WSDOT Glossary for Cost Risk Estimating Management

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Washington State
Department of Transportation

Glossary

The beginning of wisdom is the definition of terms -Socrates (470-399 BC)

A	
AACEI	Association for the Advancement of Cost Engineering International
Accountability	The quality or state of being accountable; *especially*: an obligation or willingness to accept responsibility or to account for one's actions. *SOURCE: Merriam-Webster Online Dictionary*
Accuracy Forecast Accuracy	The difference between the forecasted value and the actual value (forecast accuracy). *SOURCE: Principles of Forecasting by J. Scott Armstrong*
Activity	A component of work performed during the course of a project. *SOURCE: PMBOK Third Edition*
Activity Duration	The time in calendar units between the start and finish of a schedule activity. *SOURCE: PMBOK Third Edition*
AEI	Advanced Elicitation Interviews – Risk Elicitation interviews that are held in advance of an upcoming workshop.
Allowance Design Allowance Construction Allowance	Additional resources included in an estimate to cover the cost of known but undefined requirements for an activity or work item. A Base Cost. Additional resources included in an estimate to cover the cost of known but undefined requirements for a *design element*. Additional resources included in an estimate to cover the cost of known but undefined requirements for a *construction activity* or work item. *SOURCE: WSDOT CEVP® Definition*
Alternatives and Options	• When making a selection, you decide between ***alternatives***. • When holding an option, you defer the selection between ***alternatives*** to a later date. *SOURCE: New Generation Whole-Life Costing*
Analogy	A resemblance of situations… A forecaster can think of how similar situations turned out when making a forecast for a given situation. *SOURCE: Principles of Forecasting by J. Scott Armstrong*
Anchoring Forecast Accuracy	The tendency of judges' estimates (or forecasts) to be influenced when they start with a "convenient" estimate in making their forecasts. This initial estimate (or anchor) can be based on tradition, previous history, or available data. *SOURCE: Principles of Forecasting by J. Scott Armstrong*
Assess	…implies a critical appraisal for the purpose of understanding or interpreting, or as a guide in taking action.
B	

Base Cost	The Base Cost represents the cost which can reasonably be expected if the project materializes as planned. There is uncertainty or variance associated with the base cost.
Base Cost Estimate	The sum of Base Costs.
Base Cost Validation	A detailed examination of Base Costs for the particular project under consideration to assess validity, reasonableness, consistency and accuracy of these costs. Base Costs are initially estimated by the Project Team and reviewed and validated during the Risk Workshop by the Cost Team and Subject Matter Experts. *SOURCE: WSDOT CEVP® Working Definition*
Base Uncertainty	An inherent uncertainty in the base estimate. This uncertainty is always present and is not caused by risk events. The uncertainty that exists even if no risk events are present. Base uncertainty is normally expected to be symmetric; that is of the form: base value $\pm$x%. *SOURCE: WSDOT CEVP® Working Definition*
Base Uncertainty Notes and Examples	❑ **Base Cost Uncertainty** Uncertainty in the base is typically treated as symmetric. Example: base price estimate is $80 per unit, we might want to capture base uncertainty as say $80 $\pm$10%; we would not normally capture base uncertainty as -10% to +20% because this implies some judgment that it is more likely to be high rather than low which is more appropriately captured as risk. Base uncertainty is separate and distinct from "risk events"; a synonym for base uncertainty might be: tolerance. Additional uncertainty, particularly if it is asymmetric indicates there is a risk component and it should be captured as such and documented in the risk register with appropriate characterization of the probability and consequences of the risk. The amount of base uncertainty can be different with each project. Base uncertainty is typically relatively small (say $\pm$5% to $\pm$20%) and because it is symmetric it maintains the neutrality of the base estimate. ❑ **Base Quantity Uncertainty** Uncertainty in quantity estimates is also present (think of the tolerance in measuring something).

The "ideal base estimate" is unbiased and neutral- it is not optimistic and it is not conservative. The Base represents what we can reasonably be expected to pay if the project materializes as planned. Base costs and quantities are initially estimated by the Project Team and reviewed and validated during the Risk Workshop by the Cost Team and Subject Matter Experts. Base cost validation is accomplished through a detailed examination of Base Costs for the particular project under consideration to assess validity, reasonableness, consistency and accuracy of these costs.

EXAMPLE (**base cost uncertainty**): When you decide to fill the gas tank in your car you may have a general idea what you will pay per gallon –but you do not know for sure – until you actually get to the gas station and make the purchase - there is some uncertainty about the cost per gallon.
EXAMPLE (**base quantity uncertainty**) If your car has a gas tank rated at 20 gallons and your gas gauge indicates that you have half a tank –that informs you to the amount of gas you **estimate** you will need –but you are not certain – half a tank informs you that you need about 10 gallons; when you fill it up the actual amount will likely fall between 9 and 11 gallons, not precisely 10 gallons.

