



# Communications for Disaster Response & Emergency Coordination in the United States

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# Agenda

- Types of Emergencies
- Communication Requirements
- Disasters
- Land Mobile Radio Communications
- Interoperability: APCO Project 25
- Alaska & Hawai'i Systems in Use
- Organizational Model





# Types of Emergencies

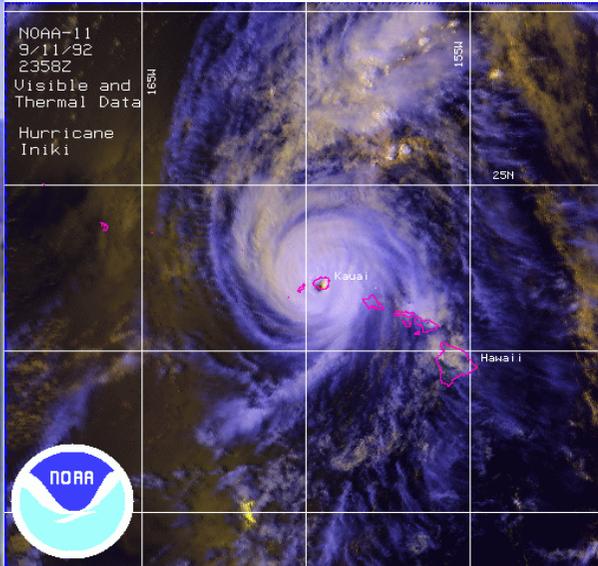
- Natural disaster
  - Hurricane Iniki
  - Wild fire
  - Earthquake
- Man-made, technological
  - Aircraft accident
- Avoidance/Mitigation
  - Pro Bowl
  - Weapons of Mass Destruction



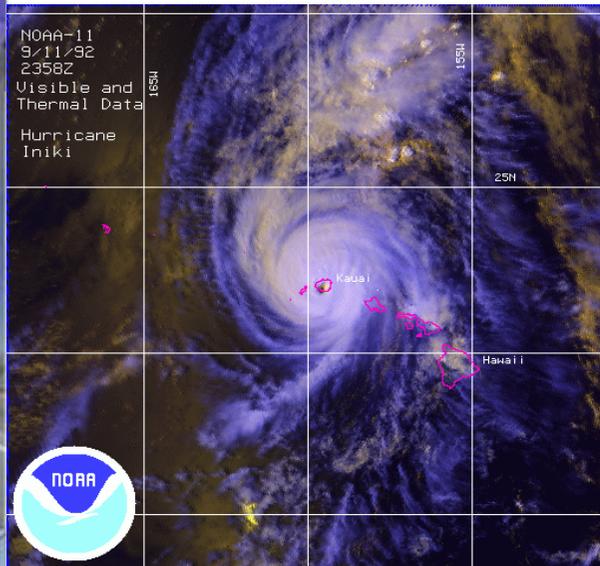
# Communications Requirements

- Interoperability among agencies
  - 911 (Police, Fire, EMS)
  - Civil Defense
  - Military
  - Utilities (Electric, Gas, Water)
  - Relief agencies (Red Cross)
- Transition narrowband radio operations to meet national mandate
- Wide area voice and data radio communications
- Conserve spectrum resources

# Disasters



# Natural Disasters



- Hurricane Iniki (1992)
  - 6 dead
  - \$2.3B damages

# Natural Disasters



- Wild fires
  - Remote (Alaska)
  - Urban encroachment (Hawai'i)



# Man-made Disasters



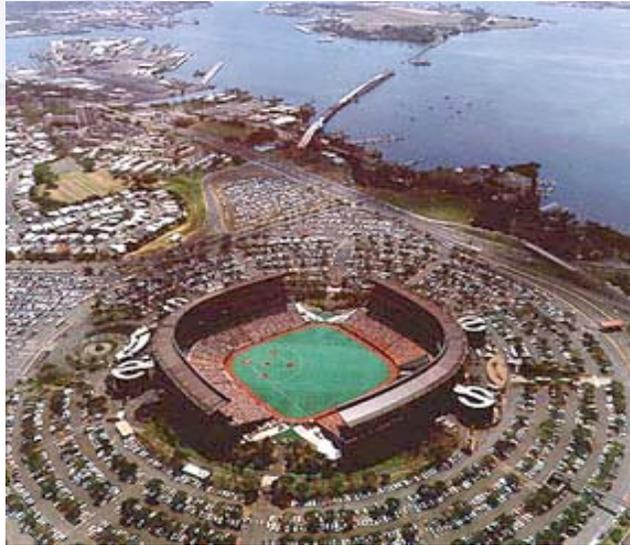
• Blackhawk Crash(2002)

