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Public Safety Communications Policy: Before and After Hurricane Katrina

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Summary

Since September 11, 2001, the effectiveness of America's communications capabilities in support of the information needs of first responders and other public safety workers has been a matter of concern to Congress. The Intelligence Reform and Terrorism Prevention Act of 2004 (P.L. 108-458) included sections that responded to recommendations made by the 9/ll Commission, in its report of July 2004, and by others in recent years, regarding public safety communications. Most public safety advocates consider that the communications failures following the onslaught of Hurricane Katrina demonstrate that there is much still to be done to provide the United States with adequate communications capabilities in emergencies. Whereas bills introduced before Hurricane Katrina struck the Gulf Coast have tended to address public safety communications in broad terms, with an emphasis on funding and interoperability, recent bills have put more emphasis on infrastructure.

In response to Hurricane Katrina, Senator Joseph I. Lieberman introduced S. 1725, a bill, that expands a similar, earlier bill (S. 1274). The new bill gives equal weight to building a more robust infrastructure and to assuring interoperability. A reconstruction funding bill (S. 1765) introduced by Senator Mary L. Landrieu would direct $600,000,000 specifically to a Louisiana state program that would upgrade emergency communication statewide. Other communications funding bills include S. 1645 and S. 1762 (Senator Boxer), H.R. 1323 (Representative Stupak), and H.R. 1795 (Representative Maloney). The Deficit Reduction Omnibus Reconciliation Act of 2005 (S. 1932, Senator Gregg) includes provisions for up to $1.45 billion for interoperable communications, and improvements in 911 and emergency alert systems. Some of the budget bill's provisions are comparable to the Digital Television Transition Act of 2005 marked up by the House Committee on Energy and Commerce on October 26, 2005. Both bills arrange for the clearing and auctioning of spectrum, including spectrum designated for public safety use. Other bills that address encumbered spectrum issues are H.R. 1646 (Representative Harman and S. 1268 (Senator McCain). More bills to fund interoperability, to improve emergency communications, to release spectrum, and to address related issues are expected before the end of the 1st Session of the 109th Congress. For example, Senator John F. Kerry has introduced a bill that would look at developing a back-up system to assure resilient communications for emergency responders (S. 1703).

At the end of the 108th Congress, significant steps were taken by Congress regarding improvement in public safety communications, many of them in response to recommendations by the 9/11 Commission. Commission recommendations for action to improve communications and the testimony and comments of experts are used as the framework for this report in reviewing issues such as spectrum availability; new technologies like smart radios (software-defined radio, SDR); funding; and longer term goals and concerns. The nature of the problem of how best to meet the nation's emergency communications needs has not changed, but the events of Hurricane Katrina have raised the level of awareness of the problem, among the public and at every level of government. The 109th Congress is likely to press for detailed responses and measures that could shape policy decisions going forward.

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Public Safety Communications Policy: Before and After Katrina

Background

Public safety agencies include the nation's first responders (such as firefighters, police officers, and ambulance services), 911 call center staff, and a number of local, state, federal — and sometimes regional — authorities. Communications, often wireless radios, are vital to these agencies' effectiveness and to the safety of their members and the public. Wireless technology requires radio frequency capacity in order to function, and existing wireless technology is designed to work within specified frequency ranges.

Different operations, different applications, different rules and standards, and different radio frequencies are among the problems first responders face in trying to communicate with each other. Interoperability, also referred to as compatibility or connectivity, refers to the capability for these different systems to readily contact each other. Facilitating interoperability has been a policy concern of public safety officials for a number of years.[1] Since September 11, 2001 — when communications failures added to the horror of the day — achieving interoperability for public safety communications has become an important policy concern for Congress. The damage to communications infrastructure caused by Hurricane Katrina and subsequent flooding has revealed the extent to which the concerns of Congress, as expressed in legislation, have yet to be acted upon. Although interoperability in communications is correctly perceived as a subset of the larger problem of providing comprehensive communications support, it is a pivotal solution. Shortcomings in efforts to develop emergency communications to satisfactory levels are not the consequence of a misplaced focus on interoperability. Appropriate solutions for achieving interoperability, such as building 700 MHz/800 MHz wireless networks, are among the investments needed for a more robust communications infrastructure.

Planning: Post Katrina

Federalization of emergency response for disasters or catastrophic events could become inevitable unless states and communities have adequate resources to act in a timely manner. Current disaster response plans of the Federal Emergency Management Agency (FEMA) are built on the assumption that local resources will be adequate after a disaster strikes until additional resources arrive. The destructive chaos that followed in the wake of Hurricane Katrina revealed many weakness in current assumptions and plans, such as those in the National Response Plan and the National Incident Management System. Two critical pieces of infrastructure failed

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[1] Difficulties in communications after a major plane crash in the Potomac River in January 1982 is often cited as the impetus for expanding interoperability in the Capital Area.

early on: electrical power and communications. A well-planned and robust emergency communications system should be sustainable at reasonable levels of operation even after electrical power is lost. Resources to sustain operations include back-up generators and fuel, redundant systems, self-healing networks, access to multiple technologies, common radio frequencies for wireless communications, sufficient spectrum bandwidth to support communications needs, and the proper equipment and infrastructure to make it all work. As testimony before Congress has regularly substantiated, industry plans for disasters, prepares to the best of its capacity, and carries out the plans as needed;[2] similar levels of planning and capacity to respond need to be achieved for emergency communications (and other public safety services) in communities.

Since September 11, 2001, Congress has passed important legislation to respond to problems revealed after the attacks on the World Trade Center and the Pentagon, including problems of communications at the disaster sites. Provisions of the Homeland Security Act of 2002 (P.L. 107-296) instruct the Department of Homeland Security (DHS) to address some of the issues concerning public safety communications in emergency preparedness and response and in providing critical infrastructure. Telecommunications for first responders is mentioned in several sections, with specific emphasis on technology for interoperability.[3] Acting on recommendations made by the National Commission on Terrorist Attacks Upon the United States (9/11 Commission), Congress included several sections regarding improvements in communications capacity in the Intelligence Reform and Terrorism Prevention Act of 2004 (P.L. 108-458). These recommendations and some approaches to their implementation are the main topics of this report.

The extensive damage to communications infrastructure and the disastrous failures of communications among first responders and emergency workers after Hurricane Katrina struck the Gulf Coast has confirmed what many in the public safety community have said for a number of years: the nation must bring together its technological capabilities in a plan that fully addresses the need for better public safety communications. Testimony by Chairman Kevin J. Martin of the Federal Communications Commission has provided a cogent summary of actions that should be taken, by the federal government and others.[4] Chairman Martin has pointed out, for example, the need to make 911 call centers more robust; to have more than one technology in use — both to increase the reach of communications and to provide system redundancy; to provide better technology to first responders, such as smart radios — discussed in this report, and the need for more spectrum.

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[2] For example, testimony from telecommunications executives at Senate Committee on Commerce, Science and Transportation hearing, "Communications in a Disaster," September 22, 2005.

[3] Notably, P.L. 107-296, sec. 201. and Sec. 502

[4] For example, written and oral testimony by Chairman Martin before Senate Committee on Commerce, Science and Transportation, "Communications in a Disaster," September 22, 2005; and House of Representatives, Committee on Energy and Commerce, "Public Safety Communications from 9/11 to Katrina: Critical Public Policy Lessons," September 29, 2005.

Capacity for Response. Under the direction of the FCC, the 50 states, Puerto Rico, and the Virgin Islands are covered by 55 regional plans[5] that cover at least one component of a plan for interoperable communications: band plans for use of 700 MHz frequencies in public safety communications. In most cases, the regional groups that prepared the band plans for FCC approval are the same groups that have prepared or participated in the preparation of their states' emergency communications plans. The FCC-mandated regional plans for 700 MHz are thus incorporated into larger statewide, or regional, planning efforts. From the perspective of national planning, a shortcoming of these individual state or regional plans is that they do not consistently meet a uniform standard of performance and technical compliance. Furthermore, there is no national emergency response plan that has evaluated how communications equipment in one state might be used to bolster or replace equipment in another state, in the wake of a catastrophe; indeed, this effort would have limited value unless the equipment is fully, truly interoperable.

There are 10 federal regions, plus the National Capital Area, established by FEMA for coordinated emergency responses. Creating a national emergency communications solution with federal support could be achieved through interlocking regional networks. These networks would have common procedures, standards and network interfaces so that they could work together or operate as back ups to failed components in catastrophic situations; they could also be responsive to local needs and state controls. Such networks work better with newer technologies, including the better technologies and common channels that can be implemented once critical spectrum is released by television broadcasters.

Currently, FEMA, the Army Corps of Engineers, the Red Cross, other agencies and organizations, and private sector companies have portable communications units — typically trucks with generators, satellite dishes, banks of computers, and racks of radios — that they deploy according to their own plans and timetables. On site, each organization "owns" and controls its own assets, and shares on an ad hoc basis. This self-contained capacity for response is difficult to coordinate and equipment is often not compatible. Work-around solutions to provide interoperability on-site are often both costly and inefficient. The time and cost of bringing replacement equipment is significantly increased when it must be reprogrammed for use at different radio frequencies and in different systems.

The 9/11 Commission has proposed using a signal corps solution to improve communications capacity, without elaborating on how this might be achieved. (Some information on signal corps organization and technology appears later in this report.) Many experts familiar with the macro-level concepts of signal corps communications support suggest that one approach for public safety could be to upgrade the type of emergency communications equipment that can be brought to a disaster site so that it resembles the far-reaching capabilities and capacity of the Army Signal Corps yet is readily accessible to local first responders and other officials "on the ground." In many situations, search and rescue teams in New Orleans and other devastated

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[5] List at [http://wireless.fcc.gov/publicsafety/700MHz/regchair.html]. Some states have overlapping plans, for example because some regional committees are for metropolitan areas. Viewed October 5, 2005.

communities could not communicate with each other because their radios did not use the same frequencies. The difficulties in coordination placed an extra burden on relief efforts. Rescue efforts improved after military forces arrived in part because of their units' superior communications resources. Effective command-and-control operations depend on communications links.

The National Response Plan. The National Response Plan lays out organization charts for authority and responsibility in Incidents of National Significance and after the declaration of a disaster or an emergency. One of the key players for emergency communications is the National Communications System (NCS). The primary role of NCS is to assure federal communications and the integrity of certain vital networks, such as for banking. It also is prepared to assist in recovery and restoration of service for commercial and emergency services. The NCS has no significant role in providing emergency communications support for first responders. The job of coordinating communications is assigned by the National Response Plan to the Federal Emergency Communications Coordinator. As described in the plan, the power of this position to command and deliver needed communications support is limited, and in any event, it occurs after the fact.

Issues for the 109th Congress

By requirements it included in the Intelligence Reform and Terrorism Act — for studies on interoperability strategies, use of technology, spectrum use, and more — Congress has assigned itself a number of specific tasks of oversight regarding emergency communications. Congress also has recognized the many dilemmas faced by its constituents in supporting communications interoperability. It has in many ways taken on the role of champion in support of programs for interoperability that benefit local communities, states and tribes. Some steps have been taken, particularly within DHS, and Congress has demanded further advances.[6] Despite indications of progress, much remains to be done. Issues that could be addressed — collectively or singly — by Congress, the Administration, the private sector, or others include the development of a long term strategy that coordinates both public safety spectrum needs and interoperable communications needs, and the coordination of the various studies requested by Congress and by the Administration. The findings and recommendations from these studies are crucial to the advancement of policy for public safety.

Accountability and Oversight. The achievement of a comprehensive set of solutions for interoperability outside the federal government's own communications needs appears to remain elusive. Participation of the federal government in a national solution for interoperability does not necessarily require federal ownership. The federal government is an important component, however, of any network that might be put in place to provide interoperable communications. In light of the critical role of federal participation, Congress could decide to extend its

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[6] See for example, comments and questions of members during hearing of the House of Representatives, Committee on Homeland Security, Subcommittee on Emergency Preparedness, Science and Technology, "Ensuring Operability During Catastrophic Events," October 26, 2005.

oversight role; proposed legislation also includes provisions that set higher standards for performance from federal agencies, notably the Department of Homeland Security.

Leadership. The devastation caused by the 2005 hurricane season, especially the impact of Hurricane Katrina on the Gulf Coast states, brought home to many how large the gap is between intentions and execution. As noted in another CRS report,[7] after FEMA was absorbed by DHS it was effectively "stripped" of responsibilities for planning for emergency communications. The leadership role for preparing a national strategy for communications interoperability was assigned to the Office of Interoperability and Compatibility within DHS, resting primarily with the SAFECOM program. The decision was made at the executive level that SAFECOM would be the lead agency for communications interoperability, a position that was strengthened by organizational changes within DHS, and ratified by Congress with the passage of the Intelligence Reform and Terrorism Prevention Act. According to public information, SAFECOM has done very little and seems poised to do even less to meet the goals originally set for it.[8]

Role of military. Just as the 9/11 Commission looked at the Army Signal Corps as a possible resource for improving interoperable communications, many are now weighing the possibility of giving a greater role to the military for emergency response within the United States. Any debate over the role of the military in implementing national policy, whether it be nation building in foreign countries or rescuing Americans from rooftops, will be much broader than consideration of its role in providing communications support. Bottom line, today the military has the communications equipment to do the job of emergency response while FEMA, the states, and first responders do not. The technology exists, but it has not been deployed at meaningful levels. Although the stories of the failures in organization in responding to disasters on the Gulf Coast are legion, in the area of emergency communications it was the inadequate technology that failed first, not the people.

