



Gregory W. Brink, CVS, PMI-RMP, CCE/A
Director – Risk Management and Economics

Qualifications

Mr. Brink is a Certified Value Specialist, Risk Management Professional, and Certified Cost Estimator/Analyst practicing Value Methodology. He has 8 years of experience performing extensive risk analysis, risk management, financial and life-cycle costing analysis, forecasting, value analysis, and economic impact analysis on projects of all scale and scope. Mr. Brink has strong technical aptitude, creative client solution development, and an ability to incorporate innovation into a wide array of value analysis, risk management, and economic and market analysis for both government and private sector organizations. Mr. Brink's specializations through the use of Value Methodology include quantitative/qualitative risk and uncertainty modeling and analysis, risk management, project management, financial analysis, economic analysis, market analysis, and economic forecasting.

Mr. Brink's experience includes working on multiple infrastructure projects of varying scale and scope, ranging from a million dollars to multibillion dollar engagements. The primary areas of focus included: risk analysis, risk management, project cost estimating, value analysis/engineering, cost-benefit analysis, economic impact analysis, project management, financial analysis and reporting, economic forecasting, material price analysis, general market analysis, commodity price and volatility forecasting, and industrial optimization.

In addition, Mr. Brink has considerable technical modeling experience using different risk and project management software tools including, Palisades @Risk, Crystal Ball, Microsoft Project, Primavera, and PERT Master.

Education

M.Sc. Engineering & Technology Management, Colorado School of Mines, 2004

- ◆ Dual Specialization: Operations Research / Organizational Leadership and Strategy

B.S. Economics, Colorado School of Mines, 2003

Registration

- ◆ Certified Value Specialist (CVS), SAVE International, Certification No.: 201006512
- ◆ Project Management Institute – Risk Management Professional (PMI-RMP), Project Management Institute, Certification No.: 1276148
- ◆ Certified Cost Estimator/Analyst (CCE/A), SCEA, Certification No.: 2406

Employment Record

- ◆ Value Management Strategies, Inc., Director-Risk Management (2009-Present)
- ◆ HDR Engineering, Inc., Senior Economist, 2005-2009
- ◆ Accenture, Ltd., Technology Analyst, 2004-2005
- ◆ AllCare Home Health, Inc., Operations Analyst, 2002-2004

Professional Affiliations

- ◆ Transportation Research Board (TRB), Member
- ◆ American Economic Association (AEA), Member
- ◆ Mid-Continent Regional Science Association (MCRSA), Member

Publications

- ◆ Society of Cost Estimators and Analysts (SCEA), Member
 - ◆ SAVE International, Member
- SAVE International, Interactions Newsletter
- ◆ Published: *Performance Uncertainty and the Value Equation*, 2010
 - ◆ Published: *A Relationship of Value*, 2010
 - ◆ Published: *A Review of Predictably Irrational and Its Relationship to Value Engineering*, 2009
- SAVE International, Conference
- ◆ Published *Function Driven Risk Management*, 2010
 - ◆ Presented: *Function Driven Risk Management*, 2010
- MCRSA & IMPLAN User's Conference
- ◆ Published: *IMPLAN Technology and Infrastructure Economic Impact Modeling*, 2008
 - ◆ Presented: *IMPLAN Technology and Infrastructure Economic Impact Modeling*
- Transportation Research Board Annual Meeting, 2008 & 2009
- ◆ Presented: *Strategic Economic Development Best Practices*, 2008
 - ◆ Presented: *Risk Management in Engineering and Construction Best Practices*, 2009

Representative Experience

Gregory Brink has performed Value Engineering, Risk Analysis, and Economic Analysis in a variety of fields ranging from transit and transportation construction, technology, water/wastewater, healthcare, and vertical building construction. He has conducted and participated in several Value Engineering studies, Risk Analyses, Risk Audits, and Economic Analyses with VMS, Inc. and previously with HDR, Inc., for clients such as:

