

# **Risk & Homeland Security Decision-Making: What Do Decision-Makers Need? What Can Risk Analysis Provide?**

**Presented at the “DHS 2008 University Centers of  
Excellence Summit” in Washington, DC**

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20 March 2008



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*“We need to adopt a risk-based approach in both our operations and our philosophy. Risk management is fundamental to managing the threat, while retaining our quality of life and living in freedom. Risk management must guide our decision making as we examine how we can best organize to prevent, respond and recover from an attack.”*

Secretary Michael Chertoff  
Department of Homeland Security  
16 March 2005

- Absolutely essential to use risk information when making decisions
- The Question is “How?”



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# Fundamental Propositions

- At best, decisions can only be Risk-Informed, never “Risk-Based”
- Managing risk is everyone’s job in DHS, but the risks managed will be a function of
  - Specific Area of Responsibility/Mission
  - Organizational Level – Strategic, Operational or Tactical
- There is no Risk Assessment or Risk Management “Silver Bullet”
- Needed
  - A suite of different risk assessment and risk analytic tools tailored to specific problems or issues but which remain true to core principles
  - A framework identifying invariant elements of any risk assessment methodology



# DHS Risk-Informed Decision Matrix

## Decision Type

## Context

## Essential Nature of Decision

### Strategic

International  
National  
Levels of Gov't

ID Desired Societal Outcomes  
Policy (Goal Setting)  
Setting Broad Strategies to Reach Identified  
Outcomes & Goals

### Broad Budget Formulation

Topical/Issue  
Department  
Agency  
Mission/Program

### Operational

Department  
Agency  
  
Mission/Program  
Mission Prioritization  
Mission Design &  
Concepts of Operations

Policy Implementation  
Selecting Among Alternative Means to Achieve  
Identified Ends  
Capability Building  
Detailed Budget Development

### Tactical

Department  
Agency  
  
Mission/Program  
Mission/Task  
Performance

Policy Execution  
Selecting Among Alternative Courses of Action  
Allowed Under ConOps & Policy  
Capability Utilization  
Budget Execution



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Field Operations

# Desired Characteristics

- Intellectually sound at a conceptual level
- Common understanding of the role of “risk” in decision-making
- A clear lexicon that is standardized yet also flexible
- A menu of proven methodologies with guidance on applicability and proper usage
- Specific tools, built using proven methodologies but appropriately tailored to the problem or issue in question
- Use of quantitative measures/data when possible and appropriate
- Use of subjective or qualitative data when necessary or appropriate, coupled with methods of reducing variability
- Use of appropriate methods to elicit expert opinion



# Where are we today?

- **The state of the art in Risk Assessment and related analyses is inadequate to the Homeland Security problem-space**
- **We must do the best we can with the tools available**
- **We must remain dedicated to improving risk assessment and risk analytics capabilities over time**



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# Needs & Sources of Support

## Needs (partial list)

- Methodologies tailored to specific problems/issues
- Basic and applied research to fill gaps in risk assessment and risk analytics state of the art
- Improved Risk Communications
  - Generally
  - Within specific disciplines or other communities of interest
  - Between specialized communities and disciplines

## Sources

- University Centers of Excellence
- Homeland Security Institute
- Other FFRDCs
- National Labs
- Consultants/Contractors
- Others?



