VOICE OVER INTERNET PROTOCOL (VoIP) AND THE FUTURE OF 9-1-1 SERVICES

HEARING

BEFORE THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION UNITED STATES SENATE

ONE HUNDRED TENTH CONGRESS

FIRST SESSION

APRIL 10, 2007

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SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ONE HUNDRED TENTH CONGRESS

FIRST SESSION

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VOICE OVER INTERNET PROTOCOL (VoIP) AND THE FUTURE OF 9-1-1 SERVICES

TUESDAY, APRIL 10, 2007

U.S. SENATE,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Washington, DC.

The Committee met, pursuant to notice, at 2:30 p.m. in room SR–253, Russell Senate Office Building, Hon. Daniel K. Inouye, Chairman of the Committee, presiding.

OPENING STATEMENT OF HON. DANIEL K. INOUYE, U.S. SENATOR FROM HAWAII

The CHAIRMAN. This afternoon, the Committee will examine the provisions of Enhanced 911, known as E–911, as well as specific issues related to S. 428, introduced by Senators Nelson and Snowe earlier this year.

9-1-1 is the most effective means for Americans to contact emergency services. It was created nearly 30 years ago, and it has come to mean that help is only a phone call away. As technology has advanced, so has 9-1-1 service.

Now many places in the Nation have E–911. In these areas, when you call for help, your phone number and your location are automatically transmitted to emergency personnel. If your call is disconnected or you're disoriented or do not know your location, this information can make all the difference in securing your safety.

But the E–911 system was built for wireline service. So as technology advanced and wireless phones grew in popularity, we worked to apply E–911 principles to wireless service. With the advent of Voice over Internet Protocol, we are challenged again to ensure that our 9-1-1 polices are up to date.

In 2005, the FCC required interconnected VoIP providers to offer E–911 service. With millions of VoIP customers in the United States, there is no doubt that this measure has saved lives. Today, we'll consider what additional measures are needed to ensure that VoIP E–911 not only works, but works well.

When it comes to public safety, and services like E–911, we must always strive to do better. If questions arise about new communications services, we should tackle them. If questions arise about the location accuracy of E–911 in existing services, we must tackle them, too. When lives are on the line, first responders need location information that is as accurate as possible.

I'd like to thank Senator Nelson and Senator Snowe for their leadership on E–911 and IP-enabled services. I look forward to

hearing from our witnesses today. But, before we do, may I call upon the Vice Chairman, Senator Stevens, who will soon become the Strom Thurmond of the Arctic Circle.

[Laughter.]

STATEMENT OF HON. TED STEVENS, U.S. SENATOR FROM ALASKA

Senator STEVENS. I don't know what I'm going do with you, Dan.

[Laughter.]

Senator STEVENS. Mr. Chairman, thank you very much. I hope you'll print my full statement in the record.

In my statement, I point out that the Committee already secured $43.5 million for grants to improve our country's 9-1-1 capability in the 9/11 Commission's Recommendations bill. Ensuring that 9-1-1 capability exists for all voice services, including wireline, wireless, and Internet Protocol is the next critical step.

What's not in that statement is my favorite story of the two snow mobilers that were going across the snowfilled area south of Mount McKinley, and they were sort of racing and shouting at one another, and all of a sudden one of them hit a crevasse and just disappeared. And the other one raced up to the edge of the crevasse and looked down, and there is the first snow-mobiler, his skis and the wheels had stuck in the crevasse, and he's standing on the seat trying to figure out how to get up about 70 feet to where his friend was, at the land level. And he couldn't figure out what to do, and he suddenly remembered his cell phone, and he dialed 9-1-1, and luckily there was a satellite going over. It was picked up, and 25 minutes later the National Guard pulled him out of that crevasse. Now, that's what 9-1-1 means to my part of the country. And E–911 will mean even more.

So, I'm delighted to have you all here this afternoon.

Thank you very much.

[The prepared statement of Senator Stevens follows:]

PREPARED STATEMENT OF HON. TED STEVENS, U.S. SENATOR FROM ALASKA

I would like to thank Chairman Inouye for calling this afternoon's hearing. 9-1-1 calls serve as the first point of communications between the public and our Nation's first responders and is critical to our Nation's safety and security.

As a co-chair of the 9-1-1 caucus, I hope that we will be able to move forward with legislation to address the outstanding issues related to 9-1-1. I also look forward to hearing from the witnesses about how we can improve our 9-1-1 service throughout the country, including in Alaska.

Upgrades to the 9-1-1 network are critical, but we will fail if rural America is left behind.

The Senate already secured $43.5 million for grants to improve our country's 9-1-1 capability in the 9/11 Commission bill. Ensuring that 9-1-1 capability exists for all voice services, including wireline, wireless and Internet protocol, is the next critical step.

It is also critical that the technology work properly. I was concerned to hear recent reports that have indicated that the location accuracy can vary greatly throughout the country. It is important that we continue to improve this capability.

The FCC, under Chairman Martin's leadership, has done an outstanding job regarding 9-1-1. But issues of liability protection and ensuring that everyone has the same access to 9-1-1 components, including the disabled community, are issues that require the further attention of Congress.

I am pleased to see that under Senator Inouye's capable leadership, public safety communications and 9-1-1 will continue to be a central focus of this committee's communications agenda. Thank you.

The CHAIRMAN. I thank you, sir.

And, Senator Nelson?

STATEMENT OF HON. BILL NELSON,
U.S. SENATOR FROM FLORIDA

Senator NELSON. Well, let me thank you, Mr. Chairman. And thanks to you and Senator Stevens for bringing up this legislation.

I'll tell a story that happened in my State of Florida, in Deltona, which is a town just north of Orlando, a couple of years ago. A young mother had an emergency with her daughter, and she dialed 9-1-1. Well, what they didn't know was they had VoIP service. And so, there was no 9-1-1 on VoIP, which is one of the personal stories that has spurred me to action in offering this legislation.

Thanks to you all for your leadership, the two of you. You took the essence of this bill that's in front of us and passed it last year in the Senate, and then the House stripped it out. Since then, the Federal Communications Commission has taken some action. I appreciate that very much. But there are some holes that we need to fill, and that's why, along with Senator Snowe and Senator Clinton, we filed this legislation, S. 428. It resolves any remaining issues regarding the FCC's jurisdiction over VoIP services by putting it in the code and building on the regulations that have been issued by the FCC. In addition, it resolves issues relating to the potential liability of VoIP providers who provide that access to 9-1-1 services. Finally, the legislation takes a critical step toward ensuring the development of a new 9-1-1 network. Boy, did we see the need for that in Katrina, when people would call, but the 9-1-1 center wasn't operating because it was under water. Well, when you go completely digital, those little packets of information will find their way around until they find a center that is working. And so, this new network will be resilient, it will be redundant, and it will allow calls to be automatically rerouted so that they can get them to working facilities.

Despite the tragedy—and we've had others you know—we now have Professor Gray, at Colorado State University saying that because of La Niña, this is going to be a very active hurricane year. And I certainly hope that they do not hit a land mass, but, if they do, it's just another example that we'd better be ready.

So, time is not on our side. Lives are at stake. And I'm very grateful to you, Senator Inouye, Mr. Chairman, and Mr. Vice Chairman, Senator Stevens, for having a hearing on the bill.

The CHAIRMAN. I thank you very much.

This afternoon, we have five outstanding witnesses: Mr. Dale Hatfield, former Chief of the Office of Engineering and Technology at the Federal Communications Commission, now at the University of Colorado at Boulder; Ms. Wanda McCarley, President, Association of Public-Safety Communications Officials International, Incorporated, and Operations Manager, Tarrant County 9-1-1 District in Texas; and Mr. Jason Barbour, President, National Emergency Number Association, and 9-1-1 Director, Johnston County, North Carolina; Ms. Sharon O'Leary, Executive Vice President, Chief Legal Officer, Vonage, of New Jersey; Mr. Stephen Meer, Chief Technology Officer, Intrado, Incorporated, of Colorado.

And may I now recognize Mr. Hatfield?

