



FDIC 2003 John Jay Command and Control Conference



U.S. Army Land Warrior System – Integrating Complex Technologies in the Field

U.S. Army Communication and Electronics Command

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- Presentation and Product Demonstrations
- Panel Discussion/Q&A
- Table Top Display



How Army Research and Development Can Enhance Fire/Rescue and Disaster Response.

- **Military Technology and Equipment for Fire Service Use**
- **Tailored, Modularized Communications, Command & Control, and Electronic Sensor Equipment**
- **Quantities of High End Special Technologies Items**
- **Facilitate the Transition of Military Technologies into the Commercial World**





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The Department of Defense Has a Great Deal to Offer in Protecting and Defending the Homeland

- State-of-the-art Technology
- Life Cycle Management Knowledge
- Emergency Response Teams (e.g. Chem/bio)



**We Must Protect
the Military
Technology
Advantage**



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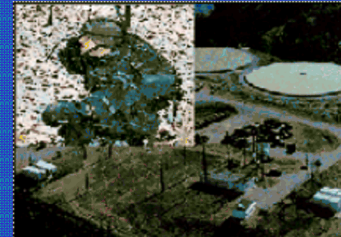


CECOM Research, Development & Engineering Center

Capabilities

- Own the Night
- Own the Spectrum
- Know the Enemy
- Improved Planning & Decision Making
- Seamless Communications
- Enhanced Situation Awareness
- Countermine
- Reduced Fratricide
- Battlefield Digitization
- Force Synchronization
- Survivability
- C2 Protect & C2 Attack
- I3MP

COMMUNICATIONS



COMMAND & CONTROL



SOFTWARE



ELECTRONIC SENSORS AND COMBAT



INFORMATION WARFARE



COMBAT SUPPORT ITEMS



AN/ASM-189



Land Warrior System

- A Close Combat Fighting System Optimizing Squad, Platoon, Company Organizations
- These Processes Not Unlike Fire Scene Operations.

I know where I am
 I know where my buddies are
 I know where we need to be

SEE FIRST

I see the enemy situation
 I understand what's developing

UNDERSTAND FIRST

We choose the fight
 - Right place
 - Right time
 - Synchronized

ACT FIRST

My unit dominates the fight
 We retain the initiative

STRIKE DECISIVELY

An Integrated Fighting System...



Issued to Combat Soldiers...
 Designed For the Close Fight...



Lethal Small Units!

Land Warrior is About Increased Combat Power, Lethality, Survivability & Tactical Awareness



Land Warrior System



Helmet Subsystem

- Soldier Color Display / Audio Headset & Microphone
- Provides Soldier a common operational picture

Weapon Subsystem

- Tailored to integrate multiple systems
 - Thermal sights / Multi-functional Laser / Day Video Sight / Alternate user input device
- Soldier is focused on killing enemy

Soldier Control Unit

- Soldier's device to control system & establish tactical identity
- Communications processor
- Single component to manage LW functions

System Power

- One on each side of soldier
- Rechargeable or disposable batteries



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Communications Subsystem

- Soldier “mesh” intercom / Leader radio / Radio Antenna / power amplification /
- Embedded soldier communication with additional radio for leader longer range communications

Computer Subsystem

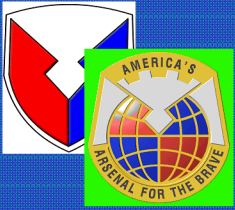
- Manages input, processing and output functions
- Stores manuals
- Stores standard map products

Navigation Subsystem

- Provides soldier position and heading on standard map products
- Utilizes dead reckoning module when GPS signal not present
- Soldier knows his location, know his teams location, maneuvers and shoots more effectively

Soldier Equipment

- Integrates soldier equipment improvements such as JSLIST / Interceptor Body Armor



Product and Research Areas

- **Thermal Sensors**
- **Position-Location Systems**
- **Through-Wall Sensors**
- **Interior Wireless Networks**
- **Radios and Radio Systems**
- **Incident Command Tools**



Helmet Mounted Thermal Imager

- Light Weight, Low Cost Helmet Mounted Imagery Systems
- Improves Mobility, Survivability, Fire Detection, Personnel Rescue, and Incident Command