Baseline	The approved time phased plan (for a project, a work breakdown structure component, a work package, or a schedule activity), plus or minus approved project scope, cost, schedule, and technical changes. Generally refers to the current baseline, but may refer to the original or some other baseline. Usually used with a modifier (e.g., cost baseline, schedule baseline, performance measurement baseline, technical baseline).
Performance Measurement Baseline	An approved integrated scope-schedule-cost plan for the project work against which project execution is compared to measure and manage performance. Technical and quality parameters may also be included. *SOURCE: PMBOK Third Edition*
Benefit-cost ratio (projects)	The ratio of the present worth of estimated project benefits to present worth of estimated project costs. If the ratio is 1.0 or higher (benefits > costs) the project is considered worthwhile; it does not mean that the project should be built, there are many projects and limited resources.
Bias	**3 a :** BENT, TENDENCY **b :** an inclination of temperament or outlook; *especially* **:** a personal and sometimes unreasoned judgment **:** PREJUDICE **c :** an instance of such prejudice **d** (1) **:** deviation of the expected value of a statistical estimate from the quantity it estimates (2) **:** systematic error introduced into sampling or testing by selecting or encouraging one outcome or answer over others *SOURCE: Merriam-Webster Online Dictionary* A systematic error; that is deviations from the true value that tend to be in one direction. Bias can occur in any type of forecasting method, but is especially common in judgmental forecasting. Bias is a major source of error. For example Tull (1967) and Tyebjee (1987) report a strong optimistic bias for new product forecasting. Some procedures have been found to reduce biases (Fischhoff and MacGregor 1982). Perhaps the most important way to control for biases is to use structured judgment. *SOURCE: Armstrong, J. Scott Principles of Forecasting*

Bond	An obligation made binding by a money forfeit; *also* **:** the amount of the money guarantee**:** an insurance agreement pledging surety for financial loss caused to another by the act or default of a third person or by some contingency over which the third person may have no control *SOURCE: Merriam-Webster Online Dictionary*
C	
CEVP	Cost Estimate Validation Process 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. 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 how risks can be lowered and cost vulnerabilities managed or reduced. A dividend of CEVP® is to promote the activities that will improve cost and schedule forecasting. CEVP is typically used for projects over $100M.

CEVP Team	The CEVP Core Team plus the Project Team, working together as an integrated unit during the CEVP workshop
Confidence Interval	An expression of uncertainty. The likelihood that the true value will be contained within a given interval. In forecasting the confidence level refers to the uncertainty associated with the estimate of the parameter of a model while the prediction interval refers to the uncertainty of a forecast. See also Prediction Interval. *SOURCE: Principles of Forecasting by J. Scott Armstrong*
Confidence Range	The difference between upper and lower values of a set of numbers or results within specific Confidence Levels. For example: "…the range of cost between the 10% and 90% Confidence Levels is $###XXX."
Configuration Management	A process governing design, implementation, and ongoing operations that approves and documents system changes. Management of a project's base scope, schedule, and budget including aka change management. Note: Configuration management is a term that has traditionally applied to the computer and telecommunications industries but is now being used in other industries as well. After establishing a configuration, such as that of a telecommunications or computer system, the evaluating and approving changes to the configuration and to the interrelationships among system components.. *SOURCE: Wikpedia* *SOURCE: WSDOT CEVP® Working Definition*
Conservatism	The assumption that things will proceed much as they have in the past. *SOURCE: Principles of Forecasting by J. Scott Armstrong*
Construction Administration Costs	The Base Costs of administration, management, reporting, design services in construction and community outreach etc. which are required in the Construction Phase *SOURCE: WSDOT CEVP® Working Definition*
Construction Phase	The activities associated with the administration of a contract for specified services and physical infrastructure. Primarily, the construction phase includes change management, assurance that safety and associated impacts to the traveling public are mitigated, payment for work completed, and the documentation of physically constructed elements, certification and documentation of quality. *SOURCE: WSDOT Construction Office* That part of a project life cycle during which the construction work is carried out, aka implementation phase. Source: http://www.maxwideman.com/pmglossary/PMG_C06.htm#Construction