**STATEMENT OF DALE N. HATFIELD, FORMER CHIEF,
OFFICE OF ENGINEERING AND TECHNOLOGY,
FEDERAL COMMUNICATIONS COMMISSION;
INDEPENDENT CONSULTANT AND ADJUNCT PROFESSOR,
INTERDISCIPLINARY TELECOMMUNICATIONS PROGRAM,
UNIVERSITY OF COLORADO AT BOULDER**

Mr. HATFIELD. Thank you very much, Mr. Chairman and members of the Commerce Committee. I'm very pleased and honored to appear before you today to testify on important national issues associated with Voice over Internet Protocol and the future of 9-1-1 services.

My name is Dale Hatfield, and I'm currently an independent consultant and adjunct professor at the University of Colorado at Boulder. As detailed in my prepared testimony, I have some other affiliations, but today I'm testifying on my own behalf as a private citizen.

My involvement in 9-1-1 issues goes back to the late 1990s, when I was Chief of the Office of Engineering and Technology at the FCC. I retired from that position and government service in 2000, and, about a year later, the Commission asked me to conduct an independent study into the technical and operational issues associated with wireless 9-1-1. The final report of my inquiry was submitted to the agency in October of 2002.

In my full written testimony, I touch on three of the overarching findings from my 2002 report, including the need to modernize our wireline E–911 infrastructure, a critical need that I was, of course, pleased to see is being addressed in S. 428, introduced by Senators Nelson and Snowe.

The FCC came back to me in 2005 and asked me to update my earlier report. At the time, they were unable to fund a comprehensive update, and consequently settled on the state of work that encompassed three areas, one, providing an independent view of the current state-of-the-art in wireless location technologies; two, reviewing the technical and other interrelationships between wireless E–911 and nomadic Voice over IP issues; and, three, evaluating the technical and other challenges faced by smaller wireless carriers in deploying what we refer to as Phase II wireless E–911.

As some of you may know, the FCC stopped my work on the second report in the spring of last year. However, in the time I have remaining, I'd like to share with you some of the recommendations that I was contemplating when the work was terminated.

First, the Commission should take appropriate steps to encourage the stakeholders to agree on a common testing methodology for assessing location accuracy in wireless 9-1-1 systems. This recommendation stemmed from my finding that even when public or non-public measurement data is available, differences in testing methodologies make it extremely difficult to interpret the results and to compare overall accuracies attained. That is, it's extremely difficult to make apples-to-apples comparisons across carriers, location technologies, types of geographic areas, and over time. Moreover, for reasons that I will explain in a moment, the revised methodology should take into account increased indoor usage of wireless devices.

Second, the Commission should arrange for the filing of aggregated accuracy measurement data using the common or more

standardized methodology. This aggregated data could, in turn, be used by the Commission staff or others to ascertain and routinely track the current state-of-the-art in location-based technologies in various environments, such as rural or urban or suburban. It may also be appropriate to report the state-of-the-art to the Congress on a regular basis, as well, since it affects all of us so directly.

Third, the Commission should take appropriate steps to encourage the development of hybrid, or blended, technologies that combine handset or GPS-satellite-based location solutions, which tend to work best outdoors and in less congested areas, and network or terrestrial triangulation-based systems, which tend to work best in more congested urban areas, where the cellular antenna sites are more densely packed and evenly distributed. This could go a long way toward solving the legitimate problems that rural carriers using network-based solutions face in meeting accuracy requirements where there are not enough antenna sites or the sites are geographically distributed in such a way that reliable triangulation is not possible.

Fourth, the Commission should formally investigate the issues associated with reliably locating wireless customers who call 9-1-1 when they are indoors. This was, and is, perhaps my most important recommendation. Its importance stems from two observations: (a) that an increasing fraction of all cellular calls, perhaps 40 to 60 percent, are made indoors from offices, homes, dormitories, hotel rooms, sports arenas, airports, and so forth; and (b) that an increasing number of customers are giving up their landline telephone and relying entirely upon their cellular phone for traditional voice communications services. Issues arise with handset-based solutions which depend upon the reception of GPS satellite signals to function properly. The fact that the GPS signals come in from far out in space means they are typically much weaker than the signals arriving at the handset from a nearby cellular tower. The result is that a cellular subscriber may be able to successfully complete a 9-1-1 call from within a building, but, in contrast, the satellite signals are too few or too weak to allow an accurate position fix to be obtained. Moreover, indoors, even network-based location systems may suffer, in terms of location accuracy, due to the weakening of additional terrestrial signals needed for triangulation. A solution, of course, that provides good in-building coverage for wireless customers could also be used to automatically locate nomadic VoIP-based use, as well.

Fifth, and finally, the Commission should work with their wireless carriers to ensure that customers understand the limitations of current location technologies, as compared to the wireline system, when they call 9-1-1.

That finishes the summary of my testimony, and I will conclude by saying that I applaud the Committee for addressing the critical issues associated with 9-1-1. And, of course, I'd be happy to answer any questions, when it's appropriate.

[The prepared statement of Mr. Hatfield follows:]

PREPARED STATEMENT OF DALE N. HATFIELD, FORMER CHIEF, OFFICE OF ENGINEERING AND TECHNOLOGY, FEDERAL COMMUNICATIONS COMMISSION; INDEPENDENT CONSULTANT AND ADJUNCT PROFESSOR, INTERDISCIPLINARY TELECOMMUNICATIONS PROGRAM, UNIVERSITY OF COLORADO AT BOULDER

Chairman Inouye, members of the Committee on Commerce, Science, and Transportation, and congressional staff, I am pleased and honored to appear before you today to testify on important national issues associated with Voice over Internet Protocol ("VoIP") and the Future of 9-1-1 Services. My name is Dale Hatfield and I am currently an independent consultant and adjunct professor at the University of Colorado at Boulder. In the interest of full disclosure, I should mention that I am also on the board of directors of Crown Castle International, a major operator of radio towers for the wireless industry here in the United States and Australia. In addition, along with two colleagues of mine at the University of Colorado, I was recently engaged by an industry group to study certain funding issues associated with the continued rollout of wireless E–911 services in the U.S. However, today I am testifying before you on my own behalf as a private citizen.

In today's testimony, I will emphasize how our E–911 policy should be responsive to a changed telecommunications landscape. The way we use our phones is markedly different than just a decade ago. People increasingly rely upon VoIP or cellular phones for voice communication, sometimes fully substituting such services in lieu of traditional wireline services. Moreover, VoIP and cellular calls are commonly made from indoor locations which present challenges relating to in-building location abilities. Today's changed telecommunications landscape makes the topic of E–911 particularly important and I commend this Committee for its attention to the topic.

Specifically, I would today like to explore three perspectives concerning the Future of 9-1-1 services. *First*, to provide some background context on the issue, I'll quickly provide a high-level overview of the results of an independent inquiry that I conducted for the Federal Communications Commission ("FCC" or "the Commission") in 2002. *Second*, I'll discuss my current observations on the topic, many of which stem from a subsequent investigation commissioned by the FCC in 2005, which requested that I update portions of my prior report. As some of you may know, the FCC stopped my work on this second report in the spring of last year. Accordingly, *third*, I will conclude by sharing some of the recommendations which I was contemplating when my work was terminated. As I will explain, I think it is important that the Commission take appropriate steps to encourage stakeholders to agree on a common testing methodology (or to at least reduce the differences and ambiguities associated with existing methodologies) for assessing location accuracy involved in finding 9-1-1 callers. Moreover, this revised methodology should take into account increased indoor usage of wireless devices.

My involvement in 9-1-1 issues goes back to the late 1990s when I was Chief of the Office of Engineering and Technology at the Federal Communications Commission ("FCC" or "the Commission"). I retired from government service in the year 2000 and about a year later—in November of 2001—the Commission asked me to conduct an independent inquiry into the technical and operational issues associated with *wireless* E–911. Early in the following year—2002—the agency announced the details of the inquiry whose purpose was—and I am essentially quoting from the Commission's formal notice—to obtain an expert, informed, unbiased assessment of the technical and operational issues that impact wireless E–911 deployment including any obstacles to deployment and steps that might be taken to overcome or minimize them. My independent inquiry got started in earnest in April 2002 and the final report was submitted to the agency in October of that same year.