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[7] CRS Report RL33064, "Organization and Mission of the Emergency Preparedness and Response Directorate: Issues and Options for the 109th Congress," by Keith Bea.

[8] See for example the somewhat contradictory written and oral testimony of Dr. David G. Boyd, Program Manager, SAFECOM and Deputy Director, Office of Systems Engineering & Development, Science and Technology Directorate, Department of Homeland Security, at hearings of the Senate, Committee on Commerce, Science and Transportation, "Communications Interoperability - Session I," September 29, 2005 and of the House of Representatives, Committee on Energy and Commerce, "Public Safety Communications from 9/11 to Katrina: Critical Public Policy Lessons," September 29, 2005.

I. PROGRESS AND GOALS

Intelligence Reform and Terrorism Prevention Act

The National Commission on Terrorist Attacks Upon the United States (9/11 Commission) analysis of communications difficulties on September 11, 2001 was summarized in the following recommendation.

> Congress should support pending legislation which provides for the expedited and increased assignment of radio spectrum for public safety purposes. Furthermore, high-risk urban areas such as New York City and Washington, D.C., should establish signal corps units to ensure communications connectivity between and among civilian authorities, local first responders, and the National Guard. Federal funding of such units should be given high priority by Congress.[9]

The Commission, in this paragraph, recognized the important link between access to spectrum and the effectiveness of communications technology. Briefly, the recommendation says:

- free up and assign more **spectrum** for public safety use;
- establish **communications support** (the role of a signal corps typically is to provide information systems and networks for real-time command and control);
- with **interoperable communications** (connectivity); and
- prioritize funding these communications operations for **high-risk urban areas**.

The 9/11 Commission recommendations for public safety are a pithy summation of issues raised in the last decade or so. Provisions in the Intelligence Reform and Terrorism Prevention Act of 2004 (P.L. 108-458) that respond to the recommendations of the Commission and of the public safety community, among others, are discussed below. The discussion also includes legislation introduced in the 109th Congress that responds to or modifies provisions of the act.

Spectrum Allocation

The Balanced Budget Act of 1997 requires the Federal Communications Commission (FCC) to allocate 24 MHz of spectrum at 700 MHz[10] to public safety,

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[9] The National Commission on Terrorist Attacks Upon the United States, *The 9/11 Commission Report: Final Report of the National Commission on Terrorist Attacks Upon the United States*, (Washington: GPO, 2004), p. 397.

[10] Radio frequency spectrum is measured in hertz. Radio frequency is the portion of electromagnetic spectrum that carries radio waves. The distance an energy wave takes to complete one cycle is its wavelength. Frequency is the number of wavelengths measured at a given point per unit of time, in cycles per second, or hertz (Hz). Typical designations are: kHz — kilohertz or thousands of hertz; MHz — megahertz, or millions of hertz; and GHz — gigahertz, or billions of hertz. Bandwidth refers generally to the capacity of (continued...)

without providing a hard deadline for the transfer.[11] The channels designated for public safety are among those currently held by TV broadcasters; they are to be cleared as part of the move from analog to digital television (DTV). The 9/11 Commission urged that Congress take prompt action to assure the release of spectrum at 700 MHz — allocated for public safety, but not released — to support needed interoperable network and more robust communications capacity. In the aftermath of Hurricane Katrina, where failures in communications contributed to problems in rescue efforts, members of the 9/11 Commission, among others, expressed dismay that the essential first step toward the creation of a more robust emergency communications capability — the release of spectrum for wireless communications — has yet to be taken.

Public Safety Spectrum Needs and Television Broadcasting. The 9/11 Commission report regarding spectrum availability speaks directly to the issue of the 700 MHz spectrum that has been assigned to public safety but is not yet available. It recommended that Congress pass proposed legislation (the HERO Act, see below) that would free those channels. Although the task of freeing spectrum for public safety could be addressed as a separate issue, many recent actions have focused on the steps to be taken for releasing all the encumbered spectrum while assuring access to broadcast television programs.[12] Beginning with the 107th Congress, Representative Jane Harman has introduced in each Congress legislation that would assure the timely release of radio channels at 700 MHz for public safety use. The Homeland Emergency Response Operations Act, or HERO Act (H.R. 1646), reintroduced in April 2005, requires the FCC to "take all actions necessary to complete assignments" for these channels so that operations could begin no later than January 1, 2007, adhering to the deadline originally envisioned for the completion of the transition to DTV for all affected channels.

New Legislative Proposals. More comprehensive bills covering the release of spectrum and the transition to DTV have been introduced or are planned. The Spectrum Availability for Emergency-response and Law-enforcement to Improve Vital Emergency Services, or SAVE LIVES Act (S. 1268, Senator McCain) would set a deadline of December 31, 2008[13] for the release of spectrum held by broadcasters and address issues of the transition from analog to digital broadcast technology. Among the provisions of the bill are several that address public safety and communications needs. The bill would allow spectrum auction proceeds from the sale of cleared analog spectrum to be allocated directly to a grant program to

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[10] (...continued)
channels to carry voice and data, a function of technology and the amount of spectrum assigned. Most frequency assignments for first responders are narrowband and most channels currently in use are located below 512 MHz.

[11] 47 U.S.C. § 309 (j) (14).

[12] For example Hearing of the House of Representatives, Committee on Energy and Commerce, Subcommittee on Telecommunications and the Internet, "The Role of Technology in Achieving a Hard Deadline for the DTV Transition," February 17, 2005.

[13] S. 1268, Sec. 2 (a) (1).

improve communications interoperability for first responders.[14] Allowance is made for the possibility that Congress will ask the FCC to allocate additional spectrum for public safety after it has considered an FCC report on spectrum needs.[15] (See below.) To ensure that the FCC has the authority to conduct the auction of the designated radio frequencies, the bill extends the auction authority of the FCC until September 30, 2009;[16] it is currently set to expire in September 2007. The bill covers many aspects of concern in carrying out the transition to digital TV. The bill, for example, establishes criteria for distributing set-top converter boxes[17] and authorizes funds for the program.[18] These funds will be paid out from revenue generated by the auction of designated spectrum.[19] Other provisions cover rules for notifying consumers of the pending transition;[20] provision of digital signals over cable;[21] and requirements for the FCC to complete certain pending proceedings that impact the DTV transition.[22] Since Hurricane Katrina, Senator McCain has argued for a hard date of January 1, 2007.

The Deficit Reduction Omnibus Reconciliation Act of 2005 (S. 1932, Senator Gregg) contains some legislative solutions that would facilitate the release of spectrum for public safety. It would set a definite date of April 7, 2009 for the release of spectrum at 700 MHz[23] currently held by broadcasters;[24] require auctions by the FCC of the freed spectrum;[25] extend the FCC's auction authority (it is scheduled to expire in 2007) until September 30, 2009;[26] commit money from any auction(s) of spectrum at 700 MHz, scheduled to take place not later than FY2010, to reducing the budget deficit as specified in H.Con.Res. 95;[27] and create a fund to

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[14] S. 1268, Sec. 5 (f).

[15] S. 1268, Sec. 3 (a) (2) "(II) (cc)."

[16] S. 1268, Sec. 3 (b).

[17] S. 1268, Sec. 4.

[18] S. 1268, Sec. 4 (f).

[19] S. 1268, Sec. 4 (f) (1).

[20] S. 1268, Sec. 6.

[21] S. 1268, Sec. 7.

[22] S. 12689 Sec. 9.

[23] Wireless (radio frequency) spectrum is measured in cycles per second, or hertz (Hz). Standard abbreviations for measuring frequencies include kHz — kilohertz or thousands of hertz; MHz — megahertz, or millions of hertz; and GHz — gigahertz, or billions of hertz.

[24] S. 1932, Sec. 3002.

[25] S. 1932, Sec. 3003 (a).

[26] S. 1932, Sec. 3003 (b).

[27] For the House Committee on Energy and Commerce, the total commitment could be $14,734,000,000 for fiscal years 2006 through 2010; H. Con. Res 95, Concurrent Resolution on the Budget for Fiscal Year 2006, Title II, Sec. 201 (a) (2) (C). Reconciliation instructions call for a net contribution toward the deficit of $4.080 billion from Energy and Commerce Committee; Senate budget reconciliation sets the amount from Commerce

(continued...)

hold auction proceeds, some of which would be applied to public safety communications needs.[28]

The House Committee on Energy and Commerce marked up the Digital Television Transition Act of 2005 (referred to herein as House DTV Bill)[29] on October 26, 2005. Some of its provisions are comparable to those in S. 1932. All or part of the House DTV bill could be added as amendments to H.Con.Res. 95, depending on the rules that are to be established by the House Committee on Rules. H.Con.Res. 95 could be debated during the week of November 7, 2005.

Improving Spectrum Capacity for Public Safety. The Intelligence Reform and Terrorism Prevention Act requires the FCC, in consultation with the Secretary of Homeland Security and the National Telecommunications and Information Administration (NTIA),[30] to conduct a study on the spectrum needs for public safety, including the possibility of increasing the amount of spectrum at 700 MHz.[31] This provision is responsive to the many public safety officials who believe that additional spectrum should be assigned for public safety use — and not exclusively for first responders.[32] In addition to providing spectrum for other types of users, the spectrum available for public safety should be able to support high-speed transmissions capable of quickly sending data (such as photographs, floor plans and live video). This requires providing frequencies with greater bandwidth to enable wireless broadband and new-generation technologies. Although radio frequencies have been designated for state and local public safety use in the 700 MHz range, there are no allocations specifically for federal use at 700 MHz and the bandwidth assignments are judged by most experts to be too narrow for full broadband. Many have advocated that additional spectrum be allocated at 700 MHz to accommodate federal users and to support newer, broadband wireless technologies as part of a nationwide network for public safety communications. The Spectrum Coalition for Public Safety has circulated proposed legislation that would allocate

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[27] (...continued)
Committee at $5 billion [S. 1932, Sec. 3005, (d)].

[28] S. 1932, Sec. 3005 (c)

[29] Citations attributed to House DTV Bill are from Committee Print, dated October 20, 2005.

[30] The NTIA, Department of Commerce, administers federal use of spectrum.

[31] P.L. 108-458, Title VII, Subtitle E, Sec. 7502 (a).

[32] In 1997 amendments to the Communications Act of 1934 , Congress defined public safety services as "services — (A) the sole or principal purpose of which is to protect the safety of life, health or property; (B) that are provided (i) by State or local government entities; or (ii) by nongovernmental organizations that are authorized by a governmental entity whose primary mission is the provision of such services ; and (C) that are not made commercially available to the public by the provider." [47 U.S.C. § 337 (f)(1)]. The Intelligence Reform and Terrorism Prevention Act uses the more restrictive definition of first responders as provided in the Homeland Security Act of 2002 (6 U.S.C. § 101).

additional spectrum at 700 MHz for use by state and local first responders, critical infrastructure industries, and federal public safety agencies.[33]

Although, cumulatively, radio frequencies designated for non-federal public safety total over 90 MHz,[34] the characteristics of these frequencies are dis-similar, requiring different technological solutions. The fragmentation of spectrum assignments for public safety is a significant barrier to achieving interoperability in the future, and is presently among the technical problems that plague public safety communications, such as out-of-date equipment, proprietary solutions, congestion, and interference. The immediate barrier to achieving radio communications interoperability is — simply put — that UHF and VHF frequencies[35] cannot connect directly with each other, and that older, analog equipment widely used below 512 MHz cannot connect with newer digital equipment at 800 MHz. Technology for new frequencies at 4.9 GHz is still in the early stage of development but these frequencies appear suitable primarily for local-area (short-range) transmission. None of the above frequency assignments can, using current technology, support wide-area communications relying on high-speed, data-rich transmissions. Providing new spectrum at 700 MHZ for key communications capabilities, including interoperable connections, is viewed by many as the optimal solution for overcoming problems caused by incompatible radio frequencies and technologies.

Responding to Congress's requirement for a study, the FCC has begun the process with a request for comment on the future spectrum needs of emergency response providers.[36] A statement, by Commissioner Michael J. Copps, accompanying the request for comment sums up the sentiments of many of those involved in public safety.

