# DEVELOPING A VA/VE POLICY FOR BRITISH COLUMBIA

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## Abstract

Subsequent to the paper *The State of Value Analysis / Value Engineering in B.C.* (McConachy & Baker, SAVE' 97), one Ministry in the province of British Columbia developed a VA / VE policy which applies the two-step process advocated in that paper as well as a variable level of effort for a VA or VE exercise that includes not performing a study if the expected benefit is insufficient. The Province's Treasury Board has adopted a similar policy that incorporates the two-stage process of VA in the early phase of project development followed by VE in a later phase. The Ministry policy includes a numeric scoring system to guide the selection of the appropriate level of effort. There is provision for auditing these Decision Guides.

## Background

As set out in Reference 1, we call the process "value analysis" when it is applied to analyzing program or project planning at early development stages when there typically has been sufficient planning and design input to have identified a preliminary scope, but before the detail design has commenced. That is, the VA process is an opportunity to analyze and modify the scope or content of the project ("the what").

The process we call "Value Engineering" (VE) uses the same disciplined, systematic set of techniques that isolate primary and secondary functions and is carried out on detailed design and engineering issues - i.e. the VE process is an opportunity to analyze and modify systems, components and materials ("the how").

There are two VA / VE processes currently used in B.C. - the Society of American Value Engineers (SAVE) process which they call Value Engineering and the Quantity Surveyor Society of B.C. (QSSBC) process which they call Value Analysis.

The SAVE process generally involves the utilization of a peer review team to critique an existing design. Peer reviewers are persons of equivalent expertise with no prior involvement in the project. Contrary to SAVE's independent peer review approach, the QSSBC approach only works with the project design team.

## Contacts with Other Transportation Agencies

Discussions at SAVE'97 identified the transportation agencies in North America which were on the leading edge in developing appropriate processes. These agencies were surveyed and played a major role in the development of the policy for B.C.

Although the responses from the states of Washington, Virginia and Arizona varied considerably, they had a consistent theme - in order to obtain best value from the process, it is necessary to use some judgment about which projects are selected for analysis and to set the level of effort consistent with the expected benefit.

The development of our recommended model was significantly influenced by the recent work done by WashDoT who subjected their VE process to a VE review. We recommended their three "windows of opportunity" and their general approach of tailoring effort to specific project circumstances.

## A VA/VE Model for the Ministry

### General

In selecting a VA/VE process for the Ministry, we have been guided by the same "value for money" principle that is the cornerstone of the discipline of value analysis. We desire a range of processes where the level of effort reflects the potential for enhancing value. If there is no likelihood of changing the scope and cost of a project, then resources should not wasted on a VA/VE study.

The $5 million limit established by Treasury Board triggers the requirement for a formal process and submission. VA/VE processes are applicable and potentially beneficial to projects with total capital costs less than this threshold and the Policy and Guideline reflect this principle. The Business Cases developed to advance projects through the approval process must include a recommendation on the degree of VA/VE to be applied.

This policy and guideline is intended to assist project managers in obtaining the benefits of applying the VA/VE process; it is not a "cookbook" approach and does not override sound judgement based on the characteristics of any specific project.

Recommended Model

Numerous processes were compared for the best value and fit for our local circumstances. A hybrid of what we considered best features was proposed as the policy.

