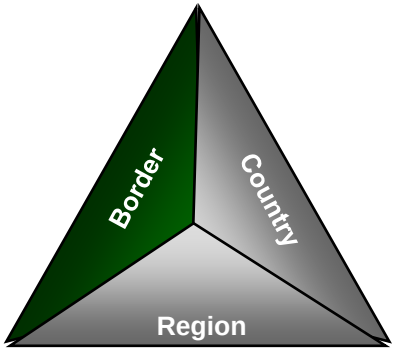
SAND2010-1945P

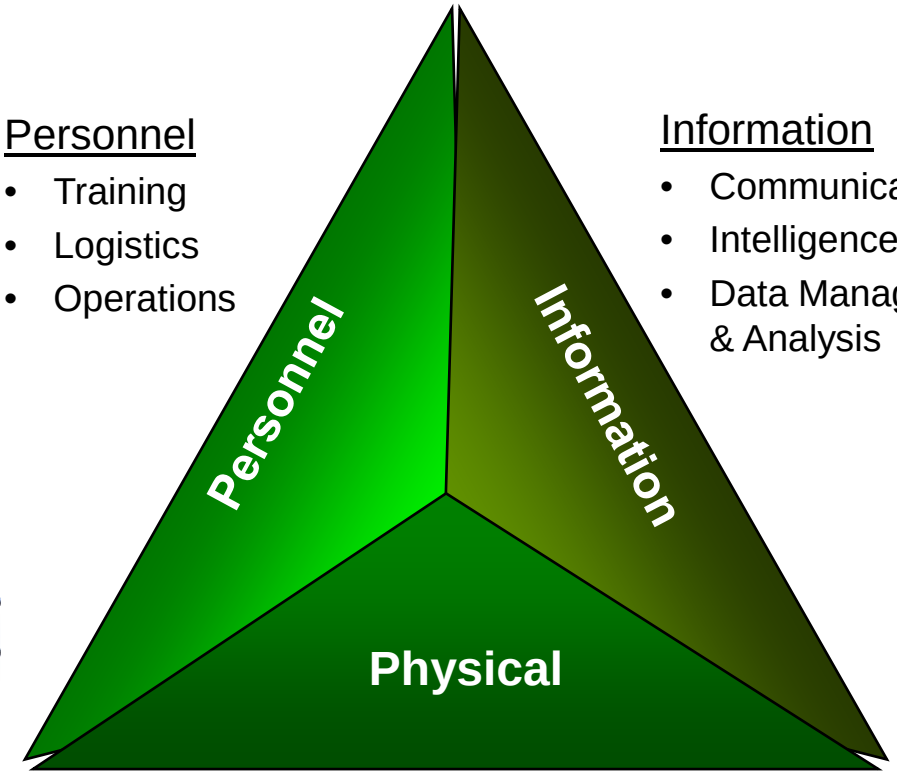
Sector Equipment Material Capabilities

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**

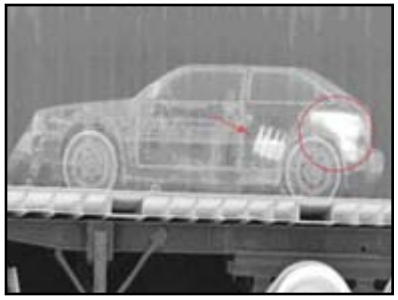
Ports of Entry: Screening / Detection / Inspection Technologies

