

WSDOT Glossary for Cost Risk Estimating Management



**Washington State
Department of Transportation**

Glossary

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

Sources

1. *Merriam-Webster Online Dictionary*
2. *Principles of Forecasting by J. Scott Armstrong*
3. *PMBOK Third Edition*
4. *PMI Combined Standards Glossary*

A	
AACEI	Association for the Advancement of Cost Engineering International
Accountability	The quality or state of being <u>accountable</u> ; <i>especially</i> : an obligation or willingness to accept responsibility or to <u>account</u> for one's actions. (1)
Accuracy Forecast Accuracy	The difference between the forecasted value and the actual value (forecast accuracy). (2)
Activity	A component of work performed during the course of a project. (3)
Activity Duration	The time in calendar units between the start and finish of a schedule activity. (3)
Actual Cost	Total <i>costs</i> actually incurred and recorded in accomplishing <i>work</i> performed during a given time period for a <i>schedule activity</i> or <i>work breakdown structure component</i> . Actual cost can sometimes be direct labor hours alone, direct costs alone, or all costs including indirect costs. Also referred to as the actual cost of work performed (ACWP). (4)
“acts of God” See also “Force majeure”	Inevitable, unpredictable, and unreasonably severe event caused by natural forces without any human interference, and over which an insured party has no control, such as an earthquake, flood, hurricane, lightning, snowstorm. Acts of God are insurable accidents and valid excuses for non-performance of a contract. Also called act of nature. See force majeure. <small>Businessdictionary.com</small>
Advance Elicitation Interviews, AEI	... Risk Elicitation interviews that are held in advance of an upcoming risk assessment workshop (CRA/CEVP). <i>Source: WSDOT</i>
Allowance	Estimated amount of resources included in the base estimate to cover the cost of known but undefined requirements for an activity or work item.
Alternatives vs Options	When making a selection, you decide between alternatives . When holding an option , you defer the selection between alternatives to a later date. <i>Source: New Generation Whole-Life Costing</i> Note: Options have value.
Analogy	A resemblance of situations... A forecaster can think of how similar situations turned out when making a forecast for a given situation. (2)
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. <i>Source: Principles of Forecasting by J. Scott Armstrong(2)</i>
Assess	...implies a critical appraisal for the purpose of understanding or interpreting, or as a guide in taking action.
Assumptions	... factors that, for planning purposes, are considered to be true, real, or certain without proof or demonstration. [output/input] <i>Source: PMI Combined Standards Glossary</i> NOTE: be careful not to “assume away” risk.
ATC	Alternative Technical Concept – An ATC (in Design Build contracts) is a proposal that offers savings in time or cost during design and construction of the project, and ultimately to obtain the best value for the public.

B	
Base Cost Estimate	- a term in quantitative cost risk analysis that represents a reviewed and/or validated project cost estimate The base cost represents the “reasonably expected” cost if the project materializes as planned, including PE, RW, and CN costs. The base cost estimate is unbiased and neutral; it is not optimistic or conservative. It does not anticipate any expense due to risk events, but does include the WSDOT standard construction contingency. Base costs reported to program management shall be in current-year dollars (uninflated estimate). <i>Note: See WSDOT Plans Prep Manual 800.03 (2).</i>
Base Cost Estimate Validation	A detailed examination of the estimated costs for a particular project under consideration to assess validity, reasonableness, consistency and accuracy of these costs. <i>Note:</i> <ol style="list-style-type: none"> 1. <i>Review and validate estimates several times throughout project development.</i> 2. <i>For quantitative analysis the project costs are initially estimated by the Project Team and then reviewed and validated prior to and/or during the workshop, this reviewed and validated estimate becomes the base cost estimate for quantitative analysis.</i>
Base Uncertainty	See base variability.
Base Variability	Inherent variability not caused by risk events. Base variability captures a modest symmetric range about the estimated value of the form: base value $\pm x\%$. (typically from $\pm 5\%$ to $\pm 15\%$ depending on level of project development and complexity of the project). The variability represents quantity and price variations about the estimated base).
<p>EXAMPLE: When filling a gas tank there is an idea of what it will cost. It is <i>not certain</i> until the purchase. Uncertainty exists with respect to cost per gallon and quantity. If the gas tank capacity is 20 gallons and the gas gauge indicates half a tank- that approximates the gas needed. The actual amount likely falls between 9 and 11 gallons, not precisely 10.0 gallons.</p>	
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. (3)
Basis Of Estimate <i>(estimate basis and assumptions)</i>	Documentation to enable the agency to easily track changes to project scope, cost, and schedule. This document provides a trail about what is known about the project. This allows project “knowns” as well as “unknowns” to be clearly identified. This documentation is important because multiple estimators may be involved on the project; complex projects take years to develop and estimates must be completed multiple times. <i>Source: NCHRP Report Number 574</i>
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.

