



# Risk Management



# Project Managers are busy!

Why should we spend time  
on risk management?

**ALL PROJECTS**  
should have *some*  
documented risk  
management activity



# Risk Management

- Identify and Analyze
- Respond, Monitor and Control



Project Risk Management (PM/PMBOK)

Risk Management Planning

WSDOT Project Risk Management

**Identify**  
Risk Identification

**Analysis**  
Qualitative Risk Analysis    Quantitative Risk Analysis

WSDOT Risk Based Estimating  
CRA and CEVP Workshops  
Self-Modelling Risk Matrix

- Modeling results.
- Ranked Risk Register with significant risks identified.
- Possible response strategies.

Putting it to work in the real world  
For  
Real results that you can see and measure.

**Response (pro-active)**    **Response (reactive)**  
Risk Response Planning

Risk Monitoring and Control

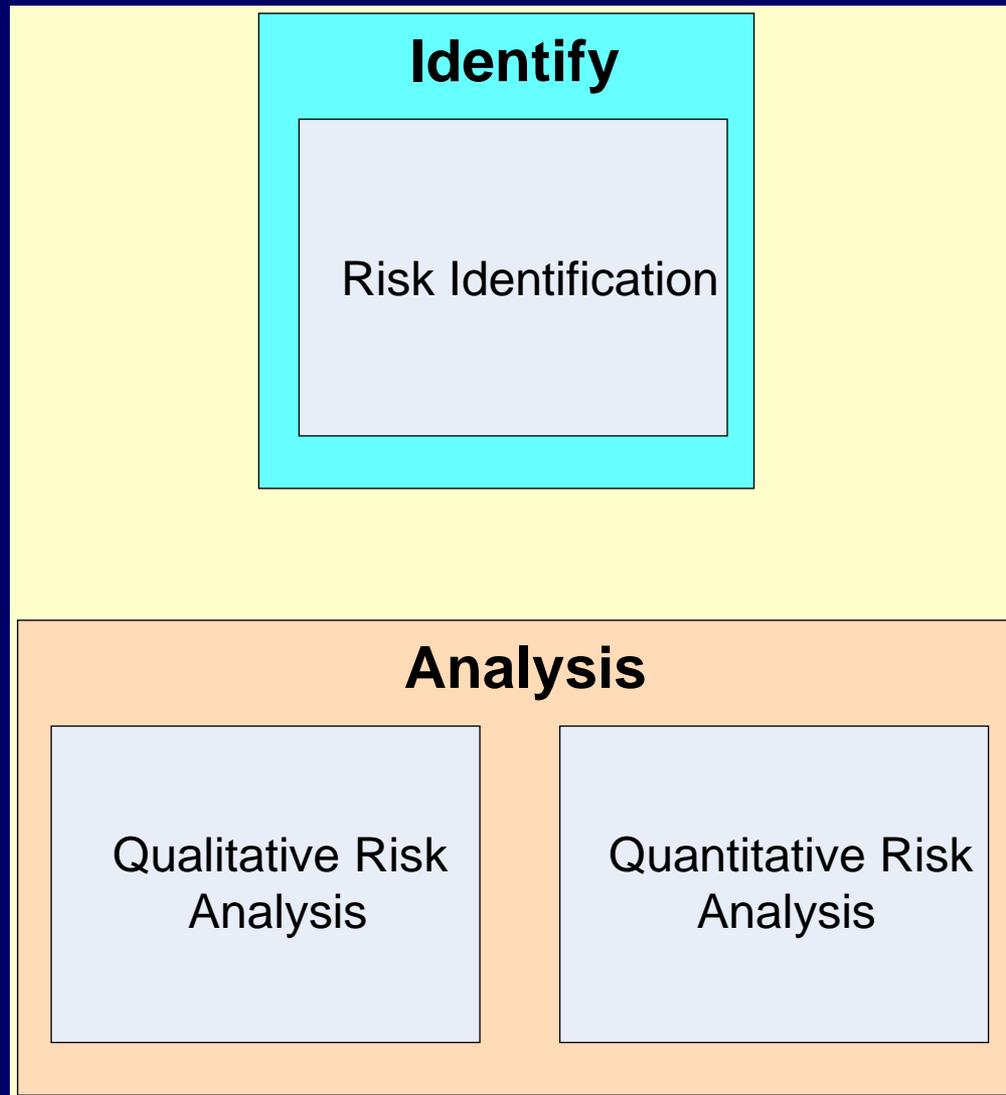
The thinking and planning have been accomplished.