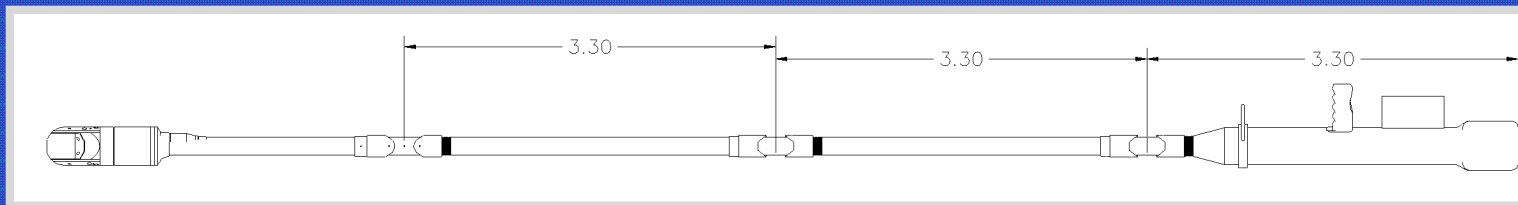
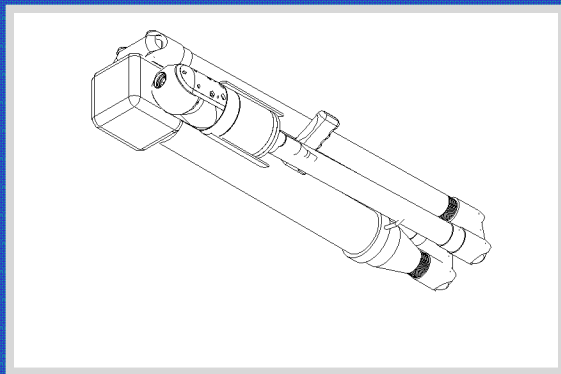
- *Weight - 17 Ounces*
- *Housing - Ultem*
- *Mounting - Helmet or Mask*
- *Battery Type - 9V Lithium*
- *Battery Life - ~3.5 Hours*
- *Temp Ranges - 70⁰C for 45 min*
120⁰C for 10 min
340⁰C for 5 min





Thermal Imaging Rubble Probe

- Thermal Probe for Collapsed Building, Rubble, or Below Grade Search and Rescue.
- Thermal and Daylight Camera
- Light Weight & Low Power
- Weight - *Less than 10 lbs.*
- Dimensions - Length: 120 in. total/30 in. folding sections. Diameter: 2.5 in.
- Pan Range - +/- 170° (360° visible)
- Tilt Range - 280° total
- Battery Life - Greater than 3.0 Hours



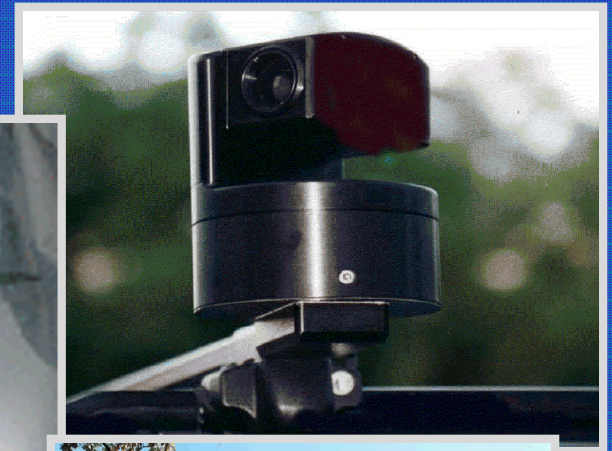


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Wireless Area Thermal Imaging Camera

- *Pan and Tilt Thermal Imaging System for Area/Scene Observation, and Incident Command.*
- *Thermal and Daylight Cameras*
- *Wireless Link Between the Pan-and-Tilt and Operator Control Units.*





Thru-Wall Sensor

- Detects Slightest Movements
- Can be Used for Interior or Collapsed Building Search & Rescue
- Senses Through Drywall/Wood Frame and Concrete/Cinder Block Walls





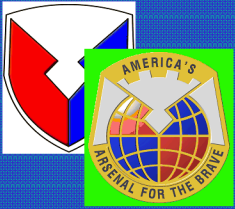
Thru-Wall Sensor

- Hand-held, Affordable, Rugged System for Through-wall or Through-rubble Detection of Personnel.
- Improves Firefighter Survivability and Search and Rescue Operations.



