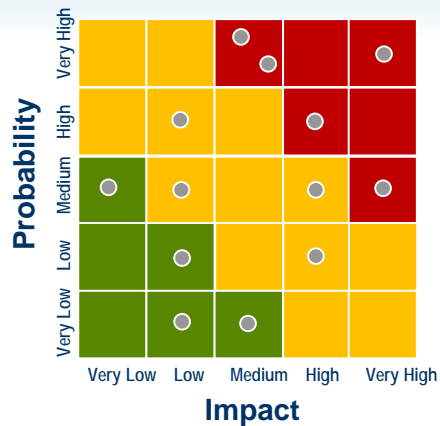
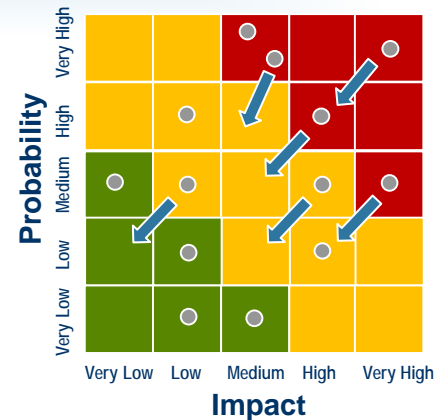


Risk Management Buys Down Risk



Identify Risk

Decreased Risk



Define Needs

Manage Risk

Report Risk

Evaluate Risk

Analyze Results



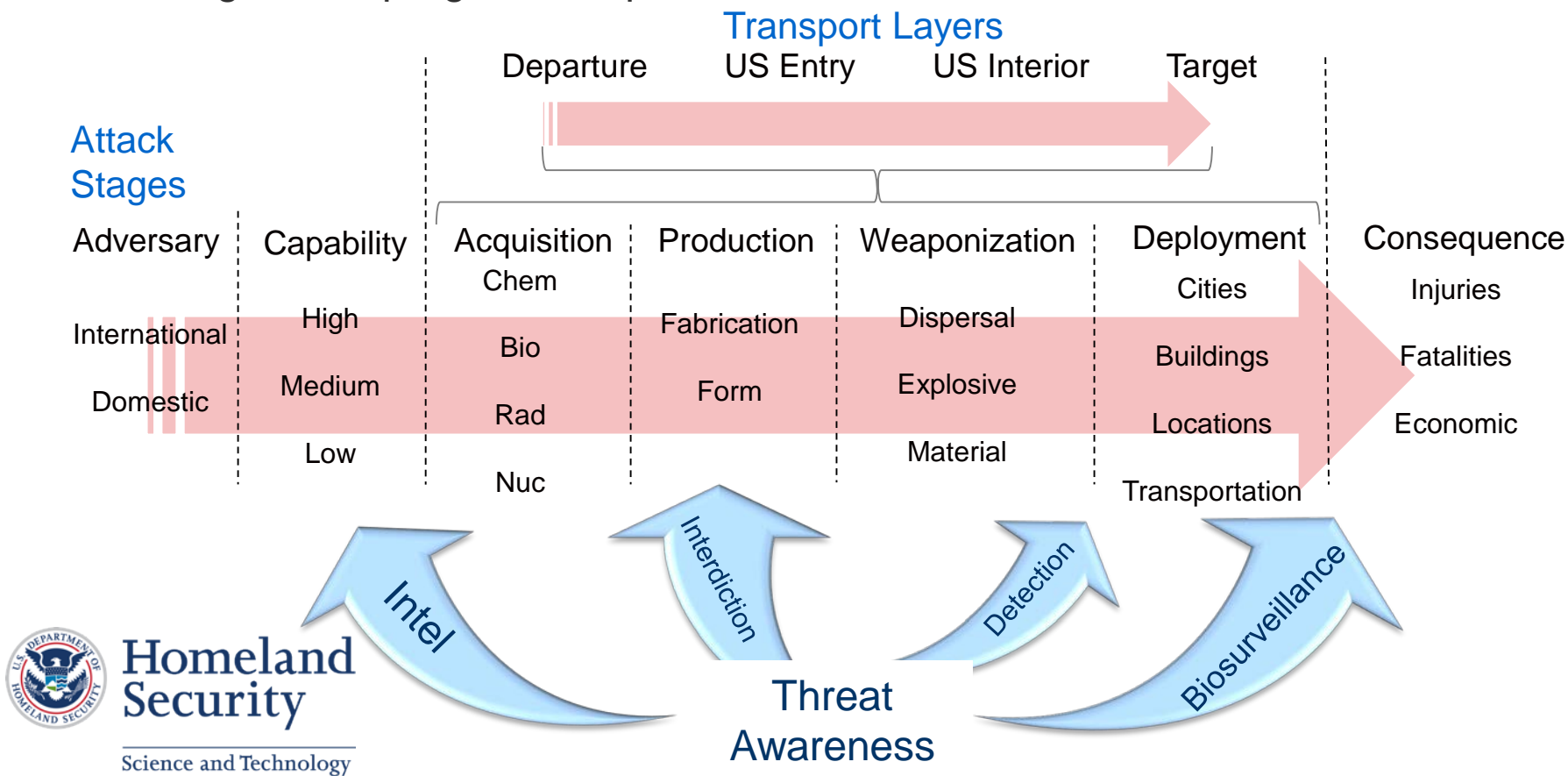
**Homeland
Security**

Science and Technology

FOR OFFICIAL USE ONLY. NOT FOR DISTRIBUTION

Evaluation of Addressable Risk

- The TRAs consider the key stages of an attack planning, acquisition, production, weaponization, deployment, and consequences
- Threat awareness across all stages may have a significant impact on risk. The TRAs can assess impact by mapping program objectives to attack stages and accounting for the program's impact



Mitigation Optimization and Net Assessment (MONA)

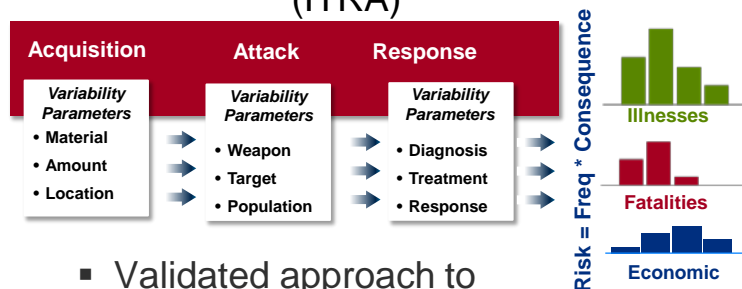