It is now time to act.

**ACTION POINTS FOR SIGNIFICANT RISKS**

1. **DECIDE** on your response:
  - Avoid
  - Transfer
  - Mitigate
  - Accept
2. **DETERMINE** cost of your response and record it in your Risk Management Plan, carry out the response you have decided on.
3. **REVIEW** and document status of risk at your regularly scheduled meetings.

Reporting on status of risk management should be an element of the standard scope, schedule and budget reporting expected for the project.



**Response  
(pro-active)**

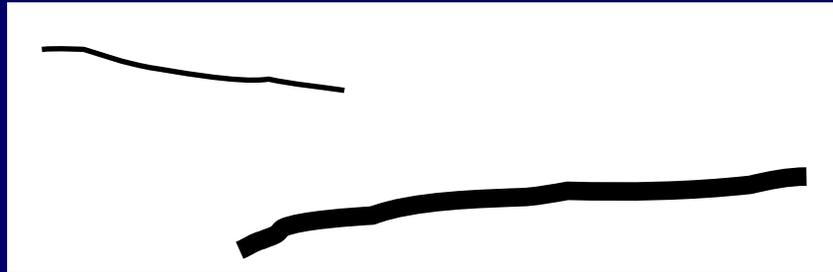
**Response  
(reactive)**

Risk Response Planning

Risk Monitoring  
and Control

# Uncertainty

- All measurements have uncertainty
- All estimates are uncertain



UNCERTAINTY - *The lack of knowledge of the outcome for a particular element or value*



# Risk

*Combination of the probability of an uncertain event and its consequences*

A positive consequence presents an *opportunity*; a negative consequence poses a *threat*

# Risk

*Exposure to the consequences of uncertainty... the chance of something happening that will have an impact upon objectives. It includes the possibility of loss or gain, or variation from a desired or planned outcome, as a consequence of uncertainty associated with following a particular course of action. Risk thus has two elements: the likelihood or probability of something happening; and the consequences or impacts if it does.*

*Source: "Project Risk Management Guidelines", 2005,  
Cooper, Grey, Raymond, Walker*

# Project Risk

Exposure of stakeholders to the consequences of variations in outcome. The overall risk affecting the whole project, defined by components associated with risk events, and other sources of uncertainty **to be managed** at the strategic level.

*Source: Project Risk Analysis and Management Guide,  
2004 APM Publishing*

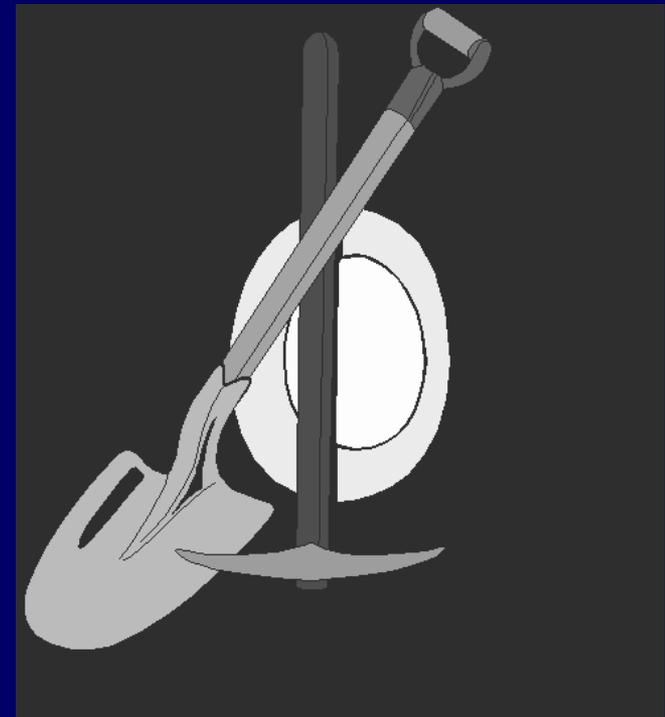


# Risk

■ Threat

or

Opportunity





We do not work in an  
environment of absolute  
certainty



# Risk Tolerance?

- Is WSDOT Risk Averse?
  - How would you know?
  - What criteria would you consider?
  - Is it better to avoid risks or take risks?

# Risk Tolerance

- What is your tolerance for risk?

HOV  
Lane



# Risk Tolerance

- What is your tolerance for risk?

