

Solving Problems with the West Block Tunnel, Parliament Hill during Construction

CSVA Conference

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Steve Taylor CVS-Life

Topic Overview

- *Focus of this presentation is to explain the 2014 effort to market VE to the Canadian Federal Government following the lead of the US in mandating its use.*
- *Based on the confidential nature of the topic, project and location no details will be provided on the actual project.*
- *The presentation will focus on how the timing of the project coincided with the marketing effort being undertaken in parallel.*



Background



- 2013 and 2014 CSVA Strategic Planning Meetings
- Objective to research, Lobby and Market to Canadian Government
- Build on US Circular 131



- OMB first outlined principles of value engineering in a 1988 circular that was updated in 1993.
- Defense's reported cumulative savings of more than \$10 billion in fiscal 2011 and fiscal 2012
- OMB first such update in two decades instructs agency managers to adopt "value engineering" to boost innovation and achieve savings.
- In a revision of OMB Circular A-131 published Dec. 26 2013 tasks agencies with applying value engineering to programs costing more than \$5 million
- It requires the naming an official to be accountable for embracing the concept.

Sequence of Steps



- Presentation to Pierre Poilievre, MP Nepean-Carleton
- Contact Minister Hon Diane Finley, Minister of Public Works and Government Services Canada
- Presentation to Treasury Board

Improvements Parliamentary Precinct



The Hill







2014 VE to aid delivery of West Block Improvements

- *VE Study Public Works and Government Services Canada (PWGSC) and PCL Constructors Canada Inc.(PCL)*
- *Project - West Block Southwest Service Tunnel project.*
- *This project is delivering a 60 m link to connect mechanical and IT building services that will connect from the Kent Wellington tunnel (under Wellington Street) to the rehabilitated West Block building*
- *Southwest corner of the West Block building.*

West Block Mechanical Services

- *Mechanical steam and chilled water for heating and cooling of the building is delivered from the Cliff Street plant through underground piping network from the west.*
- *The connection into the building will come from an underground connection from the Kent-Wellington tunnel (located 14 m below Wellington Street) to feed mechanical service connections to the new building.*
- *The baseline design provides this connection through a lateral tunnel (oriented north-south) connection into a service shaft located at the*

VE Study

- *Value Engineering (VE) Study to review the West Block Southwest Service Tunnel.*
- *This review is to allow owners, designers and independent team members an opportunity to examine the design with an objective of delivering a cost effective project to PWGSC that can meet the current Treasury Board budget.*
- *The current baseline design (May 2014) exceeds the approved budget by 76%.*

Wellington Tunnel



Study Objectives

- To provide steam and chilled water service to West Block (not specified as a tunnel)
- To be built within the EPA of June 2010 for \$7 million
- Ensure project completion by September 2016



Team

- Design Team
- Independent Team
- Contracting Team
- Estimating Team
- PWGSC Staff



