**Mobile EAS Coalition
Comments on DRAFT NISTIR 8018**

September 12, 2014

**Public Safety Mobile Application Security Requirements Workshop
Summary (DRAFT NISTIR 8018)**

The Mobile EAS Coalition commends APCO International, in cooperation with FirstNet and the Department of Commerce, for convening the workshop titled "Public Safety Mobile Application Security Requirements." We welcome the opportunity extended by the NIST Computer Security Division to comment on DRAFT NISTIR 8018.

Mobile EAS and related advanced services currently in development can be a powerful, cost-effective, and near-term solution for at least some of the challenges identified in the workshop, specifically unintentional denial of service (DoS) caused by predictable congestion of the FirstNet LTE infrastructure. As the workshop participants noted, "Video upload will likely place the most strain on FirstNet and is one of the easiest network demands to conceptualize." The inherent one-to-many architecture of digital broadcasting technology can be a very powerful complement to the unicast architecture of LTE, thereby conserving FirstNet bandwidth for other communications needs.

Relying on the dual use of existing television broadcasting infrastructure, Mobile EAS and its underlying technology of digital television (DTV) broadcasting, can distribute multiple video and other rich media assets to an unlimited number of handheld, vehicular, or fixed receive devices. Critically, it can do this without placing *any* bandwidth demand on the LTE network. M-EAS and DTV are most effective at distributing or redistributing video and other rich media assets from the incident commander to field units, including video acquired from the field that needs to be retransmitted more broadly to other units. An example using DTV would be live video acquired from police helicopters that needs to be seen not just by decision makers at headquarters, but the incident commander and multiple ground units as well.

Mobile EAS: Available Now Without Additional Spectrum

Mobile Emergency Alerting System (Mobile EAS or M-EAS) is a next-generation, dual-use, public alert and warning system for a mobile, 21st Century America. It utilizes the backbone of the nation's existing television broadcasting infrastructure and the powerful new technology of Mobile DTV. By using terrestrial digital broadcasting, M-EAS delivers rich media content to an unlimited number of mobile phones or other devices without utilizing, let alone stressing, the cellular network. It takes advantage of the one-to-many nature of broadcast television, thus ensuring high reliability and the mass, instantaneous distribution of life-saving information – crucial in emergency events when cellular networks may be unavailable.

Emergency Communications for the Public and First Responders

Very importantly, M-EAS can also deliver rich media content specifically to first responders in the field. Surveillance video, inundation maps or storm tracks, photos of suspects, plume models or medical treatment protocols, for example, can be delivered to field units without encumbering public safety networks needed for two-way communication.

In this way, M-EAS can provide a secure overlay network that can preserve and extend the capabilities of the planned FirstNet and existing public safety communications systems. The underlying technology of Mobile DTV fully incorporates conditional access digital rights management of commercial content, so encrypting sensitive media assets for access by only authorized users is already possible.

Standards-Based and Field Tested

M-EAS is built to the Common Alerting Protocol (CAP) and is designed for seamless incorporation into the U.S. Integrated Public Alert and Warning System (IPAWS). M-EAS was standardized by the Advanced Television Systems Committee (ATSC) as A/53 – Part 10 of the existing Mobile DTV standard in March 2013. ATSC also has convened a cross-industry Implementation Team to facilitate deployment.

M-EAS technology was developed through a collaboration of LG Electronics and its Zenith R&D Lab, PBS, Harris Broadcast (recently renamed GatesAir), Triveni Digital, and Monroe Electronics. Other companies, including, RoundBox, Expway, Elgato, and Siano Silicon, also have contributed to its development, as have NAB Labs, the Corporation for Public Broadcasting, Fisher Media (now Sinclair), Capitol Broadcasting Company, Inc. and other commercial and public broadcasters.

M-EAS was successfully tested by public and commercial television stations in different regions of the country. WRAL (owned by Capitol Broadcasting Company, Raleigh, NC) was the first station to execute a memorandum of agreement with the Federal Emergency Management Agency (FEMA) to receive and distribute IPAWS

alerts. Several TV stations have deployed elements of M-EAS in West Palm Beach and Orlando, Florida, for the current hurricane season.

Lifeline to the Public Even When Cellular Is Disrupted or Jammed

M-EAS—using existing spectrum and commercial off-the-shelf technology—is highly complementary to, but in no way dependent upon, the cellular network before, during, and after disasters. M-EAS presents a rare opportunity to dramatically improve America's public safety communications capability, requires no additional spectrum, and can be deployed through marginal investments in existing and planned infrastructures. It leverages the one-to-many architecture of broadcasting to overcome the chronic congestion of other networks.

Utilizing the backbone of the nation's existing television broadcasting transmission capacity and the new technology of Mobile DTV, M-EAS delivers rich media content to an unlimited number of mobile phones or other television receiving devices. M-EAS alerts are carried seamlessly by the Mobile DTV (MDTV) service from the nation's broadcasters. More than 150 U.S. television stations already are broadcasting MDTV signals. MDTV requires no additional spectrum, but does require special encoding equipment at television stations, as well as MDTV receivers in mobile phones, tablets and other hand-held TVs. For broadcasters who have deployed MDTV along with their regular broadcast services, M-EAS capability can be included at a relatively small incremental investment.

