CAPITAL MANAGEMENT PROCESS REVIEW FOR THE GOVERNMENT OF BRITISH COLUMBIA

Appendices

April 2000

Deloitte Consulting

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Appendix A:

Lines of Inquiry

APPENDIX A: LINES OF INQUIRY

The lines of inquiry illustrate the key phases of capital project contracting upon which we focussed our review of the selected capital projects. The relevant lines of inquiry are set out for each phase of the capital project's life cycle. The scope of our review included all phases up to the delivery/commissioning phase of each capital project.

The following lists all the major elements within each line of inquiry and the types of questions that were considered in our review.

General Information

Elements

- Determination of project ownership
- Management structure of the project
- Source of funding of the project
- Involvement of central agencies in the project

Sample Questions

- Is ownership clearly defined and has appropriate legal documentation been prepared?
- Has management continuity been provided throughout the project?
- Is there an appropriate management structure in place?
- Is there an acquisition strategy in place?
- Have financing alternatives been considered and evaluated?
- At what phase in the project are the central agencies involved and how often are they up-dated?

Project and Risk Management

Elements

- Procedures for briefing the Minister
- Liaison with related Crown corporation's board of directors
- Regularity of reporting
- Establishment of schedules, budgets, financial and other controls
- Consideration of specifications, regulations and legislation
- Tracking of milestones and project objectives

Sample Questions

- Have the project managers ensured that the information provided to stakeholders is complete, accurate and realistic, and timely?
- Did Treasury Board staff review and approve contracts as required?
- Were milestones, significant events and deviations reported to the relevant authorities?
- Does the contractor provide progress reports on the financial and physical status of the project?
- Were the relevant ministries notified of unsatisfactory performance?
- Are the individuals managing the project information qualified and competent?
- Are controls in place for each phase?

- Have the required resources been defined, committed and acquired at the lowest cost possible commensurate with achieving the project objectives of each phase?
- Has each project phase been defined and managed according to its particular objectives, terms of reference, etc.?
- Has timely completion of each phase and the overall project been given high priority?

Responsibility and Accountability

Elements

- Establishment of levels of authority
- Definition of roles and responsibilities for each phase of the project
- Communication of roles and responsibilities

Sample Questions

- Has overall responsibility been assigned to one project leader?
- At what phase in the project was the project leader assigned?
- Did the project leader have sufficient authority to exert effective leadership throughout the project?
- Who was responsible for initial planning, cost estimating, requesting funds, receiving approval for the project, implementation, etc.?
- Have key individuals involved in the project been determined for planning and implementation?
- What were the responsibilities of persons assigned to the project and were they appropriately communicated?
- Was there continuity throughout the project with regards to project organization?

Requirements Definition

Elements

- Determination of program objectives
- Definition of requirements with reflected program objectives
- Consideration of public policy issues
- Estimation of project costs
- Preparation of statement of requirements
- Approval in principle

Sample Questions

- Are the objectives for the project clear and documented?
- Have the project objectives been approved by the appropriate Minister?
- Is there an adequate statement of need?
- Is the need linked to the program objectives and the mandate and strategic plan of the Ministry?
- Is the defined need regularly reviewed?
- Is the need justifiable and is there documentation to support this?
- Does the need reflect general government objectives?
- Have known and potential costs been considered?
- Is there documention of the analysis performed with supporting information?

- Have appropriate analytical methods and assumptions been used and consistently applied?
- Has the analysis been presented to the appropriate stakeholders?

Specifications Definition

Elements

- Performance of options analysis
- Determination of possible constraints
- Creation of risk profiles
- Development and evaluation of preliminary project concept design
- Revision of cost estimation
- Establishment of project management methodology
- Transition from a preliminary phase to a project that is clearly defined
- Further development of budgets, schedules, organization and financial and management controls

Sample Questions

- Have alternatives been considered which would fulfill similar needs?
- Have possible problems and potential solutions been explored?
- Have technology issues been considered?
- Have feasibility studies been conducted on the available options?
- Have appropriate analytical techniques been applied for qualitative and quantitative items, when possible?
- Has the options analysis been reviewed and approved?
- Have government objectives outside the ministry been considered?
- Has the financial impact of the life cycle effect on: financial, social, human, and physical resources been considered?
- Have risk levels been defined and established?
- Has the degree of risk associated with the project been assessed, both qualitatively and quantitatively?
- Have life cycle costs been used as a basis for the concept design and in evaluating concept design alternatives?
- Has a cost benefit analysis been conducted on the project options?
- Have the life cycle costs of the project been calculated for the various options?
- Has a construction agreement prepared and approved, following the review of all contract requirements with the contractor?
- Has the specification analysis been reviewed and has the option selected been approved by senior personnel?
- Have the assumptions used in the option selected been disclosed?
- Are appropriate financial controls in place with regards to payments?

Procurement Process

Elements

- Processes and alternatives for contracting project design and construction
- Assessment of cost versus quality
- Consideration of industrial benefits

Sample Questions

- Have the options of out-sourcing, in-house and PPP (Public Private Partnership) been evaluated and documented?
- Has the procurement strategy been approved and by whom?
- Has availability and pricing of required resources been analyzed and defined?
- Has a list of qualified and available contractors been established, reviewed and approved?
- Has a Request for Proposal been sent to all contractors identified?
- Is the procurement process competitive or non-competitive?
- Is the bidding process transparent and fair?
- What methods were used to evaluate tenders?
- Has employing a local contractor for regional economic benefit been considered?
- If the selection of a contractor was influenced by industrial benefits, has the rational for their selection been documented?

Construction

Elements

- Development and renewal of detail design
- Consistency of design with project objectives, costs, and constraints
- Financial management, supervision and inspection
- Delegation of authority
- Establishment of authorization and protocol for changes required
- Contingency planning

Sample Questions

- Has a comprehensive project brief been prepared?
- Was an approved master and outline schedule prepared from the project brief identifying milestone dates throughout the project life?
- Were all drawings and specifications required for obtaining tenders for construction complete?
- Is there an appropriate plan and system of quality assurance/control in place?
- Have periodic project reports been prepared including: progress reports, deviations, completion dates, test results and recommendations, cash flows, projections, etc.?
- Has there been appropriate delegation of authority?
- Have appropriate approvals been obtained throughout this phase?
- Has appropriate contingency planning taken place?

Delivery/Commissioning

Elements

- Formal process to assess project completion
- Delivered capital asset is consistent and reflective of project objectives
- Establishment of protocol for unsatisfactory delivery
- Project closure via transition and delivery of capital asset

Sample Questions

- Is there a formal process in place to conduct quality reviews to ensure that the capital asset meets expectations and requirements?
- Are outstanding items documented?
- Does the process include reviewing the project to determine if milestones were adequately met within the pre-determined time frame and according to budget?
- Are debriefed documents retained and distributed to other project managers as recommendations to be considered for similar projects?
- Is there a clear definition or explanation as to what would be considered "unsatisfactory" delivery?
- Has a protocol been established to follow if an asset delivered is determined to be unsatisfactory?
- Has a preventative maintenance program been developed in conjunction with contractors and users?