| Item/ Organization | SAVE International | OSSBC | WASHDoT | Virginia/ Arizona | Recommended For Ministry |
|---|---|---|---|---|---|
| Timing of Sessions | #1 @ 15%, #2 @ 65% of detailed design (DD) or, 1 only @ 25% of DD If extremely large: 1@ conceptual stage or 1 @ preliminary stage | #1 @ facilities program, #2 prior start working drawings, #3 working drawings / CNSTN documents – Contract | #1 @ concept stage #2 @ schematic stage #3 @ 30% development stage | #1 @ 20% complete #2 @ 55-60% complete (Virginia) | #1 @ conceptual #2 PJVA at preliminary #3 @ 25% detail |
| Level of Effort | Function of complexity and timing for average complexity, 5-6 members | Not addressed | Variable | Variable | Variable per decision chart |
| Workshop Duration | 3-5 days consecutive | Not addressed | 3-5 days | Arizona: >$100M - 5 days $20-40M - 4 days >$55M - 3 days Simple - 2 days | 2-5 days |
| Team Composition | Team of peers – one per discipline plus VE facilitator | Design team plus VA consultant | 5-8 internal w/ some VE training | | Mix of internal and external peers, rep(s) from design team (minority) |
| Facilitator Qualifications | Certified by SAVE | Experienced PQS | Internal know both design and VA | Staff of CVS's (Virginia) | Experienced consultant |

Our model for the timing of VA/VE sessions in transportation projects, shown diagrammatically in Figure 1, shows a four-phase project life cycle diagram with a different type of value review in each phase. The potential review points are:

- program value analysis (PGVA) in the System Planning phase
- project value analysis (PJVA) in the Project Planning & Evaluation phase
- project value engineering (PJVE) in the Project Design & Engineering phase
- value engineering proposals (VEP) in the Property Acquisition & Construction phase

We recommended a 3-stage approach that included PGVA, PJVA and PJVE but Treasury Board did not consider PGVA within the bounds of their mandate and the Ministry Project Management Committee that sponsored development of the policy deferred PGVA to their Planning Committee. As the requirements for Program VA were not incorporated into the policy, they will not be discussed further in this paper.