Mitigation Optimization and Net Assessment (MONA) provides a consistent quantifiable approach for investment, management, and effectiveness of DHS programs in reducing Chem, Bio, Rad, Nuc (CBRN) Risk

DHS Programs



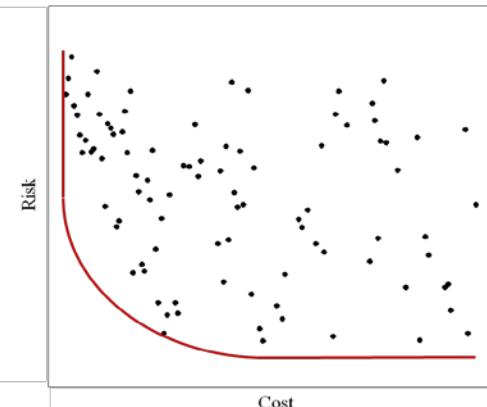
- Ongoing efforts to reduce risk to the Homeland

Integrated CBRN Terrorism Risk Assessment (ITRA)

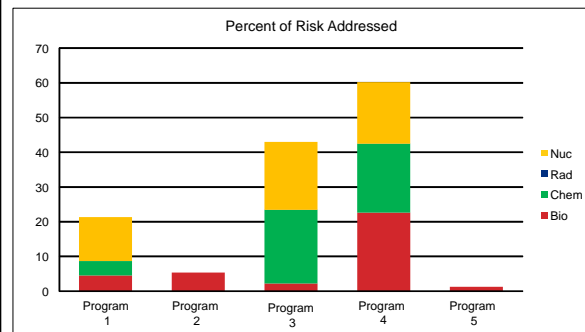


- Validated approach to quantify CBRN Risk

MONA



- Investment vs CBRN Risk Reduction



- Detailed analysis of estimated effectiveness



Homeland Security

Science and Technology

MONA-Mapping DHS Programs

- Structure of the analysis
 - Divide risk by PPD-8 Mission Areas and Core Capabilities
 - Mapping of risk assessment pieces (e.g., scenarios, parameters) to mission areas. For example, “attack” detection systems may also fit in mitigate-threats and hazard identification.