- ◆ Oregon Department of Transportation
- ◆ Washington State Department of Transportation
- ◆ Minnesota Department of Transportation
- ◆ Utah Department of Transportation
- ◆ California Department of Transportation
- ◆ Alaska Department of Transportation
- ◆ Wisconsin Department of Transportation
- ◆ Palouse Regional Transportation and Planning Office, Palouse, WA
- ◆ City of Denver, Denver, CO
- ◆ Oregon Water Resources Department, Salem, OR
- ◆ Covington Water District, Seattle, WA
- ◆ Brazos Valley Groundwater Conservation District, Bryan and College Station, TX
- ◆ Eastern Municipal Water District
- ◆ U.S. Department of State – Overseas Building Operations
- ◆ U.S. Army Corps of Engineers – Kansas City District
- ◆ U.S. Army Corps of Engineers – Alaska District
- ◆ U.S. Army Corps of Engineers – Ft. Worth District
- ◆ Port of Tacoma, Tacoma, WA
- ◆ Port of Kennewick, Kennewick, WA
- ◆ Port of Benton, Benton, WA
- ◆ Central Oregon Pacific Shortline Railroad, Roseburg, OR
- ◆ Winchester Rail Yard, Winchester, OR
- ◆ Echostar Satellite, Englewood, CO
- ◆ Nevada Site Services, Pahrump Valley, NV

Value Analysis/Value Engineering Project Studies

HIGHWAY AND TRANSIT PROJECTS

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| California Department of Transportation | <ul style="list-style-type: none">◆ D-4 Highway 1/Calera Parkway◆ Schuyler Heim Bridge Replacement and SR47 Expressway◆ D-6 24th Street Improvements◆ D-3 I-80 Roadway Rehabilitation◆ D-6 Avenue 416 Kings River Bridge Replacement Project◆ D-7 LA 405 Roadway Rehabilitation |
| Minnesota Department of Transportation | <ul style="list-style-type: none">◆ Cayuga Bridge Replacement Project◆ Lafayette Bridge Replacement Project◆ Dresbach Bridge Replacement Project◆ Hastings Bridge Replacement Project◆ St. Peter Bridge Replacement Project◆ St. Croix Bridge Replacement Project◆ Red Wing Bridge Replacement Project◆ Winona Bridge Replacement Project◆ TH60 Upgrade Project |

ENVIRONMENTAL FACILITIES, WATER AND WASTEWATER TREATMENT PLANTS

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| U.S. Army Corps of Engineers, Kansas City District | <ul style="list-style-type: none">◆ GIWW Item 22A Temporary and Permanent Floodwall, Lafourche Parish, Louisiana |
| Eastern Municipal Water District | <ul style="list-style-type: none">◆ Sun City Force Main and Recycled Water Pipeline |

PUBLIC/GOVERNMENT FACILITIES

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| U.S. Army Corps of Engineers, Alaska District | <ul style="list-style-type: none">◆ FTR 159 Battle Command Training Center◆ FTR 251 Brigade Combat Team Complex Phase 1 |
| U.S. Army Corps of Engineers, Ft. Worth District | <ul style="list-style-type: none">◆ Ft. Hood 69th ADA Complex |
| U.S. Department of State – Overseas Building Operations | <ul style="list-style-type: none">◆ U.S. Embassy, Bishkek, Kyrgyzstan◆ U.S. Embassy, Islamabad, Pakistan◆ U.S. Embassy, Kabul, Afghanistan |

