJECTION DATA

APPENDIX D(v)
SUMMARY OF POTENTIAL HOSPITAL SITES

APPENDIX E
CRITERIA AND EVALUATION OF THE CONSTRUCTION OPTIONS

Potential new construction solutions were evaluated as a low, medium or high fit using the following criteria:

Fit on Site - site master plan can fit all buildings including expansion capability, parking and site services economically and satisfy functional requirements.

Operational Rating - solution provides a structure that is efficient and effective operationally.

Functional Fit - the solution creates an environment that enables optimal functional fit between organizations and specific programs.

Expandability - the solution allows for expansion within and external to the building envelope.

Structure/Architecture - building has a good exterior envelope, (i.e. provides comfort, energy efficient, durable, require minimal maintenance). Architecture delivers a healing environment that promotes wellness through quality design of space, lighting, colour, material selection and building systems. Economical structure that minimizes capital cost yet delivers a very good functional fit.

Capital Cost - cost and delivery of project requirements are optimized.

Operating Cost - estimated operating cost to both the hospital and Cancer Centre. This takes into account relative increases or decreases to each party based on the design (attached directly versus via pedway, etc.).

Reuse of Existing Design - current design includes all of the design work to 1997. Examples of some items of reuse include:

- site investigations highway noise studies, water retention for the 100 year storm, soils, survey, existing tree survey, zoning & municipal requirements;
 - some fire protection concepts;
 - user group reviews and data (areas of change will require user involvement);
 - functional requirements, room layouts & configuration;
 - room by room detailing – modular architectural woodwork, laboratory modular design, wall protection detailing etc.;
 - some specification & material investigations;
 - some equipment co-ordination;
 - information and data collection for preparation of door, hardware, finish and colour schedules;
 - electrical and mechanical system concepts;
 - mechanical and electrical room requirements and detailing – lighting concepts; and
 - mechanical and electrical specifications relating to fittings and fixtures.
-

Evaluation of New Construction Options

Evaluation Criteria	Option 1: Build Original Design and Renovate Once Complete (no BCCA)	Option 2: Build Original Design and put Cancer Centre on site	Option 3: Redesign, Add Less Costly Building and Attach Cancer Centre	Option 4: Complete Redesign (less costly Building concept included) with Cancer Centre Attached
Fit on Site	Good	Poor ¹	Good	Good
Operational Rating (Hospital + BCCA)	Very Good + Poor ²	Fair + Fair ¹	Very Good + Very Good	Very Good + Very Good
Functional Fit	Very Good	Fair – Good ³	Good ⁴	Good ⁴
Expandability	Good	Poor ⁵	Fair ⁶	Fair ⁶
Structure/ Architecture	Good	Good	Good – Very Good	Good – Very Good
Capital Costs	Good ⁷	Fair	Very Good	Good
Operating Costs (Hospital + BCCA)	Good + N/A	Good + Poor	Very Good + Very Good	Very Good + Very Good
Re-use of Existing Design	Very Good ⁸	Very Good	Good	Poor ⁹
Project Schedule	Very Good ¹⁰	Very Good ¹⁰	Good	Extremely Poor ¹¹

Notes:

- ¹ Fit on site is poor, operational rating is fair and as the two buildings cannot be directly linked – a pedway or other connection would need to be constructed to provide indoor access from one building to the other.
- ² Hospital has very good rating as it is stand alone and is designed for hospital programs. Cancer Centre does not exist in this option therefore, poor operational rating.
- ³ Functional fit is very good for the hospital but only fair for BCCA as access to the hospital is more remote than is desired. Patients, families and staff would need to travel through the building link to access services on a regular basis.
- ⁴ Rating is reduced from very good in option 1 to good in options 3 and 4 as compromises have to be introduced to make a smaller hospital building work. It should be noted that the very good rating in option 1 does not include a cancer centre.
- ⁵ Poor expandability as buildings have been 'fit' into the site rather than planned for in conjunction with one another and with patient and staff parking and movement accounted for.
- ⁶ Expandability is somewhat better in options 3 and 4 than in option 2, but only receive a fair rating. This is not anticipated to be a problem as patient needs for this site for both acute care and cancer services have been included to 2015. Again the good rating for option 1 is due to the fact that there is no cancer centre included in this option.
- ⁷ Capital cost appear good partly because there is no cancer centre included in this option and partly because of the extensive renovations that would be required to meet the programming needs.
- ⁸ Reuse of existing design is very good as this option assumes building exactly what is designed to date. It must be noted that extensive renovations will be required post construction to meet programming needs and that this option does not include a cancer centre.
- ⁹ Reuse of existing design is poor as this option assumes starting again from scratch and ignoring any work to date.
- ¹⁰ Project schedule is very good for options 1 and 2 as the existing plans can be started as soon as they are brought up to code requirements. There is no cancer centre in option 1 and option 2 assumes that the cancer centre construction could lag behind the hospital.
- ¹¹ Project schedule is extremely poor as this option means starting again with all user group meetings and conceptual design.

