

TSA's Risk-Based Approach to Passenger Screening

Advanced Development for Security Applications (ADSA12)
Personnel and Divested Items Screening at the Checkpoint

May 12, 2015

Boston, MA



Transportation
Security
Administration

Risk-Based Security (RBS)

Key Drivers

- Declining Resources
- Increasing passenger volume
- Evolving terrorist threat
- Negative public image

RBS was not developed in a vacuum. RBS policies should be considered within the context of the full scope of changes implemented since 2009

- Intelligence Community Improvements
 - collection, analysis, sharing
- Changes to Security Technologies
 - detection capabilities, new technologies, Secure Flight
- Procedural Changes
 - primary screening, alarm resolution, resource allocation

RBS for passenger screening began in October 2011

Outcome objective of RBS philosophy is to provide the most effective security in the most efficient way

RBS always intended to apply to more than just passenger screening

RBS Guiding Principles / Key Precepts

1. The majority of airline passengers are low risk.
2. The more information available on each passenger, the easier it is to assess risk.
3. Behavior detection and interviewing techniques are strengthened in the screening process.
4. TSA optimizes screening processes and the use of technology to gain system-wide efficiencies.
5. Increases security by focusing on unknowns that help to expedite known/trusted travelers.

- A one-size-fits-all application of security measures is unsustainable.
- The adaptive nature of the terrorist adversary makes a myopic focus on finding potential threat objects an unwinnable proposition.
- Working to eliminate risk is neither fiscally nor operationally possible.
- Low-risk designation does not mean no-risk.
- Government watch lists provide the best proxy for unknown terrorists.
- Security effectiveness and facilitating legitimate traveler and commerce movement are not incompatible.

Risk-Based Security: Multi-Attribute Value Creation



"We are looking at other ways to screen smarter and use our resources in a fiscally responsible way to provide the most effective security as efficiently as possible, to strengthen security and measurably improve the travel experience for everyone."

– Former Administrator John Pistole (2012)

- Security Effectiveness: how the policy impacts the overall effectiveness of security operations
- Operational Efficiency: how the policy impacts the efficiency of security operations
- Passenger Experience: how the policy will affect individual passengers
- Industry Vitality: what are the potential financial and other implications for airports and airlines due to the policy
- Political Acceptance/Fiscal Implications: anticipated level of Congressional and public acceptance of the policy and how the policy might impact TSA's budget

TSA Pre✓[®] - RBS for Passengers

- Segments passengers by risk judgment and provides low and lower-risk travelers an expedited physical screening experience
- Improves security and resource use by focusing on high-risk travelers/those TSA knows less about
- Eligibility for TSA Pre✓[®] Screening as
 - Certain High Mileage Frequent Flyers
 - Member of Low Risk Population (LRP)
 - Enrolled in a DHS Known Traveler Program
 - Via Trip-by-Trip Risk Assessment

What is
TSA Pre✓?



Calendar Year	Airlines	Airports*	# Expedited	% Expedited
2011	2	5	225K	<3.5%
2012	5	35	37M	5.8%
2013	7	102	79M	33.3%
2014	11	125	287M	44.3%
2015 Projected	15	140	320M	50%

* Expedited screening provided in standard lanes at all airports

TSA Pre✓[®] Passenger Experience at the Airport

TSA Pre✓[®] Experience

- Access to TSA Pre✓[®] lane
- Quicker transit through airport security screening
- Enhanced travel experience

