

Application of VA and Risk Analysis on Mega Projects

steVE Holmes, P.Eng, CVS



You are working on a priority
project



The project is huge

The pressure to deliver is
intense

There are no easy text book
solutions

How do you know you have
the "right" answer?

Should you challenge the
answer ?

How do you show them

there are other answers?

Presentation Overview

- MTO's VE Program
- Building on Success
- Windsor Essex Parkway
- Proof of Concept - Windsor-Essex Parkway
- Highway 407 East Extension
- Supporting Decision Making in Mega Projects
- Questions

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



Ministry of Transportation, Ontario

- Rural Ontario
Highways

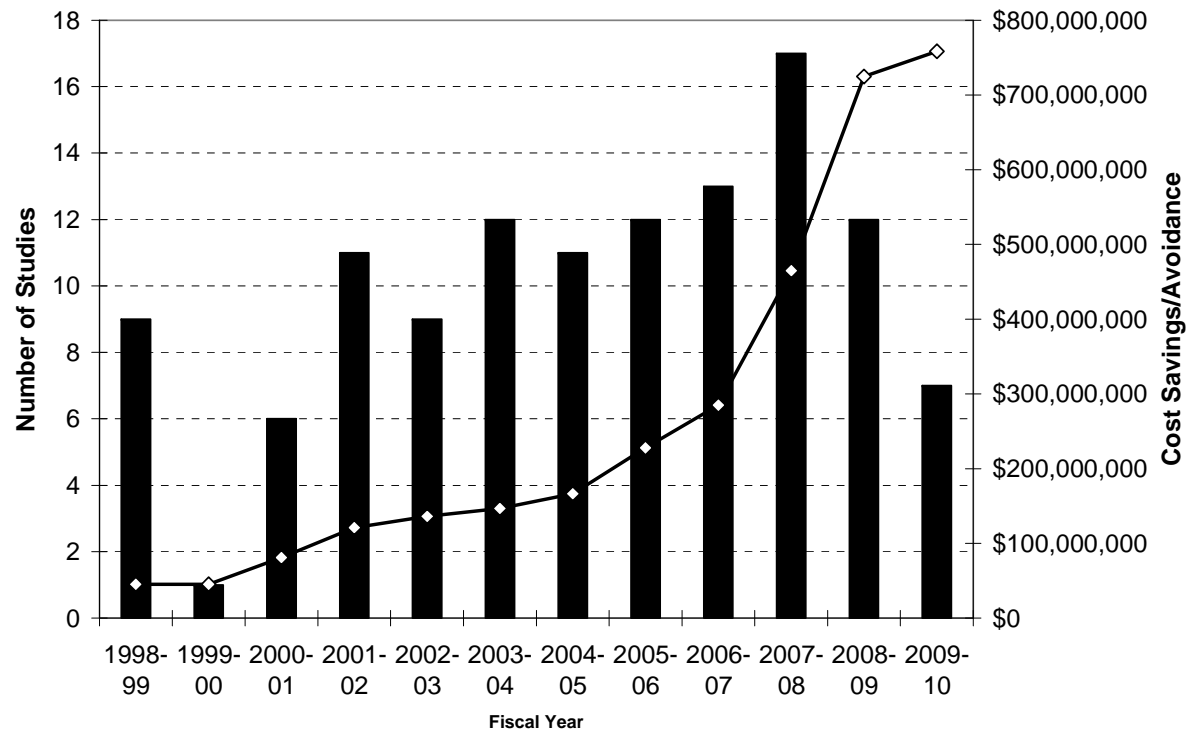


MTO's VE Experience

So Far

VE Program in place for 12 Years

Cumulative savings / cost avoidance > \$750 Million



Building On Success

- 1998 – Studies on Policies & Procedures
- 2001 – Increasing focus on preliminary design, VE policy released
- 2003 –Processes, and products
- 2005 – Use of VE/Risk Analysis Windsor-Detroit Border, Use of VE /FPS on IT projects
- 2008 – New VE policy mandating use of VE on new corridors and other major projects
- 2010 – Use of VE/FPS in organizational restructuring.

