

Much of the emergency response capabilities of America's public safety agencies, such as local fire departments and coordinating federal agencies, hinge on effective and immediate interoperable communications across geographic, bureaucratic, and jurisdictional boundaries. Despite this need, few federal or state organizations possess the financial resources or technical expertise to implement and maintain interoperable wireless communications systems beyond their immediate vicinity and spectrum allocations.

Interoperability as discussed in this paper is the ability for subscribers of private networks such as Nextel's nationwide iDEN network to interoperate with existing two-way radio, public telephone, paging, and other voice and data users using a simple console that connects the two networks. This consolidation of multiple telecommunications connections allows public safety organizations to manage a complex combination of services as a single, integrated solution.

In addition to discussing interoperability, the paper will describe how many current efforts to create statewide or national interoperable networks are hindered by technical limitations such as spectrum shortages and economic constraints. These limitations prevent implementation of feature-rich and innovative equipment and services such as real-time wireless access to secured databases and two-way messaging. The paper will show how integrating public wireless networks into traditional Land Mobile Radio (LMR) networks can alleviate many of these limitations.

The paper's discussion of public safety wireless communications and interoperability is divided into three parts: an introduction to public safety wireless communications, an evaluation of the current strengths and difficulties common to existing LMR networks, and a discussion of the enormous potential hybrid public safety wireless networks evidenced by specific implementation examples. Technical journal articles, presentations, and white papers drawn from the FCC, federal and state public safety organizations, and completed hybrid network implementations will provide the paper with a balanced yet technical perspective.

The discussion of the hybrid network configuration—arguably the most significant section of the paper—will detail how public wireless companies can build a solid relationship with federal, state, and local public safety organizations by implementing handsets capable of providing multiple services such as long-range digital walkie-talkie service with talkgroups, digital cellular, mobile messaging, and wireless Internet and application access. An overview will be given of how newly released technologies such as Global Positioning System (GPS) handsets offer valuable benefits to the public service community—in this case the ability to track emergency responders and better coordinate multiple agencies responding simultaneously to an emergency situation.

This third section will also indicate how services traditionally reserved for LMR networks are now available to public network subscribers, such as priority access and queuing, single-button emergency calling, AES-level data encryption, and spectrum efficiencies allowing organizations to successfully meet upcoming federal narrowband requirements. Other features now emerging as critical to effective public service communications such as emergency response teams capable of rapidly deploying temporary wireless networks will also be discussed. Nextel's iDEN technology will be used as an example of how a public wireless network can be built, implemented, and maintained in a manner consistent with the reliability and functionality expectations of existing LMR users.