

# CRS Report for Congress

Received through the CRS Web

## Emergency Communications: Wireless Enhanced 911 Issues Update

Linda K. Moore

Analyst in Telecommunications and Technology Policy  
Resources, Science, and Industry Division

### Summary

The present capability and future effectiveness of America's network of emergency telecommunications services is among the homeland security issues under review by Congress and other entities. Emergency calls (911) on both wireline (landline) and wireless networks are considered by many to be part of this network. *The 9/11 Commission Report* recommends that 911 call centers be included in planning for emergency responses.

One of the intents of Congress in passing the Wireless Communications and Public Safety Act of 1999 (P.L. 106-81), and of the Federal Communications Commission (FCC) in implementing the act, is to make wireless enhanced 911 (W-E911) technology universally available throughout the United States. Enhanced 911 provides Automatic Number Identification (ANI) and Automatic Location Identification (ALI) functions for emergency calls to Public Safety Answering Points (PSAPs). A report on technical and operational problems that might be impediments to timely deployment of 911, known as the "Hatfield Report," recognized the need to upgrade 911 infrastructure nationwide, discussed some of the difficulties encountered by PSAPs, and recommended the creation of a 911 bureau at the Executive Level.

Legislation introduced in the Senate on June 12, 2003 (S. 1250) addressed many of the issues raised in the Hatfield Report, such as federal support for emergency call centers (PSAPs); protection of state funds collected as telephone surcharges for 911; and interconnection with other emergency services. The bill would require the head of the National Telecommunications and Information Administration (NTIA) at the Department of Commerce to create a Task Force to facilitate coordination with federal, state and local communications. A companion bill (H.R. 2898) was introduced in the House on July 25. Both bills were reported out of committee. An amended version of the House bill that would include the National Highway Traffic Safety Administration in a joint program of coordination and funding was passed November 4; the Senate version of the bill has been placed on the calendar for floor action. This report will be updated.

## The Hatfield Report

“Report on Technical and Operational Issues Impacting the Provision of Wireless Enhanced 911 Services,” known as the Hatfield Report, was submitted to the Federal Communications Commission (FCC) on October 15, 2002.<sup>1</sup> The author, Dale N. Hatfield, formerly Chief, Office of Engineering and Technology at the FCC, was assisted in his research by staff in the FCC’s Commercial Wireless Division of the Wireless Telecommunications Bureau. As its title indicates, the report’s focus is primarily on technical and operational issues. Recommendations in the Hatfield Report with a bearing on public policy include:

- FCC advocacy for the establishment of a “National 911 Program Office” within the Department of Homeland Security;
- Continuing or increased role for the FCC in the rollout of W-E911;
- Creation by the FCC of an advisory committee, possibly under the Federal Advisory Committee Act, to be responsible for oversight of the overall system engineering;
- Identification of a “champion” at the federal level for PSAPs, such as the aforementioned National 911 Program Office.

Observations in the report that might be the basis for policy initiatives include:

- The critical nature of location information in W-E911 in supporting first responders in emergencies;
- The “seriously antiquated” condition of the infrastructure that underlies enhanced 911 for both wireline and wireless emergency calls.

## The Role of the Federal Communications Commission

The FCC has responded to the Hatfield Report with several new initiatives to bolster its role in supporting 911. These include creating an Enhanced 911 (E911) Coordination Initiative to bring together relevant stakeholders to foster cooperation and coordination. The FCC has also announced the creation of a 911 subcommittee for the National Reliability and Interoperability Council (NRIC), a Federal Advisory Committee that provides best practices and other guidelines for telecommunications operations, including homeland security and public safety. The 911 subcommittee will focus on technical issues regarding network architecture and standards. A key priority will be to measure and improve the accuracy of location information for wireless calls to 911.<sup>2</sup>

Since October, 1, 2001, wireless carriers have been expected to meet FCC guidelines for providing W-E911 to PSAPs. The FCC took an important first step toward adopting rules for W-E911 in 1996 with a first *Report and Order* (FCC 96-264) citing provisions

---

<sup>1</sup> [[http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native\\_or\\_pdf=pdf&id\\_document=6513296239](http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6513296239)] is the URL. (Viewed May 17, 2004.)

