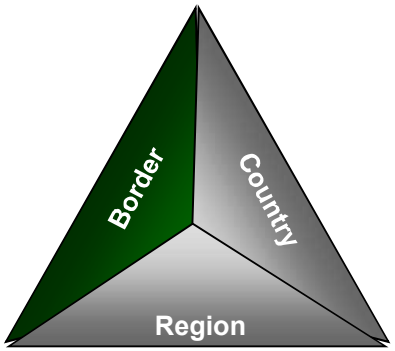
SAND2011-3066P

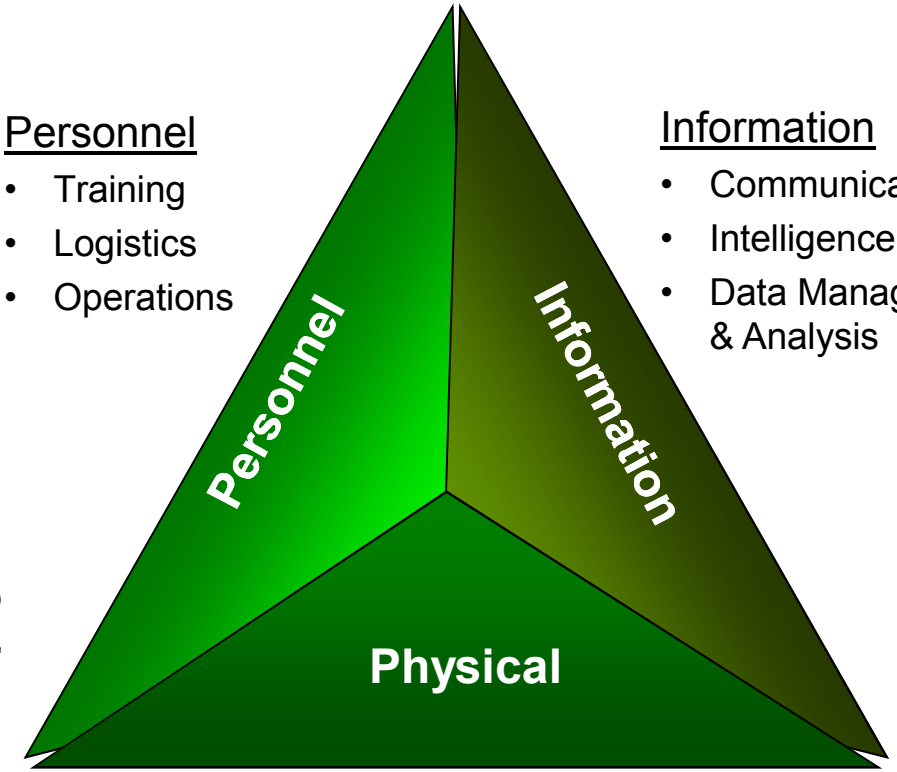
Sector Equipment Material Capabilities

Module 5

Border System Elements



- **Points of entry and areas in between, in the domains of:**
  - **Land**
  - **Water**
  - **Air**



Personnel
- Training
- Logistics
- Operations

Information
- Communications
- Intelligence
- Data Management & Analysis

Physical
- **Infrastructure**
- **Equipment & Technology**
- **Logistics**

Differing Equipment Contexts

- **Ports of Entry and Open Borders present fundamentally different equipment needs and requirements**
- **Ports of Entry**
  - **Fixed, controllable entry points**
  - **Operations oriented towards facilitating authorized flows of traffic, while at the same intercepting unauthorized flows**
- **Open Borders**
  - **Numerous, non-fixed, difficult to control entry points**
  - **Operations primarily (though not always) oriented towards preventing unauthorized traffic flows**

Primary Functions

- **At both Ports of Entry and Open Borders, equipment capabilities must support the four basic border security functions:**
  - **Surveillance / Screening**
  - **Detection / Inspection**
  - **Response**
  - **Disposition**
- **Equipment should be chosen to address a Port of Entry or Open Border's unique context, including:**
  - **Regular / historical traffic flows**
  - **Threats**
  - **Personnel capabilities/training**
  - **Environmental: climate, topography, wildlife, vegetation**

Ports of Entry: Functional Areas and Basic Elements

- The equipment utilized at Ports of Entry generally addresses three basic traffic types:
  - Persons
  - Vehicles
  - Cargo
- The basic elements include:
  - Fixed elements / facilities
  - Screening / detection / inspection sensor technologies

Ports of Entry: Infrastructure / Facilities / Communications

- **Fixed elements may include:**
  - **Fences / gates / portals / vehicle barriers**
  - **Primary Inspection Area**
  - **Secondary Inspection Area**
  - **Personnel facilities**
  - **People processing facilities**
  - **Cargo handling / inspection facilities**
  - **Containment areas (for contraband, apprehended suspects)**
  - **Observation towers**