While I do not intend to go back and review the findings and recommendations of that report in any detail in this testimony, certain aspects of the findings are still relevant today. In the report, I highlighted three over-arching findings:

First, I stressed the importance of E–911 in general and wireless E–911 in particular to the safety of life and property and to homeland security. I noted that Congress had acknowledged this importance with the passage of the Wireless Communications and Public Safety Act of 1999. I also noted how the continued growth in wireless—cellular phone—networks and the public's dependency upon them had further underscored the importance of wireless E–911. If I were writing that passage today I would point out that the importance and dependency has further increased as a rising percentage of all E–911 calls are made from wireless devices and some subscribers even give up their landline service and rely solely upon their cellular phones for basic voice services.

Second, in 2002, I pointed out that in the preceding years the center of attention of the industry had clearly shifted from discovering, developing, evaluating and selecting the ways of locating mobile units in wireless systems to integrating the loca-

tion information into the existing E–911 system. I regarded that as good news at the time because it indicated that there was no longer any real disagreement regarding the technical feasibility of providing wireless E–911 to the then approximately 130 million wireless subscribers in the United States. I went on to argue that the challenge at that point was to successfully complete the implementation of wireless E–911—a process that was still in its early stages at that point. The report also noted that the shift in emphasis to actual deployment of the technology had surfaced other issues and challenges that needed to be overcome to facilitate the timely rollout of wireless E–911—issues and challenges that I addressed in the main body of the report.

Viewed from today's perspective—nearly 5 years later—I would note that we have fallen short in terms of implementation because, as recently reported by National Emergency Number Association—NENA—". . . only fifty-four percent of Public Safety Answering Points ("PSAPs") covering two-thirds of the population have the necessary technology to locate wireless 9-1-1 callers." I would also note that—besides the emergence of VoIP which has created an additional set of challenges—the increased use of wireless devices inside buildings presents formidable challenges, a topic that I will address in more depth later in my testimony.

In the *third* initial finding in my report in 2002, I raised concerns about the technical limitations associated with the existing *wireline* E–911 network infrastructure. Namely, the existing infrastructure was largely built upon outdated analog technology in an increasingly digital world. I concluded that while the wireline E–911 network was generally recognized as being reliable, it was also recognized that it had serious limitations in terms of speed, scalability, and adaptability—limitations that not only burdened the development of wireless E–911 at the time but also constrained our ability to extend E–911 access to a myriad of emerging non-traditional devices and networks. While those limitations were understood to a certain extent in 2002, they are even more apparent today. For example, with the camera phone that I have in my pocket, in calling E–911, I could send a picture of a suspect's car speeding away from a crime scene because modern, all-digital packet switched networks based upon the Internet Protocol suite are perfectly capable of conveying voice, data, image and even video traffic. The challenges to that vision include not only the still-remaining limitations of the existing wireline E–911 infrastructure but also the ability of the PSAP to receive, process, and display such information.

While I have not studied in great detail S. 428, the bill known as the "IP-Enabled Voice Communications and Public Safety Act of 2007," I was gratified to find that it requires the National E–911 Implementation Coordination Office "to develop and report to Congress on a national plan for migrating to a national IP-enabled emergency network capable of receiving and responding to all citizen activated emergency communications. . . ." Such a network would not only facilitate wireless E–911 calling but also the handling of VoIP calls made over broadband wired networks.

With that background on my first report done on behalf of the FCC, I would now like to turn to some more recent efforts—and some of the tentative findings and recommendations that stem from that work. The FCC came back to me in 2005—about 3 years after the completion of my first report—and asked me to update it. At the time, they were unable to fund a comprehensive update and, consequently, we negotiated and settled on a statement of work that encompassed three areas:

- Providing an independent view of the current state-of-the-art in location technologies that were currently deployed
- Reviewing the technical and other interrelationships between Wireless E–911 and nomadic VoIP issues
- Evaluating the technical and other challenges faced by smaller carriers/telecommunications providers in deploying Phase II services

My proposed methodology for the update was the same as I used in my original report. Namely, I would conduct interviews with stakeholders and other technical experts, study peer-reviewed technical journal articles, review industry produced white papers, evaluate anecdotal evidence, etc. One hope was that stakeholders would be a little more open with me than they might be when dealing with other stakeholders or with the Commission itself. Additionally, in the spirit of achieving open communications with stakeholders, it was agreed early-on that I would focus my attention on longer range issues and not on the really contentious issues of the moment. For example, at that time, one of the really hot issues was the question of how big an area the wireless carriers should be allowed to average over in carrying out the accuracy measurements to demonstrate that they were in compliance with the Commission's rules and regulations. That is, the issue was whether the

averaging should be done on a PSAP-by-PSAP basis or, alternatively, over a state-wide or other larger area. While I had identified this issue in my earlier study, it had become so charged and contentious by the time of my second report that to address the issue would risk overshadowing the remainder of the study. Accordingly, this issue was left outside the scope of my second inquiry.

With regard to the first question I was to address in the second study—the state-of-the-art in location technology—I would like to offer the initial comment that I think it is an extremely important topic. We—including the general public—need to know how well the E–911 systems are doing in terms of the overall accuracy with which they are locating wireless callers. Specifically, it is important to know how well they are actually performing in operational systems in the field rather than in laboratory or other, more controlled settings. As the old management adage says, "You can't manage what you don't measure." Without information from measurements on operational systems, how can we tell whether things are improving and how, as consumers, can we make informed purchasing decisions? If, as has been reported, the FCC takes action to require wireless providers to improve accuracy, how will public safety officials and the public know that improvements are actually being achieved in the field?

Going directly to this point, when I began the second study, I quickly discovered that, in terms of the overall performance of currently deployed wireless E–911 systems, there was very little in the way of publicly available information upon which to ascertain the actual state-of-the-art in location technologies. However, by signing Non-Disclosure Agreements—NDAs—I was able to gain access to some actual performance information—routine measurements made on working systems. And, as it turned out, APCO, under its project LOCATE, had recently completed a series of accuracy measurements of their own in several markets with different topological and other characteristics. By signing an NDA, APCO very graciously made that information available to me; unfortunately, however, I was unable to fully absorb it before the FCC stopped my work in the spring of last year. Because of the NDAs I signed, I cannot talk now about that aspect of my work—the actual accuracy results being obtained—and will not do so.

Rather, what I would like to do in the remainder of my testimony here this afternoon is to give you a flavor of my *tentative* conclusions regarding other aspects of the study—conclusions relating to issues other than the one dealing with the actual position accuracies being obtained in the field. First, with regard to the overall problem of measuring location accuracy, I found that even when public or non-public measurement results were available, differences in testing methodology make it extremely difficult to interpret the results and compare the overall location accuracies obtained. That is, it is extremely difficult to make "apples to apples" comparisons across carriers, location technologies, types of geographic areas—urban, suburban and rural—and over time. Such differences in methodologies are primarily the result of the flexibility in test procedures permitted under the FCC's rules and the test procedures recommended by industry groups. These procedures—such as the ones addressed in Office of Engineering and Technology Bulletin 71 ("OET–71")—do not specify a detailed testing methodology; rather they provide what amounts to as guidance for the carriers and their vendors in creating such a detailed test methodology or plan.

From a regulatory perspective, there are some good reasons to provide such flexibility so that changes in technology, for example, do not require time consuming regulatory proceedings to change the agency's rules. Clearly such flexibility has advantages to the wireless carriers. But I found that such flexibility produces the difficulties in making valid comparisons as I touched upon a moment ago. More specifically, I observed that a major factor producing differing—or hard to compare—test results is how the locations for making the required test calls are determined.

Although not as important a factor, differences in the way handset- and network-based solutions work add an additional level of complexity in terms of comparing the performance of different location technologies. This is because, within the two basic technological approaches, there are significant tradeoffs among yield, time-to-first-fix and accuracy that have not been fully explored. For example, one technology (or one implementation of a technology) may produce a less accurate position location but produce it very quickly while another technology or implementation may produce a more accurate estimation of the location but at the cost of some delay. In that case, is the more accurate fix always to be preferred? Now that the location technologies are more mature, it may be time to investigate these tradeoffs in more detail.

Now otherwise legitimate differences in test methodologies—*e.g.,* how test calls are distributed geographically—or system implementations can result in potentially serious disagreements in terms of regulatory compliance and, for the purposes of the

study I was conducting, in terms of ascertaining the current state-of-the-art and the associated trends. Having observed this, I felt strongly—and still feel strongly—that serious repercussions could result if these and other differences in methodology (*e.g.,* between public safety entity-sponsored accuracy testing and carrier-sponsored testing) are left unresolved.

