

*Expanding the Advantage through Collaboration*

# *Expeditionary and Maritime Systems*

## *Department*

### *Coastal & Maritime*

#### *Security*

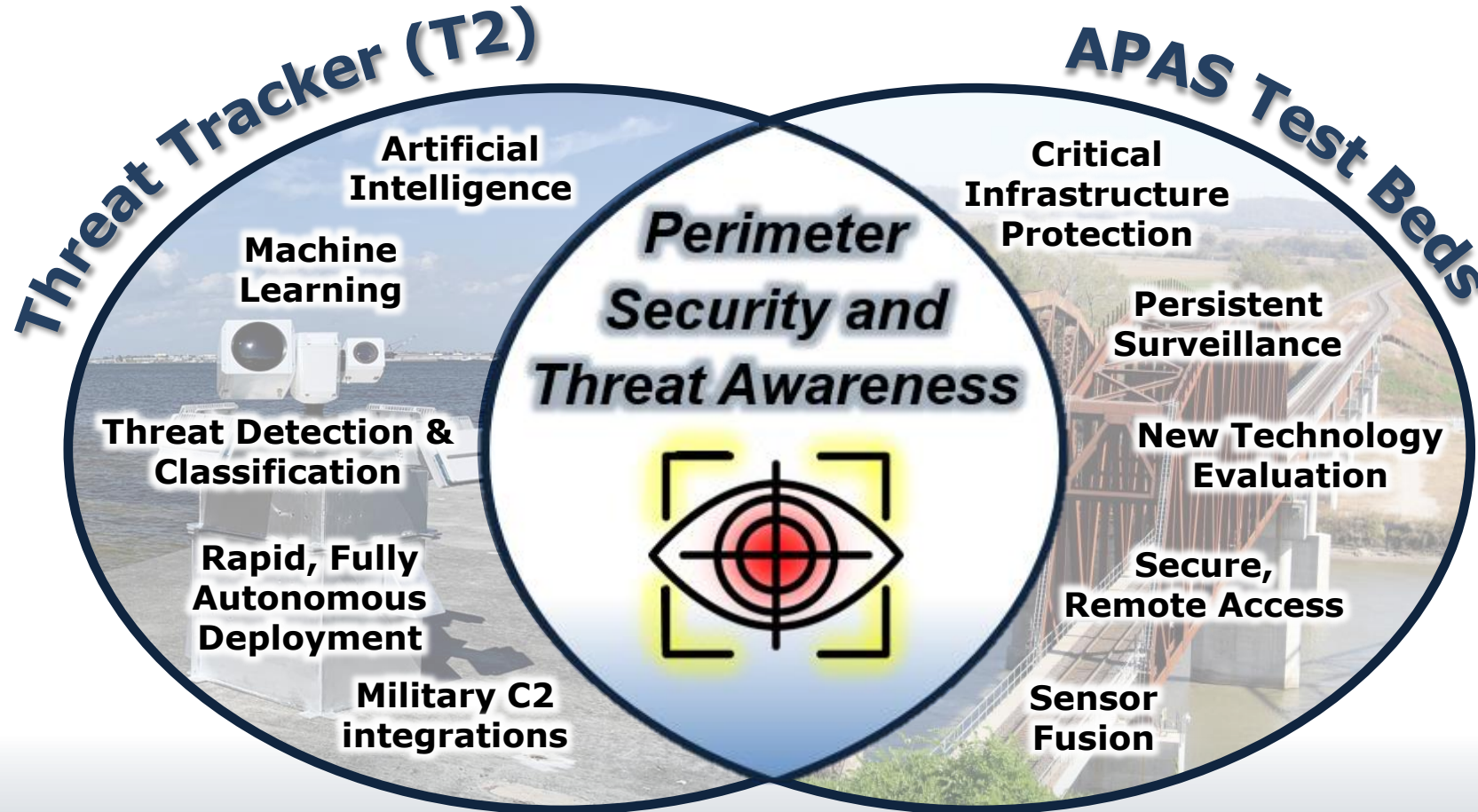
March 2022

**Adaptive Persistent Awareness Systems (APAS)  
Project Capabilities**



NSWC PANAMA CITY DIVISION





### MISSION



Through collaborative partnerships, APAS provides security technology recommendations and solutions for Counter-Unmanned Aerial Systems (C-UAS), Critical Infrastructure, Mass Transit Public Areas, and Air Cargo by evaluating existing technologies and developing requirements for new security technologies to safeguard the traveling public.