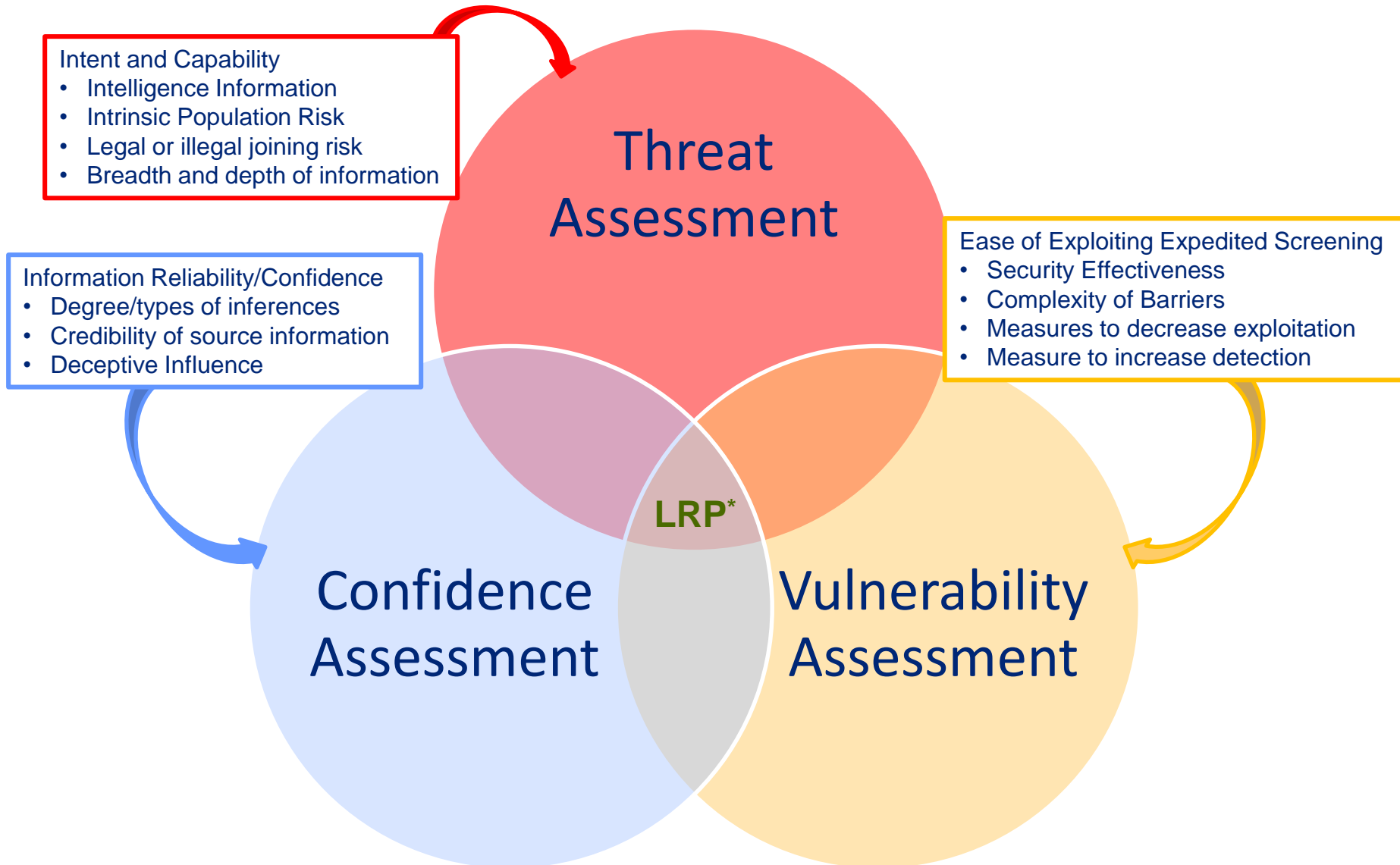
No Divestiture of:

- Shoes
- 3-1-1 compliant bag
- Laptop
- Light outerwear/jacket
- Belts

1. Access to TSA Pre✓[®] lane (children age 12 and under traveling with an eligible parent or guardian are allowed)
2. Present boarding pass and ID to the Travel Document Checker
3. Scan barcode on boarding pass
4. If directed by the Travel Document Checker, proceed through the TSA Pre✓[®] lane for expedited screening

TSA incorporates unpredictable security measures throughout the airport and no individual is guaranteed expedited screening

Low-Risk Population Risk Assessment Considerations



* Low Risk Population

Near-Term Expansion of RBS

1. Continue expansion of TSA Pre✓[®] with majority of passengers receiving expedited physical screening
 - Extend airline participation (U.S. and foreign carriers)
 - Additional trusted populations
 - Increase TSA Pre✓[®] Application Program enrollments
 - Expand application program enrollment options
2. Adopt risk-based approach to other aspects of aviation security (e.g., checked baggage, air cargo)
3. Improved travel experience
 - Recognition of viable non-U.S. known/trusted traveler programs
 - Reciprocity with TSA Pre✓[®] like lanes at certain non-U.S. airports
 - Further collaboration with CBP, airports and airlines for international travelers
 - Consolidated security technology to streamline security process for all travelers

