



The National Center for Risk and Economic Analysis of Terrorism Events (CREATE)

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CREATE - Background

- First DHS university center in a competition of 72 universities
- Started operations in March of 2004
- \$4 million per year for three years
- Renewed for three more years
- Focus on risk and economic analysis



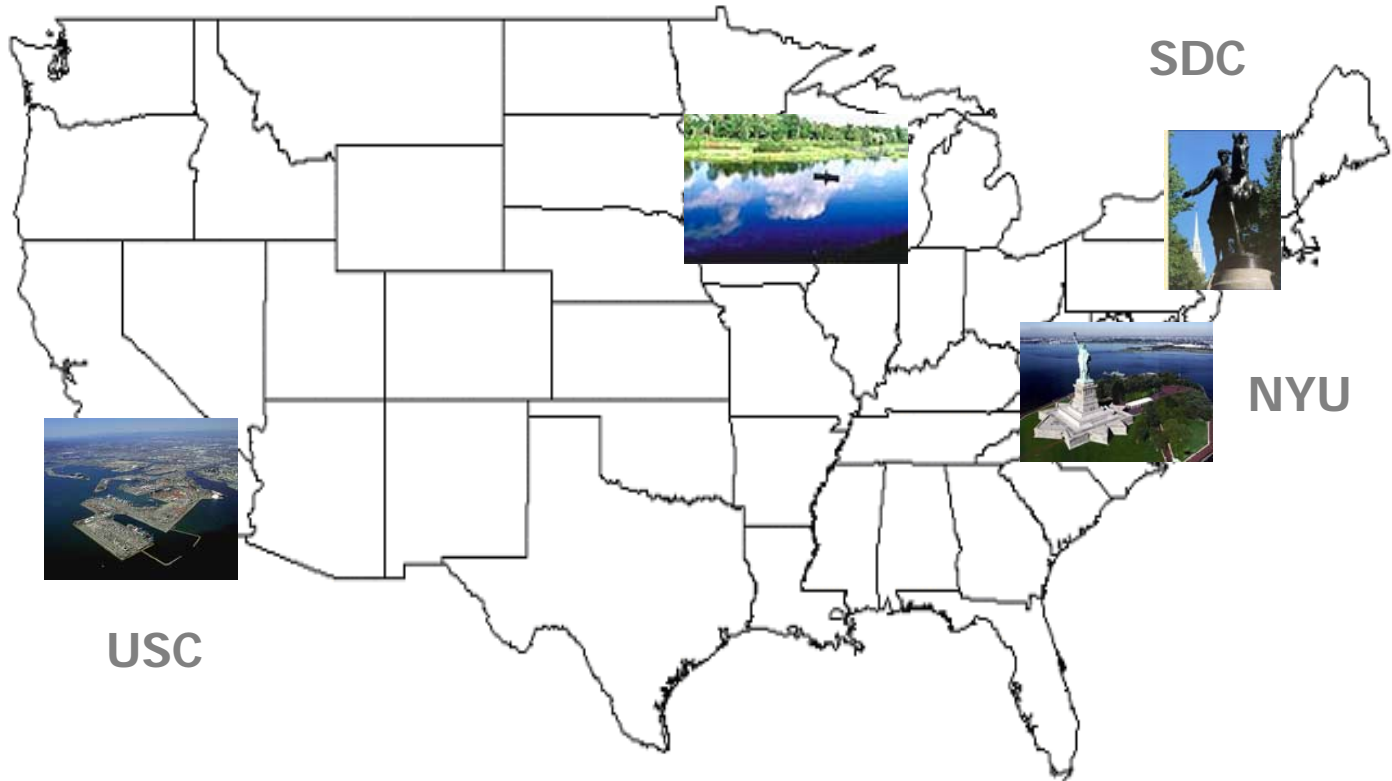
2004



2007

CREATE as a National Center -- 2004

U of Wisconsin, Madison

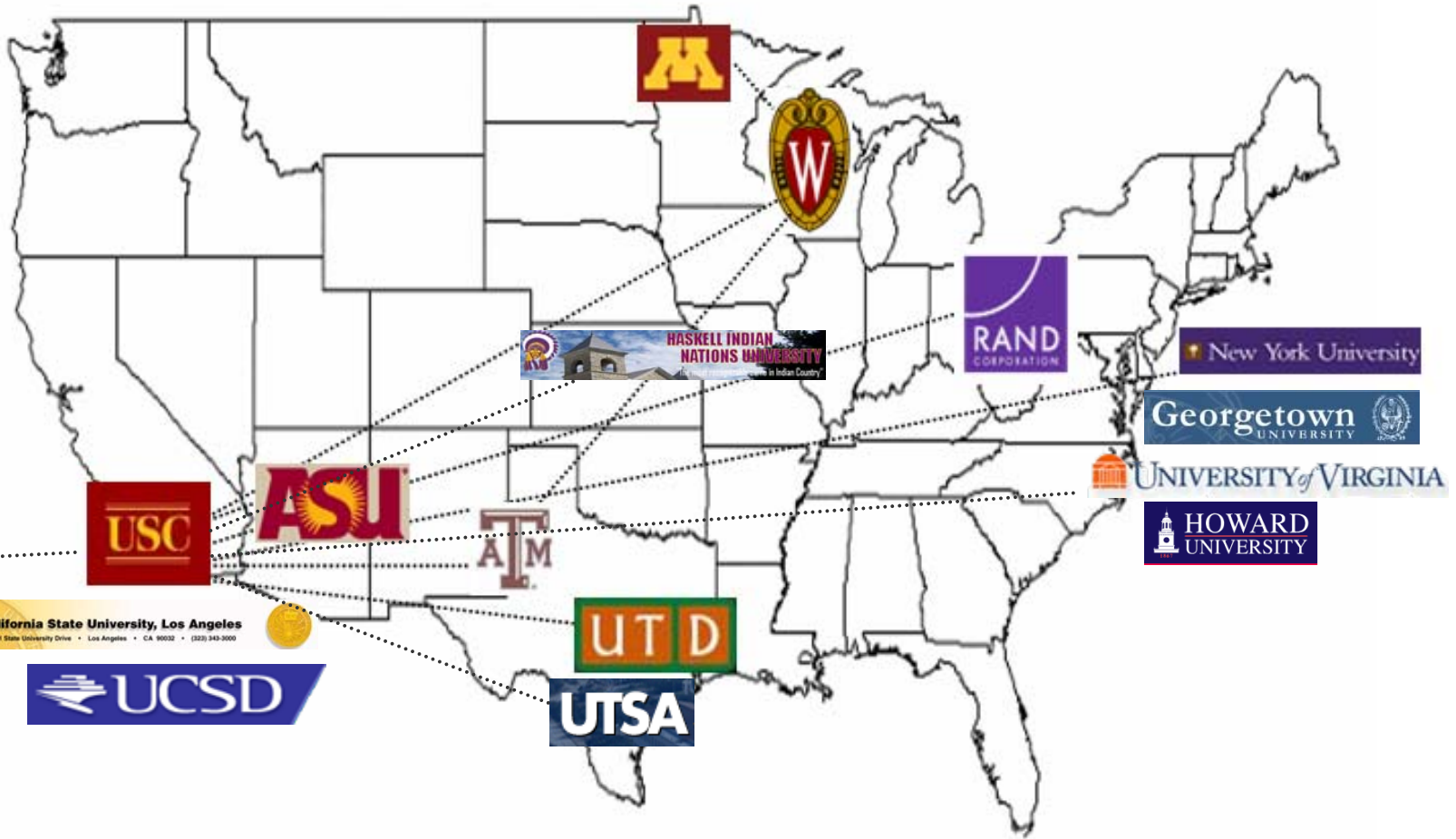


USC

SDC

NYU

CREATE as a National Center -- 2007



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Why Risk Analysis?

“...We have to ... identify and prioritize risks -- understanding the threat, the vulnerability and the consequence. And then we have to apply our resources in a cost-effective manner..... “



Why Risk Analysis?

- **“Risk based” prioritization of investments**
 - Requested by Secretary Chertoff
 - Requested by many in Congress
- **To quantify risks**
 - Develop threat and attack scenarios
 - Assess probabilities of attacks
 - Assess probability of success, given an attack
 - Assess consequences of successful attacks
- **To quantify risk reduction from countermeasures and allocated resources**
 - Protection
 - Prevention
 - Response and recovery



Why Economic Analysis?

