

Value Engineering in Government

Edward C. (Ted) Lane, P.Eng., AVS

2008 CSVA Conference

Creating Value



Presentation Overview

- ✓ MTO and our VE experience
- ✓ Why VE?, Why a VE Program?
- ✓ Getting started with VE
- ✓ Building your VE Program
- ✓ Success and next steps
- ✓ Getting help
- ✓ Your questions???

Value Engineering in Government

Ministry of Transportation, Ontario

- 16,500 km roads
- 2500 bridges
- Ferries
- Remote airports
- \$1.5 Billion capital program



Ministry of Transportation, Ontario

- Southern Ontario Urban Freeway



MTO's Experience with Value Engineering

Ministry of Transportation, Ontario

- Rural Ontario
Highways

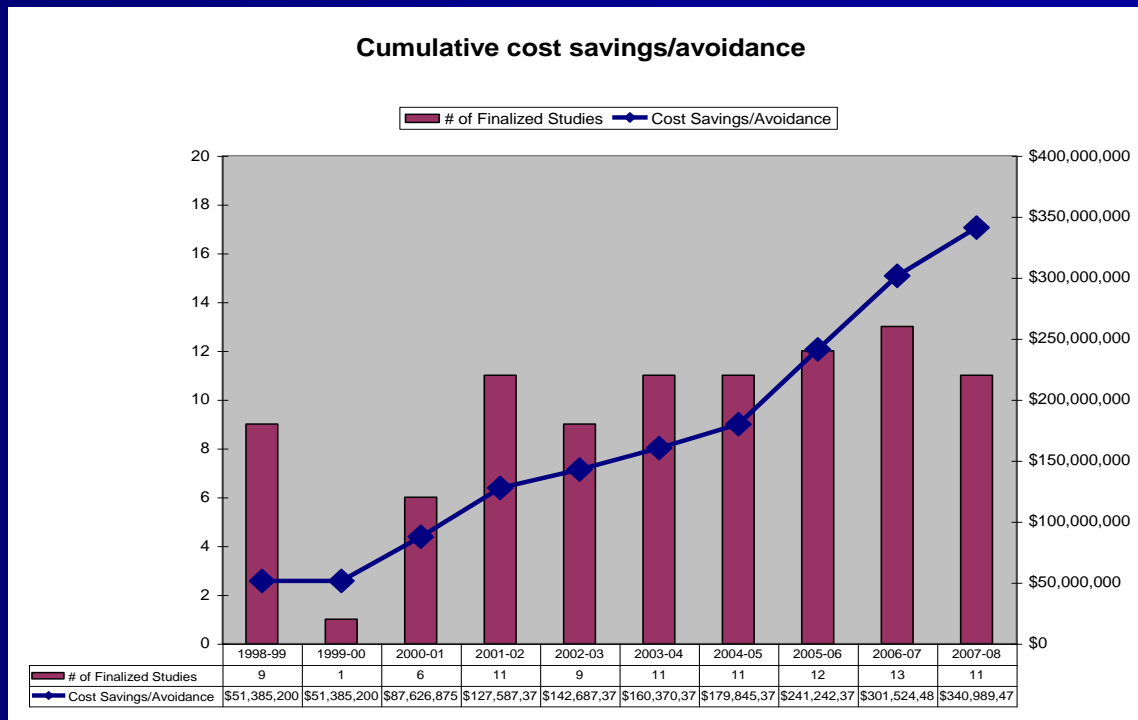


MTO's VE Experience

So Far

- VE Program in place for 10 Years

- Cumulative savings / cost avoidance > \$340 Million



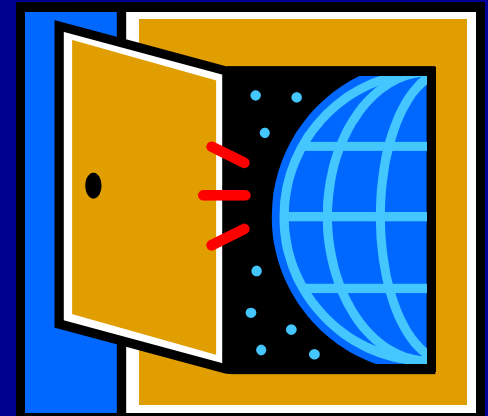
Why VE?