Appendix B:

Illustrative Project Classification Framework

APPENDIX B: ILLUSTRATIVE PROJECT CLASSIFICATION FRAMEWORK

This represents a potential project classification framework. Note that this is not a definitive framework for assessing risks, it is merely an example to illustrate how projects could be placed into one of three classifications.

The risk framework could be based on:

Probability

0 = no chance of factor becoming a problem
1 = low probability of factor becoming a problem
2 = medium probability of factor becoming a problem
3 = high probability of factor becoming a problem

Weighting (i.e., impact on project)

0 = factor has no impact on project
1 = factor has low impact on project
2 = factor has medium impact on project
3 = factor has significant impact on project

Notes – This does not allow for much variation for weighting factors – this could be expanded in general or on a project-by-project basis.

– Three levels of project classification could be used i.e., low, medium and high risk.

– The probability and weighting factors could be adjusted as the project proceeds.

– Not all factors will be applicable at the outset of the project. For example, the project manager/team/contractor experience will generally apply only as the capital project proceeds.

Area	Factor	Probability 0 - 3	Weighting 0 - 3	Result (Probability Impact)
General Risk	High Visibility			
	Public Concerns/Objections			
	Environmental Factors			
	Safety Issues			
	Legislative Changes			
Management Risk	Complexity			
	Unclear or Changing Scope			
	New Technology			
	Project 'Newness' (Has this ever been done before?)			

Area	Factor	Probability 0 - 3	Weighting 0 - 3	Result (Probability Impact)
	Experience Level of Project Manager (Has he/she done something like this before?)			
	Experience Level of Project Team/Contractor (Have they done something like this before?)			
	Aggressive/Changing Time Schedule			
	Labour Productivity Drop			
Construction Risk	Availability of Skilled Trades			
	Labour Disruptions			
	Material/Equipment Availability			
	Weather-related Problems			
Economic Risk	Project Funding Uncertainty			
	Labour Cost Increases			
	Material/Equipment Cost Increases			
	Currency Fluctuation			
	Project Total			

Based on the total risk assessment, projects could be classified in three levels as follows:

Score	Risk Classification
<P	Low Risk
P-Q	Medium Risk
Q+	High Risk

The project classification (Class A, B or C) could be based on cost and risk as follows:

	Project Risk		
Project Cost	**Low Risk**	**Medium Risk**	**High Risk**
0 – X Million	Class C	Class C	Class B
X – Y Million	Class C	Class B	Class A
> Y Million	Class B	Class A	Class A

Appendix C:

Best Practices for Reporting Information on Capital Projects

A. General Principles
B. Reporting Needs
C. Reporting Plan
D. Report Types
E. Bank/Lender Expectations

APPENDIX C: BEST PRACTICES FOR REPORTING INFORMATION ON CAPITAL PROJECTS

A. GENERAL PRINCIPLES

1. Simplicity and Clarity

- The language and presentation of documentation and information should be kept as simple as possible to avoid confusion and misinterpretation.
- Documentation to senior officials as it relates to the project should be clear and unbiased.

2. Accuracy and Completeness

- A requirement should be in place stipulating that all project managers are to provide timely and accurate cost reporting.
- Appropriate financial controls should be in place to better ensure accuracy of information output.
- Appropriate project control procedures documenting formally approved scope, schedule and budget parameters should be in place.
- The project manager should be aware and in control of the following engineering information to ensure that reports are complete and comprehensive, allowing proper evaluation of a project's progress:
  - Labour hours
  - Drawing production
  - Specifications and contract writing production
  - Vendor drawings and data
  - All problem areas through weekly meetings or punch lists
  - Reporting should be comprehensive of performance, scope, time and cost

3. Timeliness

- A project control cycle should be developed and followed to help ensure variances are tracked and monitored as they occur or in the most timely manner possible.
- The amount of time to complete the control cycle should be kept as short as possible, in order to:
  - Attend to problems efficiently; and
  - Monitor and control related and non-related problems that could be developing in the interim.

- Information gathered and integrated into the reports should be current to ensure analysis is conducted on the most relevant information.

- All reports should be received on a timely basis.

4. Frequency

- Reports that monitor project progress including scope, cost and schedule, against plans should be produced on a regular basis.

- Based on a review of various program management practices and standards, at least monthly reports are generally required with weekly in many instances.

- To fulfill the monthly/weekly reporting requirement, data must be maintained on a weekly/daily basis at the project level for it to be ready for review by the project manager at any time.

- Trend forecasts on a weekly basis from the project manager are recommended.

5. Transparency and Revision

- Authorized personnel are to review and evaluate reports generated.

- Relevant, accurate and up-to-date information is to be presented to senior management and to Treasury Board.

- All problems or potential problems are to be brought forward, not disguised or obscured, regardless of possible political or other implications.

6. Continuity

- Anticipated risks, costs and effects should be analyzed and reported throughout the construction process.

- The schedule format should be designed in a manner that it can be used both for in-house and review purposes, including cost and performance tracking.

- A "bottom-up" reporting approach should be implemented, whereby the most detailed reporting occurs at the project level, on a daily basis, incorporating all pertinent information that is required at the top of the reporting hierarchy. As the information flows up the reporting hierarchy, it increasingly loses its detail in order to reflect the reporting needs of each level of reporting.

B. REPORTING NEEDS

1. Establishing an Appropriate Level of Reporting

- Before reporting needs are established, the general structure of a capital project should be broken down into components to enable better project management and control.
- The components should be organized hierarchically in order that external attention can be focussed on the most pertinent areas.
- Constraints, or other factors that limit reporting options should be considered. For example: if a majority of the resources are procured, more consideration should be given to reporting of contractual information.
- Communication requirements should be identified by combining the type and format of information required with an analysis of the value of the information.
- Furthermore, project resources should be expended only on communication of information which contributes to success or where lack of communication can lead to failure.
- The following interrelationships and issues need consideration in order to properly determine project communication requirements:
  - Stakeholder analysis
  - Project organization and stakeholder responsibility relationships
  - Disciplines, departments, and specialties involved in the project
  - Logistics of how many individuals will be involved with the project and at which locations
  - External information needs

2. Creating Minimum Reporting Requirements

- Although all projects differ, a minimum reporting standard should be established which is general and flexible to allow for specific project reporting needs, while providing concrete guidelines and requirements for all projects.
- As a minimum requirement, capital project reporting should incorporate the following concepts:
  - Cost - project cost in constant and current dollars.
  - Time - target dates, impact of potentially and actually missing target dates on the project and on departmental operations, all target dates missed and revised.
  - Performance - expected and essential characteristics and quantity of product resulting from the project.