- Our economy is a major terrorist target
 - *“If their economy is destroyed, they will be busy with their own affairs rather than enslaving the weak peoples. It is very important to concentrate on hitting the US economy through all possible means.”*
 - *“The young men (of the jihad) need to seek out the nodes of the American economy and strike the enemy’s nodes.”*
- Small local terrorist attacks can have large national economic impacts
- Concern about spending too much on security
 - intelligent allocation of resources





CREATE Mission

“Advancing risk and economic science to improve our Nation’s decisions to counter terrorism”

To develop advanced models and tools for the evaluation of the risks, costs and consequences of terrorism and to guide economically viable investments in homeland security



Other Important Mission Elements – Education and Outreach

- To educate the next generation of homeland security professionals in the areas of risk and economic analysis
- To reach out to a broad constituency concerned with risks and economic consequences of terrorism



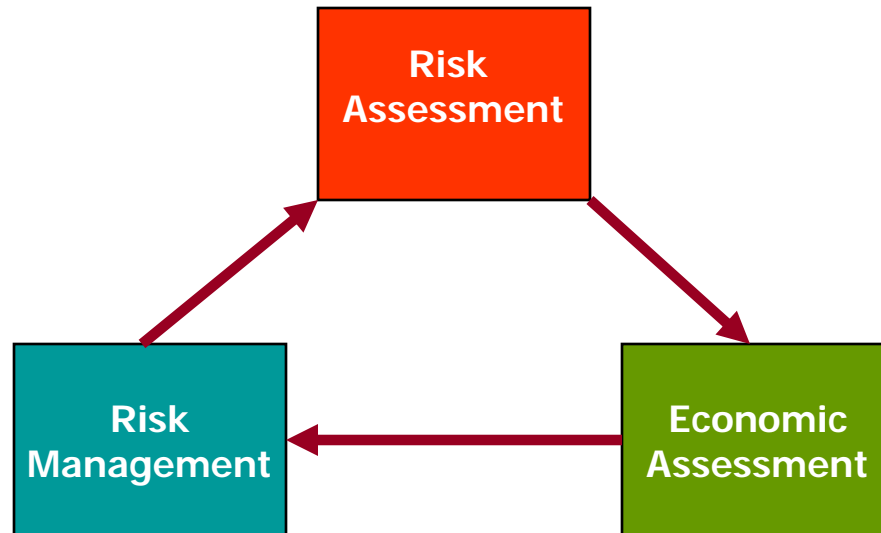
Risk and Economic Analysis is Interdisciplinary

- **Social Science**
 - Economics
 - Psychology
 - Political Science
 - Public Policy and Planning
- **Engineering**
 - Industrial and Systems Engineering
 - Electrical Engineering
 - Civil Engineering
- **Computer Science**