Speeding





# Why is it Important to Understand Risk Tolerance?

Complete project management plans **must** consider risk

- To be proactive
- To take action to shift the odds in our favor
- To avoid surprises



**Risk Management Plans** are critical because they **prompt action** by the Project Manager and Project Team

Risk Management is **standard practice for all WSDOT Projects** and is an integral component of all Project Management Plans



# Command Intent

Military expression

- Is clearly known and identified
- To help field personnel respond

“No combat plan survives contact with the enemy”

- Enemy response
- Weather
- Others get involved
- Key asset is destroyed



# Project Intent

- What is the core goal of the project?
  - We know the team mission  
(part of our project management plan)
- Have we considered threats to the project?
- Have we considered opportunities to aid in completing the project?



# Executive Order 1032.00

...**all...projects** are to be delivered consistent with the principles and practices of the department's project management process.  
<http://www.wsdot.wa.gov/Projects/ProjectMgmt/>

# Executive Order 1038.00

...**are directed to** support the department's efforts to identify, share and manage risk across all organizations and functions.

Project Management On-Line Guide

Pre-Construction Construction



- [Project Description](#)
- [Team Mission/Assignment](#)
- [Major Milestones](#)
- [Boundaries](#)
- [Team Identification](#)
- [Roles/Responsibilities](#)
- [Measures of Success](#)
- [Operating Guidelines](#)

- [Work Breakdown Structure\(WBS\)/Master Deliverables List \(MDL\)](#)
- [Task Planning and Scheduling](#)
- [Budget](#)
- [Risk Planning](#)
- [Communication Plan](#)
- [Change Management Plan](#)
- [Quality \(QA/QC\) Plan](#)
- [Transition and Closure Plan](#)

- [Project Team Commitment](#)
- [Management Endorsement](#)

- [Manage the Scope, Schedule and Budget](#)
- [Manage Risks](#)
- [Manage Change](#)
- [Communicate](#)
  - [Progress](#)
  - [Issues](#)
  - [Lessons Learned](#)

- [Implement Transition Plan](#)
- [Review Lessons Learned](#)
- [Reward & Recognize](#)
- [Archive](#)

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**RISK PLANNING**



**MANAGE RISKS**

# Risk Management Planning

- Risk Identification
- Qualitative Risk Analysis
- Quantitative Risk Analysis

## Risk Management

- Respond (take action!)
- Risk Monitoring & Control



# Take Action

## Risk Responses

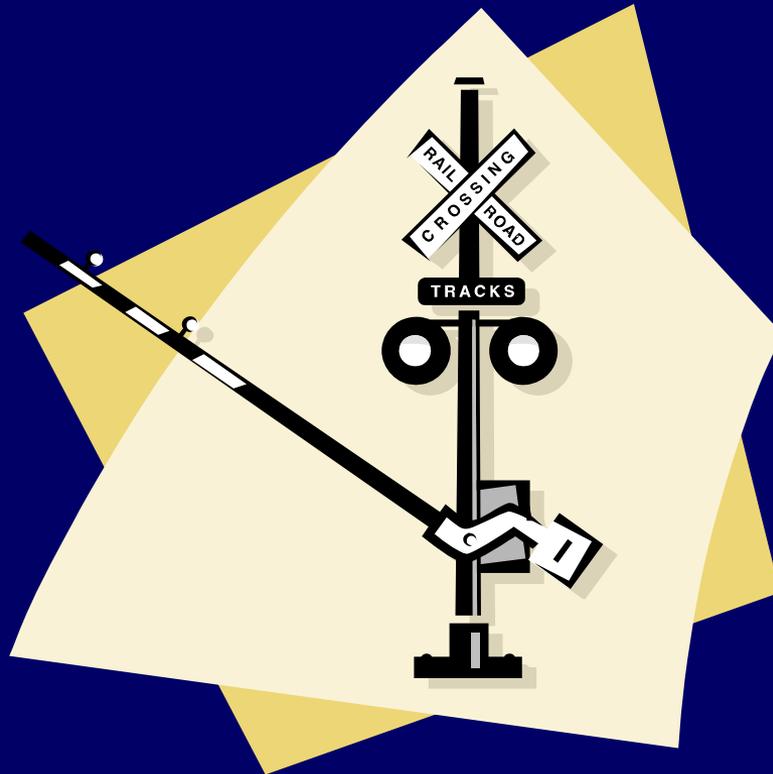
- Avoid
- Transfer
- Mitigate
- Accept

*“Experience is not what happens to you, it is what you do with what happens to you.” - Aldous Huxley*

