

Leveraging TV Spectrum: A Hybrid Solution to Video Overload on Wireless Networks

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#### M-EAS sponsors of APCO Emerging Tech 2014









# Companies working on M-EAS



























# Mobile Emergency Alert System (M-EAS)

A "hardened" mass-alerting system for reaching citizens anytime, anywhere

## What is M-EAS?

- M-EAS is a next-gen service that adds CAP-based or other formatted emergency messaging to Mobile DTV
- M-EAS rides on top of terrestrial DTV signal
- M-EAS is a robust, mass-alerting system designed to reach citizens during emergencies
- M-EAS can also be used as a secure, dedicated network for first responders and emergency managers

#### M-EAS Can Serve First Responders

Secure tactical video and other content to first responders, recovery teams, hospitals, and others authorized users



# What Problem(s) Does It Solve?

We rely on cell phones to run our lives, but they tend to be useless—or at least far from useful—when we need them most.

Bloomberg BusinessWeek
 Aftermath of Boston bombing

# Sandy's Toll on Telecom

Sandy Takes Out 25%

of Cell Towers –
of CongislandPress.com

Outages Expose Wireless Carriers' Backup Plans – The Wall Street Journal

Authorities said cell phone traffic was so heavy that it hampered their ability to respond to emergencies – ABC News



## WEA's May Contribute to the Problem

#### **Received from Severe Alert**

Flash Flood Warning this area til 9:30 AM EDT. Avoid flood areas. Check local media. -NWS

6:27 AM, Aug 25

Each Broadcast TV Station can serve all kinds of users ...using only its regular DTV channel



## M-EAS Content Sources



**SNG** 



**ENG** 



**News Copter** 

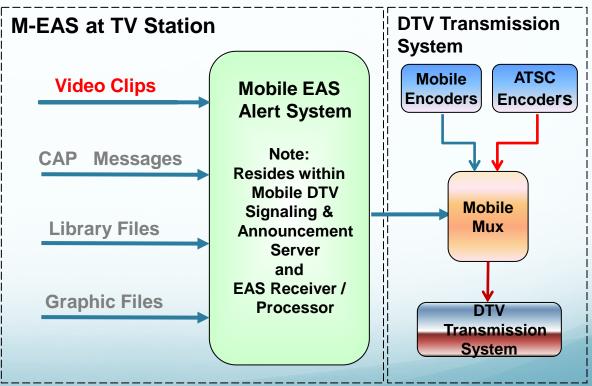


Traffic Cameras



**Live Studio** 

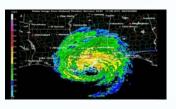
#### **Video Clips from Various Sources**



