Lessons Learned:
Implementing risk based estimating

Evaluating Change

- Is there a significant problem that must be addressed?
- Am I the right one to address it?
- Is this the right solution?
- What will it cost me to implement?
What is the Problem?

- Is there uncertainty?
  - Labor
  - Materials
  - Outside influences
  - ROW / landowners
  - Geotech / unsuitable site
  - Other

Why Me?

- Baseline
- Reporting
- Project Completion
- Accountability
Typical Solutions

- Use policy or practice to add contingency
- Risk register – Risk identification
- Inflate estimate to make up difference
- Take your lumps

New Idea - RBE

- How much time will it take?
- Will it work?
- What support will I have?
**Process & Results**

- Labor and materials
- Outside influences
- ROW / land owners
- Geotech / unsuitable site
- Other

**Identify & Risks**

**Quantify**

**Allows for:**
- Focused attention
- Resource allocation
- Expectation setting
- Proactive management
- Fewer surprises

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**Proactive Management**

- Snapshot – immediate actions
- Update – capture new risks
- Identify issues early – trend over time
Limitations of RBE

- Does not solve problems
- Does not provide certainty
- Requires expertise and learning
- Is only one tool
- Requires commitment to get full benefit

Implementation Strategies

- Find champions
- Develop in-house expertise
- Right time / right situation
- Adjust policy / procedures
- Executive support
- Quick wins
- Consistent application
- Transparency
- Partner participation
Evaluating Change

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Questions?

David Smelser
WSDOT Rail Capital Program Manager
(360) 705 – 6916
smelsed@wsdot.wa.gov
WSDOT’s Cost and Schedule Risk Assessment – Innovative Solutions

- WSDOT Project Management (PM)
- Short history of the WSDOT process of Risk Assessment (RA)
- RA process overview
  - Definition
  - Scalability
  - Resources required
  - Benefits

WSDOT’s Cost and Schedule Risk Assessment – Innovative Solutions

- Lessons learned
  - Develop in-house expertise
    - Resources
    - Tools
  - Risk reserve
  - Risk Treatment Planning
Innovations at WSDOT Risk Assessment

- Combine Value Engineering with Risk Assessment (VERA)
- Number of risks
- Market conditions
- Risk’s conditionality
  - Dependency
  - Correlation
- Risk’s severity

WSDOT’s Cost and Schedule Risk Assessment – Innovative Solutions

WSDOT Project Management

- Initiate and Align
- Plan the Work
- Manage Change
- Endorse the Plan
- Work the Plan
- Transition and Closure
- Risk Assessment
- Risk Treatment Planning
- Monitoring & Control
Risk Management Cycle

- Organization’s Policies
  - E 1031; E 1053; E 1042;
  - IL 4071;

- Establishing the project’s context
  - Project objectives, assumptions, base cost & duration

- Risk Assessment
  - Risk identification
  - Risk analysis
  - Risk evaluation

- Communication & consultation
  - Decision making
  - Implementation
  - Next look
  - Monitoring and Control

- Risk Treatment Planning (Fight or Flight)
  - Avoidance
  - Acceptance
  - Changing the likelihood
  - Changing the consequences
  - Sharing

- Implementation

- Response

Thirteen Years of Risk Assessment

“CEVP® (risk-based analysis) was developed to address risk and uncertainty - very useful results”

“...transportation department effort to plan more accurately and manage money more effectively...So give DOT some

“Giving citizens a range of costs, including full disclosure of the variables, is not only politically smart, but it’s common sense”

Seattle Post-Intelligencer, June 2002
Methods of delivery of project risk assessment:
• Started with Cost Estimating Validation Process (CEVP) in 2002
  - Projects above $100 million
  - Requires External Subject Matter Experts

• Added the Cost Risk Assessment (CRA) in 2003
  - Projects between $25 and $100 million
  - May be done with only WSDOT participants
Thirteen Years of Risk Assessment

Methods of delivery of project risk assessment:

- Started with Cost Estimating Validation Process (CEVP) in 2002
  - Projects above $100 million
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- Added the Cost Risk Assessment (CRA) in 2003
  - Projects between $25 and $100 million
  - May be done with only WSDOT participants
- Combined Value Engineering and Risk Assessment (VERA) in 2005
  - Projects over $25 million and bridges over $20 million
  - Any other projects that may benefit from VERA
  - Requires External Subject Matter Experts
Risk Assessment -- Process overview

- Definition – is a systematic cost and schedule review that incorporates the effect of uncertainties upon project’s objectives.

