Washington State Department of Transportation
Cost Estimate Validation Process (CEVP®)

EASTSIDE EDITION

The Seattle Times — TUESDAY

Sticker shock: Cost estimates for highway projects skyrocket

COMMUNICATING RESULTS

Each project's CEVP® summary reflects the unique features of a separate project. But all of the summaries share the following points:

- Project cost estimates are stated in dollar ranges, not as single numbers. This reflects the limits of estimating precision at the planning stage when crucial decisions are yet to be made and the specific risks cannot be exactly costed.
- Risk considerations specific to each project are identified and described so that specific risk issues can be foreseen, discussed, and evaluated by the public as the project moves forward.
- Likelihood of project construction schedules have been taken into account and schedule-based adjustments made to the estimates to reflect the smaller purchasing power of dollars to be spent on construction several years in the future.
- Changes from previous CEVP® releases are included in the one page summaries for projects that have gone through an updated CEVP® review.

MEDIA RESPONDED POSITIVELY

"The Transportation Department developed its new numbers through a new process called "cost estimate validation" or CEVP®, which features another layer of review by outside experts…The agency's Urban Corridors Administrators, characterized it as ***an effort to deal more openly and honestly with risks and uncertainties****. "*

Seattle Times
June 2002

"Giving citizens a range of costs, including full disclosure of the variables, "is ***not only politically smart, but it's common sense****"…"*

Seattle Post-Intelligencer
June 2002

Washington State Department of Transportation (WSDOT) wants the public and decision makers to have the best possible information about the probable cost ranges of major transportation projects. The word "range" is important and fundamental to the CEVP®. We cannot completely and accurately predict the future, but we can, using recognized risk and uncertainty techniques, better forecast the range of costs and time a project will require. And then, we can more realistically plan for and manage the best – and the worst – possibilities

WSDOT decided to open the "black box" of estimating and present a candid assessment of the range of potential project costs, including acknowledgement of the uncertainty of eventual project scope, the inevitable consequence of cost escalation due to inflation, and other major risks.

WSDOT's strategy, and commitment, was to deal openly with the process of public infrastructure estimating so that the public would better understand and be better informed as they, and elected officials, make critical project funding decisions. The challenge was to develop a valid procedure to do this.

With the encouragement and support of Secretary Douglas MacDonald, WSDOT developed a specific management-cost-risk assessment tool called the Cost Estimate Validation Process (CEVP®).

WHAT IS CEVP®?

CEVP® is an intense workshop where transportation projects are examined by a team of top engineers and risk managers from local and national private firms and public agencies reviewing project details with WSDOT engineers. Many of the participants have had extensive first-hand experience with large project programming and delivery.

ESTIMATING METHODS

Conventional	CEVP®
Estimate is a NUMBER	Estimate is a RANGE
Risk in contingencies	Risk is explicit
Risk management can be ad-hoc	Risk management is formal and explicit, significant risks (and opportunities) are quantified
	Relies on judgment from experience

The CEVP® workshop team uses systematic project review and risk assessment methods to evaluate the quality of the information at hand and to identify and describe cost and schedule risks. Importantly, the process examines, from the very beginning, how risks can be lowered and cost vulnerabilities managed or reduced. In other words, a dividend of CEVP® is to promote the activities that will improve final cost and schedule results.

PURPOSE OF CEVP®

1. To Validate/Evaluate an estimate of probable cost early in the development and decision process for a project, in order to identify a reasonable target cost, and
2. To identify cost and schedule risk associated with the project, and
3. To provide risk management tools and processes, and
4. To thereby deliver the promised projects in accordance with the established target cost and planned schedule.

Washington State Department of Transportation

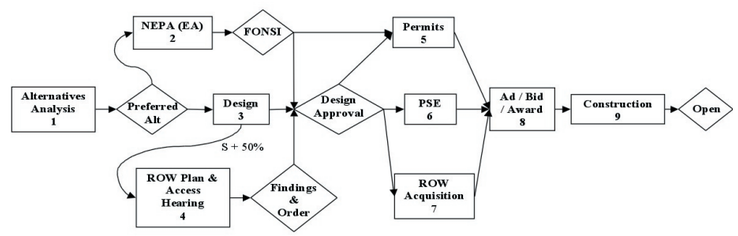
A Cost-Risk Assessment (CRA) will accomplish the following:

- Validate/Evaluate the cost estimate, in terms of quantities and unit costs, to the extent possible based on the project information available (estimate QA/QC)
- Review/validate the markups
- Review/validate schedule estimate
- Reduce reliance on general contingency by identifying project specific risk associated with both cost and schedule.
- Consider and quantify risk and opportunity
- Produce a probabilistic cost and schedule range for the identified scope.

WHAT IS SPECIAL ABOUT CEVP® ?

