

RISK MANAGEMENT TRAINING



Agenda

- ◆ Risk Overview
 - ✓ Risk Assessment
- ◆ Risk Management
 - ✓ Risk Response
 - ✓ Risk Allocation
 - ✓ Risk Monitoring & Controlling
- ◆ Risk Modeling
 - ✓ Pre-Mitigated Results
 - ✓ Post-Mitigated Results
 - ✓ Lessons Learned



Presented By Tim Brock, PE

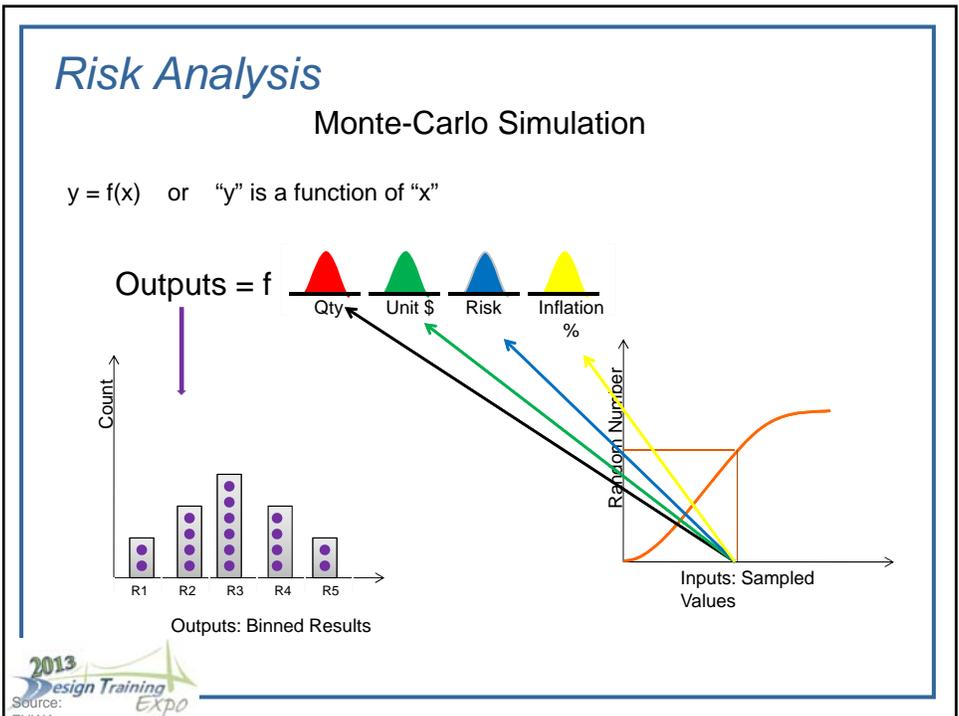
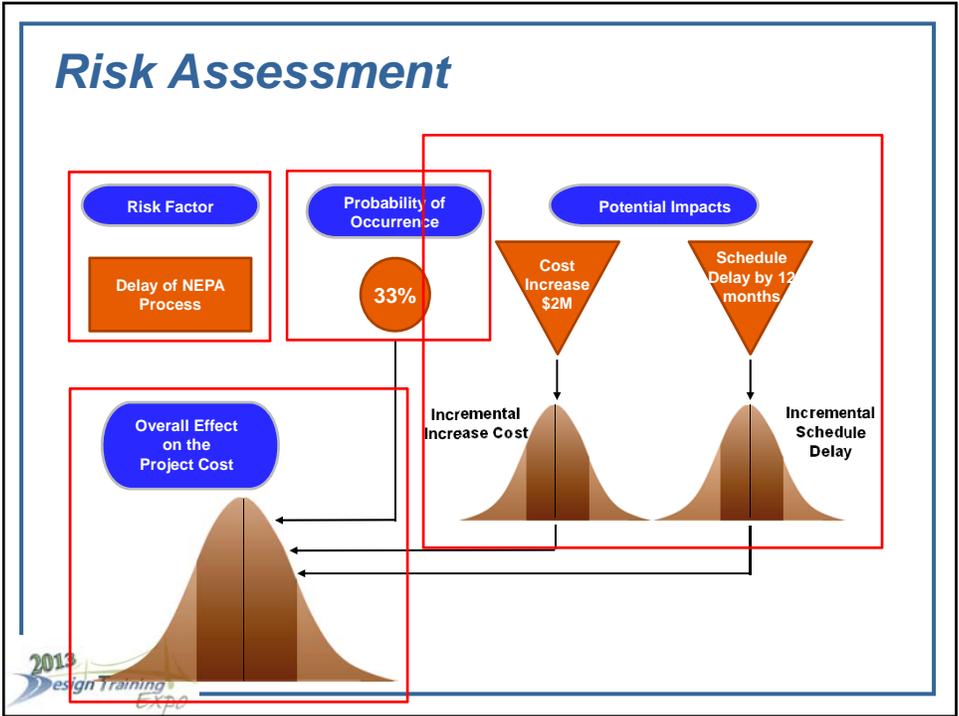
RISK MANAGEMENT OVERVIEW



