



CREATE Terrorism Modeling System (CTMS) and the Risk Analyst Workbench (RAW)

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**Presentation to USC/UK Homeland Security Solutions Conference
September 8, 2005**

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System of Tools to Address These Problems

- Portfolio Allocation/Budgeting
- Programmatic Investments and Policies
- Targeted Investments
- Acting on Intelligence

System of Tools and Methods,
Adaptable to All Risks



CREATE Terrorism Modeling System (CTMS)

1. Structured problem characterization
2. Staircase model of terrorism intervention
3. Four-step modeling system
4. Terrorism Magnitude Scale
5. Integrated family of software tools

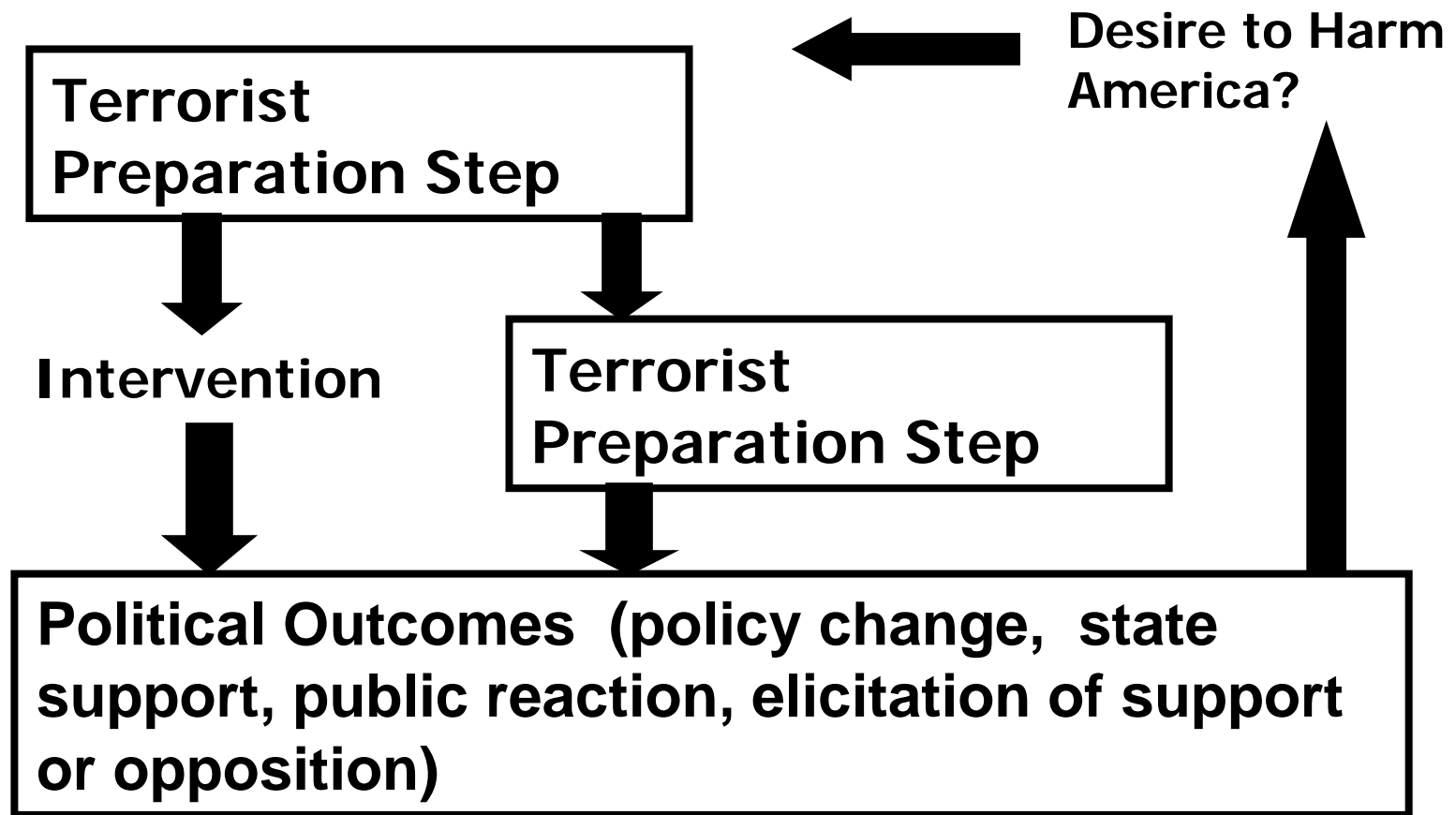


1. Structured Characterization: Framing the Question

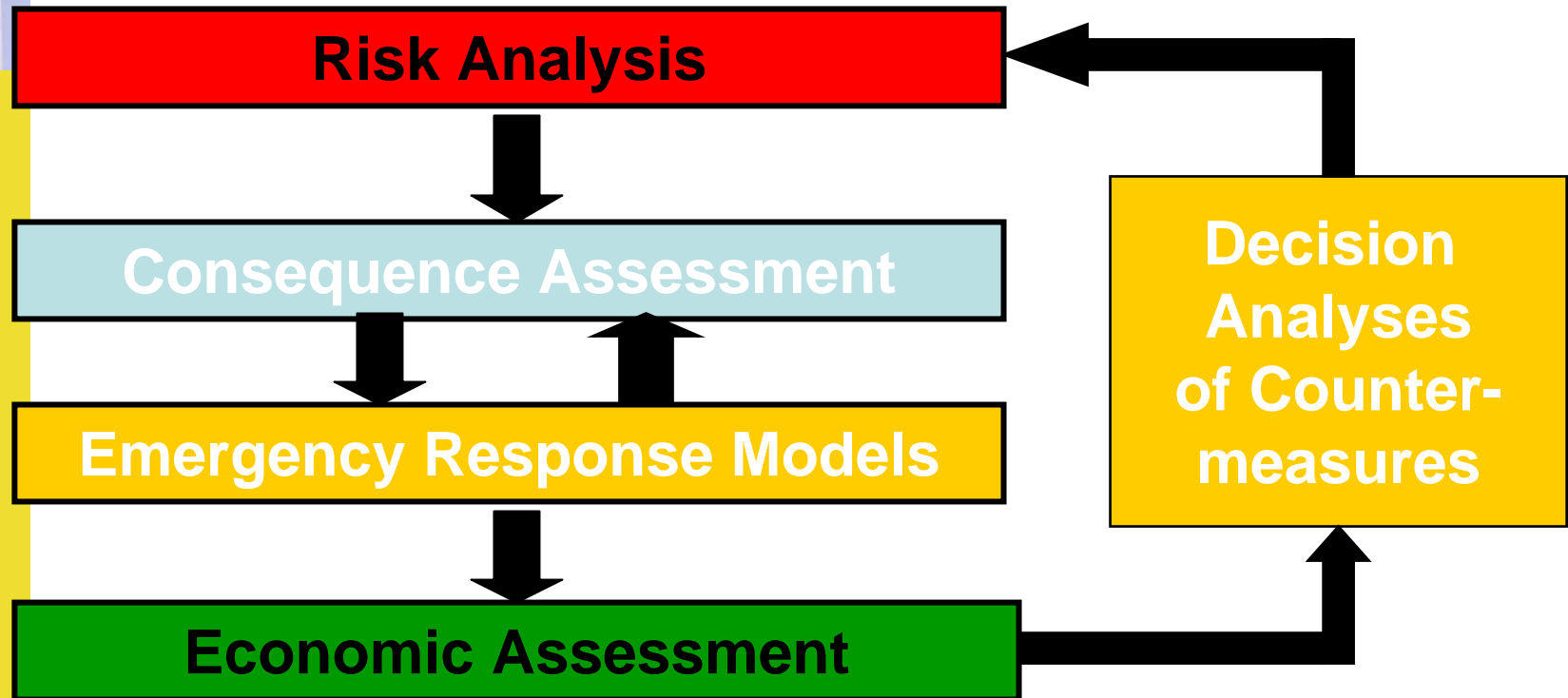
- A. Threat
- B. Terrorism outcomes
- C. Counter-measures
- D. Correspondence of counter-measures to threats