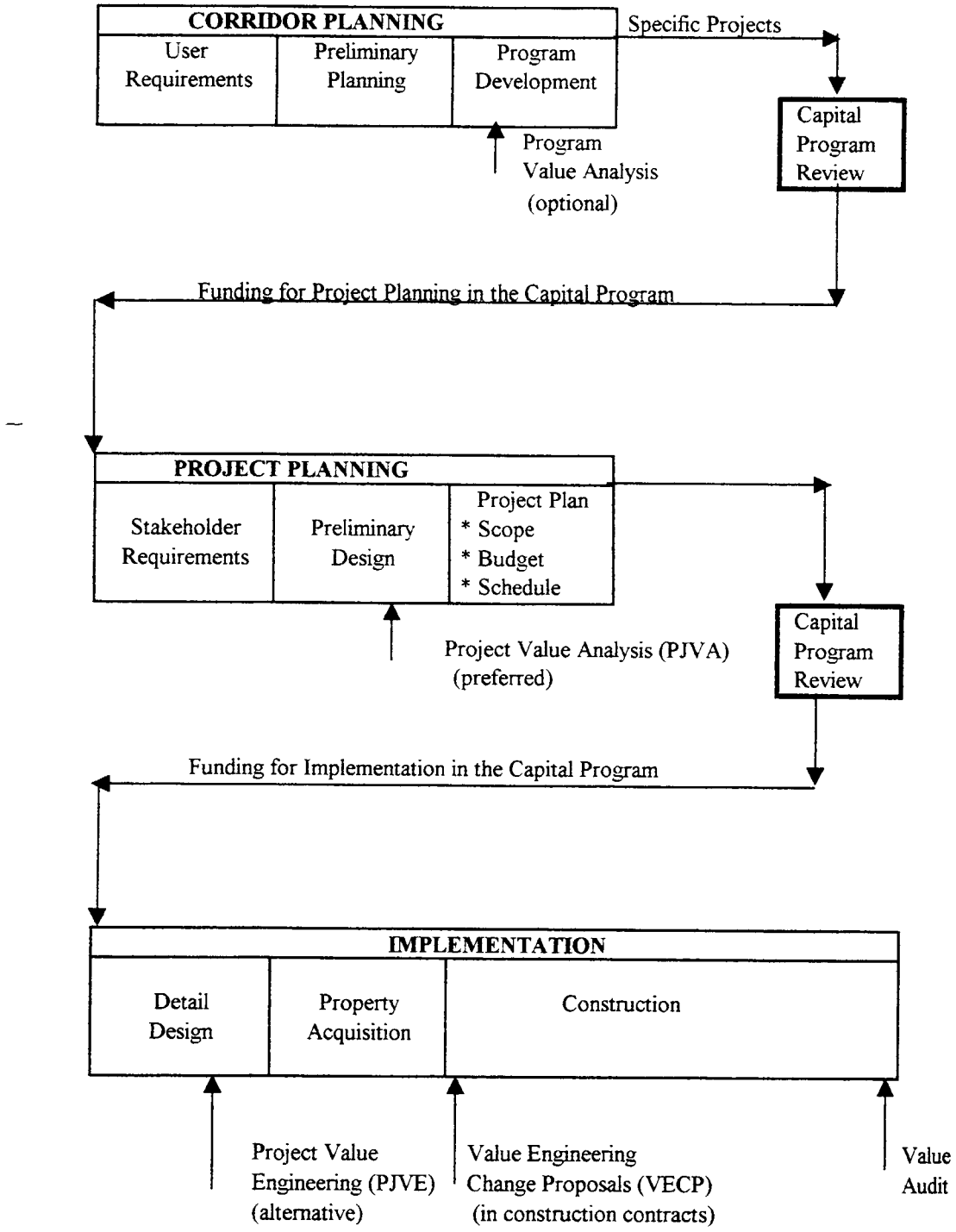


**Figure 1 - Model for Review of Value**

Rather than constituting the review team completely with external peers as with the SAVE process or only with the project design team as with the QSSBC process, we have compromised on a mix of Ministry expertise, outside expertise and representative(s) of the design team. On the basis of the session timing and team composition described above, a range of processes for the three sessions was developed as set out below.

Range of Project VA and VE Processes

| Process | Description |
|---|---|
| PJV1 | A VE team of facilitator and several specialized experts for 3 - 5 days * (The SAVE peer review process) |
| PJV2 | An experienced VA facilitator and a "standard" review team for 4-5 days* |
| PJV3 | An experienced VA facilitator and a "standard" review team for 2-3 days* |
| PJV4 | An experienced VA facilitator with a reduced review team for 1 - 2 days * |

## Qualifications and Selection of VA and VE Teams

Qualifications for Facilitators

Currently in B.C., there is no single qualification or certification process for VA and VE facilitators. The need for a solid grounding in objectively assessing cost and value has led to the majority of VA facilitators currently providing services in B.C. coming from a quantity surveying background in the buildings sector of the construction industry.. Although QSSBC is currently preparing guidelines for accreditation of VA facilitators, they do not certify members for VA facilitation capabilities at this time. Experience and references from satisfied clients have provided the major qualification of this source of facilitators.

In the project value engineering stage of a project, the need for facilitation skills and an objective cost estimating background remains a key requirement. Typically engineers with specialized training have had more involvement in facilitating VE processes. The Society of American Value Engineers (SAVE) has two levels of certification - the Certified Value Specialist (CVS) and the Value Management Practitioner (VMP).

Given our multi-level approach with both VA and VE exercises and the range of processes for each, it is expected that Ministry would be able to draw from both sources of facilitation expertise.

Participation of Design Team

Based on the QSSBC approach in the B.C. government buildings sector and the current practices in Washington and Arizona states, we recommend that representative(s) of the design team be included on the review team to provide the historical perspective and prevent the review from following any "dead ends". The design team should provide at least one member (Arizona invites a representative; Washington requires one). Members of the design team must not comprise the majority of the review team.

Source of Review Team Members

To obtain maximum value for the VA/VE processes, we recommended considerable use of Ministry staff on review teams. Note that suitable Ministry candidates should not have had prior involvement in the project to be reviewed. VA/VE exercises have significant training benefits and the opportunities to participate should be spread more or less equally throughout the Ministry.