Contingency (see also allowance, reserve)	A markup applied to account for substantial uncertainties in quantities, unit costs and the possibility of currently unforeseen risk events related to quantities, work elements or other project requirements. *SOURCE: WSDOT CEVP® Definition* A margin of resource or specification in excess of the base estimate (for example, of money available for the conduct of a project, or float with the initial project plan, or over specification of product characteristics) to enable the achievement of project objectives in the face of the impact of specific risk events. *SOURCE: Project Risk Analysis and Management Guide, 2004 APM Publishing* Potential gains and losses known to exist at the balance-sheet date although the actual outcomes will only be known after one or more events have occurred (or not occurred). Depending on the nature of a particular contingency, it may be appropriate to include it in the financial statements or to show it as a **note to the accounts**; *SOURCE: A Dictionary of Business and Management*. Ed. Jonathan Law. Oxford University Press, 2006
Design Contingency	A markup applied to cover the cost of undefined and as-yet unknown design requirements – it is expected to be zero at completion of design. *SOURCE: WSDOT CEVP® Definition*
Construction Contingency	Additional applied to cover the cost of undefined and as-yet unknown construction requirements - expected to be zero at completion of construction. *SOURCE: WSDOT CEVP® Definition*
Contingency (WSDOT Plans Prep Manual) (see also Engineering Percentages)	***WSDOT Plans Prep Manual: 830.03 Engineering and Contingencies*** *Contingency percentages are set up to handle unforeseen changes in a project. Changes such as additional work, quantity over-runs, and additional items are some of the contingencies that maybe expected in a project. Currently for all WSDOT contracts, contingencies are limited to 4% of the total contract amount. For local agency projects administered by WSDOT off the State Highway system no contingencies percentage will be set up.*
Contingency Planning Business Case	A justification for the allocation of project resources to a particular risk response. In general, the cost of the response (in time and/or money) will be justified on the basis of a reduction or elimination of a threat, or realization of an opportunity, bearing in mind both the probability and impact of the threat or opportunity. The business case may not be based entirely on money or time, as unquantifiable impacts, such as health and safety or corporate reputation, may be an important part of the impact assessment. *SOURCE: Project Risk Analysis and Management Guide, 2004 APM Publishing*
Correlation	Correlation is a statistical measure of the association between two uncertain variables. Values of the correlation coefficient range from -1 to +1. *SOURCE: WSDOT CEVP® Definition*
Cost Engineering	An area of engineering principles where engineering judgment and experience are used in the application of scientific principles and techniques to problems of cost estimation, cost control, business planning and management science. (those who practice cost engineering are ***cost engineers***) SOURCE: http://www.maxwideman.com/pmglossary/PMG_C11.htm

Cost Lead	The cost lead will participate and lead portions of a Cost Estimate Validation Process (CEVP) or Cost Risk Assessment (CRA) workshop for the project. Work includes workshop participation, leadership and facilitation, preparation, pre-workshop meetings, documentation, follow up, reconciliation of workshop results, management consulting, technical report writing, process evaluation and communication, and meeting requests to rerun models or assess new scenarios for the project. Travel to and from workshop and/or project locations.
Cost of Quality	[Technique]. Determining the costs incurred to ensure quality. Prevention and appraisal costs (cost of conformance) include costs for quality planning, quality control (QC), and quality assurance to ensure compliance to requirements (i.e., training, QC systems, etc.). Failure costs (cost of non-conformance) include costs to rework products, components, or processes that are non-compliant, costs of warranty work and waste, and loss of reputation. *SOURCE: PMBOK Third Edition*
Cost Team	Those CEVP Team members plus Project Team members who focus on Cost for the particular project under consideration.
CPM	Critical Path Method - a scheduling technique for projects with multiple stages and/or activities
CRA	Cost Risk Assessment – workshop typically used for projects between $25M and $100M.
Critical Path	a path connecting all activities which have minimum or zero slack times. The critical path is the longest path through the network.
CY	Current Year
Current Year Dollars	Today's price; the estimated cost of the project if the project were built and completed in the analysis year, in present-day dollars; *(The notion is equivalent to the economist's notion of constant or real dollars.)* *SOURCE: WSDOT working definition*

D	
Deliverable	[Output/Input]. Any unique and verifiable product, result or capability to perform a service that must be produced to complete a process, phase, or project. Often used more narrowly in reference to an external deliverable, which is a deliverable that is subject to approval by the project sponsor or customer? See also product, result, and service. *SOURCE: PMBOK Third Edition*
Design Allowance	See allowance.
Design Phase	The effort (budget/cost) of taking a project through the planning, scoping, and design phases. Planning and scoping typically have separate budgets but are encompassed under Design or Preliminary Engineering (PE). The terms "Design" or "Design Phase" are sometimes used interchangeably with PE. *SOURCE: WSDOT working definition*

Distributions	A characteristic statistical pattern of occurrences of values for a particular outcome when repeated many times. In statistical modeling, values are generated within a defined range according to a particular distribution, thought to be representative of the value being modeled. Normal, uniform, beta, and negative exponential are examples of distributions. Each of these distributions has characteristic shapes when values are plotted against frequency of occurrence. For example, a normal distribution has a bell shape, exponential curves from horizontal to vertical and uniform has a straight horizontal line. *SOURCE: Project Risk Analysis and Management Guide, 2004 APM Publishing*