Best Practices	Generally refers to methods or techniques recognized, within a given industry or discipline, to achieve stated goals or objectives. Example: best practices are achieved when an organization demonstrates consistently superior organizational project management processes. Relevant related information: ISO 9000 family of quality management systems
Bias	3 a: <u>BENT</u> , <u>TENDENCY</u> b: an inclination of temperament or outlook; <i>especially:</i> a personal and sometimes unreasoned judgment. (1)
Bidding Environment Bond	See market conditions. An obligation made binding by a money forfeit; <i>also</i> : 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. (1)
C	
CEVP® (see CRA)	Cost Estimate Validation Process is an intense workshop where a team of top engineers and risk managers examine transportation project costs and schedules. The team is comprised of experts from private firms and public agencies. The team reviews project details with WSDOT engineers. Many participants have extensive first-hand experience with large project programming and delivery. The workshop team uses systematic project review and risk assessment methods to evaluate the quality of information. The team identifies and describes risks. The team estimates the impacts of risks in terms of cost, and schedule. The process offers the opportunity to reduce the number or impact of risks. The process promotes activities to improve cost and schedule forecasting. The process is for projects over \$100M.
CEVP® Team	Typically includes risk analysts, cost estimating experts and relevant subject matter experts working collaboratively with the Project Team.
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. (2)
Configuration Management	A systems engineering process for establishing and maintaining consistency of a product's performance, functional, and physical attributes with its requirements, design, and operational information throughout its life. Source: Wikipedia
Consequence	Outcome of an event affecting objectives. Source: ISO 31000, Risk management – Principles and guidelines
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
Construction Phase	That part of a project life cycle during which the construction work is carried out, also known as the implementation phase. Source: http://www.maxwideman.com/pmglossary/PMG_C06.htm#Construction
Construction Contingency	Funds authorized at the time of contract award to be expended on unexpected, urgent, minor needs due to uncertainties in quantities, unit costs, and minor risk events that occur during construction.

Contingency	An amount added to an estimate to allow for items, conditions, or events for which the state, occurrence, or effect is uncertain and that experience shows will likely result, in aggregate, in additional costs. Typically estimated using statistical analysis or judgment based on past asset or project experience. <i>Source: Association for the Advancement of Cost Engineering International (ACEI)</i>
Control	Measure that is modifying risk. (synonyms: direct, guide, steer, care-for) <i>Source: ISO 31000, Risk management – Principles and guidelines</i>
Correlation	a statistical measure of the association between two uncertain variables. Values of the correlation coefficient range from -1 to +1. “...measure of the strength of the relationship or association between variables” <i>(After George W. Summers, William S. Peters, & Charles P. Armstrong. Basic Statistics in Business and Economics, 3rd edition. Belmont, CA: Wadsworth Publishing Company).</i> <i>Note: Some mistakenly assume correlation infers a degree of causation; correlation is not causation.</i>
Cost	The expenses a contractor will incur in performing contract work. Cost + Profit = Price <i>Source: Guide to Contract Pricing 5th Edition, 2009</i>
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) <i>Source: http://www.maxwideman.com/pmglossary/PMG_C11.htm</i>
Cost Lead	Leads the cost estimate review for a risk assessment workshop. Duties include leadership, facilitation, preparation, documentation; follow up, reconciliation of workshop results, technical report writing, process evaluation and communication. May participate in assessing new scenarios for the project.
Cost of Quality	[Technique]. Determining the costs incurred to ensure quality. These include: 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. (3)
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 (see CEVP)	Cost Risk Assessment – a workshop following the same methodology as CEVP® but use of extensive external subject matter expertise is somewhat relaxed. CRA workshops are 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.
D	
Deliverable	Any unique and verifiable product, result or capability to perform a service that must be produced to complete a process, phase, or project. See also product, result, and service. [output/input]. (3)
Design Phase	The effort (budget/cost) of taking a project through the planning, scoping, and design phases. Planning and scoping typically have separate budgets encompassed under Design or Preliminary Engineering (PE). The terms “Design” or “Design Phase” are interchangeable.