Aviation Security – The Next Ten Years

Critical Mission Drivers

- Likelihood of reduced future security funding
- Projected growth in commercial aviation
- Increasingly sophisticated terrorist tactics and tradecraft

Desired Future State

- Unified approach to aviation security across the aviation domain
- Comprehensive, multi-threat vector consideration of flight-by-flight risk
- Improved collaboration between government and industry to deploy resources for greatest risk mitigation impact
- Enhanced decision support tools and analytics to inform resource decisions
- Use of risk tolerance thresholds to identify where there is unused risk capacity (opportunities for greater efficiencies) and excess risk (where to target increased mitigation measures)
- Consolidated security technology to streamline checkpoint experience and increase operational efficiency

Long Range Objectives for Aviation Security

- Create a more complete and comprehensive view of risk across the aviation domain
- Improve security effectiveness and overall risk mitigation for commercial aviation
- Employ dynamic screening / adaptive security measures allocated based on risk
- Provide holistic application of RBS principles system-wide
 - Further risk segmentation of passengers, property, cargo
 - Allocate security resources to best manage risk within acceptable tolerance ranges
- Reduce government and industry total costs of security while enhancing value for the American people
- Improve operational efficiency with more effective resource allocation using sound risk management principles

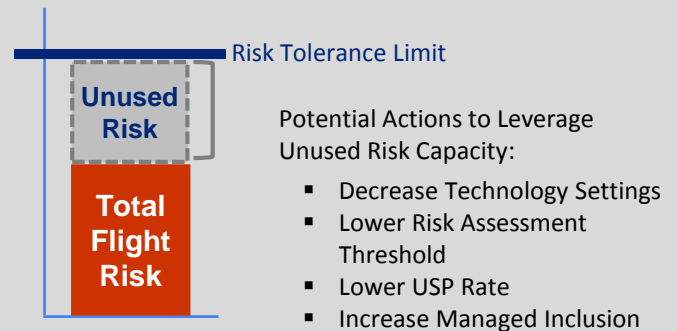
Dynamic Aviation Risk Management Solution (DARMS)

For each flight, the total flight risk can be determined by aggregating the risk levels of eight major dimensions...

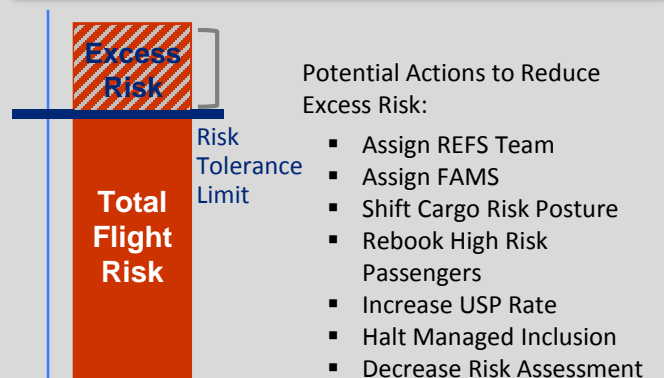
...and when compared to the risk tolerance limit, potential response actions can be identified.



Low Total Flight Risk



High Total Flight Risk



DARMS – Critical Capability Needs

- Big-data analytics to identify key risk indicators across each potential flight risk vector
- A multi-attribute risk algorithm for assessing risk on a per flight basis
- Collect and aggregate key risk indicator information (both direct and transferred) across the aviation domain
- Assign a risk judgment to travelers and products, and track their movement throughout the aviation stream of commerce
- Quantify the risk-mitigation effect of each countermeasure (both individually and in combination) as it relates to direct and transferred risks at the individual flight level
- Dynamically adjust security countermeasures in response to the assigned risk judgment associated with the traveler or product being screened **and** the assessed risk level of the individual flight
- An appropriate collaborative government/private sector governance structure suited to the future risk-management environment
- Advanced decision support and data analytics visualization tools for aviation domain risk management