E	
Earned Value Analysis	"Earned Value" is a project management technique. It measures what you got, for what you actually spent; the value of the work accomplished; the measured performance; the Budgeted Cost of Work Performed (BCWP).
Engineering Percentages **(WSDOT Plans Prep Manual)** (see Contingency)	***WSDOT Plans Prep Manual: 830.03 Engineering and Contingencies*** … *Engineering percentages is the amount of monies set up in each contract for the departments operating costs to administer that project. These percentages will vary by type of work and total dollar amount of the contract. On an average, the department has been running around 15% engineering on all projects in the improvement and preservation programs. Therefore, when starting an estimate for a project enter 15 percent as a beginning point for construction engineering and adjust it up or down, using the following table, before final PS&E submittal. The Region Program Development/Management staff, based on appropriate justification, can approve any changes in the construction engineering percentages for a project different from the rates listed. Copies of the approved justification letter shall be submitted with the final PS&E turn in for advertisement. To use the following tables, once the Program and sub-programs have been identified, enter the table with the appropriate dollar amount of the Construction cost only. Construction costs include any below the line items that have Engineering and contingencies applied to them such as utility agreements and work by state forces other than WSDOT. Record that percentage in your estimate. When a project has multiply, programmed sources (example: P1 paver with some I2 safety collision reduction work) break out the construction costs associated with each program and use a weighted average.*
Escalation	The total annual rate of increase in cost of the work or its sub-elements. The escalation rate includes the effects of inflation plus market conditions and other similar factors. See also inflation.
Estimate	An estimate is comprised of two components: the base cost estimate component and the risk/uncertainty component. An estimate is more appropriately expressed not as a single number but as a range. SOURCE: *WSDOT working definition* A quantitative assessment of the likely amount or outcome. Usually applied to project costs, resources, effort, and durations and is usually preceded by a modifier (i.e. preliminary, conceptual, order-of-magnitude, etc.). It should always include some indication of accuracy (e.g. ± x percent). *SOURCE: PMBOK Third Edition* …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… *SOURCE: Merriam-Webster Online Dictionary*
Estimate at Completion (EAC)	The expected total cost of a project when the defined scope of work will be completed. *SOURCE: PMBOK Third Edition*
Estimate to Complete (ETC)	The expected cost needed to complete all the remaining work for a… project. *SOURCE: PMBOK Third Edition*
Event	Something that happens, an occurrence, an outcome. *SOURCE: PMBOK Third Edition* A point in time when certain conditions have been fulfilled, such as the start or completion of one or more activities. *SOURCE: Cost Control of Capital Projects by R. Max Wideman, 1995*

Expected Value	Probability **X** Impact An expected value is the best estimate of what should happen on average (that is, the mean outcome for cost, activity duration and so on). The expected value for a probability distribution function is calculated by multiplying all possible values by their probabilities. Expected values may be cumulative, particularly in the case of costs, but there may be factors involved that prevent this from being the case. For example, there may be overlaps or omissions inherent to the probability distributions being summed. *Source: Project Risk Analysis and Management Guide* Expected Monetary Value (EMV) Product of an event's probability of occurrence and the gain or loss that will result. For example, if there is a 50% probability of snow, and the snow will result in a $100 loss, the expected monetary value of the snow event is $50 (0.5 X $100). *Source: Risk Management Concepts and Guidance*
Expert Judgment	Judgment provided based upon expertise in an application area, knowledge area, discipline, industry, etc. as appropriate for the activity being performed. Such expertise may be provided by any group or person with specialized education, knowledge, skill experience, or training, and is available from many sources include: other units within the performing organization; consultants; stakeholders; including customers; professional and technical associations; and industry groups. *SOURCE: PMBOK Third Edition*
F	
FHWA	Federal Highway Administration - division of USDOT that funds highway planning & programs.
Flowcharting	The depiction in a diagram format of the inputs, process actions, and outputs of one or more processes within a system. *SOURCE: PMBOK Third Edition*
Force majeure risks	Low-probability risks with a high impact on the project, usually arising from causes outside the project's sphere of influence – for example catastrophic environmental conditions, disturbance of normal working conditions or prevention or suspension of operations. Force majeure risks are difficult to manage within a project and are often escalated to a higher level. SOURCE: Project Risk Analysis and Management Guide, 2004 APM Publishing
Forecasts	Estimates or predictions of conditions and events in the project's future based on information and knowledge available at the time of the forecast. Forecasts are updated and reissued based on work performance information provided as the project is executed. The information is based on the project's past performance and expected future performance and includes information that could impact the project the future, such as estimate at completion and estimate to complete. *SOURCE: PMBOK Third Edition*
Future Costs	Costs that are escalated by projected inflation rates to specific points in time, consistent with a particular project schedule.
FY	Fiscal Year
G	

Goal	**1a:** the terminal point of a race **2:** the end toward which effort is directed: **AIM** Synonym - intention
GSP	General Special Provisions,
H	
Historical Information	Documents and data on prior projects including project files, records, correspondence, closed contracts, and closed projects. *SOURCE: PMBOK Third Edition*
Human Resource Planning	The process of identifying and documenting project roles, responsibilities and reporting relationships, as well as creating the staffing management plan. *SOURCE: PMBOK Third Edition*
I	
ICE	Interstate Cost Estimate
Impact	The effect on the project objectives if a risk event should occur. SOURCE: Project Risk Analysis and Management Guide, 2004 APM Publishing
Inflation *(See IL 4071.00)*	[1]A persistent tendency for prices and money wages to increase. Inflation is measured by the proportional changes over time in some appropriate price index...; [2]an increase in the volume of money and credit relative to available goods and services resulting in a continuing rise in the general price level. [1]A Dictionary of Economics. John Black. Oxford University Press, 2002. Oxford University Press. St. Martin's Univ. [2]Merriam-Webster/online

