RAND Homeland Security and Defense Center

Predicting Terrorism Risk for TSA Security Programs

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RMAT Is One of Several TSA Risk Tools

- Risk Management Analysis Tool (RMAT) simulates terrorist attacks on aviation system
  - Developed by The Boeing Company in conjunction with TSA and other industry and agency stakeholders
- RMAT designed to estimate risk reductions attributable to new programs, accounting for
  - Terrorist intentions, targeting preferences, and tactics
  - Effectiveness of existing layers of security
  - Likely damage from 60 kinds of attack
- TSA asked RAND to independently validate RMAT

Summary of RAND Findings On RMAT

- TSA can use RMAT for some purposes, such as
  - Explore plausible futures or effects
  - Repository of knowledge and intelligence estimates
  - Insights for other terrorism risk models
- RMAT is unlikely to accurately predict risk reductions
  - requires precise data that cannot be reliably estimated
  - results are sensitive to errors and uncertainty
- RMAT could inform simpler, more transparent policy models that would be useful in program planning and analysis
- Our evaluation applies to other terrorism risk models
  - Deterrence analysis
  - Risk shifting

What do We Mean by Deterrence?

- Deterrence can be through several mechanism
  - Punishment—fear of retaliation for an action
  - Denial—fear an action will not have desired effect
- Deterrence by Denial generally more effective for terrorists
- Levels of Deterrence
  - Strategic—don't perform a class of actions
  - Operational—don't perform a specific action
  - Tactical—stop an action once initiated

How Does Risk Shifting Work?

- Operational deterrence leads to risk shifting
  - Can be either by punishment or by denial
- The addition of a new security layer causes terrorist to change targets
  - For example, magnetometers deterred hijackers but risks may have shifted into plane bombings
- New security layer can
  - Drive terrorist to much less effective modes of attack
  - Have no impact if target was already undesirable or layer is not seen by terrorist
  - Push terrorist to a more vulnerable target

What about Risk Shifting can by Modeled? (1 of 2)

- Deterrence is driven by terrorists' knowledge and beliefs
  - Their assessments may be very different from our own
- Modeling risk shifting requires estimates for
  - Utility for different targets and modes of attack
  - Risk tolerance
  - Learning parameters
- Value of each parameter is uncertain
  - Varies between and within terrorist groups
  - May change over time

What about Risk Shifting can by Modeled? (2 of 2)

- RMAT included risk shifting, but
  - Risks remained in the aviation sector
  - Focused on few terrorist classes
  - Did not include tactical deterrence
- RMAT is too sensitive to fundamentally unknowable parameters
  - TSA turned off the risk shifting for reports
- Simple, low-resolution models can provide an indication of tradeoffs between modes of attack
  - List possible paths for attack
  - Assess public vs. private knowledge of security
  - Examine the relative effect of changes to security

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