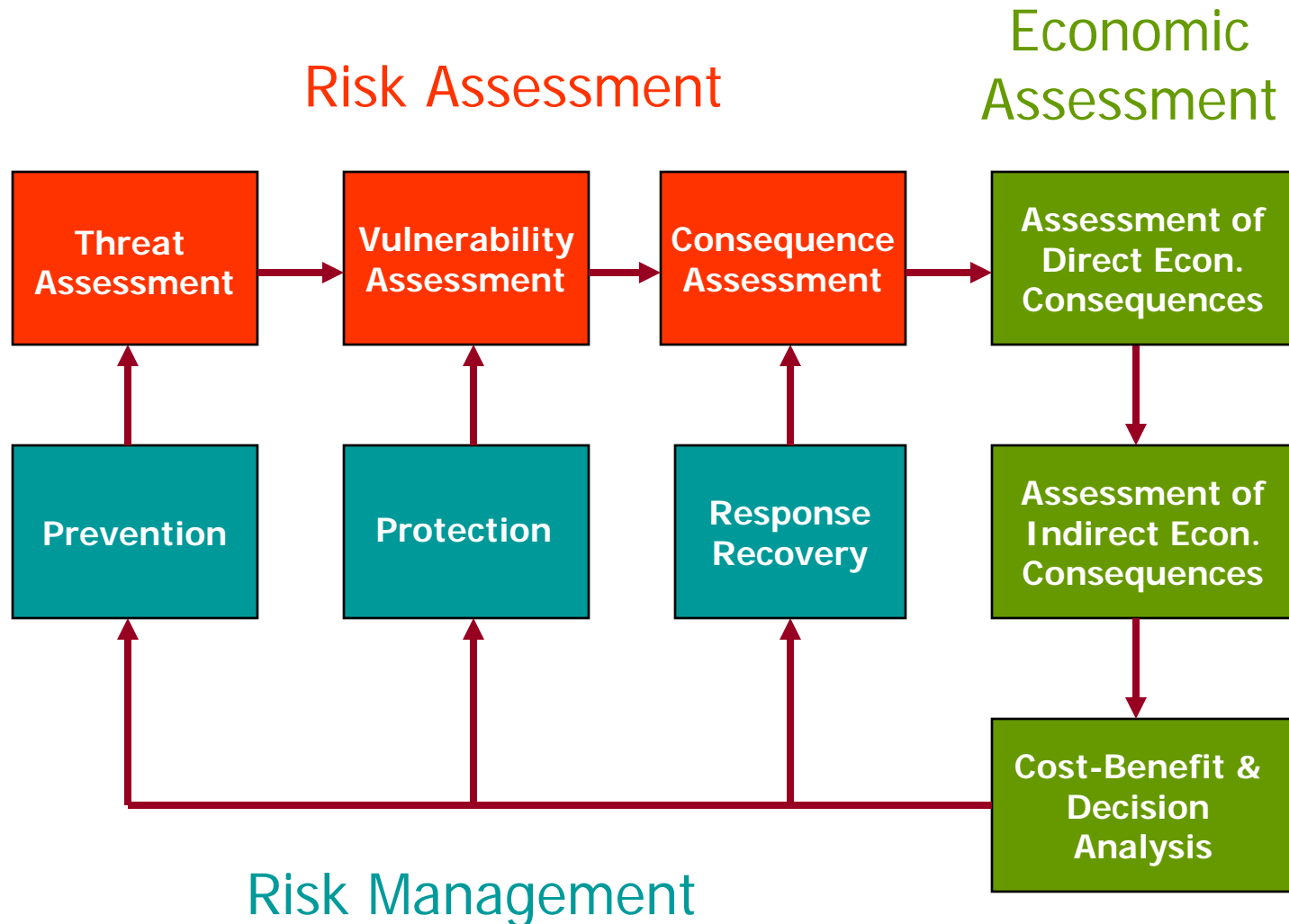
CREATE Researchers

- **34 faculty members**
 - 23 Professors, 3 Associate Professors, 3 Assistant Professors
 - 5 adjunct, research professors, etc.
- **20 Other Researchers**
 - 4 Postdoctoral Research Associates
 - 16 research scientists, computer scientists, etc.
- **Committees and Testimony**
 - 18 major DHS related committees (NAS or similar)
 - Testimony before the House HS Committee
- **Other Quality Indicators**
 - Seven researchers with 1,000+ citations (ISI Web of Science)
 - One member of the NAS, two of the NAE

CREATE Research Framework



CREATE Research Framework



CREATE Case Studies – Year 1

	<i>Case Studies</i>		
<i>Modeling and Analysis Areas</i>	MANPADS	Dirty Bomb	Electricity
Risk Assessment			
Economic Assessment			
Risk Management			

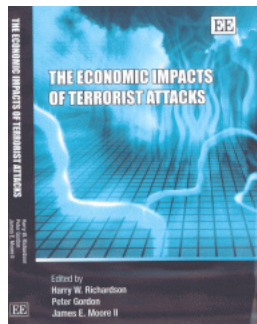
CREATE Case Studies – Years 2-3

	<i>Case Studies</i>		
<i>Modeling and Analysis Areas</i>	Bioterrorism	Border Security	Risk-Based Allocation
Risk Assessment			
Economic Assessment			
Risk Management			

CREATE Alignment with DHS Customers

	<i>DHS/S&T Divisions</i>					
<i>CREATE Modeling & Analysis</i>	Explosives	Chem/Bio	Command/Control/Interop.	Borders/Maritime	Human Factors	Infrastr./Geophys.
Risk Assessment						
Economic Assessment						
Risk Management						

Examples of Center Projects and Products



Applied Research Projects

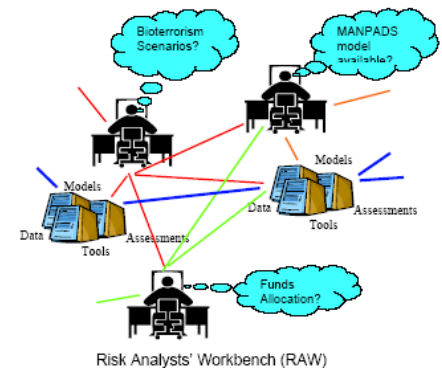
Analysis of dirty bomb attacks on ports
 Analysis of terrorist attacks on electrical grid
 Border security decision analysis
 Economic analysis of bioterrorism events

Fundamental Research Projects

Game theory extensions to terrorism problems
 Decision analysis with adaptive responses
 Probabilistic models of terrorist preferences
 Network reliability and failure models

Software Development

Risk Analysis Workbench (RAW)
 MANPADS Decision Tree Software
 National Interstate Economic Impact Model
 Emergency response models
 ARMOR