2. Staircase Model of Intervention



3. Four-Step Modeling System



4. Event Magnitude Scale

- Enable order of magnitude comparisons
- Consider three key attributes: human, financial, symbolic
- Provide familiar reference point
- Solution: base 10 logarithmic scale, with maximum of 8
- New Orleans, WTC both likely a level 6 event by the scale



5. Integrated Software Tool: Risk Analyst Workbench (RAW/ISI)

1. Structured Problem Formulation
2. Guided Assessment of Threat Magnitude (scaling for each attribute)
3. Association of Counter-Measures with Threats – Guided Solution Generation
4. Ability to Call Analytical Tools or Data Sets to Support Analysis
5. Forced Consideration of Options and Outcomes

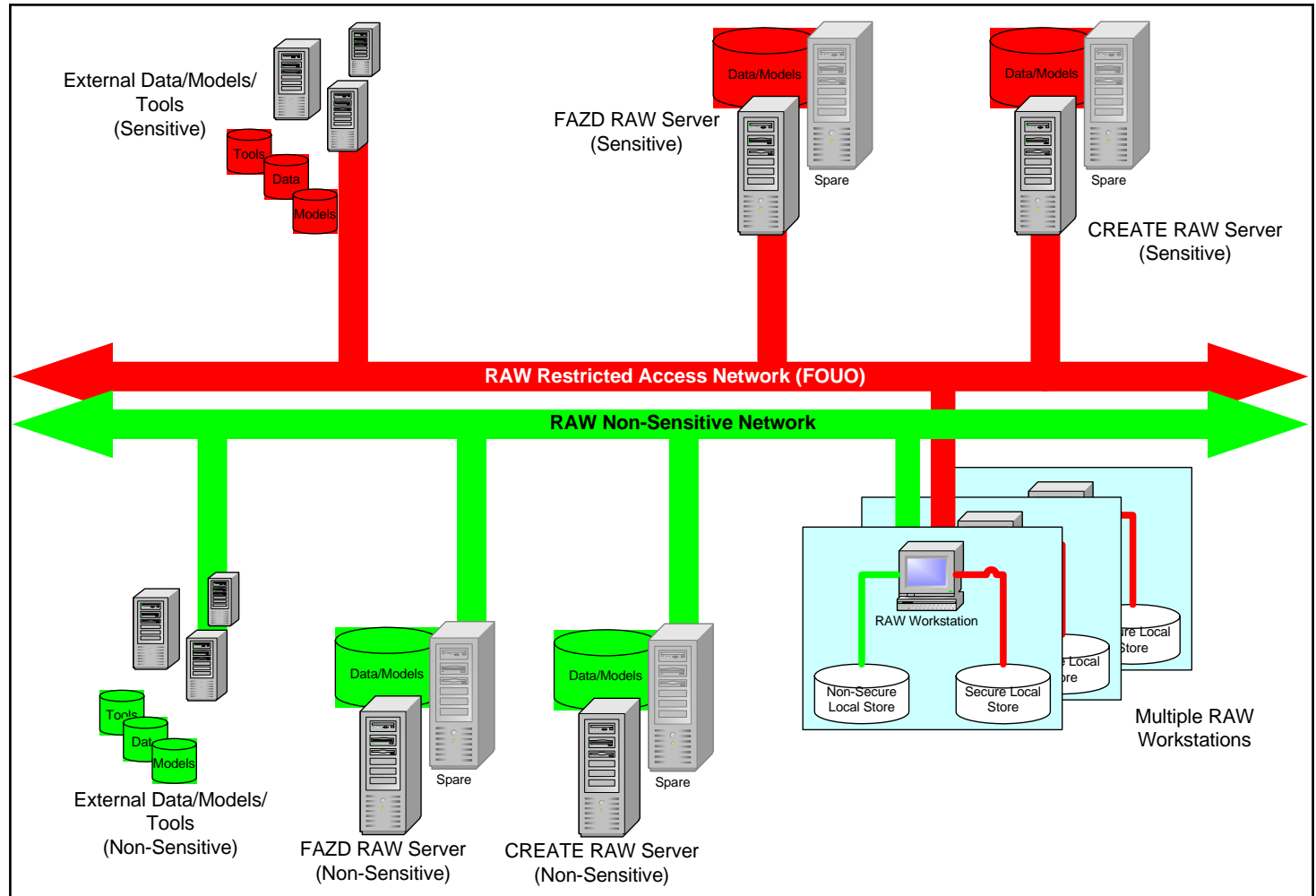


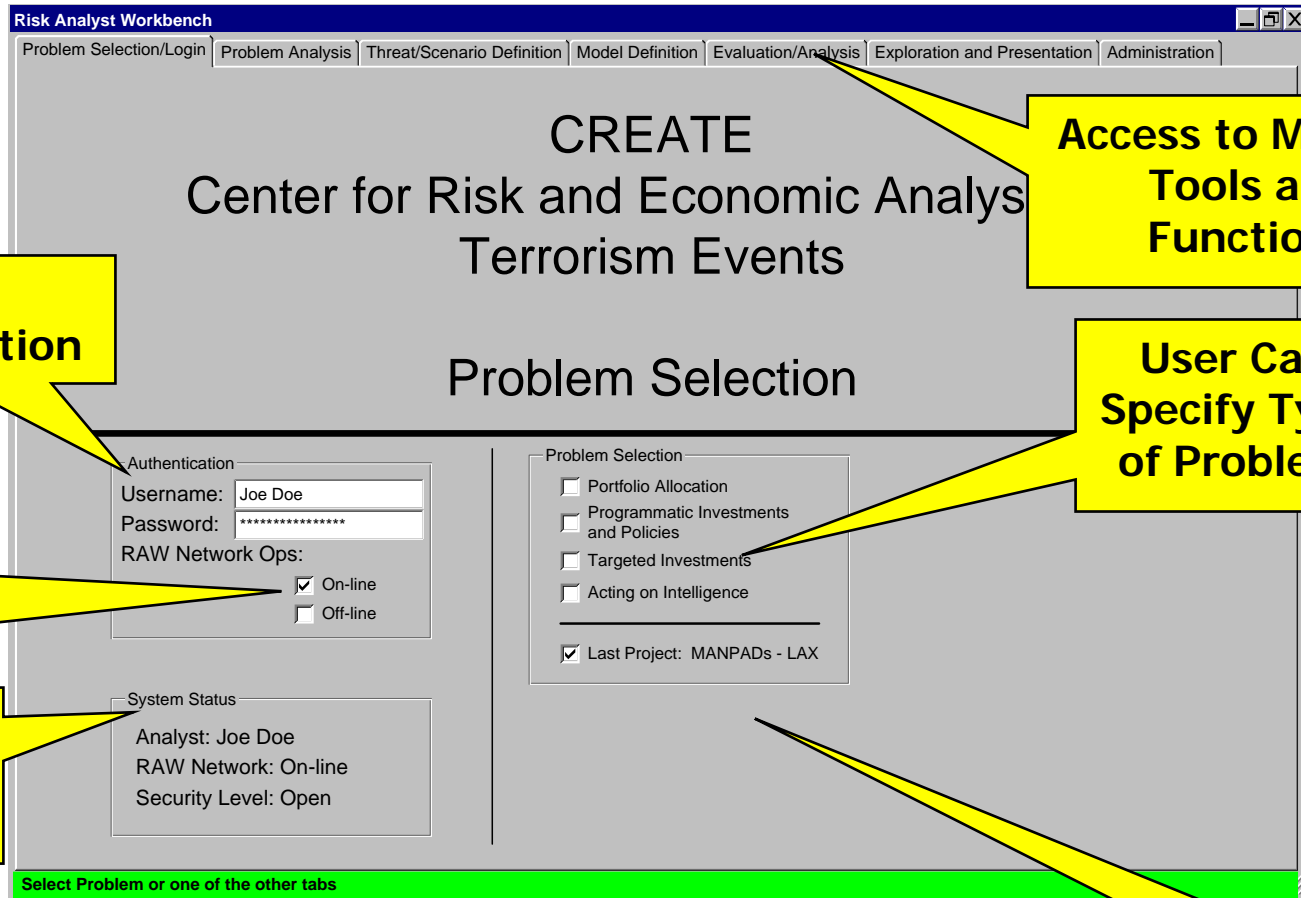
Risk Analyst Workbench (RAW): Features

- Distributed software environment
- Integration of risk assessment models, presentation tools, and data
- Collaborative decision environment
- Standardize scenario definition
- Built-in redundancy
- Secure dissemination of results
- Real-time data monitoring
- “What-if” support