Appendix F
CURRICULUM VITAE

CURRICULUM VITAE

ROBERT BILLINGTON

QUALIFICATIONS: Bachelor of Architecture, Texas A & M University
Master of Architecture, Texas A & M University
Canadian College of Health Service Executives
Registered Architect, State of Washington
Certified, National Council of Architectural Registration Boards
Certified, Royal Architectural Institute of Canada
Member, Architectural Institute of British Columbia
Member, American Institute of Architects
Member, AIA Academy of Architecture for Health
Member, AIBC Healthcare Facilities Committee
Travel/Study Scholarship to England and Europe, Association of Collegiate Schools of Architecture Exchange Student Program
Health Facilities Research Scholarship/Grant, Texas A & M University
Travel/Study Scholarship to Sri Lanka, USS HOPE Ship
Direct Commission, Lieutenant, Navy Surgeon General's Office, U.S. Navy
Canadian Architect Yearbook Award (for British Columbia Medical Centre)
First Place Design Award, American Institute of Architects Health Facilities Review (for Saskatoon City Hospital)

EXPERIENCE:

1976 - Present **Partner/Project Director – The RPG Partnership (previously known as Resource Planning Group Inc., Vancouver)**
For a variety of projects, including master planning, functional programming, site and facility evaluations, and design consultation.

1979 - 1992 **Principal/Partner/Project Director – Billington Poon Architects, Vancouver (subsequently renamed Poon Gardner Billingtonnormalton Architects)**
For a variety of health care and education projects ranging in size from an addition to a small 30-bed rural health centre to replacement of a 488-bed community teaching hospital and a new Student Services Centre to the University of British Columbia campus.

1974 - 1976 **Programmer/Planner/Designer - Arthur Erickson Architects, Vancouver**
For a major new medical centre in Vancouver, Canada to consist of a child and maternal centre of 350 beds and adult centre of 500 beds and for 2 secondary schools. Roles included master planning, functional programming and schematic design.

- 1971 – 1974 **Senior Programmer/Designer and Associate – Caudill Rowlett Scott/Architects & Planners, Houston, TX**
On a number of health care and education projects in the continental USA and overseas.
- 1968 - 1971 **Officer-In-Charge Of Programming and Design Coordination – United States Navy, Surgeon General's Office, Washington, DC**
For a number of Naval health facility projects in the continental USA, Hawaii and overseas. These included dispensaries (clinics), dental clinics and hospitals ranging in size from 50 beds to 2,000 beds.
- 1968 **Architect Intern - USS H.O.P.E. (Health Opportunities for People Everywhere) Ship Colombo, Sri Lanka**
In charge of preparing information regarding cultural/local context and master programming (Design Brief) for a new 800-bed teaching hospital for the Faculty of Medicine, University of Sri Lanka.