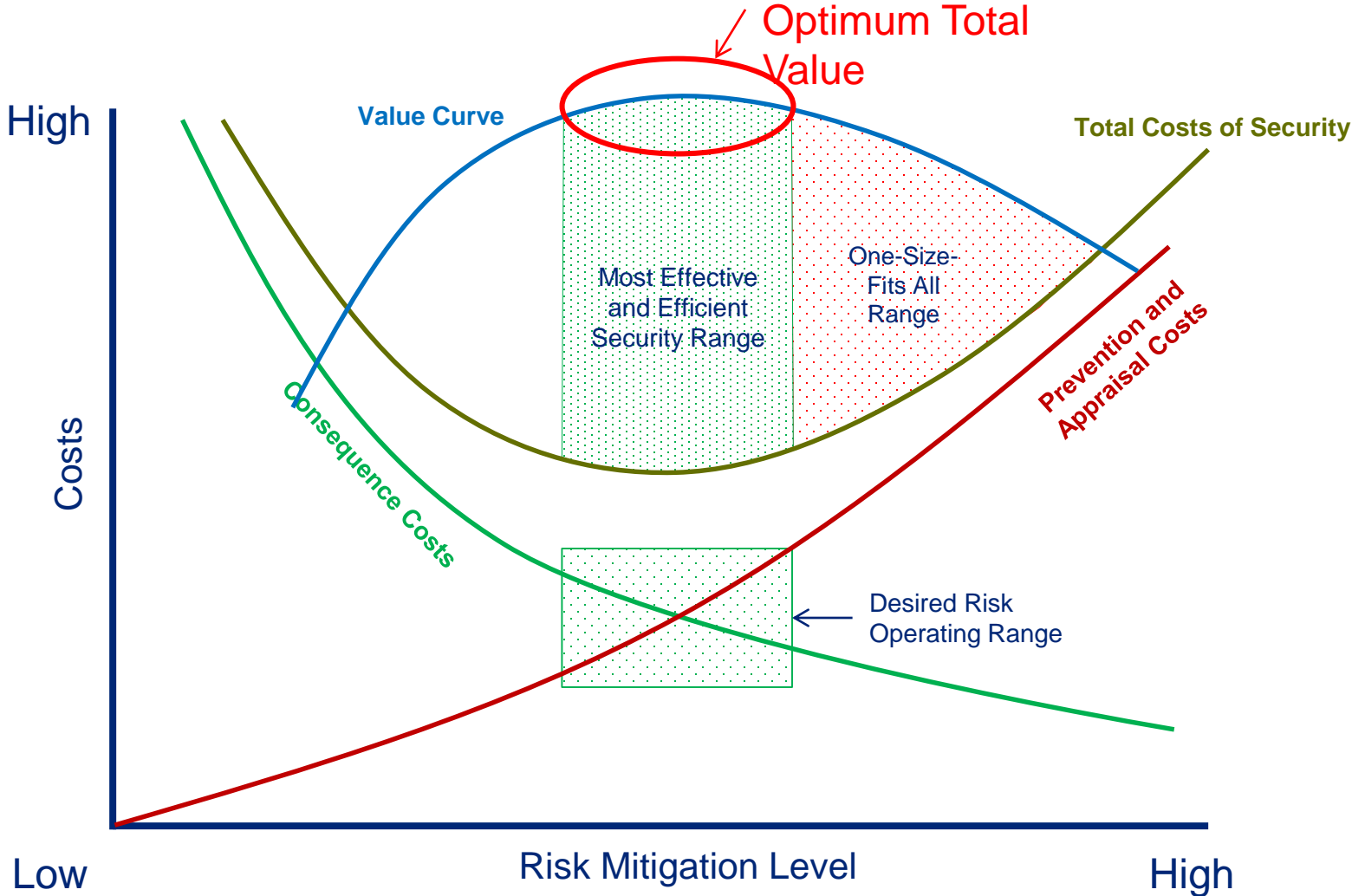
Thank you



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BACK-UP SLIDES

Adapting the Cost of Quality Curve



DARMS Proof of Concept Modelling

Completed at CREATE Center at USC via DHS S&T

Comparison of Current approach to future DARMS approach

- Shift from screening differentiation based on passenger risk category,
to
- Passenger screening differentiation based on flight and risk category