# Take Action

## Risk AVOIDance responses

- Eliminate the risk (or stay away from it)



# Avoidance Actions

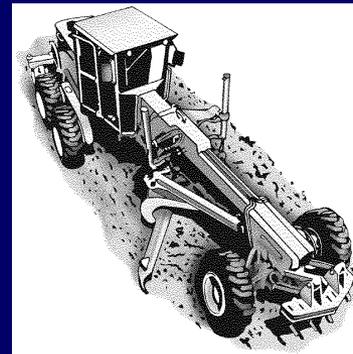
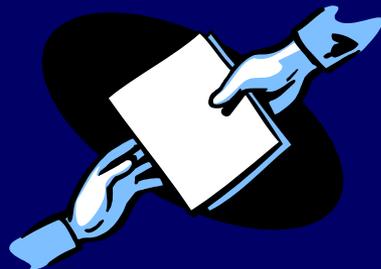
- **Avoidance (direct responses)**
  - *Clarify requirements*
  - *Define objectives (project intent)*
  - *Obtain information*
  - *Improve communication*
  - *Undertake research, prototype or further development*
- **Avoidance (indirect responses)**
  - *Change scope to exclude risk elements*
  - *Adopt a familiar approach instead of an innovative one*
  - *Use proven technology instead of leading edge*
  - *Build redundancy into project design*
  - *“Design out” certain types of risk*

# Take Action

- Risk Transfer responses  
*(this is Not Free!)*

At a recent conference, a heavy civil contractor offered the following quote:

***“Contractors do not take risk ....  
They price it”.***





# Transfer the Risk

- **Transfer (to a third party)**
  - *Typically limited to financial risk exposure*
  - *Can include use of insurance*
  - *Performance bonds, warranties, and guarantees*
  - *Self-insurance*
- **Transfer (use contract to pass liability)**
  - *Use of a fixed price*
  - *Risk-reward or risk-sharing contracts*
  - *Target cost incentives*
  - *Liquidated damages or penalty/incentive payments*
  - *Design-Build vs Design-Bid-Build*

# Take Action

- Risk **Mitigation** responses
- Risk **Acceptance** responses



# Take Action

- **Mitigation Responses**

- *Tackle the causes of the risk*
- *Seek to reduce the probability of the risk occurring*
- *Seek to reduce the impact if the risk does occur*

- **Acceptance Responses**

- *Establish a 'risk budget' for defined risks*
- *Assign a cost for unforeseen risk events*
- ***Develop a risk aware culture*** *for the project team*
- *Incorporate risk management into routine processes*
- *Include risk response strategies in the project plan and budget*

# Secondary Risk Effects

- Risk Profiles Change
- Risks Evolve



# Risk Management Plan (RMP)

In recognition of risk and good business practice we create a RMP

Project Title  
 Project PIN #  
 Date  
 Project Mngr Name Telephone Number (xxx) xxx-xxxx

## PROJECT RISK MANAGEMENT PLAN

Priority	PROJECT RISK MANAGEMENT PLAN															
	Risk Identification						Qualitative Analysis				Risk Owner	Risk-Response Strategy		Monitoring and Control		
Status	ID #	Date Identified Project Phase	Risk Event (threat/opportunity)	SMART Column	Risk Trigger	Impact Area	Affected MDL/WBS Level 2 process	Probability	Impact	Risk Matrix		Strategy	ACTION TO BE TAKEN (include advantages and disadvantages)	Status Interval or Milestone Check	Date, Status and Review Comments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Instructions	Active=actively monitored & controlled Dormant=risk is not currently a high priority, but may become active in the future. Retired=no longer a threat to project objectives.	E1	For example: 6/30/99 Scoping	Risk is an uncertain event or condition that, if it occurs, has a positive (opportunity) or negative (threat) on a project.  For example: Wetland Mitigation requires additional R/W.	Detailed description of the risk includes information on the risk that is Specific, Measurable, Attributable, Relevant and Timebound. Describe the consequences of the risk to scope, schedule, budget or quality.	Triggers are indications that a risk has occurred or is about to occur. Used to determine when to implement the Risk Response Strategy.  For example: Wetland impact is greater than 1/2 acre.	Is the primary impact to the scope, schedule, or budget?	Which WBS element will be modified as part of the response strategy? For example: PC-19 Environmental Permits	Assessment of the likelihood of occurrence. Valid entries are Low or High.	The severity of the risk's effect on the projects objectives. Valid entries are Low or High.	High: Substantial impact on cost, schedule, or technical. Substantial action required to alleviate issue. Low: Minimal impact on cost, schedule, or technical. Normal management oversight is sufficient.	Name of the person or office responsible for managing the risk event.	Avoidance Transference Mitigation Acceptance (See PM Online Guide for strategy definitions.)	Develop options and determine actions to be taken in response to the risk event. Immediate action may be required at the time of identification. Estimate value of risk and estimate cost to respond.	For example: Completion of wetland delineation expected: 2/28/00	For example: Last status update 4/30/00. Wetland delineation completed 3/15/00. Over 1 acre of wetland was delineated, action is being taken to expedite meetings with regulatory agencies & expedite the effort to provide appropriate wetland mitigation & attain project permits.
							WBS 165 Perform Environmental Studies and Prepare Draft Environmental Document (DED)									