CURRICULUM VITAE

FRANCES M. CARUTH

QUALIFICATIONS: Banff School of Management Executive Program, 1989
M.Sc., Health Services Planning & Administration, UBC, 1987
B.Sc., Rehabilitation, University of Toronto, 1980
Member, Canadian College Health Services Executive
Clinical Associate Professor, Faculty of Medicine, UBC Health
Care & Epidemiology

EXPERIENCE:

1990 – Present

BC Cancer Agency

Vice President, Planning (1995 – Present)

Director, Planning & Development (1990 – 1994)

Lead client representative in the development of:

- Vancouver Island Cancer Centre, 2001
- Gene Sequencing Start-up Laboratory, 1999
- Cancer Centre for the Southern Interior, 1998
- Fraser Valley Cancer Centre, 1995
- Additional vaults, VCC
- Multiple high tech equipment installations
- Planning for the BC Cancer Research Centre

1986 – 1990

Vancouver General Hospital

Director, Management Support Programs

Efficiency Enhancement/Process Improvement Programs

Developed Lotus-based micro-costing system for high cost procedures

1983 – 1986

Vancouver Teaching Hospitals

Analyst

Management Engineering Unit 13.1

Prior to 1982

Physiotherapist

Range of roles as clinician and/or manager/teacher in acute and long-term care rehabilitation

CURRICULUM VITAE

JERRY FRANK

QUALIFICATIONS

University of British Columbia, B.Arch., 1977
University of Calgary, B.Sc., Pure Mathematics, 1974
Architectural Institute of British Columbia
Royal Architectural Institute of Canada
Alberta Association of Architects
BC Building Envelope Council
Architecture for Health Committee, RAIC

EXPERIENCE

With Architectura:

Health Care

MSA General Hospital, Abbotsford, BC
MSA Hospital Feasibility Study, Abbotsford, BC
Surrey Memorial Hospital Ambulatory Care Centre Expansion, BC
Surrey Memorial Hospital Master Plan 1991, Surrey, BC

Other Projects

YVR Parkade, Vancouver, BC
Glenayre Electronics Expansion, Burnaby, BC
British Columbia Systems Corporation Expansion Study, BC

With other firms:

Office

Jeanne & Peter Lougheed Building, Banff, AB
Court of Queens Bench (250,000 sq. ft.)
DND Medical/Dental Facilities, Suffield, AB
Calgary Winter Club Master Planning, Calgary, AB
Trans Alberta Utilities Corporate Head Office, Calgary, AB (450,000 sq. ft.)
MEPC, Morguard Properties (150,000 sq. ft.)
McFarlane Tower (132,000 sq. ft.)
Calgary Family and Youth Courts, Calgary, AB
Bankers Hall Calgary, AB
Trans Alta Utilities Corporate Office, Calgary, AB
Court of Queen's Bench, Calgary, AB

Health Care

Windermere District Hospital, Invermere, BC
Holy Cross Hospital, Calgary, AB
Red Deer Regional Hospital, Red Deer, AB

Education

Scurfield Hall, University of Calgary, AB
Mount Royal College, Calgary, AB

CURRICULUM VITAE

ALAN HARTLEY

QUALIFICATIONS: University of Toronto, Bachelor of Architecture, 1979
Regent College, Dip. C.S., 1983
American Institute of Architects
Architectural Institute of British Columbia
Royal Architectural Institute of Canada
Urban Development Institute

EXPERIENCE:

1988 - Present

Architectura Planning Architecture Interiors Inc., Vancouver, BC

Airports

Vancouver International Airport, Retail Design, Vancouver, BC
Lester B. Pearson Airport, Toronto, ON – Retail Design
Chicago, Midway Airport, Chicago, IL – Retail Planning
San Antonio Airport, San Antonio, TX – Retail Planning
Nashville Airport, TN – Retail Planning
Vancouver International Airport, Vancouver, BC – Retail Planning

Office

Glenayre Manufacturing and Office, Vancouver, BC
H.A. Simons Building, 111 Dunsmuir, Vancouver, BC
Angus Corporate Centre Office Buildings, Vancouver, BC
1138 Melville St. Office Building, Vancouver, BC
RCMP E. Division Northern Headquarters, Prince George, BC

Retail

Canwest Mall, Victoria, BC
Broadmead Village Shopping Centre, Victoria, BC
Parkgate Village Shopping Centre, North Vancouver, BC
Ikea, Vancouver, BC

CURRICULUM VITAE

PETER G. KALLOS

QUALIFICATIONS:

B. E. S. University of Manitoba 1972.
M. Arch University of Manitoba 1976
Registered Architect in British Columbia
Member of Royal Architectural Institute of Canada

EXPERIENCE:

1991 - Present

Senior Project Manager - BCBC, Victoria

Major School Projects, School District 69, Qualicum
Historic Restoration of St. Ann's Academy, Victoria
Tenant Improvement Project, Library Square Vancouver
Two Phases of Kutenai Place, Nelson
Assorted commercial lease development projects for Ministries of Health, Education, Children and Families, Environment, Labour Relations Board, Ombudsman,

1979 - 1991

Director, Project Development - SHC, Regina

Responsible for development and construction programs resulting in 1000 units per year for each calendar year.