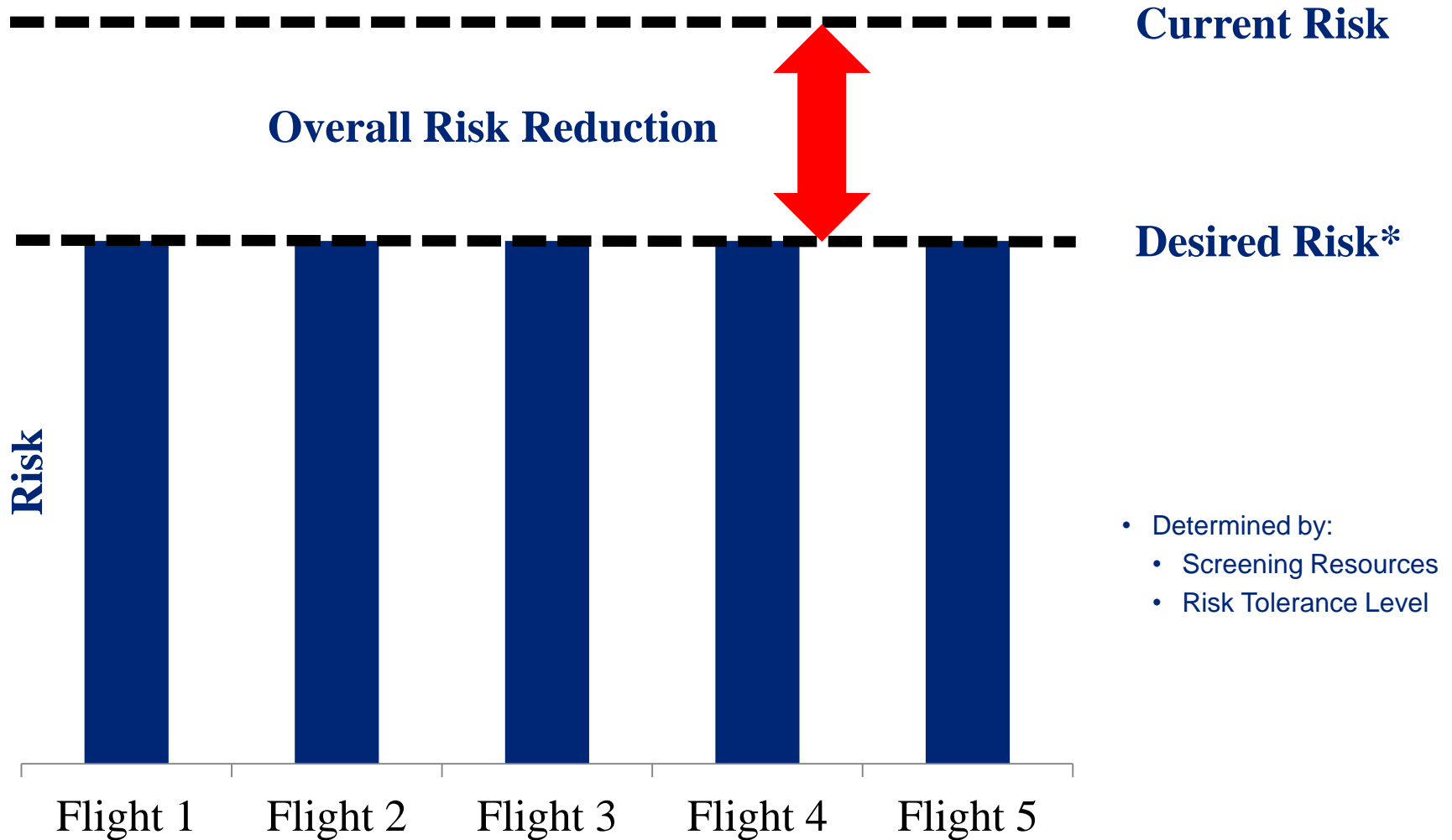
Used current six risk categories in TSA traveler risk continuum