Example Applications



- **Border Security**
 - System-wide study of border security
 - Immigration and Customs leadership training
- **Transportation Security**
 - MANPADS countermeasures
 - Radiological portals in sea ports
- **Infrastructure Protection**
 - Dirty bomb attacks on sea ports
 - Allocating BZPP funds in California
- **Weapons of Mass Destruction**
 - Prioritizing risks of biological attacks
 - Dirty bomb attacks on the LA/Long Beach harbors
- **Intelligence Analysis**
 - Project risk analysis of radiological attacks
 - Analysis of motivation and intent of terrorists





Technology Transitioning

- **Tools and Models Transferred to User Communities**
- **Horizontal Network of DHS contacts to transfer knowledge through collaborations**
- **Risk Analysis Workbench**
- **ARMOR**
- **Graduating Students**

Examples of Education Activities

- **Students, Research Assistants and Post-docs**
 - 53 students received CREATE funding
 - 35 Ph.D. students
 - Many will write Ph.D. theses on terrorism, homeland security issues
 - Six post-doctoral scholars
- **Degree Programs and Courses**
 - New Masters Degree in Systems Safety and Security
 - New Certificate in Systems Safety and Security
 - New Aviation Security program
 - Many new or modified courses
- **Visitor and Diversity Programs**
 - Seven DHS scholars
 - Four summer visiting faculty and six students from minority serving institutions
- **Internship Program**
- **FireScope**



Programs and Courses

- New programs
 - Masters degree in Systems Safety and Security
 - Certificate degree in SSS
 - Aviation Safety and Security Program
- New Courses
 - Risk Analysis
 - Terrorism and Public Policy
 - Aviation Security
- Twelve modified courses



Visiting Programs

- DHS Scholars and Fellows
 - Four students in 2005
 - Five students in 2006
 - Two students in 2007
- DHS minority research program
 - Three teams in 2005
 - Three teams in 2006, one at NYU
 - One of the teams is receiving continued funding from CREATE



Emerging Themes

- **Risk assessment is difficult**
 - Too many attack scenarios
 - Adversaries seek vulnerabilities and high impact
 - Probabilities of threats and attacks shift with our action
- **Some risk assessment tasks are easier**
 - Screening can significantly reduce attack scenarios
 - Relative probabilities can be assessed
 - A terrorist attack is a multistage project – use project risk analysis
- **Indirect economic impacts are important**
 - Can overshadow direct impacts
 - Can be reduced by policy interventions
 - Can be reduced by risk communication
- **Focus on risk management helps**
 - Multiple defenses and interventions
 - Not all countermeasures are cost-effective
 - Conclusions are often robust with respect to “soft” inputs



It Takes a Center....

- to bring multiple perspectives and scientific approaches to bear on terrorism issues
- to innovate and integrate research at the cutting edge of science
- to provide continuity in a rapidly changing environment
- to leverage resources and link homeland security to a broad network of academic and private institutions
- to be a trusted and credible source of information for the public
- to build an enduring base of knowledge and to educate the leaders for the future

Website: www.usc.edu/create



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CREATE

CREATE - Center for Risk and Economic Analysis of Terrorism Events - is the first university center of excellence funded by the U.S. Department of Homeland Security



CREATE is an interdisciplinary national research center based at the University of Southern California and funded by the Department of Homeland Security. The Center is focused on risk and economic analysis of the U.S. and comprises a team of experts from across the country, including partnerships with New York University and the University of Wisconsin at Madison.

Our Mission

CREATE's mission is to improve our Nation's security through the development of advanced models and tools for the evaluation of the risks, costs and consequences of terrorism and to guide economically viable investments in homeland security. We will accomplish our mission through an integrated program of research, education and outreach that is designed to inform and support decisions made by elected officials and governmental employees at the national, state, and local levels. We are also working with private industry, both to improve the security of private enterprises and to work in partnership toward meeting the needs of public organizations.

The Center aims to become the world's leading academic program for modeling the risks and vulnerabilities of terrorism, assessing the direct and indirect consequences, gauging their economic impacts, and evaluating the effectiveness of countermeasures.

Latest News

- > [March 16, 2006](#)
Disaster Response Project Appears in Local News
- > [February 21, 2006](#)
CREATE Researcher co-authors "The Political Economy of Terrorism"
- > [February 17, 2006](#)
CREATE Researcher Discusses Engineering Homeland Security Strategies on NAE Radio
- > [November 17, 2005](#)
CREATE Director Testifies Before Congress on Terrorism Risk Assessment
- > [July 1, 2005](#)
Change in CREATE Management

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