1978 - 1979

Architect, Winnipeg Airport Systems Study

Task force responsible for programming major expansion to/replacement of the Winnipeg International Airport.

1976 - 1978

Graduate Architect, MMP Architects, Winnipeg.

Design Architect for assorted Civic, Commercial and Residential projects.

1974 - 1976

Student (summers) MMP Architects, Winnipeg Worked on wide range of projects including RCMP Headquarters, Sandy Bay golf course residential development

1972 - 1974

Student Architect with Fingold Associates, Winnipeg

Hotel and restaurant projects across Canada

CURRICULUM VITAE

BRUCE L. RABER

QUALIFICATIONS:

B. E. S. University of Manitoba 1976.
M. Arch University of Manitoba 1979
Registered Architect in British Columbia, Alberta, Manitoba
Member of Royal Architectural Institute of Canada
Associate Member of the American Institute of Architects
Member Joint AIBC/Ministry of Health-Health Care Committee
Symposium on Health Care Design -Program Advisory Council

EXPERIENCE:

1997 - Present

Stantec Architecture, Vancouver-Managing Principal

Scarborough Hospital, Tobago
The Richmond Hospital
Surgical Suite Upgrades
Diagnostic Imaging Expansion-Phase 3
Maternity and Pediatrics study
Port of Spain Hospital Renovations, Trinidad
Brandon Regional Hospital Expansion Project
Vancouver General Hospital
Tower Completion Project
Radiology Department
Trauma Special Care Unit
Site Services
Pulmonary Function Laboratory
Hyperbaric Unit Relocation
On-Call Suites
Cardiac Cath Expansion
QLT Research Facility, Vancouver
Neonatal Intensive Care, Royal Alexandra Hospital
Vancouver Richmond Health Board Facilities Management Program

1993 - 1997

WSAG Architects, Vancouver, Managing Partner

Vernon Jubilee Hospital ER and Surgical Suite Renovations
BC Research Institute for Child & Family Health, Vancouver
Inex Pharmaceuticals Laboratory, Burnaby
Surrey Memorial Hospital Phase III
Vernon Hospital Master Plan
Hotel de Health, Anguilla, B.W.I.
The Richmond Hospital
Phase II Expansion

Screening Mammography
Surgical Daycare and PAR
ICU Expansion
Nuclear Medicine Addition
Surgical Suite Renovations
St. Paul's Hospital Renovation Projects, Vancouver

1986 - 1993

WSAG Architects, Edmonton-Principal

Chilliwack General Hospital Redevelopment Studies
Royal Alexandra Hospital Diagnostic, Critical Care, & Treatment Centre,
Edmonton
Office for Three Doctors, Edmonton
Dr. Cook Extended Care Centre, Lloydminster
South Wing Extension, Misericordia Hospital, Edmonton

1983 - 1986

Architect, SMR Architects, Edmonton (MMP Architects, Winnipeg).

Design and Project Architect for assorted Commercial and Residential projects.