### FOCUS AREAS



- Gather knowledge and expertise from technical experts and industry partners to effectively inform APAS's recommendations
- Expand partnerships with internal and external stakeholders to promote industry engagement and improve security technologies
- Assess and highlight new and emerging threats in APAS's mission space to find advanced solutions for security technologies

## APAS CAPABILITIES

#### Surface Security Technology



Evaluate advanced perimeter intrusion technologies and facilitate industry awareness to help address identified surface transportation security capability gaps.

#### Mass Transit Security Technology



Evaluate advanced Detection at Range technologies and facilitate industry awareness to help address identified surface transportation security capability gaps.

#### C-UAS



Technology assessments of C-UAS systems. APAS evaluates their ability to track, classify, identify, and mitigate UAS threats in urban environments.

#### Air Cargo



Develop new and enhance current air cargo security policies and requirements to promote aviation security and work collaboratively with stakeholders to reduce terrorist risks.

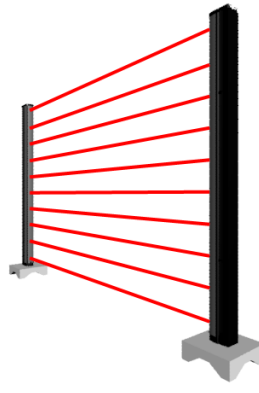
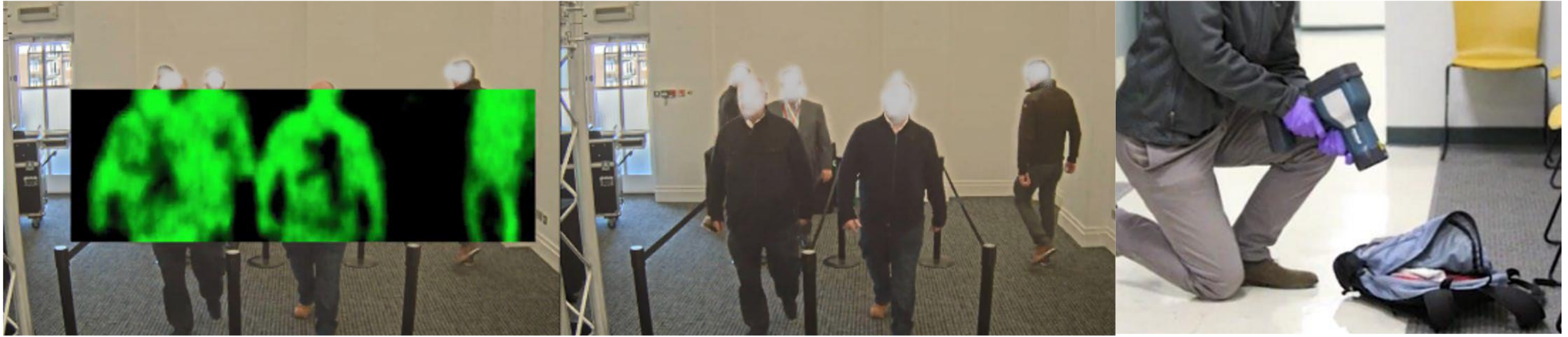
#### Airport Infrastructure Protection (AIP)



Identify capability gaps to provide airports with robust infrastructure protection to improve airport security and situational awareness

# APAS Project Capabilities

## Security Technology



APAS assesses the technology marketplace, evaluates advanced technologies and facilitates industry awareness to help address identified surface transportation security capability gaps.

### APAS ACTIVITIES



1

**Facilitate integration** of emerging technologies into high-risk surface venues to address threats and provide operational feedback

2

**Analyzes the current marketplace** for advanced security technology solutions through extensive market research

3

**Coordinate with** government agencies, technical experts, and end users to represent a variety of stakeholders' perspectives

4

**Facilitates industry** awareness of advanced security technology solutions through a Critical Infrastructure Protection Integrated Products Technology Sensor Catalog

5

**Leads technology capability gap development** in collaboration with stakeholders



- ▶ Secure critical infrastructure for the country
- ▶ SMEs who can rapidly stand-up systems and provide technical knowledge and answer industry questions
- ▶ A catalog of security technology evaluations readily available to industry
- ▶ Early identification of emerging threat types



- ▶ Operators cannot remain focused on monitoring for threats like a persistent autonomous system
- ▶ Unmanned System (UxS) counter-measure decision-making timelines are seconds and any actions that need to be taken must be done immediately and without hesitation
- ▶ The cost to staff a full time operator around the clock becomes unsustainable
- ▶ By removing the human from the loop, staff is available to perform other important tasking



- ▶ Having worked APAS for over a decade has led to NSWC PCD having the technical capability to tackle emerging problems and threat types
  - NSWC PCD SMEs were able to merge their knowledge of EO/IR cameras, radars, AI/ML to create a system that is more than the sum of its parts
  - Created an autonomous UxS detection system
  - Utilized Navy funding to develop an autonomous UxS detection prototype in less than 9 months.



