

DHS S&T Borders & Maritime Security

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From Science and Technology... Security and Trust



Homeland Security



Borders and Maritime Security Division

Mission Statement

Develop and Transition Capabilities that Improve the Security of our Nation's Borders without Impeding the Flow of Commerce and Travelers

- **Stop Bad Things and Bad People from Entering the Country**
AND
- **In the Maritime - Protect the Public, the Environment, and U.S. Economic and Security Interests**

Borders are all land and maritime borders including U.S. ports-of-entry, vast stretches of remote terrain and inland waterways

Customers:

Include all Federal, State, Local, and Tribal Law Enforcement Agents, including first responders



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Border Security: Representative Technology Needs

- Improved ballistic protection via personal protective equipment
(Borders/Maritime Division Lead)
- Improve detection, tracking, and identification of all threats along the terrestrial and maritime border
(Borders/Maritime Division Lead)
- Ability to access ICE databases in which voice information is entered; provide analytical, reporting, and automated case deconfliction; classify, identify voice samples *(C2I Division)*
- Non-lethal compliance measures for vehicles, vessels, or aircraft allowing for safe interdiction by law enforcement personnel *(Borders/Maritime Division Lead)*
- Non-destructive tools that allow for the inspection of hidden or closed compartments to find contraband or security threats *(Borders/Maritime Division Lead)*
- Improved analysis and decision-making tools that will ensure the development/implementation of border security initiatives *(Borders/Maritime Division Lead)*
- Ability to non-intrusively determine the intent of subjects during questioning
(Human Factors Division)
- Ability for law enforcement personnel to quickly identify the origin of gunfire and classify the type of weapon fired *(Borders/Maritime Division Lead)*



Maritime Security:

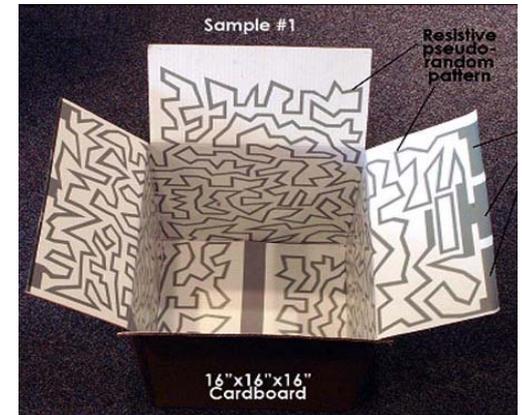
Representative Technology Needs

- Wide-area surveillance from the coast to beyond the horizon; port and inland waterways region - detect, ID, and track
(Borders/Maritime Division Lead)
- Data fusion and automated tools for command center operations *(Borders/Maritime Division Lead)*
- Vessel compliance through non-lethal compliance methods *(Borders/Maritime Division Lead)*
- Enhanced capability to continuously track contraband on ships or containers
(Borders/Maritime Division)
- Improved ballistic personal protective equipment for officer safety
(Borders/Maritime Division Lead)
- Improved WMD detection equipment for officer safety; improved screening capability for WMD for maritime security checkpoints *(Borders/Maritime Division Lead)*



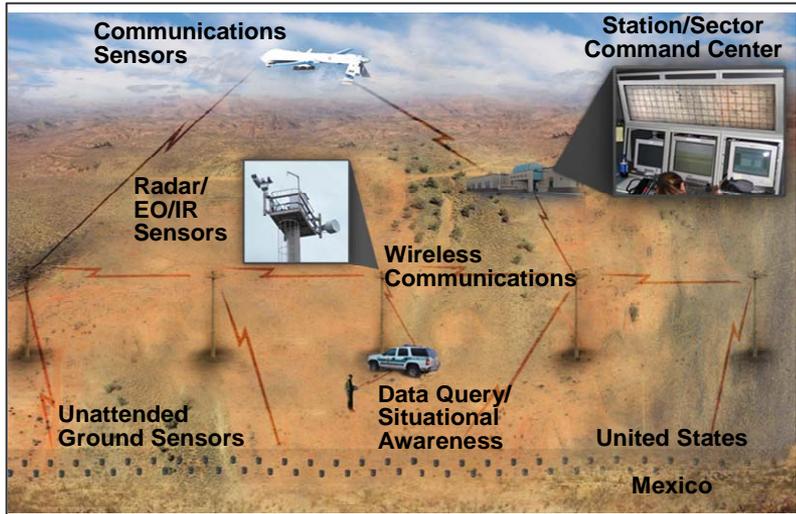
Cargo Security: Representative Technology Needs