> A useful report to Congress will: (1) include a survey of what spectrum is currently being used by which entities across the country; (2) understand that not all frequencies are the same and therefore assess whether we are matching spectrum with appropriate physical characteristics to current and future public safety needs; (3) indicate whether some bands are being underutilized because public safety needs have changed since initial allocation; (4) assess the current interference situation in public safety bands; (5) identify various approaches to interoperability and their success or failure; (6) identify the current availability of interoperable channels and whether or not they are widely used and why; and (7) determine how a nationwide interoperable network can connect not only local

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[33] Spectrum Coalition for Public Safety at [http://www.spectrumcoalition.org].

[34] Estimated at approximately 97 MHz in Testimony of Michael K. Powell, Chairman, Federal Communications Commission, at Hearing of Senate Committee on Commerce, Science and Transportation, "Spectrum for Public Safety Users," September 8, 2004. The NTIA has apparently not supplied a similar estimate of frequencies assigned to federal agencies that are or can be accessed for public safety purposes.

[35] Very High Frequency (VHF) and Ultra High Frequency (UHF) are transmitted in three bands in the United States — low VHF, high VHF and UHF.

[36] "Federal Communications Commission Requests Comments on Spectrum Needs of Emergency Response Providers," FCC News, March 29, 2005, WT Docket No. 05-157 at [http://www.fcc.gov].

> police and fire entities, but also the FBI, DHS, FEMA, and other critical Federal agencies. I also believe that we must begin to understand that emergency rooms and the medical community are integral parts of emergency response and homeland security. If we build a system that excludes the medical community it will be dangerously incomplete.

The need for greater spectral capacity will grow with the number of participants in interoperable systems and the amounts of information being shared on these systems. Bottlenecks in communications are a problem that is already manifest among federal computer networks and landline transmissions, and many believe it will worsen as more information is pushed through. As emergency response units become more mobile, demand for time-critical, wireless communications capacity will also increase. New technologies that improve communications capacity are being introduced almost continuously, but the need to provide suitable spectrum for a full range of voice and data communications will persist.

The Cost of Fragmentation. The number of radio frequencies available for interoperable communications capability can significantly impact first responder communications, and the range of these frequencies can significantly impact the cost of equipment. Manufacturers cite short production runs for wireless handsets as one of the causes for higher costs associated with public safety communications equipment. An analog walkie-talkie might cost $300, a recent "typical" price. A radio with limited interoperability that meets Project 25 standards[37] might cost as much as $3,000 in a limited production run. The greater the number of communications devices using compatible frequencies, the greater are the opportunities for economies of scale in production, which in turn typically lowers the cost and final price on equipment. Purchasing "cross-talk" equipment — to provide interoperability by linking radio frequencies through a black box — can run into the millions of dollars. Beyond issues such as risk-assessment, prioritizing, and equity in funding programs, many within Congress and without are concerned about the long-term implications of funding short-term communications solutions, such as cross-talk equipment.[38] Many believe that the unavailability of spectrum at 700 MHz is stalling advances in technology and planning for new networks, thus adding to the short-term costs of maintaining public safety communications. Therefore, many argue that creating common, interoperable channels at 700 MHz is cost-effective as well as organizationally and technologically desirable.[39]

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[37] Project 25 refers to the suite of standards for public safety communications under development by the Telecommunications Industry Association, a standards-setting body authorized for this program. [http://www.tiaonline.org/standards/project_25/]. Viewed October 13, 2005.

[38] For example, statements at Hearing of the House of Representatives, Committee on Homeland Security, Subcommittee on Emergency Preparedness, Science and Technology, "The Need for Grant Reform and The Faster and Smarter Funding for First Responders Act of 2005," April 13, 2005. The cross-patch equipment that federal funding provided to New Orleans in 2003 was washed away in post-Katrina flooding.

[39] Speakers at a CRS-sponsored seminar provided equipment cost estimates and were among those who have confirmed the need for access to spectrum at 700 MHz as part of the solution for achieving interoperability. *Public Safety Communications: Interoperability* (continued...)

Communications Support and Interoperability

The 9/11 Commission recommendation to use signal corps to assure connectivity in high-risk areas is apparently a reference to the Army Signal Corps. In testimony before Congress, Commissioner John F. Lehman commented on the lack of connectivity for first responders and referred to the "tremendous expertise" of the Department of Defense (DOD) and its capabilities in procurement, technology, and research and development. Referring specifically to the Army Signal Corps, Mr. Lehman suggested that the DOD should have responsibility to provide "that kind of support to the first responders in the high-target, high risk cities like New York."[40]

The role of a signal corps typically is to provide information systems and networks for real-time command and control. The Army maintains mobile units to provide capacity and specialized support to military operations, worldwide. According to the U.S. Army Info Site on the Internet

> The mission of the Signal Corps is to provide and manage communications and information systems support for the command and control of combined arms forces. Signal support includes Network Operations (information assurance, information dissemination management, and network management) and management of the electromagnetic spectrum. Signal support encompasses all aspects of designing, installing, maintaining, and managing information networks to include communications links, computers, and other components of local and wide area networks. Signal forces plan, install, operate, and maintain voice and data communications networks that employ single and multi-channel satellite, tropospheric scatter, terrestrial microwave, switching, messaging, video-teleconferencing, visual information, and other related systems. They integrate tactical, strategic and sustaining base communications, information processing and management systems into a seamless global information network that supports knowledge dominance for Army, joint and coalition operations.[41]

The Army Signal Corps is intended to provide a communications backbone, a core network, with important elements such as spectrum management, the operation of communications centers, and support of communications networks that include both large area regional communications and radio coverage for local wireless interoperability. The Corps' communication backbone delivers connectivity on site among combined forces and connectivity to command centers. These operations are scalable and can be deployed when and where needed.

Interoperability: SAFECOM. Responsibility to coordinate and rationalize federal networks, and to support interoperability, has been assigned to SAFECOM by the Office of Management and Budget (OMB) as an e-government initiative. This

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[39] (...continued)
Technology Workshop, November 17, 2003.

[40] Testimony of Commissioner John F. Lehman, National Commission on Terrorist Attacks Upon the United States, Hearing, House of Representatives, Committee on Government Reform, "Moving from 'Need to Know' to 'Need to Share'," August 3, 2004.

[41] From [http://www.us-army-info.com/pages/mos/signal/signal.html]. Viewed October 13, 2005.

role has been supported by the Administration[42] and confirmed by Congress with language in the National Intelligence and Terrorism Prevention Act.[43] Programs at SAFECOM, now placed within the DHS Office for Interoperability and Compatibility, are primarily consultative in nature and focused on administrative issues. While it makes important contributions to testing equipment and working on technical and operational standards for interoperable equipment, SAFECOM does not appear to be planning for a standardized network overlay that can encompass the many useful, but mostly not connected, networks that already play vital roles in public safety communications.

Interoperability: Integrated Wireless Network. Separately, an Integrated Wireless Network (IWN) for law enforcement is being planned as a joint program by the Departments of Justice, the Treasury, and Homeland Security. DHS is represented in the IWN Joint Program Office through the Wireless Management Office of the Chief Information Officer.[44] IWN, from its description, will have limited interoperability at the state and local level. The described objective of IWN is network integration for "the nation's law enforcement wireless communication, and data exchange capability through the use of a secure integrated wireless network."[45] Most of the parameters of the IWN program — equipment, technologies, standards, use of spectrum, etc. — will be established through the final choice of vendor or vendors and the network solutions proposed. There are some specific requirements, such as for open standards or standards that are readily available to all — such as Project 25 — [46] and use of VHF frequencies already assigned to federal users.[47] Currently, the program has selected five companies as semi-finalists.[48] These companies have been asked to submit a detailed system design and an

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[42] Testimony of Karen S. Evans, E-Gov/IT Director, Office of Management and Budget, Hearing of the House of Representatives, Committee on Government Reform, Joint Hearing, Subcommittee on National Security, Emerging Threats and International Relations and Subcommittee on Technology, Information Policy, Intergovernmental Relations and the Census, "Public Safety Interoperability: Can You Hear Me Now?," Nov. 6, 2003.

[43] P.L. 108-458, Title VII, Subtitle C, Sec. 7303 (a) (2).

[44] Memorandum of Understanding Between the Department of Homeland Security, the Department of Justice, and the Department of the Treasury Regarding a Joint Tactical Wireless Communications System, at [http://www.usdoj.gov/jmd/iwn/schedule.html]. Viewed October 13, 2005.

[45] Request for Comment, Draft Phase 2 Request for Proposals, October 13, 2004, C.2.3 (a), page 8 at [http://www.usdoj.gov/jmd/iwn/schedule.html]. Viewed October 13, 2005.

[46] Request for Comment, Draft Phase 2 Request for Proposals, October 13, 2004, C.2.1 (d), page 8 at [http://www.usdoj.gov/jmd/iwn/schedule.html]. Viewed October 13, 2005.

[47] Presentation by Michael Duffy, Deputy Chief Information Officer, E-Gov, Department of Justice, at Integrated Wireless Network (IWN) Industry Day, April 27, 2004.

[48] They are: AT&T, Boeing, General Dynamics, Lockheed Martin and Motorola. From Results of the IWN Phase I Downselect at [http://www.usdoj.gov/jmd/iwn/schedule.html]. Viewed October 13, 2005.

implementation plan[49] and are encouraged to provide "innovative, big-picture, solution sets."[50] The departmental objectives for coverage are: major metropolitan areas; major highways; U.S. land and sea border areas; and ports of entry.[51] The reported estimated cost for IWN is $10 billion.[52] Funding is provided jointly from budgeted sums designated for the upgrading of communications equipment to meet NTIA requirements for narrowbanding and interoperability.[53] Although the network being sought is intended to serve law enforcement users within the three sponsoring departments, descriptions of the program invoke the possibility that IWN will provide the template for national interoperability.[54]

Interoperability: First Responders. In terms of achieving interoperability for the nation's first responders, the deployment of IWN could be viewed by some as a glass that is either half empty or half full. Among the positive contributions that IWN will provide to public safety communications are: the eventual adoption, on a massive scale, of a network architecture that can be emulated by all — presumedly with standardized interfaces; coordination of communications and interoperability among important components of homeland security; and significant improvements in communications technology and the efficient use of spectrum.

There could be questions as to how this project, running parallel with plans from the Office of Interoperability and Compatibility, will impact the goal that Congress has set for nationwide interoperability. Will it, for example, delay work on standards development until the process of vendor selection is complete and the standards for IWN have been fully established? Will the proposed interface between federal law enforcement personnel and selected state and local officials be extendable to, say, interoperability between those officials and local firefighters or EMS personnel? Should other federal networks be built along functional lines and then linked with IWN, possibly providing the connectivity needed at the state and local level among different types of responders? Will there be a link to emergency alert and warning systems? Could IWN serve as a connecting link between state and local first

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[49] Request for Comment, Draft Phase 2 Request for Proposals, October 13, 2004, A.4 (a), page 3 at [http://www.usdoj.gov/jmd/iwn/schedule.html]. Viewed October 13, 2005.

[50] Request for Comment, Draft Phase 2 Request for Proposals, October 13, 2004, C.2.1(c), page 7 at [http://www.usdoj.gov/jmd/iwn/schedule.html]. Viewed October 13, 2005.

[51] Request for Comment, Draft Phase 2 Request for Proposals, October 13, 2004, C.2.1. (c), page 7 at [http://www.usdoj.gov/jmd/iwn/schedule.html]. Viewed October 13, 2005.

[52] "Massive Federal Wireless Project Delayed," by Wilson P. Dizard III, GCN, March 30, 2005.

[53] Memorandum of Understanding Between the Department of Homeland Security, the Department of Justice, and the Department of the Treasury Regarding a Joint Tactical Wireless Communications System, and Presentation by Michael Duffy, Deputy Chief Information Officer, E-Gov, Department of Justice, at Integrated Wireless Network (IWN) Industry Day, April 27, 2004.

[54] "The successful deployment and operation of IWN will be a key enabler for national coordination capability," in Request for Comment, Draft Phase 2 Request for Proposals, October 13, 2004, C.2.5 (b) (1), page 10 at [http://www.usdoj.gov/jmd/iwn/schedule.html]. Viewed October 13, 2005.

responder networks and the military. The specification to use federal frequencies apparently solves the problem of spectrum access for IWN but does not appear to move toward the solution to the vexing problem of providing suitable radio frequencies for interoperability for first responders. The frequencies that IWN is to use are the same frequencies that were generally not available to those responding to terrorist attacks on September 11, 2001.

Emergency Communications: Responses to Katrina

Congress responded to recommendations for improvements in programs to support communications and foster interoperability with language in the Intelligence Reform and Terrorism Prevention Act that raises the bar for performance and accountability, as well as easing some of the obstacles to performance.[55] Among the program goals the act sets for the Department of Homeland Security and the Federal Communications Commission are the following.