- In all cases, a permissible variance variation level should be established for each project, and, if necessary, for each factor being measured. This will enable management to review and analyze pertinent variances only and will allow for the timely recognition of what constitutes a material variance.
- More specifically, to be effective, progress reports and reporting requirements should incorporate the follow minimum standards:
  - Comparison of actual costs to budgets, with explanations for variances above the established threshold
  - Corrective action to be taken on the variances identified
  - Progress of design against schedule, reason for delays and remedial action taken
  - Details of scope changes and related costs
  - A narrative including:
    - Accomplishments for the period
    - A simple statement indicating project is on, ahead or behind schedule
    - A listing of any changes to project objectives or scope
    - A listing of any factors or changes that have affected the business climate
    - Any unanticipated problems that are currently being faced
    - Any changes required due such problems
    - A listing of persons whose approval is required to implement these changes
    - Any additional anticipated problems
    - All action steps that are being taken or planned
    - All potential constraints should be identified, analyzed and reported
    - Additional relevant comments

C. REPORTING PLAN

- A reporting management plan should be created. The characteristics of this plan depend on the needs of Treasury Board as the ultimate authority of the project, and on the organizational structure of the project.
- As government capital projects all have similar organizational structure (or can be broken down into two main groups: Crown corporations and social capital), a communication management plan framework can be established for all projects, which should be modified or enhanced to reflect specific project reporting requirements.
- A reporting management plan can be informal, formal, highly detailed or high level based on project needs. However, regardless of its structure, the reporting management plan should provide:
  - Detail on the method to be used to gather and store various types of information, including procedures for updating and correcting previously distributed material.

- Factors to consider when establishing the communications technology required and the methods of transfer of information, including the dependency of the project's success on the immediacy of the need for information; the need and frequency of updated information; the availability of technology; expected project staffing; the length of the project, etc.
- A distribution structure detailing to whom information will flow, and what methods will be used to distribute various types of information. This should be conducted with reference to the project organization chart and should include the following elements.
  - Identification of departments involved, e.g., Engineering; Procurement; Estimating; Accounting; Planning and Scheduling; Construction; Payroll.
  - Identification of the persons responsible for reporting and report drafting and their reporting requirements.
  - Time and resources should be given to the departments or persons responsible for reporting in order to enable them to fulfil their functions.
  - A description of the information to be distributed, including format, content, level of detail, and conventions/definitions to be used.
  - Production schedules showing when each type of communication will be produced.
  - Methods for assessing information between scheduled communications.
  - A method for updating and refining the communications management plan as the project progresses and develops.

D. REPORT TYPES

1. Status Reports

Status reports should be frequent, short, concise and contain pertinent information only. The following are specific contents, which should be considered when designing status reports:

- Cost
  - Cost commitment reports
  - S curve envelopes showing cost, commitments, trends and forecasts backed by tables showing budgets and forecasts
  - Costs incurred to date and what was acquired with those expenditures
  - Costs projected to completion and estimated date of completion
- Schedule
  - Chart, narrative description and milestone schedule
  - Schedule for goods acquired
- Variance Analysis
  - To date and projected performance; cost and schedule variances to date should be measured using an "earned value" approach

- Reporting procedures for variance analysis should be as brief as possible so feedback can be generated and responses can be developed in a timely manner
- Any rescheduling required due to the variance analysis should be accomplished in a short time frame
- Protocol for project and functional management when variances are identified are to be established, such as:
  - Diagnosis of problem
  - Corrective action
  - Developing a plan to recover the position
- Such protocol should result in the following responses:
  - Determination that variance does not require corrective action
  - Functional modification
  - Recovery plans
  - System redesign
  - Notification of unsatisfactory performance to persons responsible for procurement and financing to the supplier
- A specified area to address decisions made
- Detailed action to be taken on outstanding times and related physical progress to financial status
- A section which indicates that appropriate follow-up action has been taken and the contractor properly notified
- Exception reports

- Trends
  - Costs
  - Schedules of engineering, procurement and construction (referring to cost commitment and productivity or tracking curves for small projects)
  - Major trends should be highlighted and a discussion of their frequency and tendency to become change orders
  - Ongoing analysis of factors associated with the project, the degree of certainty of completing the project on time and within the current specifications and budget established
  - Extent of delays and projected revised completion dates
- Engineering Progress
  - Drawings
  - Specifications
  - Contracts
  - Design
  - Manpower

- Procurement (in general, covered in the engineering progress section)
  - List of purchase orders and contracts and the amount committed to them
  - A narrative highlighting monthly activity
- Construction Report, including a tabled calculation of productivity based on:
  - Man-hours
  - Materials
  - Contract expenditures
- Performance
  - Quality of work
  - Test results and recommendations
- Site Photographs

A sample table of contents for a monthly project status report follows.

SAMPLE TABLE OF CONTENTS FOR A MONTHLY PROJECT STATUS REPORT

2. Contractor and Designer Briefs

Contractor briefs should be prepared containing all information necessary for contractors to conform to project briefs, considering:

- Performance and quality specifications, design criteria/special requirements and schedule requirements
- Site restrictions and options
- Options for bidding on alternatives
- Scope of work/exclusions
- Mandatory design standards

A comprehensive brief should be prepared for designers including all information necessary to conform to project approval documents, considering:

- Procurement requirements
- Design development procedures
- Scope of design work
- Design project budget
- Project schedule requirements

A project brief should be prepared including:

- Statement of objectives
- Work breakdown structure
- Project agreement
- Project schedule
- Project budget

3. Budgets

From the project brief, approved budgets and individual budgets should be developed for:

- Design fees
- Project team costs
- Contractor tender packages
- Material supplies
- Operating costs

Capital cost estimates should be prepared, considering:

- Capital cost content of each work package
- Procurement cost
- Project organization costs
- Initial training costs
- Levels of risk

Operating cost estimates should be prepared for each work package, considering:

- Continuing training costs
- Basic operating costs
- Cyclical and non-recurring costs
- Lease payments/rentals

4. Schedules

Project schedules should include:

- All major events and dates must be clearly identified, and if statement of work is supplied by the "customer", these dates should be included
- If for any reason the customer's milestones cannot be met, the customer should be notified immediately
- The exact sequence of work should be defined through a network in which interrelationships between events can be identified
- Schedules should be directly related to the work breakdown structure. The minimum requirement should be to show where and when all tasks start and finish
- All schedules must identify the time constraints and if possible should identify the resources required for each event
- The complexity of the schedules should be tailored to each individual project's needs. Normally, multiple schedules are developed (at least two):
  - Summary schedules for management and planners and detailed schedules for the doers and lower level control
  - More detailed schedules may be strictly for interdepartmental activities
- Program management must approve all schedules down through to the first three levels of the work break down structure
- When draft reports are to be prepared all detailed schedules are to be consolidated and each functional program team member together with those in charge of reporting are to integrate all plans and schedules to verify that contractual dates can be met. This helps assure completeness and accuracy
- Reviews with customer should be undertaken to ensure nothing has fallen through the cracks. This minimizes production costs by reducing the number of early revisions

A complete project schedule should be prepared establishing:

- A schedule for each component
- Work packages in priority
- Milestone dates which should include: project start and end- date and other major milestones such as review meetings, prototype, procurement, testing, and reporting deadlines
- Dates of critical requirements
- Identification of degrees of risk associated with the time periods used in the critical path

Schedules can be developed using various methods such as:

- The critical path method: calculates a single, deterministic early and late start and finish date for each activity based on specified, sequential network logic and single duration estimated. Focus is on calculation float in order to determine which activities have the least scheduling flexibility
- The graphic evaluation and review technique: probability
- The program evaluation and review technique: sequential network logic and weighted average duration estimated to calculate project duration

E. BANK/LENDER EXPECTATIONS

Listed below are the documents/controls expected by a banker/lender for a major construction project.

