

# Alien Migration Interdiction System (AMIS)

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IRS Contract IR&D

# Problem

**Vast unmanned and unmonitored borders with environmentally challenging conditions, limited surveillance capabilities, and few early warning sensors**



# Background

*Challenges that affect monitoring operations:*

- **Nonexistent Infrastructure:** Lack of power for communications and sensor subsystems creates challenges for long-term solutions and autonomous designs.
- **Limited Resources:** U.S. Coast Guard and Border Patrol lack personnel for surveillance, alien migration interdiction, and counter-drug missions.
- **Environmental Conditions:** Extreme cold, heat, and humidity affect long-term performance of equipment.
- **Cost:** Thousands of miles of border demand a low-cost solution.

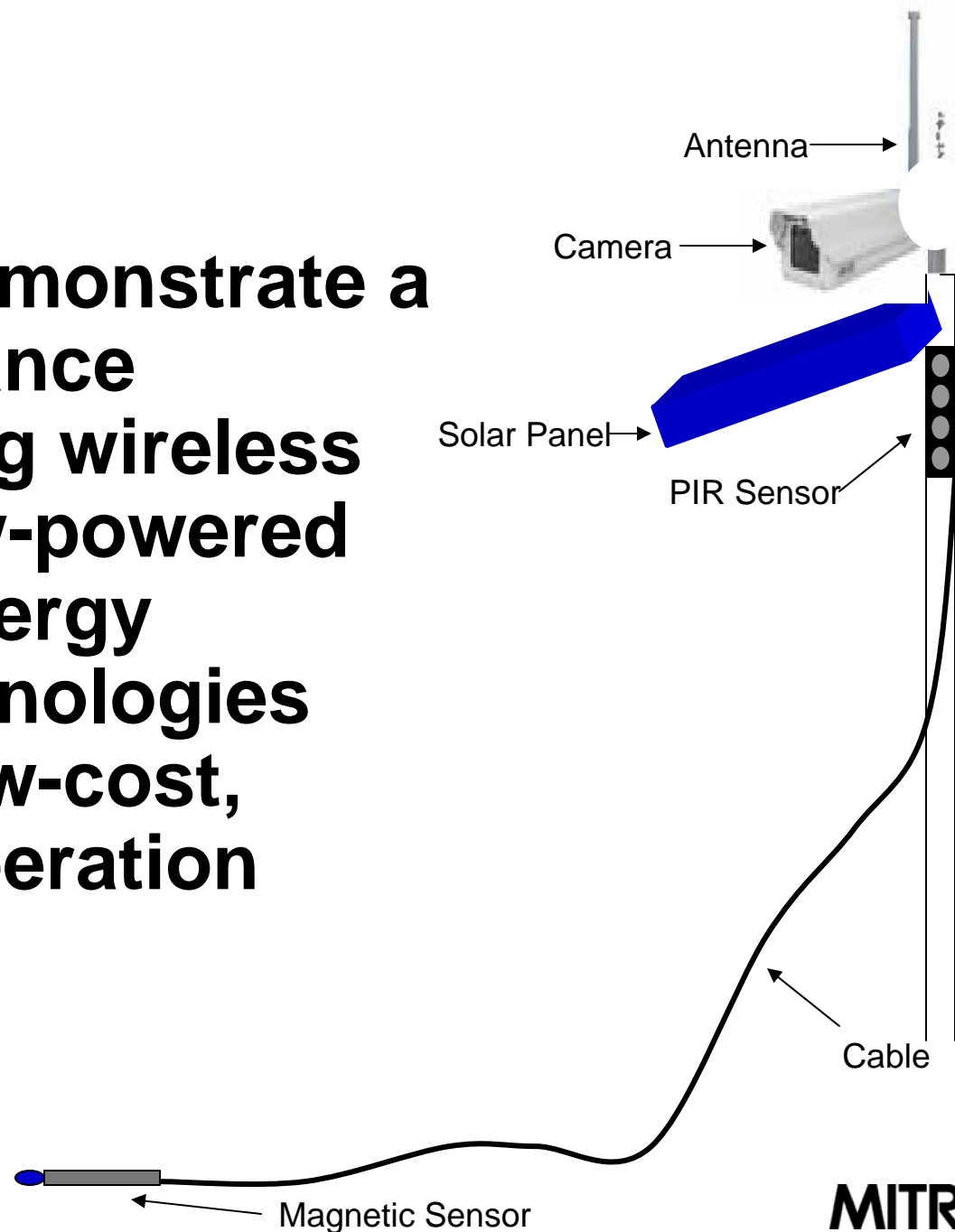


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# Objective

**Develop and demonstrate a border surveillance solution utilizing wireless networking, low-powered sensors and energy harvesting technologies designed for low-cost, autonomous operation**



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# Activities

- **Exploring wireless radio technologies for ad hoc communications with sensor, voice, and video traffic**
- **Investigating low-powered sensors, energy harvesting technologies, power storage subsystems, and IP video cameras**
- **Conducting shoreline and desert deployment site surveys**
- **Exploring WAN integration for command center monitoring operations**