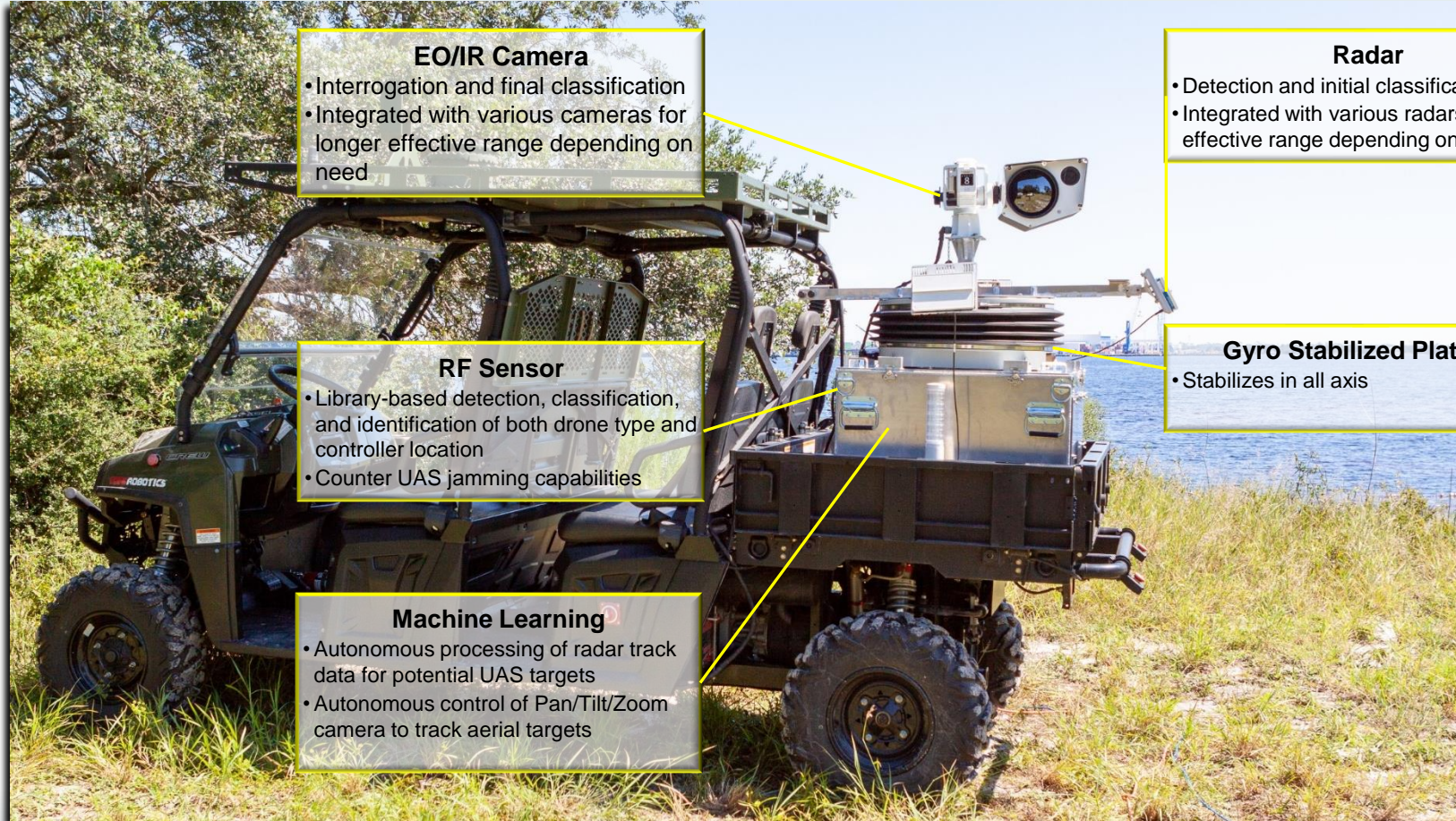


- ▶ Small form factor UxS detection system
- ▶ For use in mobile or static environments
- ▶ Detects, Tracks, Classifies and Mitigates
  - UAS
  - Surface Vessels
  - Vehicles
  - Flexible Government owned software allows for rapid inclusion of other threat types
- ▶ No user input needed following initial setup.
- ▶ Utilizes the latest cutting edge techniques and sensor fusion to classify detections from sensor data and computer vision technology