With an M-EAS alert, users are given the option to select specific and timely rich-media information pertaining specifically to that alert. M-EAS can also incorporate geo-codes in the CAP profile, thus leveraging the GPS capability in mobile devices for highly granular geo-targeting of alerts. All of these additional information assets, as well as geo-codes, are sent as packetized files via the broadcast signal, a one-to-many application that is not susceptible to overload.

Because it transmits multi-media content, M-EAS also provides accessibility for people with disabilities. It can deliver information through audio, video, images, vibrations, text, text-to-speech, and simultaneous translation. The alert can also "wake up" devices from standby mode whether or not they are being used for mobile TV viewing.

Hardened Infrastructure Makes M-EAS Non-Grid-Dependent

Whether deployed as a complement to FirstNet, as a public alerting system, or both, M-EAS also can mitigate an unintended DoS caused by widespread power outages. That's because most television stations are "hardened" with uninterruptable power supplies (UPS), back up generators, and extended fuel reserves. This allows stations to provide vital services to the public and first responders as back up resources are brought in to restore the LTE network.

Under "best practices" recommended by the FCC's Media Security and Reliability Councils I & II after the 9/11 attacks of 2001, most broadcast facilities have back-up power with large reserves of fuel for generators. Additionally, the Warning, Alert and Response Network (WARN) Act of 2006 provided funding to noncommercial television licensees to, in part, install or upgrade back-up power, and most public stations have completed their backup power projects. This funding, from 2008 spectrum auction revenue, significantly added to the number of stations in a given market that are able to ride out electric power disruptions.

For these and other reasons (and unlike many cell towers), all television broadcast transmitters were reported to have stayed on the air before, during, and after Superstorm Sandy, regardless of whether their transmitters continued to receive power from the grid.[1] As M-EAS utilizes the broadcast infrastructure, it reaps the benefits of this "hardened" system. Because cellphone and tablet batteries can be recharged from cars and other resources, M-EAS can be classified as "non-grid-dependent" from transmission to reception. This offers flexibility and resilience in emergency communications that other alerting avenues are unable to provide currently.

Future-Proofed for Next-Generation Broadcast Technologies

Consensus is building among leading U.S. broadcasters for the next-generation TV broadcasting standard, known as "ATSC 3.0," and mobile TV will be a core service, allowing direct reception on enabled cell phones and tablets. In addition to other services such as 4K Ultra HD, *advance*d emergency alerting is planned to be an important component of the new standard as well. In fact, the ATSC has established basic system requirements that will leverage the already-available M-EAS standard, workflows and architecture for advanced EAS in the new broadcast system.

In addition to its mobile applications, ATSC 3.0 can significantly enhance the nation's legacy Emergency Alert System (EAS), which traces its roots to the earliest stages of the Cold War. In combination with FirstNet, NG9-1-1, and other services provided by wireless carriers, cable and satellite providers, radio broadcasters, and federal, state, and local public safety agencies, broadcasters' provision of ATSC 3.0 can play a major role in realizing the national aspiration for a robust, modern, emergency communications system.

Not only can ATSC 3.0 provide a powerful just-in-time complement to FirstNet, it also has the potential to become a backbone of the IPAWS interoperable "network of networks." In the years ahead, because of ATSC 3.0, broadcast television will reach millions of viewers on tablets and smartphones as well as living room TV sets. Today's proven Mobile EAS technology can be the foundation for a new era for

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[1] *NYC TV Broadcasters Stay On-Air During Sandy*, TV Technology, November 11, 2012

public alerting to a wide range of fixed and mobile consumer devices, as well as a powerful and cost-effective overlay system for first-responders.

For a general overview, please visit www.MobileEAS.org.

Support for FirstNet and 21st Century Public Safety Communications

The Mobile EAS Coalition supports FirstNet and shares its goal of improving emergency communications for our nation and local communities. The challenges faced by FirstNet in designing, provisioning, and deploying the network are unprecedented but solvable. The M-EAS Coalition realizes that our role in reducing stress on network bandwidth addresses only some of FirstNet's challenges. But as trusted "first communicators," and given our long history as the backbone of the legacy EAS, the broadcast industry has emergency communications in its DNA.

The Mobile EAS Coalition would welcome a dialogue with NIST, APCO, and/or FirstNet to further explore how we might contribute to the deployment of the public safety broadband network. With our bandwidth, reach, and long history of working with emergency managers, combined with powerful new digital technologies like MDTV, M-EAS, and ATSC 3.0, broadcasters can be effective partners with FirstNet. Along with other stakeholders, we can help FirstNet create a resilient public safety communications system for the mobile, connected America of the 21st Century.

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