Risk Management for Practitioners

The 29th Japan Road Congress – Risk Management Symposium
Tokyo, Japan
2 November 2011

Connie Yew
Federal Highway Administration
U.S. Department of Transportation
Topics

• Why Risk Management?
• Risk Management Framework
• Example of Risk Management Application
• Information on Designing for Disasters
Why Risk Management?

- Aging Infrastructure
- Congestion
- Inadequate Funding
- Accountability for Use of Federal Funds

Source: FHWA
Aging Infrastructure

Source: AASHTO
Will 23 lanes be enough?

Proposal would put I-75 among country’s biggest

By ARIEL HART
ahart@ajc.com

It’s wider than an aircraft carrier. Far wider than the carving on Stone Mountain. Wider than the White House stretched end to end, twice. It’s the planned I-75, all 23 lanes, coming soon to Cobb County. As currently conceived it’s 388 feet across, wider than a football field is long.

23 LANES: The state Department of Transportation is planning to expand I-75 (below) and I-575 in Cobb and Cherokee counties. The 23-lane stretch would be between Delk and Windy Hill roads on I-75.

Traffic heads north on I-75, just north of I-285, on Thursday. A proposal for the interstate is enough to make a road builder weep with joy, and make others wonder whether it’s overkill.

Source: AASHTO

Congested Highways

U.S. Department of Transportation
Federal Highway Administration
Highway Account of the Highway Trust Fund: Receipts and Outlay Discrepancy

Source: AASHTO

*Excludes $8.017 billion transfer from General Fund to Highway Account of HTF in September 2008.
**Excludes $7 billion transfer from General Fund to Highway Account of HTF in August 2009.
Stewardship & Oversight at Federal Level

Stewardship: funds spent well
  - Efficient & Effective Management of Fund

Oversight: funds spent correctly
  - Consistent with Laws, Regulations & Policies

Traditional Focus:
  – Process Management
  – Project Management

New Focus:
  – Risk-based Program Management
  – Performance Management
Risk Management Framework

Identify

Analyze

Document Prioritize

Info Gathering

Monitor, Evaluate, Adjust

Incorporate in Plan

Respond

Prioritize

Respond

Document

Identify
What is Risk?

- Future event
- May or may not occur
- Direct impact to project / program
- Positive or Negative

(Opportunity or Threat events)
Risk Statement

Risk statements should identify:

• A specific and definable event (What if?)
• Likelihood that event will occur (How likely?)
• The impact if it does occur (Then what?)
Risk Identification

Unknowns

Knowns
Tools & Techniques

- Brainstorming
- SWOT Analysis
- Delphi Technique
- Expert Interviews
- Checklists
- Assumption Analysis
- Crawford Slip
Risk Analysis

**Qualitative**: Assesses risk likelihood and impact using a scale of high, medium, and low

**Quantitative**: Analyzes risk likelihood and impact numerically using specific numbers (likelihood, cost, time)
### Ordinal Risk Rating Matrix

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>VH</td>
<td>M</td>
</tr>
<tr>
<td>H</td>
<td>M</td>
</tr>
<tr>
<td>M</td>
<td>L</td>
</tr>
<tr>
<td>L</td>
<td>VL</td>
</tr>
<tr>
<td>VL</td>
<td>VL</td>
</tr>
<tr>
<td>VL</td>
<td>L</td>
</tr>
<tr>
<td>L</td>
<td>M</td>
</tr>
<tr>
<td>M</td>
<td>H</td>
</tr>
<tr>
<td>H</td>
<td>VH</td>
</tr>
<tr>
<td>VH</td>
<td>UA</td>
</tr>
<tr>
<td>VL</td>
<td>L</td>
</tr>
<tr>
<td>L</td>
<td>M</td>
</tr>
<tr>
<td>M</td>
<td>H</td>
</tr>
<tr>
<td>H</td>
<td>VH</td>
</tr>
<tr>
<td>VH</td>
<td>UA</td>
</tr>
</tbody>
</table>