Risk Analysis / Risk Management

HIGHWAY AND TRANSIT PROJECTS

- Oregon Department of Transportation, Salem, OR***
 - ◆ Provided Program Risk Management for the OTIA III State Bridge Program, a \$1.3 billion program which is replacing or repairing 365 bridges throughout the state of Oregon. Responsibilities as a risk manager included risk analysis and risk management of over 52 individual projects. Included in this was the development of an economic-based risk analysis of programmatic escalation costs, ongoing risk analysis for all projects in relation to engineering life-cycle cost management, development of the Estimation Validation Risk Assessment (EVRA) for cost-risk analysis on engineering cost estimates of every structure, risk assessment of bonding capacity and arbitrage avoidance, trend analysis and forecasting of commodities in relation to materials markets.
- California High Speed Rail***
 - ◆ Performing Program Management and Oversight risk auditing services for the delivery of the \$45 billion California High Speed Rail Project throughout the state of California. This is inclusive of ensuring that the proper risk management approach and modeling techniques are deployed in order to effectively deliver the program. In addition, services include the assurance of a robust risk management program implementation.
- Washington Department of Transportation, Seattle, WA***
 - ◆ Designed and facilitated the implementation of a new programmatic risk management framework currently in use on the \$4.5 billion Alaskan Way Viaduct project. Responsibilities included the design and management of the development of a “one of a kind” risk management software that allows for programmatic management of risks across multiple staged contracts. This included the elicitation of over 400 cost and schedule risks, ranking and identification of high risk contractual elements, development and running of a Monte Carlo risk model, development of risk response strategies, and development of a complete program/project risk management plan. The filtering and control processes put in place in the risk management framework allow for the iterative management of high likelihood/high impact risks in a top-down approach. The iterative process is helping to manage risk for the 11 separate contracts comprising one of the most complex infrastructure projects (including the boring of a tunnel under the Starbucks tower in downtown Seattle) in US history.
- Oregon Department of Transportation, Portland, OR***
 - ◆ Responsible for modeling, calculating the associated costs and benefits of adding in regional arterial connectors in the Portland metropolitan area, and performing a risk analysis in relation to the economic impacts derived. This analysis included determining travel time savings, environmental cost savings, vehicle operating cost savings, and additional safety cost savings in relation to the total cost of constructing the additional arterial roadways. The sensitivity of all output was then measured and presented using Monte Carlo simulation to determine risk-adjusted output and provide for a range of expected values.

**Minnesota Department
of Transportation,
Minneapolis, MN**

- ◆ Performed cost risk analysis in coordination with value engineering studies for a program of major structures to be replaced in Minnesota totaling more than \$3 billion in construction value. This included working with the study team members to identify risks, probabilities of impact, and potential range of risk impacts in the development of individual risk registers and identification of areas of potential value engineering problem solving. This also included identifying appropriate risk response strategies and modeling new project profiles based on response strategies to the risk. Also included was the modeling of the implementation of value engineering recommendations in a new way to represent the true realizable opportunity. Results of the cost risk analysis included the range of expected project cost in current year dollars (as well as year of expenditure dollars), anticipated impacts to schedule in terms of project let date and duration, and the development of a risk management plan for use in monitoring and controlling risk throughout the project lifecycles.

**California Department
of Transportation,
Los Angeles, CA**

- ◆ Facilitated workshop and developed quantitative risk model for assessing potential cost and schedule impacts associated with the replacement of the \$635 million Schuyler Heim Bridge in the Port of Long Beach area. Potential risks, their probabilities and potential impacts, and expected outcomes were developed in accordance with workshop team member input. Results of the cost risk analysis included the range of expected project cost in current year dollars (as well as year of expenditure dollars), anticipated impacts to schedule in terms of project let date and duration, and the development of a risk management plan for use in monitoring and controlling risk throughout the project lifecycles.

**Wisconsin Department
of Transportation,
Green Bay, WI**

- ◆ Performing Program Management and Oversight risk management services for the \$1.5 billion US-41 Highway Reconstruction program in Green Bay, Wisconsin. This includes the implementation of a cradle to grave risk management effort that iterates through risk identification, risk analysis, risk response planning, and risk monitoring and control. Included in these services is the facilitation of risk workshops, inclusive of quantitative modeling of cost and schedule risks that may impact the project based on the identified probabilities and associated impacts. Risk response strategies and action plans based on relatively high impact areas are developed to proactively manage risk for the lifecycle management and delivery of the program.

