



**Homeland  
Security**

# S&T Stakeholders Conference

## Biological Activities & Accomplishments – Gen3

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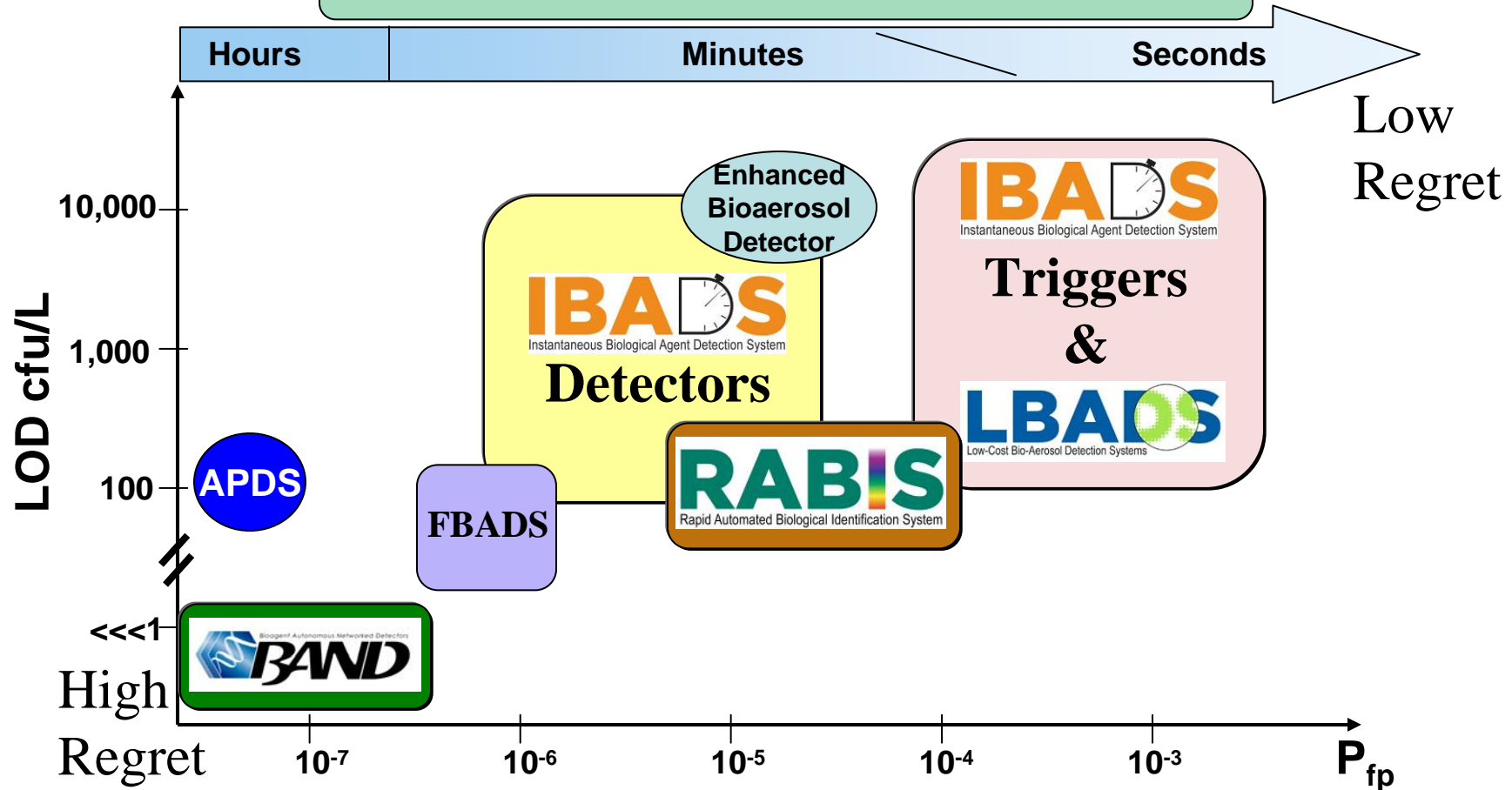


June 2-5, 2008

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# DHS BW Countermeasure Strategy

BIAD 1&2: Assay Support & Forensics



# BioWatch to BAND, 3<sup>rd</sup> Generation Sensors

**Aerosol Collection**



**Sample Processing**

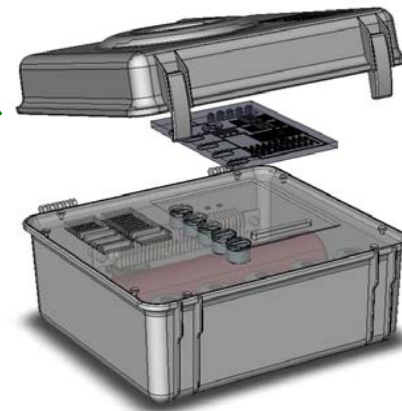


**LRN Analysis**

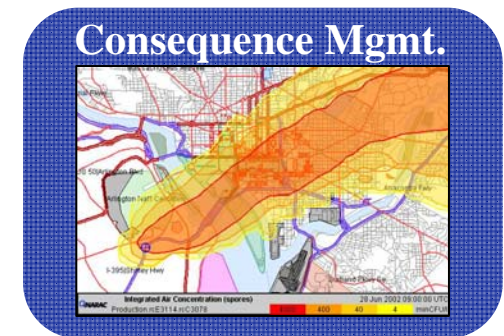


The BAND systems fold 3 basic BioWatch Functions into 1 “Lab-in-a-Box”:

- Aerosol collection
- Sample processing
- LRN analysis



**Gen3 BioWatch  
BAND Unit**



Consequence management remains in the hands of the BioWatch operators.