# Man-made Disasters



- Exxon Valdez (1989)  
–\$2.8B damages

# Avoidance/Mitigation

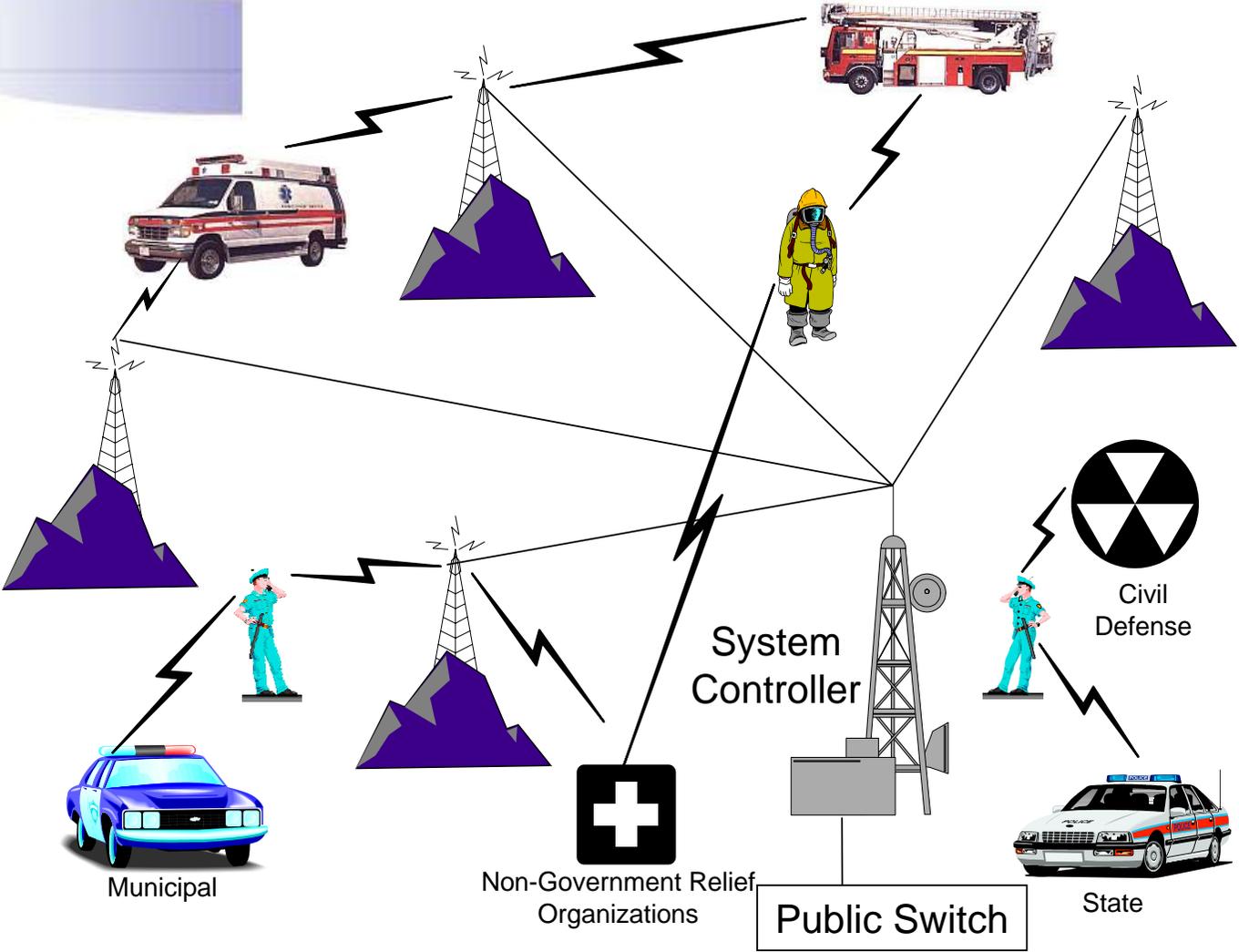




# Land Mobile Communications

- **Trunked Radio**
  - Point to multiple points calls, user groups
  - Robust configuration designed for emergency responders
  - Flexible priority
  - Multiple security levels
  - OTAR
  - Data
  - Automated Vehicle Location
  - Integrated Voice & Data

# Trunked Radio Model



Radio



## APCO Project 25

- Efficient spectrum usage with FDMA
- Greater power/range than TETRA
- Robust architecture
  - 24 channels per site
- Data communication capability
  - Radio:radio
  - Radio:network
  - Network:radio
- VHF and UHF spectrum
- Simulcasting possible