- Develop a comprehensive, national approach for achieving interoperability.
- Coordinate with other federal agencies.
- Establish appropriate minimum capabilities for interoperability.
- Accelerate development of voluntary standards.
- Encourage open architecture and commercial products.
- Assist other agencies with research and development.
- Prioritize within DHS for research, development, testing and related programs.
- Establish coordinated guidance for federal grant programs.
- Provide technical assistance.
- Develop and disseminate best practices.
- Establish performance measurements and milestones for systematic measurement of progress.[56]

The act also instructs the Secretary of Homeland Security to lead a study to "assess strategies that may be used to meet public safety telecommunications

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[55] A discussion of federal programs is included in the Appendix of this report.

[56] P.L. 108-458, Title VII, Subtitle C, Sec. 7303 (a) (1).

needs."[57] The strategies study is to address the need for nationwide interoperable communications networks, the capacity of public safety to use wireless broadband applications, and the communications capabilities of "all emergency response providers. . . ." The use of "commercial wireless technologies to the greatest extent possible" is to be considered.

Proposed Legislation for Emergency Communications. Responding to the catastrophic failure of emergency communications in Gulf Coast States after the passage of Hurricane Katrina, Senator Joseph I. Lieberman presented a broad-based bill for changes in management of emergency communications within the Department of Homeland Security. Some of the elements of S. 1725 were in an earlier bill, S. 1274, introduced by the Senator in June 2005. S. 1725 was passed by the Committee on Homeland Security and Governmental Affairs on September 22, 2005 and reported, as amended in mark up, to the Senate on September 29 by Senator Susan M. Collins.

The thrust of S. 1725, the Assure Emergency and Interoperable Communications for First Responders Act of 2005, as reported, is to raise the level of accountability by DHS for the performance of emergency communications by expanding the department's responsibilities and by providing more detail about what is to be accomplished. The option of creating an Office for Interoperability and Compatibility within DHS that is part of P.L. 108-458[58] would be amended to become a requirement for an Office of Emergency Communications, Interoperability and Compatibility.[59] Among the responsibilities specified for the office would be: to conduct extensive outreach programs nationwide for the improvement of emergency communications;[60] to coordinate with the National Communication System;[61] to develop a national strategy;[62] to develop a national architecture that "defines components of an interoperable system and how they fit together;[63] to set up a task force with broad responsibilities;[64] to work with the Office of Domestic Preparedness in helping to create regional task forces, among other goals, and in funding and conducting a number of pilot programs.[65] Goals of the pilot programs include testing new technology in a real-world environment; encouraging more efficient use of existing resources; and testing and deploying more robust and effective public safety

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[57] P.L. 108-458, Title VII, Subtitle E, Sec. 7502 (b).

[58] P.L. 108-458, Title VII, Subtitle C, Sec. 7303 (a) (2).

[59] S. 1725, Sec. 3 (a) '(2).

[60] S. 1725, Sec. 3 (a) '(2) '(C) '(iv).

[61] S. 1725, Sec. 3 (a) '(2) '(C) '(iv) '(I).

[62] S. 1725, Sec. 3 (a) '(2) '(C) '(iv) '(II).

[63] S. 1725, Sec. 3 (a) '(2) '(C) '(iv) '(III).

[64] S. 1725, Sec. 3 (a) '(2) '(C) '(iv) '(IV).

[65] S. 1725, Sec. 3 (a) '(2) '(C) '(iv) '(V).

communications systems.[66] Other responsibilities of the office encompass working with the private sector to develop solutions to improve communications and interoperability;[67] to use modeling and simulation for training exercises and to develop command-and-control functionality;[68] and to take all necessary steps to improve emergency communications capabilities and to achieve communications interoperability.[69]

The bill would amend the definition of "Interoperable Communications" as it appears in P.L.108-458[70] to read "Interoperable Communications and Communications Interoperability," and adds a definition for "Emergency Communications Capabilities." This term describes the uninterrupted flow of information to emergency responders at all levels, even after significant loss of capacity and critical infrastructure.[71]

Other provisions in the bill that reaffirm or slightly modify provisions passed as part of P.L. 108-458, include sections on pilot programs for communications in high-risk urban areas,[72] for collaboration with the Department of Defense in research and development,[73] and in requirements for states in order to qualify for funding.[74] Authorizations for funding are increased by nearly $4 billion over amounts authorized in P.L. 108-458.[75] S. 1725 would establish a panel to work with the Office of Domestic Preparedness in reviewing grants. The review panel would include members with technical expertise in emergency communications and interoperability as well as emergency response providers. Also building on language in P.L. 108-458, S. 1725 requires measures to resolve problems with interoperability in negotiations with Canada and Mexico.[76]

An example of ways in which the bill would seek to make DHS more accountable for progress in improving emergency communications is a requirement

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[66] S. 1725, Sec. 3 (a) (2) '(C) '(iv) '(IX).

[67] S. 1725, Sec. 3 (a) (2) '(C) '(iv) '(X).

[68] S. 1725, Sec. 3 (a) (2) '(C) '(iv) '(XI).

[69] S. 1725, Sec. 3 (a) (2) '(C) '(iv) '(XII).

[70] Sec. 7303 (g) (1).

[71] S. 1725, Sec. 3 (b).

[72] S. 1725, 'Sec. 316 would amend Title II, Homeland Security Act. Similar language appears in P.L. 108-458, Sec. 7304

[73] S. 1725, 'Sec. 314, '(b). A recommendation to consult DOD for development of pilot projects is in P.L. 108-458, Sec. 7304 (d).

[74] S. 1725, Sec. 107 and P.L. 108-458, Sec. 7303 (f).

[75] S. 1725, Sec. 106 and Sec. 107; some similar language for funding formulae and requirements appears in S. 21.

[76] S. 1725, SEC 111 and P.L. 108-458, Sec. 7303 (c). Language on cross-border communications grants in S. 1725 also appears in H.R. 2360, 1 Sec. 605.

for a "baseline interoperability assessment.[77] A project to establish a nationwide baseline for interoperability has been undertaken by SAFECOM. The assessment was to have been undertaken in 2004; it was delayed until 2005; it is now promised for summer 2006.[78]

Evaluating the need for more robust emergency communications system, Senator John F. Kerry has proposed the Communications Security Act (S. 1703). The bill would amend the Homeland Security Act to require a study by DHS and the FCC of "the technical feasibility of creating a back-up emergency communications system that complements existing communications resources and takes into account next generation and advanced telecommunications technologies." Among the technologies to be considered are satellite connections. The language of the bill would equip all public safety entities with the necessary equipment, this could be interpreted to include 911 call centers, an important part of the emergency communications safety net.

Related Legislative Initiatives

High-Risk Urban Areas. The 9/11 Commission recommendation urged immediate funding of signal corps in high-risk urban areas to assure connectivity "among civilian authorities, local first responders, and the National Guard." The act responded by amending the Homeland Security Act to specify that DHS is to give priority to the rapid establishment of interoperable capacity in urban and other areas determined to be at high risk from terrorist attack. The Secretary of Homeland Security is required to work with the FCC, the Secretary of Defense, and appropriate state and local authorities to provide technical guidance, training, and other assistance as appropriate.[79] Minimum capabilities for "all levels of government agencies," first responders, and others include the ability to communicate with each other and to have "appropriate and timely access" to the Information Sharing Environment, an initiative treated elsewhere in the act.[80]

The act further requires the Secretary of Homeland Security to establish at least two pilot programs in high threat areas. The process of development for these programs is to contribute to the creation and implementation of a national model strategic plan.[81] The purpose of this plan is to foster interagency communications

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[77] S. 1725, 'Sec. 314 '(a).

[78] Oral testimony of Dr. David G. Boyd, Program Manager, SAFECOM and Deputy Director, Office of Systems Engineering & Development, Science and Technology Directorate, Department of Homeland Security, Hearing of the House of Representatives, Committee on Energy and Commerce, "Public Safety Communications from 9/11 to Katrina: Critical public Policy Lessons," September 29, 2005.

[79] P.L. 108-458, Title VII, Subtitle C, Sec. 7303 (d), 'Sec. 510 '(a).

[80] P.L. 108-458, Title VII, Subtitle C, Sec. 7303 (d), 'Sec. 510 '(b).

[81] P.L. 108-458, Title VII, Subtitle C, Sec. 7304 (a).

at all levels of the response effort.[82] Building on the 9/11 Commission recommendation to use the resources of the Army Signal Corps, the Secretary is to consult with the Secretary of Defense in the development of the pilot projects, including review of standards, equipment, and protocols.[83] DHS was to have established at least two pilot projects in high threat or urban areas for interagency communications by March 2005;[84] as of the date of this report, this program is in review.

Proposed Legislation for Urban Areas. Underscoring the need to aid first responders in urban areas, H.R. 1795 (Representative Maloney) would require DHS to provide a communications system for the New York City Fire Department, including radios for the entire department and upgrades to its dispatch system. The bill specifies that such a network should be "seamless from the receipt of a 911 call to the dispatch of the firefighter,"[85] and interoperable with other public safety offices within the city.[86] Other systems requirements include being able to transmit a firefighter's identity and location;[87] sufficient capacity to send, in real time, data about buildings and property;[88] performance tested for operation in "all locations and under all conditions in which firefighters can reasonably be expected to work . . .".[89]

Funding Programs, Selected Issues. Grants that have helped to pay for new programs for interoperability have come from a number of federal sources, notably from Department of Justice programs and, within the Department of Homeland Security (DHS), from the Federal Emergency Management Administration (Emergency Preparedness and Response Directorate) and the Office for Domestic Preparedness (ODP) in the Border and Transportation Security Directorate. Grant programs such as those at ODP for Urban Area Security and High-Threat Urban Areas are on-going.[90]

According to an undated fact sheet from DHS, since September 11, 2001 the Administration has allocated $200 million specifically for improving interoperability

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[82] P.L. 108-458, Title VII, Subtitle C, Sec. 7304 (b).

[83] P.L. 108-458, Title VII, Subtitle C, Sec. 7304 (d).

[84] P.L. 108-458, Title VII, Subtitle C, Sec. 7304 (a).

[85] H.R. 1795, Sec. 2 (11) (A).

[86] H.R. 1795, Sec. 2 (11) (B).

[87] H.R. 1795, Sec. 3 (b) (2) (B).

[88] H.R. 1795, Sec. 3 (b) (3) (C).

[89] H.R. 1795, Sec. 3 (c).

[90] For full details, please refer to CRS Report RS21677, *Office for Domestic Preparedness Grants for 2004: State Allocation Fact Sheet*; CRS Report RL32696, *Fiscal Year 2005 Homeland Security Grant Program: State Allocations and Issues for Congressional Oversight;* and CRS Report RS22050, *FY2006 Appropriations for State and Local Homeland Security*, all by Shawn Reese. A report from the Government Accountability Office provides many details about funding for first responders, especially grants from ODP: *Management of First Responder Grant Programs and Efforts to Improve Accountability Continue to Evolve*, April 12, 2005, GAO-05-530T.

and $5.4 billion has been provided to states for emergency preparedness that could include interoperable communications.[91] An internal assessment within DHS of 2004 grant funds spent for interoperability indicates that states and territories spent nearly a billion federal dollars on interoperable communications equipment in that budget year.[92] The Department of Justice has funded grants for interoperable communications totaling $242 million for the years 2003 -2005.[93] Interoperable communications equipment is a loose term that can mean cross-talk equipment (a sort of black box that translates messages from one radio frequency to another), radio handsets that are certified as interoperable, and systems that are deemed interoperable because they connect to more than one agency. Partly under federal guidance, substantial sums of money have been spent at the local and state level for equipment that has improved communications for certain scenarios. There is no information to suggest that federal emergency communications programs have addressed the greater need for comprehensive planning or interoperability on a national scale.

The amount of dollars available, furthermore, represents a small portion of the "several billions" that the Government Accountability Office (GAO) reports as the estimated sum needed to achieve interoperability.[94] The GAO concludes that "federal funding assistance programs to state and local governments do not fully support regional planning for communications interoperability."[95] One cause cited was the restraint on planning and budgeting imposed by limiting federal funding to annual grants only.

Provisions of the Intelligence Reform and Terrorism Prevention Act permit federal funding programs to make multi-year commitments for interoperable communications for up to three years, with a ceiling of $150 million for future obligations.[96] The act authorizes annual sums for a period of five years to be used for programs to improve interoperability and to assist interoperable capability in high-risk urban areas; the 2005 authorization is $22,105,000; the amount rises each year to $24,879,000 in 2009.

Some Proposals for Funding Interoperable Communications. In addition to S. 1725, other bills have been introduced that address the perceived need

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[91] Department of Homeland Security, "Fact Sheet:RapidCom 9/30 and Interoperability Progress" [http://www.dhs.gov/dhspublic/interapp/press_release/press_release_0470.xml]. Viewed September 8, 2005.

[92] "Interoperable Communications Funding Report - United States - FY2004," Department of Homeland Security, Office of Domestic Preparedness, for planned expenditures for grants under State Homeland Security Program, Law Enforcement Terrorism Prevention Program, Citizens Corp Program, Urban Areas Security Initiative, and Transit Security Program. Preliminary report does not include all data.