PREVENT		PROTECT	MITIGATE	RESPOND	RECOVER
Planning					
Public Information and Warning					
Operational Coordination					
Interdiction and Disruption		Community Resilience		Infrastructure Systems	
Screening, Search and Detection		Long-Term Vulnerability Reduction		Critical Transportation	Economic Recovery
Forensics and Attribution	Access Control and Identity Verification	Risk and Disaster Resilience Assessment		Environmental Response/Health and Safety	Health and Social Services
Intelligence and Information Sharing	Cybersecurity	Threats and Hazard Identification		Fatality Management Services	Housing
	Physical Protective Measures			Mass Care Services	Natural and Cultural Resources
	Risk Management for Protective Programs and Activities			On-Scene Security and Protection	
	Supply Chain Integrity and Security			Operational Communications	
				Public and Private Services and Resources	
				Public Health and Medical Services	
				Situational Assessment	



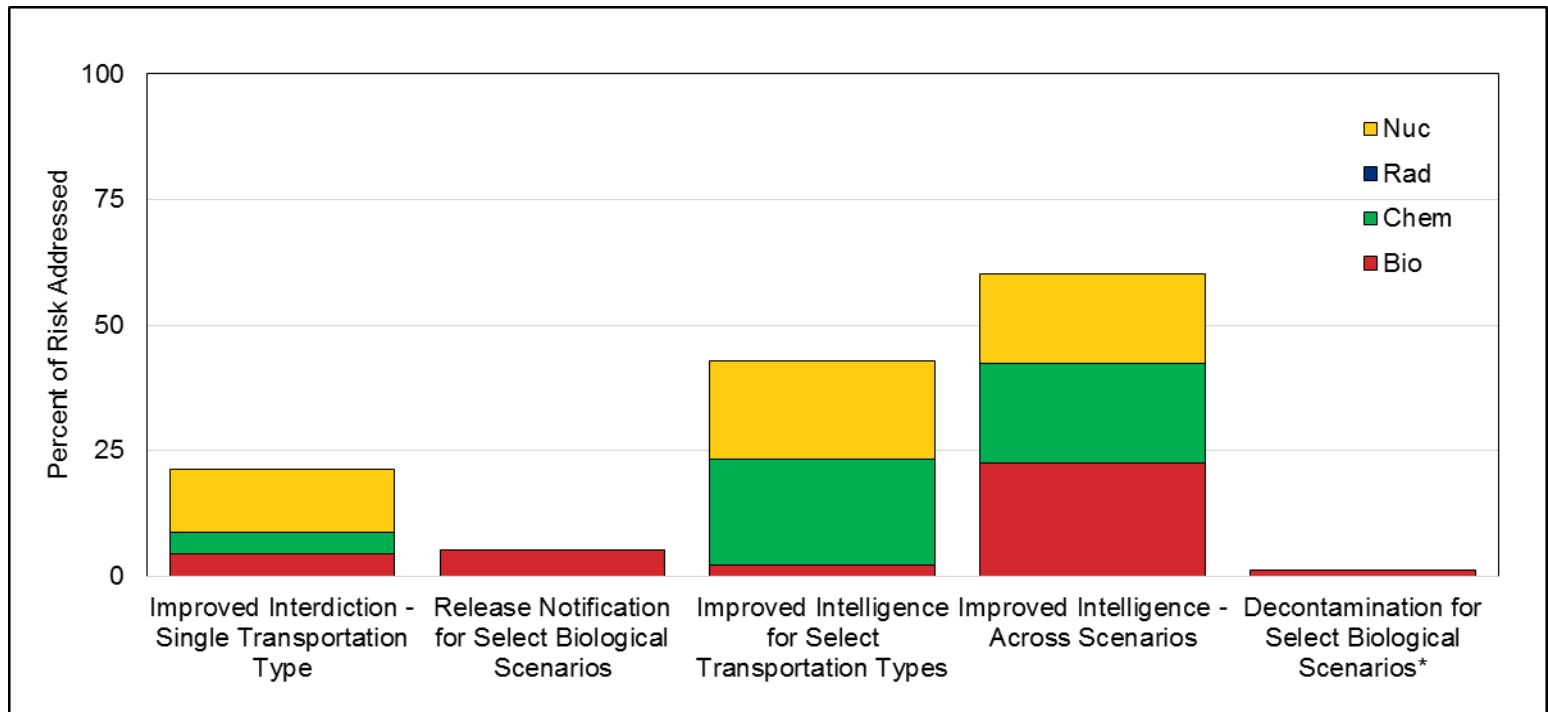
Homeland Security

Science and Technology

FOR OFFICIAL USE ONLY. NOT FOR DISTRIBUTION

MONA (Cont.)