Application Level Documents

a. Quantity surveyor report - this report would be by a qualified quantity surveyor and would include all major components in a project and would include the cost to put them in place using industry standard costing for a geographical area.

b. An as built appraisal - this would be a fair market value appraisal of the project on an as built basis. This would include a number of assumptions about the future revenue streams based on market data and lease up assumptions.

c. A detailed project plan - the project plan would be a business case for the project. This plan would include a set of pro-forma financial statements, a detailed activity chart, a list of approvals required and their status. The pro-forma financial statements would include revenue projections and detailed cost accumulations by month during the construction period. The business case would include market data as to available space rental rates and provide a rationale for the project. An internal rate of return for the project would also be supplied based on the pro-forma financial statements.

d. Architects' drawings - including detailed working drawings.

e. If the project proponent is new to the lender, a corporate profile with prior project experience would be required with detailed resumes of the project managers.

f. Title report on the land.

g. Current financial statements for the entities involved in the project.

h. A list of contracts tendered and the costs involved.

i. A detailed cost budget for the project including all soft and hard costs. Soft costs include all consultants' reports, architects, engineers, interest during construction, permits and other levies. The hard costs would be broken down by major components of the project. These would include site preparation, on site and off site services, building shell costs, electrical, plumbing and HVAC costs.

j. If the project is a revenue producing property or a property to be sold, pre-leasing and pre-sale data would be required.

k. If personal covenants are being included then net worth statements of the principals.

l. Phase I environmental report and if anything is found, a Phase II report.

m. Land purchase contract.

n. Credit reports on company and individuals.

o. Often a map identifying the project, site photos and aerial photos would be provided.

p. Certified resolutions and bylaws of the borrowers.

q. Evidence of appropriate insurance coverage during construction with the lender as loss payee.

Construction Progress Documents

a. Architects and quantity surveyor reports identifying the costs incurred to date and the percentage of completion by major project and budget category each month.

b. A monthly report identifying costs incurred to date relative to budget with an explanation of variances. This report would show progress draws to date with the current draw requested. This report and project draw request would include certification by a senior official and the architects. Contractor billings would be attached.

c. A report covering the progress to date and any variances from the initial completion dates would be provided. Often photographs of the site would be included indicating progress.

Completion Documents

a. Final progress draw submitted.

b. Occupancy permits.

c. Municipal inspector reports.

Appendix D:

Best Practices for a Standard Approach to Capital Project Management

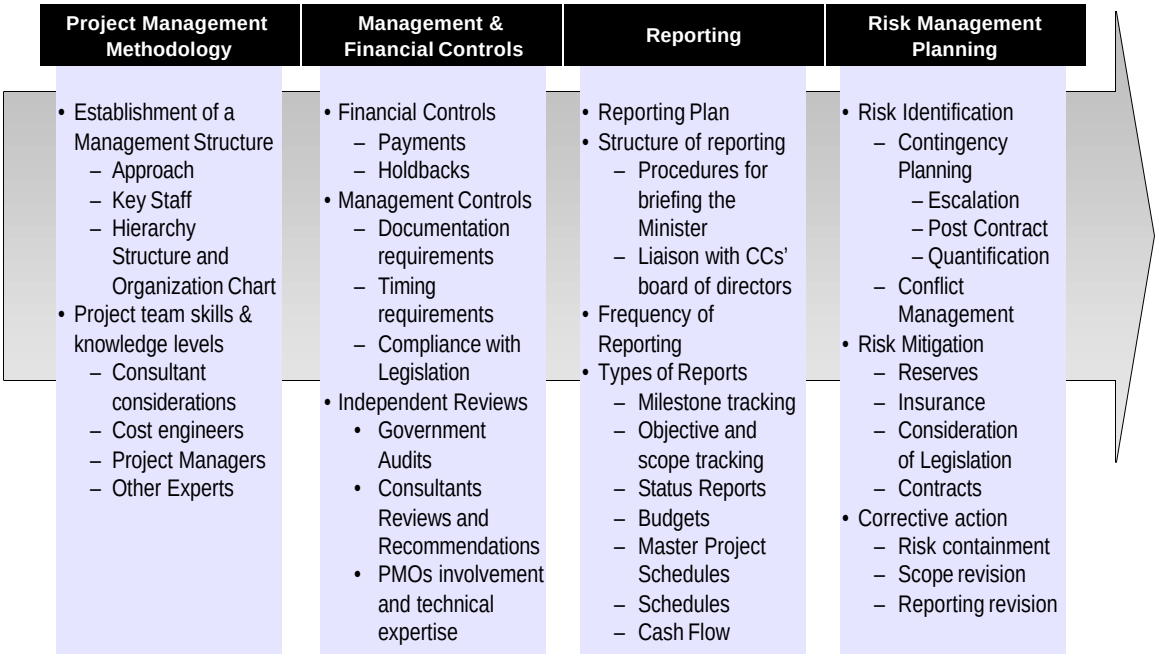
APPENDIX D: BEST PRACTICES FOR A STANDARD APPROACH TO CAPITAL PROJECT MANAGEMENT

Introduction

This Appendix elaborates upon the best practices identified in the Main Body of our Report. The reader may wish to examine or contact the references cited in the Report.

Project and Risk Management

Project and risk management encompasses project management methodologies, risk management planning, financial and management controls to manage and mitigate risk as well as aspects of reporting. Project and risk management mechanisms and processes should be determined at the inception of the project and carried out throughout the project phases.



Responsibility and Accountability

Similar to project and risk management, responsibility and accountability are also pertinent throughout the project's life cycle. It is crucial that roles and responsibilities be defined, clear, and communicated before the project commences in order to ensure proper leadership and accountability throughout the project. This not only includes communication within the upper echelons, but also the communication of corporate goals at the lower organizational levels.

Overlapping responsibilities should be kept to a minimum, unless they have been specifically designed as a control mechanism. Furthermore, clarity and definition of roles and responsibilities minimize misinterpretation and provide direction to successfully complete the necessary requirements.

This is especially important for government capital projects due to the interface between the central agencies, Crown corporations, ministries and local agencies.