Camera

## M-EAS Content Sources

#### **Graphic Content Files from Local or External Sources**



Weather Radar Systems

TV Station Graphic Systems

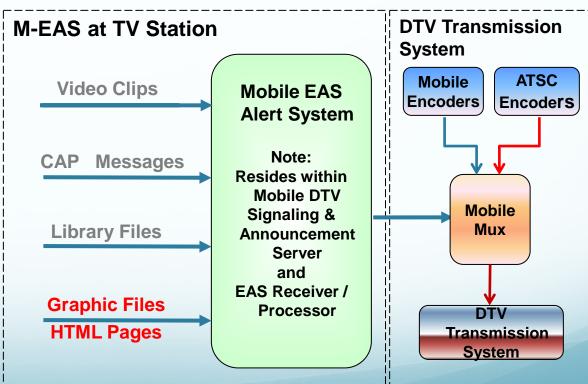
Google



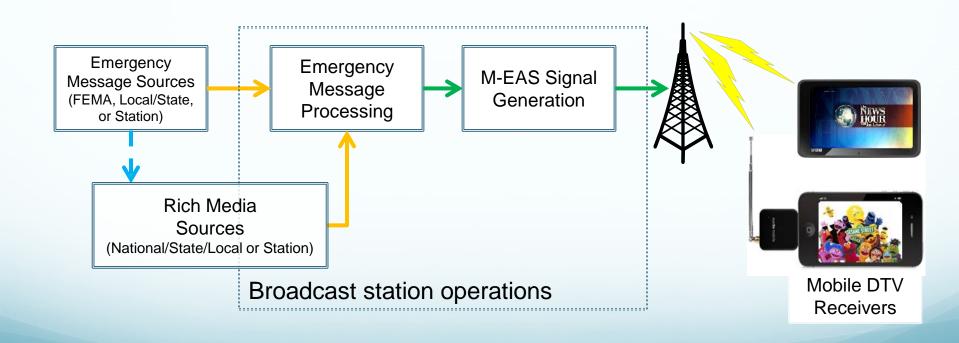
Hyperlinks to Internet Content

Electronic Still Camera





# M-EAS General Signal Flow



## M-EAS Interactive Screen Example



Pop-up Alert Message Available Associated Media

View Alert Media

## Alert Appears as an On-Screen Banner



#### Banner Close-Up - Select Banner for More



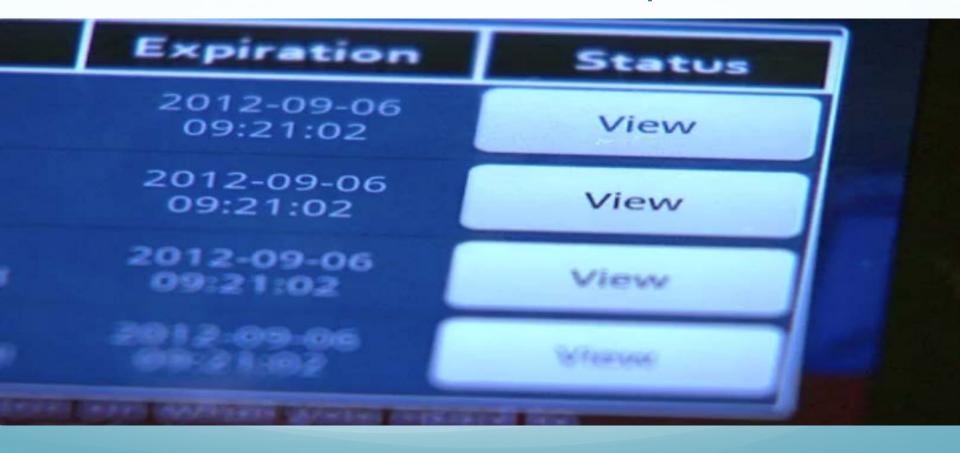
## Populated Content from Banner Selection