[93] Office of Community Oriented Policing Services, Department of Justice, at [http://www.cops.usdoj.gov/Default.asp?Item=1600]. Viewed September 23, 2005.

[94] *Federal Leadership Needed to Facilitate Interoperable Communications Between First Responders*, Government Accountability Office, GAO-04-1057T, September 8, 2004, p. 16.

[95] Ibid, Highlights.

[96] P.L. 108-458, Title VII, Subtitle C, Sec. 7303 (e).

for funding for interoperable communications. As is discussed throughout this report, the need for better funding of public safety communications has been addressed in many forms and forums. Legislation to increase federal spending on interoperable communications has taken many approaches. Senator Barbara Boxer, for example, introduced S. 1645, the First Responders Interoperable Communications Act, which authorizes $300,000,000 in fiscal years 2006 through 2010 for grants to improve interoperable communications between state and local first responders and for the purchase of communications systems.

In 2004 the state of Louisiana created the "Louisiana Totally Interoperable Environment Strategic Plan," known by the acronym LATIE.[97] The plan recognized the need for improvement in emergency communications across the state and proposed building a statewide network with links to all 64 parishes. The existing 800 MHz system, acquired in 1995, had become outdated and could not easily be expanded. LATIE proposed a more robust network, interoperable, with an Internet Protocol (IP) backbone. The primary system infrastructure would be built around a wireless system using both 700 MHz and 800 MHz frequencies. An initial request for proposal was issued in May 2005.[98] The Louisiana Katrina Reconstruction Act (S. 1765, Senator Landrieu) includes authorization of $600,000,000 exclusively for interoperable communications grants to LATIE.[99]

Taking a different approach to funding, the Public Safety Interoperability Implementation Act (H.R. 1323, Representative Stupak) would establish in the U.S. Treasury a Public Safety Communications Trust Fund[100] to be funded in part with annual appropriations of $500 million for each of three fiscal years,[101] and in part with a percentage of certain spectrum auction proceeds.[102] The fund is to be administered by the NTIA, in consultation with a board of five directors appointed by the Secretary of Commerce. The board is to consult with the Department of Homeland Security, which may also be represented by one or more members on the board.[103] The NTIA Administrator is to make grants from the fund "to implement interoperability and modernization . . . for the communications needs" of public safety organizations and related agencies or entities.[104] Preference for grants is to be given to those proposing inter-agency or regional and multi-jurisdictional interoperability programs.[105]

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[97] Website at [http://www.lsp.org/interoperability.html]. Viewed September 28, 2005.

[98] At [http://www.lsp.org/interoperability/pdf/RFPTechnicalConsultantFinal.pdf]. Viewed September 28, 2005.

[99] S. 1765, Title II, Subtitle C, Sec. 222.

[100] H.R. 1323, Sec. 3, 'Sec. 106 '(a) '(1).

[101] H.R. 1323, Sec. 3, 'Sec. 106 '(f).

[102] H.R. 1323, Sec. 3, 'Sec. 106 '(a) '(2).

[103] H.R. 1323, Sec. 3, 'Sec. 106 '(b) '(1).

[104] H.R. 1323, Sec. 3, 'Sec. 106 '(c) '(1).

[105] H.R. 1323, Sec. 3, 'Sec. 106 '(c) '(2).

The Deficit Reduction Omnibus Reconciliation Act of 2005 (S. 1932, Senator Gregg) would create a fund to receive a portion of spectrum auction revenue to cover some of the costs to consumers of conversion to digital TV and for other purposes. The Senate budget reconciliation would set aside up to $3 billion toward paying for the cost of a program for consumers and up to $1.9 billion for public safety-related programs, including $1 billion to fund improvements in emergency communications interoperability.[106] These distributions would extend past 2010. The House DTV Bill would place $990,000 million in a fund to pay for a program to help households buy converter boxes that will receive digital signals on analog TV sets.[107] Among amendments that cover allocations to assist in the transition is provision for a public safety communications trust fund that would receive $500 million. (Amendment, Representative Upton).

[106] S. 1932, Sec. 3005 (c).

[107] Digital Television Transition Act of 2005, Committee Print, Sec. 105 (a) (3).

II. POLICY IMPLICATIONS

Policy and Planning

At a number of hearings throughout the 108th Congress,[108] and in reports by the Government Accountability Office,[109] the need for better governance and planning for interoperability was raised repeatedly. While not embracing the 9/11 Commission recommendation for a Signal Corps, the Intelligence Reform and Terrorism Prevention Act does include requirements for planning and for studies and reports that might lead to future changes in governance and national policy for interoperability and planning. The Administration also has asked for detailed studies and plans regarding spectrum use and communications for public safety.

Federal Planning

On November 30, 2004, President George W. Bush issued a memorandum to the heads of Executive Departments and agencies regarding steps to be taken to improve the management of spectrum assigned for federal use.[110] Most of these steps are to implement recommendations made by the Federal Government Spectrum Task Force in its report to the President in June 2004.[111] Among the deadlines provided in the memorandum are two requirements related specifically to public safety. One requirement is for the Secretary of Homeland Security to identify public safety spectrum needs by June 2005. The Secretary is to work with the Secretary of Commerce and, as needed, with the Chairman of the Federal Communications

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[108] Hearing of the House of Representatives, Committee on Energy and Commerce, Subcommittee on Telecommunications and the Internet, "Protecting Homeland Security: A Status Report on Interoperability Between Public Safety Communications Systems," June 23, 2004; Hearing of the House of Representatives, Committee on Government Reform, Subcommittee on National Security, Emerging Threats, and International Relations, "Public Safety Interoperability: Look Who's Talking Now," July 20, 2004; Committee on Government Reform, Subcommittee on Technology, Information Policy, Intergovernmental Relations and the Census, "More Time, More Money, More Communication?" September 8, 2004; Hearing of Senate Committee on Commerce, Science and Transportation, "Spectrum for Public Safety Users," September 8, 2004.

[109] For example, *Challenges in Achieving Interoperable Communications for First Responders,* Government Accountability Office, GAO-04-231T, November 6, 2003; *Federal Leadership and Intergovernmental Cooperation Required to Achieve First Responder Interoperable Communications*, GAO-04-720, July 2004; *Federal Leadership and Intergovernmental Cooperation Required to Achieve First Responder Interoperable Communications*, GAO-04-963T, July 20, 2004; *Federal Leadership Needed to Facilitate Interoperable Communications Between First Responders*, GAO-04-1057T, September 8, 2004; and *Homeland Security: Management of First Responder Grant Programs Has Improved, but Challenges Remain*, GAO-05-121, February 2005.

[110] "Presidential Determination: Memorandum for the Heads of Executive Departments and Agencies," November 30, 2004, Office of the Press Secretary, News & Policies, at [http://www.whitehouse.gov/news/releases/2004/11/20041130-8.html]. Viewed October 13, 2005.

[111] *Spectrum Policy for the 21st Century: The President's Spectrum Policy Initiative*.

Commission; representatives from the public safety community; state, local, regional and tribal governments; and the private sector. Also, by year-end 2005, the Secretary of Homeland Security is to lead the preparation of a Spectrum Needs Plan, "to address issues related to communication spectrum used by the public safety community, as well as the continuity of Government operations." Concurrently, the Secretary of Commerce is to develop a Federal Strategic Spectrum Plan.

State Planning

The Intelligence Reform and Terrorism Prevention Act links grant-making with planning efforts in its provisions.[112] Requirements for planning for spectrum and interoperability in order to qualify for funding assistance include 1) description of available radio frequency uses and planned uses;[113] 2) description of how plans for spectrum use and interoperability are compatible with plans for "Federal, State and local governmental entities, military installations, foreign governments, critical infrastructure, and other relevant entities;"[114] and 3) inclusion of a five-year plan showing how resources will be used.[115] The language provides criteria for non-federal planners that could be expected to mesh with federal planning efforts required by the Administration and in other sections of the act.[116] Furthermore, additional provisions of the act require the Secretary of Homeland Security to establish at least two pilots to develop a "regional strategic plan to foster interagency communications," consistent with the national strategic plan to be developed at the request of Congress by the Secretary of Homeland Security.[117]

The strategic planning efforts required by Congress and by the Administration have similar goals. Although requirements for federal planning are more extensive than what has been asked of states and other non-federal entities, a possible synergy among the various programs could lead to the crafting of a nationwide plan with clearly defined links to state and local planning and to the private sector. A template for interoperability planning has been developed within DHS that could be used as a first step toward meeting the planning requirements set forth in the act.[118]

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[112] Funding programs are covered in several CRS reports, including CRS Report RL32696, *Fiscal Year 2005 Homeland Security Grant Program: State Allocations and Issues for Congressional Oversight*, by Shawn Reese.

[113] P.L. 108-458, Title VII, Subtitle C, Sec. 7303 (f) (2).

[114] P.L. 108-458, Title VII, Subtitle C, Sec. 7303 (f) (3).

[115] P.L. 108-458, Title VII, Subtitle C, Sec. 7303 (f) (4).

[116] Notably, P.L. 108-458, Title VII, Subtitle E, Sec. 7502.

[117] P.L. 108-458, Title VII, Subtitle C, Sec. 7304 (b).

[118] Statewide Communication Interoperability Planning (SCIP) Methodology, SAFECOM Program, Directorate of Science and Technology, Department of Homeland Security at [http://www.safecomprogram.gov/NR/rdonlyres/9628BE4B-E7A5-4F1B-9179-2CFCF2653CA9/0/SCIPMethodology.pdf]. Viewed October 12, 2005.

Policy and Technology

The act requires the Secretary of Homeland Security, the FCC, and the NTIA to conduct a study to assess strategies for public safety communications. The study is to include

- The need and efficacy of deploying nationwide interoperable communications networks.
- The capacity of public safety entities to use wireless broadband applications.
- The communications capabilities of all emergency response providers, including hospitals and health care workers, and current efforts to promote communications coordination and training among emergency response providers.[119]

Conclusions from this assessment might lead to recommendations for the development of a nationwide network for public safety, as many have advocated.[120] As has been noted by public safety communications experts, the federal government is but one operator of networks, in use or planned. There are also important networks operated or planned by states, and some private networks — such as those owned by utilities — that are accessible for public safety use. These networks could be linked through common interfaces to provide local, regional, or national coverage, as needed. The 9/11 Commission proposed a signal corps approach to public safety communications for high-risk urban areas. Such a capability would seem to include a system architecture to provide a backbone for wide area and local area networks and to support interoperability system-wide, as needed.

In addition to local gateways, communities — and the military — are testing leading edge technologies that can overcome problems of limited capacity of assigned frequencies, incompatible standards and other technical problems. The technologies being tested to improve interoperability include software-driven radios and smart antennae, mesh networks, and cognitive radio.

Software defined networks (radios, base stations, antennae) move wireless communications away from hard-wired equipment, where functionality is built into the components at the factory, by allowing changes in parameters to be downloaded remotely. Parameters that can be changed include standards and frequency assignments. Smart radio, sometimes referred to as cognitive radio, has the potential to eliminate entirely the need for frequency assignments. Cognitive radio is able to seek out and use any available frequency through miniaturized software programs contained within radio equipment. Advanced versions of software-defined radio

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[119] P.L. 108-458, Title VII, Subtitle E, Sec. 7502 (b).

[120] For example, testimony of Gary Grube, Chief Technology Officer, Motorola, Inc. at Hearing of Senate Committee on Commerce, Science and Transportation, "Spectrum for Public Safety Users," September 8, 2004.

(SDR) being tested today are the building blocks for commercial applications of cognitive radio.

The Department of Defense, its agencies, and military departments have been leaders in research and development for software-programmable radios and base centers. These new technologies are expected to provide seamless interoperability in tactical operations and decrease the cost of infrastructure. A key program is the Joint Tactical Radio System (JTRS), designed to help the military migrate from its current wireless technology to SDR.[121] DOD is promoting the use of JTRS and its software communications architecture for homeland security and public safety communications and interoperability.

Mesh networking is another promising technology that can facilitate public safety communications and interoperability. Mesh networks use radios that also act as mobile antennae, eliminating dependency on fixed antenna. Cities that are trying mesh networks for public safety include Medford, Oregon; San Mateo, California; North Miami Beach, Florida; and Garland, Texas.[122] The mesh network systems being installed for public safety in some communities and cities use proprietary standards and are not interoperable, echoing the proprietary, incompatible cellular radio networks that were developed in the last century to be the mainstay of today's mostly non-interoperable systems for public safety.

Other communities are using unlicenced spectrum to use Wi-Fi networks (fixed antennae) for public safety communications.[123] Using commercial, third-generation (3G) wireless technologies is also an option for first responders. New 3G phones offer high-speed Internet access and image transmissions as well as voice communications. Off-the-shelf camera phones can relay photos from an incident site to a command center, or vice versa. Advanced mobile phones are being prepared to receive multi-channel TV broadcasts in test markets. Interoperability for commercial wireless is supported by network backbones.