- Time Modulated Ultra Wide Band (UWB) Chipset
- Millions of Low Power Coded Pulses Per Second Across an UWB Spectrum
- Fire/Rescue Applications for Collapsed Building, Below Grade, and Interior Search and Rescue





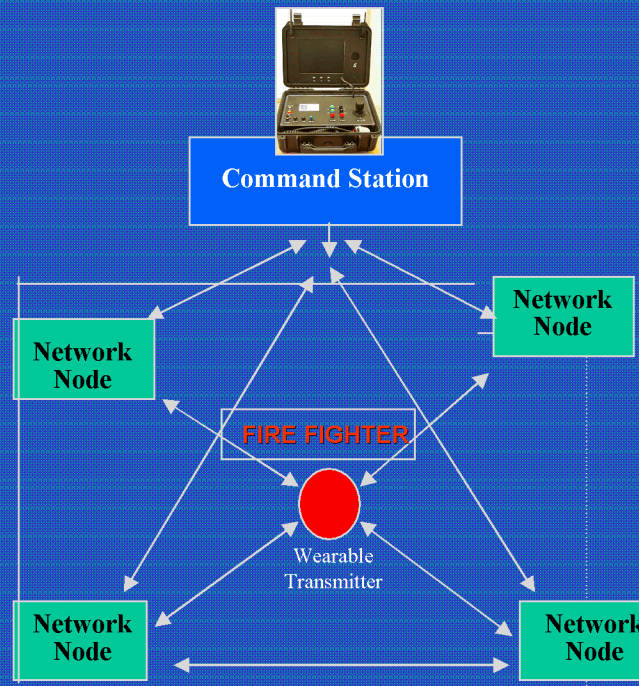
Position-Location System

- Accurate (to 1 meter), Easy to Set-up and Operate, Affordable Firefighter Position Location and Tracking System
- Designed for Interior Operations

-Range: 150-350 Feet Indoors

-Accuracy: 1 Meter Both Horizontal and Vertical

-Usability: All Normal Residential and Low-Rise Commercial Office Buildings



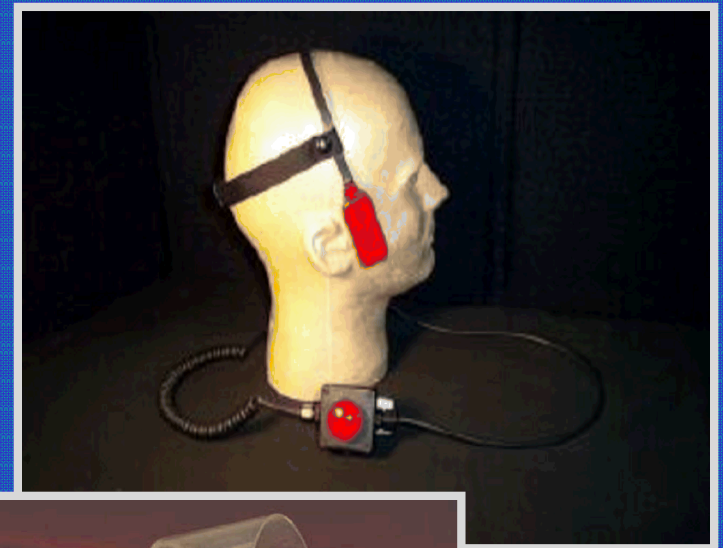
- Each Fire Fighter Transmits a Unique Digital Identification Code.
- Small Worn or Dropped Ultra Wide Band (UWB) Transceivers Track Relative Locations. Combination of Worn and Dropped Transceivers Creates a Wireless Network
- Signal "Flight Time" (TDOA-Time Delay Of Arrival) and Arrival Angle Determines Exact Horizontal and Vertical Position