West Block Site

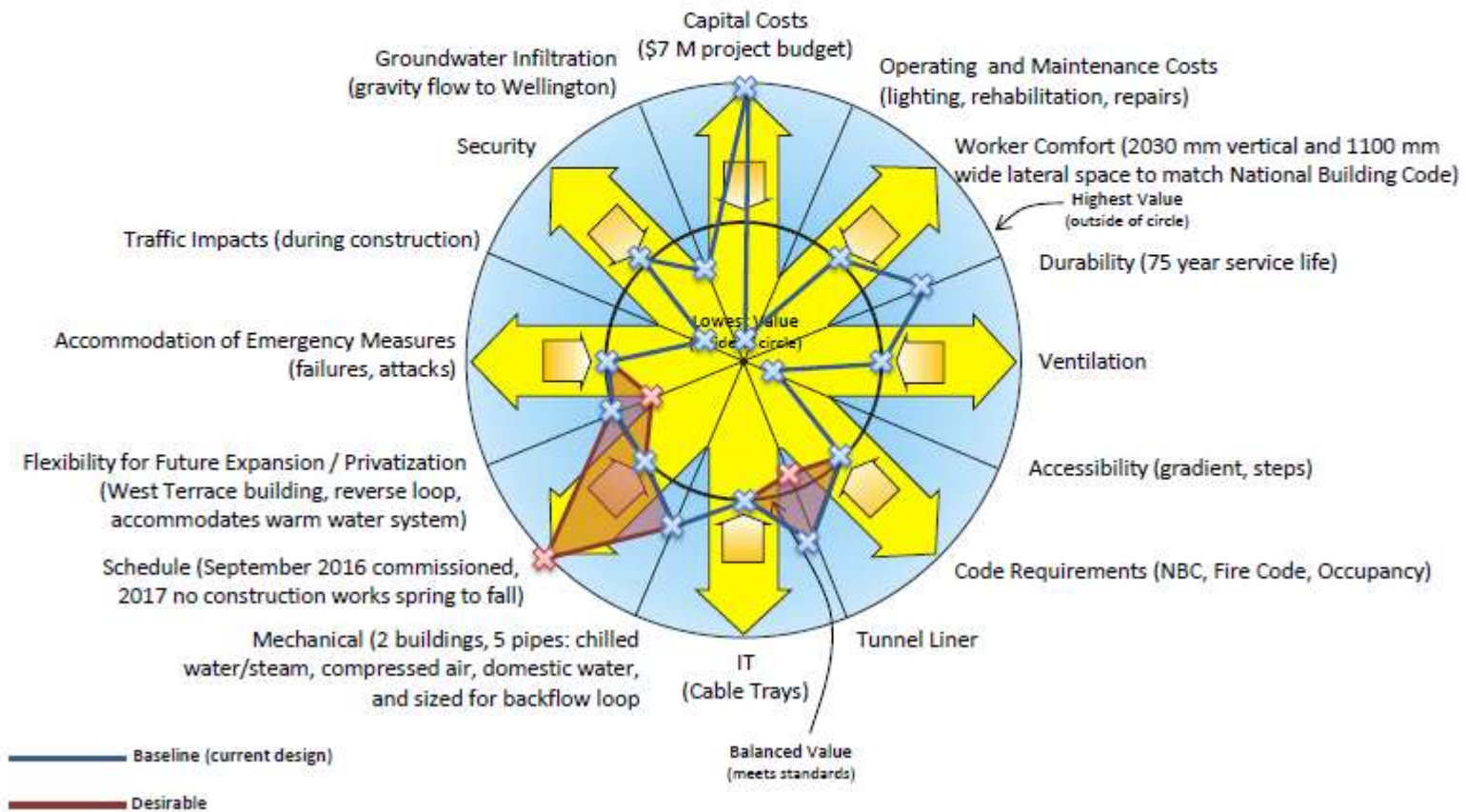


Significant Issues

- Budget established from early surface cut and cover connection concept
- Escalation was included in budget to 2012
- Production rates on tunnelling projects are low and result in high unit prices for tunnelling
- Baseline design has reviewed tunnelling concepts with full access for workers

Quality Model

Quality Model West Block Renovation Project Southwest Service Tunnel Value Engineering Study



Target Costing

Component	Cost Million (including expenses)	Worth/Target Cost
Excavation and Backfill	4.0	2.24
Demolition and Removals	0.1	0.063
Structural	2.3	1.26
Vestibule	0.0	0.014
Stairwell	0.1	0.07
Moisture	0.2	0.105
Mechanical Piping	1.6	0.91
Electrical	0.3	0.14
Contingency: design and Pricing	1.3	0.749
Contingency: Escalation	0.2	0.133
Contingency : Construction Changes	2.3	1.26
Total	12.5	7.0



Target Capital = \$4.9 m
 Target = \$2.1 m



Target Costing/Function Analysis

Component	Cost	Functions /Type	Target Cost	Alternatives...
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- Traditional Functional Analysis
- Cost based function analysis
- Focus on necessary work to be performed or delivered
- Identify trade-offs and decisions based on budgetary constraints
- What is the best project that must fit within budget

Alternative Strategies

- **1. Sub-surface Connection - XXX**
- **2. Subsurface – XXX**
- **3. Surface Connection – XXX**

Cost Based Decision-Making

Component	Strategy 1:	Strategy 2:	Strategy 3:
Rock	-2.9	-1.5	-0.9
Chamber	-0.5	-0.5	-0.5
Waterproofing	-0.5	-0.5	-0.5
Concrete Liner	-1.5	-1.5	-1.5
Worker Access	-0.275	-0.275	-0.275
Additional Piping			+0.25
Wellington Shaft	+0.7	0	0.7
Coring	+2.8	0	0
Estimate Corrections	-0.2	-0.2	-0.2
Additional Contingency Reduction	-0.9	-0.9	0
Reductions	-\$3.2	-5.4	-3.2
Total Cost	\$9.3 million	\$7.1 million	\$9.3 million

Senior Management – Decision Making

- Senior Management Review Panel attended Final Team Presentation
- 3 different bodies participating
- Acceptance of Performance = Need
- Decision made at conclusion of presentation
- Project moved forward
- No need to proceed to Treasury Board

Feedback from Design Team PM

- I was recently given a copy of your report and must admit I was impressed by the results. It will be a very useful guiding document for us moving forward and a strong scope baseline for me to reference if we start identifying any deviations.
- Overall I really enjoyed the exercise while gaining a new appreciation for the process and the possible results of proper value engineering. I look forward to future opportunities to work in this area of engineering with the hope that it is once again in combination with you and your team.

CSVA Follow up with Treasury Board

- Treasury Board was aware of the success of the project before the meeting
- Treasury Board is currently drafting policies that could include VE
- Implementation and timing uncertain

Closure



Questions



Contact Information:

Steve Taylor P.Eng, PE, CVS-Life
BTE, Ottawa Ontario