Risk Analysis Workbench





Risk Analyst Workbench

Problem Selection/Login | Problem Analysis | Threat/Scenario Definition | Model Definition | Evaluation/Analysis | Exploration and Presentation | Administration

CREATE
Center for Risk and Economic Analysis
Terrorism Events

Problem Selection

Authentication

Username: Joe Doe
Password: *****

RAW Network Ops:

On-line
 Off-line

System Status

Analyst: Joe Doe
RAW Network: On-line
Security Level: Open

Problem Selection

Portfolio Allocation
 Programmatic Investments and Policies
 Targeted Investments
 Acting on Intelligence

Last Project: MANPADS - LAX

Select Problem or one of the other tabs

Access to Multiple Tools and Functions

User Authentication

User Can Specify Type of Problem

User Can Specify On or Off-line

Current Session Status

User Can Open Previous Problem



Scenario Definition

Access to Multiple Tools and Functions

Risk Analyst Workbench

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Scenario Name: MANPAD CACE 13

Text Description (Narrative):
Determine probability and consequences of a successful MANPAD attack against an commercial jetliner near a major airport

The Process: Scenario Definition Flow

```

    graph LR
      1[Define Target] --> 2[Define Weapon]
      2 --> 3[Define Adversaries]
      3 --> 4[Define Counter-Measure (if used)]
      4 --> 5[Define Consequence (if used)]
  
```

1 Target
Location: Dallas/Ft Worth [Map]
Coordinates: 34N - 120W

2 Weapon
Type: SA-7
Location: Inside fence parameter

3 Adversaries
Number 3

Name	Location	Role	Experience
Suspect 1	Houston	Leader	Iraqi military
Suspect 2	Waco	Trigger	Al Queda training
Suspect 3	Waco	Protection	Unknown

4 Counter-Measures
 Part of Scenario

Type	Location	When Deployed	Costs
Flares	Aircraft	One second after detection	\$1M/Aircraft
Chaff	Aircraft	One second after detection	\$750K/Aircraft

