



# Open Infrastructure for a Nationwide Emergency Services Network

*Mark Gaynor, Boston University, USA*

*Scott Brander, Harvard University, USA*

*Alan Pearce, Information Age Economics, USA*

*Ken Post, Alert Systems Inc., USA*

---

## ABSTRACT

*The article suggests and supports a public policy in which the Federal Communications Commission (FCC) should seize a unique opportunity to resolve some of the nation's critical communications problems in times of crises with the allocation of a portion of the spectrum at 700 MHz for the deployment of a nationwide interoperable emergency broadband wireless network built by a public-private partnership. It then presents a convincing theoretical model that advocates that an open and/or neutral, as opposed to a closed, network will add greater efficiency, greater choice, while advancing public safety along with the deployment of new and valuable technologies, applications and services. [Article copies are available for purchase from InfoSci-on-Demand.com]*

*Keywords:* 700MHz Spectrum; Emergency Services; EMS Network; Open Network Architecture

---

## INTRODUCTION

Traditional economic markets cannot—and do not -- always meet all of the needs of society (Pearce, 2006). Public Safety is one example where business and government must cooperate for the overall benefit of

society. With correct public policy and open infrastructures, business can thrive while society receives immeasurable gains. Because of new threats to society, along with an apparent increase in the number of so-called natural disasters, there is need for new thinking and new solutions in order

to deal with these potentially catastrophic emergencies. The 2008 FCC auction of the nationwide D band (FCC, 2007) presented a unique opportunity to resolve some of the nation's communications problems in times of crises.

This article is an extended version of a paper (Gaynor, et. al. 2008) presented at the 5th International Conference on Information Systems for Crisis Response and Management (ISCRAM) that proposed an infrastructure based on open standards to be built by a public/private partnership would best serve the needs of the Nationwide Emergency Services Network (NESN). Our proposed infrastructure will allow distributed management to promote innovation leading to the introduction of new devices, applications, and services, along with centralized control for nationwide crisis management. In the proposed architecture, local entities, e.g., first responders (ambulance, fire and police) are able to develop and deploy emergency services with applications and services that they urgently need. Many of these applications and services are not currently available or not affordable to individual agencies. Too often the results are unnecessary loss of life and property with recovery costs amounting to billions of dollars annually. Devices manufactured by any vendor should be able to interoperate on this "open" NESN. An "open" NESN will encourage the promotion of innovation and provide economic opportunities for a wide variety of device manufacturers, service providers, and application developers. At the same time, it will promote greater public safety by enabling more effective and efficient communications at lower costs. We briefly present and discuss a model that in a future version of this article will be used to prove theoretically that openness in application, services,

and devices are critical to maximize the benefits of any Nationwide Emergency Services Network (NESN).

Public safety mobile communications networks in the United States are in dire straits. More than seven years after the 9/11 terrorist attacks on New York City, Washington, D.C., and Pennsylvania, the public safety community still lacks the resources to build a robust and interoperable nationwide network to serve public safety and national law enforcement agencies (Lipton, 2006; Pearce, 2006). First responders lack the basic voice and data communications services that they need to confront terrorism, natural disasters, chemical spills, and other emergencies that threaten life and property and cost the nation multiple billions of dollars annually.

One example of local emerging interoperability of emergency networks is the Capital Wireless Information Network (CapWIN) organization (Capwin 2007). Capwin was created in the Washington area because communication networks of fire, police, and other emergency services were not interoperable between departments, and were not interoperable across municipal boundaries. Police from the Washington, DC, area did not have effective communications with their counterparts in Virginia and Maryland. By building a local, interoperable network Capwin will enable communication between organizations across geographic areas. This idea should be replicated throughout the country.

The D band spectrum at 700MHz ideally fits the needs of a NESN because this spectrum is nationwide, unencumbered, and has good physical propagation properties. Combined with the FCC proposed regulations concerning network build out and performance parameters, the D band could meet the nation's needs for effec-

14 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: [www.igi-global.com/article/open-infrastructure-nationwide-emergency-services/4011](http://www.igi-global.com/article/open-infrastructure-nationwide-emergency-services/4011)

## Related Content

---

### Mobile Agents Security Protocols

Raja Al-Jaljouli and Jemal H. Abawajy (2014). *Crisis Management: Concepts, Methodologies, Tools, and Applications* (pp. 166-202).

[www.irma-international.org/chapter/mobile-agents-security-protocols/90716](http://www.irma-international.org/chapter/mobile-agents-security-protocols/90716)

### Lessons of Disaster Recovery Learned for Information Systems Management in US Higher Education

Ruben Xing, Zhongxian Wang, James Yao and Yanli Zhang (2012). *Managing Crises and Disasters with Emerging Technologies: Advancements* (pp. 88-103).

[www.irma-international.org/chapter/lessons-disaster-recovery-learned-information/63306](http://www.irma-international.org/chapter/lessons-disaster-recovery-learned-information/63306)

### Between a Rock and a Cell Phone: Communication and Information Technology Use during the 2011 Uprisings in Tunisia and Egypt

Andrea Kavanaugh, Steven D. Sheetz, Riham Hassan, Seungwon Yang, Hicham G. Elmongui, Edward A. Fox, Mohamed Magdy and Donald J. Shoemaker (2013). *International Journal of Information Systems for Crisis Response and Management* (pp. 1-21).

[www.irma-international.org/article/between-rock-cell-phone/77319](http://www.irma-international.org/article/between-rock-cell-phone/77319)

### Sentiment Analyses of Twitter for Winter Storm Leo

Seungil Yum (2021). *International Journal of Disaster Response and Emergency Management* (pp. 46-63).

[www.irma-international.org/article/sentiment-analyses-of-twitter-for-winter-storm-leo/281109](http://www.irma-international.org/article/sentiment-analyses-of-twitter-for-winter-storm-leo/281109)

### Assessing the Level of Community Resilience to Drought in Kitui County, Kenya

Agnes Kalekye Kithikii, Edward Musungu Mugalava and Samuel Soita China (2023). *International Journal of Disaster Response and Emergency Management* (pp. 1-19).

[www.irma-international.org/article/assessing-the-level-of-community-resilience-to-drought-in-kitui-county-kenya/335480](http://www.irma-international.org/article/assessing-the-level-of-community-resilience-to-drought-in-kitui-county-kenya/335480)