ITS: The Next Public Safety Technology Challenge
by Clay Paxton

Not too many short years ago, the membership of NENA1 stimulated the entire E9-1-1 community, as well as the FCC2 , with the notion that wireless 9-1-1 callers should enjoy essentially the same benefits as wire-line E9-1-1 callers. What followed was an industry alive with debate, discussion, and compromise. The resulting policy declarations3 have had a tremendous impact on our entire 9-1-1 service community including carriers4 , equipment manufacturers, vendors, and service providers. This is the good news! However, as we often see, the good news is also the bad news, or in reality, merely the next appropriate challenge.

Now that we've let the Technology Genie out of his (or her) bottle to play, we've encountered a number of others who are playing in or near our yard. One of those activities is a world-wide effort called ITS or Intelligent Transport Systems5 . In its simplest form, ITS is a system of on-board electronics which communicate with various systems using wireless communication technologies. These systems are intended for a wide range of services and functions primarily intended for traffic and transportation controls. Some of the applications are automated toll collection, traffic control patterns, alternate traffic routing, automatic vehicle location (AVL), accident response of emergency vehicles, and various concierge services.

An important component of these systems are associated with a feature that is being called "Mayday." Those existing systems with which we are mostly aware are the systems being deployed in Cadillac and Lincoln vehicles6 . These are systems that utilize a combined cellular/GPS technology to route a call to a private service center providing both caller location and voice-path communication. The call is most often driver initiated but there are provisions for automatic call initiation. When the vehicle system is augmented with sensors (similar to those used to deploy an airbag) throughout the vehicle, front, rear, sides, and interior seats, a deployed sensor can cause a call to be initiated automatically. Based on the number of sensors deployed, and rate of deployment, probability factors can be calculated to estimate vehicle damage, and occupant injuries. Also, the seat sensors can calculate the weight of each occupant, determine number of occupants, probability male/female and adult/child. Additionally, all information is made available regarding the vehicle registration data, i.e. make, model, color, and registered owner address and telephone numbers as well as any other information that the owner may choose to have maintained by the system data base.

As we've often seen in the development of technology, the question arises that once we have the capability, what are the most appropriate applications? Currently, the technology is only being used to communicate with private service centers7 for concierge services such as driving directions, nearest hotels, roadside services, restaurant recommendations and etc. However, once we have the ability to validate the signal, so that it is more than a simple alarm, doesn't it make more sense to out-pulse that call as a wireless 9-1-1 call rather than the 800 call to the service center? Wouldn't it be better to send out the emergency "Mayday" message directly to the emergency service provider than to an intermediary service center? How can that be accomplished using the E9-1-1 network? What equipment and facilities might be needed by the emergency service providers to utilize the technology?

For these as well as a myriad of other questions, NENA was invited to participate in the development of

national standards for ITS and specifically Mayday Systems. ITS is a federally funded effort through the FHWA (Federal Highway Administration) and is closely aligned with a coordinated standards development effort involving IEEE (Institute of Electrical & Electronic Engineers) and SAE (Society of Automotive Engineers) as well as other involved organizations.

To this end, NENA has received grant assistance so that we might fully participate in the standards development effort to insure that our membership's interests are fully considered. This is a significant watershed event wherein our NENA leadership has both gained further recognition at the federal policy level that NENA's participation is critical to the standards development process as well as engaged into the grant process to secure funding for our active participation. This is a tremendous accomplishment on our membership's behalf and there are further initiatives currently underway by our NENA staff to insure compliance with our creed, "One Nation - One Number."

These continue to be very exciting times in this very dynamic industry. Remember that it was just a few short years ago that we were told that ANI and ALI was impossible on wireless 9-1-1. Now we can have 10 digit ANI and ALI down to cell site sector. In a couple of years, location will be at the FCC mandated 125 meters RMS and as ITS is deployed by FHWA and the automobile manufacturers, location designations will commonly be within 10 meters. So this is no longer Star Wars. This is technology available today and being readied for deployment in the very near future.

While there are many exciting advances being made in science, medicine, and manufacturing, few venues hold more short-term implications for us as those in telecommunications, transportation, and public safety. It's important that we influence these processes in a way that best serve not only our NENA membership but more importantly the citizens and communities we serve. As well intentioned as the engineers are who are developing the standards, the user's perspective is essential to molding the application.

This is "Great Stuff" and you will be learning more about this exciting effort in the near future and as we progress. You are also encouraged to engage into the process and help shape the direction with your ideas and requirements. You may either contact me directly or go through the NENA offices. My contact numbers are: (602) 632-5680, fax (602) 632-5681 or email to: cpaxton@worldnet.att.net.

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1 Many of our members hold concurrent membership in APCO as well as NENA and formed the nucleus of an industry consensus on wireless E9-1-1.
2 The Federal Communications Commission
3 The FCC's NPRM (Notice of Proposed Rule Making) 94-102 was the initial regulatory instrument for the provisioning of E9-1-1 in the wireless environment in a manner essentially comparable to wire-line E9-1-1 systems. While it was initially only binding on wireless carriers, it has had a profound impact on all aspects of our 9-1-1 service community.
4 Carriers are not only wireless carriers but also the traditional wire-line carriers (i.e. RBOCs) and satellite systems.
5 The precursor to this was the IVHS or Intelligent Vehicle Highway System. The renaming was to better capture the totality of the effort and to include other than "just" vehicles and highways as transport means.
6 The GM system is called "On-Star" and the Ford Motor Company system is called "RESCU."
7 These centers are often termed as "Private PSAPs" by the ITS community but they only serve as sources of information or relay points for emergency services much the same as an alarm company might relay an alarm to local law enforcement.

Clay Paxton is a member of both the Network and CPE Technical Committees of NENA and has been actively engaged in the development of technology solutions for the provisioning of Enhanced 9-1-1 ubiquitously throughout our nation. He is the former executive director, 9-1-1 and Emergency Services for Pacific Bell in California, and lieutenant with both the Alameda County Sheriff's Department in Oakland, CA and the Sacramento County Sheriff's Department in Sacramento, CA. He is currently serving as a consultant to the NENA Executive Board in the development of national standards for E9-1-1 integration into ITS.