

# *Toward Risk-Based Aviation Security*

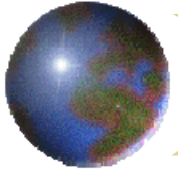
by

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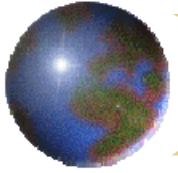
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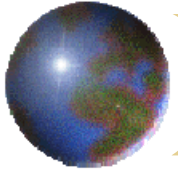
## *Overview of presentation*

- ❏ Macro-level anti-terrorism considerations
- ❏ Using relative cost-effectiveness: an example
- ❏ Comparative aviation security: Canada, Europe, and the United States
- ❏ An approach to more risk-based aviation security
- ❏ Conclusions



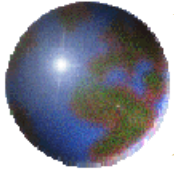
## *Some macro-level considerations*

- ❑ Inherent asymmetries give the advantage to terrorists (e.g., target-rich vs. target-poor environments).
- ❑ Benefit/cost analysis is far more difficult for anti-terrorism than for other issues (Copenhagen Consensus paper).
- ❑ Terrorists adapt and counter defensive technologies (RAND).
- ❑ Hence, defenses need to be flexible and dynamic, not static.



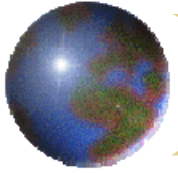
## *Relative cost-effectiveness is a promising approach.*

- Analogy with safety regulatory analysis: estimate annual cost per life saved.
- U.S. DOT uses \$3 million per life saved as benchmark.
- Stewart & Mueller analyze in-flight and pre-board TSA security measures.
- Plausible assumptions show that air marshals are 225 X as costly as cockpit doors; sensitivity analysis confirms general result.
- Similar calculation finds pre-flight screening 35X as costly as cockpit doors.



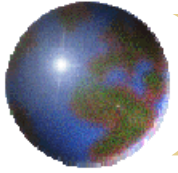
## *Comparative approaches: Canada, Europe, and USA*

- ❖ Hijackings were the initial threat in all three cases.
- ❖ ICAO Annex 17 provides the basic framework for all member states.
- ❖ Regimes amended as threat evolved to include in-flight bombings and suicide terrorism.
- ❖ 9/11 led to CATSA in Canada, TSA in US.
- ❖ EU-wide policy since 2002; amended 2008.



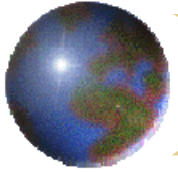
## *Who pays for aviation security?*

- ✚ Canada: 100% covered by tax on airline tickets (mode-specific).
- ✚ Europe: varies by country but mostly airline, airport, and passenger charges (largely mode-specific).
- ✚ USA: about 50% of TSA aviation costs covered by aviation taxes; balance from general fund. Other costs in airport budgets, paid by airlines. (Mix of modal and “defense” approach).



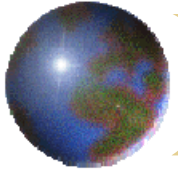
## *Who provides aviation security?*

- Canada: crown corporation (CATSA), regulated by Transport Canada.
- Europe: mostly airports, regulated by transport ministry.
- USA: TSA and airports (regulated by TSA).
- Canada and Europe outsource airport screening; USA does not (hence, less flexible).



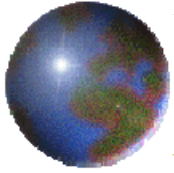
## *How risk-based are aviation security policies?*

- ICAO Annex 17 calls for threat-based, risk-assessed security policies—but spells out numerous “input” requirements.
- CATSA Advisory Panel and Auditor General called for risk-based policies.
- EU’s 2008 policy calls for tailoring policies based on relative risk.
- TSA and parent agency DHS use risk-assessment rhetoric.



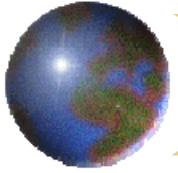
## *Risk-based policies in practice: cargo, not passengers*

- Generally, “known shipper” policies, random screening, and intelligence-based screening have prevailed in air cargo (similar to maritime and surface transport).
- But the most prominent risk-based passenger policy—Registered Traveler—has not been implemented anywhere.
- What TSA allows as RT is not risk-based at all.



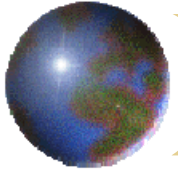
## *Outline of a risk-based approach*

- Change emphasis from detecting dangerous objects to detecting dangerous people.
- Allocate screening resources (passenger and baggage) based on relative risk.
- Use savings to increase security within terminal, on the ramp, and at airport perimeter.
- Subject all components to cost/life saved analysis.



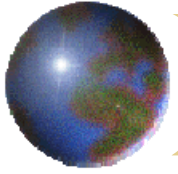
## *Three-tier approach to passengers*

- Low-risk: security clearance or pass criminal-history background check (Registered Travelers).
- High-risk: either those identified as risks by intelligence information or about whom very little information exists.
- Ordinary passengers: everyone else.



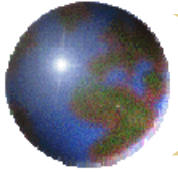
## *Risk-based passenger screening*

- Registered Travelers: pre-9/11 screening in fast lanes (no shoe or jacket removal or laptop, etc. removal).
- Ordinary travelers: current screening process.
- High-risk travelers: mandatory “secondary screening” for those on watch list (body scan and explosives screening of carry-ons); detention for those on no-fly list.



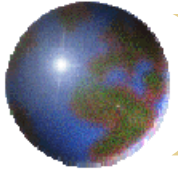
## *Risk-based checked-baggage screening*

- Registered Travelers: 2-D X-ray of bags, plus random use of EDS.
- Ordinary travelers: tiered system, 2-D X-ray followed by EDS if indicated.
- Watch-list travelers: mandatory EDS.



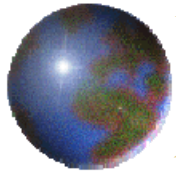
## *Conclusions (1)*

- Target-hardening is inherently problematical, given terrorist flexibility. But since aviation is a high-profile target, we have to do something.
- Relative cost-effectiveness (annual cost per life saved) is a workable approach to choosing among aviation security tools.
- A risk-based approach to selecting security measures would shift resources to more cost-effective tools.



## *Conclusions (2)*

- Risk-based measures should be flexible, changing in response to new information.
- Mode-specific security funding may incentivize risk-based policy.
- The biggest obstacle to a risk-based approach is elected officials' preference for dramatic, visible (and static) measures.



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