Our experience is that not all the positions on a review team can, or should, be filled with Ministry staff. Teams should be more-or-less equally split between Ministry personnel and candidates from local consultants. The standard review team assumes this split and the costs of the various processes have been estimated on this basis.

## A VA/VE Policy for the Ministry

Statement of Policy

Every project with total capital costs in excess of the amount set by Treasury Board (currently $5 million) shall be subjected to a value analysis / value engineering process at an appropriate level of effort. This guideline shall be used to assist project managers in determining that level.

The guideline is provided for the benefit of Ministry Project Managers who are required by the VA/VE policy to determine the appropriate level of effort, initiate the selection of a VA/VE consultant and oversee implementation of any recommendations accepted by the project team. A VA/VE study is not complete until any changes to the project scope, schedule and budget have been approved.

Treasury Board has accepted the variable level of effort approach partially on the basis that there will be an auditable process trail. If their confidence is lost, the requirement for VE could become a fixed level of effort for every project - regardless of complexity. The project manager shall complete the selection chart and make appropriate notations justifying the process selection. Since the selection process is subject to management audit, maintenance of accurate records is imperative. In the event the project manager decides, on the basis of the guideline, that no VA/VE process is justified, the project sponsor shall countersign the decision chart.

## Guidelines for Level of Effort

The project is best rated as a whole for project VA. The factors to be evaluated are : capital cost, complexity, stage of design, schedule urgency and previous studies of options considered. A sample Decision Guide PJVE (without scoring) is attached as Figure 2.

For Project VE, the project can be broken into components to focus the effort on those areas most likely to see benefits. For example, if the contract contains both roadworks and structures, separate ratings can be done on the two components. A structure could be divided into the superstructure and the substructure and the result could be that VE is only justified on one component.

### Validation of Project VA/VE Guideline

After the policy was in final draft, the processes were tested on one VE and one VA exercise. Adjustments were made before the policy was adopted.

Two projects were reviewed and an independent opinion obtained for the appropriate VA/VE level of effort. The Decision Guides indicated processes that were consistent with those recommended by the independent assessment. The participants in the first VA study were interviewed and generally agreed that the level of effort was adequate although a number of improvements were suggested and many adopted. On this basis, the Decision Guides were considered to be validated.

### Closure

The Ministry has now adopted a VA / VE policy which incorporates a two-step process as well as a variable level of effort for a VA or VE exercise.

### References

1. *The State of Value Analysis / Value Engineering in B.C.* , McConachy and Baker, Proceedings of SAVE 1997 Annual Conference

| Decision Factor | For each factor, circle one number in each row. | | |
|---|---|---|---|
| Prior Value Review Processes | Both PGVA and PJVA # | PJVA Completed # | None # |
| Capital Cost of Component | < $2M # | $2M - $5M # | > $5M # |
| Type of Component | Roadworks # | Simple Structures # | Complex Structures # |
| Stage of Design | Detailed Completed # | Detailed less than 50% # | Preliminary Complete # |
| Studies available Indicating number of Options Investigated | Considerable # | Some # | None # |
| Schedule Urgency | High # | Moderate # | Low # |
| Score per Column | | | |
| Total Score = Sum of the Three Column Scores | | | |

| Total Score | Process | Description |
|---|---|---|
| 25 – 35 | PJV1 | A VE team of facilitator and several specialized experts for 3 - 5 days. |
| 20 – 30 | PJV2 | An experienced facilitator with a "standard review team for 4 - 5 days. |
| 15 – 25 | PJV3 | An experienced facilitator with a "standard" review team for 2 - 3 days. |
| 10 – 20 | PJV4 | An experienced facilitator with a reduced review team for 1 - 2 days. |
| 0 –15 | - | No review is justified |

**Figure 2**