J	
Job	**1 a :** a piece of work; *especially* **:** a small miscellaneous piece of work undertaken on order at a stated rate **b :** the object or material on which work is being done **c :** something produced by or as if by work. *SOURCE: Merriam-Webster Online Dictionary*
K	
Knowledge	An understanding of something or a process with the familiarity gained through experience, education, observation or investigation, it is understanding a process, practice or technique, or how to use a tool. *SOURCE: PMBOK Third Edition*
L	
Lessons Learned	The learning gained from the process of performing the project. Lessons learned may be identified at any point. Also considered a project record to be included in the lessons learned knowledge base. *SOURCE: PMBOK Third Edition*
M	
Magnitude	The expected value of consequence associated with an event.
Market Conditions	Market conditions are the consequence of supply and demand factors which determine prices and quantities in a market economy and which are separate from inflation. Market conditions include things like: competitive environment during bidding and contracting; the labor market; resource availability; etc. (also see inflation) Working definition
MDL Master Deliverables **List**	a standardized Work Breakdown Structure; a comprehensive listing of project elements that is agreed to by all regions –This list is intended as a starting point for the creation of work breakdown structures (WBS) for projects. The Master Deliverables List is organized in project phases and listed down to the deliverables level. http://wwwi.wsdot.wa.gov/projects/PDIS/MDL.htm
Measures of Effectiveness (MOE)	Are measures or tests, which reflect the degree of attainment of particular objectives. Measures of Effectiveness (MOEs) are used to compare competing alternatives. MOEs are sometimes called performance measures.
Mitigation	Any action taken to reduce the impact of an undesirable risk event. WSDOT *CEVP® working definition* The term 'mitigation' is often used to refer to all responses to threats but some practitioners use the term to refer specifically to proactive risk responses and others specifically to reactive risk responses. SOURCE: Project Risk Analysis and Management Guide, 2004 APM Publishing To compensate for wetlands destroyed during construction. WSDOT *Environmental*

Monte Carlo Analysis	A technique that computes or iterates the project cost or schedule many times using input values selected at random from the probability distributions of possible costs or durations, to calculate a distribution of possible total project cost or completion dates. *SOURCE: PMBOK Third Edition*
Monte Carlo Sampling	A method of simulation modeling using a large number of random trials across the range of the distribution. Latin Hypercube is an alternative sampling method using stratified sampling. Latin Hypercube tends to result in convergence of the model using fewer trials. SOURCE: Project Risk Analysis and Management Guide, 2004 APM Publishing
Monte Carlo Simulation	A technique of multiple simulations of outcomes incorporating the variability of individual elements to produce a range of potential results
MPD	Managing Project Delivery. MPD is a WSDOT management process for project delivery from team initiation through project closing. Training in MPD is provided and the ATMS course code is B71. Now referred to as "PMP" Project Management Process at WSDOT.
N	
Noise	The random, irregular, or unexplained component in a measurement process. Noise can be found in cross-sectional data as well as time series data. *SOURCE: Principles of Forecasting by J. Scott Armstrong*
O	
Occam's Rule	The rule that one should not introduce complexities unless absolutely necessary. "It is vain to do more what can be done with less." *SOURCE: Principles of Forecasting by J. Scott Armstrong*
Opportunity	A risk with positive consequences. *SOURCE: Project Risk Management Guidelines, Cooper, Grey, Raymond, Walker*
Opportunity Events (risk events with positive consequences)	Potential beneficial events that positively affect the project resulting in improvements to cost, schedule, safety, performance or other characteristic - but are greater than the minor variance inherent in Normal Costs. Examples include strategies to reduce cost or accelerate schedule, beneficial funding decisions, improved revenue projections etc.
Optimism	A state of mind that causes the respondent to forecast that favorable events are more likely to occur than is justified by the facts. Many of us are susceptible to this bias. We think we are more likely to experience positive than negative events. Warnings about optimism bias help only to a minor extent. Analogies may help to avoid optimism. *SOURCE: Principles of Forecasting by J. Scott Armstrong*
P	
PMBOK	An acronym meaning Project Management Body of Knowledge. The term PMBOK(TM) is used by the Project Management Institute to refer to their Guide to the Project Management Body of Knowledge publication.
PMI	Project Management Institute, Inc.