1982 - 1983

Architect, Cullen Carter and Hill, Nottingham, England

Design and project Architect for assorted residential projects

1979 - 1982

Graduate Architect with Thorkellson Architects and Wyness Architects in Edmonton

Project and design architect on commercial, residential, institutional and religious projects

CURRICULUM VITAE

PETER SALUSBURY

QUALIFICATIONS

Diploma, Building Technology, B.C.I.T., 1979
Certified Professional Program, City of Vancouver, BC
Code Advisory Committee, BC Building Code, 1990 & 1998
Applied Science Technologists and Technicians of BC, 1988

EXPERIENCE

1986 - Present **Architectura Planning Architecture Interiors Inc.**, Vancouver, BC
Principal

1980 - 1986 **Isaac-Renton Architects**, Vancouver, BC
Project Manager focussed on multi-level care facilities

Projects

Burnaby Youth Custody Centre — Facility Development Study
Victoria Youth Custody Centre, V.A. Shadow Team Member (Corrections Specialist)
Burnaby Youth Custody Centre and Youth Forensic Psychiatric Centre, Burnaby, BC
Prince George Regional Correctional Centre, Prince George, BC
Matsqui Institution, 120-bed medium-security living unit, Matsqui, BC
RCMP Northern BC Headquarters, Prince George, BC
RCMP Penticton Detachment, Penticton, BC
MSA General Hospital, Matsqui, BC (Design Development Team)
Louis Brier Home and Hospital, Vancouver, BC
Surrey Memorial Hospital Ambulatory Care Expansion, Surrey, BC
Duke Point Ferry Terminal, Nanaimo, BC

CURRICULUM VITAE

KAIEN SHIMIZU

QUALIFICATIONS:

- Doctorate in Architecture, University of Michigan
- Bachelor of Architecture, University of British Columbia
 - Bachelor of Science (Civil Engineering), University of Alberta
 - Member, Architectural Institute of British Columbia
 - Wells Bennett Scholarship, University of Michigan
- Institute of Environmental Studies Fellowship, Rockefeller Foundation, University of Michigan

EXPERIENCE:

1999 - Present

Principal - The RPG Partnership, Vancouver

For a wide variety of projects including the functional programming for DND Detentions Barracks, University Health Network Research Laboratories, BC Cancer Research Centre, and the Royal Alexandra Hospital Ambulatory Care Centre.

1975 - 1999

Partner - The APRA Group Inc., Vancouver

For a wide variety of projects including master planning, functional programming, site and facility feasibility studies, and design consultation. Projects ranged from the Resort Municipality of Whistler Master Plan to the Canadian Science Centre for Human and Animal Health.

1994 - 1975

Programmer/Planner – Erickson Architect

Shaughnessey Hospital Redevelopment, master program.

1970 - 1974

Doctoral Student – University of Michigan, Doctor of Architecture

Graduate Program

Research Projects:

Institute of Gerontology – facilities program and master plan for the Chelsea Methodist Home

University of Michigan Health Centre – computer based simulation model for Health Maintenance Organization

Planning for Cardiac Care: computer model for CCU beds

Dissertation of "New Generation of Single Resource Based Communities.

1968 - 1970

Project Architect – McCarter Nairne and Partners

Kitimat planning for new subdivision.

Port Hardy master plan for new subdivision.

Whitehorse Elementary School contract documents.

Shaughnessey Golf Course Site Master Plan for Housing.

1965 - 1968

Design Architect – George Barnes Architect

Kelowna Airport design and contract documents.

Kelowna Golf and Country Club, design and contract documents.

Kelowna Secondary High School, contract documents.

Various private houses design and working drawings.

1963 - 1965

Design Architect – Don Bittorf Architect

Harry Ainley High School design and contract documents.
Various private houses design and contract documents.

CURRICULUM VITAE

MIKE WHITE

QUALIFICATIONS: Bachelor of Architecture, Cambridge University

EXPERIENCE:

- 1986 - Present **Project Manager / Senior Planner – The RPG Partnership, Vancouver**
On a wide variety of planning projects ranging from 1,000-bed tertiary care health centres to 20-bed rural community health centres. In particular, developed a special planning knowledge of the high-tech diagnostic and critical care areas. Managed or has been a senior planner/ programmer on over 50 healthcare facilities planning projects in British Columbia, Alberta, Saskatchewan and Ontario.
- 1984 - 1986 **Project Manager / Senior Planner - Billington Poon Architects, Vancouver** (subsequently renamed Poon Gardner Billington Architects)
For a variety of health care projects ranging in size from an addition to a small 30-bed rural health centre to replacement of a 488-bed community teaching hospital.
- 1981 - 1984 **Senior Medical Planner - Thompson Berwick Pratt & Partners, Vancouver**
For the Vancouver General Hospital Redevelopment project.
- 1977 - 1981 **Senior Medical Planner - Brewer Smith Brewer Maxwell, United Kingdom**
On numerous health care projects in UK, Canada, Australia, West Africa, Saudi Arabia and Kuwait.
- 1968 - 1977 **Medical Planner - Hospital Design Partnership, United Kingdom**
For numerous health care projects in the UK and West Africa, including the development of the UK standard hospital planning systems known as Best Buy, Harness and Nucleus.