Convergence and Coordination

The concept of public safety communications is expanding as new technology makes it possible to include many whose role in preventing or responding to disaster lies outside the conventional definition of first responder. A more inclusive description of public safety responders might include utility workers, health care workers other than those in emergency medical services, and operators in 911 call centers. A Focus Group for the National Reliability and Interoperability Council

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[121] See [http://jtrs.army.mil/]. Viewed September 28, 2005.

[122] For more about mesh networks and public safety, see Government Computer News, "Oregon City Builds Mesh Network," May 24, 2004 and "Wireless Mesh Network Good as Gold," June 7, 2004, both by William Jackson.

[123] Wi-Fi, for wireless fidelity, operates on unlicensed frequencies. An example of how Wi-Fi can support public safety is the plan of Cook County, Illinois to implement Wi-Fi for public and private sector use. See "Metro Wi-Fi Finding Friends," by Ed Sutherland, Network Computing's Mobilepipeline, July 30, 2004 at [http://nwc.mobilepipeline.com/26100806]. Viewed October 13, 2005.

(NRIC VII) suggests the term "emergency agency" and provides a suggested list of "agents" that might be part of an expanded "emergency response internetwork;" technology would provide the capability to link all parties and policy would determine the circumstances for, and type of, communication.[124]

A broader policy for public safety communications would include more types of communications capabilities as well as more participants and recipients. Although not included in its list of recommendations, the 9/11 Commission commented on the often inadequate response of the 911 call centers serving New York City,[125] and suggested "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."[126] The acuity of this observation was demonstrated after Hurricane Katrina struck the Gulf Coast. Emergency communication systems generally failed before commercial networks. 911 call centers continued to receive calls for help long after their links to emergency personnel had collapsed. The convergence of communications technology, typified by the near-ubiquity of the Internet and the wide availability of advanced wireless telephony, presages a world of end-to-end communications for public safety. These communications capabilities could incorporate a wide variety of systems and networks and be able to support almost any type of emergency response, emergency alert, or public safety information. The emergency communications safety net, although it might be torn, would be strong enough to hold, and serve its purpose.

Another law passed in the 108th Congress, enacted in the same time frame as the Intelligence Reform and Terrorism Prevention Act, created an E-911 Implementation Coordination Office to foster improvements in 911 call centers.[127] Although no funding has been provided specifically for 911 programs, the existence of such an office at the federal level is a step toward coordinating 911 programs with emergency alert systems and other public safety programs. Separately, the Intelligence Reform and Terrorism Prevention Act contains two provisions for collecting information on emergency alert systems. One requires a study about the use of telecommunications networks as part of an all-hazards warning system, specifying that technologies to consider would be "telephone, wireless communications, and other existing communications networks . . .".[128] The act also requires a pilot study using

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[124] NRIC VII, Focus Group 1D, Communications Issues for Emergency Communications Beyond 911; Report #1 - Properties and network architectures that communications between PSAPs and emergency services personnel must meet in the near future ," December 6, 2004, pp. 12; 26-27. PSAPs are Public Safety Answering Points, also known as 911 Call Centers. NRIC is a Federal Advisory Committee chartered by the FCC, see Appendix. See [http://nric.org/meetings/docs/meeting_20041206/FG1D%20Final%20Report.pdf]. Viewed October 13, 2005.

[125] Final Report of the National Commission on Terrorist Attacks Upon the United States, Official Government Edition, 2004, pp. 286-287; 295; 306.

[126] *Op cit.*, p. 318.

[127] P.L. 108-494, Title I.

[128] Requirement for Study Regarding Nationwide Emergency Notification System, (continued...)

technology now being used for an Amber Alert network,[129] to improve public warning systems regarding threats to homeland security. This study and pilot, along with other pilots underway for public safety and emergency communications,[130] will add to the body of information and experience being created by the federal government and others.

Policy and Progress

The debate about public safety communications and the role of federal policy is long running. The framework for current discussions — which accommodate recent advances in technology — most likely dates to a report in 1996 by the Public Safety Wireless Advisory Committee (PSWAC).[131]

Some Recommendations from the Public Safety Sector

Listed below are some key components of a desirable public safety communications policy for first responders described in the PSWAC study and in more recent reports, testimony, and other comments cited in this report. According to these sources, a national policy for public safety communications needs to address and correlate a myriad of complex goals, such as

- Coordinated assignment and use of spectrum at various frequencies.
- Muscular and sustained efforts to complete the development and application of technical and operational standards.
- Public sector adaptation of new technologies already available in the private sector such as for high-speed, data rich, and video or image transmissions.

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[128] (...continued)
Intelligence Reform and Terrorism Prevention Act, Title VII, Sec. 7403.

[129] An Amber Alert is used to locate missing children. It is named after Amber Hagerman, kidnaped and murdered in 1996; also referred to as the AMBER Plan, for America's Missing: Broadcast Emergency Response. websites with additional information include [http://www.amberalertnow.org], [http://www.amberalert911.org] and the site of the National Center for Missing and Exploited Children [http://www.ncmec.org]. All sites viewed June 23, 2005. See also CRS Report RS21453, *Amber Alert Program Technology*, by Linda K. Moore. The program and policy issues are discussed in CRS Report RL31655, *Missing and Exploited Children: Overview and Policy Concerns*, by Edith Cooper.

[130] Some key programs are discussed in the Appendix. See also CRS Report RL32527, *Emergency Communications: The Emergency Alert System (EAS) and All-Hazards Warnings*, by Linda K. Moore.

[131] The Public Safety Wireless Advisory Committee (PSWAC) was chartered in 1995, at the request of Congress, to study public safety spectrum and make recommendations for meeting spectrum needs through the year 2010. The following year, PSWAC submitted a report containing recommendations for the improvement of public safety communications over wireless networks. *Final Report of the Public Safety Wireless Advisory Committee*, September 11, 1996.

- Long-term support of research and development for new technology.
- Coherent goals that encourage private investment in technology development.
- Nationwide network of communications operations centers (regional signal corps) that can serve as back-up facilities to each other and to state and interstate centers and networks.
- Interoperability of communications among first responders and public safety agencies.
- Managerial structure that can successfully coordinate not only disparate federal, state, and local agencies but also the different cultural and technical needs of independent first responder units.
- Framework to match policy goals with implementation needs to assure the effectiveness of federal funding for programs and grants.

Provisions in the Intelligence Reform and Terrorism Prevention Act

Congress has responded with provisions in the Intelligence Reform and Terrorism Prevention Act that provide specific instructions to federal departments and agencies to take actions to meet many of the goals outlined above, as well as respond to other concerns articulated by the public safety community. Key tasks that the act requires for public safety communications include

- Sense of Congress that it must pass legislation that resolves spectrum release as part of the transition to digital television; first session. Sec. 7501.
- Requirement for a study on spectrum for public safety and homeland security; December 2005. Sec. 7502 (a).
- Requirement for a study on strategies to meet interoperable communications needs; December 2005. Sec. 7502 (b).
- Report on plan to accelerate development of national interoperable standards, including milestones and achievements; April 2005. Sec. 7303 (b).[132]
- Establishment by the President of a mechanism for coordinating cross-border interoperability issues with Canada and Mexico; June 2006. Sec. 7303 (c).

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[132] Responding to a CRS inquiry on status, DHS has indicated that the report has been completed and is in review.

- Requirement to establish at least two pilot projects in high threat or urban areas for interagency communications; March 2005. Sec. 7304 (a).[133]

- Reports on interagency communications pilots; interim, June 2005; final June 2006. Sec. 7304 (e).

- Authorization of funds for interoperable communications projects within DHS (not grant funds); fiscal years 2005 through 2009. Sec. 7303 (a) (3).

- Requirement for a study on the use of telephone, wireless and other existing communications networks as a means of providing a nationwide emergency notification system; September 2005. Sec. 7403.[134]

- Requirement for a pilot study using a warning system similar to the Amber Alert communications network (using funds made available for improving the national warning system regarding terrorist attacks) with a report on findings and recommendations; September 2005. Sec.7404.

Some Key Requirements in Presidential Memorandum on Spectrum Use

Partly concurrent with requirements from Congress regarding improved communications and spectrum use are a number of federal programs and deadlines set by the President.[135] Requirements with near-term deadlines that have a bearing on public safety are

- Requirement for the Office of Management and Budget (OMB) to provide guidance for federal agencies regarding the identification of spectrum requirements and the costs of investments in spectrum-related programs; May 2005.

- Requirement for agencies to implement methods recommended by OMB, including steps to ensure greater consideration of more efficient and cost-effective spectrum use; November 2005.

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[133] Responding to a CRS inquiry on status, DHS has indicated that the pilot project program is being reviewed.

[134] The Department of Homeland Security is testing all types of digital technologies in pilots to develop an integrated alert system known by the acronym IPAWS.

[135] "Presidential Determination: Memorandum for the Heads of Executive Departments and Agencies," November 30, 2004, Office of the Press Secretary, News & Policies, at [http://www.whitehouse.gov/news/releases/2004/11/20041130-8.html]. Viewed October 13, 2005.

- Requirement for the Secretary of Commerce to provide agency-specific strategic spectrum plans; November 2005.

- Requirement for the Secretary of Homeland Security to identify public safety spectrum needs; May 2005.

- Requirement for the Secretary of Homeland Security to develop a comprehensive plan — the Spectrum Needs Plan — to address issues that include spectrum use by the public safety community; November 2005.

What's Been Accomplished

A survey of recent, key federal actions in areas concerning interoperability might be summarized as follows

- Participation in a number of demonstration projects (e.g., Homeland Security Urban Area Security Initiative).

- Planning for rationalization and improvement of federal communications networks (e.g., Integrated Wireless Network).

- Conducting pilot, part of the Integrated Public Alert and Warning System (IPAWS), to test an all-digital emergency alert network. This project may be expanded to include the Congressional requirement for a pilot using Amber Alert technology.

- Provision of planning tools and consultative services to state and local first responders (e.g., SAFECOM programs).[136]

- Assistance in improving standards (for example, requirements for compatibility with Project 25 standards) and identifying needs for standards (e.g., SAFECOM's requirements documents).

- Improvements in spectrum management for public safety (e.g., FCC creation of the National Coordinating Committee and plans for rebanding to reduce interference on public safety radio channels).

- Planned studies and pilots required by Congress and the Administration (noted above).

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[136] Testimony of Michael D. Brown, Under Secretary of Homeland Security for Emergency Preparedness and Response, "Federal Emergency Management Agency," House of Representatives, Committee on Appropriations, Subcommittee on Homeland Security, March 9, 2005.

Appendix I - Federal Administration

The lead federal program for fostering interoperability is administered by the Wireless Public SAFEty Interoperable COMmunications Program, dubbed Project SAFECOM,[137] part of the Department of Homeland Security. The key federal agencies for spectrum management in first responder communications are the Federal Communications Commission (FCC) and the National Telecommunications and Information Administration (NTIA). Among other responsibilities, the FCC supervises spectrum for non-federal public safety agency communications. The NTIA — part of the Department of Commerce — administers spectrum used by federal entities. SAFECOM has not to date played a major role in spectrum policy. DHS has created an Office of Interoperability and Compatibility (OIC) of which SAFECOM is a part. In June 2004 DHS announced the creation of a Regional Technology Integration Initiative. DHS has also announced the organization of a National Incident Management System (NIMS) in response to a Presidential Directive (HSPD-5).[138] A NIMS Integration Center is planned to deal with compatibility and could be responsible for at least some interoperable communications.

National Telecommunications and Information Administration

To address the need for interoperability spectrum, in June 1999 the NTIA designated certain federally-allocated radio frequencies for use by federal, state, and local law enforcement and incident response entities. The frequencies are from exclusive federal spectrum, and are adjacent to spectrum used by state and local governments. NTIA's "interoperability plan," — developed in coordination with the Interdepartmental Radio Advisory Committee (IRAC)[139] — is used to improve communications in response to emergencies and threats to public safety. In 1996, the NTIA created a public safety program to coordinate federal government activities for spectrum and telecommunications related to public safety. Today, its successor, the Public Safety Division of the Office of Spectrum Management, participates in various initiatives to improve and coordinate public safety communications. The Division is preparing a *Spectrum Efficiency Study* and an *Interoperable Communications Summary Guide*.[140] Two forums on public safety and spectrum use have been sponsored by the NTIA, one in June 2002 and another in February 2004.[141]

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[137] Additional information is at [http://www.safecomprogram.gov/].

[138] Full document at [http://www.dhs.gov/interweb/assetlibrary/NIMS-90-web.pdf]. Viewed October 13, 2005.

[139] IRAC, with representation from 20 major federal agencies, develops policies for federal spectrum use, and represents the United States at International Telecommunications Union conferences. See [http://www.ntia.doc.gov/osmhome/irac.html]. Viewed October 13, 2005.