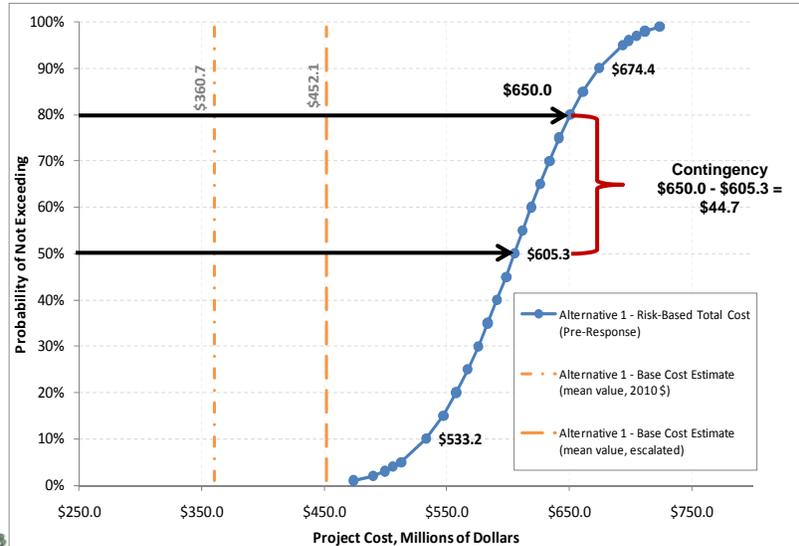
What is Risk?

- ◆ “An uncertain event or condition that, if it occurs, has a positive or negative effect on the project’s objectives.”





Risk Analysis – Pre-Mitigated Results



Risk Analysis – The Register

Risk Register for I-4						Initial Risk Quantification														
Project #	Risk ID	Risk Name	Activity Impacted	Risk Description	Initial Probability of Occurrence (%)	Cost Risk Information (Millions \$)			Schedule Risk Information (Months)			Initial P(L)			Initial P(M)			Initial P(H)		
						Initial Low Cost	Initial Most Likely Cost	Initial High Cost	Initial Low Schedule	Initial Most Likely Schedule	Initial High Schedule	Initial P(L) Schedule	Initial P(M) Schedule	Initial P(H) Schedule	Initial P(L) Cost	Initial P(M) Cost	Initial P(H) Cost			
1	105.02	Design, Structures, and Geotech Risks	118	Add South Street Modification	100%	\$93.40	\$93.40	\$93.40	0	0	0	4.2	4.3	4.4						

Initial Probability of Occurrence (%)	Cost Risk Information (Millions \$)			Schedule Risk Information (Months)			Initial P(L) Schedule	Initial P(M) Schedule	Initial P(H) Schedule
	Initial Low Cost	Initial Most Likely Cost	Initial High Cost	Initial P(L) Cost	Initial P(M) Cost	Initial P(H) Cost			
100%	\$93.40	\$93.40	\$93.40	0	0	0	4.2	4.3	4.4