Determination & Definition of Roles & Responsibilities	Communication of Roles & Responsibilities	Accountability
• Discussion and Documentation • Definition of Roles - Central Agencies -Ministries - Crown Corporations - Local Agencies Project Manager Contractor Engineer Designer	• Meetings and information distribution - Central Agencies - Ministries - Crown Corporations - Local Agencies	• Establishment of Project leader - Accountability - Initial planning - Cost estimating - Requesting funds - Receiving approval

Long-Term Capital Planning

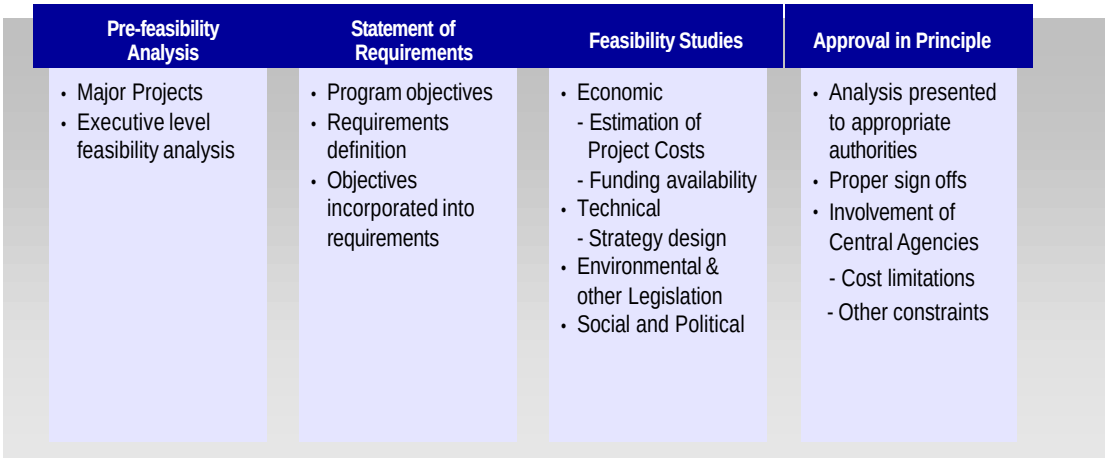
Long-term capital planning allows the local and provincial agencies to focus on strategic goals and project variables. The long-term capital plans enable the Government to foresee capital requirements and project needs in advance. Long-term capital planning should incorporate operating, economic and socio-political elements of potential capital projects, as well as the funding availability of such projects. More importantly, long-term planning should include lessons learned from ongoing and previous projects through annual updating and revision of policies as conducted in the follow-up phase.

Identification of Strategic Project Variables	Eligibility for Funding	Project Requests
• Operating - Purpose and objectives -Technological change - Volume - Capacity • Economic - Market indicators (cycles) - Industry Forecasts • Socio-political - Consideration of Public Policy Issues	• Alternatively Financed Projects • Cost Shared Projects • Capital Expenditure Reallocation	• Approval Process • Business Case Requirements • Reporting and Audit

Project Concept

Prior to planning, designing and construction, there should be the recognition of a need for a new facility and the birth of an idea to fulfill this need. This phase encompasses three main elements: pre-feasibility analysis; needs definition; and feasibility studies. Feasibility studies are to be of an economic, technical, social and political nature. If any one of the feasibility studies fails or is inconclusive and cannot be remedied, no further resources should be expended on this project concept.

Proper implementation of this phase can reduce unnecessary spending, facilitate transition into the planning phase of the project and may reduce costs associated with the planning phase, if thoroughly conducted.

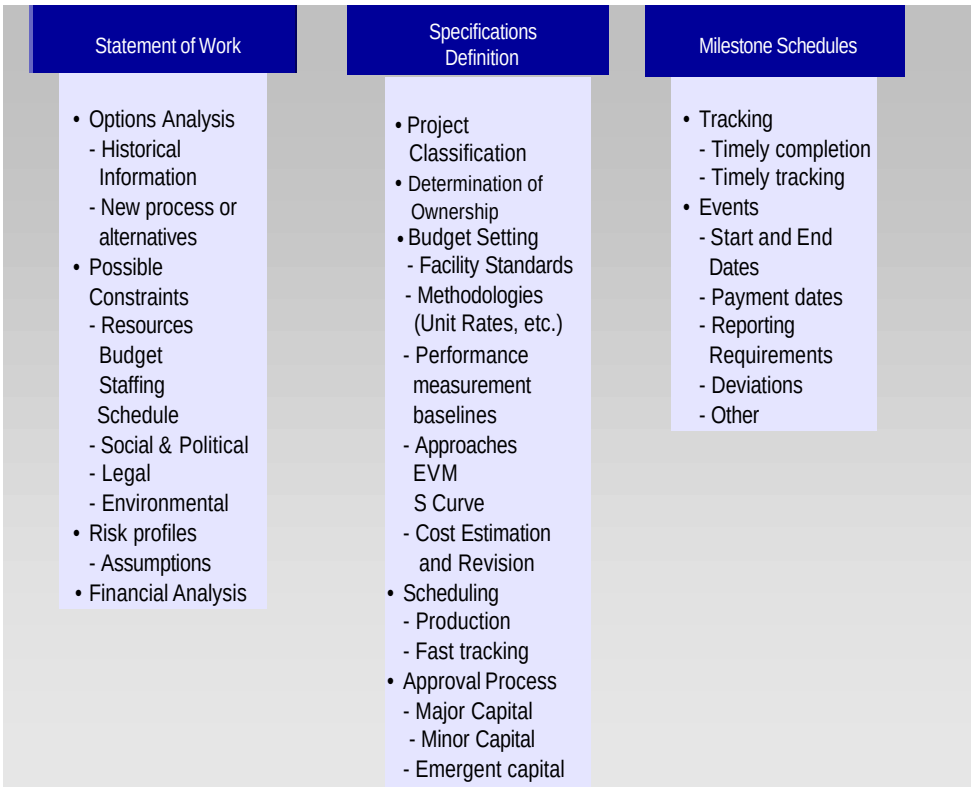


Specifications Definition and Project Planning

Once the project has been given the "green light", project specific planning should proceed immediately. Project planning is generally conducted in a short time frame, with limited resources, whilst encompassing the entire scope of the project. As a result, if planning is poorly conducted, a poorly executed project is more likely to ensue. Adequate resources should be allocated to this phase and planning elements should be revisited, to ensure that they meet the needs of the project as the project develops.

Planning includes two main areas: a statement of work, including the options analysis, possible constraints and risks; and the specifications definition, once an option has been selected. The specifications definition includes milestone schedules, approvals, budget setting, and scheduling.

Milestone charts and master production schedules should be used to ensure that the critical path for the successful completion of the project ensues. The minimum standards for milestone charts should include: start and completion dates; completion of major deliverables; key internal and external reporting requirements; and the appropriate approval and timing of the approval required at each phase. However, it is not sufficient to merely produce such schedules; the relevant milestone information should be communicated to all relevant parties and updated on a regular basis.



Engineering and Design

Engineering and design should be divided into two main areas: preliminary concept design and detailed design. Both areas consist of similar core elements including design development, evaluation, review and approval. The distinguishing features between evaluation and review, is that an evaluation is concerned primarily with ensuring the design is reflective of the project's objectives and scope, while a review is concerned with regulations, licensing, safety and other standards.