- Reduce project costs
- Improve project designs, function, performance & safety
- Validate planning & design decisions
- Confirm project cost estimates
- Introduce new ideas

Why a VE Program?

- Accomplish more projects for the same \$
- Ensure Organized and Systematic Application of VE
- Ensure Benefits of VE are realized
- Maximize Savings!
- Adopt VE as a Best Practice in your project management/delivery process
- Foster a Culture of Innovation

Value Engineering in Government



Getting Started with VE



Value Engineering in Government

Getting Started with VE

You will need:

- VE Program Champion – *You?*
- The Need for VE?
- Knowledge and Experience
 - Pilot VE studies
 - VE Training
 - Participation in others' studies
 - Help from the VE community
 - Expert Consultants
 - Answers to the questions:
Incl. - Why do we need VE?
- Business Case
 - How will VE be used?
 - Costs?
 - Expected Benefits? - *Examples*



Getting Started with VE

- Corporate Understanding and Executive Support for VE



Establish and sustain

Value Engineering in Government

Getting Started

Understand your Organization

- What are your Organizations values?
 - Cost?, Safety? Client satisfaction?
- What will be your Targets for VE?
 - Projects, Standards, Processes??
- Who are the Decision Makers?
 - To undertake studies?
 - To implement recommendations?
- What is your Approach to Risk?
 - Risk Tolerant or Risk Averse?
- How Flexible are you?
 - *Open to new ideas, or comfortable with established approaches?*
 - *Engineering solutions a right or wrong answer, or just one solution to a problem?*



Getting Started

Understand your Organization

MTO's context for VE

Engineering & Construction Review

- Outsourcing
 - 80% of Planning and Design
- *Total Project Management - TPM*
 - Accountability for all elements of design - *hands off*
 - Pre-qualified consultants
- Request for Proposal process for consultants – RFP
- Grow a VE capability in the province

Value Engineering in Government

Getting started

MTO's approach

Value Engineering Task Force

- Initial VE Experience Hwy 69 / 11 Expansion
- Learning from others
- Introduction to VE session
- Pilot Project and Mod 1 Training
- Help – agencies & organizations
- SAVE-International
- CSVA
- Consultant - *Robinson Stafford and Rude*

Value Engineering in Government

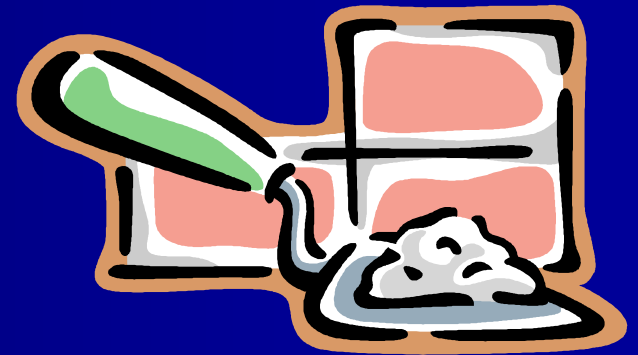
Building your VE Program



Value Engineering in Government

Elements of your VE Program

- Policies & Procedures
- Guidelines for project selection
"VE by default"
- VE Program Organization
Program Independence
- Knowledge / Expertise
- Staffing
- Funding