Ports of Entry: Screening / Detection / Inspection Technologies

Detection Portals

Package Scanners

Metal Detectors

Vehicle Inspection Technologies

X-Ray Scanners

Radiation Detectors

Fiber Optic Inspection Tools

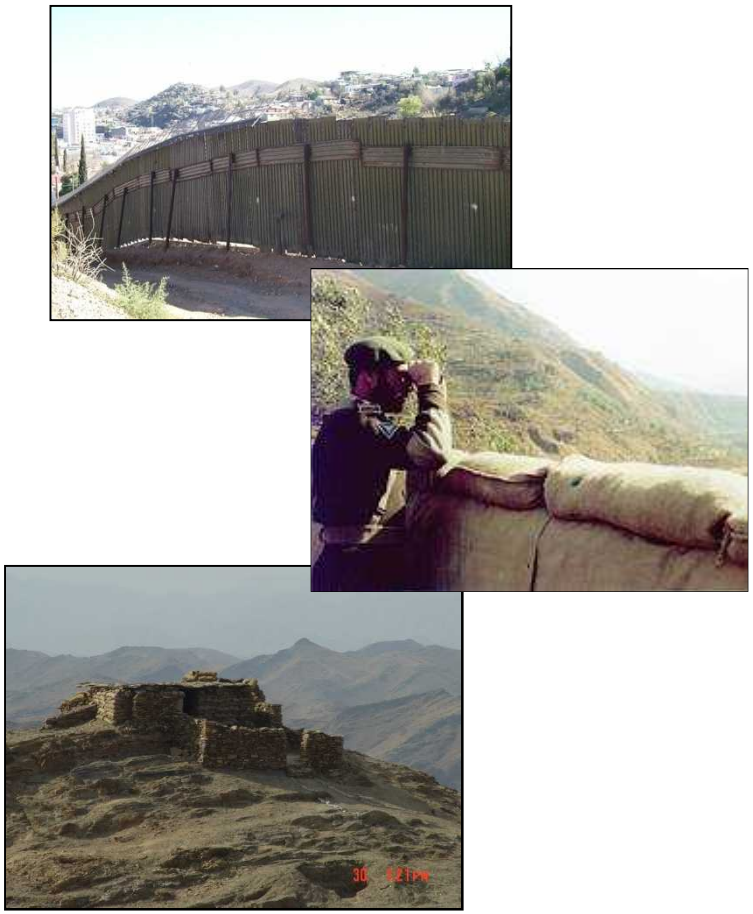
Handheld Contraband Detection Equipment

Open Borders: Functional Areas and Basic Elements

- **The equipment utilized at Open Borders addresses a variety of traffic types, including:**
  - **People (small or large groups), which may include:**
    - **Migrants / nomads**
    - **Hikers / hunters / tourists**
    - **Refugees**
    - **Smugglers**
    - **Illegal immigrants**
    - **Insurgents / terrorists**
  - **Vehicles (generally small – ATVs, 4x4s)**
  - **Pack animals carrying people or contraband**

Open Borders: Infrastructure / Facilities / Communications

- **Fixed elements may include:**
  - **Fences / vehicle barriers**
  - **Floodlighting, spotlights**
  - **Observation posts**
  - **Conveyances/vehicles**
  - **Electrical power sources**



Open Borders: Screening / Detection / Inspection Technologies

Ground Surveillance Radars

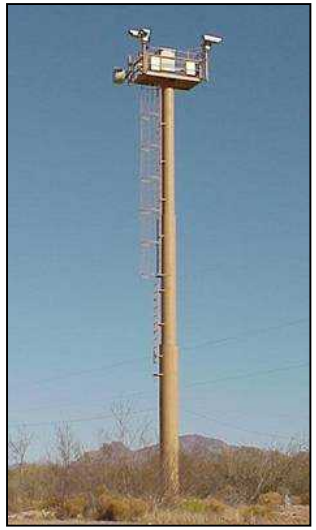
Cameras/Sensors

Seismic Sensors

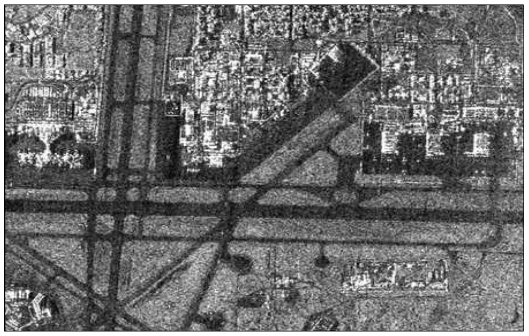
Buried Fiber Optic Sensors

Magnetic Sensors

Mobile Sensor Platforms



Sensor Towers



Aerial/Satellite Remote Sensing

Sector Equipment / Materials

- **Equipment / materials are only as effective as the human resources managing their operations and maintenance**
- **In the absence of a well-trained, attentive and reactive operator, sensor technologies are virtually useless**
- **Many technologies are expensive and require regular maintenance – both must be taken into consideration in advance of purchase and deployment**