Appendix G
SPACE REQUIREMENTS SUMMARY

SPACE REQUIREMENTS
SUMMARY

THE TABLE BELOW ILLUSTRATES GROSS AREAS IN SQUARE METRES (CGSM) FOR EACH SERVICE CATEGORY OF FACILITIES, FUNCTIONAL COMPONENT (CGSM) AS WELL AS THE BUILDING GROSS SQUARE METRES (BGSM) FOR THE FVHC/EFVCC BUILDING(S) AS A WHOLE, AS MASTER PROGRAMMED, AS REVISED FOLLOWING A PROGRAM VALUE ANALYSIS/REVIEW BY KPMG CONSULTANTS, AND AS CURRENTLY FACILITY PROGRAMMED.

Caveats to Note:

This is not a final space summary as we have not had our final meetings with user group teams nor have we received future (2015) staffing headcount figures from FVHR for use in finalizing both office and staff locker/washroom requirements, but it would appear that we will easily remain within the gross area allowable for the FVHC.

9.0 FRASER VALLEY HEALTH CENTRE

	1. 2000 Master Program GSM	2. 2000 Post-Program VA GSM	3. 2001 Facility Program GSM	Variance 2. to 3. GSM
A High/Medium Serviced Facilities (Post Disaster)				
A1 General Medical/Surgical Inpatient Units	5 735	6 135	5 961	- 174
A2 Maternal Child Program	4 687	3 912	3 429	- 483
A3 Mental Health/Psychiatry Program	3 337	2 537	2 285	- 252
A4 Palliative Care Unit	600	600	676	+ 76
A5 Critical Care Units	1 600	1 200	1 930	+ 30
A6 Emergency	1 475	1 475	1 461	- 14
A7 Surgical Suite	1 965	1 965	1 754	- 211
A8 Medical Imaging	2 200	2 200	2 463	+ 263
A9 Laboratory Medicine	1 500	1 250	1 345	+ 95
A10 Morgue/Autopsy	190	190	146	- 44
A11 Biomedical Engineering	194	194	332	+ 138
Subtotal Component Area, A	23 483	21 658	21 782	+ 124
B Low Serviced Facilities (Post Disaster)				
B1 Surgical Day Care/Same Day Admit	760	760	618	- 142
B2 General Day Care Unit	800	800	879	+ 79
B3 Diagnostic Services Centre	493	493	809	+ 316
B4 Pharmacy	650	650	689	+ 39
B5 Health Information Management	838	838	1 007	+ 169
B6 Volunteers/Auxiliary Services	102	102	101	- 1

Fraser Valley Health Centre
 Eastern Fraser Valley Cancer Centre

	1. 2000 Master Program GSM	2. 2000 Post-Program VA GSM	3. 2001 Facility Program GSM	Variance 2. to 3. GSM
B7 Spiritual Care Services	90	90	89	- 1
B8 Main Entry Facilities	400	400	329	- 71
Subtotal Component Area, B	4 133	4 133	4 521	+ 388
C Low Serviced Facilities (Non Post Disaster)				
Wellness Centre	1 207	Incl.. in C1	Incl. in C1	Incl. in C1
Outpatient Clinics	435	Incl.. in C1	Incl. in C1	Incl. in C1
C1 Ambulatory Care Centre	--	1 810	1 433	- 377
Pre-Admission Clinic	348	300	Incl. in C1	Incl. in C1
C2 Rehabilitation Services	400	400	453	+ 53
C3 Site Administration	570	570	433	- 137
C4 Education Facilities	470	470	791	+ 321
C5 Renal Services	680	680	809	+ 129
Subtotal Component Area, C	4 110	4 230	3 919	- 311