- High Risk, Unknown Risk, Low Risk 1 – 4

Modeled as a threat screening game using advanced game theory

- Allows for quantitative comparison of both approaches
- Incorporates advanced adaptive adversary research
- Defender selects countermeasures strategy and attacker selects targeted flight and attack method
- Defender Goal: Minimize risk across all flights and attack methods
- Adversary Goal: Maximize the negative impact

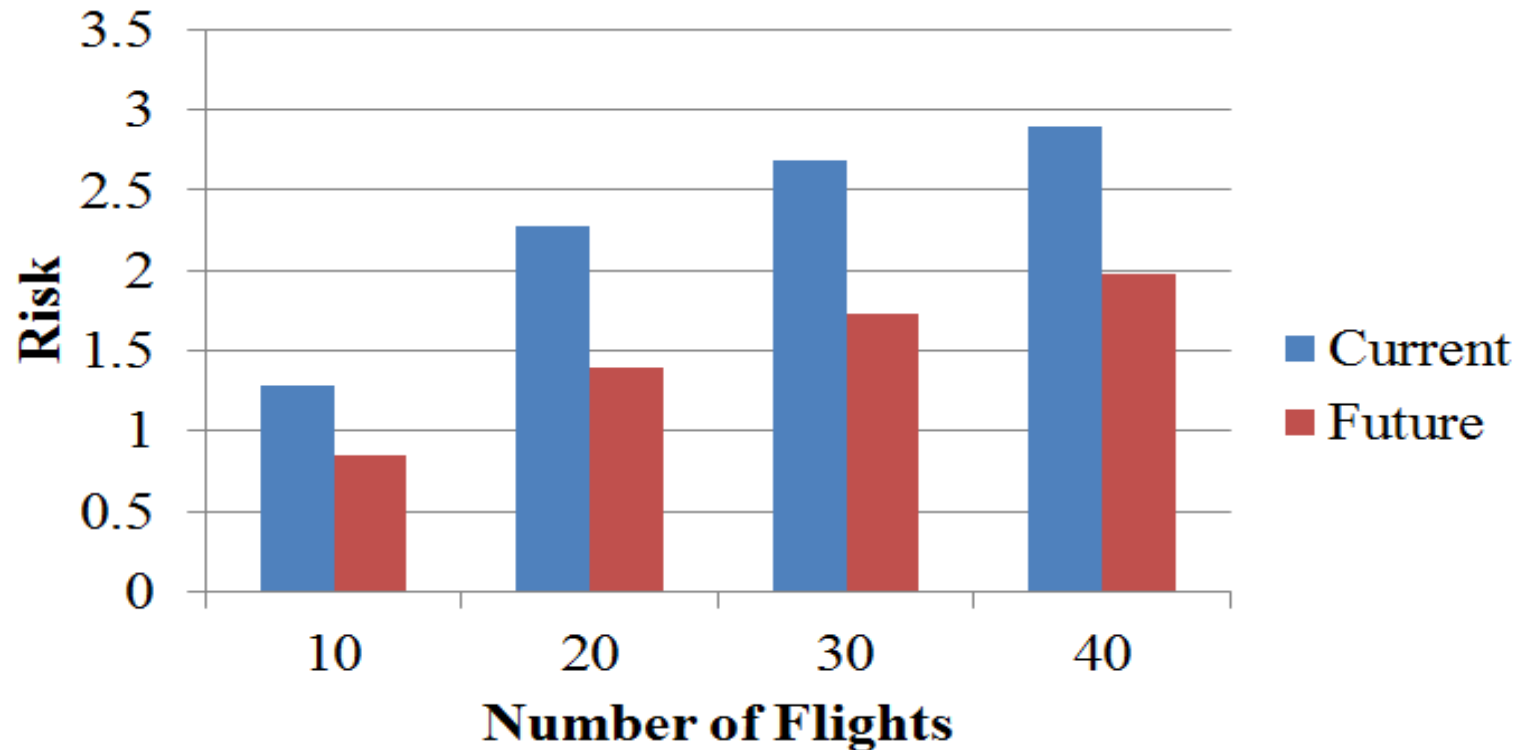
Buying Down Risk



Solution Quality Comparison