Basic Overview

- **Sensors**
  - **When an alarm is triggered – either by a sensor or visual observation by border protection force personnel – data will be generated**
  - **This data needs to be communicated, assessed, and the information shared**
  - **Detection has not occurred until the data is assessed and communicated to appropriate personnel for response**
- **Communication**
  - **Ensure the timely flow of information**
  - **Modes: direct connection by wire or fiber,**

    telephone - wire or cellular, Radio Frequency (RF), wireless networks, satellite, Internet, or combinations of above
- **Information Management**
  - **Data display and review**
    - **Text-Based, Graphical, Real-Time or Delayed Retrieval**
  - **Data analysis and decision support**
  - **Archiving of data**
  - **Initiation of response to event**

Communications / Sharing Data

Getting the Word Out

- On-Site
- Local/Regional Headquarters
- National Headquarters
- Intelligence Organizations
- Analysis Organizations for Trends Analysis

Communications must be bi-directional to be effective at all levels.

System Compatibility and Considerations

- National communication requirements and compatibility
- Survive and work in various environmental conditions
- Security of the equipment / sensors
  - Covert installation
  - Protective measures to delay intruder from stealing or destroying before response force arrives
- System Reliability, Availability, Maintainability (RAM)
  - Supported by current infrastructure
- Life Cycle costs
  - How often need to replace system components

Exercise 5-1: Characterize Sector Equipment / Material Capabilities

- **Break into two groups**
  - **One group will assess existing equipment capabilities at the designated Port of Entry sector**
  - **The second group will assess capabilities at the designated Open Border sector**
- **Using the tables in your workbook, check off at right for each capability that applies**

Exercise 5-2: Sector Equipment / Material Capabilities Gap Analysis

- **Utilizing the assessments from Exercise 1, perform a gap analysis in regards to equipment / material capabilities at the designated Port of Entry and Open Border sectors.**
  - Were there any gaps in equipment / material capabilities?
  - Are any of these gaps clearly detrimental to current border security efforts, or are they irrelevant to the current context and threats previously identified?
  - Which deficiency has the worst impact on unit capability and effectiveness?
  - What is the best technology/equipment facet of your program? How does it improve the effectiveness of the unit? Where can the success be repeated or modeled?
  - Are there any additional equipment / material gaps that are not made apparent by the table? Was there anything not included in the table that should be?

Why Do Field Testing?

- **Have you ever purchased an item only to find out it didn't do what the manufacturer said it would?**
- **Who makes sure what you buy is good quality, won't harm you and does what it says it does?**
- **How will you assure yourself that the technologies that you choose to secure your border will do the job and are cost effective?**

Evaluation Categories

- Ease of Installation
- Adequacy of Documentation
- Detection Capability
- Nuisance and False alarms
- Vulnerability Assessment
- Adaptability / Compatibility
- Maintenance / Reliability
- Special Requirements
- Manufacture's Support

Suggesting changes to the manufacturers is appropriate – Get what you need!

Component and System Testing Methodologies

- **Functional Type Test (FTT)**
  - Does the system do the function it was designed to do?
- **Performance Type Test (PTT)**
  - After FTT completed
  - Does the system meet performance requirements?
- **System Type Test (STT)**
  - FTT/PTT for components and system completed
  - Does the system conform to overall system design and interoperability, compatibility, and usability?

For all tests, determine what the system is still missing to meet border security objectives.

Understanding Performance Measures of Detection, Delay, and Response

- Detection
  - Probability of Detection
    - Time for communication and assessment
    - Alarm without assessment is not detection
  - Frequency of Nuisance alarms / False alarms
  - Vulnerabilities
- Delay
  - Increase time available to defeat threat
    - Create delay and/or increase early warning of intrusion
  - Increase time for threat to disable sensor system
- Response
  - Probability of communication to response force
  - Time to communicate
  - Time to Deploy
  - Probability of deployment to adversary location
  - Response force effectiveness

Effective Field Testing Requires A Systematic Approach and Dedicated Facility

- **Testing reveals whether sensors/systems meet manufacturer specifications and lets you examine tradeoffs.**
- **Functions of test facility**
  - **Test hardware under realistic operating conditions**
  - **Develop sensor specifications**
  - **Test communications and information management**
  - **Investigate alternative monitoring system designs**
  - **Develop maintenance procedures**
  - **Provide training for installers and operators**
- **A potential basis for cooperation**
  - **Sharing of information of types of effective sensors**
  - **Provide border guards with on hands experience**