A critical example of the importance of location weighting is what percentage of the test calls are made from inside buildings as opposed to out in the open. For reasons that I will expand upon in a moment, this is especially true of handset-based solutions which depend upon the reception of Global Positioning System ("GPS") satellite signals to function properly. The fact that the GPS signals come from far out in space means that they are typically much weaker than the signal arriving at the handset from a nearby cellular tower. The result is that a cellular subscriber may be able to successfully complete a 9-1-1 call from within the building while, in contrast, the satellite signals are too few or too weak to allow an accurate position fix to be obtained. That is, you can complete the call but you cannot be automatically located. If it is true that as many as 40–60 percent of all cellular calls are made indoors—from an office, home, sports arena, restaurant, airport or whatever, then it follows that a corresponding percentage of test calls should be made from such locations. I do not believe that is the case today.

Still another factor that bears heavily upon this issue is the phenomenon that younger people—such as college students—and other people in our society are increasingly giving up their landline telephone and relying entirely upon their cellular phone for traditional voice communications. This continuing trend, known as wireless for wireline substitution, clearly compounds the problem of in-building accuracy performance. I should also mention that various devices and systems—such as bi-directional amplifiers ("BDAs"), distributed antenna systems, "leaky-coax systems," and pico-cells—have been developed and deployed to enhance in-building cellular coverage without a corresponding "boost" in GPS signals. While these systems may have important consumer benefits in terms of better coverage, they may exacerbate the problem of accurately locating in-building E–911 callers. Moreover, even network-based location systems may suffer in terms of location accuracy due to the weakening of the additional terrestrial signals needed for triangulation.

Since this issue of in-building coverage is perhaps the most important finding that emerged from my study, I would like to say a few more words about it. One thing I want to make clear is that, in raising this in-building coverage issue, I am not being critical of past efforts to develop and deploy wireless E–911 location systems. When we embarked upon this program of locating wireless E–911 callers well over a decade ago—cellular phones were still rather clunky devices and the cost of cellular service was still relatively high compared to landline calling. At that time, few could have fully appreciated the increasing percentage of calls that would be made from inside buildings and the technological advances that would facilitate such calling. The systems that have been developed have, in many ways, been truly amazing and we should all be thankful for them. But the fact of the matter is, people are making more indoor calls and, with existing technology, we may have trouble locating them there. Hence, it doesn't make sense to me—and it is potentially misleading to consumers—to have test methodologies that require placing only a small fraction of the test calls from inside buildings when it is likely that a significantly greater fraction of cellular calls are made from such locations.

Turning now to another part of my second study, the interrelationship between wireless E–911 and nomadic VoIP, a major challenge for nomadic VoIP services is the lack of a system for automatically entering or confirming the location of VoIP phone or other end-user device. Requiring customers to manually enter their location information when movement is not infrequent is fraught with problems. When a VoIP user moves his or her device from a certain location and fails to update his or her new location information, then a call to 9-1-1 may not be properly routed. For example, if a VoIP user moves from a home or office location in Washington, D.C. to a rented beach house in Rehobeth, Maryland and fails to update his or her location information, then a call to 9-1-1 may be answered in Washington rather than Rehobeth with potentially disastrous results. Moreover, and not surprising, since nomadic VoIP calls require a broadband connection for good performance, they are more apt to be made from indoors. This means that wireless and VoIP E–911 systems share a common need for an automatic location system that works well from within buildings. Thus in considering the interrelationship between wireless and VoIP E–911 requirements, it is quite possible that there could be substantial benefits from developing an automatic location system that would serve both needs.

I will come back to this issue in a moment but, before I do, let me add just a few words about the rural issue. Rural carriers using network-based terrestrial solutions face legitimate problems in meeting accuracy requirements where there are

not enough antenna sites or the sites are geographically distributed in such a way that reliable triangulation among them is not possible. An extreme example of this would be a small and rural community served by a single cellular base station antenna site. Under these circumstances, network-based terrestrial triangulation will not work in the absence of additional cellular base station antenna sites. Ultimately, technology may produce a solution to this rural problem through the use of "hybrid" or blended solutions that combine handset (GPS satellite) based solutions, which tend to work best outdoors and in less congested areas, and network (terrestrial triangulation) based solutions which tend to work best in more congested urban areas where the cellular base station antenna sites are more densely packed and evenly distributed. However, even a hybrid solution could leave *in-building* coverage problems for wireless E–911 and for nomadic VoIP providers who might try to solve their automatic location problem using the same blended approach.

With that background, I would like to conclude by suggesting to you some of the recommendations that I was contemplating at the time my work was terminated last year:

- *First*, that the Commission take appropriate steps to encourage the stakeholders to agree on a common testing methodology (or to at least reduce the differences and ambiguities associated with existing methodologies) for assessing location accuracy. Moreover; the revised methodology should take into account increased indoor usage of wireless devices

- *Second*, that the Commission arrange for the filing of aggregated accuracy measurement data using the common or more standardized methodology. This aggregated data could, in turn, be used by the Commission (or by a third-party with appropriate protection of proprietary data) to ascertain and track the current state-of-the-art in location-based technologies in various environments— *e.g.,* urban, suburban and rural. It may also be appropriate to report the state-of-art to the Congress on a regular basis as well

- *Third*, that the Commission take appropriate steps to encourage the development of hybrid or combined technologies that would solve the rural location problem I described earlier

- *Fourth*, that the Commission, through an appropriate forum such as its own Technological Advisory Counsel ("TAC") or the National Academy of Engineering, and, perhaps, in conjunction with other governmental agencies such as the Department of Homeland Security and the National Telecommunications and Information Administration of the Department of Commerce, investigate the broad issue of in-building location taking into account wireless and perhaps nomadic VoIP requirements as well

- *Fifth*, that the Commission work with the wireless carriers to ensure that customers understand the limitations of location technologies as compared to the wireline system when they call 9-1-1.

That concludes my testimony and I would be happy to entertain any questions that you might have.

The CHAIRMAN. I thank you very much, Mr. Hatfield.

And may I assure the panel that all of your full statements will be made part of the record.

And now, may I recognize Ms. Wanda McCarley? President McCarley?

STATEMENT OF WANDA S. McCARLEY, PRESIDENT, ASSOCIATION OF PUBLIC-SAFETY COMMUNICATIONS OFFICIALS (APCO) INTERNATIONAL; OPERATIONS AND TRAINING MANAGER, TARRANT COUNTY 9-1-1 DISTRICT, FORT WORTH, TEXAS

Ms. McCARLEY. Good afternoon, and thank you, Chairman Inouye and Co-Chairman Stevens and members of the Committee, for the opportunity to appear before you here today to testify on behalf of the Association of Public-Safety Communications Officials International, APCO, and its more than 15,000 members who manage and operate emergency communications centers worldwide.

My name is Wanda McCarley, and I'm the Operations and Training Manager for the Tarrant County 9-1-1 District in Fort Worth, Texas. I also serve as the President of APCO International.

We're here today to discuss the future of 9-1-1. Public safety faces three major challenges to meeting the public's expectations for 9-1-1 in the future. Among these challenges are technology, funding, and staffing. My testimony will focus mostly on the challenge of technology, but I would also like to request that my full testimony, which also discusses funding and staffing challenges in more detail, be submitted for the record.

On behalf of APCO and its members, I would like to applaud the leadership of Senators Nelson, Snowe, and Clinton for introducing Senate bill 428. We strongly support the bill's intent to require VoIP service providers to provide 9-1-1 capability, including E–911 functionality, to subscribers in accordance with the FCC's order. Also, we support extending liability protection to PSAPs for VoIP 9-1-1 calls. APCO strongly supports ensuring a State and local government's ability to impose and collect a 9-1-1 fee from VoIP service providers. Finally, APCO asserts that VoIP providers should not be able to offer services to new customers where the provider is not able to comply with the FCC's requirements.

The public expects that when they dial 9-1-1, regardless of the technology, they will receive immediate and effective emergency response. As public-safety communications officials, meeting these expectations is our primary goal, and there is no room for error.