GOVERNMENT AND PUBLIC FACILITIES

**U.S. Department of State
– Overseas Building
Operations**

- ◆ Developed qualitative risk modeling framework for the use in value engineering applications for the construction of new U.S. Embassy facilities worldwide. In addition, services for OBO-DOS include the modeling of performance, cost, and schedule risks using the established qualitative risk modeling tool that focuses on the identification of risk events, their relative likelihoods of occurrence, and the relative associated impacts. Based on the modeling data value engineering solutions are developed as risk response strategies and action plans in order to proactively manage the risk profile of each individual project.

Economic and Financial Analysis

HIGHWAY AND TRANSIT PROJECTS

**Oregon Department
of Transportation,
Salem, OR**

- ◆ Provided Program Management for the OTIA III State Bridge Program, a \$1.3 billion program which is replacing or repairing 365 bridges throughout the state of Oregon. Responsibilities included economic and financial modeling, forecasting, market analysis, and engineering management optimization. Using the combination of all of these modeling techniques Mr. Brink was able to optimize the timing of projects for the OTIA III State Bridge Delivery Program such that a sufficient and more economically sustainable flow of work was allowed to be bid by contractors. Other studies included labor and wage analysis, management of quarterly financials, forecasting of commodity prices, economic impact modeling to determine the economic effects of the cash flows being disbursed for design and construction, and modeling of highway user benefits in order to minimize queue lengths with respect to travel time during construction.

**Washington Department
of Transportation,
Seattle, WA**

- ◆ Performed a market based labor and wage analysis for the pontoon construction of the SR520 Floating Bridge in Seattle, WA. The study focused on determining whether the labor capacity and wage levels were sufficient to provide for a reasonable market basis to support constructing the pontoons at Grays Harbor, WA. This analysis also included determining the potential impacts to construction costs that could be incurred in the form of potential labor premiums that may have to be paid in order to bring in the needed amount of skilled trade labor.
- ◆ Developed a benefit-cost model that assesses the impacts of increased capacity, transit ridership, and congestion relief on the I-5 corridor over the Columbia River. This was an analysis assessing the benefit-cost relationship of including the installation of transit lines on the Columbia River Crossing (CRC) Bridge between Portland, OR and Vancouver, WA. The model was developed based on the primary collection and assessment of demographic data and analysis of the economic development related impacts such as growth in employment and increased trade. The main economic development impacts focused on Vancouver's potential development opportunities resulting from construction of new transit terminals.

City of Denver, CO

- ◆ Developed highway user benefit-cost model that analyzed the economic cost of lane closures during construction in peak, midday, and off-peak times in relation to travel times, environmental impacts, vehicle operating costs, queue lengths, and origin-destination pair route transference. This analysis was ultimately utilized in determining a fee structure to charge contractors on a per mile basis for closures incurred during construction in excess of the allowable traffic management plans established for the construction periods.

***Utah Department
of Transportation,
Salt Lake City, UT***

- ◆ Performed a market based labor and wage analysis for the construction of the Legacy Parkway in Salt Lake City, UT. The study focused on determining whether the labor capacity and wage levels were sufficient to provide for a reasonable market basis such that wages would not incur significant premiums, particularly in the skilled trades. This analysis also included determining the potential impacts to construction costs that could be incurred in the form of potential labor premiums that may have to be paid in order to bring in the needed amount of skilled trade labor, as well as for devising proactive strategies for developing or attracting needed labor resources.
- ◆ Developed a highway transportation benefit-cost model to assess the range of potential outcomes for tolling feasibility on the US 6 corridor at Spanish Fork, UT. The model includes the assessment of the impacts of safety as it relates to accidents, travel time, emissions and environmental impacts, and vehicle operation costs. The benefit-cost analysis demonstrated the range in values for cost savings achieved to traffic, including a feasible tolling fee in relative comparison of the costs incurred of the proposed corridor improvement.