Risk Analysis – The Register w/ Responses

Risk Register for I-4						Initial Risk Quantification													
Item #	ID #	Risk Specific Category	Activity Impacted	Risk Name	Description	Initial Probability of Occurrence (%)	Cost Risk Information (Millions \$)			Schedule Risk Information (Months)			Schedule Risk Information (Months)						
							Initial Low Cost	Initial Most Likely Cost	Initial High Cost	Initial Low Schedule	Initial Most Likely Schedule	Initial High Schedule	Initial P10 Cost	Initial P50 Cost	Initial P90 Cost	Initial P10 Schedule	Initial P50 Schedule	Initial P90 Schedule	
1	003.02	Design, Structures, and Geotech Risks	118	Add South Street Modification	Need to add plan work. Additional construction cost. Initial Risk is being governed separately from I-4 section. 20,000 plus 4000 which is already included in the base file numbers.	100%	\$0.40	\$0.40	\$0.40	0	0	0							

Risk Response			Mitigation Risk Quantification										
Review Frequency	Risk Response Strategy	Response Comments	Probability of Occurrence (%)	Cost Risk Information (Millions \$)			Schedule Risk Information (Months)				Expected Value Schedule Response		
				Low Cost (Response)	Most Likely Cost (Response)	High Cost (Response)	Expected Value Cost (Response)	Low Schedule (Response)	Most Likely Schedule (Response)	High Schedule (Response)			
54	55	56	57	58	59	60	61	62	63	64	65	66	
	Reduce	See if Turnpike construct the bridge instead (TP may not need to replace bridge, may be able to get vertical clearance exception).	25%	\$1.00	\$1.50	\$2.50	\$0.40						
	Reduce	Conduct soil borings where ponds would be to get a better idea of the type of soil. Cost for boring test: for a 10 acre drainage pond, around \$50k per test for 10 tests.	40%	\$3.00	\$4.50	\$6.00	\$1.80						



Presented By Robert Quigley, PE

RISK MANAGEMENT

RISK RESPONSE

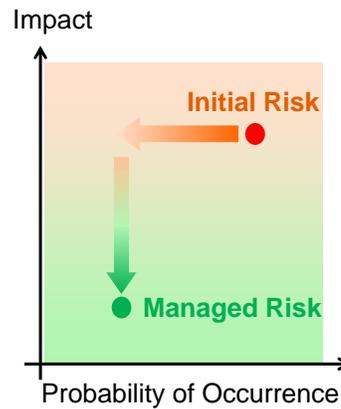
RISK ALLOCATION

RISK MONITORING & CONTROLLING

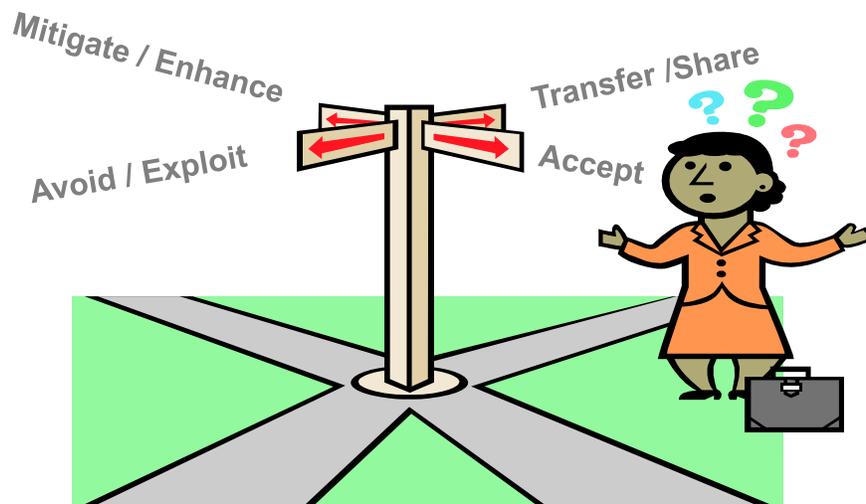


Risk Management

- ◆ Risk Assessment's aim is to assess potential impact of various scope, event, and budget risks on the project's cost and schedule.
- ◆ Risk Management's aim is to identify opportunities and mitigation strategies to reduce both the likelihood of an event occurrence and the potential effect if it occurs.