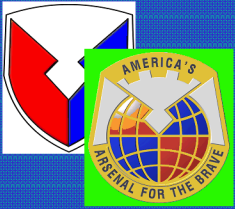


Bone Conduction Headsets

- Radio Message Is Fed Into Bone Conduction Speaker
- Speech Is Converted to Vibration
- Skull Bones Are Vibrated by Speaker Transmitting Vibration to Inner Ear
- User Hears Radio Message the Same As If It Had Been Transmitted Via Air Through Outer and Middle Ear

- System Is Mounted in Helmet Using Velcro
- Microphone Is Positioned on Forehead in Sweatband
- Speakers Are Positioned on Both Cheeks

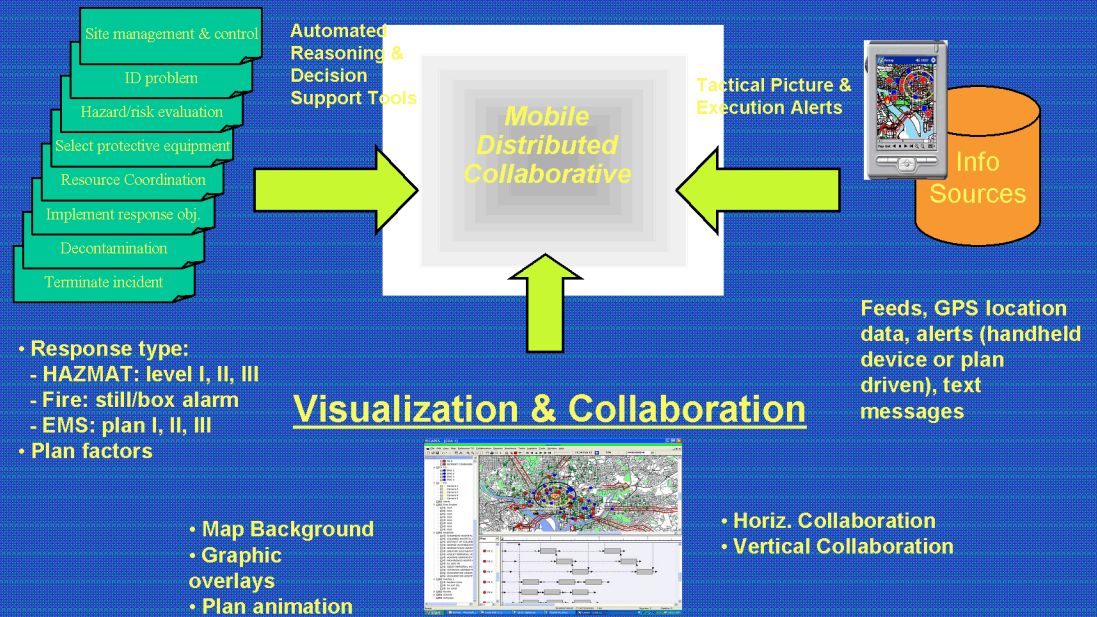




Homeland Security "Davinci" Decision Support System

- Estimate time, resource requirements, outcomes
 - Evaluate emergency management requirements/options
 - What-if scenario analyses
- Enables flexibility in changing environments
 - System generates plan options
 - Situational awareness (e.g., traffic conditions, hospital beds, logistics & sustainment requirements)
 - Enables coordination