# Risk Management

**Risk Management** is an integral component of **day-to-day project management**.

Project teams implement and **continuously upgrade the Risk Management Plan** throughout the project.

Primary Risk Management functions include:

- Monitoring risk and opportunity elements
- Identifying new risk and opportunity elements
- Evaluating/upgrading probability of occurrence and potential impacts
- Devising and implementing response strategies
- Evaluating and documenting the effectiveness of response actions
- Reporting to Region/Organization Management and Stakeholders



# WSDOT RMP Tools

- **Three Tools**

- Qualitative (PMOG)
- Quantitative (Self-Modeling)
- Quantitative Detailed (Workshops)

- **Workshops**

- Cost Risk Assessment (CRA) \$25M-\$100M
- Cost Estimate Validation Process (CEVP) >\$100M

# RMP Tools

- **Risk Management Plan Spreadsheet on the Project Management Online Guide at:**

[http://www.wsdot.wa.gov/Projects/ProjectMgmt/OnLine\\_Guide/Phase\\_Guides/Pre-Construction/PC\\_Plan\\_the\\_Work/PC\\_Plan\\_Risk.htm](http://www.wsdot.wa.gov/Projects/ProjectMgmt/OnLine_Guide/Phase_Guides/Pre-Construction/PC_Plan_the_Work/PC_Plan_Risk.htm)

- Qualitative
- <\$25 Million
- Used for early screening on larger projects

# RMP Tools

- **Self-Modeling RMP Worksheet** posted:

<http://www.wsdot.wa.gov/Projects/ProjectMgmt/RiskAssessment/>

- Quantitative
- <\$25 Million
- Used for early screening on larger projects, and combined VE/CRA workshops

# RMP Tools

- **Detailed RMP** posted at:

<http://www.wsdot.wa.gov/Projects/ProjectMgmt/RiskAssessment/>

- Provided after CRA/CEVP workshops
- Quantitative
- >\$25 Million
- A portion of this RMP is completed following the workshop; the project **team takes action** and **responds** to risk and continuously **manages** and **monitors risk**

# RMP Risk Identification

## Typical RMP

Risk Identification								
Priority	Status	ID #	Date Identified Project Phase	Risk Event (threat/opportunity)	SMART Column	Risk Trigger	Impact Area	Affected MDL/WB Level 2 process
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Instructions	<b>Active</b> =actively monitored & controlled <b>Dormant</b> =risk is not currently a high priority, but may become active in the future. <b>Retired</b> =no longer a threat to project objectives.	E1	For example: 6/30/99 Scoping	Risk is an uncertain event or condition that, if it occurs, has a positive (opportunity) or negative (threat) on a project.  For example; Wetland Mitigation requires additional R/W.	Detailed description of the risk. Includes information on the risk that is <b>Specific, Measureable, Attributable, Relevant</b> and <b>Timebound</b> . Describe the consequences of the risk to scope, schedule, budget or quality.	Triggers are indications that a risk has occurred or is about to occur. Used to determine when to implement the Risk Response Strategy.  For example: Wetland impact is greater than 1/2 acre.	Is the primary impact to the scope, schedule, or budget?	Which WBS element will be modified as part of the response strategy? For example: PC-19 Environmental Permits
								WBS 100 Project Management