## P25 Characteristics

- Common air interface
  - 12.5 KHz channels
- RF subsystem
- Intersystem
- Interconnect
- Network management
  - Fault, Performance, Configuration, Accounting, Security
- Host and Network Data



## APCO Project 25 Usage

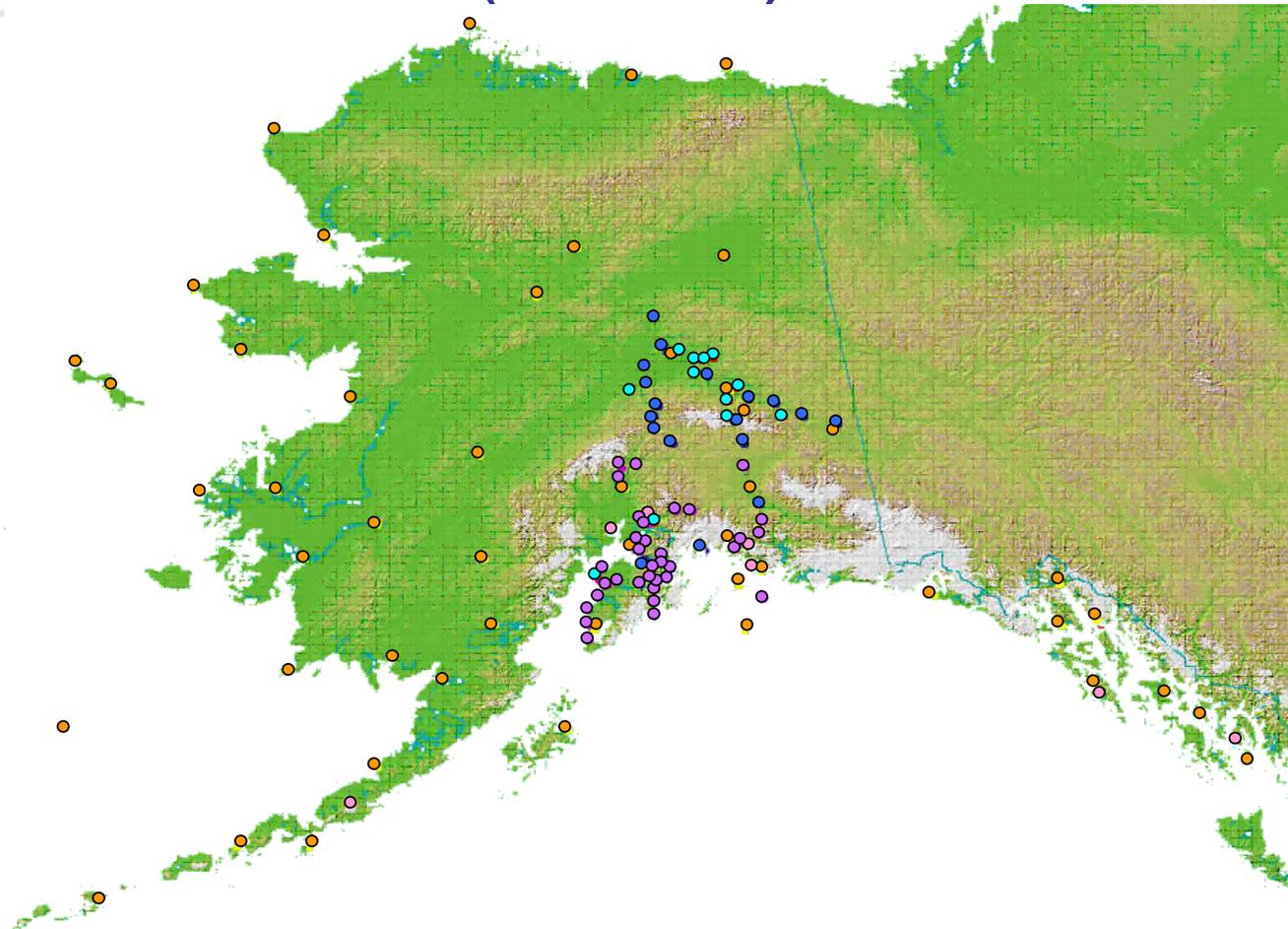
- US Standard for public safety LMR
  - National Wireless Communications Infrastructure Program
  - Alaska Land Mobile Radio (ALMR)
  - Pacific Mobile Emergency Radio System (PACMERS)
- Used in Korea National Railroad



## Alaska & Hawai'i Systems in Use

- Alaska Land Mobile Radio (ALMR)
  - State of Alaska
  - Department of Defense (PACMERS-Alaska)
- Hawai'i
  - Department of Defense (PACMERS-Hawaii)
  - County of Hawai'i (PACMERS-COH)