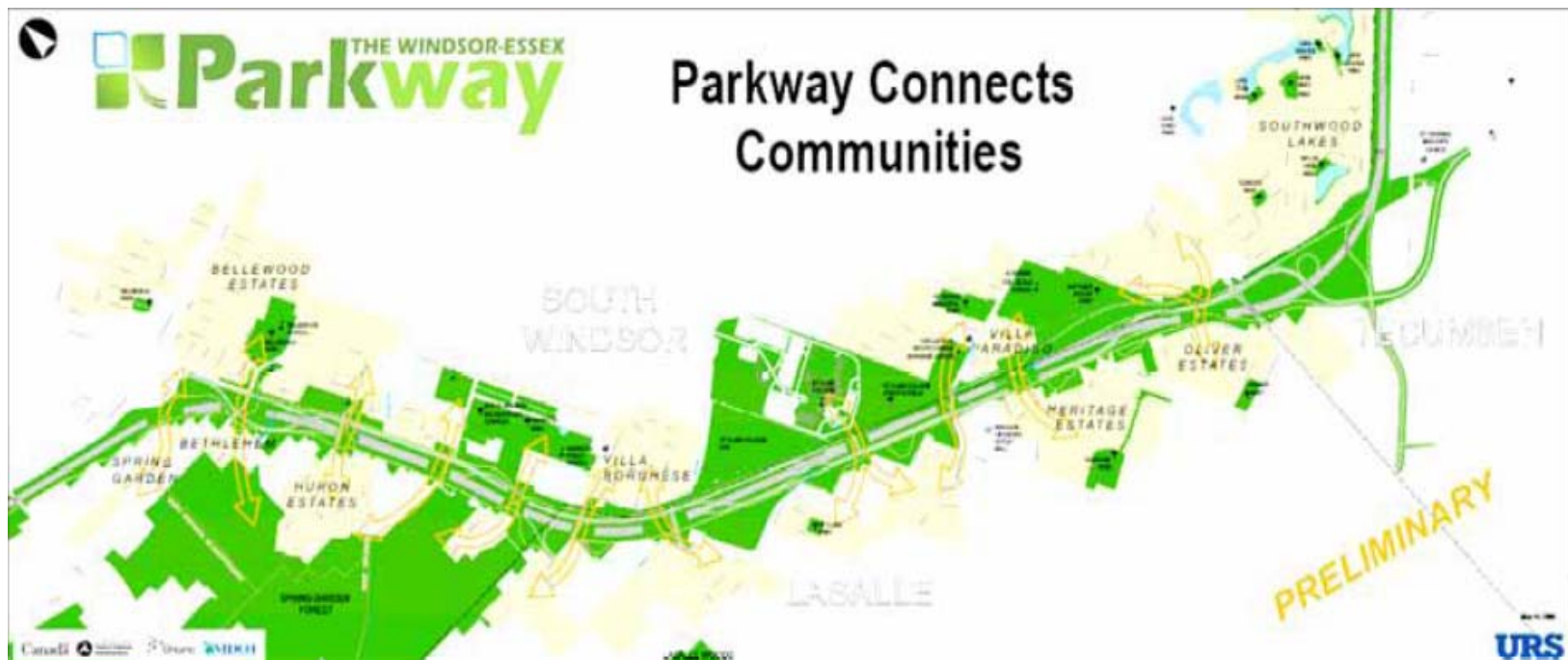
VE Studies – Mega Projects

- Mega Projects are under time constraints
- Requires confidence that results will be implemented.
- Mega projects often being delivered by Alternative Deliver (P3, DB, CMCG...)



Windsor Essex Parkway

Value Engineering and Risk Based Cost and Schedule Estimating Study (Fall 2008)



The Windsor-Essex Parkway

- End-to-end solution connecting existing terminus of Highway 401 to Border Plaza for New Crossing over Detroit River to Interstate I-75 in Michigan
- Below-grade 6-lane freeway – approximately 9 km
- 11 short tunnels providing 1.8 km of coverage over the road
- Local service roads alongside Parkway
- 240 acres of parkland
- More than 20 km of recreational trails

Value Planning – Windsor-Essex Parkway

- Value Planning/ Risk Analysis study 2006
- Study undertaken prior to submitting proposed road alignments for environmental assessment for a new facility
- 5 different highway alignments had been proposed.
- VE team challenged to determine if there was a 6th concept.

Proof of Concept through VE

- An independent VE study challenges project assumptions
- VE study documents owner's efforts to challenge the design teams solutions.
- VE team's elimination of alternatives important.

Avoid Perception of Bias

- A VE team usually identifies the best value alternative.
- Must avoid perception of bias.
- Use Function Analysis & evaluate alternatives against functions.

Windsor-Essex Preliminary Design VE/ Risk (2008)

	Team	Activities
Workshop 1 VE/Risk -5 days	2 CVS, 2 Risk Elicitators, 41 SME	Risk Register Info, FA, Creative
Workshop 2 Risk – 3 days	2 Risk Elicitor, 27 SME	Risk schedule, costs
Workshop 3 VE – 5 days	2 CVS, 2 Risk Elicitor, 31 SME	Develop, Present Model Risks

VE Study a Success because

- Pre Planning
- Risk Analysis and Function Analysis enabled team to understand risks and needs of project.
- Depth of team enabled comprehensive development of ideas, rapid acceptance.
- Previous border crossing VE studies created acceptance of the process and expectation of changes to the project. Agencies were familiar with process and participated in workshops.

Highway 407 East Extension



407 East Extension VE study

- Selected high value targets for VE study (freeway connections)
- VE Team critically reviewed basic functions and identified opportunities to facilitate project approvals and implementation
- Study resulted in change in design concept
- Achieved > \$100 M in cost avoidance



Decision Making in Mega Projects

- Opportunity to improve value in any project.
- VE effective at accelerating decision making.
- Tight workshop schedule
 - VE teams/ process synthesize info rapidly
 - Fast Turnaround & Implementation
 - Need to focus studies on key areas
- Decision makers need complex projects to be challenged to ensure good value.



Questions?