[140] Additional information at [http://ntiacsd.ntia.doc.gov/pubsafe/]. Viewed JOctober 13, 2005.

[141] Agenda and reports of the 2004 Public Safety Forum are available at [http://www.ntia.doc.gov/ntiahome/ntiageneral/specinit/forum2/]. Viewed October 13, 2005.

Federal Communications Commission

Over roughly the last 20 years, the FCC has initiated several programs that involve state, local, tribal and — usually — private sector representatives. In 1986, it formed the National Public Safety Planning Advisory Committee to advise it on management of spectrum in the 800 MHZ band, newly designated for public safety. The following year, the FCC adopted a Public Safety National Plan that, among other things, established Regional Planning Committees (RPC) to develop plans that met specific needs. The FCC encourages the formation of RPCs with a broad base of participation. The RPCs have flexibility in determining how best to meet state and local needs, including spectrum use and technology.

The regional planning approach is also being applied to spectrum in the Upper 700 MHz band.[142] Technical and operational standards, including interoperability standards, were developed and recommended to the FCC through the Public Safety National Coordination Committee (NCC). Standards for narrowband radio applications, for example, were recommended to the FCC and adopted in early 2001. Established by the FCC in 1999 and ended in 2003, the NCC had a Steering Committee from government, the public safety community, and the telecommunications industry.

Homeland Security. After Hurricane Katrina, the FCC proposed to establish a panel to examine the impact of Hurricane Katrina and make recommendations to the FCC regarding actions it might take to improve public safety operations, disaster preparation, and network reliability. The FCC is also planning to work with Congress to establish a Public Safety/Homeland Security Bureau within the FCC. The new bureau would have responsibility for coordinating pubic safety, homeland security, and disaster management activities at the FCC.[143]

Among past actions by the FCC specifically in support of homeland security were the chartering of the Media Security and Reliability Council (MSRC)[144] and the renewal of the charter for the Network Reliability and Interoperability Council (NRIC).[145] Both of these are Federal Advisory Committees. MSRC has been active in evaluating the effectiveness of the Emergency Alert System. The primary role of NRIC is to develop recommendations for best practices for private sector telecommunications to insure optimal reliability, interoperability, and connectivity of networks. The current NRIC focus groups are: Near Term Issues, E911; Long Term Issues, E911; Best Practices, E911 and Public Safety; Emergency Communications Beyond E911; Best Practices, Homeland Security - Infrastructure; Best Practices, Homeland Security - CyberSecurity; Best Practices, Wireless Industry; Best Practices, Public Data Networks; and Broadband.

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[142] See [http://wireless.fcc.gov/publicsafety/700MHz]. Viewed October 11, 2005.

[143] FCC News, "FCC Takes Steps to Assist in Hurricane Katrina Disaster Relief," September 15, 2005 at [http://www.fcc.gov].

[144] See [http://www.fcc.gov/MSRC/Welcome.html]. Viewed October 13, 2005.

[145] See [http://www.nric.org].

Spectrum and Interoperability. The FCC's strategic goal for spectrum is to "Encourage the highest and best use of spectrum domestically and internationally in order to encourage the growth and rapid deployment of innovative and efficient communications technologies and services."[146]

Regarding interoperability, the FCC describes its role as "directing efforts toward allocating additional spectrum for public safety systems, nurturing technological developments that enhance interoperability and providing its expertise and input for interagency efforts such as SAFECOM."[147] However, the FCC asserts that there are limitations on what it can do. "The Commission is only one stakeholder in the process and many of the challenges facing interoperability are a result of the disparate governmental interests . . . making it difficult to develop and deploy interoperable strategies uniformly."[148]

Department of Homeland Security, Office of Interoperability and Compatibility

The function of the Office of Interoperability and Compatibility (OIC) is to address the larger issues of interoperability. Among the goals of the OIC is the "leveraging" of "the vast range of interoperability programs and related efforts spread across the Federal Government" to "reduce unnecessary duplication" and "ensure consistency" in "research and development, testing and evaluation (RDT&E), standards, technical assistance, training, and grant funding related to interoperability." To achieve this, DHS will create within OIC "a series of portfolios to address critical issues." The OIC's initial priorities are for communications (SAFECOM), equipment, training and "others as required." To fulfill the portfolios, OIC will use a "systems engineering or lifestyle approach" to create "action plans." These will be "developed through a collaborative process that brings together the relevant stakeholders to provide clear direction on a path forward." This "end-user" input is expected to produce "a strategy and action plan" for each portfolio.[149] No time line for accomplishing these planned steps has of yet been provided,

SAFECOM. With the support of the Administration, Project SAFECOM was designated the umbrella organization for federal support of interoperable

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[146] See [http://www.fcc.gov/omd/strategicplan/#goals]. Viewed October 13, 2005.

[147] Testimony of John B. Muleta, Chief, Wireless Telecommunications Bureau, Federal Communications Commission at Hearing of the House of Representatives, Committee on Government Reform, Subcommittee on Technology, Information Policy, Intergovernmental Relations and the Census, "More Time, More Money, More Communication?" September 8, 2004.

[148] Ibid.

[149] Testimony of Dr. David G. Boyd, Program Manager, SAFECOM and Deputy Director, Office of Systems Engineering & Development, Science and Technology Directorate, Department of Homeland Security, Hearing of the House of Representatives, Committee on Government Reform, Subcommittee on National Security, Emerging Threats, and International Relations, "Public Safety Interoperability: Look Who's Talking Now," July 20, 2004.

communications. It was agreed within DHS that SAFECOM would be part of the Science and Technology Directorate, in line with a policy for placing technology prototype projects under a single directorate; this decision was reportedly based on the research-oriented nature of the programs envisioned for SAFECOM by its administrators.[150] The Intelligence Reform and Terrorism Prevention Act affirmed this decision by giving DHS the authority to create an office for interoperability within the Science and Technology Directorate and to manage SAFECOM as part of that effort.[151] SAFECOM has released a template for interoperability planning that can be used by states to establish a strategy for interoperability[152] and is preparing a methodology to establish a baseline for interoperability achievements as an evaluation tool to measure the success of future interoperability programs. SAFECOM expects to release initial findings on the baseline measurement some time in 2006.[153]

SAFECOM absorbed the Public Safety Wireless Network (PSWN) Program, previously operated jointly by the Departments of Justice and the Treasury. PSWN was created to respond to recommendations made by the Public Safety Wireless Advisory Committee regarding the improvement of public safety communications over wireless networks. PSWN operated as an advocate for spectrum management policies that would improve wireless network capacity and capability for public safety. SAFECOM, however, has no authority over spectrum management decisions. The following quote is a summary of SAFECOM's position on spectrum policy.

> Spectrum policy is an essential issue in the public safety communication arena. Unfortunately, State and local public safety representatives are frequently not included in spectrum policy decisions, despite their majority ownership of the communications infrastructure and their importance as providers of public and homeland security. SAFECOM will hence play a role in representing the views of State and local stakeholders on spectrum issues within the Federal Government. Last year, SAFECOM was appointed to an interagency Spectrum Task Force to contribute such views, and the ongoing working relationship that has developed between SAFECOM and the FCC will, we believe, pay huge dividends in the future.[154]

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[150] "Homeland Security Starting Over With SAFECOM," Government Computer News, June 9, 2003.

[151] P.L. 108-458, Title VII, Subtitle C, Sec. 7303 (a) (2).

[152] Statewide Communication Interoperability Planning (SCIP) Methodology, SAFECOM Program, Directorate of Science and Technology, Department of Homeland Security at [http://www.safecomprogram.gov/SAFECOM/library/interoperabilitycasestudies/1223_statewidecommunications.htm]. Viewed April 26, 2005.

[153] Oral testimony of Dr. David G. Boyd, Program Manager, SAFECOM and Deputy Director, Office of Systems Engineering & Development, Science and Technology Directorate, Department of Homeland Security, at hearing, House of Representatives, Committee on Energy and Commerce, "Public Safety Communications from 9/11 to Katrina: Critical Public Policy Lessons," September 29, 2005.

[154] Boyd, Hearing, July 20, 2004.

SAFECOM was chosen in October 2001 as one of 24 e-government initiatives. It was categorized as a government-to-government initiative in the original strategizing for e-government programs.[155] When SAFECOM was created in 2001, the managing partner for SAFECOM was the Department of the Treasury. Subsequently, the program was assigned to the Federal Emergency Management Agency (FEMA), following FEMA when it moved to the Emergency Preparedness and Response Directorate of the Department of Homeland Security (DHS). Once at DHS, SAFECOM was assigned to the Directorate of Science and Technology. As the Government Accountability Office (GAO) has noted in testimony and reports,[156] the change in leadership has delayed progress at SAFECOM. The GAO has also expressed concern over a lack of leadership and focus and raised questions of governance. Testimony by David Boyd[157] has stressed the importance to SAFECOM of more authority in certain funding decisions and in its interactions with other federal agencies, and the need for an in-depth gap analysis — the assessment of current levels of interoperable communications capability compared to requirements.

The GAO has recommended that the Director of the Office of Management and Budget work with DHS to review SAFECOM's functions and establish a long-term program with appropriate authority and funding to coordinate interoperability efforts across the federal government.[158]

Other notable observations from the GAO include:

- The fragmented federal grant structure for first responders does not support statewide interoperability planning. SAFECOM has developed grant guidance for interoperability, but cannot require that consistent guidance be incorporated in all federal first responder grants.

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[155] Office of Management and Budget, *Implementing the President's Management Agenda for E-Government: E Government Strategy*, February 27, 2002, p.13.

[156] For example, U.S. Government Accountability Office, *Federal Leadership and Intergovernmental Cooperation Required to Achieve First Responder Interoperable Communications*, GAO Report GAO-04-963T (Washington: July 20, 2004); and U.S. Government Accountability Office, *Federal Leadership Needed to Facilitate Interoperable Communications Between First Responders*, GAO Report GAO-04-1057T (Washington: September 8, 2004).

[157] Testimony of Dr. David G. Boyd, Program Manager, SAFECOM and Deputy Director, Office of Systems Engineering & Development, Science and Technology Directorate, Department of Homeland Security, Hearing of the House of Representatives, Committee on Government Reform, Subcommittee on National Security, Emerging Threats, and International Relations, "Public Safety Interoperability: Look Who's Talking Now," July 20, 2004 and Hearing of the House of Representatives, Committee on Government Reform, Subcommittee on Technology, Information Policy, Intergovernmental Relations and the Census, "More Time, More Money, More Communication?" September 8, 2004.

[158] U.S. General Accountability Office, *Federal Leadership Needed to Facilitate Interoperable Communications Between First Responders*, GAO Report GAO-04-1057T (Washington: September 8, 2004).

- The federal government can provide the leadership, long-term commitment, and focus to help state and local governments meet interoperability goals. For example, the federal government can provide the leadership and support for developing (1) a national database of interoperable communications frequencies, (2) a common nomenclature for those frequencies, (3) a national architecture that identifies communications requirements and technical standards, and (4) statewide interoperable communications plans.[159]

SAFECOM, however, articulated a different approach in testimony and its 2003 Strategy Planning Session. In its strategy summary, it reported that it intends, over the course of 10 to 20 years, to "Adopt a national strategy from the bottom up to incorporate effective public safety communications."[160] Boyd also reaffirmed his belief that "any effort to improve communications interoperability must be driven from the bottom up."[161] This approach necessitates a focus on communications at the incident level. At this level, SAFECOM appears to be giving the greatest attention to improving radio interoperability, particularly through the deployment of cross-talk hardware. This decision in turn leads to an emphasis on increasing the amount of equipment standardization, improving operating standards and protocols, and consulting on how to install and use new equipment. According to Boyd's testimony, the focus for SAFECOM is on three areas: creation of an architectural framework, the development of standards, and the coordination of federal activities.[162] The architectural framework is intended to aid SAFECOM in determining priorities for the development of standards. The framework "will reflect a system-of-systems approach to develop interface standards to help improve the problem of communications interoperability."[163] It appears that it will be modeled along the lines of a pyramid, with decision-making starting at the base and building up. The organic nature of the SAFECOM model for infrastructure development apparently requires a long time-line (usually extending, in testimony, to 20 years) and resists description in terms of long-term goals and deadlines. By describing its achievements and plans within the framework of short-term milestones, many of which involve the preparation of studies by outside consultants, SAFECOM appears to have avoided addressing many of the strategic goals originally envisioned for its mission, without an official explanation for the shift in emphasis.

SAFECOM Strategy as an E-Government Initiative. In 2002 and 2003, OMB sequentially described SAFECOM's mission, milestones and goals. It appears that many of these goals have not been met, or have been modified. The 2002 E-Government Strategy document described SAFECOM's mission as follows:

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[159] Ibid.

[160] SAFECOM Strategy Planning Session," Executive Summary, May 2003 Findings, p. 4.

[161] Boyd testimony, *September 8, 2004*.

[162] Ibid.

[163] Ibid.