***Alaska Department
of Transportation,
Anchorage, AK***

- ◆ Performed a financial viability analysis of the proposers for the Glenn/Bragaw Interchange Design-Build contract to be awarded. This analysis included determining the ability of companies to operate in terms of their operating structure, projected revenue stability, and potential risk of default. The analysis included a detailed analysis of each proposing company's bonding capacity in order to minimize the risk of default in relation to a contract being awarded.
- ◆ Performed a financial viability analysis of the proposers for the Gravina Island Interchange Design-Build contract to be awarded. This analysis included determining the ability of companies to operate in terms of their operating structure, projected revenue stability, and potential risk of default. The analysis included a detailed analysis of each proposing company's bonding capacity in order to minimize the risk of default in relation to a contract being awarded.

***Palouse Regional
Transportation Planning
Office,
Palouse, WA***

- ◆ Developed a logistical transportation model in assessing the areas needed for improvements in the investment of infrastructure funds with respect to the highest demand truck routes. Construction of the model was based on primary data collected through a survey geared towards capturing freight data from regional shippers in order to assess which stretches of highway would be the best investment for the RTPO to seek state funding for.

***Microsoft,
Redmond, WA***

- ◆ Developed a life-cycle cost analysis for aid in the selection of the employee transit system to be constructed on the main campus of Microsoft's headquarters in Redmond, WA specifically for connecting facilities, laboratories, and office space. The life-cycle costing approach focused on operational costs, maintenance costs, future upgrade costs, salvage value, and a rough order of magnitude estimate of first installation costs.

LOGISTICAL AND PORT FACILITIES PROJECTS

- Port of Tacoma,
Tacoma, WA**

 - ◆ Responsible for the construction of a mutually exclusive investment alternatives financial assessment model of potential development options of the South Sound Logistics Center (SSLC). The model includes the discounted cash flow analysis of net present value and return on investment of operational costs, capital expenditure development costs, and potential fees/revenues to be extracted from various rail and freight shipping activities involved in the proposed multi-modal facility. The development of the financial model included assessing the various potential build-out options of the SSLC through time and a mutually exclusive alternatives ranking. An element of uncertainty and variable risk was also introduced into the model to attain risk-adjusted cash flow results.

- Grundy County,
Seneca, IL**

 - ◆ Developed an economic benefit-cost model and economic impact input-output model for the assessment of the viability and economic impact to the regional economy of the establishment of a multi-modal logistical facility known as the I-80 Railport in Seneca, IL. The benefit-cost model observed savings to shippers, pavement wear savings from truck diversion, reduced accident savings, and reduced environmental impacts relative to the infrastructure investment costs of the full build-out option. The economic impact model estimated job creation, labor income, tax revenues, economic output, and value added of freight movement on the direct, indirect, and induced levels in order to assess the growth to the regional economy that could be anticipated.

- CORPS Railroad,
Roseburg, OR**

 - ◆ Developed an economic impact input-output IMPLAN model for calculating the direct, indirect, and induced economic impacts including job creation, labor income, tax revenues, economic output, and value added of freight movement through the CORPS Rail Yard. The analysis was utilized for the justification of the obtainment of grant money for the upgrading of the facility to stimulate more regional economic growth.

- Port of Kennewick,
Pasco, WA**

 - ◆ Performed a market analysis and estimated the corresponding direct, indirect, and induced economic impacts by utilizing a customized IMPLAN input-output economic model. Economic impacts observed included job creation, labor income, tax revenue, resulting economic output and value added to the local economy of locating a wine business incubator at the Port of Kennewick. This data was utilized to plan for the site size, revenue forecasting, and for anticipated business relocation and development planning in the port district.