Risk Response



Risk Response Strategies

Threats Risk Factors that Increase Cost or Schedule	Opportunities Risk Factors that Reduce Cost or Schedule
Avoid: Change the project scope to eliminate the impact of a risk.	Exploit: To make a proactive decision to take action to show that an opportunity is realized.
Transfer: Move a risk to another party who is more capable at handling the risk (such as the developer or insurance company).	Share: Assigning ownership of the opportunity to a third-party who is best able to capture the benefit for the project.
Mitigate: The project team may seek to lessen the impact of a specific risk item, which may involve the consumption of additional time and/or money. Mitigation usually requires positive action and has a cost.	Enhance: Take action to increase the probability and/or impact of the opportunity for the benefit of the project; seeking to facilitate or strengthen the cause of the opportunity, and proactively targeting and reinforcing its trigger conditions.
Accept: To take no action when a response may be too costly to be effective or when the risks are uncontrollable and no practical action may be taken to specifically address it. In active acceptance, the project team sets up a contingency reserve fund to account for the residual expected value of the remaining risks.	



Risk Response Planning

- ◆ **Risk Response Plan** – A plan of action designed to reduce the impact once a risk event has occurred
 - ✓ **Planning** – Prior to the risk event occurring as though it will occur
 - ✓ **Trigger** – Identifies that the risk event has occurred and notifies the team to implement the risk response plan
 - ✓ **Implementation** – Actions to take after the risk event has occurred



Tracking, Monitoring & Control

- ◆ Development of Risk Management Plan involves:
 - ✓ **Identifying Risk Owners** to take responsibility for key risk factors and associated risk response strategies
 - ✓ **Identifying Monitoring Frequency** for risk updates and feedback on the effectiveness of risk response strategies
 - ✓ **Updates to the Risk Model** and results at key milestones and when baseline cost and schedules are updated
 - ✓ **Update Risk Management Plan** continuously to document and report progress



Tracking, Monitoring & Control

Risk Response Plan		Monitoring & Control		
Strategy	Action To Be Taken (response actions including advantages and disadvantages. Specify the time frame)	Risk Owner	Risk Review Dates	Date, Status & Review Comments (to show the history of risks monitoring, do not delete previous comments)
Mitigation	Finalize design to identify all wetlands that are impacted. Early coordination with the outside agencies to determine mitigation ratio	Design Leader / Enviro. Mgr.	2008-Dec-2 2008-Jan-2	As of Nov. 15, 2008 there are only two potential areas where there could be additional wetland impacts. As of De. 2, 2008 agency has initially determined that mitigation ratio would be 4:1.