# RMP Risk Analysis

## Typical RMP

Qualitative Analysis						
Probability	Impact	Risk Matrix				
(10)	(11)	(12)				
Assessment of the likelihood of occurrence. Valid entries are Low or High.	The severity of the risk's effect on the projects objectives. Valid entries are Low or High.	<p><b>High:</b> Substantial impact on cost, schedule, or technical. Substantial action required to alleviate issue.</p> <p><b>Low:</b> Minimal impact on cost, schedule, or technical. Normal management oversight is sufficient.</p>				
		<p>Probability</p> <table border="1"> <tr> <td>H</td> <td></td> </tr> <tr> <td>L</td> <td></td> </tr> </table> <p>L H Impact</p>	H		L	
H						
L						



# Risk Components

- Uncertainty
- Value (loss or gain)
- Time component

**Document all risk components**



# Risk Management Mistakes to Prevent

Waiting until late in the project before addressing risk in a serious manner **can cause:**

- Expensive workarounds because of the late attention;
- Precludes solutions available earlier;
- Late surprises are more disruptive to the schedule.

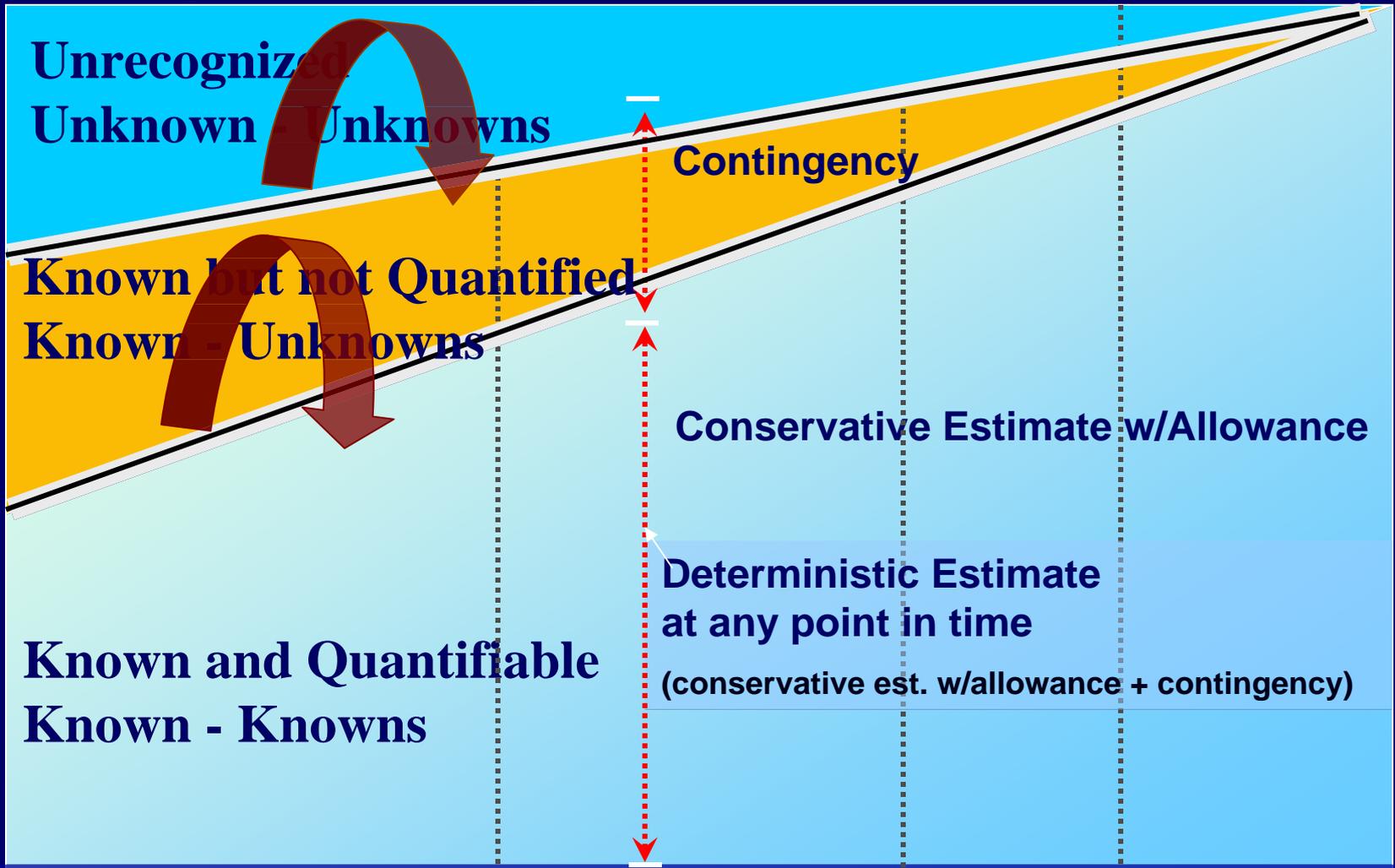
Allowing the risk management plan to lapse **can manifest as follows:**

- Project team identifies risks early, but takes no action. When the risk does occur it is just as unprepared as the team that delayed action until late in the project.

