Pacific Northwest
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Airport Risk Assessment Model (ARAM): Increasing the Effectiveness of Airport Security Countermeasures

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ARAM: So What? Who Cares?

- **Space:** Optimal resource allocation to enhance security at airports
- **Problem:** How to quantify and minimize risk from threats and use associated countermeasures more effectively?
- **Solution:** Airport Risk Assessment Model (ARAM)
- **Results:** ARAM can significantly reduce risk compared to ad hoc methods and is soon being deployed at the Sea-Tac Airport
- **TRL:** 4-6
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Airport Risk Assessment Model

- *Developed by Pacific Northwest National Laboratory – first model to dynamically quantify risk from terrorist threats at airports*
- *Automatically optimizes recommended assignment locations of deployable security countermeasures*
- *Demonstrated to DHS S&T, TSA, Port of Seattle Security/Police Department, and Delta Airline Security*
- *To be operationally deployed at Sea-Tac in summer 2019, with additional airports to follow*
- *Sponsored by DHS S&T Apex Screening at Speed program*

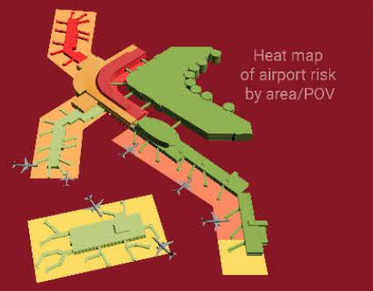
ARAM

AIRPORT RISK ASSESSMENT MODEL

ARAM AIRPORT RISK ASSESSMENT MODEL

AIRPORT DEFINITION

AIRPORT AREAS
+ POINTS OF VULNERABILITY (POV)



DEPLOYABLE COUNTERMEASURES

- TSA Transportation Security Officer
- TSA Canine
- TSA Visible Intermodal Prevention and Response
- Airport Police Dept. Patrol
- Airport Police Dept. Canine
- Airport Security

ASSESSED INPUTS

THREATS

- PBIED
- VBIED
- Chem/Bio
- Active Shooter
- Insiders
- Placed IED

EFFECTIVENESS AGAINST THREAT

- Prevent & Detect
- Deterrence

DATA INPUTS

- Employees
- Vehicles
- Passengers
- Vendors
- Other
- Flights

RISK MODEL

RISK COMPONENTS

CONSEQUENCE

- Death/injury
- Economic Impact
- Environmental impact
- National Defense
- Symbolic Effect
- Recoverability
- Redundancy

VULNERABILITY

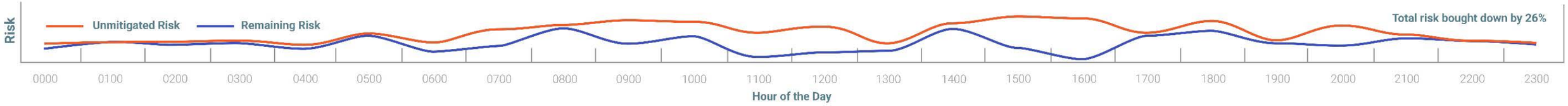
- Availability
- Accessibility
- Organic Security
- Target Hardness

