

Economic Tools for Security- Related Issues in Constructed Facilities

Robert E. Chapman
Office of Applied Economics
Building and Fire Research Laboratory
National Institute of Standards and Technology

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Technical Approach

Goal: Develop Economic Tools to Aid Facility Owners and Managers in the Selection of Cost-Effective Strategies that Respond to Extreme Events.

Products Under Development:

- **Case Study Report**
- **Methodology Report**
- **Software Tool**



Case Study Report

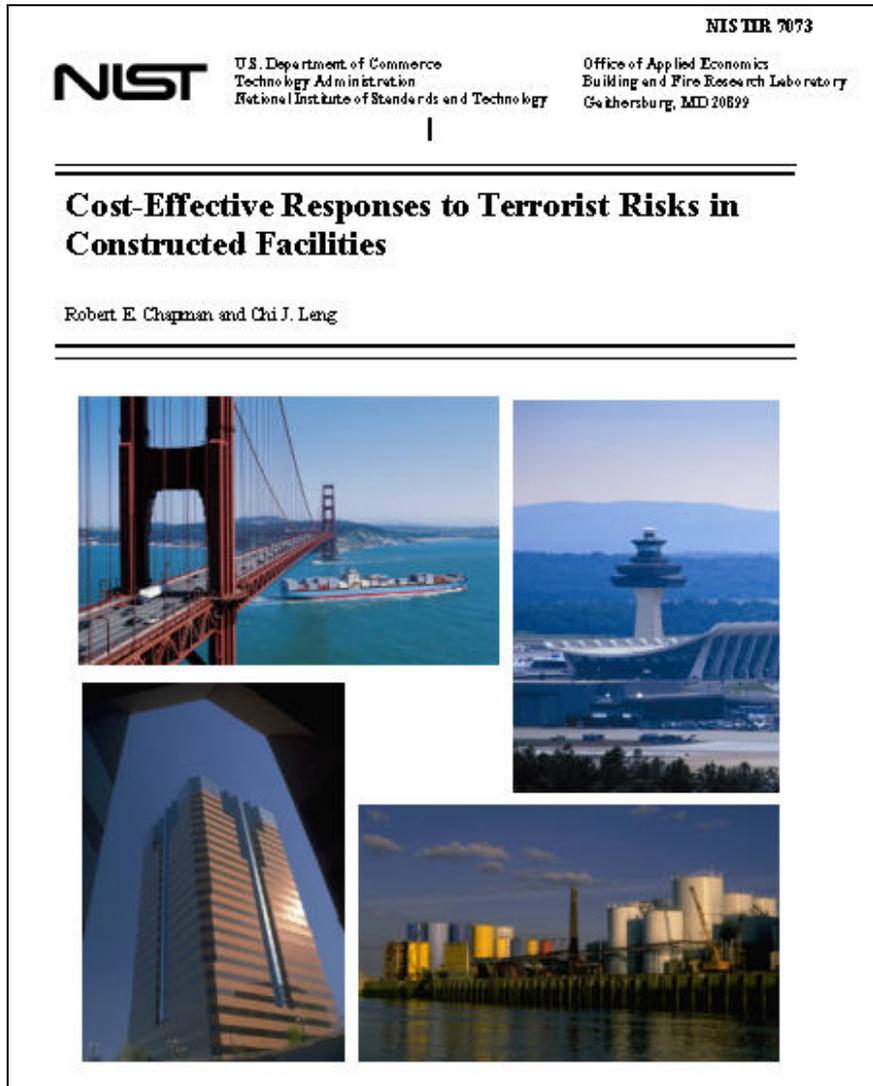


NISTIR 7025

- **Life-Cycle Costs**
- **Event Modeling**
- **Cost Accounting Framework**
- **Multiple Levels of Analysis**
- **Links to ASTM Standard Economic Methods**



Methodology Report



NISTIR 7073

- **Mitigation Strategies**
 - ✓ **Engineering Alternatives**
 - ✓ **Management Practices**
 - ✓ **Financial Mechanisms**
- **Three-Step Protocol**
 - ✓ **Risk Assessment**
 - ✓ **Specify Alternatives**
 - ✓ **Economic Evaluation**
- **Proposed Software**



Software Tool

Cost Summary Window

Project: Data Center Renovation

Cost Type: LCC

Edit Costs/Events: Base Case Alt. 1 Alt. 2 Alt. 3

	\$5,937,608	\$5,254,903	\$0	\$0
Total:				
Costs by Bearer:				
<input checked="" type="checkbox"/> Owner/Manager	\$3,297,962	\$3,472,413	\$0	\$0
<input checked="" type="checkbox"/> Occupant/User	\$1,971,941	\$1,505,989	\$0	\$0
<input checked="" type="checkbox"/> Third Party	\$667,705	\$276,501	\$0	\$0
Costs by Budget Category:				
<input checked="" type="checkbox"/> Capital Investment	\$1,168,484	\$1,771,858	\$0	\$0
<input checked="" type="checkbox"/> O&M	\$4,081,892	\$3,200,685	\$0	\$0
<input checked="" type="checkbox"/> Other	\$687,233	\$282,359	\$0	\$0
Costs by Component:				
<input checked="" type="checkbox"/> Building/Facility Elements	\$2,826,402	\$3,028,991	\$0	\$0
<input checked="" type="checkbox"/> Building/Facility Site Work	\$155,626	\$246,355	\$0	\$0
<input checked="" type="checkbox"/> Non-Elemental	\$2,955,581	\$1,979,557	\$0	\$0
Costs by Mitigation Strategy:				
<input checked="" type="checkbox"/> Engineering Alternatives	\$3,873,520	\$3,509,327	\$0	\$0
<input checked="" type="checkbox"/> Management Practices	\$2,064,088	\$1,745,576	\$0	\$0
<input checked="" type="checkbox"/> Financial Mechanisms	\$0	\$0	\$0	\$0

- Means of Implementation
- Key Features
- Software Rollout
 - ✓ Beta Version (September 2004)
 - ✓ Version 1.0 (March 2005)
 - ✓ Version 2.0 (March 2006)



Sample Input: Capital Investment Costs

Capital Investment Cost Information

Capital Investment

Cost Item: Alternative:

Initial Quantity:
 Future Unit Cost:
 Salvage

Escalation Rate:
Year Cost Incurred: (Year = 2008)

Classification Information

Bearer:
 Owner/Manager
 Occupant/User
 Third Party

Mitigation Strategy:
 Engineering Alternatives
 Management Practices
 Financial Mechanisms

Component:
 Building/Facility Elements
 Default to Unifomat II
 Building/Facility Site Work
 Non-Elemental



Additional Products

- **Construction Industry Institute**
 - ✓ NIST GCR 04-865 “Best Practices for Project Security”
- **Wharton Risk Management Decision Processes Center**
 - ✓ NIST GCR “Economic Incentives” & Software Testing
- **AACE International**
 - ✓ *Cost Engineering* Article on Three-Step Protocol
 - ✓ Article on Software *2004 AACE International Transactions*



Next Steps

- **Public Release of Software Product**
 - ✓ Solicit Feedback and Make Improvements
 - ✓ Build in New Analysis Features
- **An Opportunity**
 - ✓ Participate in Beta Test
- **Future Research**
 - ✓ Standards Development
 - ✓ Training Materials
 - ✓ Workshops on Use of Standards