Parametric Estimating	An estimating technique that uses a statistical relationship between historical data and other variables (e.g. lane miles, square footage, etc.) to calculate an estimate for activity parameters such as scope, cost, budget, and duration. Accuracy is dependent on the sophistication and the underlying data built into the model. An example for the cost parameter is multiplying the planned quantity of work to be performed by the historical cost per unit to obtain the estimated cost. SOURCE: PMBOK Third Edition
Participation Matrix	A spreadsheet to plan the attendance and timing of workshop participants.
Percentiles from Monte Carlo Simulation Results Range	Percentiles of Year Of Expenditure (YOE) Cost from a Monte Carlo simulation are interpreted as follows: Assuming the characterization of YOE cost uncertainty is correctly capture, the X-percentile, indicates the probability that the YOE cost will not exceed X-percent. *SOURCE: WSDOT CEVP® Definition*
Performance Measurement Baseline	An approved integrated scope-schedule-cost plan for the project work against which project execution is compared to measure and manage performance. Technical and quality parameters may also be included. See also configuration management. *SOURCE: PMBOK 2003*
Prediction Interval	The bounds within which future observed values are expected to fall, given a specified level of confidence. For example, a 90% prediction interval is expected to contain the actual forecast 90% of the time. However, estimated prediction intervals are typically too narrow for quantitative and judgmental forecasting methods. *SOURCE: Principles of Forecasting by J. Scott Armstrong*
Proactive Risk Response	An action or set of actions to reduce the probability or impact of a threat (or delay its occurrence), or increase the probability or impact of an opportunity (or bring forward its occurrence). Proactive risk responses, if approved, are carried out in advance of the occurrence of the risk. They are funded from the project budget. *SOURCE: Project Risk Analysis and Management Guide, 2004 APM Publishing*
Program	A group of projects having specified schedules and costs.
Programming	The process of developing a list of prioritized projects, with accurate cost estimates and spending plans, to put forward for the legislature to approve for funding. The heart of this effort is prioritizing projects within their various program and sub-program categories (preservation and improvement) safety, mobility, etc.
Probability	An estimate of the likelihood that a particular risk event will occur, usually expressed on a scale of 0 to 1 or 0 to 100 percent. In a project context, estimates of probability are often subjective, as the combination of tasks, people and other circumstances is usually unique. *SOURCE: Project Risk Analysis and Management Guide, 2004 APM Publishing* The chance of an event occurring, measured as a percentage or fraction, where 100% or 1 represents certainty. "Probability –is degree of certainty and differs from absolute certainty as the part differs from the whole." *Jacob Bernoulli drawing from the work of Leibniz, p. 123 "Against the gods –the remarkable story of risk" by Peter L. Bernstein*

Probable Cost of Risk Events	Costs associated with risk events, typically with substantial variability.
Product	An artifact that is produced, is quantifiable, and can be either an end item in itself or a component item. *SOURCE: PMBOK Third Edition*
Project Schedule	The Schedule as presented by the Project Team, corresponding to the Project Team Estimate.
Project Team	The Team representing the particular project under consideration.
Program Development	Specific work site events designed to educate and inform employees of their commute options and available incentives. The promotion may be an on-site event tow to four hours long or a distribution of materials to all employees.
Project	The ***Project Management Institute*** defines a **project** to be "a temporary endeavor undertaken to create a unique product or service." **Projects** are distinct from "operations," which are usually ongoing and repetitive activities.
Project Objectives	A statement of specific and measurable aims by which the degree of success of the project will be assessed. *SOURCE: Project Risk Analysis and Management Guide, 2004 APM Publishing*
Project Manager	A **project manager** then is any person assigned to lead a team toward completion of a **project**. A **project manager** applies specialized knowledge, skills, tools, and techniques in order to meet defined goals and customer expectations for a **project**.
Prospectus	Description of a project.
PSE / PS&E	Plans Specifications and Estimate. This is the set of contract plans with specifications and the design engineer's estimate for a project.
	Q
Quality	The degree to which a set of inherent characteristics fulfills requirements. SOURCE: PMBOK Third Edition
Quality Assurance ("QA")	All those planned and systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements for quality. SOURCE: ISO & Quality Management for Projects & Programs, Lew Ireland 1991
Quality Control ("QC")	The process of monitoring specific project results to determine if they comply with relevant standards and identifying ways to eliminate causes of unsatisfactory performance. SOURCE: ISO & Quality Management for Projects & Programs, Lew Ireland 1991
Qualitative assessment	An assessment of risk relating to the qualities and subjective elements of the risk –those that cannot be quantified accurately. Qualitative techniques include the definition of risk, the recording of risk details and relationships, and the categorization and prioritization of risk relative to each other. SOURCE: Project Risk Analysis and Management Guide, 2004 APM Publishing
Quantitative Analysis	Modeling of numerical outcomes by combining actual or estimated values with an assumed or known relationship between values, using arithmetic or statistical techniques, to determine a range of likely outcomes of a variable or to understand how variance in one or more values is likely to affect others. *SOURCE: Project Risk Analysis and Management Guide, 2004 APM Publishing*

