

~ Making the Nation Safer through Research ~

## 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 investment to counter terrorism. CREATE accomplishes its mission through an integrated program of research, education and outreach, spanning the disciplines of engineering, social sciences, and information science.

- **First U.S. Department of Homeland Security (DHS) Center of Excellence**
- **Based at the University of Southern California (USC)**
- **Current university partners include**
  - Arizona State University
  - Cal State Los Angeles\*
  - Claremont McKenna College
  - Georgetown University
  - Haskell Indian Nations University\*
  - Howard University\*
  - Monash University, Australia
  - New York University
  - Princeton University
  - Stanford University
  - Technion Israel Institute of Technology
  - University of California, San Diego
  - University of Hawaii, Hilo\*
  - University of Pennsylvania
  - University of Texas at Dallas
  - University of Virginia
  - University of Wisconsin
- **75 Faculty and Researchers**
- **100+ Students engaged in research**
- **30 Research projects per year**
- **20 software tools/models completed or in development**

\* Minority Serving Institution

## Leadership

Dr. Stephen Hora is the Director of CREATE. He is an expert in decision and risk analyses with particular interest in the use of subject matter experts, statistical modeling, and the analysis of technological, natural, and environmental hazards. Dr. Hora is a Research Professor of Industrial and Systems Engineering at the Viterbi School of Engineering and of Public Policy and Management at the School of Policy, Planning and Development at the University of Southern California.

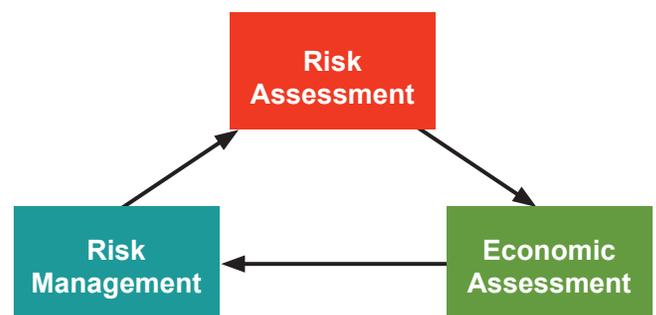
## Education

CREATE has developed several programs to educate current and future homeland security leaders. In addition to engaging more than 100 research assistants, CREATE has developed homeland security specializations for a Master's of Public Policy and a Master's of Operations Research, with emphasis on risk based economic analysis. New coursework based on CREATE's research has been developed and shared with hundreds of university students. Professional short courses are also offered through the Executive Program in Counterterrorism and the Aviation Safety & Security Program.

## Research

CREATE's research program is based on the modeling and analysis areas of risk assessment, economic assessment, and risk management as shown in the figure below.

**Risk Assessment** – Our team includes several pioneers in the development and use of risk assessment models and tools and their applications to natural and man-made



disasters. We have adapted these tools to terrorist threat, vulnerability, and consequence assessments, building on our research in probabilistic risk analysis, expert elicitation of risks and uncertainties and in game theory. In addition, we are using risk-based methods to improve the allocation of funds to fight terrorism.

**Economic Assessment** – Our team includes world-class experts in the economic modeling of major disasters, cost-benefit analysis, and the impact of risk perceptions on economic decisions. We are modeling the costs of terrorist attacks on critical infrastructure and the use

of weapons of mass destruction, including both direct impacts and indirect impacts on the economy as a whole.

**Risk Management** – A major focus of CREATE is to develop advanced models and tools for risk management—the evaluation, implementation and monitoring of terrorism countermeasures. Risk management alternatives include prevention, protection, and response and recovery. CREATE examines how to reduce threats, vulnerabilities, and consequences of terrorism by cost-effective investments.

## CREATE’s Modeling and Analysis and Application Areas

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

### Application Areas

While CREATE focuses on medium and long term research that advances the knowledge base and the intellectual capacity of our nation to counter terrorism, we also are committed to having an impact on short and medium term policy debates. CREATE achieves this by applying fundamental research concepts to specific problems relevant to DHS and the Nation. Applications of CREATE methodologies are developed in areas linked to the operational divisions of DHS in close collaboration with DHS leaders in these units. Examples are given below:

#### *Borders/Maritime*

- Development of a risk management course for ICE agents and officers
- Port operations modeling for security risk management and resource allocation

#### *Explosives*

- Risk and economic analysis of MANPADS attacks
- Explosives detection technologies

#### *Infrastructure/Geophysical*

- Risk analysis of major attacks on regional electricity systems
- Decision models to improve allocations of funds to critical infrastructure assets

#### *Chem/Bio*

- Risk and economic analysis of a major radiological attack on ports
- Support of economic and risk assessment of 30 biological threats conducted by the National Biodefense Analysis Countermeasures Center

#### *Human Factors*

- Decision analysis models of terrorist preferences for weapons types and targets
- Models of terrorist attacks as complex projects

#### *Command/Control/Interoperability*

- Game theoretic randomization of operational units to minimize vulnerability