CEVP® requires specific skills, personnel and resources. WSDOT has found that the process generally requires:

1. A knowledgeable and committed owner.
2. A well-shaped, complete project estimate and schedule
3. Available/involved team members:
   a. Project Team Members
   b. Internal and External Subject Matter Experts
   c. Skilled cost and risk team leads
4. Sufficient expertise to "validate" base costs
5. Suitable Risk modeling technology
6. Ability to understand results (i.e., issues and limitations of a "first-order" analysis).
7. Sufficient time and available resources



PROCEDURES TO CONDUCT CEVP®

1. Project and Method Selection Phase and Preparation – select the right projects, prepare and educate the team, ensure appropriate timing, define scenarios to be assessed, gather data to explain project.
2. Workshop Initiation – Establish workshop goals, workshop scope and project alternatives to be explored; Project Team presentation of: 1) scope and assumptions for each alternative, 2) cost and schedule estimate, 3) major issues and concerns; Development of project flow chart (basis for the cost and schedule risk and uncertainty model)
3. Cost Analysis/Validation and Risk Identification – Cost Analysis/Validation Team breakout activities; Risk Team breakout activities; Environmental Costing Team breakout activities; Modeling Team breakout activities. This can occur simultaneously or in a linear fashion, depending on the structure most important for the project.
4. Integration and Model Construction – Breakout team reports and coordination; Reconciliation of breakout assumptions; Construction of cost/schedule risk and uncertainty model.
5. Presentation of Results – Oral presentation of workshop results; written report of workshop results, with possible beginning mitigation strategies identified.
6. Validation of Results & Generation of Risk Response Plan – Project Team validates workshop results. A risk response plan is created that explains how identified cost-risk is going to be managed. A decision, with management input, will be made as to what "target number" the project will be managed to, as well as how and when to communicate CEVP® results. A decision will be articulated that will express commitment to the CEVP® range, or whether further analysis is needed. This further analysis could include a VE study, or, if it is necessary to explore and evaluate cost on alternative project scenarios, cycling back to step 1 above.
7. Implementation and Performance Measurement – Integration of risk response plan into the project risk management plan. At appropriate periods, and/or by audits, tracking whether project costs have occurred, and if so, whether another CEVP® is warranted, tracking activities taken to reduce cost through management of risk, and ultimately tracking accuracy of the CEVP® by comparing CEVP® results with final costs of WSDOT projects.

Note: CEVP® continues to be developed. The CEVP® summaries are not a warranty that the estimates are perfect, for it is true that you only know the final costs of a project when the project is finally completed. CEVP® cannot change the fact that it is very early in the project development process for many of these major projects. There are still many unknowns. But risk areas that could drive up project costs can be communicated fairly to the public. In addition, the early identification of a risk area creates management opportunities to minimize the potential of project costs associated with some of those risk areas.

USEFUL RESULTS

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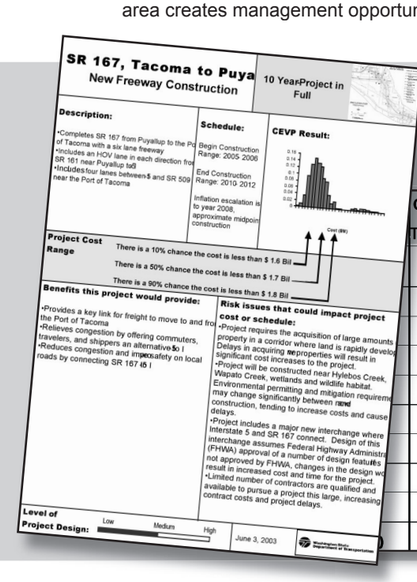
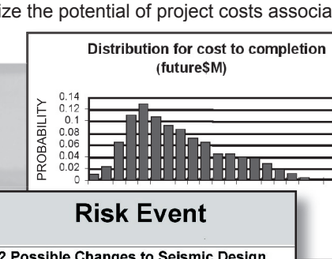
CEVP® results are presented as cost and schedule distributions. These distributions can describe the following:

- Current dollar versus year of expenditure cost
- Fully funded or partially funded scenarios
- Comparative design options
- Expected date of project completed
- Expected schedule to meet project milestones

Another key output from the CEVP® assessment is the ranked listing of those risk and opportunity factors contributing to the uncertainty in a particular estimate such as those illustrated in the Risk Event table. The ranked risk table presents the most important risk issues, along with a measure of their contribution to the total uncertainty in the estimate. The variety of risks, including technical risks, policy risks, environmental risks, construction risks, etc. can be treated in a consistent way using these data.





Contribution To Risk Cost	Risk Event
26%	T12 Possible Changes to Seismic Design Criteria
21%	T2. Sound Transit Rail N Link Realignment
13%	T30. Project Delivery Method
10%	T31. Other (Low Risk) Items
10%	T22. Right of Way
7%	T3. Market Conditions (High Bids)
3%	T14. Constructability of I– 405 I/C
2%	T26. Local Access Improvements
2%	T28. TDM
1%	T16. Construction Staging Areas