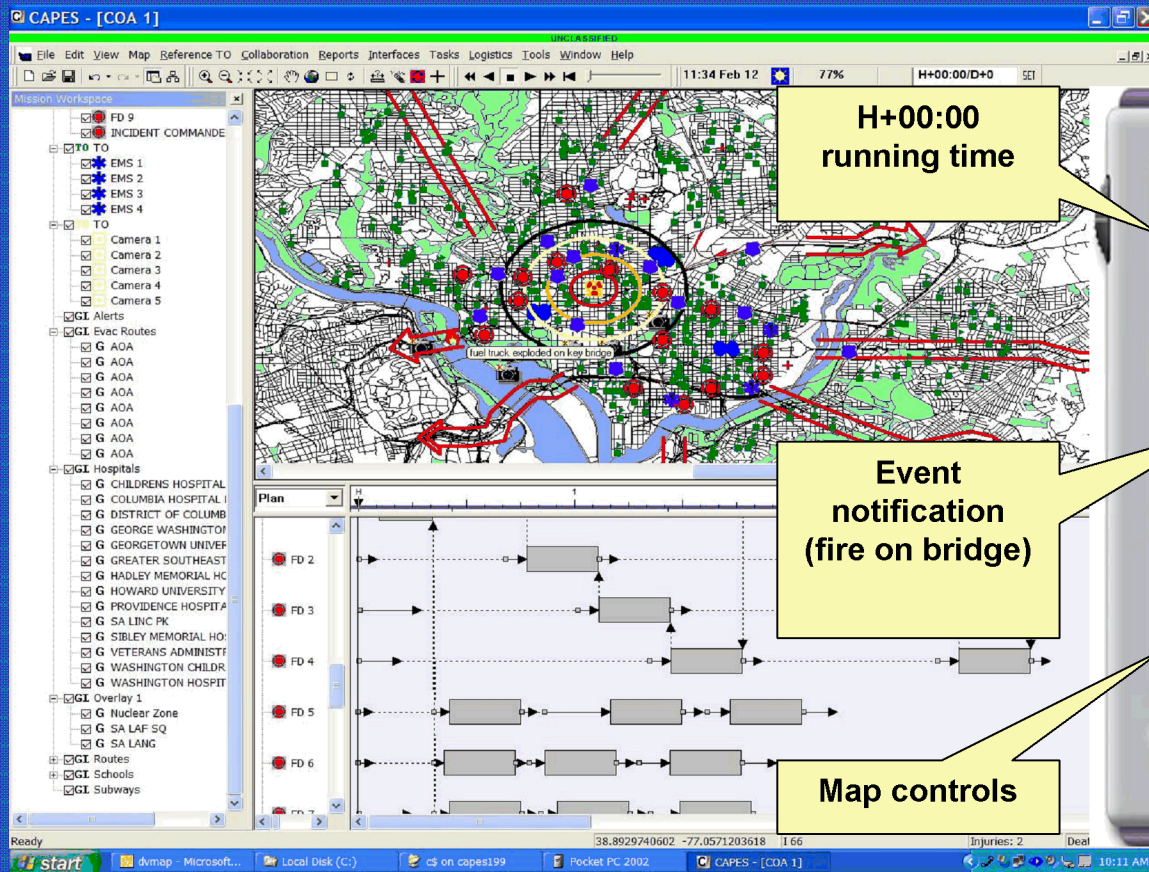
Incident Management: Hazmat Situation Monitoring & Alerts





Homeland Security "Davinci"

- Incident Command Decision Support Tool
- Wireless Hand-held Devices for Information Exchange



H+00:00
running time

Event
notification
(fire on bridge)

Map controls



Full color plan
download

GPS location-
data integration

Full plan
animation with
'VCR' controls



Contingency Communications Vehicle

- Voice
- Video
- Data
- PCS Integrated Cellular Services



- 96 + phones
- Internet LAN
- Private LAN
- Fiber connection to other networks
i.e. Fire/Police
- Military or commercial satellite communications
- Access to fixed infrastructure/commercial voice & data networks