The risk assessment must provide actionable data that may optimize the project objectives.

- Scalability – the level of effort varies depending on project’s magnitude and complexity.
Risk Assessment -- Process overview

- Resource required – is represented by a wide range (minimal when the workshop is produced in-house and tens of thousands of dollars when consultants are involved)

- Benefits:
  - Better understanding of project’s objectives
  - Minimizes surprises
  - Provides data for optimizing the project’s objectives
Risk Assessment -- Lessons learned

Executives Support!!

Risk Assessment -- Lessons learned

- Develop in-house expertise
  - Human resource – dedicated team that should have a passion toward understanding and enhancing the process of risk management
Risk Assessment -- Lessons learned

- Develop in-house expertise
  - Human resource – dedicated team that should have a passion toward understanding and enhancing the process of risk management
  - Tools – develop tools that are applicable towards department needs.
    - Simulation model,
    - Communication tools

- Collaborate with consultants
Lessons learned – Risk Reserve

Risk Reserve = Legislative Budget - Operational Budget

Lessons learned – Risk Reserve

Risk Reserve = Legislative Budget - Operational Budget

With Active RM

Without Active RM

$5M Risk Reserve
Risk Assessment -- Lessons learned

- Risk Treatment Planning
  - It allows the project team to digest the information obtained from the risk workshop and to decide on risk treatment strategies.
Risk Assessment -- Lessons learned

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  - It provides better raw data (cost, schedule and risks) for risk analysis.

- The cost risk profile is more accurate
Risk Assessment -- Lessons learned

- Risk Treatment Planning
  - It allows the project team to digest the information obtained from the risk workshop and to decide on risk treatment strategies.
  - It provides better raw data (cost, schedule, and risks) for risk analysis.
  - The cost risk profile is more accurate.
  - It initiates the implementation of risk treatment strategies.

Risk Assessment -- Innovations

- Combined Value Engineering with Risk Assessment (VERA) – represents the most efficient process of risk assessment. It was used for projects ranging from less than $10 million to over $1 billion.
Risk Assessment -- Innovations

- Number of risks – we recommend the assessment of only significant risks. When a significant risk occurs it will require supplemental intervention.
Risk Assessment -- Innovations

- Number of risks – we recommend the assessment of only significant risks. When a significant risk occurs it will require supplemental intervention.

- Market Conditions – we found the MC may be the most important driver of the construction cost. MC is driven by the expected number of bidders on the project.

Comparison of the Low Bid vs. the Estimate Based on Number of Bidders
Risk Assessment -- Innovations

- Risk’s conditionality
  - Dependency – every risk must be evaluated in relationship with other risks.
  - Correlation – must be justified and documented. Correlation is a powerful way of increasing the cost distribution range and sometimes is abused.

- Project risks map – comprehensive visual representation of the project risks
Traditional Tornado Diagram

Candidates for Cost Risk Management (pre-mitigated)

- High
- Moderate
- Low
- Very Low

Threat's impact

Opportunity's impact

Risks Map

Schedule

Cost

Discovery

Agreement

Pile drive

Holding capacity

Pile drive

Scope changes

Agreement

QC/QM delivery

Marine Const.

Concrete piles

Seismic Upgrade

Slip 3

Hazard. Mat.

Marine Const.

Concrete piles

Seismic Upgrade

Schedule Cost

GC/CM delivery

Sailing Schedule

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• WSDOT has over 13 years experience in the field of project risk assessment

• WSDOT uses a scalable approach of risk management
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