- Measuring mitigation opportunities
 - Addressable risk = Give full credit to an option and estimate risk buy down.
Answers question about upper limit of a certain mitigation action



**Homeland
Security**

Science and Technology

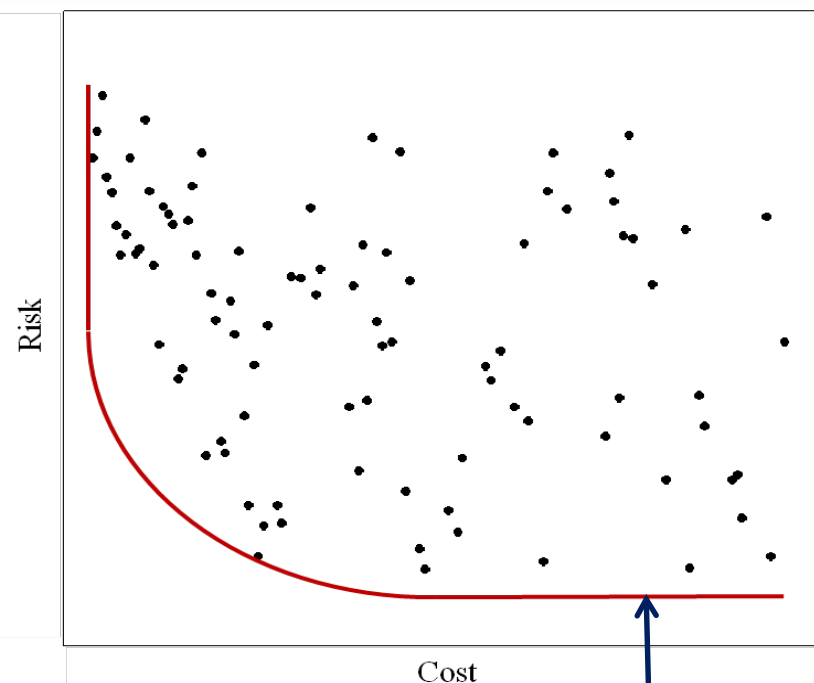
FOR OFFICIAL USE ONLY. NOT FOR DISTRIBUTION

Buying Down Risk

Efficient Frontier

- Use the comprehensive risk assessment to evaluate many risk mitigation options
- Estimate change in risk and cost for the mitigation option
- Obtain a large set of best options for buying down risk
- Decision maker then evaluates the options to identify those that are the most acceptable

Each point is an evaluation of a risk mitigation portfolio using the risk assessments



Red line shows the efficient frontier where the best risk buy-down options exist.



**Homeland
Security**

Science and Technology

FOR OFFICIAL USE ONLY. NOT FOR DISTRIBUTION

Future Efforts

- **Agroterrorism Risk Management**

- Partnership with USDA APHIS and DHS NPPD
- Focus primarily on intentional introductions/releases of biothreat “pests”
- Update and improve prior assessment in coming year
 - Address larger scenario set
 - Adopt or build the best methods for estimating probability & consequences
 - Path forward established through requirements process

- **Enhanced and Advanced biological hazards**

- Capture advancements in biotech, synthetic biology, and pharma
- Anticipate alternative targets and/or intended outcomes
- Expand list of potential adversaries



**Homeland
Security**

Science and Technology

FOR OFFICIAL USE ONLY. NOT FOR DISTRIBUTION



**“We Do ANALYSIS
that Buys Down Risk”** 

-DHS S&T CBD Risk Assessment Programs



**Homeland
Security**

Science and Technology

FOR OFFICIAL USE ONLY. NOT FOR DISTRIBUTION



Homeland Security

Science and Technology



Backup slides

FOR OFFICIAL USE ONLY. NOT FOR DISTRIBUTION

Variability – Event Tree

- Entire event tree evaluated multiple times; 2011 BTRA results has 100 evaluations