# APAS Project Capabilities

## Threat Tracker Components



**EO/IR Camera**

- Interrogation and final classification
- Integrated with various cameras for longer effective range depending on need

**RF Sensor**

- Library-based detection, classification, and identification of both drone type and controller location
- Counter UAS jamming capabilities

**Machine Learning**

- Autonomous processing of radar track data for potential UAS targets
- Autonomous control of Pan/Tilt/Zoom camera to track aerial targets

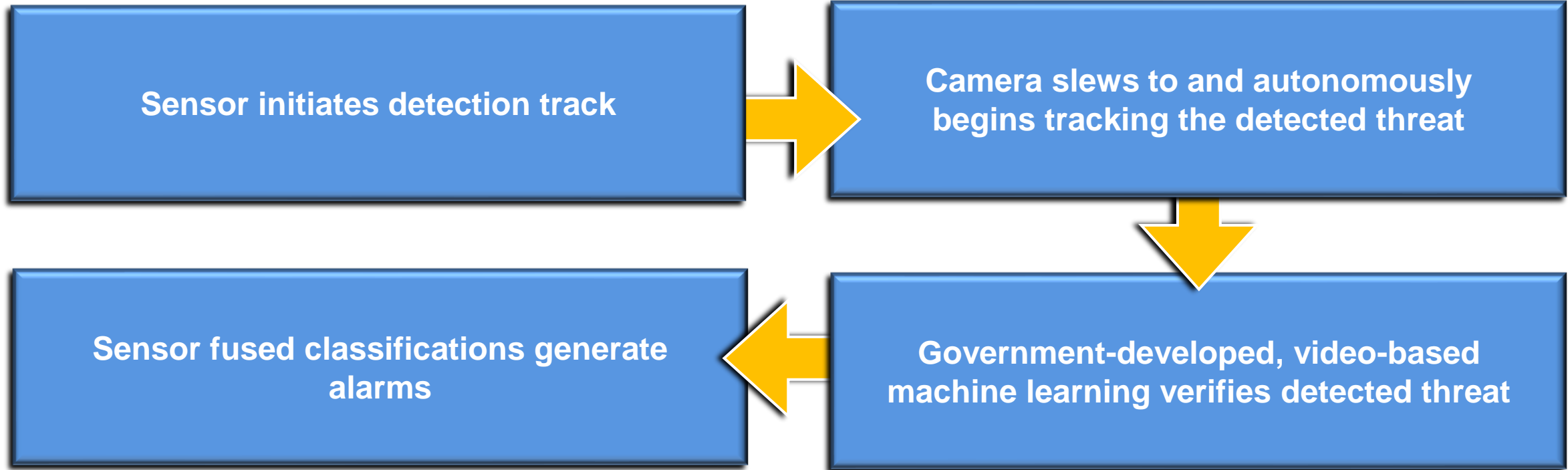
**Radar**

- Detection and initial classification
- Integrated with various radars for longer effective range depending on need

**Gyro Stabilized Platform**

- Stabilizes in all axis

Sensor Agnostic  
Government developed software



- ▶ Deployable and operational within 30 minutes.
- ▶ Mounts to a variety of platforms.
  - Inputs/Outputs
    - 110VAC
    - 1 Cat-5e
- ▶ 2-person portable.
- ▶ Modular software design allows for integration into other systems; utilizing fielded sensors and hardware to automate the threat detection process .



▶ FY21:

- Expanded from UAS to multiple threat types
- Integrated multiple RF based sensors for increased performance and to meet non-light of sight requirements
- Ruggedized system design for increased durability
- Implemented CoT protocols for rapid integration into other C2 systems

▶ FY22 objectives:

- Integrate new radar and thermal camera to meet JROCM-078-20 for detection/classification range
- Develop software to provide a common airspace when using multiple nodes of T2
- Deliver a Technical Data Package
- Completion of IATT package
- Integrate CTC-IN to be standard part of T2 package

# Questions?

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