A key element to meeting these expectations is ensuring the 9-1-1 call-taker is able to obtain, quickly, the best location information possible for the caller. To address location issues raised by wireless 9-1-1 calls, APCO established Project LOCATE. In 2005, Project LOCATE began an independent study to test wireless location data delivered to PSAPs by wireless carriers. I would like to request that the Project LOCATE final report also be submitted for the record.*

The CHAIRMAN. Without objection.

Ms. MCCARLEY. To summarize, the study found that wireless location accuracy performance of the wireless carriers in the designated PSAP test areas did not meet Project LOCATE's expectations, that the public-safety community would be best served by developing a positive partnership with the wireless service providers, and that the efforts to maximize the usefulness of location data delivered to the PSAP with wireless 9-1-1 calls must be continuous and supported by appropriate Federal, State, and local regulatory, legislative, and Executive Branch authorities.

In 2006, APCO also established Project 41, a part of Project LOCATE, to address the impact on operational practices facing public safety communications specific to VoIP and emerging technologies. We need to be proactive with new consumer telecommunications services to ensure they are able to provide effective and comprehensive E–911 services to the calling public. 9-1-1 must not be an afterthought to new consumer services. Congress needs to be proactive about legislative solutions that ensure technologies of tomorrow meet today's public expectations for 9-1-1 services.

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*The information referred to is retained in Committee files.

Future 9-1-1 services will be based on radically different technology and architecture. Absent new and consistent funding solutions, local county executive decisionmakers will be truly challenged to migrate legacy systems in favor of new technology. The IP PSAP of the future will offer many benefits; however, without adequate funding, the disparity between the capabilities of PSAPs across the country that exist today will only be exacerbated.

We ask Congress to keep the promise it made in 2004, when it passed the ENHANCE 911 Act, and appropriate the authorized $250 million for the 2008 budget year. This grant program will help many local PSAPs, especially in rural communities, that are struggling to upgrade their systems to meet technological challenges.

As discussed in my written testimony, PSAPs also face staffing, retention, and training issues. We need your help to ensure that local emergency communications centers have what they need to keep their most valuable resource, that resource being people.

Once again, I would like to thank you for allowing me the opportunity to be here today. Our Nation's 9-1-1 systems need your support. Their challenges are many. APCO looks forward to working with you toward solutions for the future of 9-1-1.

Thank you.

[The prepared statement of Ms. McCarley follows:]

PREPARED STATEMENT OF WANDA S. MCCARLEY, PRESIDENT, ASSOCIATION OF PUBLIC-SAFETY COMMUNICATIONS OFFICIALS (APCO) INTERNATIONAL; OPERATIONS AND TRAINING MANAGER, TARRANT COUNTY 9-1-1 DISTRICT, FORT WORTH, TEXAS

Thank you, Chairman Inouye and Co-Chairman Stevens, and members of the Committee for the opportunity to appear before you today to testify on behalf of APCO International and its members, who manage and operate emergency communications centers worldwide. My name is Wanda McCarley and I am the Operations and Training Manager for the Tarrant County 9-1-1 District in Fort Worth, Texas. I also serve as the President of APCO International.

APCO was established in 1935 and it is the Nation's oldest and largest public safety communications organization, representing members around the world who manage and operate communications systems and facilities for police, fire, emergency medical services and other state and local government public safety agencies. APCO International's mission is to be a member-driven association of communications professionals that provides leadership; influences public safety communications decisions of government and industry; promotes professional development; and, fosters the development and use of technology for the benefit of the public.

From the very beginning, APCO International's members have played a critical role in the development of 9-1-1 services. Our members were there when the first 9-1-1 call was placed in Haleyville, Alabama on February 16, 1968 and today they are responsible for answering and dispatching emergency services to thousands of 9-1-1 calls made every day around the country.

Over the past 30 years, APCO's members have done a great job of educating the public to dial 9-1-1 in case of an emergency. Today, 9-1-1 is the primary lifeline the public uses to reach emergency services when a one-year-old child accidently falls in to a pool and is not breathing, when a person feels chest pains and believes they are having a heart attack, when a eyewitness sees a major car accident occur on the highway, when a passerby sees a suspicious package left alone near an office building, and the hundreds of other emergencies that happen every day around the country.

However, I am here to tell you that not all is well with 9-1-1. Public safety faces three major challenges to meeting the public's expectations of the future, including technology, funding, and staffing.

Technology

The prompt, effective dispatch of appropriate emergency services to any reported event is dependent upon obtaining the best location information possible from the

caller. This essential element of competent dispatching must occur regardless of the technology used to access the emergency number, 9-1-1.

Since the beginning, the 9-1-1 and Enhanced 911 (E–911) infrastructure has been built to process hard wire/landline 9-1-1 calls from people's homes and offices. Consumers who use wireless or Voice over Internet Protocol (VoIP) services often recall the hard wire/landline 9-1-1 service at their home, which translates the assigned telephone number to a unique, physical address and believe that the same is true for wireless and VoIP 9-1-1 calls. Today, while technologies such as wireless and VoIP services provide a wide array of new telecommunications services to their customers, they have been challenged to provide a comprehensive and effective solution for E–911 that meets the public's expectations.

APCO International applauds the leadership of Senators Nelson, Snowe and Clinton for introducing the IP-Enabled Voice Communications and Public Safety Act of 2007 (S. 428). We are grateful that this bill has taken in to consideration issues that are very critical to improving VoIP 9-1-1 services. While APCO International has not taken a formal position on the bill, we strongly support the bill's intent to require VoIP services to provide 9-1-1 service, including E–911 service, to its subscribers in accordance with the orders of the Federal Communications Commission (FCC). Also, we strongly support the provision of the bill that extends liability protection to public safety answering points for VoIP 9-1-1 calls. Finally, APCO International strongly supports the provision of the bill that ensures a State and local government's ability to impose or collect a 9-1-1 fee from VoIP service providers. We believe that VoIP providers should not be able to offer services to new customers in geographic areas where the provider is not able to comply with the FCC's 9-1-1 and E–911 requirements contained in the FCC's Order in WC Docket Nos. 04–36 and 05–196.

Project LOCATE Report

Shortly, APCO will be releasing a report on location performance testing of wireless 9-1-1 calls. In August of 2005, APCO's Project Locate Our Citizens At Times of Emergency (LOCATE) began an independent study to test wireless location data delivered to Public Safety Answering Points (PSAPs) by wireless carriers. Project LOCATE's assessment of the location data delivered to the PSAP was conducted in a manner consistent with the published FCC guidelines. The effort demonstrated by Project LOCATE showed that public safety and the wireless service providers share a common, sincere goal in improving location data delivered to the PSAP.

This is the first public safety study to review wireless E–911 system performance conducted at selected sites, representing a wide variety of topography and demographics. The goal of the testing was to assess overall wireless location performance and the operational impact of inaccurate data on PSAPs. Some of the issues addressed in the study included:

- The value of the location data in terms of prompt, effective dispatch of the appropriate emergency services;
- The variables that contribute to the quality of the location data presented to a PSAP when emergency calls are made from wireless devices;
- The lessons that have been learned since the deployment of Phase II wireless E–911; and
- The best practices that can be adopted to improve the effective deployment and performance monitoring of Phase II wireless E–911, as well as the processing of per call location data at the PSAP.

Since 1996, the FCC has taken action to improve the quality and reliability of 9-1-1 emergency services for wireless telephone users by adopting rules to govern the availability of basic 9-1-1 services and the implementation of Enhanced 9-1-1 (E–911) for wireless services. The Commission's wireless 9-1-1 rulings seek to improve the reliability of wireless 9-1-1 services and to provide emergency services personnel with location information that will enable them to locate and provide assistance to wireless 9-1-1 callers more quickly. To further these goals, the agency has required wireless carriers to implement E–911 service, subject to certain conditions and schedules.

Truly effective wireless deployment will continue to require accurate location data, as defined in FCC Docket Number 94–102. However, the standard of location accuracy established by the Commission is not routinely delivered to the PSAP, nor is it required under current FCC rulemakings. Further, the vast majority of PSAPs often have no means to assess the location performance deviation per PSAP based on credible end-to-end performance testing.

This Project LOCATE Final Report seeks to offer PSAPs and others a number of effective practices. The findings of Project LOCATE show that a good partnership with all wireless services providers involved is critical to timely deployment, implementation and accurate delivery of wireless 9-1-1 information.