# Components of Cost Uncertainty

**KNOWLEDGE & UNCERTAINTY**

Programming Planning      Scoping Design/PS&E      Ad/Bid/ Award      Construct



EARLY <<< LEVEL OF PROJECT DEVELOPMENT >>> FINAL



# Risk Identification and Analysis

- Risks identified, quantified, analyzed
- Risks prioritized
- Risk Management Plan developed

## Now what?

- Decide
- Act
- Know and maintain Project Intent

# RMP = Action

- Risk Management Plans are **Action Plans**
  - **Decide** on response to the risk (avoid, transfer, mitigate, accept) and who will own the risk
  - **Determine** the cost of the response action and record in the RMP
  - **Review** and document status of risk at regularly scheduled project meetings



# Decide and Act

## Eight Steps to making better risk decisions

1. Work on the right decision problem
2. Specify objectives
3. Create imaginative alternatives
4. Understand the consequences
5. Assess tradeoffs
6. Clarify uncertainties
- 7. Think risk tolerance. In order to choose an alternative with an acceptable level of risk, we need to know how much risk we can tolerate.**
8. Consider linked decisions

# RMP Risk Response

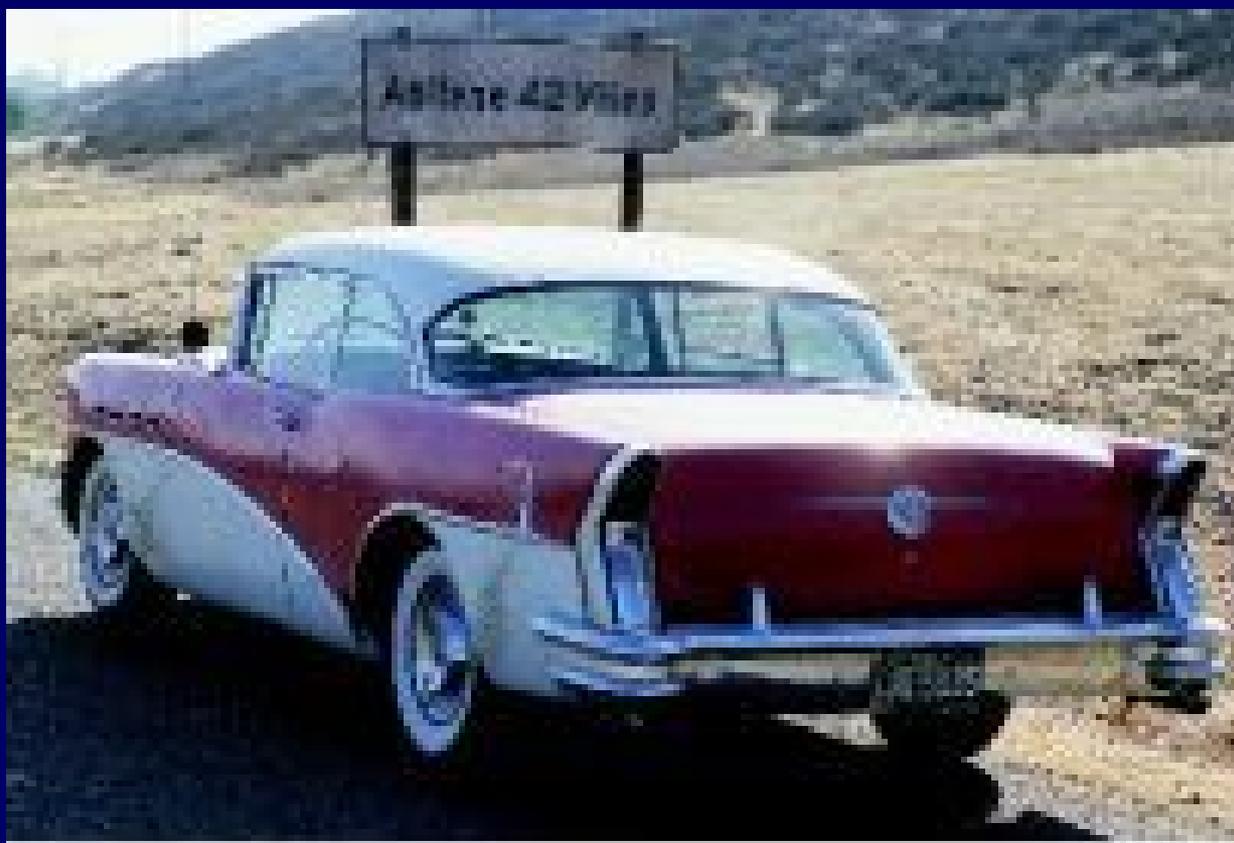
## Typical RMP

Risk Owner	Risk-Response Strategy	
	Strategy	ACTION TO BE TAKEN (include advantages and disadvantages)
(13)	(14)	(15)
Name of the person or office responsible for managing the risk event.	Avoidance Transference Mitigation Acceptance (See PM Online Guide for strategy definitions.)	Develop options and determine actions to be taken in response to the risk event. Immediate action may be required at the time of identification. Estimate value of risk and estimate cost to respond.

# RMP Risk Monitoring

## Typical RMP

Monitoring and Control	
Status Interval or Milestone Check	Date, Status and Review Comments
(16)	(17)
For example: Completion of wetland delineation expected: 2/28/00	For example: Last status update 4/30/00. Wetland delineation completed 3/15/00. Over 1 acre of wetland was delineated, action is being taken to expedite meetings with regulatory agencies & expedite the effort to provide appropriate wetland mitigation & attain project permits.



## The Abilene Paradox

- Risk/uncertainty
- Negative fantasies
- "Groupthink" (fear of separation)

■ Biases

# Do we really want to go to Abilene?



**Action anxiety** often makes us hesitate to take any action at all

**we are the solution...**

“On the plains of hesitation lie the blackened bones of countless millions, who at the dawn of victory, sat down to rest, and in resting, died.”

-Adlai E. Stevenson



# Risk Management is a blend of Science and Art

- Assess **threats and opportunities**