THREAT LIKELIHOOD

RISK ENGINE

Optimal countermeasure assignments: which POVs and when to patrol

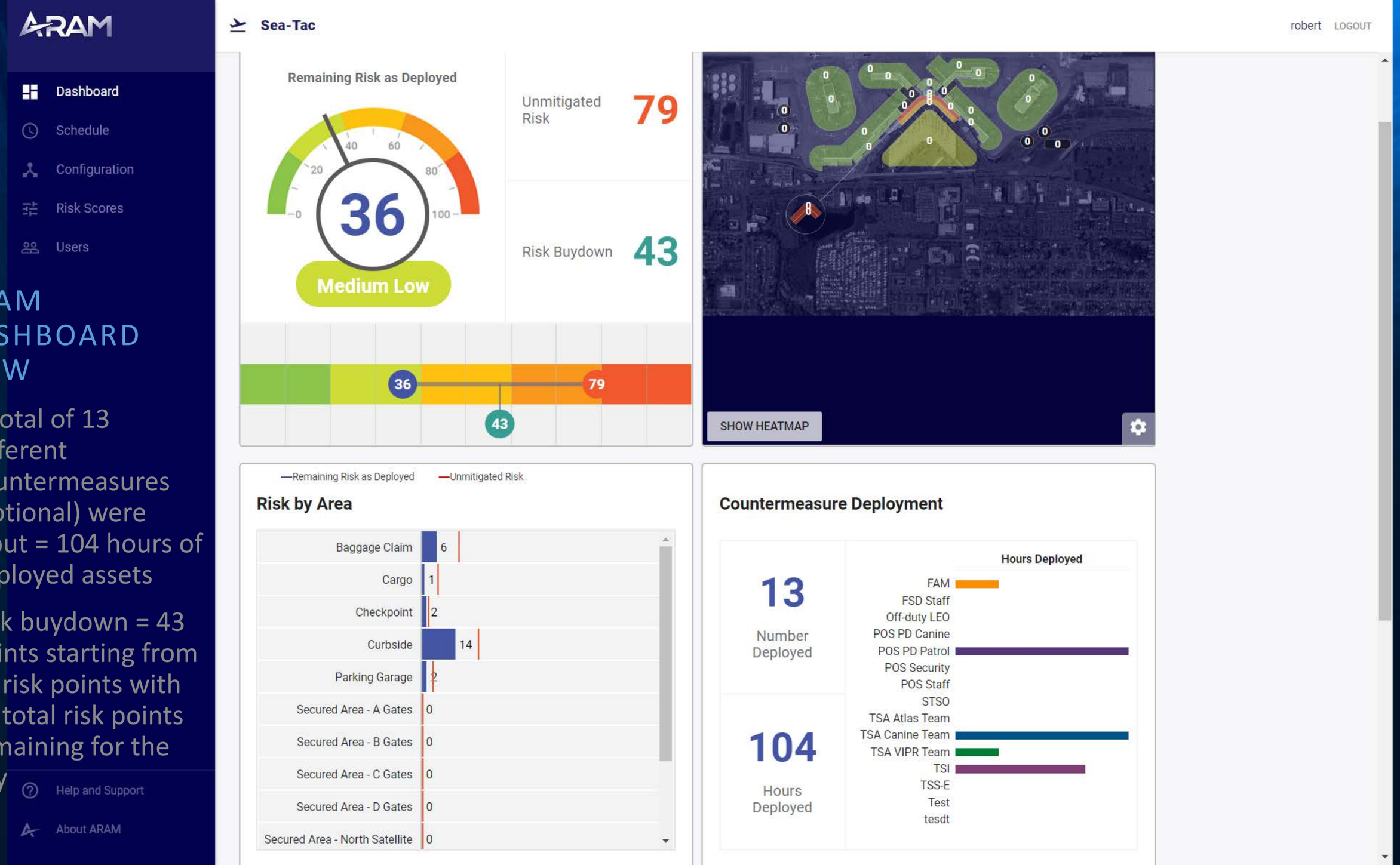
OPERATIONS



ARAM DASHBOARD VIEW

A total of 13 different countermeasures (notional) were input = 104 hours of deployed assets

Risk buydown = 43 points starting from 79 risk points with 36 total risk points remaining for the day



Why ARAM?

- *Risk-based approach to decide on best use of discretionary resources*
- *Accounts for multiple threats*
- *Unity of effort across stakeholder organizations / reduces duplication of effort*
- *Tracks risk and risk reduction trends over time*
- *Easy to use*

Potential Spin-offs

- *Extensions to other transportation venues (e.g., trains, cruise ship terminals, etc.*
- *Border Operations Risk Assessment Model (BORAM)*
  - *Goal: optimize placement of border patrol agents and technologies to minimize risk*
- *Optimal resource allocation at ports-of-entry*

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Thank you