For public safety officials to be effective in their daily responsibilities, as well as before, during and after an emergency event, public safety agencies throughout all levels of government, i.e. federal, state and local, must be able to communicate with each other. This initiative would address the Nation's critical shortcomings in efforts by public safety agencies to achieve interoperability and eliminate redundant wireless communications infrastructures. At the same time, it would assist state and local interoperability and interoperability between federal public safety networks.

Value to Citizen: Coordinated public safety/law enforcement communication will result in saved lives, as well as better-managed disaster response. Consolidated networks will yield cost savings through reduction in communication devices, management overhead of multiple networks, maintenance and training.

Value to the Government: Billions of dollars could be saved through a right-sized set of consolidated, interoperable federal networks, linked to state wireless networks, resulting in a reduction in communications infrastructure, overhead, maintenance and training.[164]

Milestones - 2002. In February 2002, SAFECOM milestones, all planned for completion by the end of that year, included the following:

- Define the communications concept of operations for interaction that identifies the communications requirements to address the two highest probable threat scenarios: Bio terrorism and natural disasters.

- Develop an integrated public safety response solution that addresses the top two threat scenarios by using existing infrastructure augmented by available commercial capability.

- Complete a gap analysis of existing inventories of public safety wireless communications at federal, state and local level.[165]

Goals - 2003. In the April 2003 E-Government Strategy Report, the immediate (2003) goals for SAFECOM were restated, as follows:

- Define the requirements for first responder interoperability at state, local, tribal, and federal levels to develop a long-term architecture.

- Identify gaps between existing wireless systems and interoperability requirements.

- Develop national architecture

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[164] Office of Management and Budget, *Implementing the President's Management Agenda for E-Government: E Government Strategy*, February 27, 2002, p.30.

[165] Ibid, p. 15.

- Develop concept of operations for interoperability.[166]

Many Goals Not Met. Comparing the stated goals of SAFECOM as an e-government program, with its current progress and programs, it appears that the emphasis has been on short-term goals. There is virtually no indication, in testimony, of long-term planning for national interoperability. Among its accomplishments, SAFECOM has partly met the goal of developing a requirements statement with the qualitative assessment of communications needs at the incident level, as provided in the March 2004 "Requirements" document. A gap analysis is reportedly underway, with delivery planned for late 2005.[167] The "concept of operations" for "interaction" (2002) or "interoperability" (2003) could be equated with the pyramid structure advocated by SAFECOM, discussed below, and this may provide the framework for an "integrated public safety response solution." An integrated response solution and a national architecture are promised for the future.[168] The 2002 milestone of providing a plan to use "existing infrastructure augmented by available commercial capability" is being addressed if infrastructure is defined as local radio communications equipment bolstered by cross-patch hardware. It is not being met, and seems to have been rejected by SAFECOM, if infrastructure is meant to include wide-area networks, Internet communications backbones and other regional or national communications capacity that would provide broad-based communications the support.

In testimony,[169] OMB described SAFECOM goals as including the provision of "interoperable wireless solutions for Federal, state, and local public safety organizations," that would include "coordination of all Federal interoperability efforts." In OMB's description of long-term strategic goals, as outlined in the 2003 e-gov plan, there appears to be an implicit assumption that there are redundant wireless communications infrastructures that can be identified and eliminated. This planning document describes the SAFECOM initiative as addressing "critical shortcomings," including two significant points where communications interoperability is lacking; interoperability between *state and local* authorities, as well as interoperability between *federal* public safety networks. The plan indicates that some (unidentified) networks would be consolidated to yield costs savings. Further "Billions of dollars" in savings are presumed by creating a right-sized set of consolidated, interoperable federal networks, linked to state wireless networks. To date, there appears to be no information on SAFECOM plans for improving wireless communications networks at the national or regional level; the focus of the program

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[166] Office of Management and Budget, *Implementing the President's Management Agenda for E-Government: E Government Strategy*, April 2003, p. 30.

[167] U.S. Department of Homeland Security, Fact Sheet: Achieving First Responder Communications Interoperability - a Local, State and Federal Partnership, at [http://www.dhs.gov].

[168] *Boyd testimony, September 8, 2004.*

[169] *November 6, 2003 Statement of Karen Evans*, Testimony before a subcommittee of the House Committee on Government Reform, 108th Cong., 1st sess. [hereinafter cited as *November 6, 2003 Evans Statement*].

on hardware solutions at the incident level would seem to preclude plans for network interoperability or the establishment of standards for new interoperable technologies such as mesh networks or cognitive radios. Work at the incident level is primarily local, focused on short-range interoperability solutions. Wide area networks and nationwide, end-to-end communications rely on technologies not being tested or evaluated by SAFECOM at the incident level.

In particular, the build-from-the-bottom-up approach for interoperability, advocated by SAFECOM, would appear to be at odds with the e-government goal of achieving efficiencies at the communications network level. Modern networks, with their incorporation of software programs on chips, other software-programmable technologies, nanotechnology, and meshed communications systems, to cite some examples, are generally built out from a common design, requiring some degree of centralization. In that respect, the goals of the IWN appear to be more aligned to the original goals of the e-government strategy. Its intentions include the construction of a national network, the identification and prioritization of end-user functional requirements, and the use of open standards that would be adapted by other public safety agencies.

Evolution of SAFECOM's Goals . The explanation of SAFECOM provided in 2002 by OMB,[170] would suggest that the original mission was much broader than the milestones that have been used to chart progress. It is possible, therefore, that SAFECOM has not merely suffered delays because of changes in the managing partner, as the GAO has observed,[171] but also because it has changed course, redefining its purpose.

Regional Technology Integration Initiative

In June 2004, the Directorate of Science and Technology introduced a new initiative to facilitate the transition of innovative technologies and organizational concepts to regional, state, and local authorities.[172] The initiative has selected four urban areas from among those currently part of the Homeland Security Urban Area Security Initiative. Two of the areas that have been reported as choices are Cincinnati, Ohio and Anaheim, California.[173] Each area will reportedly receive $10 million to expand new systems that test more advanced technologies for public safety

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[170] Office of Management and Budget, *Implementing the President's Management Agenda for E-Government: E Government Strategy*, February 27, 2002, p.30.

[171] U.S. General Accountability Office, *Federal Leadership and Intergovernmental Cooperation Required to Achieve First Responder Interoperable Communications*, GAO Report GAO-04-740 (Washington: July 2004).

[172] DHS Press Releases, including "Homeland Security Launches Regional Technology Integration Initiative in Seattle," February 18, 2005 [http://www.dhs.gov/dhspublic/display?content=4362] and "Fact Sheet: Regional Technology Initiative" at [http://www.dhs.gov/dhspublic/display?theme=43&content=3704]. Viewed September 13, 2005

[173] "Department of Homeland Security funding initiative aims to spur interoperability among locals," by Jim McKay, Government Technology, September 2004, p. 1.

communications, including interoperability. Anaheim, for example, reportedly has created a virtual operations center (instead of a building), relying on network technology to connect police, fire, medical services and public utilities in case of an emergency. The announced goal is to get all who respond to disasters and other emergencies to work from a common base.[174]

National Incident Management System

NIMS also has announced plans to address questions of interoperability and communications, although no mention of spectrum policy is mentioned in the DHS report on NIMS issued March 1, 2004.[175] The objective for communications facilitation is summarized as "development and use of a common communications plan and interoperable communications processes and architectures."[176] NIMS envisions mandatory compliance with "national interoperable communications standards, once such standards are developed."[177] These standards will include interoperable wireless communications for "Federal, State, local and tribal public safety organizations."[178]

Integrated Wireless Network

The Integrated Wireless Network (IWN) for law enforcement is being planned as a joint program by the Departments of Justice, the Treasury, and Homeland Security. DHS is represented in the IWN Joint Program Office through the Wireless Management Office of the Chief Information Officer.[179] IWN, from its description, will have limited interoperability at the state and local level. The described objective of IWN is network integration for "the nation's law enforcement wireless communication, and data exchange capability through the use of a secure integrated wireless network."[180]

National Communications System

The National Communications System is assigned responsibility for telecommunications under the Secretariat of Information Analysis and Infrastructure

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[174] Ibid.

[175] "National Incident Management System," Department of Homeland Security, March 1, 2004, at [http://www.dhs.gov/interweb/assetlibrary/NIMS-90-web.pdf]. Viewed September 14, 2005

[176] Ibid, p. 11.

[177] Ibid, p. 50.

[178] Ibid, p. 52.

[179] Memorandum of Understanding Between the Department of Homeland Security, the Department of Justice, and the Department of the Treasury Regarding a Joint Tactical Wireless Communications System, at [http://www.usdoj.gov/jmd/iwn/schedule.html]. Viewed October 13, 2005.

[180] Request for Comment, Draft Phase 2 Request for Proposals, October 13, 2004, C.2.3 (a), page 8 at [http://www.usdoj.gov/jmd/iwn/schedule.html]. Viewed October 13, 2005.

Protection within DHS.[181] It was originally within the Department of Defense, established by Executive Order in 1984 "to assist the President . . . in 1) the exercise of the telecommunications functions and responsibilities, and (2) the coordination of the planning for and provision of national security and emergency preparedness communications. . ." It consults with the National Security Telecommunications Advisory Committee (NSTAC), among others, on issues related to national security and emergency preparedness telecommunications. It is closely linked to the White House through NSTAC, which advises the President on national security telecommunications matters, and the National Security Council.[182]

Its primary functions for National Security and Emergency Preparedness are to assure critical telecommunications access for selected federal and state agencies, to coordinate restoration of service with the private sector, and to establish priorities in the restoration of service. Among its services in time of disaster, NCS operates the National Coordinating Center (NCC) for Telecommunications — which coordinates public and private sector efforts to restore telecommunications — and manages an Individual Mobilization Augmentee program to in bring civilian and military reservists to assist recovery efforts.[183]

Other Coordinating Bodies

SAFECOM has created a Federal Interoperability Coordination Council (FICC), made up of "all the federal agencies with programs that address interoperability."[184] Previously, as part of its e-government mandate to rationalize federal programs for interoperability, SAFECOM met with representatives from 60 different programs operated by the federal government or funded by or partnered with a federal agency. Many of these programs include state committees and national associations such as the Association of Public-Safety Communications Officials - International (APCO).[185] Part of the National Coordination Committee's mission was to encourage the creation of Statewide Interoperability Executive Committees (SIEC),[186] to take part in coordination efforts. The National Public Safety Telecommunications Council (NPSTC) is another important coordinating body. NPSTC unites public safety associations to work with federal agencies, the NCC, SIECs and other groups to address public safety communications issues.[187] It has been supported by the

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[181] Hoemleand Security Act of 2002, P.L. 107-296, Sec. 201 (e) (19) (g) (2).

[182] See [http://www.ncs.gov].

[183] See [http://www.ncs.gov/services.html].

[184] Boyd testimony, September 8, 2004.

[185] See [http://www.apcointl.org/].

[186] A discussion of the role of SIECs, and a recommendation to mandate their use, is contained in testimony by Stephen T. Devine, Missouri SIEC Chairperson, Missouri State Highway Patrol, at Hearing of the House of Representatives, Committee on Government Reform, Subcommittee on National Security, Emerging Threats, and International Relations, "Public Safety Interoperability: Look Who's Talking Now," July 20, 2004.

[187] Information at [http://npstc.org].

AGILE Program, created by the National Institute of Justice (NIJ).[188] AGILE has addressed interim and long-term interoperability solutions in part by testing standards for wireless telecommunications and information technology applications. The AGILE Program also has provided funding to Regional Planning Committees for start-up costs and the preparation and distribution of regional plans. AGILE is being restructured, to be replaced by a more limited function in Communications Technology, CommTech. CommTech is not designed to play a primary role in coordinating interoperability policy within the public safety community.

The SIECs, NPSTC, Regional Planning Committees and other federally-supported but not federally-directed organizations play key roles as facilitators in advancing programs for public safety communications. In recent testimony quoted above,[189] both SAFECOM and the FCC have described their roles primarily as facilitators also. SAFECOM and DHS, in its plans for the Office of Interoperability and Compatibility, seem to place a high priority on consultative functions. It appears that OIC policy will focus on portfolios of recommendations for achieving interoperability at an incident site and not on establishing the higher levels of interoperability provided by network support and back-up from regional communications command centers. In its discussions of Emergency Operations Centers and Incident Command Systems, however, NIMS seems to indicate the need for a national network architecture and fixed as well as mobile operations centers for communications network support. The Regional Technology Integration Initiative has been established to Act as a catalyst between existing technology used by first responders and the innovative technology needed in the future. It seeks to work at the local, state and regional levels but appears to favor solutions that can be applied on a regional basis.

[188] AGILE stands for Advanced Generation of Interoperability for Law Enforcement. See [http://www.ojp.usdoj.gov/nij/topics/commtech/] Viewed October 13, 2005.

[189] Boyd and Muleta, Hearing, July 20, 2004.