Detection Portals

Package Scanners

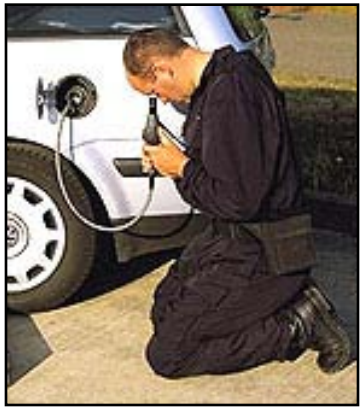
Metal Detectors

Vehicle Inspection Technologies



X-Ray Scanners

Radiation Detectors



Fiber Optic Inspection Tools

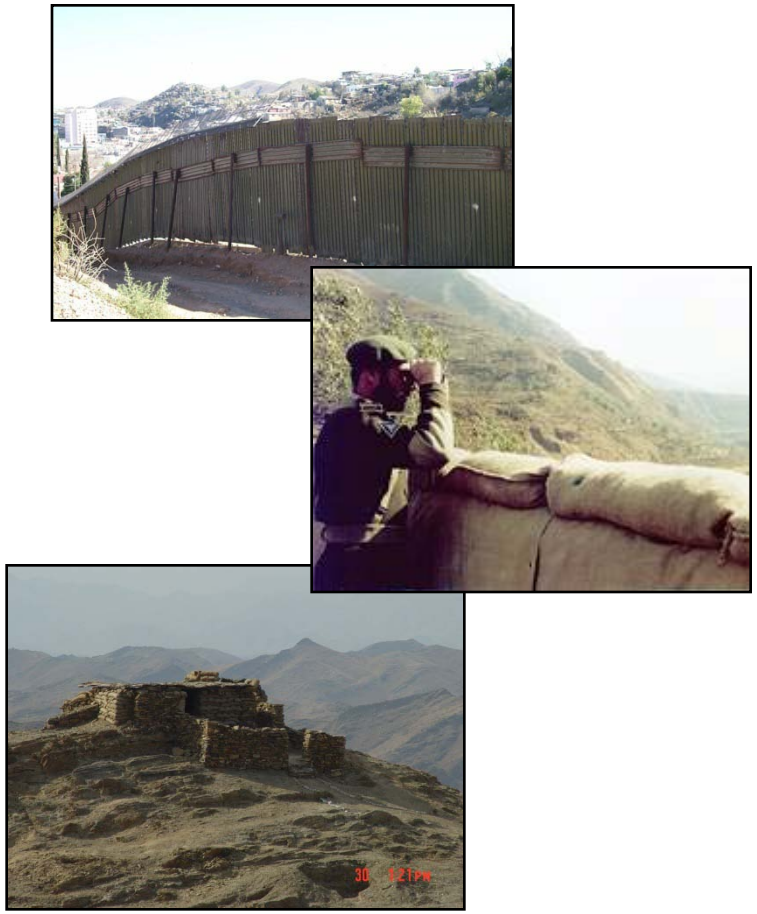
Handheld Contraband Detection Equipment

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

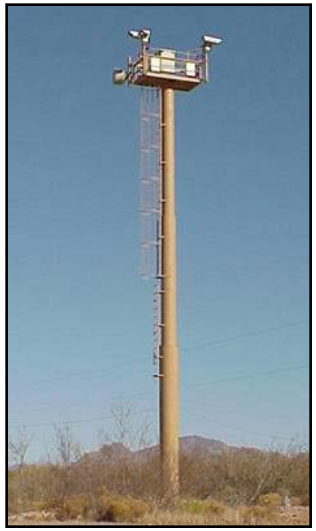
Cameras/Sensors

Seismic Sensors

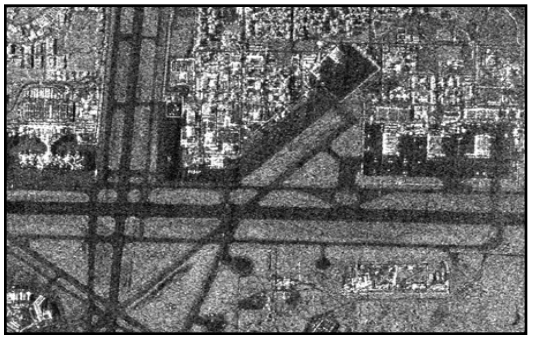
Buried Fiber Optic Sensors

Magnetic Sensors

Mobile Sensor Platforms



Sensor Towers



Aerial/Satellite Remote Sensing

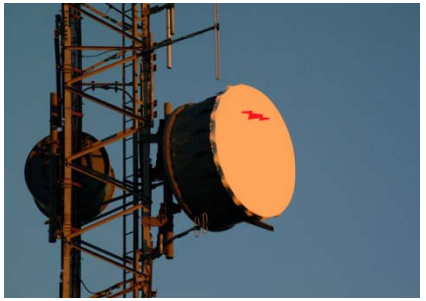
Sector Equipment / Materials

- **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**