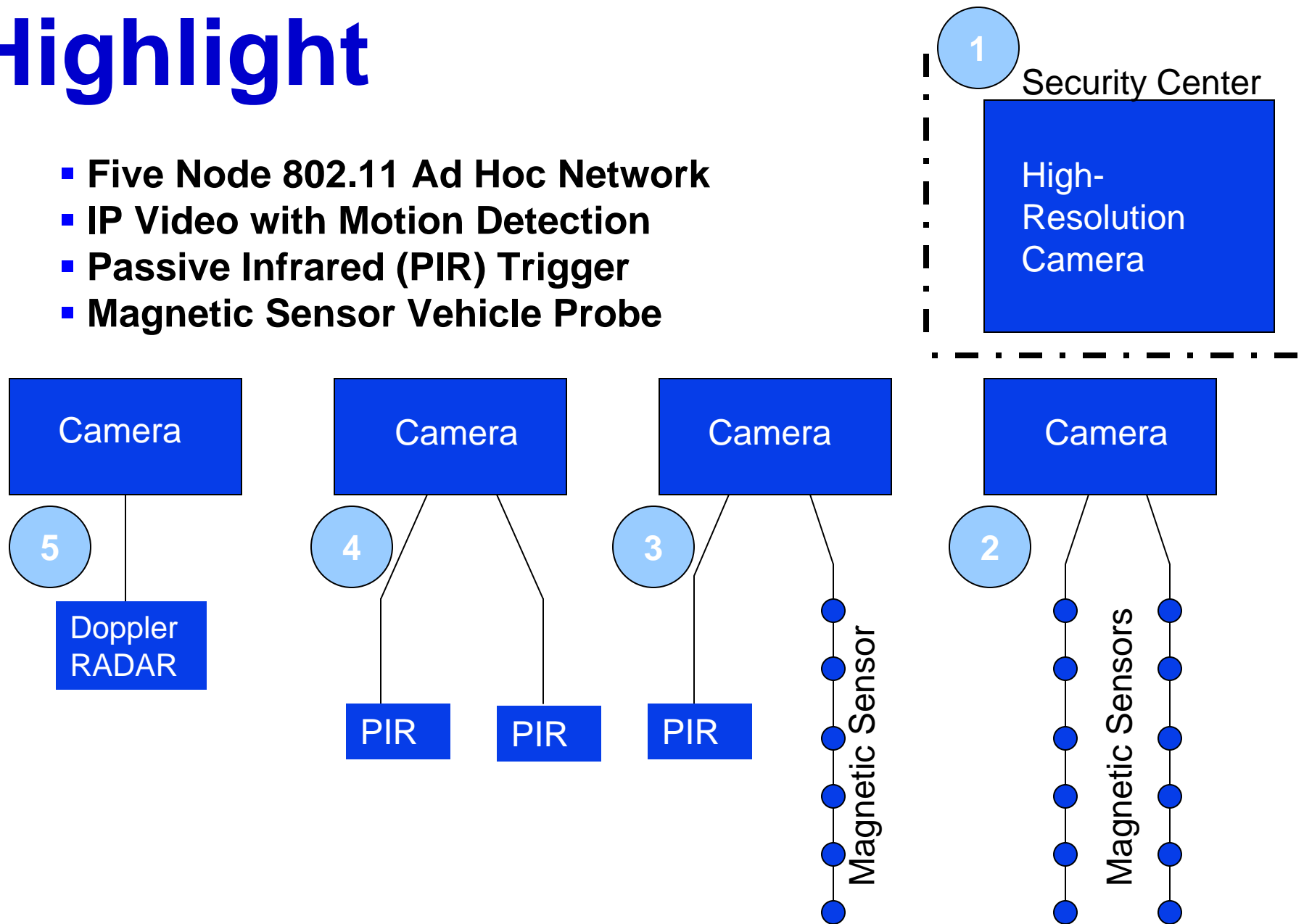
# Highlight



- Trade study of 802.11 and VHF/UHF radios, ad hoc networking, and VoIP
- Trade study of energy harvesting and power subsystem requirements
- Trade study of low-powered sensors
- Site analysis for demonstration system

# Highlight

- Five Node 802.11 Ad Hoc Network
- IP Video with Motion Detection
- Passive Infrared (PIR) Trigger
- Magnetic Sensor Vehicle Probe



# Impacts

**The AMIS Approach Is Diverse and Cost Effective.**

- Provide VoIP communications and sensor monitoring in environmentally challenged locations**
- Improve response time and mission data**
- Flexible architectures**
- Diverse sensor suites can be applied to mission needs**
- Data and video streaming could be shared with coastal and land patrols**



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# Future Plans

## ■ Demonstration

- Conduct functional demonstration of networking and sensor capabilities at coastal location
- Pursue additional demonstrations at sponsor specific location



## ■ Field Experiments

- Collect test data and compile final report
- Identify deficiencies and modify system performance and requirements