Distributions	<p>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.</p> <p style="text-align: right;"><i>Source: PRAM Guide, 2004 APM Publishing</i></p>
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E	
Earned Value Analysis	<p>“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).</p>
Elicit	<p>To draw forth...; To bring out... <i>from</i> the data in which they are implied. To extract, draw out (information) <i>from</i> a person...</p> <p style="text-align: right;"><i>Oxford English Dictionary</i></p>
Elicitation	<p>The action of eliciting or drawing forth. By elicitation, he understands....</p> <p style="text-align: right;"><i>Oxford English Dictionary</i></p>
Engineer’s Estimate	<p>The term is frequently used to mean the estimate at time of bid (called the Contract Estimate in the Plans Preparation manual), but also used by some to mean any estimate done during the PE phase.</p> <p><i>Note: See WSDOT Plans Prep Manual Division 8 Contract Estimate, 800.01.</i></p>
Escalation	<p>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.</p> <p style="text-align: center;"><i>John K. Hollmann & Larry R. Dysert. Escalation Estimation: Working With Economics Consultants. 2007 AACE International Transactions. Morgantown, WV: AACE International, p. EST.01.01. Accessed: http://www.c4ce.com/AACE_Escalation_Hollmann_Paper.pdf</i></p>
Estimate	<p>A project estimate is actually 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.</p> <p>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.). An estimate is expressed as a range; it offers an indication of accuracy. (e.g. \pm x percent).</p> <p style="text-align: right;">(3)</p>
Estimate at Completion (EAC)	<p>The expected total cost of a project when the defined scope of work will be completed.</p> <p style="text-align: right;">(3)</p>
Estimate to Complete (ETC)	<p>The expected cost needed to complete all the remaining work for a... project.</p> <p style="text-align: right;">(3)</p>
Event	<p>Occurrence or change of a particular set of circumstances.</p> <p style="text-align: right;"><i>Source: ISO 31000, Risk management – Principles and guidelines</i></p>
Expected Value	<p>Probability X Impact</p> <p>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.</p> <p style="text-align: right;"><i>Source: Project Risk Analysis and Management Guide</i></p>

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. <p style="text-align: right;">(3)</p>
F	
FOB	F.O.B. = "Freight On Board". FOB indicates where the seller's responsibility ends and the buyer's begins regarding shipment of the materials.
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. <p style="text-align: right;">(3)</p>
Force majeure risks See also "acts of God"	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. <p style="text-align: right;"><i>Source: PRAM Guide, 2004 APM Publishing</i></p>
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...past performance and expected future performance and includes information that could affect the project in the future, such as estimate at completion and estimate to complete. <p style="text-align: right;">(3)</p>
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	the end toward which effort is directed: aim
GSP	General Special Provisions,
H	
Historical Information	Documents and data on prior projects including project files, records, correspondence, closed contracts, and closed projects. <p style="text-align: right;">(3)</p>
Human Resource Planning	The process of identifying and documenting project roles, responsibilities and reporting relationships, as well as creating the staffing management plan. <p style="text-align: right;">(3)</p>
I	
Impact	The effect on the project objectives if a risk event should occur. <p style="text-align: right;"><i>Source: PRAM Guide, 2004 APM Publishing</i></p>
Inflation	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. <p style="text-align: right;"><i>1A Dictionary of Economics. Oxford University Press, 2002. St. Martin's University 2 Merriam-Webster/online</i></p>
J	