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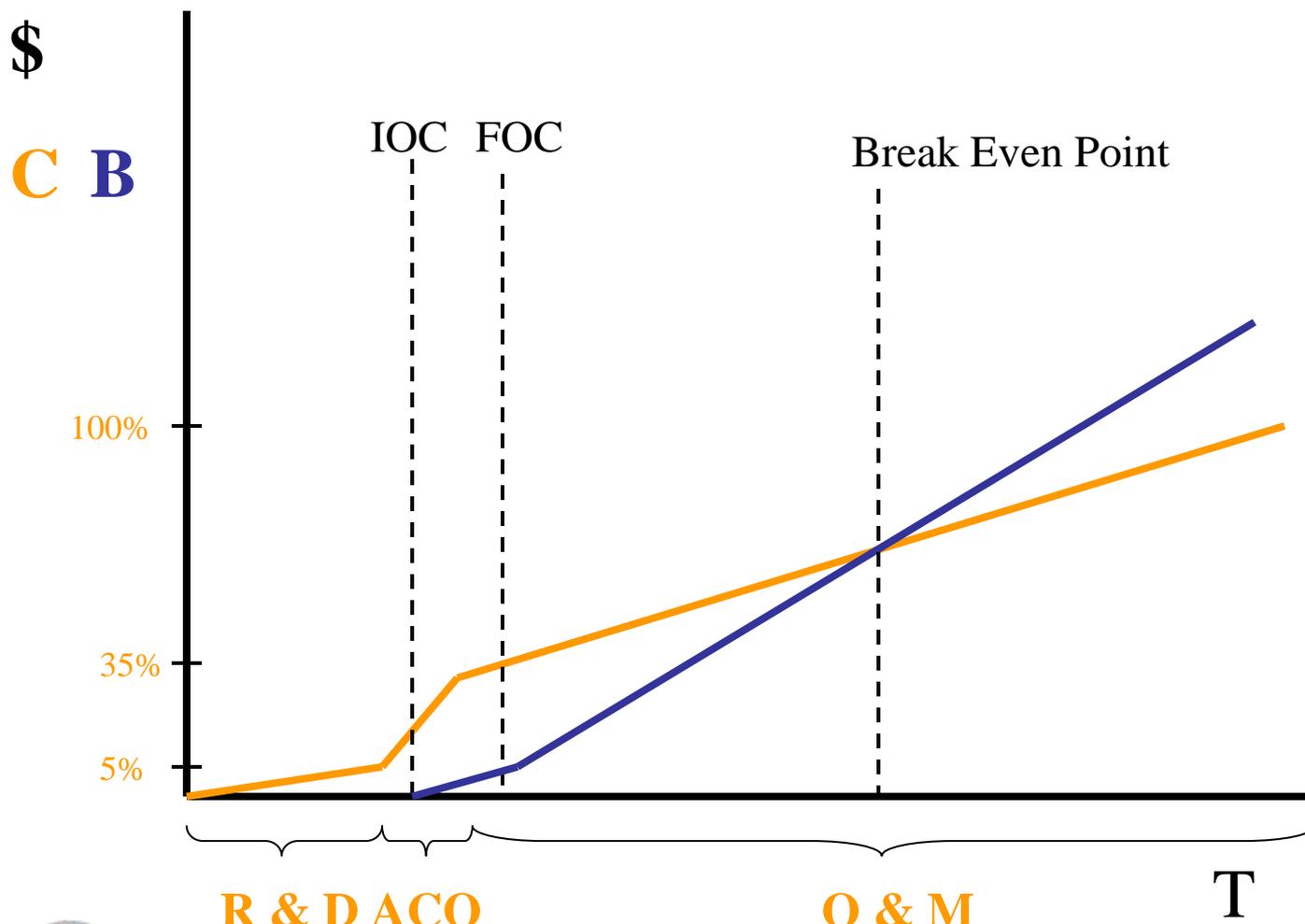
# Homeland Security Risk Analysis Objectives

- Threat
  - Capability: known, projected based on feasibility, assumed
  - Intent: known, inferred (writings, ideological consistency), assumed
- Vulnerability
  - Interaction of means of attack and target characteristics
- Consequences
  - Deaths and Injuries
  - Economic Impact: direct and indirect
  - Intangibles: FUD, government credibility, societal cohesion
- Projected Costs of Alternative Courses of Action (true Life Cycle costs)
- Projected Impact/Benefit of Alternative Courses of Action
- Benefit/Cost Analysis
- Identify decision-irrelevant variables & factors
- Eliminate clearly inferior options
- Focus on what can be done, not what to worry about



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# Cumulative Benefits & Costs – “Normal” Case