<sup>2</sup> Remarks of Michael K. Powell, Chairman, Federal Communications Commission, before the Association of Public-Safety Communications Officials International, August 11, 2003.

of the Communications Act<sup>3</sup> as the basis for its action. To facilitate the effort to provide comprehensive 911 services nationwide, Congress in 1999 passed the “911 Act”<sup>4</sup> that mandated 911 as the emergency number nationwide and made numerous provisions for its implementation. Among other provisions, the law requires the FCC to work with the states and the many other affected parties to deploy comprehensive W-E911 service.

The FCC plotted a course for reaching W-E911 in two phases. For Phase I, the carriers were given a year to prepare for PSAP requests for Automatic Number Identification (ANI) and location-finder capabilities using technology existing at the time. By 2001, for Phase II, the carriers were to have identified and implemented new location-finder technologies (Automatic Location Identification, or ALI).<sup>5</sup> From 1997 through 2000, the FCC made several changes in its accuracy requirements, impacting the carriers’ ability to develop the needed ALI technology.<sup>6</sup>

In its 1996 blueprint for implementing W-E911, the FCC noted that introducing the service nationwide would require coordination and “cooperative efforts by state and local governments, PSAP administrators, wireless carriers and equipment manufacturers.” The FCC, however, eschewed a leadership role in uniting states and communities to work together in developing coordinated plans for W-E911. In 2002, the Department of Transportation (DOT) stepped in with a program to foster cooperation and dialog among key participants. Among other actions, a partnership between DOT and three public safety associations was formed in support of a Wireless Implementation Program.<sup>7</sup>

**Wireless Carriers.** Carriers must meet standards for accuracy (ability of the technology to locate the caller within a specified number of meters); market penetration (for example, 25% of new handsets); and timeliness (for example, complying with a PSAP request within six months). To avoid penalties, carriers that cannot comply with W-E911 requirements must request waivers. For enforcement purposes, the FCC has divided wireless carriers into three tiers. Small (Tier III) and mid-sized carriers (Tier II) are treated as one group with its own administrative schedule for compliance. Tier I carriers are the nationwide providers, the six largest carriers (Verizon, AT&T Wireless,

<sup>3</sup> U.S.C. Title 47, Chapter 5, § 151, “Communications Act of 1934.” The FCC’s charter includes “promoting safety of life and property through the use of wire and radio communication.”

<sup>4</sup> P.L. 106-81, “Wireless Communications and Public Safety Act of 1999.”

<sup>5</sup> Automatic Number Identification (ANI) recognizes and displays the telephone number from which the call is placed. Automatic Location Identification (ALI) provides — in the case of wireline — the address associated with the telephone number or — in the case of wireless — the approximate geographic co-ordinates of the caller.

<sup>6</sup> For example, in 1997, the FCC recognized the possibility of handset-based solutions for Phase II, whereas previously it had discussed only network solutions (“E911 Reconsideration Order,” December 1, 1997). Handset-based technology requires alterations to the handset and new network software. Included in this category for regulatory purposes are solutions requiring new handsets and new network hardware — sometimes referred to as a hybrid solution. Solutions that work with the installed base of existing handsets and require investments in network hardware only are considered network-based. In 1999, the FCC set criteria for handset-based technology, setting stricter standards for its accuracy than for network-based solutions (“Third Report and Order,” October 6, 1999).

<sup>7</sup> For details on DOT programs, see [<http://www.itspublicsafety.net/wireless.htm>] or [<http://www.nena.org/dot.nena.org/index.htm>]. (Viewed May 17, 2004.)

Cingular, Sprint, Nextel, and T-Mobile) that collectively have about 75% of the wireless market nationwide. These are considered as a separate group and closely monitored by the FCC for compliance.