- Enhanced screening and examination by non-intrusive inspection (*Borders/Maritime Division*)
- Increased information fusion, anomaly detection, Automatic Target Recognition capability (*Borders/Maritime Division*)
- Detect and identify WMD materials and contraband (*Borders/Maritime Division*)
- Capability to screen 100% of air cargo (*Borders/Maritime Division*)
- Track domestic high-threat cargo (*Borders/Maritime Division*)
- Positive ID of cargo & detection of intrusion or unauthorized access (*Borders/Maritime Division*)



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S&T Border and Maritime Technology Projects



Border Net

A wireless communication network that will connect law enforcement agents in the field to real-time information from law enforcement databases and geographic information systems



Sensor/Data Fusion and Decision Aids

A set of situational awareness tools that fuse tactical information from multiple data sources such as sensors and monitors, and provide different layers of detail



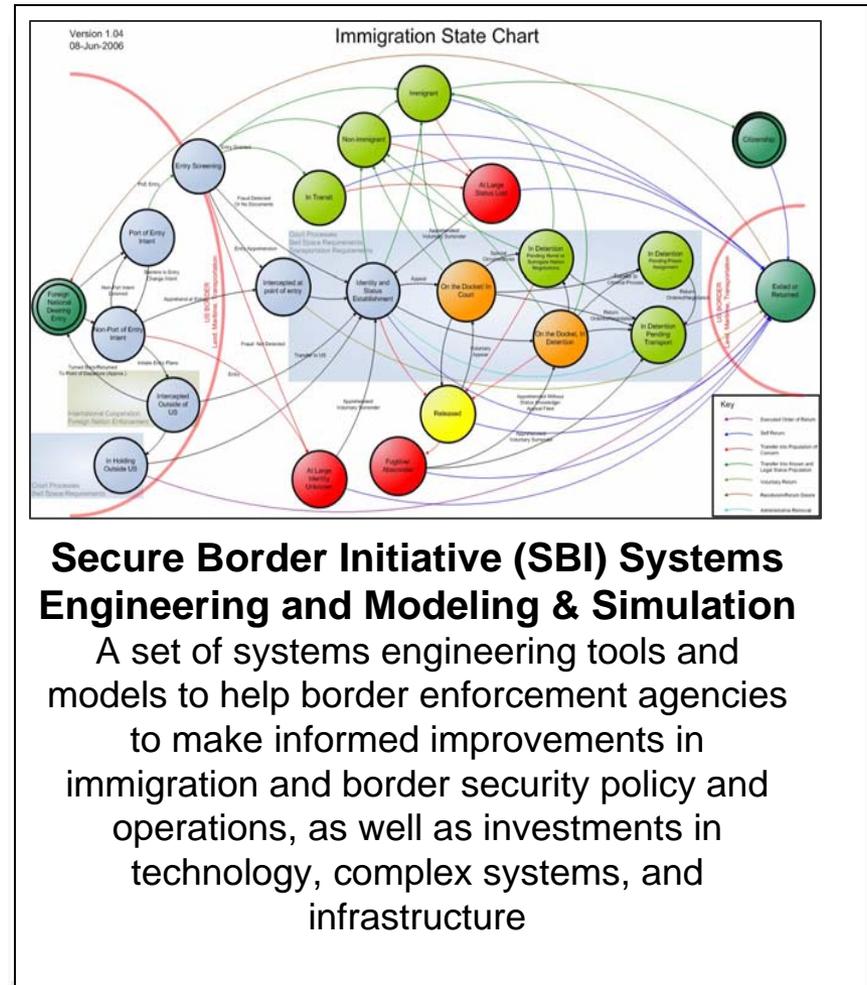
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S&T Border and Maritime Technology Projects