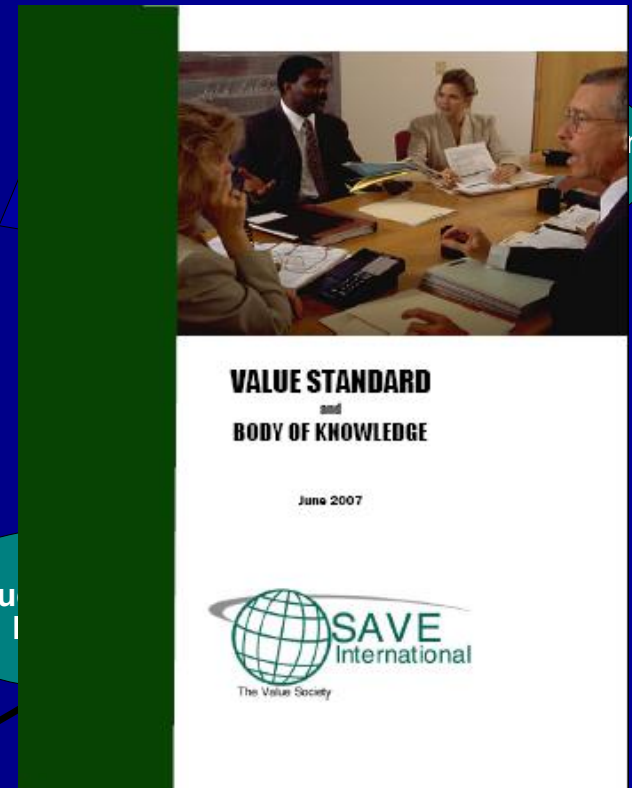
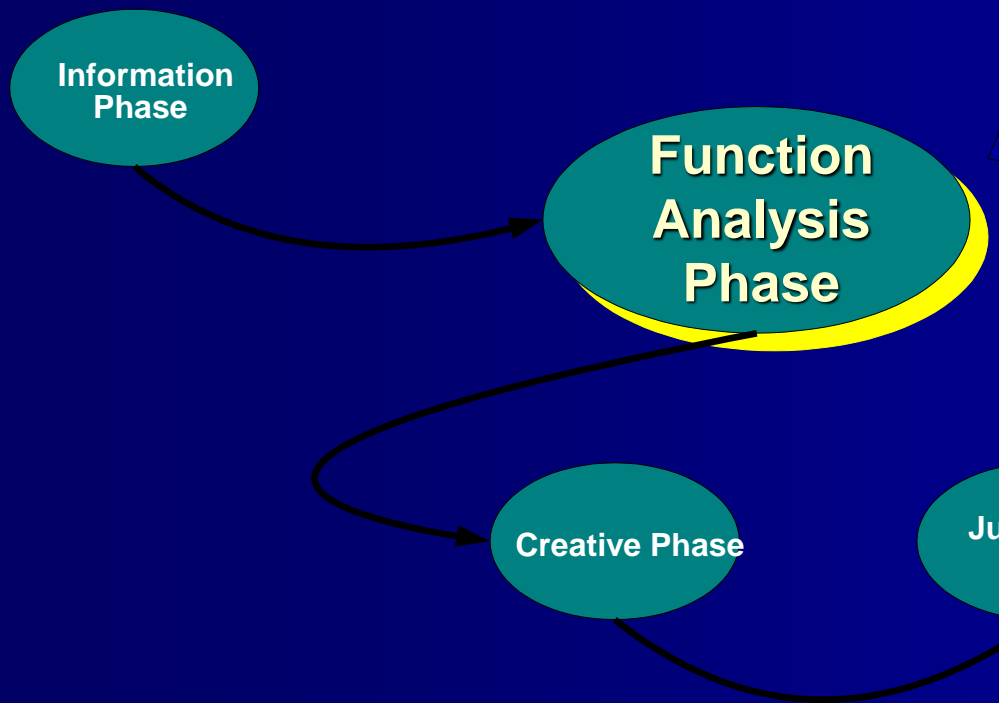
Value Engineering in Government

Tools and Procedures

- Agency Requirements for VE studies
- Expertise requirements for leaders/ team members
- Agency practices, manuals/guidelines
 - Standard job plan
 - Study documentation requirements
- Integration into your Project Management model
 - Scheduling milestones & deliverables
 - VE study identified in design consultant assignment