The findings of Project LOCATE Final Report include:

1. There is a clear expectation that the PSAP, as well as traditional first responders, will have consistent and accurate location data delivered with all wireless 9-1-1 calls to the PSAP. The wireless location accuracy performance of the carriers in the designated "PSAP Test Area" did not meet these expectations.

2. The authority having jurisdiction should implement "baseline performance testing" to better evaluate and understand how the system(s) serving the PSAP(s) collects and processes location data that is delivered to the PSAP.

3. The Effective Practices contained in the study, many of which have gained consensus by public safety, should be reviewed, understood and practiced to maximize system service potential.

4. The public safety community would be best served by developing a positive partnership with the wireless service providers within their service area, demonstrating a solid understanding of the technology and options available as well as maintaining open and candid communications regarding performance and service.

5. The supportive information contained within the Project LOCATE report should be reviewed and used properly to better understand wireless 9-1-1 services as well as better manage the expectations of the public and public safety/service stakeholders.

6. The efforts to maximize the usefulness of location data delivered to the PSAP with wireless 9-1-1 calls must be continuous and supported by appropriate Federal, state and local regulatory, legislative and executive branch authorities.

Project 41

In August 2006, APCO International established Project 41—VoIP and Emerging Technology Location Delivery Challenges that is a part of Project LOCATE to address the impact upon operational practices facing the public safety communications community specific to VoIP and related technologies. APCO International's Project 41 looks to develop partnerships with vendors and service providers to improve the location information provided, provide public education to manage the expectations of consumers, and create an effective practice guide to include technical and operational alternatives for public safety answering point (PSAP) response. Project 41 is responsible for:

- Establishing strategies to ensure public safety interests related to the deployment of nontraditional technologies, funding concerns, location challenges, and other such matters are effectively represented in related forums; and,
- Establishing effective educational strategies for public safety personnel and elected officials related to current and emerging technology, location challenges, funding concerns, current public and private strategies and APCO activities.

Next Generation 9-1-1 (NG–911) systems will ultimately occur within a broader array of interconnected networks comprehensively supporting emergency services; from public access to those services to the delivery of emergency information to call-takers, dispatchers and first responders. This development is an evolutionary process to enable the general public to make a 9-1-1 call from any wired, wireless, or Internet Protocol (IP) based device. These advances allow the emergency services community to take advantage of Enhanced 911 call delivery and other functions through new IP-based, internetworking technologies. As a result, transition to both new technology and new operational environments will be essential to that process.

On March 30, APCO International and the National Emergency Number Association (NENA) released a statement that outlined that the activities of both organizations will be mutually supportive, coordinated, and focused on achieving the best transition possible to NG–911 systems for the 9-1-1 community, without diminishing the ability to promptly and effectively locate the "caller" or "initial request for service location." APCO and NENA acknowledge that:

- NENA's focus is on the technical and architectural components of NG–911 systems, along with the operational environment in which those systems must operate; and

- APCO's focus is on the operational utility of those systems, including the development of effective educational and related strategies to optimize their use by the public, the public safety community, and the governance and public policy entities ultimately responsible.

It is the goal of APCO International to be more proactive with new consumer telecommunications services to ensure they are able to provide effective and comprehensive enhanced 9-1-1 services to their customers. Unfortunately, for technologies such as wireless and VoIP services, the principle of 9-1-1 seems to have been an afterthought as they emerged on the telecommunications marketplace to compete with traditional telephone services.

APCO International looks forward to working closely with this Committee, Congress, the FCC and all telecommunications service providers, including VoIP services, to ensure that before a consumer buys a product or service to replace their traditional telephone services with full 9-1-1 and E–911 capabilities, the provider is able comply with current public safety obligations that are inherent to today's telecommunications industry. While it is great to be able to take a picture with your wireless phone or be able to connect your VoIP phone to any broadband service, it is vital to be able to call 9-1-1 and be assured you will get prompt, effective dispatch of appropriate emergency services to the location information reported by the wireless and VoIP service provider for the event. If this information is inaccurate or missing, the results could be tragic. All of us here today have the obligation to the public we serve to ensure their safety is not compromised when a consumer decides what type of telephone service they would like to purchase.

Funding

The second challenge is funding for public safety when they are trying to meet the new demands placed on 9-1-1 systems with a change in the funding paradigm for 9-1-1 surcharges. There is a considerable discrepancy in the amount of revenue a 9-1-1 surcharge brings to a particular jurisdiction to maintain 9-1-1 services. While most jurisdictions with large subscriber bases may be able to generate enough revenue from wireless and wireline 9-1-1 surcharges, areas that have sparse population and few subscriber units often struggle to meet even the basic needs of maintaining a 9-1-1 services.

Funding for services from basic 9-1-1 to E–911 (wireline and wireless) is provided from a number of sources. The oldest and most common form of funding is a surcharge on wireline telephone subscribers within a given service area. In many states, there is also a separate surcharge on wireless subscribers within the service area. The amount of the surcharges vary based on local and state laws. A great deal of states that distribute surcharge monies at the state level to PSAPs do so based on the number of landline telephones in the jurisdiction. Unfortunately, the number of landline phones is dwindling with the increasing popularity of wireless telephones used as the primary residential communications service. While the surcharge model had a measure of appropriateness in years past, the expansion of access to 9-1-1 services at the PSAP from other devices and technology such as VoIP has created a pattern of diminishing revenue amidst increased expectation of service.

Future 9-1-1 services are expected to be based on radically different technology and architecture than are in existence today. There are some PSAPs that may make this transition easily and comfortably; while others will struggle and many will not be able to afford any changes. Absent new and consistent funding solutions, local/county executive decision-makers will be truly challenged to discard legacy systems, stranding their investment paid in most cases with public tax dollars, in favor of new and more expensive technology. The IP-based PSAP of the future has benefits in a homogenous environment; however without adequate funding mechanisms, the disparity between the capability of PSAPs across the country now, will only be exacerbated by yet another layer of disparate technology.

The increased public interest in and expectation of effective 9-1-1 services, which is unmatched by the revenue mechanisms in place, is not solely a function of technology changes however.

The survivability and sustainability of public safety communication services, including public access through 9-1-1, cannot be assumed by any political entity. There are reasonable precautions and preparations that can improve the chance to survive disasters; however each element has fiscal impact. Local/county executive decision-makers often lack the funds necessary to implement any "back-up" processes. At a "Telephone Service Priority Summit," convened by the FCC, it was reported that only about 10 percent of the primary 9-1-1 circuits across the country are protected by this service, which is seen by many to be an additional 9-1-1 expense in uncertain revenue times.

Significant challenges remain ahead for 9-1-1 managers seeking to reach even the basic level of service integrity at the local/county level amidst disaster. Each class of such challenges has a fiscal note attached, which has delayed the discussion and activity in many locations.

In order to address some of the funding issues and move PSAPs to deploy Phase II technologies, Congress passed the ENHANCE 911 Act of 2004. We are grateful to the leadership of this Committee that there has been considerable progress made to allocate $43.5 million in auction proceeds from the DTV spectrum. We applaud the efforts of the Committee and we continue to urge Congress to also appropriate the full authorized amount of $250 million for Fiscal Year 2008 for 9-1-1 grants programs established in the ENHANCE 911 Act. APCO International would also like to work with the Members of the Committee to expand the purpose of the program to ensure grant funds can be used for planning, project management, training, and equipment for computer-aided dispatch (CAD) systems and IP emergency networks.

Staffing and Training

Finally, the third challenge is the ability of local emergency communications centers to adequately staff their operations. Recruiting, retaining, and training communications center personnel, call takers, and dispatchers has proven to be one of the greatest challenges 9-1-1 faces today. Having well qualified and trained staff can make the difference between life and death. Keeping this staff after they have been trained has become a daunting challenge for public safety.