Comparison of approaches while scaling up flights

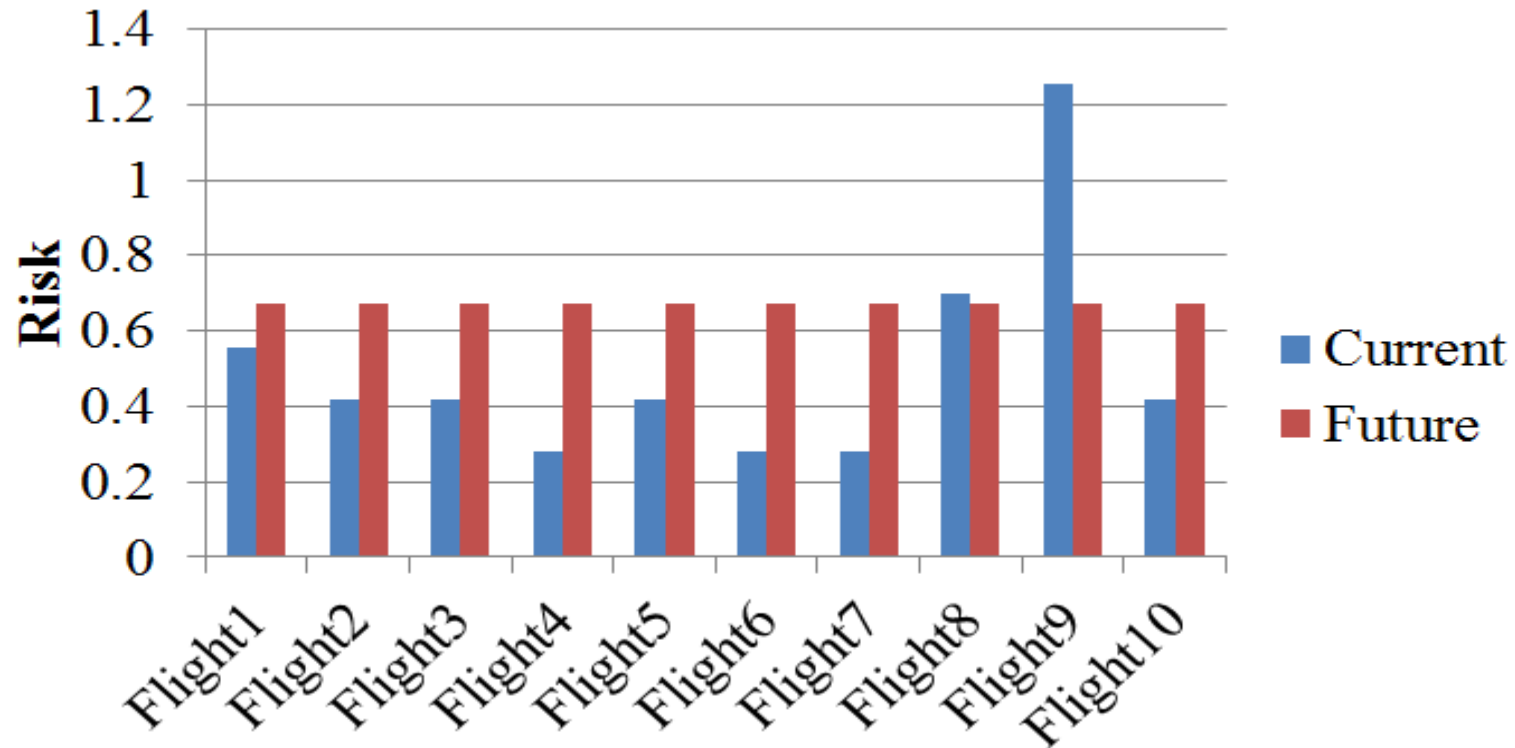
Future provides a more effective screening strategy in all cases



Specific Game Instance

Current overprotects some flights but leaves others vulnerable

Future spreads risk evenly across all flights, reducing overall risk



Flight Heterogeneity Comparison

For identical flights Current & Future are equivalent

Current performs worse as flight heterogeneity increases

Future adapts to heterogeneity, leading to consistent performance