MTO's Workshop Job Plan

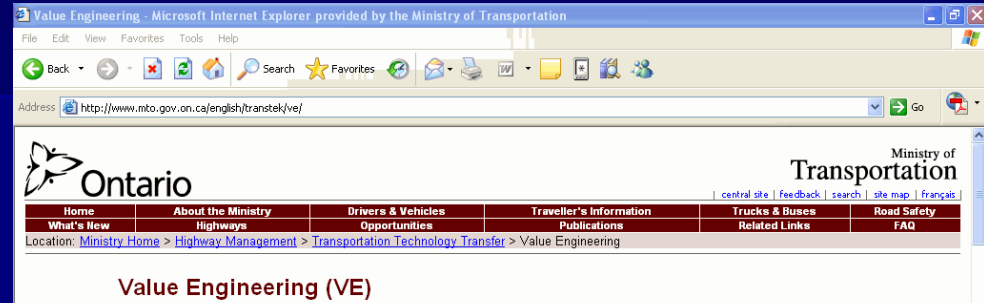


Value Engineering in Government

Tools and Procedures

*Manuals,
Software
&
Websites*

Value Engineering in Government



Tools and Procedures

Acquiring VE Services

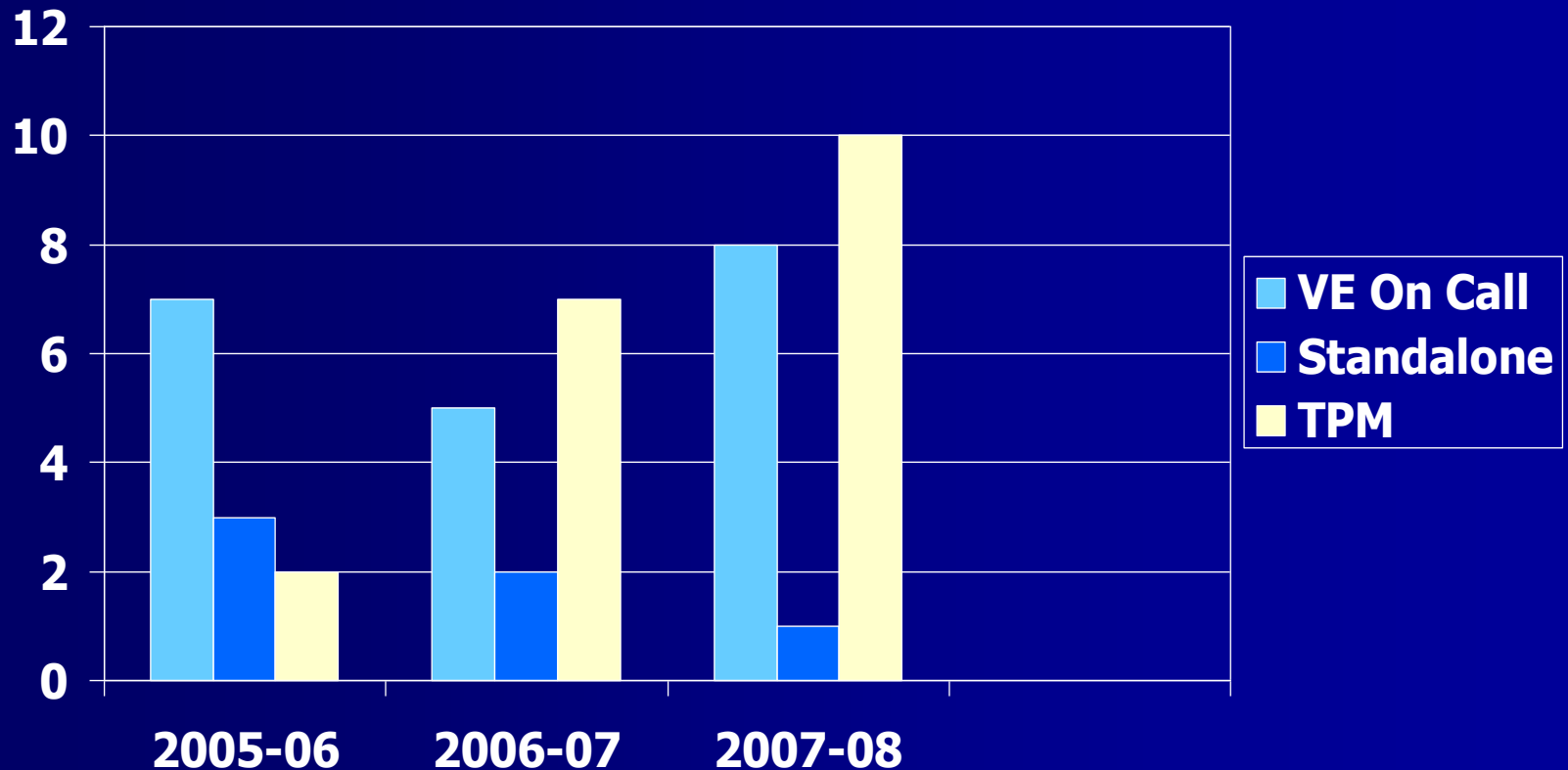
- Consultant pre-qualification
 - Hwy Engineering and VE expertise
- Outsourcing methods
 - VE within Planning & design assignments
 - Stand-alone VE assignments
 - In-house studies
 - VE services on demand



Tools and Procedures

Acquiring VE Services

MTO - VE Services Acquisition Method



Value Engineering in Government

Tools and Procedures

Acquiring VE Services

"A key ingredient to the success of the VE Program is the quality (qualifications and experience) of the team leader and specialists"

NCHRP Synthesis 232 — Value Engineering
Applications in Transportation

Tools and Procedures

Project Performance Measures

- Measure the relative performance of ideas and recommendations in satisfying the functions.