To fulfill the mission of 9-1-1 and provide efficient service to the public and the law enforcement, fire/rescue and emergency medical services (EMS) agencies served, an adequate number of qualified personnel should be on duty in the communications center. When this is not the case, the quality of service can diminish and the short and long term effect on communications center personnel often leads to staffing issues, personnel being overworked because the centers are understaffed and the increase of attrition rates. Communications centers need to strive to maintain adequate staffing levels to ensure expected services levels for the public and required by the law enforcement, fire/rescue, and EMS agencies are not jeopardized. One measure for adequate levels of staffing include developing a methodology that allows a communication center to identify the number of qualified 9-1-1 call takers necessary to answer 9-1-1 calls and other telephone lines for which the agency is responsible in an acceptable manner, within acceptable call answering and call processing times. The second measure involves developing a methodology to identify the number of qualified on-duty law enforcement, fire/rescue, EMS dispatchers necessary to adequately and safely communicate with, provide command and control assistance for and manage an acceptable number of law enforcement, fire/rescue and EMS units on a given number of radio channels. While these two functions are separate, they need to be able to work together seamlessly to ensure response times are met and lives are saved. In response to these issues, APCO International established Project RETAINS. The purpose of the program is to educate public safety and local government officials as to what they have to do to retain and improve the professionalism of their call takers and dispatchers.

While the recruitment and retention of communications center personnel is the responsibility of the local officials, there is a need to develop and promote national standards for staffing and training of communications center personnel. APCO International, as an ANSI accredited standards setting organization, is working to develop these standards.

APCO International and its members are committed to funding the development of these standards, but it will take the time and cooperation of all parties involved to establish nationally accepted standards for emergency communications center personnel. Local emergency communications centers should be able use Federal grants to train their staff to comply with nationally accredited training programs that meet the standards. However, currently there is no Federal grant program for 9-1-1 that can be used to train communications center personnel. Most often Federal grant programs go to funding equipment, but they neglect the most important element in any emergency—the human element.

Often, the first budget item that gets cut in most local governments is training. However, when it comes to 9-1-1, this is the last thing a local government should cut. Imagine if you were in a PSAP in Wenatchee, Washington and you got a 9-1-1 call from someone in the Lake Wenatchee State Park without any location information. The trained call taker should be able to ask the appropriate questions to determine the caller's locations. In order to do this the call takers will need to have a reasonable understanding of the location, terrain and landmarks within their jurisdiction. Without proper training, the local public safety agency will have to expend considerable resources (including man power) to conduct a search and rescue

operation rather than a rescue operation. While seconds, minutes and hours tick away in the search, the potential for having a successful rescue operation diminishes drastically. Training in the front end of the call will most like save money but more importantly save lives. Public safety communications grant programs should be used for training, as well as equipment, however the use of these grants should be tied to the acceptance of a nationally accredited standard by the local emergency communications center.

Once again, I would like to thank Chairman Inouye, Co-Chairman Stevens and all the members of the Committee for allowing me the opportunity to speak on behalf of the thousands of public safety communications professionals that are served by APCO International. In conclusion, I would like to say that our Nation's 9-1-1 systems need your support to meet the current challenges that are being faced by many of the of local public safety call centers today. APCO International looks forward to working with the members of this Committee to find effective solutions for technology, funding and staffing challenges to ensure the viability of our Nation's 9-1-1 systems.

Project LOCATE Report Summary*

A new generation of telephone customers is being raised without the benefit of land-based telephone lines. But they still expect rescuers to be able to find them. The issue has become more critical as the number of 9-1-1 calls from cell phones exceeds those coming from land lines, according to public safety experts. CTIA reports that 230,000 calls to 9-1-1 are made from cell phones each day. The group also estimates that 8.4 percent of households are "wireless only."

The FCC requires companies that use "network" technology—triangulating among cell towers to determine the caller's location—to come within 300 meters of the caller 95 percent of the time. Generally speaking, the network solution works better in urban areas where it may be difficult for a satellite signal to penetrate buildings. but not so well in rural areas because of a lack of towers. Phones that use satellite technology are excellent in rural areas where there is little overhead interference.

Carriers are required to test their location systems and to be able to pinpoint callers within certain distances. But they are not required to share their test results with 9-1-1 dispatchers, police and firefighters. And the Federal Communications Commission does no testing of its own.

The Project LOCATE test is the first independent evaluation of wireless location technology. Tests were conducted in seven different communities across the country—Palo Alto, CA; Marion County, FL; Jasper County, MO; Onondaga County, NY; Rowan County, NC; Bexar County, TX; and Laramie, WY. The cities were selected based on topography, demographics, existing technology and other factors.

Two companies tested used network technology primarily while five used "handset" technology, meaning they use global positioning system satellites to locate callers. Federal rules require companies using satellites to come within 150 meters for 95 percent of calls. The company identified as "carrier No. 001" in the testing was unable to come within 300 meters of the 9-1-1 caller 73 percent of the time in Onondaga County; 64 percent of the time in Marion County; and 61 percent of the time in Jasper County. Carrier No. 002 was able to hit inside the target area 90 percent of the time in Bexar County; 89 percent of the time In Laramie; 87 percent of the time in Onondaga County and 80 percent of the time in Palo Alto.

Results varied based on carriers and geography. A few communities, however, stood out for poor performance, among them Marion County, Florida, which includes the City of Ocala; Onondaga County in New York and Jasper County, Missouri.

If accuracy were measured at the community level, according to APCO's results, 71 percent of the tests would get a failing grade. But companies are allowed to measure their accuracy over a much larger area—an entire state, for example. That means highly accurate results in one area may drive up the average overall.

While the report pointed out the generally poor performance of the wireless industry in locating 9-1-1 callers, it also pointed out the need for 9-1-1 call centers to work closely with providers and the importance of public education.

The CHAIRMAN. I thank you very much, Ms. McCarley.
And now, may I recognize Mr. Barbour?

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*The full report will be retained in Committee files.

STATEMENT OF JASON BARBOUR, ENP, ON BEHALF OF THE NATIONAL EMERGENCY NUMBER ASSOCIATION (NENA)

Mr. BARBOUR. Thank you, Mr. Chairman, Vice Chairman Stevens, and members of the Committee. Thank you for bringing the 9-1-1 community to the table for these vital discussions.

My name is Jason Barbour, and I am the Director of the Johnston County 9-1-1 System in North Carolina. I'm also a volunteer firefighter, a deputy sheriff, and the President of the National Emergency Number Association. I'm also a member of APCO, and am pleased to be joined here by my friend and colleague, APCO President Wanda McCarley.

I'd like to begin by discussing the current state of 9-1-1. Today, we're averaging over 200 million 9-1-1 calls per year. Ninety-seven percent of the American public has access to enhanced wireline 9-1-1 service, and nearly 85 percent of the population now lives in areas covered by Phase II wireless E–911. However, over 40 percent of the counties do not have wireless Phase II E–911 service, and there are still over 250 counties, mostly rural, that lack E–911 service for their landline telephone service, let alone wireless or VoIP. The last year and a half has seen a tremendous amount of progress on the issue of 9-1-1 and E–911 for VoIP. Still, many areas lack VoIP E–911 service, and we believe that the passage of S. 428 and other congressional action will help solve this issue.

NENA supports S. 428, as it strengthens the FCC's VoIP E–911 order by requiring VoIP providers to provide 9-1-1 in accordance with the FCC regulations and addresses the issue of liability parity, State and local authority over 9-1-1 fees and the migration to an IP-enabled emergency network.

NENA wholeheartedly supports the liability provision of S. 428, which only Congress can provide at the Federal level. With that being said, we believe that we need to be forward-thinking to craft a bill in a manner that provides liability parity for current VoIP services and other appropriate current and future services, so we do not need to repeat this process every time a new technology comes along with 9-1-1 expectations.

Second, maintaining the current funding levels and providing funding for the development of the Next Generation 9-1-1 system is perhaps the most important issue facing 9-1-1 today. The public-safety community is extremely concerned by the immediate and growing impact of changes in communication landscapes that are leading to a loss of conventional 9-1-1 revenues. As we work to address current and future funding needs, it is essential that Congress do nothing to compromise current State and local authority to impose and collect fees on all services. Thus, NENA supports the current language in S. 428, confirming State and local authorities authority to impose and collect 9-1-1 fees on IP-enabled voice services.

Finally, the future of 9-1-1 and emergency communications. One of the challenges we have struggled with in deploying wireless and VoIP E–911 service is that we are forcing new technologies into an old 9-1-1 system that has been pushed to the limit. It is time to update our 9-1-1 system. NENA started with "one nation, one number," and has now added "any device, from anywhere, at any time." Migrating to a next-generation 9-1-1 system will certainly require

some legislative and regulatory change. The Federal Government has a key role to play in providing overall system coordination, and funding, where appropriate, to assist efforts in the states to implement standardized IP-based emergency communication networks. The Federal highway system of the 1950s comes to mind as a similar example. Therefore, NENA fully supports section 5 of S. 428, requiring the national 9-1-1 office to provide a plan for the migration from today's 9-1-1 system toward an IP-enabled emergency network.