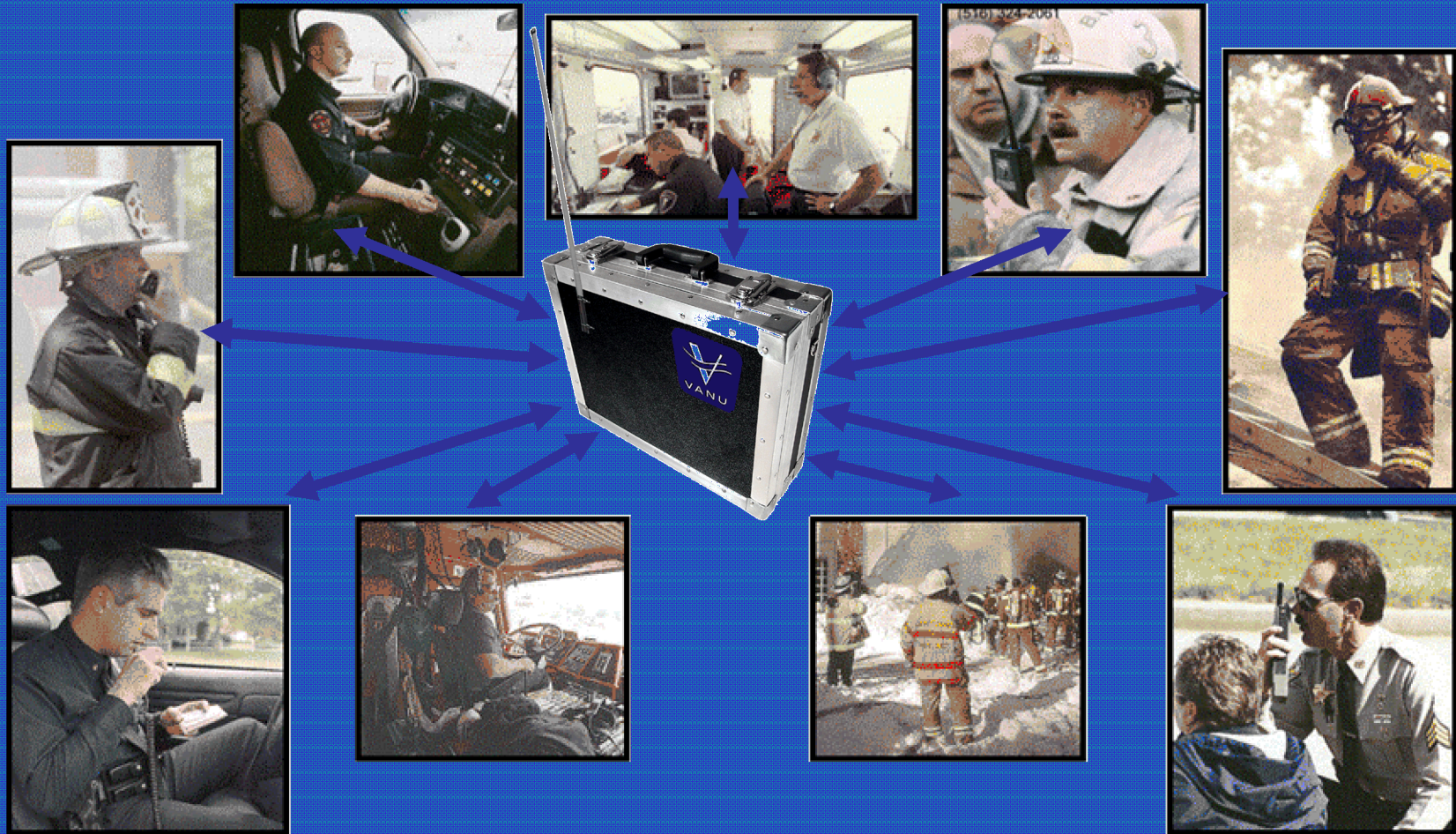


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VANU

- Software Radio Seamlessly Connects Mobile Diverse Communications Users





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Portable Emergency Broadband System “Bread Crumbs” Network

- Portable
- Instantly deployable
- Self-healing Network
- Expandable

Provides
Connectivity
Between First
Responders &
Command Center





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Army's Ft. Monmouth NJ FD Technology Test Bed

- Federal Fire Department for Evaluation of Fire/Rescue or Homeland Security Technology Transfer Systems
- Bridges the Gap Between Research & Development and Fire Service Communities