Job	1 a: a piece of work; <i>especially:</i> a small miscellaneous piece of work undertaken on order at a stated rate <p style="text-align: right;">(1)</p>												
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. <p style="text-align: right;">(3)</p>												
L													
LEAN	a methodology that incorporates tools and techniques designed to maximize customer value, while reducing waste along the entire value stream. It also focuses on improving overall efficiency, quality, and customer satisfaction.												
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. <p style="text-align: right;">(3)</p>												
Likelihood	Chance of something happening. <i>Source: ISO 31000, Risk management – Principles and guidelines</i>												
M													
Magnitude	The expected value of consequence associated with an event.												
Market Conditions	The consequence of supply and demand factors which determine prices and quantities in a market economy; separate from inflation. Market conditions include the bidding environment; the labor market; resource availability, etc. Influences include: "availability of skilled labor"; "supply of steel is low because of high demand in multiple markets causing a temporary upswing in steel prices"; "the number of bidders is expected to be low therefore competition is reduced"; "the type, size, and/or 'packaging' of the work is anticipated to influence bids and/or the number of bidders"; "influences of timing of advertisement on bidders and their responses". <i>Example of how market conditions are captured in WSDOT's self-modeling tool for risk based estimating.</i> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="3">Market Conditions applied to Base</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Better than planned (more competition, lower costs)</td> <td style="text-align: center;">25%</td> <td style="text-align: center;">20%</td> </tr> <tr> <td style="text-align: center;">Worse than planned (less competition, higher costs)</td> <td style="text-align: center;">20%</td> <td style="text-align: center;">10%</td> </tr> <tr> <td></td> <td style="text-align: center;">probability</td> <td style="text-align: center;">impact</td> </tr> </tbody> </table>	Market Conditions applied to Base			Better than planned (more competition, lower costs)	25%	20%	Worse than planned (less competition, higher costs)	20%	10%		probability	impact
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MDL Master Deliverables List	a comprehensive listing of project elements intended as a starting point for the creation of work breakdown structures (WBS) for projects. The Master Deliverables List is organized in project phases to the deliverables level. <i>http://www.wsdot.wa.gov/projects/PDIS/MDL.htm</i>												
Measures of Effectiveness (MOE)	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. 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. <i>Source: PRAM Guide, 2004 APM Publishing</i>												
Monitoring	Continual checking, supervising, critically observing or determining the status in order to identify change from the performance level required or expected. <i>Source: ISO 31000, Risk management – Principles and guidelines</i>												

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. (3)
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. <i>Source: PRAM Guide, 2004 APM Publishing</i>
Monte Carlo Simulation	A technique of multiple simulations of outcomes incorporating the variability of individual elements to produce a range of potential results
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. (2)
O	
Occam's Rule	The rule that one should not introduce complexities unless absolutely necessary. "It is vain to do with more what can be done with less." (2)
Opportunity	Uncertainty that can positively affect project objectives (positive event risk). Examples include strategies to reduce cost or durations, 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. (2)
P	
PMBOK™	Project Management Body of Knowledge – a guide from the Project Management Institute.
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. (3)
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.
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. (3)
Post-response risk	The risk <i>after</i> a response is determined and actions are taken to enhance opportunities and reduce threats to the project's objectives. The response action identifies and assigns parties to take responsibility for each risk response. Risks are known as "pre-response" if no response action has yet been determined (see below).

Practical Design	<p>Emphasizes a renewed focus on scoping projects to stay within the core purpose and need. ...agencies may eliminate nonessential project design elements resulting in lower cost and improved value.</p> <p>A concern is that agencies may overemphasize short-term cost savings without a clear understanding of how such decisions could impact other objectives (such as safety and operational performance, context sensitivity, life-cycle costs, long-range corridor goals, livability, and sustainability).</p> <p>To address this concern, agencies can make decisions that are more informed by... a Performance-Based Practical Design (PBPD) approach.... PBPD can be articulated as modifying a traditional design approach to a "design up" approach where transportation decision makers exercise engineering judgment to build up the improvements from existing conditions to meet both project and system objectives.</p> <p style="text-align: right;"><i>Source: FHWA</i></p>
Prediction Interval	<p>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.</p> <p style="text-align: right;">(2)</p>
Price	<p>The financial outlay made to pay for a product or service.</p> <p style="text-align: center;">$Price = Cost + Profit$</p> <p style="text-align: right;"><i>Source: Guide to Contract Pricing 5th Edition, 2009</i></p>
Proactive Risk Response	<p>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.</p> <p style="text-align: right;"><i>Source: PRAM Guide, 2004 APM Publishing</i></p>
Profit	<p>In a broad sense business profit is whatever monies are left after all costs have been paid. When talking about a particular contract, profit is the additional amount a contractor receives above out-of-pocket costs; profit makes it worthwhile to do the particular contract work. It is the reward for undertaking the contract task in the first place.</p> <p style="text-align: center;">$Price = Cost + Profit$</p> <p style="text-align: right;"><i>Source: Guide to Contract Pricing 5th Edition, 2009</i></p>
Program	<p>A group of projects having specified schedules and costs.</p>
Programming	<p>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.</p>
Probability	<p>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.</p> <p style="text-align: right;"><i>Source: PRAM Guide, 2004 APM Publishing</i></p> <p>“Probability –is degree of certainty and differs from absolute certainty as the part differs from the whole.”</p> <p style="text-align: right;"><i>Jacob Bernoulli drawing from the work of Leibniz, p. 123 “Against the gods –the remarkable story of risk” by Peter L. Bernstein</i></p>
Probable Cost of Risk Events	<p>Costs associated with risk events, typically with substantial variability.</p>