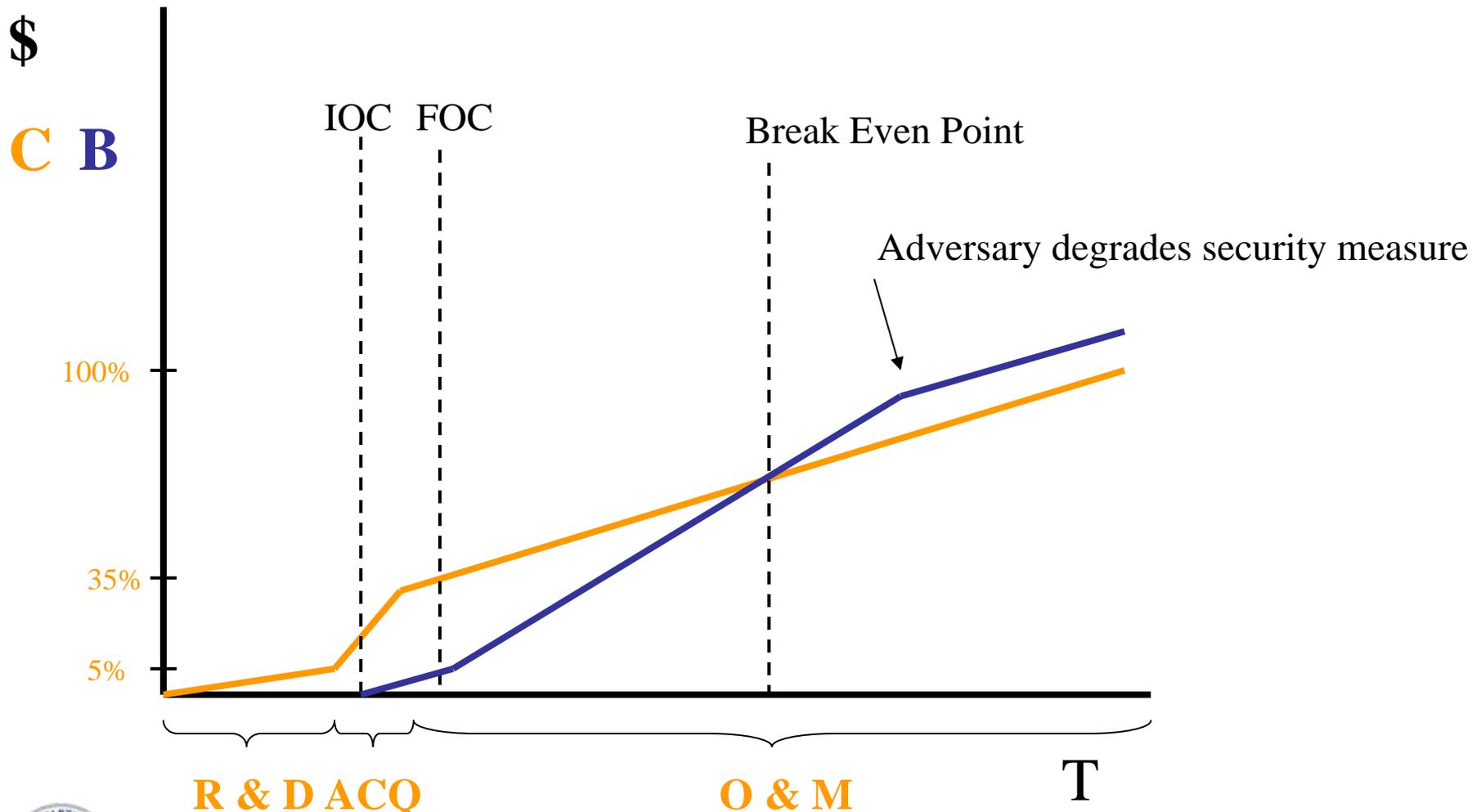


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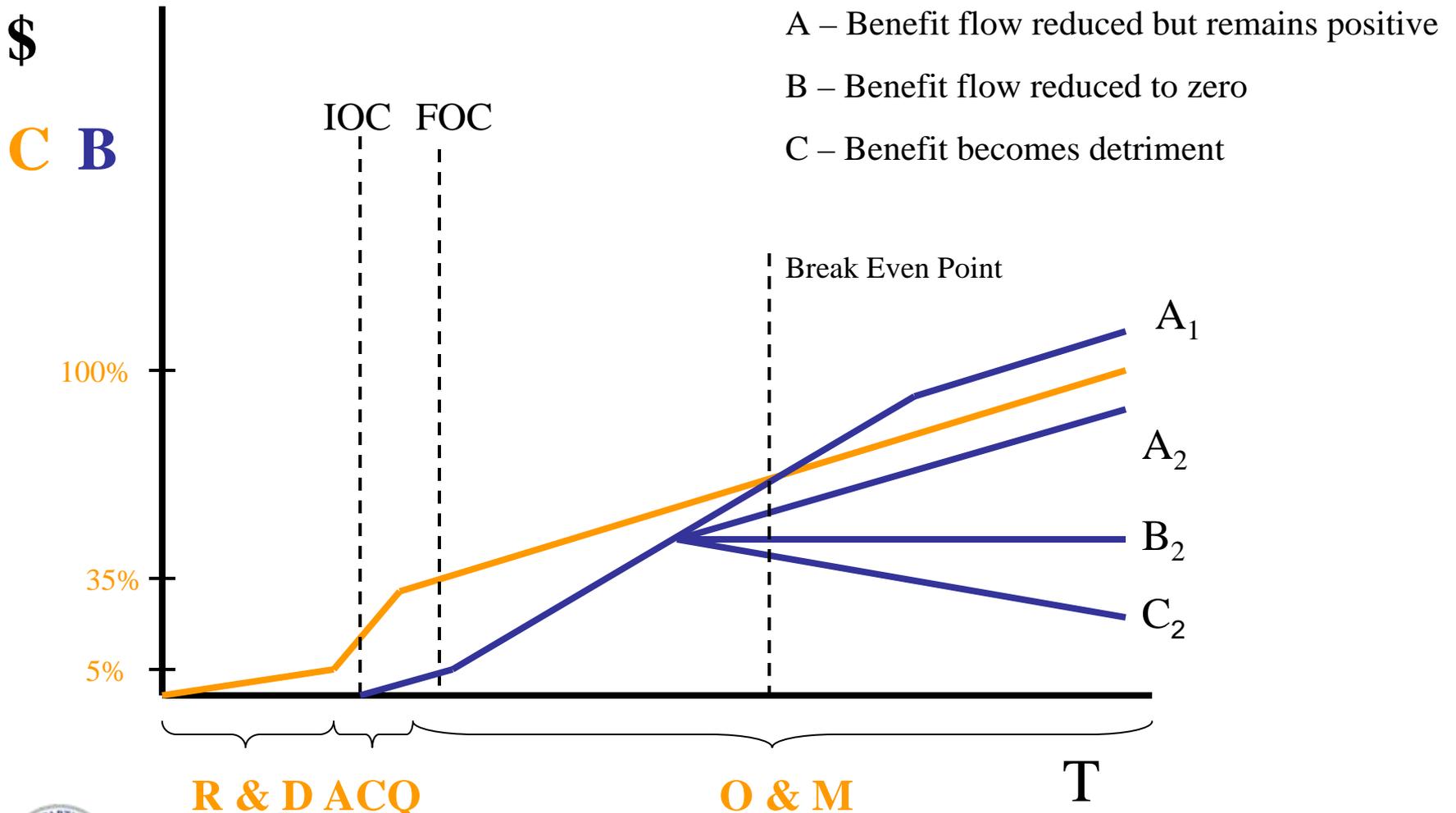
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# Cumulative Benefits & Costs – Adaptive Adversary



# Cumulative Benefits & Costs – Adaptive Adversary



# A Multi-Disciplinary Challenge

- Public Policy and Public Administration/Management
- Communications
- Economics
- Engineering and Physical Sciences
- Biological Sciences (medicine, micro-biology, veterinary, etc.)
- Intelligence
- Information Technologies
- Infrastructure and Business
- Mathematics
- Systems Analysis/Systems Management
- Social Sciences (Sociology, Psychology, Anthropology, etc.)
- Operations (military, law enforcement, emergency response, etc.)
- Decision Analysis
- Political Science



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# The Three Biggest Needs

Realistic Expectations



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# The Three Biggest Needs

Realistic Expectations

Analyst Humility



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# The Three Biggest Needs

Realistic Expectations

Analyst Humility

Appropriate Methodologies



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