In responding to the Hatfield Report, a coalition of 12 Tier III companies asked the FCC to ease standards for location accuracy for Tier III carriers, especially those in rural areas.<sup>8</sup> The FCC rules permit a wireless carrier to meet location-accuracy requirements by averaging location performance systemwide. For a variety of reasons, location identification in urban areas provides a much greater degree of accuracy than for rural areas. Carriers that specialize in meeting the niche market needs of rural customers do not have the option of averaging their system's accuracy with better-performing data from urban areas. As a consequence, many are struggling to meet the FCC's requirements for accuracy in location identification. The FCC, in a November 2003 order, refused the coalition's petition, stating that it had "not offered adequate evidence to support the broad, class-wide relief that it requests."<sup>9</sup> Approximately 90 carriers are being considered for some form of relief from the FCC's E911 rules.<sup>10</sup>

As a matter of policy in the United States, several technologies have competed over the last decade with the goal of becoming the *de facto* standard of the future for digital wireless communications in American markets. The European Union, in the same time frame, adopted a single standard, GSM (Global System for Mobile). In Europe, GSM and its successor technologies have platforms for location-finder technology that are being deployed for commercial services.<sup>11</sup> In the United States, the FCC ruled that the wireless carriers could not require that the cost of W-E911 be reimbursed by a third party (such as a state 911 fund) as a condition of providing the technology,<sup>12</sup> on the assumption that commercial applications for location technology could generate the revenue to pay for development costs.<sup>13</sup>

## Public Safety Answering Points<sup>14</sup>

One critical factor in implementing W-E911 is the ability of the PSAPs to upgrade their systems to accommodate and utilize the location information coming from the carrier. Increased digitization and better database management systems are among the

<sup>8</sup> See comments, Tier III Coalition for Wireless E911, December 3, 2002, on the FCC Electronic Comment Filing System (ECFS), proceeding "02-46" at [[http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native\\_or\\_pdf=pdf&id\\_document=6513390405](http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6513390405)]. (Viewed May 17, 2004.)

<sup>9</sup> FCC, "Order," WT Docket No. 02-377, released November 19, 2003 (FCC 03-297).

<sup>10</sup> FCC News, "FCC Creates Window for Smallest Wireless Carriers to Demonstrate Unique E911 Circumstances," October 10, 2003, at [<http://www.fcc.gov/911/enhanced/releases.html#nr>]. (Viewed May 17, 2004.)

<sup>11</sup> See CRS Report RS20993, *Wireless Technology and Spectrum Demand: Third Generation (3G) and Beyond*.

<sup>12</sup> FCC, *Second Memorandum . . .*, CC Docket No. 94-102, December 8, 1999 (FCC 99-352).

<sup>13</sup> See CRS Report RL31636, *Wireless Privacy: Availability of Location Information for Telemarketing*.

<sup>14</sup> Additional information on PSAPs can be found in CRS Report RS21222, *Implementing Wireless Enhanced 911: Issues for Public Safety Answering Points (PSAPs)*.

improvements needed at the PSAP level to reduce ANI failures, increase timeliness in response and call set-up, and allow for greater information capture. Other issues include sufficient training and staffing at call centers, upgrading LECs, the cost and complexity of location-mapping preparation, and the need for interoperability among PSAPs and other emergency communications. The effectiveness of emergency call centers as part of homeland security is diminished by the lack of back-up capability. In particular, there are no regional plans to enable call centers in one state to support call centers in other, nearby states.

The PSAPs are public entities, funded at the state or local level. While the FCC has required that a funding mechanism be in place for the PSAPs, it did not establish funding goals for state or local governments. It also was left to these governments to decide to whom and how reimbursements for W-E911 deployment costs would be allocated.

## Wireless E911 in Rural Areas

Rural areas face a number of problems in the implementation of W-E911. Rural areas tend to have a low population base and significant interstate highway traffic and these factors combine to place disproportionate demands on local PSAPs. When, as is often the case, the rural area is also economically disadvantaged, the funds for upgrading a PSAP for full ANI-ALI capabilities can be hard to come by. Ironically, a traveler who meets an accident on a remote stretch of highway is often at great risk, since the time to locate and reach him is often more difficult.

Wireless carriers also face specific problems in implementing location-finding technology in rural areas. These include the use of analog as opposed to digital cellular services (digital technology provides significantly better location-finding capability), the difficulty of installing a sufficient number of cell towers to provide “triangulation” for location technologies; and the predominance of cell towers placed along major highways (sometimes referred to as a “string of pearls”), also a complication for proper triangulation.