5 Consequence
 Part of Scenario

- Aircraft brought down
- Aircraft damaged - forced to land

SAVE AS SAVE CANCEL

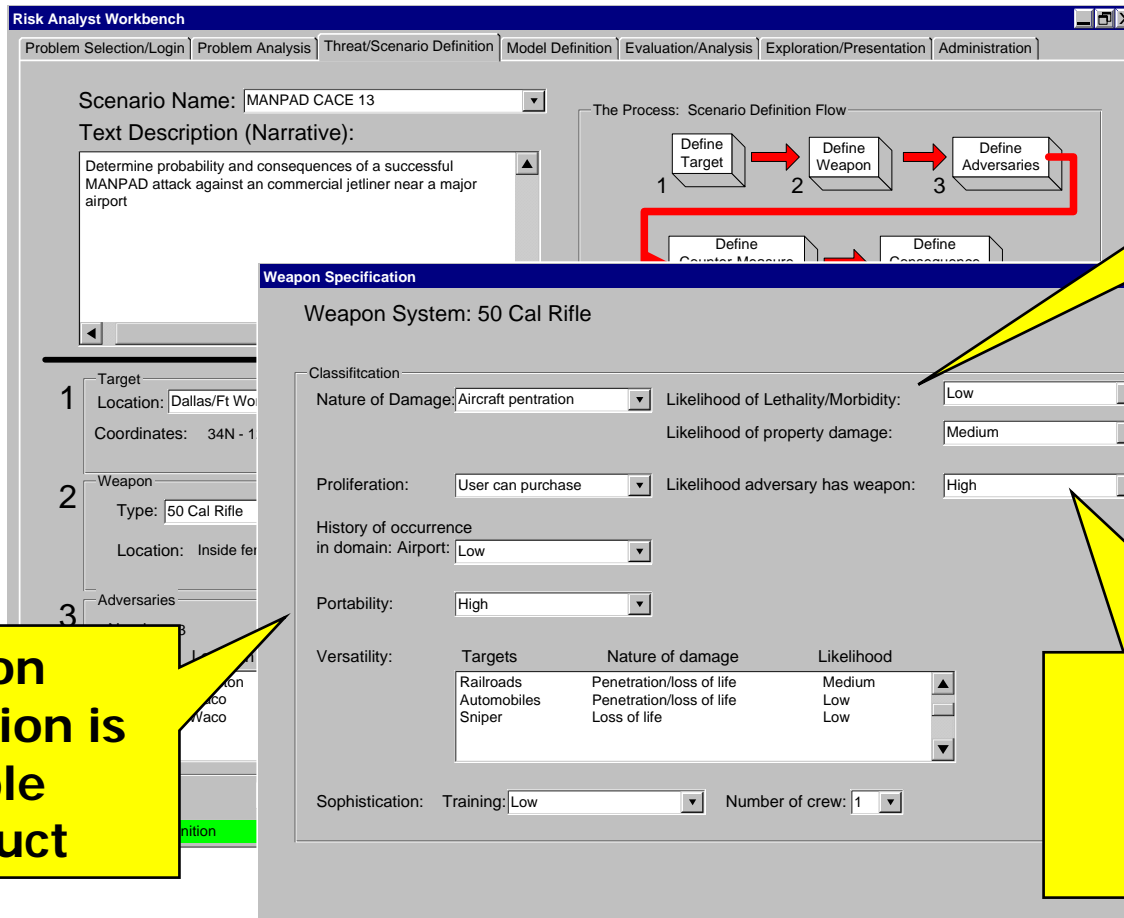
Edit Threat/Scenario definition User: Joe Doe RAW Network On-line Security: Open

Scenario Definition Process

Current Session Status



Detailed Specifications



Risk Analyst Workbench

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Weapon Specification

Weapon System: 50 Cal Rifle

Classification

Nature of Damage: Aircraft penetration | Likelihood of Lethality/Morbidity: Low | Likelihood of property damage: Medium

Proliferation: User can purchase | Likelihood adversary has weapon: High

History of occurrence in domain: Airport: Low

Portability: High

Versatility:

Targets	Nature of damage	Likelihood
Railroads	Penetration/loss of life	Medium
Automobiles	Penetration/loss of life	Low
Sniper	Loss of life	Low

Sophistication: Training: Low | Number of crew: 1

Estimate of impact from weapon

Estimate, likelihood adversary has weapon

Weapon specification is possible byproduct



Spatial Data

User selects target location via CREATE GIS interface

CREATE GIS

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1 Target
Location: Dallas/Ft Worth
Coordinates: 34N - 120W

2 Weapon
Type: SA-7
Location: Inside fence param

3 Adversaries
Number 3

Name	Location	Role
Suspect 1	Houston	Leade
Suspect 2	Waco	Trigge
Suspect 3	Waco	Prote

SAVE A...

Edit Threat/Scenario definition

OpenMap(tm)

1:50,000,000

- World Cities
- UTM Grid
- Day/Night Shading
- Date & Time
- Drawing Layer
- Distance Layer
- Graticule
- Terrain Tools
- Demo Layer
- DTED Coverage
- Water
- DTED

Lat, Lon (42.21, -70.83) - x, y (291,220)