R	
Range	The difference between the upper and lower values of a set of numbers or results, either measured absolutely or related to Confidence Levels.
Range Cost Estimate	A Cost Estimate that gives a range of costs, related to specific confidence levels.
Reserve	A provision in the project management plan to mitigate cost and/or schedule risk. Often used with a modifier (e.g. management reserve, contingency reserve) to provide further detail on what types of risk are meant to be mitigated. The specific meaning of the modified term varies by application area. *SOURCE: PMBOK Third Edition*
Result	An output from performing project management processes and activities. Results include outcomes (e.g. integrated systems, revised processes, training personnel, etc.) and documents (reports, policies, plans, studies, etc.). *SOURCE: PMBOK Third Edition*
Right-Of-Way (R/W) Phase	This effort includes the revision of existing plans or the preparation of new plans detailing the need for new Right of Way defined during the design phase. It also includes the appraisal, negotiation, and purchase of new Right of Way by the Real Estate Services office. The right-of-way phase can begin during scoping, after design completion, or anytime in between. The phase end is when the RW is certified, but this may not have a direct relationship to the construction phase, except that CN cannot begin unless the RW is certified. Except under rare circumstances, all new Right-of-Way must be acquired before the project can go to Ad. NOTE: Preparation of R/W Plans is paid for with PE dollars and is part of the design effort; Negotiation, Purchase and Acquisition of R/W are performed by the Real Estate Services office and comprise the cost of R/W. SOURCE: *WSDOT working definition*
Risk	The combination of the probability of an uncertain event and its consequences. A positive consequence presents an *opportunity*; a negative consequence poses a *threat*. Exposure to the consequences of uncertainty. In a project context, it is the chance of something happening that will have an impact upon objectives. It includes the possibility of loss or gain, or variation from a desired or planned outcome, as a consequence of uncertainty associated with following a particular course of action. Risk thus has two elements: the likelihood or probability of something happening; and the consequences or impacts if it does. Source: "Project Risk Management Guidelines", 2005 by Cooper, Grey, Raymond, Walker Project risk - the exposure of stakeholders to the consequences of variations in outcome. The overall risk affecting the whole project, defined by components associate with risk events, other sources of uncertainty and associated dependencies, to be managed at the strategic level. *SOURCE: Project Risk Analysis and Management Guide, 2004 APM Publishing*

Risk Lead	The risk lead(s) participate in a peer-level review or due diligence analysis on the scope, schedule and cost estimate for various projects to evaluate quality and completeness, including anticipated risk and uncertainty in the projected cost and schedule. The risk lead: • Leads the risk portion of the process including risk elicitation and project flowchart development for modeling. • Participates in cost validation or review and risk uncertainty workshops for selected projects. • Conducts prep sessions, follow-up meetings, and/or rerun sessions as necessary. • Provides reports and presentations documenting workshops. • Provides reports using report guide/table of contents. • Develops or implements workshops on topics such as project definition, and risk identification and management.
ROD	Record of Decision
Risk Analysis	Use of available information to determine how often events may occur and the magnitude of their consequences. It may use a wide variety of mathematical and other models and techniques. *SOURCE: Project Risk Management Guidelines Cooper, Grey, Raymond, Walker*
Risk Assessment	The overall process of risk analysis and risk evaluation. Its purpose is to develop agreed priorities for identified risks.
Risk Evaluation	Determines whether a risk is tolerable or not and identifies the risks that should be accorded the highest priority in developing responses. *SOURCE: Project Risk Management Guidelines Cooper, Grey, Raymond, Walker*
Risk Events	Uncertain events that affect the defined project resulting in impacts to cost, schedule, safety, performance or other characteristic but do not include the minor variance inherent in Base Costs. Examples include political, policy and/or management changes, changes in regulations and laws, earthquakes, fires, floods, unknown archeological sites, et al. (NOTE: Some may use the term “risk” to connote a negative event consequence and opportunity a positive event consequence.)
Risk Identification	Process of identifying, characterizing and quantifying potential risk events. WSDOT *CEVP® working definition*
Risk Management	Refers to the culture, processes, and structures that are directed toward effective management of risks –including potential opportunities and adverse effects. Risk Management Process – systematic application of management policies, processes, and procedures to the tasks of establish the context, identifying, analyzing, assessing, treating, monitoring, and communicating risk. *SOURCE: Project Risk Management Guidelines Cooper, Grey, Raymond, Walker*
Risk Miles	Those sections of highway that have a higher probability of accidents over a continuous period of time.
Risk Team	Those CEVP Team members plus Project Team members who focus on Risk for the particular project under consideration.