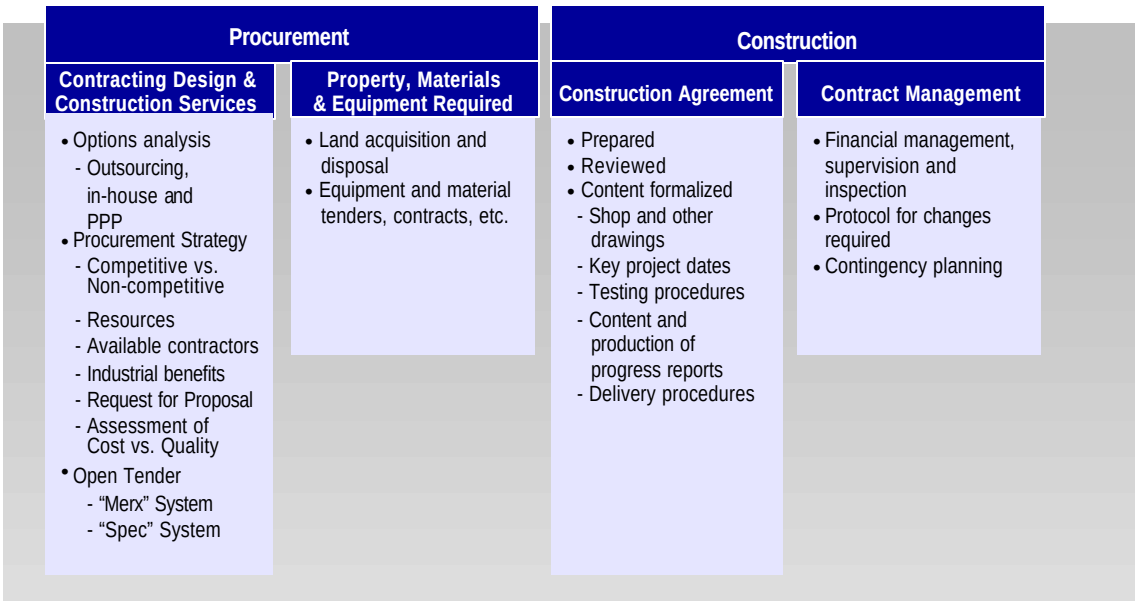
In addition to the core elements discussed above, the detailed design phase should encompass cost management and value analysis techniques. Traditionally, cost management has not been included in this phase, however, best practices indicate that this is becoming increasingly common as an effective way to maximize value and help ensure that resources are being deployed in the most effective manner.

Preliminary Concept Design	Detailed Design
• Defined requirements communicated • Development - Necessary studies conducted - Consideration of life cycle costs, requirements and future requirements • Evaluation - Provincial and local objectives - Planning requirements • Review (Regulations, licensing, Safety, other standards) • Project Brief - Accordance with TB requirements • Approvals - Regulatory approvals - Planning and scheduling requirements - Concept submission	• Development • Evaluation - Acceptable alternatives • Review • Cost Management - Value Analysis and EVM - Design reflective of objectives costs and constraints • Completion of drawings and specifications • Project Brief • Master Schedule • Pre-tender Estimates • Construction and Tender documentation • Approvals • Protocol and mechanism for changes

Procurement and Construction

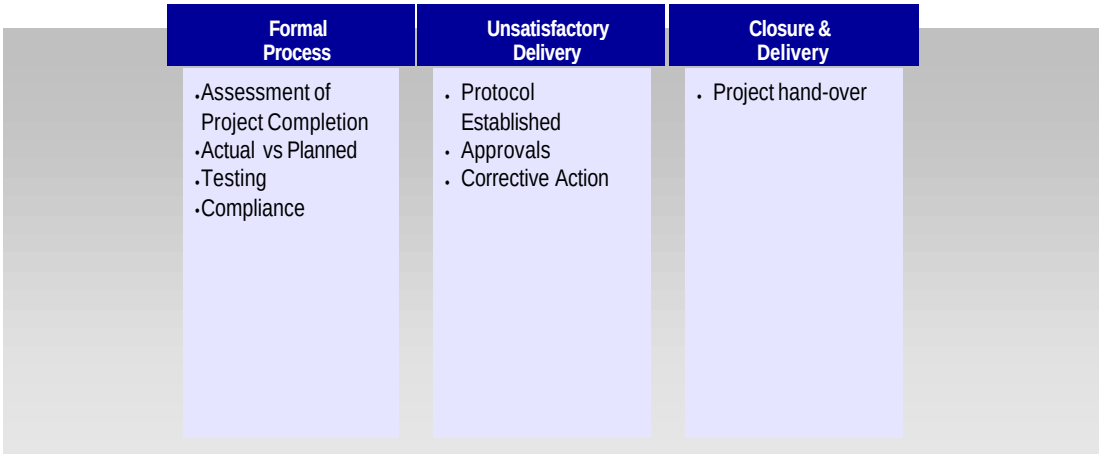
Procurement encompasses three main areas: processes and alternatives for contracting design and construction; procurement of property, materials, equipment and land; and assessment of the cost versus quality of the proposals received.

Construction management incorporates many of the principles discussed under project and risk management. However, specific to construction management is the need for contract financial management, supervision and inspection, establishing protocol for changes required and the formulation and implementation of recovery plans.



Delivery

The delivery phase is crucial in order to ensure that the final product received meets both requirements and expectations. A formal process 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. Furthermore, a protocol for unsatisfactory delivery should be established to resolve any discrepancies, disagreements and issues in the most efficient and effective manner to facilitate timely project closure and delivery.

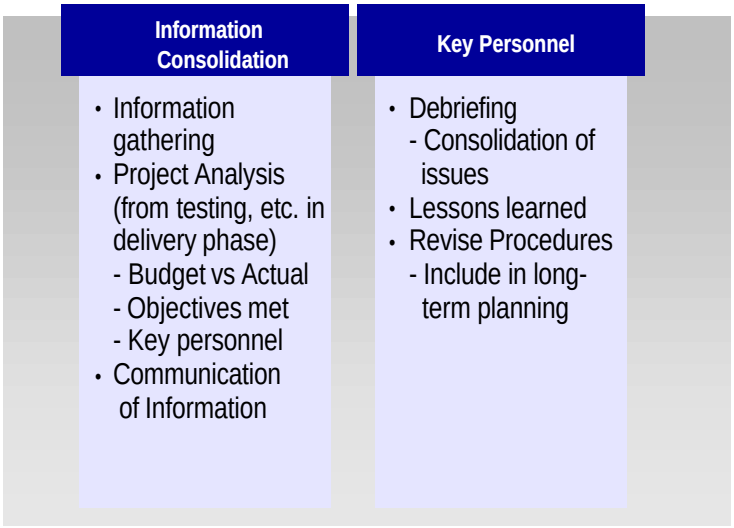


Follow-up

All information obtained and testing conducted should be consolidated to determine the project's success with regards to the asset built and the costs associated with its construction.

Key players involved throughout the capital project's life cycle should debrief the strategy implemented, each project phase, and milestone targets and tracking. All elements of the project's life cycle should be evaluated in order to determine both positive and negative outcomes to either implement or avoid on similar projects in the future.

Techniques and lessons learned should be communicated to all relevant parties; relevant procedures should be revised and integrated into the long-term capital planning phase.