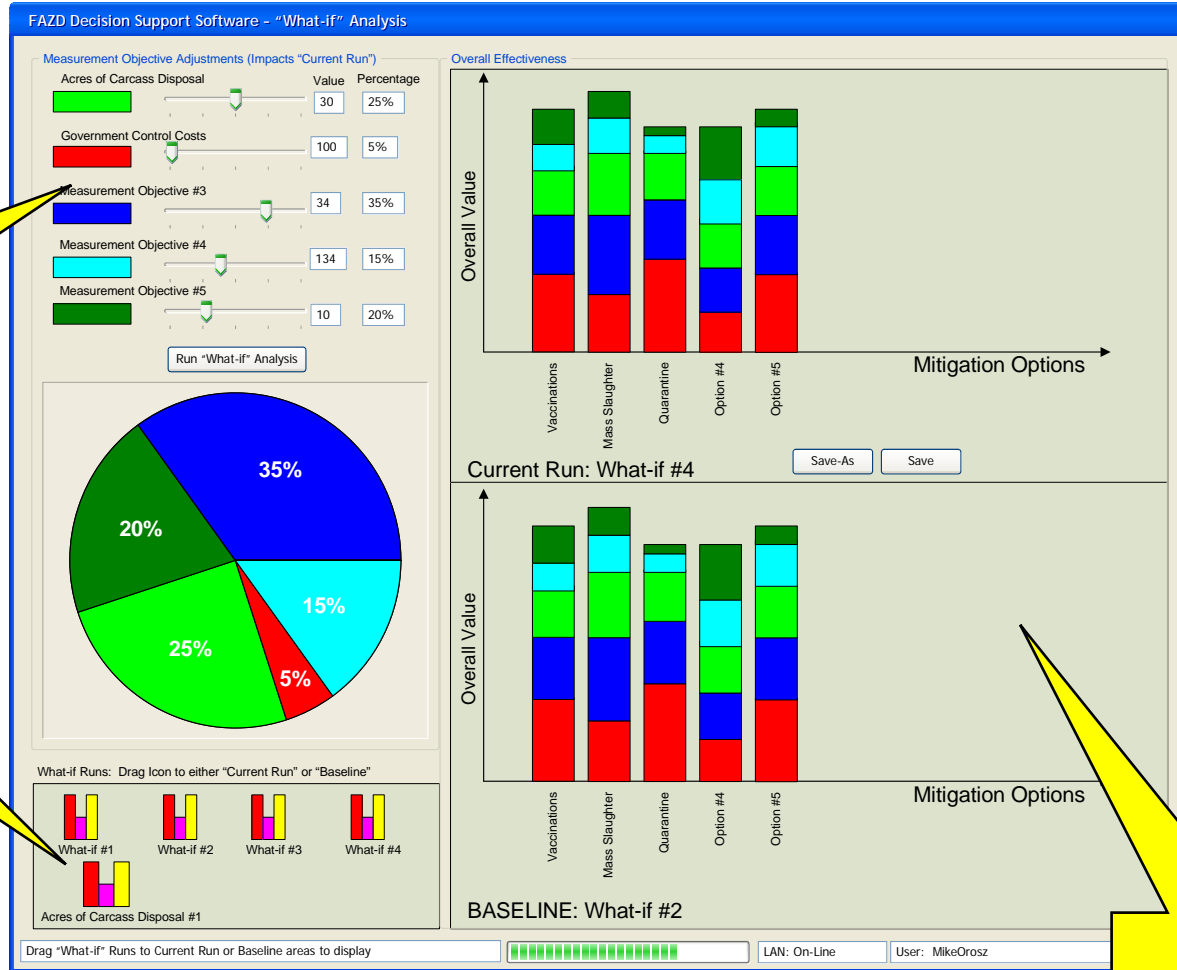
Boston



“What-if” Analysis

Sliders:
Adjust
Parameters

Previous
“What-if”
Runs



“What-if”
Comparisons



Cross Center Collaboration – FAZD Center

- National Center for Foreign Animal and Zoonotic Diseases Defense (FAZD)
- Under contract with Texas A&M FAZD to extend RAW
 - To aid in FAZD risk analysis
 - Develop decision-support tools
 - Enhanced risk modeling software
 - To promote collaboration with CREATE
- First opportunity to foster cross-center collaboration
- Preliminary design completed in August



Status

- CREATE Requirements and detailed system design completed
 - User Interface (UI) mock-ups
- CREATE RAW prototype software development started
- Preliminary FAZD requirements and system design completed