# Alaska Land Mobile Radio (ALMR)

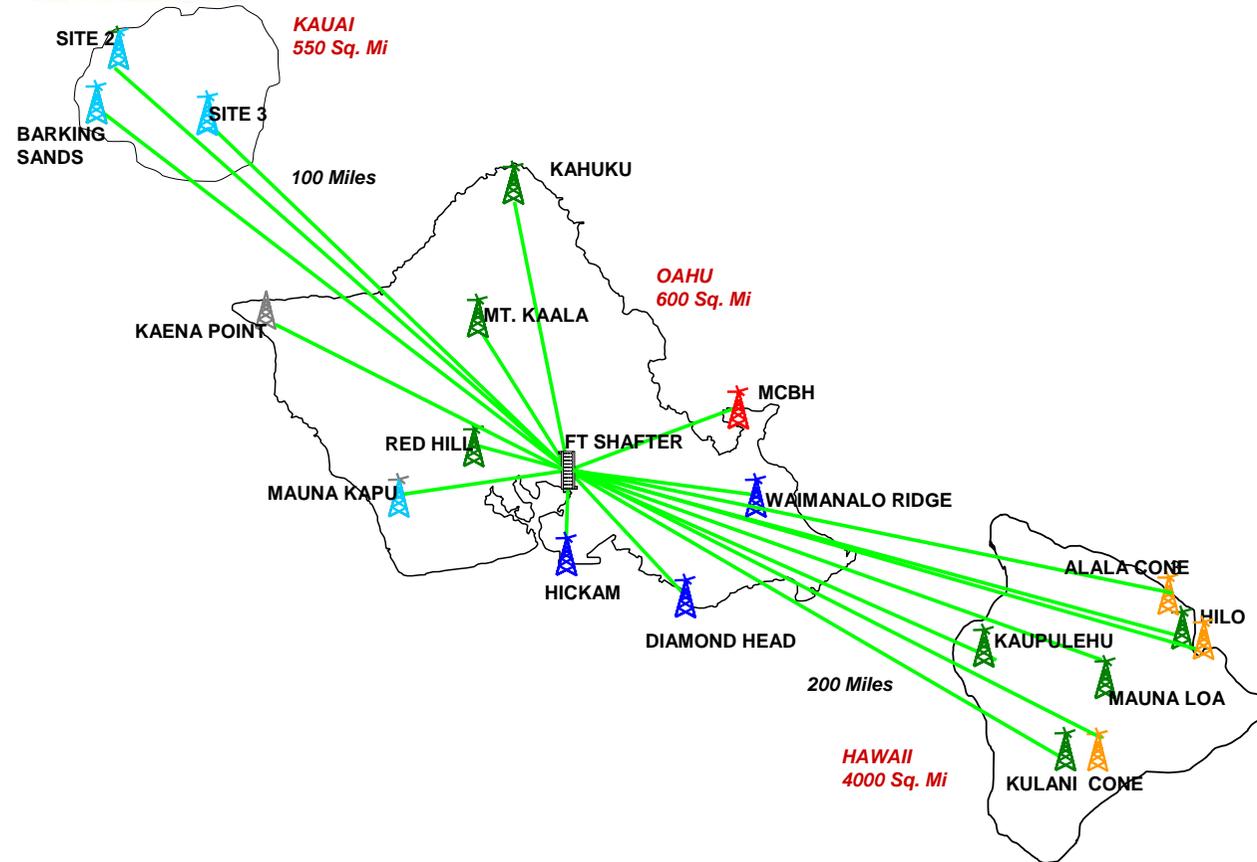




# Alaska Land Mobile Radio (ALMR)

- State Government lead agency for interoperable disaster response communications
- State and National military partnership to share development and operation costs

# Pacific Mobile Emergency Radio System (PACMERS)





# PACMERS-Hawai'i

- Military lead agency
- National military and state consortium (Hawaii Emergency Preparedness Executive Committee)
- National military and local government (County of Hawaii) partnership (sponsored by national legislature)



# Organizational Model

- **Establish top level coordination organization**
  - Represented by all disaster response & relief agencies
- **Identify legacy communications systems**
- **Identify target, standards-based communications solution**
  - Compatible with legacy systems
  - Reliable use under severe conditions
- **Coordinate funding requirements across all program budgets**
- **Implement integrated disaster response & relief communications system**
  - Phased implementation
    - Critical shortfalls of current systems
    - Geographic priorities
  - Lifecycle migration of legacy systems



**Mahalo Nui Loa!  
Kamsahamnida!**