- Respond **flexibly**
- **Document** risk response actions



# Summary of Benefits

## Forewarned is Forearmed

- Fewer problems catch us off-guard
- Ability to prepare for and reduce uncertainty

## Realistic (risk of cost overrun is a fact)

- Risk cannot be completely eliminated but it can be moderated

## Practical and Action-Oriented

- Takes us beyond theory to actually guide decision-making
- Risk assessment/management used as tools to govern risk
- Risks can be allocated to those best able to manage them
- Risk can be managed with greater accountability

## Risk Management is part of Project Management

- Risk control activities blend naturally with project control activities
- WBS, Scope of Work, Budget, Schedule
- Progress reports, and other project management deliverables

**Continuously Monitor**

**Scope**

**Risks**

**Schedule**

**Resources**





# Risk Management

**March 2008**

**Even a correct decision is wrong  
when it was taken too late.**

*Lee Iacocca 1924-, Father of the Ford Mustang and CEO of  
Chrysler*

***The quest for certainty blocks the  
search for meaning. Uncertainty is  
the very condition to impel man to  
unfold his powers.***

*Erich Fromm 1900-1980, German-born American  
psychoanalyst*

***Both fortune and love befriend the bold.***

*Ovid (Publius Ovidius Naso) 43BC-17AD, Roman poet*

***To make a mistake is only human; to persist in a mistake is unwise.***

*Cicero 106BC-43BC, Roman orator, politician and philosopher*

***It seems that the necessary thing to do is not to fear mistakes, but rather to plunge in, to do the best that one can, hoping to learn enough from blunders to correct them eventually.***

*Abraham Maslow 1908-1970, American humanistic psychologist and originator of the Hierarchy of Needs*

***Wise men say, and not without reason, that whoever wishes to foresee the future must consult the past.***

*Machiavelli 1446-1507, Italian statesman and philosopher*

## ***John F. Kennedy: Quotation on Risk***

*When written in Chinese the word crisis is composed of two characters. One represents danger, and the other represents opportunity.*

## ***Friedrich Engels: Risk Quote***

*An ounce of action is worth a ton of theory.*

# References & Additional Reading

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*10. Enterprise Risk Management Secretary's Executive Order E 1038.00, WSDOT Enterprise Risk Management Program Finance and Administration Division, September 04, 2007.*

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<http://wwwi.wsdot.wa.gov/docs/OperatingRulesProcedures/1032.pdf>