The WSDOT Cost Estimate Validation Process®

Risk Based Estimating at WSDOT
CRA and CEVP ®

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Cost Risk and Estimating Management

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CEVP/Cost Risk Assessment – History

2002 - WSDOT begins working in earnest on a new process to better estimate costs of complex transportation projects. The process came to be known as “Cost Estimate and Validation Process, CEVP®.

2003 - First round of CEVPS conducted around the state on 12 Mega Projects.

2003 - A simpler version of cost risk evaluation was used for projects in Northwest Region, it was a one–day “due-diligence” review of smaller projects, referred to as “Schedule Cost Risk Evaluation” or “SCoRE” (SCoRE is no longer in use).

2003 - Cost Risk Assessment Workshops are used statewide on projects not large or complex enough to warrant a full CEVP.

2003 - WSDOT Cost Risk Estimating Management Office is established.

2004 - CEVPs of Major projects were updated
CEVP/Cost Risk Assessment – Today


2005 – Summer: A Policy for Cost Risk Assessment, including use of CRAs and/or CEVPs, established statewide.

2005 – Fall: A Risk Management Plan spreadsheet tool is made available on our website and provides a convenient tool for risk management planning and measuring performance of risk management efforts.

2006 – Currently: Exploring development of portfolio risk modeling tool; exploring development of risk database; exploring ways to increase the efficiency and effectiveness of CEVP®. Enjoying the 2006 TRB conference!
“Yol Bolsun”
“May there be a road!”
*Louis L’Amour - ‘The Walking Drum’

*NOTE: Yol Bolsun was a toast that meant “May there be a road” according to Louis L’Amour in his book “The Walking Drum”.
...for the price we said

and

...when we said
OUTLINE

I. Getting control of cost overruns and project delays
II. WSDOT Project Management On-Line Guide
III. Project Estimating (Cost and Schedule) – Risk Based Approach
IV. Results
V. Next Steps
Terminology

**Stochastic**, risk based, cost risk assessment, CEVP ® generally refer to the notion of probabilistic estimates that consider uncertainty and variability.

**Parametric estimating** generally refers to the use of relationships between a project’s known characteristics and known historical references for same or similar projects and project elements.

**Deterministic estimating** generally refers to “single-point” estimates that more or less directly measure the items being estimated.
Doug MacDonald’s Edict

“Project Delivery and Accountability”
(“On time… on budget!”)

The MacDonald Mantra

“What gets measured…
gets managed.”
The Questions

- How much will it cost?
- How long will it take?

The Follow-up Questions

- Why does it cost that much?
- Why does it take that long?
The Answer

An Estimate is not a number

- Projects are subject to many variables that cannot all be known beforehand.

- Cost and schedule estimates represent one possible outcome of multiple variables.

- These variables are not all directly controllable or absolutely quantifiable.

- Therefore cost and schedule estimating and the validation process must consider probabilities in assessing estimates and schedules, using a recognized, logical and tested process.
The Answer continued…
… and an Estimate is still just an Estimate.

**Estimate**
…to judge tentatively or approximately: to determine roughly the size, extent… to produce a statement of the approximate cost. Implies a judgment, considered or casual, that precedes or takes the place of actual measuring…

**Assess**
…implies a critical appraisal for the purpose of understanding or interpreting, or as a guide in taking action.
Project Risk Management . . .
“describes the processes concerned with conducting risk management on a project.”

PMBOK
Project RISK Management PLANNING

- Risk Identification
- Qualitative Risk Analysis
- Quantitative Risk Analysis

- Risk Response Strategy
- Risk Monitoring & Control

Cost Risk Analysis
CRA & CEVP®
# Risk Based Estimating at WSDOT

*Cost Risk Assessment and Cost Estimate Validation Process*

CRA and CEVP ®

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<td>• Risk Management Plan</td>
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Principles

First: VALIDATE

Avoid false precision; as big a problem as “early optimism.”

NOTE: Approximately right is better than precisely wrong.

Second: COMMUNICATE

Relate “contingency” to everyday experiences with uncertainty.

Third: IMPROVE

Invest in continuous and transparent qa/qc of your actual cost estimating process.
A strike can be in the high or low range of the strike zone, and it can be near the inside or outside of the plate.
...an estimate has a high and low range.

10% chance the cost < $861 Million
50% chance the cost < $896 Million
90% chance the cost < $937 Million
These simple management strategies underlay WSDOT’s investment in CEVP®

- Avoid “single number” estimates at all events.

- Cause intensive, peer-rich, collaborative scrutiny of project base cost estimating and assumptions.

- Ideally should be doing CEVP® prior to building our book of estimates for the legislature.

- Building budgets in ranges would be even better… Decision makers should agree on what confidence level to use for budgeting. Typically our project offices are using the 90% confidence number.

- Inspire a different character of media/public engagement.

- Emphasize common sense notions of risk description and quantification. People can relate to… Home improvement projects, Mortgage fees, Car loans (basic Chevy vs Cadillac)
74 Workshops Total
(2002 – present)

35 CEVP®
39 CRA
Qualitative Results

- Improved communication with the public.
- Improved team communication.
- Project Managers take action pro-actively to avoid, transfer or mitigate risk.
- Risks that are accepted are known.
- Risk Management Plans are integral component of project work plans.
- Potential response strategies, especially pro-active measures, are identified in the workshop.
Quantitative Results

First ten projects to go through CEVP ®

- Process hallmark is collaboration of WSDOT project teams and the consultant team (subject matter experts, cost and risk experts)

- Formal Reports Prepared

- Cost = $1.5 million (< 0.01% of total project costs)
Other Points of Interest

Project Engineers/Managers have indicated…

- “One-pagers” are very popular
- Risk register useful for project planning
- Cost and schedule validation an important feature
- Find the expert review very valuable
- The process is scalable
CHALLENGES

- Quantifying and measuring accuracy/performance of CEVP ® results and risk management efforts.

- Tracking schedule and cost estimates as the project evolves and changes.

- Maintaining consistency in workshop process while providing the flexibility required to deal with each project on an individual basis.
Next Steps

- Risk Management Plans for all of our projects
- Investigate Risk Based Estimating for Portfolios/Programs
- Develop Risk Database(s)
- Improve monitoring and quantification of results
- More fully develop performance measures.
- Make the process even more scalable.
- Explore the use of risk reserves.
Thank-you for your interest.

What are your questions?

"We have, perhaps too often, taken a best case scenario and then committed to delivering on it, when in order to deliver on it, we have to have seven or eight miracles occur. We're going to be a lot more deliberate and a lot more careful about what we say we can do at what cost and when we can do it."

-U.S. Deputy Energy Secretary Bruce Carnes on Hanford, July 2005