Appendix E:

Suggested Table of Contents for a Standard Approach to Capital Project Management Manual

APPENDIX E: SUGGESTED TABLE OF CONTENTS FOR A STANDARD APPROACH TO CAPITAL PROJECT MANAGEMENT MANUAL

1. Introduction

2. Project and Risk Management
- 2.1. Project Management Methodology
  - 2.1.1. Establishment of a Management Structure
    - 2.1.1.1. Approach
    - 2.1.1.2. Key Staff
    - 2.1.1.3. Hierarchy Structure and Organization chart
  - 2.1.2. Project team skill & knowledge level
    - 2.1.2.1. Consultant considerations
    - 2.1.2.2. Cost engineers
    - 2.1.2.3. Project Managers
    - 2.1.2.4. Other Experts
- 2.2. Management and Financial Controls
  - 2.2.1. Financial Controls
    - 2.2.1.1. Payments
    - 2.2.1.2. Holdbacks
  - 2.2.2. Management Controls
    - 2.2.2.1. Documentation requirements
    - 2.2.2.2. Time requirements
    - 2.2.2.3. Compliance with Legislation
  - 2.2.3. Independent Reviews
    - 2.2.3.1. Government Audits
    - 2.2.3.2. Consultants Reviews and Recommendations
    - 2.2.3.3. PMOs Involvement and technical expertise
- 2.3. Reporting
  - 2.3.1. Reporting Plan
  - 2.3.2. Structure of reporting
    - 2.3.2.1. Procedures for briefing the Minister
    - 2.3.2.2. Liaison with CCs' board of directors
  - 2.3.3. Frequency of Reporting
  - 2.3.4. Types of Reports
    - 2.3.4.1. Budgets
    - 2.3.4.2. Schedules
      - 2.3.4.2.1. Departmental Schedules
    - 2.3.4.3. Master Project Schedule
    - 2.3.4.4. Milestone Tracking
    - 2.3.4.5. Objective and scope tracking
    - 2.3.4.6. Status Reports
    - 2.3.4.7. Cash flow
- 2.4. Risk Management Planning
  - 2.4.1. Risk Identification
    - 2.4.1.1. Contingency planning
    - 2.4.1.2. Escalation
    - 2.4.1.3. Post Contract
    - 2.4.1.4. Quantification
  - 2.4.2. Risk Mitigation
    - 2.4.2.1. Reserves
    - 2.4.2.2. Insurance
    - 2.4.2.3. Consideration of Legislation
    - 2.4.2.4. Contracts
    - 2.4.2.5. Conflict Management
  - 2.4.3. Corrective action
    - 2.4.3.1. Risk containment
    - 2.4.3.2. Scope revision
    - 2.4.3.3. Reporting revision
      - 2.4.3.3.1 Budget etc.

3. Responsibility and Accountability
- 3.1. Determination and Definition of Roles and Responsibilities
  - 3.1.1. Central Agencies
  - 3.1.2. Ministries
  - 3.1.3. Crown Corporations
  - 3.1.4. Local Agencies
    - 3.1.4.1. Project Manager
    - 3.1.4.2. Contractor
    - 3.1.4.3. Engineer
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- 3.2. Communication of Roles and Responsibilities
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  - 3.2.2. Ministries
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  - 3.2.4. Local Agencies
- 3.3. Accountability
  - 3.3.1. Establishment of a project leader
  - 3.3.2. Responsible/accountable for
    - 3.3.2.1. Initial planning
    - 3.3.2.2. Cost estimation
    - 3.3.2.3. Requesting funds
    - 3.3.2.4. Receiving approval

4. Long-Term Capital Planning
- 4.1. Identification of strategic project variables
  - 4.1.1. Operating
    - 4.1.1.1. Purpose and objectives
    - 4.1.1.2. Technological change
    - 4.1.1.3. Volume
    - 4.1.1.4. Capacity
  - 4.1.2. Economic
    - 4.1.2.1. Market indicators (cycles)
    - 4.1.2.2. Industry Forecasts
  - 4.1.3. Sociopolitical
    - 4.1.3.1. Consideration of Public Policy Issues
- 4.2. Eligibility for funding
  - 4.2.1. Alternatively Financed Projects
  - 4.2.2. Cost Shared Projects
  - 4.2.3. Capital Expenditure Reallocation
- 4.3. Project Requests
  - 4.3.1. Approval Process
  - 4.3.2. Business Case Requirements
  - 4.3.3. Reporting and Audit

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- 5.1. Pre-feasibility stage
  - 5.1.1. Major projects
  - 5.1.2. Executive level feasibility analysis
- 5.2. Statement of Requirements
  - 5.2.1. Program objectives
  - 5.2.2. Requirements Definition
  - 5.2.3. Objectives incorporated into requirements
- 5.3. Feasibility Stage
  - 5.3.1. Economic
    - 5.3.1.1. Estimation of Project Costs
    - 5.3.1.2. Funding availability
  - 5.3.2. Technical
    - 5.3.2.1. Strategy design
  - 5.3.3. Environmental & other Legislation
  - 5.3.4. Social and Political

- 5.4. Approval in Principle
  - 5.4.1. Analysis presented to appropriate authorities
  - 5.4.2. Proper sign-offs
  - 5.4.3. Involvement of Central Agencies
    - 5.4.3.1. Cost limitations
    - 5.4.3.2. Other constraints

6. Specifications Definition and Project Planning

- 6.1. Statement of Work
  - 6.1.1. Options Analysis
    - 6.1.1.1. Historical information
    - 6.1.1.2. New process or alternatives
  - 6.1.2. Possible Constraints
    - 6.1.2.1. Resources
      - 6.1.2.1.1. Budget
      - 6.1.2.1.2. Staffing
      - 6.1.2.1.3. Schedule
    - 6.1.2.2. Social & Political
    - 6.1.2.3. Legal
    - 6.1.2.4. Environmental
  - 6.1.3. Risk profiles
    - 6.1.3.1. Assumptions
  - 6.1.4. Financial Analysis
- 6.2. Specifications Definition
  - 6.2.1. Determination of Project Ownership
  - 6.2.2. Budget Setting
    - 6.2.2.1. Facility Standards
    - 6.2.2.2. Methodologies (Unit Rates, per diems, etc)
    - 6.2.2.3. Performance measurement baselines
    - 6.2.2.4. Approaches
      - 6.2.2.4.1. EVM
      - 6.2.2.4.2. S Curve
    - 6.2.2.5. Cost Estimation and Revision
    - 6.2.2.6. Start and End Dates
    - 6.2.2.7. Payment dates
    - 6.2.2.8. Reporting Requirements
    - 6.2.2.9. Other
  - 6.2.3. Scheduling
    - 6.2.3.1. Production, etc.
    - 6.2.3.2. Fast tracking
  - 6.2.4. Approval Process
    - 6.2.4.1. Major Capital
    - 6.2.4.2. Minor Capital
    - 6.2.4.3. Emergent Capital
  - 6.2.5. Project Classification
- 6.3. Milestone Schedules
  - 6.3.1. Tracking
    - 6.3.1.1. Timely completion
    - 6.3.1.2. Timely tracking
  - 6.3.2. Events
    - 6.3.2.1. Start and end dates
    - 6.3.2.2. Payment dates
    - 6.3.2.3. Reporting requirements
    - 6.3.2.4. Deviations
    - 6.3.2.5. Other