# BAND Program Objectives

## Performance Targets

- Continuous fully autonomous operation
  - 3 hour sample intervals and 1 hour latency (2920 Samples per Year)
- Broad agent coverage > 20 agents
- High Sensitivity – Limit of Detection of 100 organisms (10 ng Toxin)
  - Assumes 3 hour, 100 Liter/minute, 90% efficient collection
- Single Agent False Positive rate of  $10^{-7}$  with a goal of  $10^{-8}$

## System Requirements

- Preserve samples for 5 days for confirmation and forensics
- Robust wireless, autonomous remote operation
- Maintenance interval exceeding 1 Month
- Operation in full range of outdoor environments
- Modest packaging and logistical requirements (i.e., 2 ft<sup>3</sup>)

## Cost of Ownership

Unit acquisition cost of **\$25K** or less

(Quant. > 1000's)

Operating costs per unit of **\$10K** per year or less inclusive

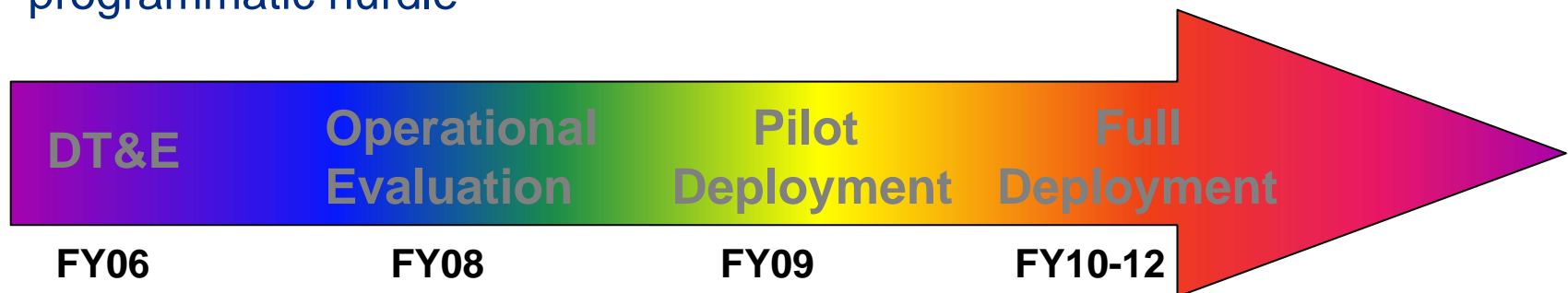
# BAND ECBC Test Plan

Test 1: Blind Sample Set
Test 2: Basic Sampler Qualification
Test 3: Wet Prep End-to-End Support
Test 4: End-to-End Light
Test 5: Simulant-Probe False Alarm
Test 6: True Clutter 1: Chamber
Test 7: True Clutter 2: 3 Months in Field
Test 8: Shake and Bake Light

Phase I   Phase II   Phase III

# Gen 3 Transition Strategy: BAND (notional)

- Multi-phased test plan evaluating both components and integrated prototypes, including 3 month field test and test with live agents.
- Operational evaluation to commence in FY09 and involve rigorous testing with near neighbors and complex backgrounds (~180,000 tests).
- OT&E in FY09.
- Full deployment scheduled for FY10-12.
  - BAND to be gradually deployed as Gen3 for BioWatch
- OHA to be one of the transition agencies of the BAND technologies
- Evaluation and validation of the BAND technologies remains a major programmatic hurdle



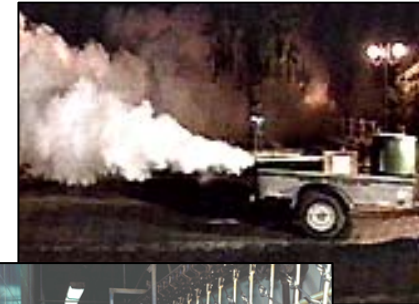
# Inter/Intra Agency Coordination



- **Developmental Test & Evaluation**
  - ECBC hosting testbed
  - LLNL providing bioinformatics support
- **Assay Validation Testing**
  - Planned for FY08
- **Pilot Testing**
  - Planned for FY08
- **Meetings**
  - BAND Tech Days (Fall 07)
  - US-UK Workshop, London (June 07)
  - San Antonio, TX (October 07)
  - Monthly meetings within S&T with guest speakers on critical issues
  - BAND/BioWatch meetings (regularly)
  - Additional collaboration-centric meetings planned

# Opportunities

- **Develop technologies and systems to identify unknown and emerging threats for biological defense**
- **Universal detection technologies that require no prior knowledge of biological threat target**
- **Automated, fully integrated, end-to-end (collection, identification and reporting) systems capable of quantifying the amount of threat agent present along with preserving samples for culturing and other confirmatory/forensics analyses**
- **A portable biological agent detector, for use at locations such as inspection stations, points of entry, facilities, and other high traffic venues, for screening suspicious materials for the presence of biological agents.**
- **Portable protocols and tools that provide minimally-trained users assistance in sampling (e.g., maritime containers and unprocessed samples), rapid detection, and field identification of illegal product, high consequence pathogens and toxins that threaten U.S. agriculture and the food industry.**







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