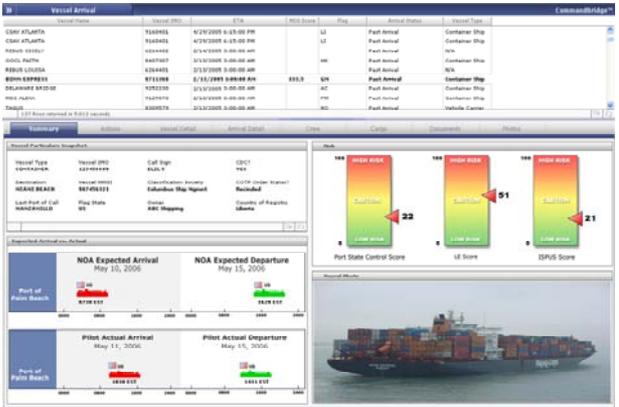
Border Detection Grid

A grid of advanced sensors to detect cross-border movement, classify what it is (e.g. friendly forces, animals, weather, or illegal activity), and locate geographically where it is



**U.S. DEPARTMENT OF
HOMELAND SECURITY**

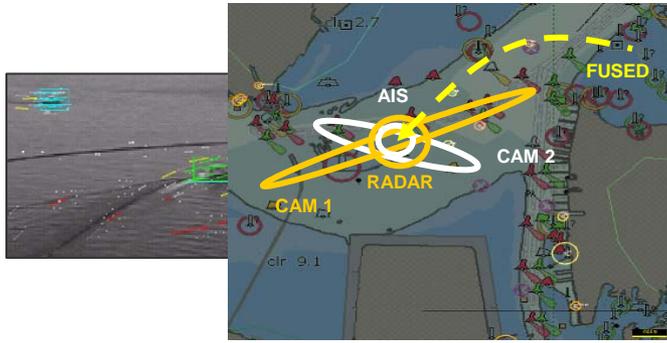
Maritime Security



The screenshot displays a maritime security software interface. At the top, there is a table titled "Vessel Arrival" with columns for Vessel Name, Arrival Date, Arrival Time, Risk Score, and Arrival Status. Below this, there are several panels: "Sensor Status" with three vertical bars for AIS, Radar, and Fused; "NOA Expected Arrival" and "NOA Expected Departure" for May 15, 2006; and "Pilot Actual Arrival" and "Pilot Actual Departure" for May 11, 2006. A large image of a container ship is shown at the bottom right.

Visualization Tools for Sector Command Center Situational Awareness and Emergency Response

Accurate situational picture that assimilates relevant sensor data and couples it with amplifying information from database or user input, which identifies threats rapidly and establishes "Blue Force" capacity and readiness



The diagram illustrates a maritime surveillance system. It shows a map of a coastal area with various vessels. A central yellow circle is labeled "RADAR". Two yellow lines radiate from the center, labeled "CAM 1" and "CAM 2". A yellow arrow points to a vessel labeled "FUSED". The text "Automated Scene Understanding" is written in bold, followed by a description of the system's capabilities.

Automated Scene Understanding

Automates the detection of prohibited, suspicious, and anomalous vessel behaviors via the Hawkeye surveillance system sensors using cameras to perform autonomous search, slew to cue, or operate independently; detects and tracks vessels, estimates vessel lengths, learns normal behavior patterns, and generates alerts



Maritime Security



Offshore Deepwater Buoys for Vessel Detection

Buoy based non-cooperative vessel detection system that is a communication relay used in depths of 4 km of water



Hawkeye Watchkeeper Prototype

An evolutionary prototype system for Coast Guard Port and Coastal surveillance which would provide detection and tracking, via RADAR, within the harbor and 12-20 nm offshore; classification and identification via daylight, low-light and night time cameras; multiple situational awareness displays for the watchstanders and Commanders; and Blue Force Tracking of participating Federal, State, and Local Port Partners



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Centers of Excellence

- Immigration
- Policy, Legal, Privacy, International
- Different Perspectives in Understanding Problem Set
- First Hand Experience
- Integrating Research and Education
- Integrating into Division Programs
- Opportunity to Demonstrate Synergies - Application to Multiple Homeland Security Problems
 - Collaboration with many resources
- “Corporate” Memory
- Enthusiasm and Energy!





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