Example Performance Measure

Construction Risk	The risk that the contractor will NOT deliver the project scope as specified in the contract bid documents within the bid price and schedule.	10 - No discernible risk of, claims, change orders, and/or disputes 1 - Extreme risk of, claims, change orders, and/or disputes
--------------------------	--	--

Tools and Procedures

VE Training

- Module 1 training
 - 40 hour certificate
- Intro to VE
 - Full day / Half day
- Lunch and Learn
 - 1 hour
- *Elevator talk*
 - *1 to 5 minutes*



Value Engineering in Government

VE Program Coordination

- VE Program Coordinator
- VE Coordinators
 - 5 Regions
 - Windsor BIIG
 - Investment Strategies Branch
- VE Coordinating Committee



What and when to study?

■ MTO's VE Policy

"Value Engineering is to be applied to suitable projects to the maximum extent that time and resources will allow."

- *Flexible and non-compulsory*

Value Engineering in Government

What and when to study?

MTO's Project Selection Guidelines

- Expansion projects
- High Complexity reconstruction
- Complex staging
- Route planning
- Planning for multiple Detail Designs
- Projects over \$10 million
- Corridor studies
- Complex or sensitive EA projects

What and when to study?

Typical study timing

Class Environmental Process

TESR



Scoping

Value Planning



Technically Preferred Alternatives to Public



Preliminary Design



Constructability



Detail Design



Construction

Tools and Procedures

VE Change Proposals

□ **The Value Engineering Incentive Clause,**



□ **The Value Engineering Change Proposal**

Change Proposal after Contract Award

Success with your VE Program

- Implementation



*The operation was
a success but ...*

Value Engineering in Government

Implementation Success

- Implementation Meeting
 - Post-Workshop - 1 week to one month
 - Executive / Sr. Management presentation
 - Decision makers present
 - Allows validation & development of recommendations
 - Involvement of Design Team – Respectfully!
 - Conservative representation of savings
 - Commitment for implementation
 - Use Scenarios to aid presentation

Scenarios

- Logical combinations of recommendations
- Themed sets of rec's simplify presentation
- Combined savings & performance improvements
- Scenarios may be modified

Examples:

- Scenario 1: *Budget Solution* – Rec's for lowest overall cost
- Scenario 2: *Performance Plus* - highest performance improvement
- Scenario 3: *Go Green* - combines environmentally friendly rec's

Implementation Success - Continued

- Follow up to confirm implementation
- Accepted recommendations incorporated into project documentation
- Identify recurring recommendations for changes to standards
- Address concerns about risk

Sustaining VE in your Organization

Building demand for VE

- Ease of use
- Annual VE plan
- Training and participation
- Encourage VE through
 - Corporate Business Plans
 - Employee performance contracts
 - Program Performance measures
- Positive results
- *Build a VE culture*

Value Engineering in Government

Sustaining VE in your Organization

Program Performance Measures

Example Program Performance Measures

Program Activity	Program Results
Number of Studies	\$ Value of Projects Studied
Number of Recommendations	% of Recommendations Implemented
Number of Staff Trained	\$ Value of Recommendations Implemented
	\$ Value of Projects not Studied – <i>Lost Opportunity</i>

For more examples: <http://www.fhwa.dot.gov/ve/2007/>

Value Engineering in Government

Sustaining VE in your Organization

Program Performance Measures

FHWA VE Program - <http://www.fhwa.dot.gov/ve/>

	FY 2007	FY 2006	FY 2005	FY 2004	FY 2003
Number of VE Studies	316	251	300	324	309
Cost of VE Studies Plus Administrative Costs	\$12.54 Mil	\$8.15 Mil.	\$9.80 Mil.	\$7.67 Mil.	\$8.42 Mil
Estimated Construction Cost of Projects Studied	\$24.81 Bil	\$21.53 Bil.	\$31.58 Bil.	\$18.7 Bil.	\$20.48 Bil.
Total No. of Recommendations	2861	1924	2427	1794	1909
Total Value of Recommendations	\$4.60 Bil	\$3.06 Bil.	\$6.76 Bil.	\$3.04 Bil.	\$1.97 Bil.
No. of Approved Recommendations	1233	996	1077	793	794
Value of Approved Recommendations	\$1.97 Bil.	\$1.785 Bil.	\$3.187 Bil.	\$1.115 Bil.	\$1.110 Bil.
Return on Investment	157:1	219:1	325:1	145:1	132:1

Value Engineering in Government

What can I do?

