

# DHS Joint Wireless Program Management Office

## Technical Advisory Board for First Responder Interoperability (Interoperability Board) Workshop

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April 23, 2012





# Background

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- **DHS operates and maintains several Land Mobile Radio (LMR) networks.**
  - More than 120,000 DHS operational users, rely on these tactical communications (TACCOM) LMR radios for communications lifeline and is critical to their safety, and success of their missions and operations
- **Legacy land mobile radio (LMR) systems present several immediate operational shortcomings**
  - Many systems are past their service lifecycle
  - Inadequate coverage, capacity, and encryption for today's mission
- **Current TACCOM approach meets immediate needs but :**
  - Does not address new mission needs for tactical voice, data & video
  - LMR spectrum scarcity
  - Interoperability and Operational challenges (complexity)
  - Expensive lifecycle cost (own and operate model with no cost sharing across broad communities)



# Vision of Next Generation Tactical Wireless Broadband Operations



**Streaming Video**



**Geospatial Location**



**Situational Awareness**



**Communications with Central Dispatcher**



**Unmanned Aerial Vehicle Feeds**



**Common Operating Picture**



**Voice and data communications**



Tactical wireless broadband provides a unique opportunity for migrating federal law enforcement and local public safety into an emerging voice/data broadband technology



# New DHS Approach

- Shift from government owned and operated to subscription-based service on national networks
- Obtain mission-required higher grade service from commercial providers for tactical use
- Spread costs over broad user base; enables use of potentially lower cost commercial devices and ecosystem
- Support a variety of subscriber devices operating over 4G-LTE networks, LMR networks or direct voice radio-to-radio (no network)



***Approach improves interoperability, increases capability while reducing lifecycle costs by sharing networks over a wide user base***



# Operational Scenarios Examples

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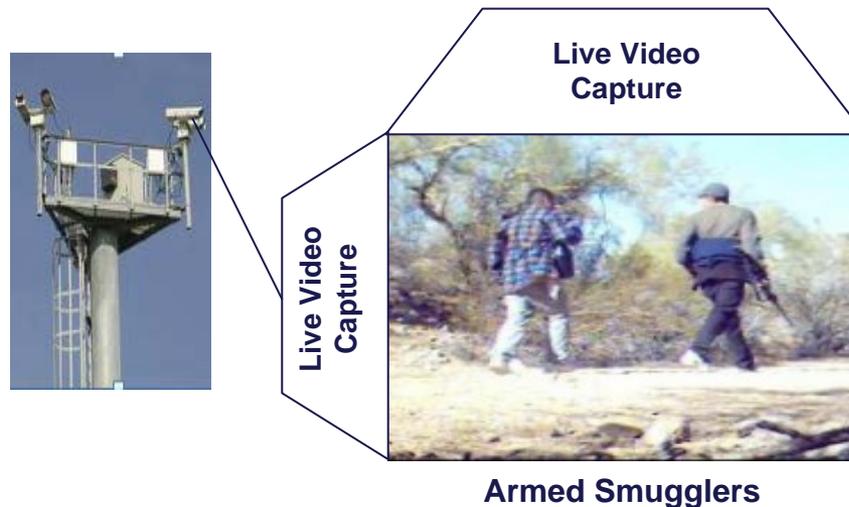
## Scenarios:

- Officer is doing an outbound check in a jet way and would like to determine if passenger has filed proper documentation
- Agent intercepts a group of five aliens along the US border or in a remote area and needs to determine status and information
- Agent intercepts an aircraft at the airfield and needs to determine crew/passengers status and aircraft history
- Officer is doing inspections in a seaport environment and would like to access commercial information on shipments



# RF Performance

- Organizations have various geographical and economic constraints and require deployment flexibility for their broadband networks.
  - Data rates should be based on minimum user requirements for various applications ( Short video or still frames can be transmitted that require less bandwidth)
  - Especially in Rural and US Border locations, these constraints necessitate the radio design provide adequate coverage first and foremost and then capacity for their broadband networks.



Picture or Video feed from surveillance tower tagged with tower location, time, other environmental factors.



# RF Performance and Optimal Design

**Capacity needs are dynamic, right-sizing backhaul is also a concern for both urban and rural areas**

- Mission requires regular surges and shifts (bigger issue in rural areas where surge capacity cannot be distributed over large user-base)
- Ability for all agencies to specify coverage & capacity requirements based on mission rather than business case

**Questionable that Commercial 4G companies (ATT and VZW) will cover the least dense portion of the United States any time soon (bottom 5 % of population density in US, Rural area's and along US borders)**

- Designs need leverage all assets(i.e. commercial, Federal and utilities site)

**Cell edge data rates are a function of the cell edge Signal to Interference Noise Ratio (SINR), which is influenced by many factors such as; Inter-site distance, Site antenna heights, Radio Frequency Environment and Interference due to neighboring sites**

- Data rates should be based on minimum user requirements for various applications

**Tower space is constricted because of companies already deploying 4G**

- Designs need incorporate current loading and use all obtainable sites.