Fraser Valley Health Centre
 Eastern Fraser Valley Cancer Centre

	1. 2000 Master Program GSM	2. 2000 Post-Program VA GSM	3. 2001 Facility Program GSM	Variance 2. to 3. GSM
D Industrial/Shop Facilities (Post Disaster)				
D1 Nutrition and Food Services	2 127	2 127	2127 ¹	--
D2 Materiel Services	1 340	1 340	1 098	- 242
D3 Ambulance Station	(460)	(460)	(460)	--
Subtotal Component Area, D	3 467	3 467	3 225	- 242
E Industrial/Shop Facilities (Non Post Disaster)				
E1 Plant Services	440	440	431	- 9
E2 Linen/Housekeeping Services	455	455	439	- 16
E3 Central Staff Facilities	0	0	300 ²	+ 300
Subtotal Component Area, E	895	895	1 170	+ 275
F Regional/Other Facilities (Non-Post Disaster)				
F1 Regional Administration	(1 866)	(1 866)	(1 746)	(- 120)
F2 Regional Materiel Services (Warehouse)	(3 500)	(3 500)	(1 897)	(- 1 603)
F3 Child Day Care Facility	(200)	(200)	(200)	--
Subtotal Component Area, F	(5 566)	(5 566)	(3 843)	(- 1 723)
Total Component Gross Area	36 088	34 958	34 617	- 341
Unassigned Gross Area (Incl. mech., ext. wall, major circulation, etc.)	12 912	11 700	12 041	+341
Public Links/Corridors		991	991	--

Fraser Valley Health Centre
 Eastern Fraser Valley Cancer Centre

	1. 2000 Master Program GSM	2. 2000 Post-Program VA GSM	3. 2001 Facility Program GSM	Variance 2. to 3. GSM
	991			
TOTAL FVHC BUILDING GROSS AREA	49 991	47 649	47 649	--

Notes:

Areas in (brackets) have not been included in the Total Component Gross Area or the Total Building Gross Area as they are to be considered outside this project funding.

1 Nutrition & Food Services is currently under review by a Food Services Consultant so this area is subject to change.

2 Central Staff Facilities is very preliminary as it is subject to the future (2015) staffing currently being estimated by FVHR.

10.0 EASTERN VALLEY CANCER CENTRE

	1. 2000 Master Program GSM	2. 2000 Post-Program VA GSM	3. 2001 Facility Program GSM	Variance 2. to 3. GSM
G High/Medium Serviced Facilities (Non-Post Disaster)				
G1 Radiation Therapy	1 850	1 850	1 420	- 430
G2 Tx Planning	660	660	730	+ 70
G3 Dentistry	25	25	54	+ 29
Subtotal Component Area, G	2 535	2 535	2 204	- 331
H Low Serviced Facilities (Non Post Disaster)				
H1 Entry Facilities	160	160	225	+ 65
H2 Patient Resources	180	180	65	- 115
H3 Patient Counselling	200	200	240	+ 40
H4 General Clinic Area	700	700	915	+ 215
H5 Systemic Therapy Area	220	220	290	+ 70
H6 Pharmacy	130	130	135	+ 5
H7 Clinical Trails Office	80	80	105	+ 25
H8 Medical Staff Office	540	540	660	+ 120
H9 Patient Information Management	300	300	415	+ 115
H10 Administration	180	180	155	- 25
H11 Staff Support	125	125	145	+ 20
H12 Clinical Support	125	125	160	+ 35
Subtotal Component Area, H	2 940	2 940	3 510	+ 570

Fraser Valley Health Centre
 Eastern Fraser Valley Cancer Centre

	1. 2000 Master Program GSM	2. 2000 Post-Program VA GSM	3. 2001 Facility Program GSM	Variance 2. to 3. GSM
Total Component Gross Area	5 475	5 475	5 714	+ 239
Unassigned Gross Area (Incl. mech., ext. wall, major circulation, etc.)	1 370	1 370	1 396	+ 26
TOTAL EFVCC BUILDING GROSS AREA (BGSM)	6 845	6 845	7 110	+ 265

Appendix H
Project Overview Section of the Facility Program