Editorial

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The first *State of Technology* conference sponsored by the Rehabilitation Engineering Research Center for Wireless Technologies[1] (Wireless RERC) was held in 2004 to discuss the challenges and opportunities of mobile wireless communications for people with disabilities. A major finding in the proceedings report emphasised that "maintaining emergency communications between public safety entities and communities most vulnerable during emergencies was critical". As a result, the *Wireless Emergency Communications State of Technology* (*SoT*) conference held in Atlanta, Georgia in 2009 (SoT, 2009) focused on facilitating open dialog among researchers and developers, public

safety and emergency management, the wireless industry, policymakers and disability advocates on how to implement accessible alerts and emergency communications. Following is a brief introduction to the topic followed by nine papers that provide more depth on topics relevant to emergency managers involved in emergency communications and the relevance of ensuring equitable access for people with disabilities.

In the USA an estimated 41.3 million men, women and children have a disability that to some degree impacts their everyday activities (US Census Bureau, 2008). The Wireless RERC Survey of User Needs in 2007 revealed that among those surveyed, 85% used wireless devices, 65% used wireless devices every day, and more than 77% of survey respondents indicated that wireless devices were very important in their daily life (Mueller *et al*., 2008). As more of these users rely on wireless devices as their primary source of communications, receiving emergency alerts on their wireless devices must be considered when developing technology to facilitate emergency and public safety communications.

Natural and man-made disasters are often unpredictable and numerous advocacy groups in the USA are working to encourage development of emergency communication technologies that serve both the general population and people with disabilities. The impact of Hurricane Katrina which devastated parts of New Orleans, Louisiana in 2005, stimulated research on the needs of people with disabilities in emergency scenarios (Columbia University, 2007) and heightened interest on the part of disability advocates (University of Kansas, 2007) in the USA concerned with the delivery of emergency communications and notifications (Harkins *et al*., 2006).

In the USA the first *national* emergency alerting and warning system was established in 1951 (CONELRAD, 1951). It was replaced in 1963 with the Emergency Broadcast System (EBS) which underwent further technical improvements, permitting state and local authorities to send early warnings and alerts, via broadcast stations. In 1994, EBS was replaced with the Emergency Alert System (EAS) which expanded the alerting system beyond traditional broadcasting to include cable systems. In 1997, it was further extended to wireless cable systems. Since 2004 newer initiatives address the development of a next generation system which integrates technologies into a mobile wireless broadband network. Additionally, due to the steady rise in cell phone penetration in the USA (some 84% of the total population (CTIA – The Wireless Association, 2008)) the Federal Communications Commission has been working on an initiative in mobile wireless phone alerting to create the Commercial Mobile Alerting System (FCC, 2008).

Through multiple rulemakings and requests for comments, it is clear that the FCC remains concerned with issues of emergency communications and public safety. At the Federal level Executive Orders, Federal statues and Federal rulemakings account for more than a dozen actions to further the goals of assuring that emergency preparedness are inclusive of people with disabilities – the accessibility aspect of wireless alerts to people with disabilities (Mitchell *et al*., 2008). The Americans with Disabilities Act was created to "provide a clear and comprehensive mandate for the elimination of discrimination against individuals with disabilities", and to ensure "access to public services" (ADA, 1990). Congress included within the Telecommunications Act of 1996, Sections 251 and 255, language to ensure individuals with disabilities had access to telecommunications services (Telecommunications Act of 1996, Pub. LA. No. 104-104, 110 Stat. 56, 1996). With the advent of emergency alerting via both wireline and wireless telecommunications services, access is dependent upon the delivery systems and

accompanying equipment being accessible by people with disabilities. In 2005, rulemakings lead to a major shift at the FCC when they amended their rules "to ensure that persons with disabilities have equal access to public warnings" (FCC, 2005).

Many parties are addressing challenges associated with the technical delivery of accessible alerts, as well as the regulatory framework in which they do (and will) operate within. The community of public safety officials at the state and local level are presented with even greater challenges as often their agencies must learn to work together across multi-jurisdictional authority and red tape to efficiently and timely respond to larger scale incidents and to discern how best to incorporate the most vulnerable populations of the elderly and people with disabilities into aspects of emergency planning or distribution of emergency alerting (NCD, 2006).

The papers presented at the Wireless Emergency Communications State of Technology Conference and herein offer a multitude of perspectives, potential and actual solutions, recommendations and best practices spanning the continuum of emergency access by people with disabilities, from alerting in mass, to individual calls for emergency assistance, from communicating in the field to accessible egress. The common thread among all the papers is the need to assure the safety of people with disabilities in times of emergency through accessible technologies.

The articles included in this special issue are representative of the important topics that relate to emergency communications, management, and technologies to assist people with disabilities. They are as follows:

'Communicating critical information using mobile phones to populations with special needs', by Sullivan *et al.*, examines the present design of both the registration process and the notification messages, revealing several concerns as to the accessibility of approaches used on one campus to improve the system for all.

In 'Communication in times of natural or man-made emergencies: the potential of speech-generating devices', author Bryen looks at how the vocabulary for communications during times of emergency can be incorporated into the design and manufacture of Speech Generating Devices (SGD).

In 'Evaluation of emergency egress information for persons who are blind', Crandall *et al.* address the complex issues involved in providing emergency egress information, which can often vary by the type and extent of the emergency for people who are blind.

In 'Accessibility of emergency communications to deaf citizens', Mueller *et al.* present findings gathered from consumer input, including through focus groups, on how to promote accessible emergency alerting systems, including the use of Short Messaging Service (SMS) for Americans with disabilities.

In 'Inclusive wireless technology for emergency communications in the UK', Langdon and Hosking review the current available technologies for emergency communications by looking at factors such as effectiveness and accessibility under emergency conditions.

In 'Leveraging online social networks for people with disabilities in emergency communications and recovery', authors Bricout and Baker present an analytical model of how online social networking can help people with disabilities in the context of an emergency event. The model includes strengths and weaknesses in planning and delivery systems.

In 'Enabling the disabled: media use and communication needs of people with disabilities during and after the Sichuan earthquake in China', Fu *et al.* explore the media use and risk communication situation before, during and after the earthquake in Sichuan province in China, with a special focus on the experiences of people with disabilities. They explore the question of whether, during a time of crisis, the communication needs of people with disabilities differ from those of the wider population.

In 'Mobile emergency alerting made accessible' authors Johnson *et al.* undertake a research effort to identify the accommodations needed by people with disabilities in next-generation mobile emergency alerting systems.

In 'State emergency plans: assessing the inclusiveness of vulnerable populations', Bennett examines how large-scale emergencies have shaped new policy regarding emergency management and how it is important that vulnerable populations be included in future emergency management plans.

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Note

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