As a project manager or team member

- Learn about VE
- Identify projects for VE
 - *Be the first to use VE in my Organization!*
- Participate positively in studies
- Be open to alternatives
- Be objective about the base case & alternatives
- Implement good recommendations into your projects
- Challenge traditional thinking:
 - *Will this always be the solution for this problem?*

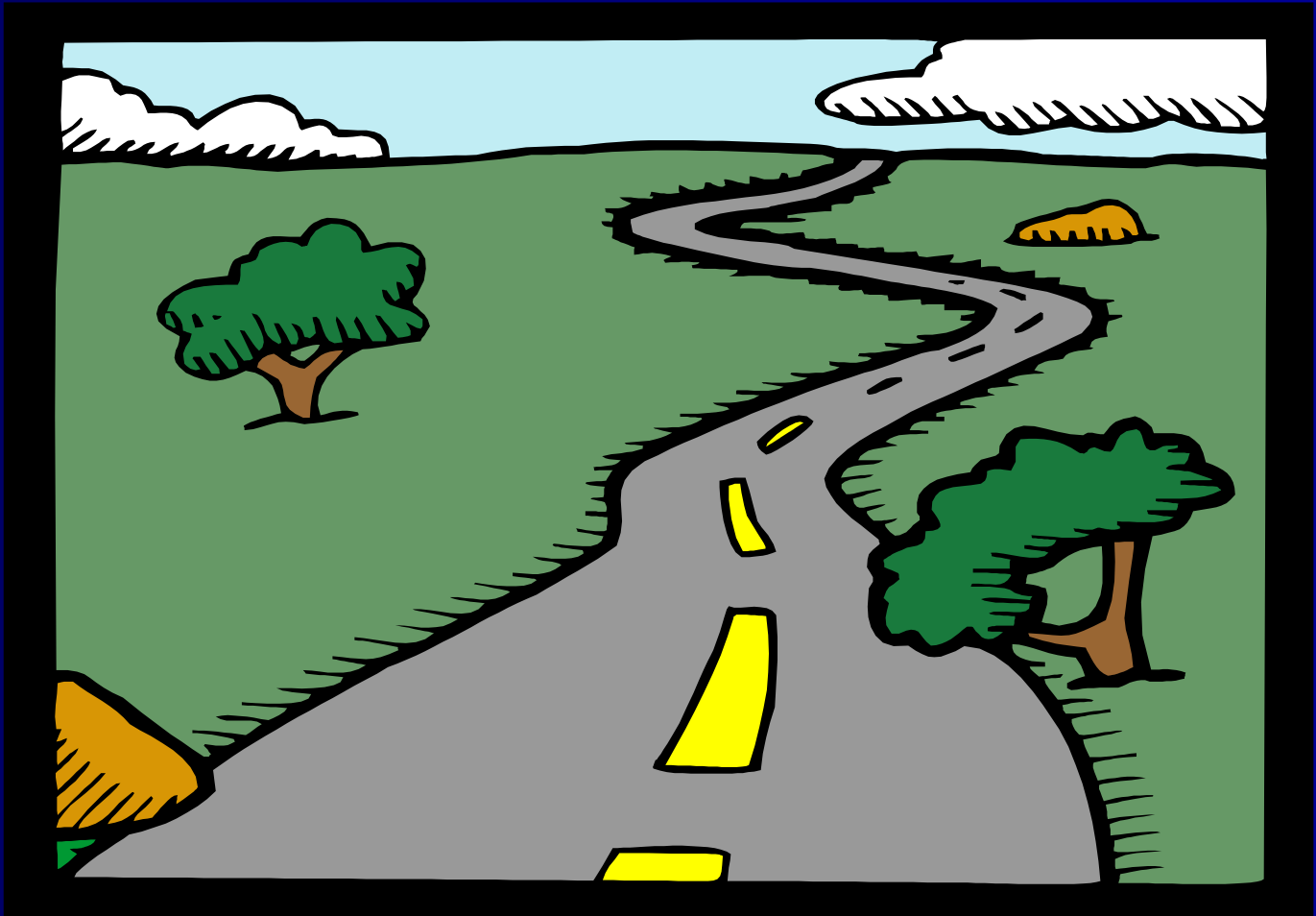
What can I do?

