Unwired

Security for

America

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Challenges Faced On September 11

On September 11, wireless communications realized a new and important role throughout the nation. Using wireless technology, passengers on doomed airline flights gave us the only understanding of what was happening several miles up in the sky. Friends and family turned to wireless communications to let their loved ones know they were safe. The industry saw a 50% increase in wireless call attempts nationwide that day. That figure rose to 125% in Washington D.C. and to 400% in New York.

The number of call attempts on September 11 presented a range of challenges to the industry, too. Call completion rates ranged from 66-92% nationwide, compared to over 95% completion rates for a peak hour on a normal day. In New York, at 11 a.m. on the 11th, that figure was almost reversed – more than 90% of call attempts did not go through. There simply weren't enough airwaves available to meet wireless customers' demand.

Emergency services faced challenges, as well. First responders could not communicate with each other. Government officials found their wireless phones were equally susceptible to network congestion. Today, the government is requesting Priority Access Service (PAS), which will allow them to move to the front of the line, utilizing the next available channel so their calls get through first. However, everything has a consequence and widespread PAS means fewer completed calls for average Americans, including fewer individual calls to 9-1-1.

Barriers To Making Wireless An Alternative Network

The attacks of September 11 reinforced how, in a time of crisis, communication is essential – for everybody. Americans desired and utilized the alternative networks of wireless communications. Unfortunately, since the number of completed calls is directly related to the amount of spectrum, many calls did not go through because there simply was not enough spectrum to carry them. Insofar as spectrum for wireless use is concerned, the United States trails the other major industrialized nations of the world.

The U.S. has designated only about half the amount of spectrum to wireless communications, compared to other industrial nations.

During and after this disaster, average Americans were not the only ones who turned to wireless as their alternative mode of communication. America's emergency personnel, fire, rescue, and police, national security personnel, FBI, CIA and others – all reached for their wireless devices. Yet, when they did, many emergency service personnel found they were hampered by old technology and insufficient spectrum.

The Washington Post reported on September 30, "Sept. 11 taught us this, among so much else: Common radio channels would help. As an intractable, mammoth blaze raged at the stricken Pentagon, fire companies on the scene from Maryland could not communicate easily with those from Northern Virginia and Washington… Portable radios had to be doled out. Runners had to be used."

This was not the first time Washington encountered this problem. In fact, it has happened repeatedly, in real-life emergencies and in drills and tests, for more than 20 years. Emergency personnel responding to the Air Florida crash in 1983 faced the same challenges, as did first responders to a Metro fire in April of 2000, as did those who conducted an emergency training exercise in September, 2000. After that exercise, the *Washington Times* reported, "…Most problems yesterday resulted from the different radio frequencies the departments use, officials said. 'Some of the messages didn't get relayed in time to all those involved,' D.C. Deputy Fire Chief James Martin said. But, he said, all jurisdictions will soon communicate with one another on one frequency."

Unfortunately, a year later, that had not yet happened and Washington's experience is not unique.

The Path To Clear Communications – More Spectrum

Why the continued problems? As the newspaper articles suggest, there is a need for better coordination and an end to isolated, "stovepipe thinking" among emergency service providers. Public safety also faces a spectrum challenge. The FCC has allocated a total of 47 MHz of spectrum for public safety, yet less than half that amount is actually available for use. Of the 46 MHz the federal government has allocated to fire, police and

emergency rescue, 24 MHz located in the 700 MHz band is currently being held for ransom by broadcasters.

These UHF broadcasters were originally given the 700 MHz band for free. When digital television emerged these same broadcasters asked the government for additional free spectrum and promised to give the old spectrum back. In one of the great lobbying loopholes of the 20th Century, however, the broadcasters convinced Congress they should not give back the spectrum until 85% of all homes were DTV-capable. To support this charade, the broadcasters estimated this would occur some time around 2006. Congress, taking broadcasters at their word, told the FCC to allocate 24 MHz of that "give back" for public safety.

Thus, the FCC has been left holding the bag. Congress ordered the FCC to allocate 24 MHz of spectrum in the 700 MHz band for public safety, but Congress did not give the FCC the tools to make it happen. In fact, just the opposite – Congress has given the broadcasters squatters rights for what seems like an indefinite period, effectively tying the FCC's hands, and keeping over half of public safety spectrum from being used by first responders.

Magnanimously, the broadcasters have come forth with a solution. They have organized the Spectrum Clearing Alliance, and offered to sell the 700 MHz band. Remember, the broadcasters received the band for free and then promised to return it if they received another spectrum grant for free. Now they want billions of dollars for this scam. It is clearly time for Congress to revisit the issue and ask whether this spectrum should be used for home shopping or homeland security.

Priority Access Services

Immediately following the events of September 11, the federal government requested Priority Access Services for National Security and Emergency Preparedness Management. The majority of these users aren't first responders, but rather managers such as the president, governors, mayors and their staffs and designees. CTIA immediately pledged to work with the government to create a feasible, interim solution and to explore a longer-term means of providing priority access. Once again, however,

spectrum presents a challenge. Already, the interim PAS request has grown from the original 500 designees in key markets to 2,000. Meanwhile the final request, to be implemented by the end of 2002, is growing past the original 50,000 designees (some have even suggested 1 million). In a wireline environment, increased PAS demand only requires lighting up another strand of fiber, but the wireless world has no dark fibers – no reserve spectrum – lying around. Thus, when a priority user demands access he or she is denying access to someone else. This problem is further complicated by data showing that a wireless PAS user's call is typically longer, thus requiring 22 times the capacity of a regular user.

Look at what this means in a wireless environment. A typical cell site supports an average of 60 simultaneous consumer-grade callers. Because of a PAS users' increased usage, however, if a site has 46 PAS users, no one else could access to a channel on that site. While 46 users doesn't sound like many, remember that in an emergency situation emergency personnel travel to the impacted area – an area typically served by a single site. In Washington D.C., on September 11, where not a single cell site was lost, demand around the Pentagon soared to such levels that local wireless companies had to bring in 10 additional cell sites to meet the demand.

September 11 demonstrated that wireless communications has achieved greater relevance in our society. The wireless industry is proud of its contributions at this time of tragedy and crisis. We will continue to work with government to fulfill our responsibilities. It is clear, however, that there were several lessons learned about wireless on September 11:

1. The evolution of commercial wireless services from ancillary to alternative network drives the need for additional spectrum for consumers.
2. First responder emergency personnel must be able to communicate seamlessly in a wireless environment.
3. It is an outrage that half the spectrum designated for public safety is being held for ransom by UHF broadcasters. Congress must address this situation.

In a crisis, communication is essential. In the 21st Century the most productive communication is wireless. We must update our policies to acknowledge this important public safety fact.