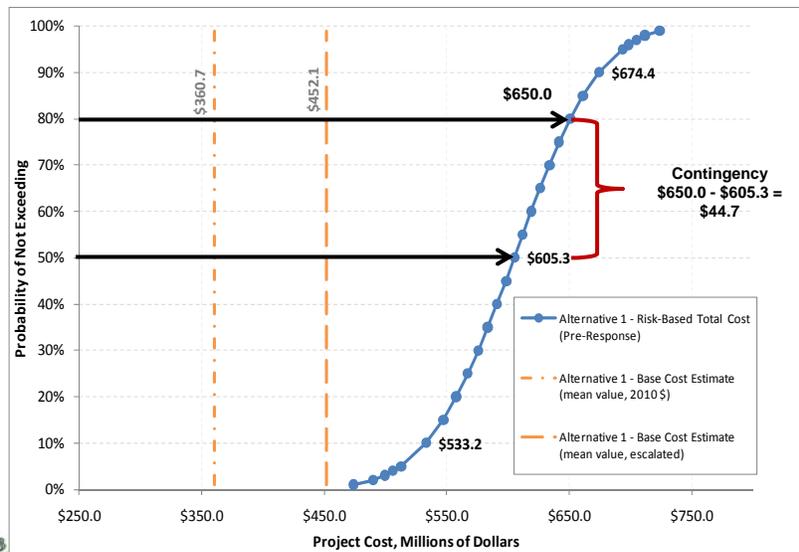


Presented By Jose Theiler, PE

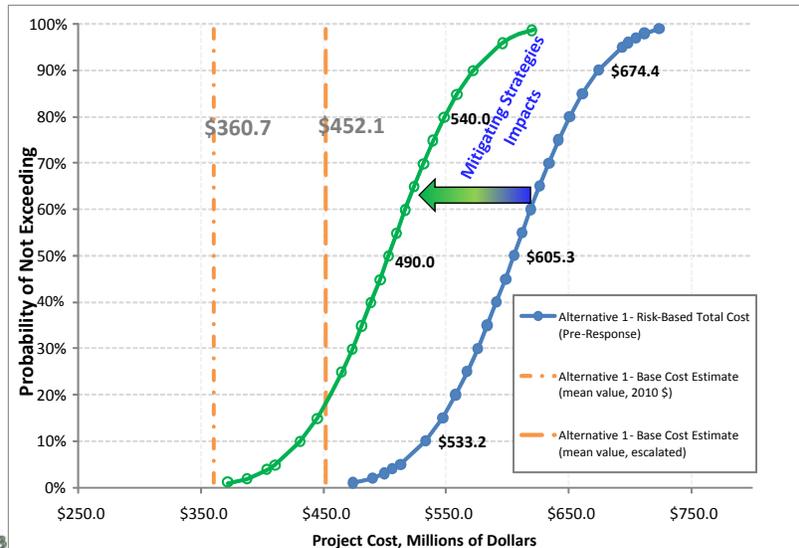
RISK MODELING



Risk Analysis – Pre-Mitigated Results



Risk Analysis – Post-Mitigated Results



2013
Design Training
Expo

Benefits

- ◆ Encouraging pro-activity and early planning
- ◆ Building confidence and credibility in project's plans and estimates
- ◆ Developing targeted mitigation strategies for all anticipated threats
- ◆ Better allocation of risks and identification of project delivery methods
- ◆ Ensuring transparency, integrity, and accountability throughout the life-cycle of the project

2013
Design Training
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Return on Investment

- ◆ Helps manage expectations for budget and schedule
- ◆ Improved Communication between stakeholders
- ◆ Risk management shown to
 - ✓ decrease 90% of project problems ⁽¹⁾ and
 - ✓ generate 5% cost savings ⁽²⁾

Source: FHWA Risk Management Workshop course materials, Golder Associates Inc. & Dr. Keith Molenaar, October 9, 2007; attributed to (1) Project Management Institute, and (2) Construction Management Institute



FDOT Lessons Learned

- ◆ I-95 Managed Lanes (Broward & Palm Beach Co.)
 - ✓ Drainage Issues
 - ✓ R/W Constraints
 - ✓ Cemetery
 - ✓ Realistic Cost Estimate → Funded Project
- ◆ Crosstown Parkway (LAP)
 - ✓ Accelerated Schedule
 - ✓ Construction Sequencing



FDOT Lessons Learned

- ◆ Flagler Memorial Bridge
 - ✓ Residual Risks
 - ✓ Secondary Risks after Response
 - Reassess
 - Fall-back Strategies
- ◆ Risk in-lieu of Flat Contingency %
 - ✓ Self-Assessment Tool
 - ✓ Mainstreamed Process (Annual WP Update)
 - ✓ Release Funding for Other Projects



What's Next?

- ◆ Risk Register Repository
 - ✓ Trending for
 - Most Occurring
 - Most Expensive
 - Response Strategies
 - ✓ Pareto Analysis
 - Training Opportunities
 - Process Improvements
- ◆ Cash Flow Analysis and Forecasting



Robert Quigley, PE – State Project Management Engineer

Tim Brock, PE – District 4 Risk & Value Engineering

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QUESTIONS?