Product	An artifact that is produced, is quantifiable, and can be either an end item in itself or a component item. (3)
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 two to four hours long or a distribution of materials to all employees.
Program	a group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually. (PMBOK)
Programming	To obtain approval to complete a project as part of the highway construction program (a plan for completing a group of projects having specified schedules and specific costs.) (WSDOT P&O Manual) <small>http://www.wsdot.wa.gov/publications/manuals/fulltext/M12-51/AB.pdf</small>
Project	The Project Management Institute defines a project to be "a <u>temporary</u> endeavor undertaken to create a <u>unique</u> 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. <small style="text-align: right;">Source: PRAM Guide, 2004 APM Publishing</small>
Project Manager	... 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 or 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. (3)
Quality Assurance ("QA")	ensuring we do the right things in the right way; setup processes to attend to each stage of project delivery. Refers to those actions, procedures, and methods to be employed at management levels, under the jurisdiction of the Project Engineer (or Quality Manager), to observe and ensure prudent quality control procedures are in place and are being carried out, and the desired results of quality professional services are being achieved in accordance with the Quality Management Plan.
Quality Control ("QC")	systems established to maintain standards by testing samples of the output to ensure results meet expectations. Refers to those actions, procedures, and methods that are to be routinely employed at the production and administrative levels, under the jurisdiction of the Project Engineer, during the development of work products to produce the desired quality professional services.
Quality Verification ("QV")	uses objective evidence to confirm requirements are met. Refers to those actions, procedures and methods employed at HQ Project Development, under the jurisdiction of the State Design Engineer or designee, to selectively review final products to ensure a Quality Management Plan was implemented, the appropriate project development process was followed, and was reflected in the final contract document. This action will also include targeted PS&E reviews at 90% on select projects based on current trends in the construction phase related to engineering errors.
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. <small style="text-align: right;">Source: PRAM Guide, 2004 APM Publishing</small>

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. <i>Source: PRAM Guide, 2004 APM Publishing</i>
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.
Residual Risk	Remaining risk after risk response actions have been implemented.
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.). (3)
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.
Risk	The effect of uncertainty on objectives. <i>Source: ISO 31000, Risk management – Principles and guidelines</i>
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: <ul style="list-style-type: none"> ✓ 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.
Risk Assessment	The overall process of identifying, describing and analyzing risks. Its purpose is to develop agreed priorities for identified risks. Some interchange the term assessment with analysis or evaluation.
Risk Events	Uncertain events that affect a defined project with impacts to cost, schedule, safety, performance or other characteristics. Risk events do not include minor variance inherent in Base Costs.
Risk Identification	Process of identifying, characterizing and quantifying potential risk events.