**Impact Scale:**
- VL (Very Low)
- L (Low)
- M (Medium)
- H (High)
- VH (Very High)

**Likelihood Scale:**
- VH (Very High)
- H (High)
- M (Medium)
- L (Low)
- VL (Very Low)
Risk Prioritization

• Never enough time, money, resource
• Focus on the most important risks
## Risk Response

<table>
<thead>
<tr>
<th>Threat Responses</th>
<th>Opportunity Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoid</td>
<td>Exploit</td>
</tr>
<tr>
<td>Transfer</td>
<td>Share</td>
</tr>
<tr>
<td>Mitigate</td>
<td>Enhance</td>
</tr>
<tr>
<td>Accept</td>
<td>Accept</td>
</tr>
</tbody>
</table>
## Response Comparison Chart

<table>
<thead>
<tr>
<th>Risks</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responses</td>
<td>+</td>
<td>-</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-1</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>
Risk Mapping

• Correlates likelihood and impact into one overall presentation tool
• Visually displays all types of risks and their associated risk level for each program or project
• Makes outliers easily identifiable by aggregating all risks in one place
## Risk Map Example

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Very High</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Risk E</td>
<td>Risk H</td>
<td>Risk A</td>
<td>Risk D</td>
</tr>
<tr>
<td>Risk B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk C</td>
<td>Risk B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk G</td>
<td>Risk C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk I</td>
<td>Risk F</td>
<td>Risk I</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Impact

<table>
<thead>
<tr>
<th>Impact</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Very High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Purpose of Risk Monitoring

Determine whether:

• Responses implemented as planned
• Response actions effective
• New responses should be developed
• Project assumptions are still valid
• Likelihood and/or impact have changed
• A risk trigger has occurred
• Proper policies and procedures followed
Risk Map with Response Strategy Effectiveness

- **Very High Likelihood**:
  - Risk E
  - Risk H
  - Risk H
  - Risk A
  - Risk D
- **High Likelihood**:
  - Risk B
  - Risk A
  - Risk D
  - Risk C
  - Risk G
- **Medium Likelihood**:
  - Risk E
  - Risk B
  - Risk C
  - Risk I
  - Risk F
  - **Eliminated**
- **Low Likelihood**:
  - Risk F
  - Risk G
  - Risk I

- **Impact**:
  - Low
  - Medium
  - High
  - Very High
Risk Management Application
Categories of Risk

10 Program Areas:

1. Finance
2. Environment
3. Planning
4. Right of Way
5. Safety
6. Design
7. Construction
8. System Preservation
9. Operations
10. Civil Rights
Risk Map
Risk Management Plan

1. Local Agency Oversight
2. PS&E Quality
3. Contract Administration
4. Quality Assurance
5. DBE Program
6. Eligibility/Improper Payments
7. Achievement of Program Goals
8. Indian Reservation Roads Program
Designing for Disaster
Partnering to Mitigate the Impact of Natural Disasters

National Building Museum
Designing for Disaster

Key Recommendations for:
- U.S. Congress
- Federal Agencies
- State and Local Governments
- Private Sector

3 Themes:
- Raising Awareness
- Linking Resources
- Planning and Building for Resiliency
Designing for Disaster

An exhibition opening in fall 2012

Source:
http://www.nationalbuildingmuseum.net/pdf/Designing%20for%20Disaster%2020110910.pdf
National Building Museum
Designing for Disaster

Highlights of Exhibition:

- Discuss disaster mitigation
- Showcase innovative research, materials and technologies
- How to work with natural systems and environment
- Present wide range of viable responses
- Explore solutions for natural disasters including, earthquakes, hurricanes, tsunamis, wildfires, tornados, flooding, subsidence
Risk Management Planning

Decide how to approach and plan risk management activities:

- Methodology
- Roles & responsibilities
- Budget
- Timeframe

- Scoring & interpretation
- Thresholds
- Report format
- Tracking
Conclusions

• Risk management is the systematic identification, assessment, planning and management

• Communication is key

• Be prepared to defend your actions

• You must plan for risk management...hope is NOT a plan
THE END

Arigatou Gozaimasu!