## The Role of Congress

Congress has expressed concern over the capacity of the carriers and the PSAPs they serve to meet the technical requirements of W-E911 in a timely and cost-effective manner.<sup>15</sup> Companion bills that would assist PSAPs, S. 1250 (Senator Burns) and H.R. 2898 (Representative Shimkus), were introduced. The Senate bill was reported out of committee unamended. The House bill was amended at its markup by the Committee on Energy and Commerce and again when passed by the House on November 4, 2003.<sup>16</sup>

Senator Burns introduced the Enhanced 911 Emergency Communications Act of 2003 (S.1250) on June 12, 2003. Among its stated purposes are: “to coordinate emergency

---

<sup>15</sup> House Committee on Energy and Commerce, Subcommittee on Telecommunications and the Internet, June 4, 2003 hearing, “Wireless E-911 Implementation: Progress & Remaining Hurdles,” and September 11, 2003 hearing, “H.R. 2898, The E-911 Implementation Act of 2003” and Senate Committee on Commerce, Science and Transportation, Subcommittee on Communications, March 5, 2003 hearing, “E-911 Implementation.”

<sup>16</sup> See CRS Report RL32126, *911 Call Center Legislation: S. 1250 and H.R. 2898*.

communications systems, including 911 services and E-911 services;” to provide “stability and resources” to PSAPs in order to “facilitate the prompt deployment of enhanced 911 services” in a “ubiquitous and reliable infrastructure;” and to ensure that certain funds collected for 911 or E911 are used for that purpose. To achieve these goals, major programs required by the bill would 1) create an Emergency Communications Task Force within the NTIA; 2) provide matching grants for emergency communications; and, 3) track telephone bill surcharges collected for states and communities to pay for emergency communications, 911, or E911, with the objective of discouraging the diversion of these monies for other purposes. The Senate bill authorizes \$500 million annually for grants, with no termination date.

The E-911 Implementation Act of 2003 (H.R. 2898) was introduced by Mr. Shimkus on July 25, 2003. The bill has the same objectives as the Senate bill and replicates some of its provisions. The House bill would encourage centralized planning for 911 by directing that grants go to entities that have a plan for wireless enhanced 911 administered by a single coordinating body. Key provisions included 1) creating an E911 Implementation Coordination Office at the NTIA; 2) providing matching grants for wireless Phase II programs; 3) requiring certification from grants recipients that funds raised for E911 through surcharges to telephone customers have not been used for other purposes, with penalties for false certification; and 4) requiring a report from the FCC on the status of rural carriers in the provision of Phase II of E911 and the Phase II technologies that are the “most effective” for these carriers. H.R. 2898 as passed by the House amended provisions for a coordination office, requiring a joint program shared by NTIA and the National Highway Traffic Safety Administration (NHTSA). The creation of a joint program to include NHTSA was one of several suggestions proposed by the Bush Administration in a letter dated September 30, 2003.

## Emergency Communications Policy

Since the passage of the “911 Act” (P.L.106-81), enhanced technology and heightened awareness of the public safety and homeland security benefits of emergency call centers have raised the bar of expectations both within the public safety community and of the citizens that rely on 911 services. There is a need, widely perceived, for a national policy regarding public safety communications that defines and incorporates the role of 911 in providing emergency communications. *The 9/11 Commission Report*<sup>17</sup> writes of the often inadequate response of the 911 call centers serving New York City,<sup>18</sup> and recommends: “In planning for future disasters, it is important to integrate those taking 911 calls into the emergency response team and to involve them in providing up-to-date information and assistance to the public.”<sup>19</sup> Congressional response to this recommendation might include considering whether there is a need for a national infrastructure or communications backbone to support and link emergency call centers with each other (for backup and redundancy) and with first responders and others in the public safety sector (including, for example, hospitals.)

---

<sup>17</sup> Final Report of the National Commission on Terrorist Attacks Upon the United States, Official Government Edition, 2004.

<sup>18</sup> *Op. cit.*, pp. 286-287;295; 306.

<sup>19</sup> *Op cit.*, p. 318.