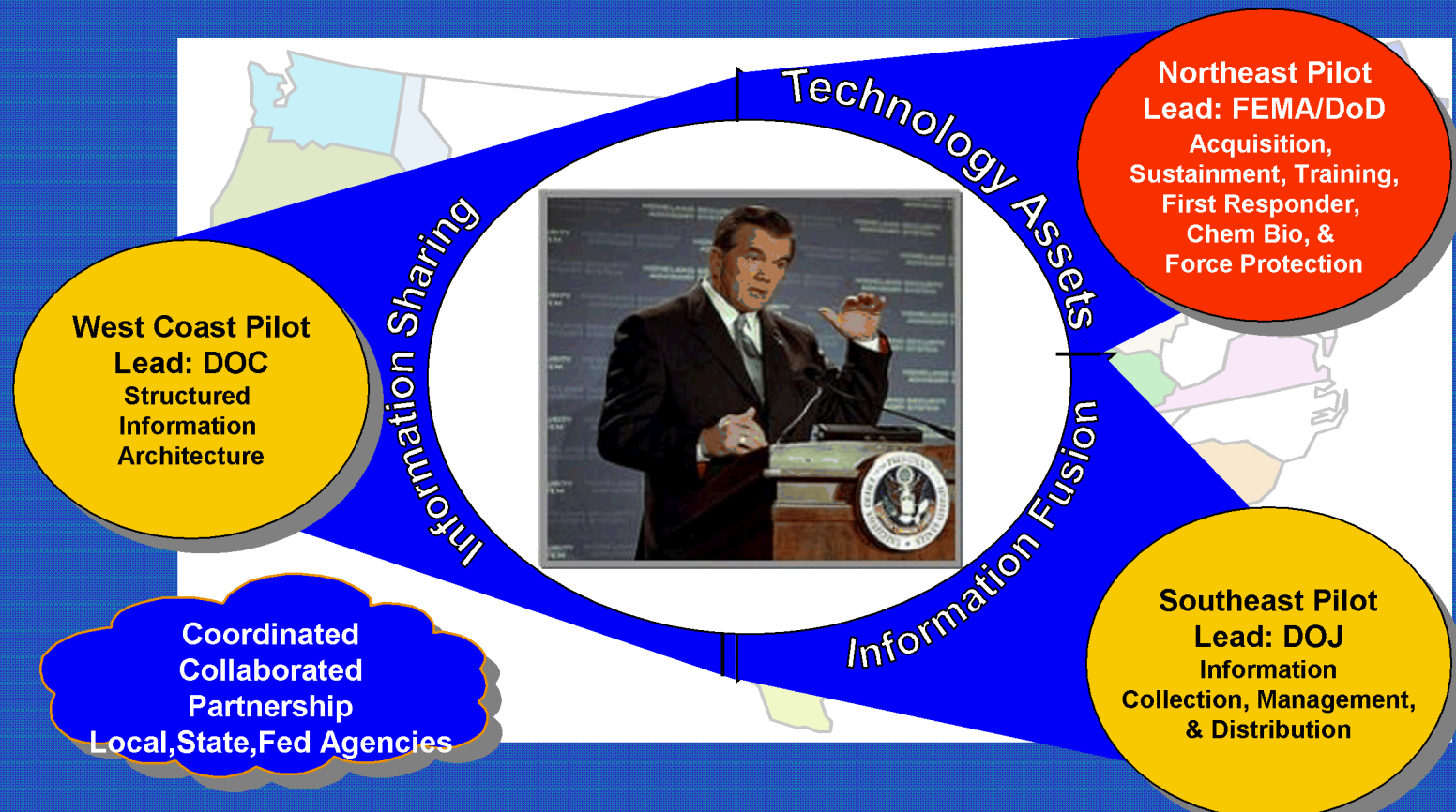


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Pilot Programs

“To take all the technology assets that we have in Government and elsewhere and use them in such a way, fuse the information in such a way, share the information in such a way that we can hopefully prevent future terrorist attacks” [Director Homeland Security]





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National Emergency Support Center- Northeast Pilot

- Leverage the Military Material Acquisition, Training and Support Infrastructure
- Consolidate National/State Requirements
- Provide High End Special Technologies Items
 - ***Dual Use Products***
 - Focus Is First Responders
 - High Volume/Economies of Scale
 - ***Limited Use Products***
 - Focus Is Follow-on Responders
 - Restricted Military Products
 - DoD Retains Ownership – Responders Operate/Train
 - ***Classified Products***
 - Focus Is Assistance to Responders
 - DoD Owns, Operates, and Controls
 - Responders Receive Information