## Individual Rich-Media Options



## Choose What Information Is Required



# Radar Images



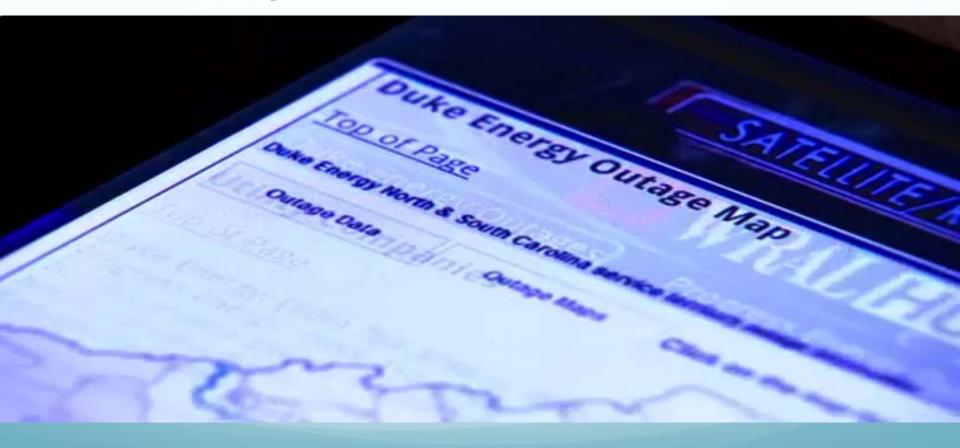
#### Local News Via M-EAS



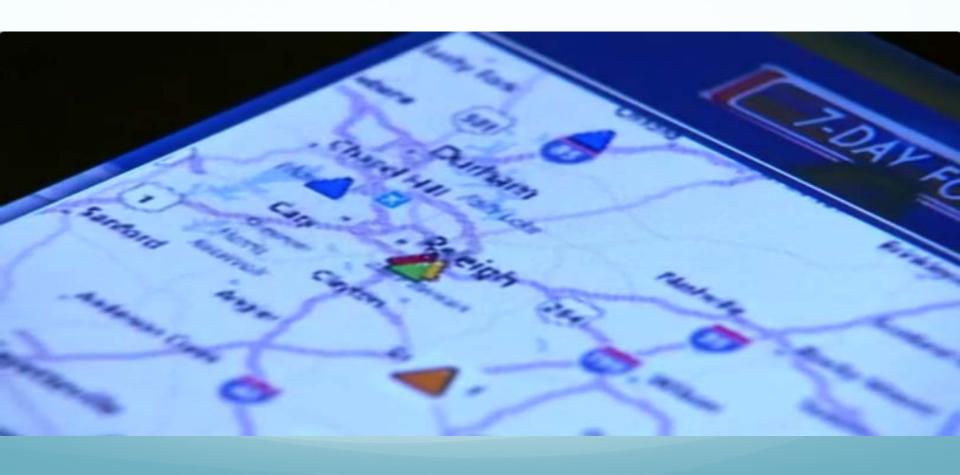
## Overview of Options



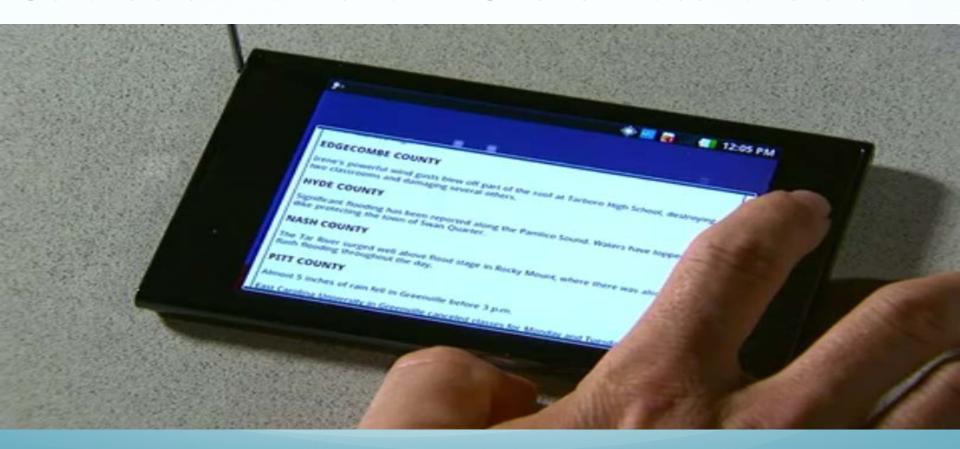
## Power Outage Information



#### **Evacuation Routes**



#### Scrollable Information – Shelter Locations etc.



# What Problem(s) Does It Solve?

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#### Partial Solution for Unintentional DoS

#### DRAFT NISTIR 8018

#### Public Safety Mobile Application Security Requirements Workshop Summary (DRAFT)

Michael Ogata Barbara Guitman. Systems and Software Division Information Technology Laboratory

Nelson H astings Computer Security Division Information Technology Laboratory

July 2014



U.S. Department of Commerce Penny Pritzler, Secretary

National Institute of Standards and Technology
Willia May, Acting Under Secretary of Commerce for Standards and Technology and Acting Director

#### Unintentional Denial of Service (DoS)

#### 3.1 Exiting Key Attribute

None

#### 3.2 Breakout Session Summary

Much like the batterylife discussion, the topic of unintentional denial of service became a conversation of how to manage potentially limited exources. This topic is for their complicates at the exact limitations of the FirstNet LTE deployment are still unknown and likely to change from diployment to deployment and situation to situation. This uncertainty, combined with the previous experiences of public softy with non-LTE commercial networks, bus left the first responder community interested to buy FirstNet will perform when stressed. What shop participants vacced concern of the impact of an utilitate of first responders saturating local cells with data such as voice, location and of most concern, edge, Video upload will likely place the most stain on FirstNet and its or of the experient network dram units to conceptuake. Participants envisioned many scenarios produing multiple, wideo streams being made available to incident commanders during an one enginery.

The group consensus was a call for remote monitoring of network traffic and/conote management of bandwidth consumers. This would allow incident Commanders to identify pollunityset applications that consume an inappropriate amount of network resources. Furthermore, it would allow dynamically strainfying network users by the current importance of this, data in capit to parcel out network bandwidth.

The central question is what mechanisms, or combination thereof, will control the function of First-Net devices. The Quality of Service from a high into L. It may never to mendate a same network competion issues on First-Net. It is unclease if they can provide the on-demandle vel of granular control first responders angle meed.

#### 3.3 Next Steps

- Identify and explain to public safety community how to use FirstNet most responsibly in terms of network throughput.
- □ Discover the real world network load limitations of LTE deployments.
- Evaluate the applicability appropriateness of vendor QoS features for use in on demand first responder network control.

#### 3.4 APCO Key Attribute Refinement and Additions

 $\ \square$  Applications must prove they use the network in an efficient and responsible manner.

3.1 Exiting Key Attribute: None

#### 3.2 Breakout Session Summary

Much like the battery life discussion, the topic of unintentional denial of service became a conversation of how to manage potentially limited resources. This topic is further complicated as the exact limitations of the FirstNet LTE deployment are still unknown and likely to change from deployment to deployment and situation to situation. This uncertainty, combined with the previous experiences of public safety with non-LTE commercial networks, has left the first responder community interested in how FirstNet will perform when stressed. Workshop participants voiced concern on the impact of multitudes of first responders saturating local cells with data such as voice, location and of most concern, video. Video upload will likely place the most strain on FirstNet and is one of the easiest network demands to conceptualize. Participants envisioned many scenarios involving multiple video streams being made available to incident commanders during an emergency.

The group consensus was a call for remote monitoring of network traffic and remote management of bandwidth consumers. This would allow incident commanders to identify and mitigate applications that consume an inappropriate amount of network resources. Furthermore, it would allow dynamically stratifying network users by the current importance of their data in order to parcel out network bandwidth.

The central question is what mechanisms, or combination thereof, will control the throttling of FirstNet devices. The Quality of Service features built into LTE may serve to remediate some network congestion issues on FirstNet. It is unclear if they can provide the on-demand level of granular control first responders might need.



#### **Request for Information**

for

**Comprehensive Network Solution(s)** 

September 17, 2014



Overview of ATSC 3.0

## ATSC 3.0: Next-Gen TV Broadcasting

- Data rates double to ≈ 38 Mbps
- Designed as LTE overlay or "mesh" network
- Mobile and indoor reception "core" services
- Advanced emergency communications already being built into the system

## Opportunity for APCO & Broadcasters

- Plan for hybrid broadcast-broadband networks, e.g.
   ATSC 3.0 and FirstNet
- Offload video traffic to preserve LTE for what is does best: point-to-point
- Provide a more robust and reliable public safety communications system to the public



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