7. Engineering and Design

- 7.1. Preliminary Concept Design
  - 7.1.1. Development
    - 7.1.1.1. Studies Conducted
    - 7.1.1.2. Consideration of Life-cycle costs
    - 7.1.1.3. Consideration of requirements and future requirements
  - 7.1.2. Evaluation
    - 7.1.2.1. Provincial and Local objectives
    - 7.1.2.2. Planning requirements
  - 7.1.3. Review (Regulations, licensing, Safety, other standards)
  - 7.1.4. Project Brief
    - 7.1.4.1. TB requirements
  - 7.1.5. Approvals
    - 7.1.5.1. Regulatory approval
    - 7.1.5.2. Planning and scheduling requirements
    - 7.1.5.3. Concept submission
- 7.2. Detailed Design
  - 7.2.1. Development
  - 7.2.2. Evaluation
    - 7.2.2.1. Acceptable alternatives
  - 7.2.3. Review
  - 7.2.4. Cost Management
    - 7.2.4.1. Value Analysis and EVM
    - 7.2.4.2. Design reflective of objectives costs and constraints
  - 7.2.5. Completion of drawings
  - 7.2.6. Project Brief
  - 7.2.7. Master Schedule
  - 7.2.8. Pre-tender Estimate
  - 7.2.9. Protocol and mechanism for changes

8. Procurement and Construction

- 8.1. Contracting design and construction services
  - 8.1.1. Options analysis
    - 8.1.1.1. Outsourcing, In-house and PPP
  - 8.1.2. Procurement Strategy
    - 8.1.2.1. Competitive vs Non-competitive
    - 8.1.2.2. Resources
    - 8.1.2.3. Available contractors
    - 8.1.2.4. Industrial Benefits
    - 8.1.2.5. Request for Proposal
- 8.2. Property, materials and equipment required
- 8.3. Assessment of Cost vs Quality
- 8.4. Construction agreement
  - 8.4.1. Prepared
  - 8.4.2. Reviewed
  - 8.4.3. Content formalized
    - 8.4.3.1. Shop and other drawings
    - 8.4.3.2. Key project dates
    - 8.4.3.3. Testing procedures
    - 8.4.3.4. Content and production of progress reports
    - 8.4.3.5. Delivery procedures
- 8.5. Contract Management
  - 8.5.1. Financial management, supervision and inspection
  - 8.5.2. Protocol for changes required
  - 8.5.3. Contingency planning

9. Delivery

- 9.1. Formal Process
  - 9.1.1. Testing
  - 9.1.2. Compliance
- 9.2. Protocol for unsatisfactory delivery
- 9.3. Project Closure and delivery

10. Follow-up

- 10.1. Information Consolidation
  - 10.1.1. Information gathering
  - 10.1.2. Project assessment
    - 10.1.2.1. Actual vs Budget
    - 10.1.2.2. Physical Project Plan vs Actual
- 10.2. Key Players
  - 10.2.1. Debriefing session
    - 10.2.1.1. Consolidation of Issues
  - 10.2.2. Lessons Learned
  - 10.2.3. Policies Revised
    - 10.2.3.1. Integrated in long-term planning

Appendix F:

Application of Recommendations for Health Project

APPENDIX F: APPLICATION OF RECOMMENDATIONS FOR HEALTH PROJECTS

Introduction

As noted elsewhere in this report, many of the problems experienced in the capital planning process apply to most ministries and Crown corporations. But the Ministry of Health projects can take years from conception to completion. This lengthy timeline has contributed to numerous problems including additional cost and ultimately to an impairment in the delivery of programs and service.

The recommendations included in this report attempt to improve the process for all areas of the Government, including Health. Our Guiding Principles outline this objective. Specifically the principles directly applicable to health projects include: bringing structure, discipline and understanding to the process; clarifying the roles and responsibilities of the participants in the process; increasing the rigour in the earliest phase of the process; and the recommended use of business cases in the process.

As an example of the application of the recommendations to the management process, the following paragraphs are illustrative of the potential implications for health in the more difficult areas of governance, justification and approval. We also comment on the linkage of our recommendations to some of the Ministry's own initiatives.

Governance

To address the issue of poorly defined roles and responsibilities, we have recommended that the current roles be carefully reviewed, redefined and communicated to all participants. Understanding and acceptance of these roles by all participants is an important factor for success.

The Capital Division would become involved in the planning process earlier, perhaps at the business case development stage. Capital Division would also ensure that follows-ups are completed to determine whether and how projects met their objectives. In this way there would be less need or inclination for Capital Division to delve into the implementation stages of the project.

By giving Capital Division a stronger central role to oversee projects and yet reduce their role in implementation, the process should be streamlined. Capital Division would therefore adopt the so-called "hands-around" concept, wherein their greatest direct involvement would be at the front-end and back-end of projects. They would oversee the implementation of projects through improved reporting and the right to review or investigate any capital project at any time.

The recommendations regarding reporting should strengthen Capital Divisions' oversight role for projects. Likewise the judicious use of the right to review any project (for example if the project appears to be running over budget or behind schedule) should give the Capital Division the comfort it needs to take a more "hands-off" approach through the implementation stages.

Project Justification, Selection and Approval

This part of the planning process necessitates an adequate identification of existing capital assets and their current condition. In the past this has not been possible within the health care area because of the lack of sufficient or reliable data. The Ministry of Health, with the development of the Health Capital Assessment and Planning System, is currently addressing this matter. This new system should aid the Ministry in determining more precisely the current condition of physical assets and compare it to present requirements and future service needs.

The Ministry must determine its immediate and long-term goals and objectives relative to capital spending and the identified capital need. These should be communicated to the agency planners along with guidelines for completing the various planning documents. The agencies should then develop their business cases for capital projects. We have recommended the use of a standard business case method and some rational method of ranking that would facilitate the justification and selection process.

We have also recommended the use, where possible, of standard costs and measures in the development of the business cases. These should be developed and agreed to by the key players including both the health care planning professionals and Capital Division. This will accelerate the approval process.

Finally, while the planning process is generally a linear one, there may be opportunities to perform some tasks on a concurrent rather than sequential basis. Wherever this is possible, time savings may occur. A clear process with well laid-out standards, expectations and procedures allows managers to progress in parallel rather than an uncertain process where approval is sought before going to the next unclear steps.

Linkage to Current Ministry of Health Initiatives

Some of the issues we identified were to be addressed in the Ministry of Health "Capital Plan Requirements" issued in January 2000. This document and the attached letter of February 1, 2000 to Health Authorities from the Ministry recognize the need for adequate physical asset inventories and begin the process to capture this information. These documents also detail the process for developing "project studies". It consists of two parts: the first is a needs justification, and the second is a definition of the project specifics. This model is similar to that recommended in our report. The new Health model also provides for Ministry cost sharing with other health agencies.

These new documents also communicate the Ministry's intention to fund capital improvement projects (those projects which increase the life of existing assets or make their operation more efficient or safe) by way of an allocation model. This step should improve the overall timeliness of projects.

The January 2000 document provides guidelines for completing the required planning documents by the agencies.

Finally, these new documents encourage the community health councils and services societies to work together to submit combined capital plans. The document states that this will become a requirement in the future. This should aid in streamlining the process, as the multiplicity of agencies currently slows the process. Any steps that reduce the number of parties in the process, without ignoring the vested interests of the various stakeholders, will expedite the process and result in cost savings and in faster service delivery.