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. <i>Source: Project Risk Management Guidelines Cooper, Grey, Raymond, Walker</i>
Risk Miles	Those sections of highway that have a higher probability of accidents over a continuous period of time.
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. <i>Source: Project Risk Management Guidelines Cooper, Grey, Raymond, Walker</i>
Risk owner	Person or entity with the accountability and authority to manage a risk. <i>Source: ISO 31000, Risk management – Principles and guidelines</i>
Risk profile	Description of any set of risks. <i>Source: ISO 31000, Risk management – Principles and guidelines</i>
Risk Register	The risk register serves as a repository for identified project risks. The risk register includes detailed information about the risk and is a “living” document that evolves as the project evolves. The risk register typically records information such as: risk ID #, status of risk, risk categories, risk Name, cause of the risk, effect of the risk, risk trigger, likelihood of risk occurrence, impact if risk does occur, response actions, and notes. The risk register serves as a project management and communication tool to aide decision-makers and facilitates risk analysis.
Risk Reserve	A reserve account to cover uncertainty and risk during project execution.
Risk Response	The process of identifying and implementing actions to enhance opportunities and reduce threats. The risk response assigns parties to take Ownership and is accountable for the response actions. threat responses: Avoid, Mitigate (reduce), Transfer, Accept (retain) opportunity responses: Exploit, Enhance (increase), Share, Accept (retain)
Risk Team	Those CEVP Team members plus Project Team members who focus on Risk for the particular project under consideration.
ROD	Record of Decision (note: the Federal Transit Authority – FTA also defines ROD as Revenue Operations Date)
S	
Scenario	a sequence of events especially when imagined; <i>especially</i> : an account or synopsis of a possible course of action or events (1)
SCoRE	Scope, Cost, and Risk Evaluation an obsolete WSDOT acronym for lower level risk assessments for smaller projects.
Scope of work	Defines the work and activities necessary to deliver a project. Establishes context and boundaries for the work.
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. <i>Source: PRAM Guide, 2004 APM Publishing</i>
Service	Useful work... that does not produce a tangible product or result, such as the performing of business functions supporting production or distribution. (3)
SMART	Specific Measurable Attributable Relevant Timebound
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. <i>Source: PM Glossary, Welcome, Project Management Solutions http://maxwideman.com/pmglossary/PMG_T00.htm</i>
Team Building	A collective term for various types of activities used to enhance social relations and define roles within teams, often involving collaborative tasks. <i>Source: wikipedia</i>
Team Management	The ability of an individual or an organization to administer and coordinate a group of individuals to perform a task. Team management involves teamwork, communication, objective setting and performance appraisals. <i>Source: wikipedia</i>
Threat	An event risk that has the potential to negatively impact project objectives.
TPA	Transportation Partnership Act (Washington State Program of Projects)
TRAC	Transportation Center (WSDOT research center)
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: <u>INDEFINITE</u> , <u>INDETERMINATE</u> <the time of departure is <i>uncertain</i> > 5: not constant : <u>VARIABLE</u> , (1)
Uncertainty	The lack of knowledge of the outcome for a particular element or value. 1 : the quality or state of being <u>uncertain</u> : <u>DOUBT</u> (1)
Uplift	Information that leads to a rise in price(s). See economic indicators . <i>Source: The Handbook of International Financial Terms. Peter Moles and Nicholas Terry. Oxford University Press 1997. Oxford Reference Online</i>
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.
Value Engineering	A systematic approach to identifying and removing unnecessary costs which do not contribute to a desired result by analyzing cost vs. function.
Variability, Variance	The fact of, or capacity for, varying in amount, magnitude or value. <i>Source: Oxford English Dictionary Online, 2010</i> Inherent fluctuations due to random events that result in a range of potential values for a quantity.

VECP	<p><i>Value Engineering Change Proposals (VECP) are post-award value engineering proposals made by construction contractors during the course of construction under a value engineering clause in the contract. It is described in <u>23 CFR 627.3(g)</u> as "A construction contract change proposal submitted by the construction contractor based on a VECP provision in the contract. These proposals may improve the project's performance, value and/or quality, lower construction costs, or shorten the delivery time, while considering their impacts on the project's overall life-cycle cost and other applicable factors."</i></p> <p style="text-align: right;"><i>Source: FHWA</i></p>
VERA	Value Engineering Risk Assessment - a workshop where both the cost risk assessment and value engineering workshops are combined.
W	
Watch List	<p>A list of major risks examined at each monthly project review meeting.</p> <p style="text-align: right;"><i>Source: Project Risk Management Guidelines Cooper, Grey, Raymond, Walker</i></p>
Workshop	<p>a usually brief, intensive educational program for a relatively small group of people that focuses especially on techniques and skills in a particular field (1)</p> <p>CRA/CEVP workshops—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.</p> <p>Informal workshop—comprised of the project team (or key project team members), other participants may be included as the project manager/project team deem necessary. <i>(WSDOT E 1053.00 December 10, 2008)</i></p>
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 typically forecasts the estimated YOE cost by taking the estimate in current year dollars and inflating it to the anticipated midpoint of construction or activity.