Risk Mitigation	Establishes and implements management responses for dealing with risks in ways appropriate to the significance of the risk, benefit-cost of the responses and importance of the project. *SOURCE: Project Risk Management Guidelines Cooper, Grey, Raymond, Walker*
S	
Scenario	a sequence of events especially when imagined; *especially* **:** an account or synopsis of a possible course of action or events *SOURCE: Merriam-Webster Online Dictionary*
SCoRE	Scope, Cost, and Risk Evaluation (a previous CRA type process)
Scope of work	Defines the work and activities to be performed to deliver a project including limits of the project. Establishes context and boundaries for the work to be performed.
Sensitivity Analysis	A technique that seeks to examine the sensitivity of model results to parameter estimates. Simple forms include varying parameters one at a time and observing the effect. SOURCE: Project Risk Analysis and Management Guide, 2004 APM Publishing
Service	Useful work performed that does not produce a tangible product or result, such as the performing of business functions supporting production or distribution. *SOURCE: PMBOK Third Edition*
T	
TAG	Transportation Analysis Group
TDM ordinances	See trip reduction ordinances
Team	Two or more people working interdependently toward a common goal and a shared reward. *SOURCE: PM Glossary, Welcom, Project Management Solutions* *http://maxwideman.com/pmglossary/PMG_T00.htm*
Team Building	The process of influencing a group of diverse individuals, each with their own goals, needs, and perspectives, to work together effectively for the good of the project such that their team will accomplish more than the sum of their individual efforts could otherwise achieve. *SOURCE: PM Glossary, Welcom, Project Management Solutions* *http://maxwideman.com/pmglossary/PMG_T00.htm*
Team Management	The direction of a group of individuals that work as a unit. Effective teams are results-oriented and are committed to project objectives, goals and strategies. *SOURCE: PM Glossary, Welcom, Project Management Solutions* *http://maxwideman.com/pmglossary/PMG_T00.htm*
Threat	A risk with negative consequences. *SOURCE: Project Risk Management Guidelines Cooper, Grey, Raymond, Walker*
TPA	Transportation Partnership Act (Washington State Program of Projects)
TRAC	Transportation Center (WSDOT research center)
Transportation	Moving people and /or goods from one place to another.
Transportation management	A concept that includes the use of TDM and TSM techniques in order to lessen traffic impacts of development and encourage private sector improvement to accommodate traffic growth. Sometimes referred to as traffic mitigation.

Transportation planning	A process to determine which transportation projects should be funded and delivered. It involves: Understanding types of decisions to be made; Assessing opportunities/limitations of the future; Identify consequences of alternatives; Relate alternatives to goals and objectives; Present information to decision-makers.
U	
Ultimate Cost	Actual cost at completion of all work elements, including all outside costs, changes and resolution of risk and opportunity events.
Ultimate Schedule	Actual schedule at completion of all work elements, including all outside costs, changes and resolution of risk and opportunity events.
Uncertain	1**:** **INDEFINITE**, **INDETERMINATE** <the time of departure is *uncertain*> 2**:** not certain to occur **:** 3**:** not reliable **:** <an *uncertain* value> 4 a**:** not known beyond doubt **: b:** not having certain knowledge **:** **c:** not clearly identified or defined 5**:** not constant **:** **VARIABLE**, *SOURCE: Merriam-Webster Online Dictionary*
Uncertainty	1 **:** the quality or state of being **uncertain** **:** **DOUBT** 2 **:** something that is **uncertain** lack of sureness about someone or something. **UNCERTAINTY** may range from a falling short of certainty to an almost complete lack of conviction or knowledge especially about an outcome or result *SOURCE: Merriam-Webster Online Dictionary* The lack of knowledge of the outcome for a particular element or value. *Working Definition*
Uplift	Information that leads to a rise in price(s). See **economic indicators**. *SOURCE: The Handbook of International Financial Terms*. Peter Moles and Nicholas Terry. Oxford University Press 1997. *Oxford Reference Online*
USDOT	United States Department of Transportation - principal direct federal funding and regulating agency for transportation facilities and programs. Contains FHWA and FTA, FRA and other agencies.

V	
Validation	A process to confirm the reasonableness, accuracy and completeness of estimated costs and quantities. Working Definition
Value Engineering	A systematic approach to identifying and removing unnecessary costs which do not contribute to a desired result by analyzing cost vs. function.
Variance, Variability	Inherent fluctuations due to random events that result in a range of potential values for a quantity. A measure of variation equal to the mean of the squared deviations from the mean. As a result, observations with large deviations are heavily weighted. *SOURCE: Principles of Forecasting by J. Scott Armstrong*
W	
Watch List	A list of major risks examined at each monthly project review meeting. *SOURCE: Project Risk Management Guidelines Cooper, Grey, Raymond, Walker*
Workshop **CRA/CEVP workshop** **Informal workshop**	3 **:** a usually brief intensive educational program for a relatively small group of people that focuses especially on techniques and skills in a particular field Merriam-Webster Online (m-w.com) CRA/CEVP workshops are a collaborative effort between the project team and subject matter experts to give a close and rigorous review of the estimated base cost and to identify and characterize the uncertainty and risk associated with the project. WDOT Working Definition An informal workshop is comprised of the project team (or key project team members), other participants may be included as the project manager/project team deem necessary. (WSDOT E 1053.00 December 10, 2008)

Y	
YOE	Year Of Expenditure. The estimated year that money will be spent to complete project work elements.
Year Of Expenditure Dollars	The estimated cost of the project when it is anticipated to be built. WSDOT forecasts the estimated YOE cost by taking the estimate in current year dollars and inflating it to the anticipated midpoint of construction. WSDOT Working Definition

REFERENCES

Merriam-Webster Online Dictionary (http://www.m-w.com/)