As a Government Manager or Executive

- All of the above, plus:
- Encourage use of VE
- Commit to VE Policy - Limit exemptions
- Visibly support VE and recognize success
- Provide resources for VE
- Understand - Successful VE does not mean bad design
- Require implementation of good recommendations
- Use VE to promote a culture of innovation
- Measure & Expect results
- Identify VE in business and performance plans
- Challenge the VE program to continuous improvement

Value Engineering in Government

Down the Road



Beyond the Basics

- Other VE Targets
- Integration of VE with other tools:
 - Risk Assessment
 - Explicit Safety Reviews
 - Context Sensitive Solutions
 - Target Costing
- Stakeholder Involvement
- Functional Performance Specification
- VE tools outside the workshop
 - Function Analysis/Fast
 - Function based Brainstorming
 - Cost Models/Pareto charts

Value Engineering in Government

MTO's Results - *so far*

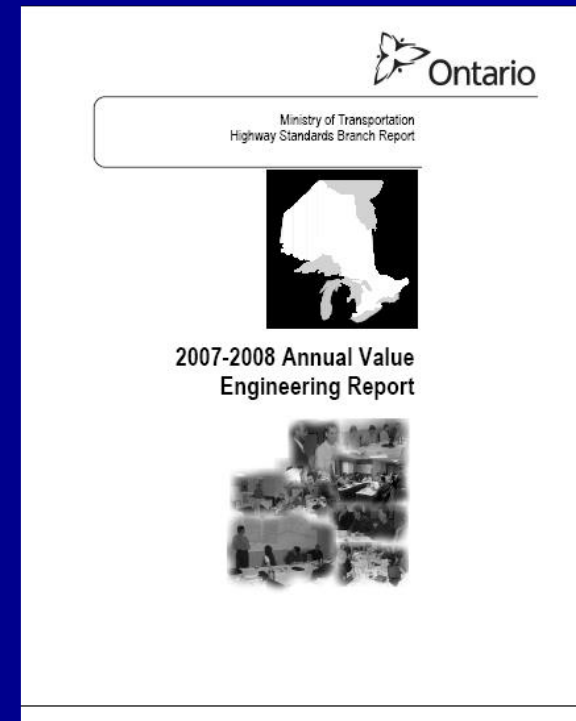
- 100+ studies completed
- > \$340 million savings/cost avoidance
- 350 staff trained in VE – Mod 1
- Value Engineering Incentive Clause in all construction contracts
- Established VE expertise in Ontario

MTO's *VE* Experience

2007/08

- 19 studies, incl. 1 business process study
- \$39.5 Million Savings / Cost Avoidance
- 32:1 ROI
- AASHTO National VE Award
Walker Road and Howard Avenue Grade Separations VE and Risk Study - Windsor

Value Engineering in Government



Success is ...

Value Improvement
through:

- Studies undertaken
&
- Recommendations
implemented



Value Engineering in Government

Where to go for help?

Canadian Society of Value Analysis

www.scav-csva.org

Save-International

www.value-eng.org

FHWA Value Engineering

<http://www.fhwa.dot.gov/ve/>

Institute of Value Management (UK)

www.ivm.org.uk

MTO's VE program

<http://www.mto.gov.on.ca/english/transtek/ve/>

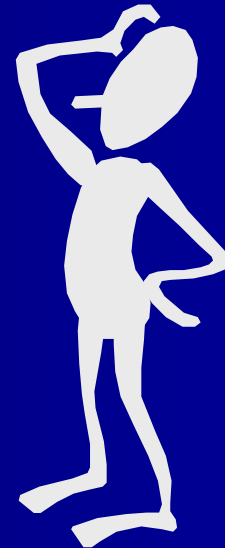
Growing VE at the Ministry of Transportation Ontario

http://value-eng.org/knowledge_bank/attachments/200421.pdf

Value Engineering in Government

Thank you!

Questions?



Value Engineering in Government