- Port of Benton,
Benton, WA**

 - ◆ Performed a market analysis and estimated the corresponding direct, indirect, and induced economic impacts by utilizing a customized IMPLAN input-output economic model. Economic impacts observed included job creation, labor income, tax revenue, resulting economic output and value added to the local economy of locating a wine business incubator at the Port of Benton. This data was utilized to plan for the site size, revenue forecasting, and for anticipated business relocation and development planning in the port district.

**Winchester Rail Yard,
Winchester, OR**

- ◆ Developed a customized IMPLAN economic input-output model to determine the direct, indirect, and induced economic impacts of upgrading and expanding capacity at the Winchester Rail Yard. The economic impacts observed included job creation, labor income, tax revenues, economic output, and value added in relation to the local economy. The basis of the analysis was utilized to obtain Federal grants for investment into the facility to further economic growth in the region.

ENVIRONMENTAL FACILITIES, WATER AND WASTEWATER TREATMENT PLANTS

**Oregon Water Resources
Department,
Salem, OR**

- ◆ Developed an uncertainty model to assess the range of potential outcomes for given alternatives in relation to water demand across municipal, industrial, domestic, and agricultural sectors. In addition, the model includes the assessment of the impacts of climate change and conservation methods being employed. The uncertainty analysis demonstrates the range in values for input and output variables in the model to be utilized by OWRD in the estimation of demand side factors and how to adequately meet those demands in the most equitable means.

**Covington Water District,
Seattle, WA**

- ◆ Facilitated meetings and workshops in order to develop a benefit-cost model for analysis to select reclaimed water system options defined in the prior completed Phase 1 feasibility analysis. Additional efforts included preparation of a brief summary of the Phase 1 final report, for distribution, as well as conducting presentations/briefings on the Phase 1 effort to a variety of stakeholder groups. The benefit-cost analysis uses the Raucher benefit-cost framework discussed in “An Economic Framework for Evaluating the Benefits and Costs of Water Reuse” which was published by the WaterReuse Foundation. The model focused on capturing many of the user associated benefits derived from the different types of water uses in the Covington-King County Water Districts in Seattle, WA.

**Brazos Valley
Groundwater
Conservation District,
Bryan and College
Station, TX**

- ◆ Developed a multi-tiered IMPLAN model and performing economic impact analysis of desired future conditions for aquifers in the Groundwater Management Area (GMA) 12 in Texas. The impact analysis was utilized to determine the quantity of Managed Available Groundwater (MAG). The analysis included determining direct, indirect, and induced economic impacts through a customized IMPLAN input-output economic model. Economic impacts observed included employment, labor income, tax revenue, resulting economic output and value added to the local economies.

**Nevada Site Services,
Pahrump Valley, NV**

- ◆ Developed an after-tax discounted cash flow model for the analysis of four mutually exclusive investment alternatives in the upgrading of a waste water treatment plant. Calculated project ranking metrics of NPV, IRR, MIRR, payback period, break-even point, and the discounted cash flow rate of return (DCFROR) with respect to the cost structure of the facility type, anticipated demand, and corresponding revenues generated by the type of facility. In addition, a risk ranking matrix was developed based on sensitivities of mutually exclusive project cash flows in order to rank the highest to lowest risk investment alternatives.

OTHER PROJECT EXPERIENCE

**EchoStar Satellite,
Englewood, CO**

- ♦ Managed team of software engineers engaged in development, implementation, and deployment of software tools across the client organization in relation to consumer billing, cash flow management, and managing positive consumer relationships for business viability. The total project was a multi-year \$110 million implementation of a Siebel Systems CRM software platform. This included performing financial analysis and development of a customer relationship management protocol, management and oversight of the financial development team, and assistance as a client liaison with Siebel Systems. Other responsibilities included project management of software engineering life-cycles, software scripting and development, as well as working with the client to design optimal application architecture.