Additionally, NENA is a firm believer in the value of public-private partnerships, and believe that there is a need for increased public safety spectrum. The advantages I have described today concerning next-generation 9-1-1 can be realized on wired or wireless broadband networks. Thus, NENA supports the implementation of a national public-safety broadband network, and believes it is important that we give public safety appropriate control of the development of such a network.

In closing, I want to leave you with this. Today, we average over 200 million 9-1-1 calls a year, 500,000 per day, 25,000 per hour, and 400 per minute. As I have testified here in the last 5 minutes, approximately 2,000 people in this great Nation have placed a 9-1-1 call for help. Let's hope they were all made in areas where Enhanced 911 is available, and let's hope there wasn't a deaf person trying to connect to 9-1-1 via text or video device, experiencing a delay because he or she could not connect directly to 9-1-1. We have made progress, but we have a lot of work to do, and ask for your support in helping us get to a next-generation 9-1-1 service.

Thank you very much.

[The prepared statement of Mr. Barbour follows:]

PREPARED STATEMENT OF JASON BARBOUR, ENP, ON BEHALF OF THE NATIONAL EMERGENCY NUMBER ASSOCIATION (NENA)

Mr. Chairman and Members of the Committee, thank you very much for providing me the opportunity to appear before you today. My name is Jason Barbour and I am a nationally certified Emergency Number Professional (ENP), serving Johnston County, North Carolina as the 9-1-1 Director. I am also a volunteer firefighter and a Deputy Sheriff. I have been working in the field of public safety communications for the better part of two decades and know firsthand the importance of our Nation's 9-1-1 system.

I'm also the President of the National Emergency Number Association (NENA), an organization consisting of nearly 7,000 members in 47 chapters across the U.S., Canada and Mexico representing public officials, fire, EMS, law enforcement and equipment and service vendors of the 9-1-1 community. Finally, I am also a member of the Association of Public Safety Communications Officials (APCO) International and I am pleased to be joined today by my friend and colleague, APCO President Wanda McCarley.

It is fitting that we are here today on the second day of National Public Safety Telecommunications Week, a Congressionally recognized week honoring the important work of 9-1-1 and public safety communications professions. Today I appear before the Committee on behalf of NENA, but also on behalf of the thousands of 9-1-1 professionals in America who work tirelessly to help those people who dial 9-1-1 in times of need. Admirable colleagues like those on my team in Johnston County, and others across the country, who continue to find ways to get the job done regardless of the technical obstacles or challenges of modern communications. I would like to thank the national leadership of the Co-chairs of the Congressional E–911 Caucus, Senators Stevens and Clinton, and Representatives Shimkus and Eshoo, and other leaders of this Committee including Chairman Inouye, Senator Nelson, Senator Snowe and all of the members of this Committee for working with NENA to promote policy to make our 9-1-1 system work like it should.

Opening Comments

Mr. Chairman and Vice-Chairman Stevens, thank you and your staff for bringing the 9-1-1 community to the table for these vital discussions concerning current 9-1-1 issues and the future of 9-1-1 and emergency communications. I applaud your initiative as well as the leadership of Senators Nelson, Snowe and Clinton for introducing the IP-Enabled Voice Communications and Public Safety Act of 2007 (S. 428), and I am here today to testify in support of this important legislation. In doing so, my comments will focus on three areas: First, the current overall state of 9-1-1, including 9-1-1 and E–911 for Voice over Internet Protocol (VoIP) service; Second, funding issues in today's world of emerging technology; and Third, the future of 9-1-1 and emergency communications. All three of these issues are interrelated and require sound national policy to maintain the stability of 9-1-1 and to transition to Next Generation 9-1-1 (NG–911) and emergency communications. The IP-Enabled Voice Communications and Public Safety Act provides a solid foundation to advance these issues.

The Current State of 9-1-1 and E–911 Service

Since its inception, the 9-1-1 system has been *the* first responder in times of individual and mass emergencies. Every day, Americans call 9-1-1 at the time of their greatest need. Today we are averaging over 200 million 9-1-1 calls per year. Ninety-seven percent of the Nation's geography is covered by at least some basic 9-1-1; ninety-nine percent of the American public has access to 9-1-1. For the caller and the public, the successful completion of a 9-1-1 call can mean the difference between danger and security, injury and recovery, or life and death.

In the past year alone tremendous strides have been made regarding a number of critically important issues facing the 9-1-1 industry. One year ago in April of 2006, less than 75 percent of the population of the United States resided in areas covered by Phase II wireless E–911. Today, that number has jumped to nearly 85 percent, representing an increase in coverage for over 30 million Americans who previously were not protected by this vital aspect of our 9-1-1 system. Additionally, the percentage of counties that are covered by Phase II wireless E–911 has increased from 47 percent to 58 percent from a year ago, an 11 percent increase. Progress is being made. At the same time, there is still a 9-1-1 divide between densely populated and low population areas. As of today there are still over 250 counties, mostly rural, that lack E–911 for their landline telephone service, let alone wireless or VoIP service. It is important that the U.S. population is increasingly being covered by wireline and wireless E–911, but we are truly a mobile society so we must consider not only where people live, but also where they may travel to. And thus, we need to continue to strive for 100 percent E–911 deployment for all areas and all technologies. This is a top priority for NENA.

Of course the last year and a half has also seen a tremendous amount of progress on the issue of 9-1-1 and E–911 for VoIP. NENA applauds the continued leadership of FCC Chairman Martin and his colleagues at the Commission for adopting the VoIP E–911 Order and their focus on improved emergency communications. FCC action and the steps taken by the public safety community working together with VoIP providers and their vendors has led to the fastest ever national rollout of E–911 service. Like the early days of wireless, it has been no easy task to retrofit an existing 9-1-1 system that was not designed for a new technology. But we have stepped up and largely met the challenge. The system currently being employed for VoIP is not perfect and it requires significant cooperation among numerous parties to work. We have only touched the surface on where we need to be concerning Internet Protocol (IP) enabled services. I would like to take this opportunity to commend the diligent work of the all volunteer NENA Technical, Operations and Regulatory Committees who have done an amazing amount of work developing standards, deployment checklists and policies to assist with VoIP E–911 implementation. Still, many areas lack E–911 for VoIP service for largely the same reasons that E–911 is not universally available for wireline or wireless service. Primarily, those reasons can be boiled down to a lack of funding, a lack of technical know-how in some instances and a failure of leadership at the state and local level in some areas where 9-1-1 service has not been made the priority it needs to be. Additionally, there has been a lack of Federal action in certain areas which we are confident will be addressed through the passage of S. 428 and in other measures by this Congress.

Needed Tools for VoIP E–911 and NG–911 Implementation

NENA supports the IP-Enabled Voice Communications and Public Safety Act of 2007 because it strengthens the FCC VoIP E–911 Order by codifying the obligation of all IP-enabled voice service providers to provide 9-1-1 and E–911 in accordance with FCC regulations. Additionally, the bill provides needed tools to assist in the

completion of E–911 deployment for VoIP service in all parts of the United States and addresses the issue of NG–911. Having said that, we believe that a few modifications to the bill will fine tune its effectiveness.

S. 428 provides several key elements to enable nationwide VoIP E–911 deployment including the following:

- *liability parity* for PSAPs, VoIP providers and their third party vendors equivalent to existing liability protections already in place for wireline and wireless service;
- *confirmation of state and local authority to impose and collect 9-1-1 fees* from IP-enabled voice service providers;
- *a requirement on the National 9-1-1 Implementation and Coordination Office (ICO)* to produce a report to Congress on the *migration to an IP-enabled emergency network;* and
- a statutory requirement that owners of the E–911 infrastructure provide access to VoIP providers who require such access to provide E–911 service.

Each of these items will assist with current VoIP E–911 implementation and 9-1-1 service for future technologies.

The three most important elements of the bill for NENA are the sections on liability parity, state authority over fees and the migration to an IP-enabled emergency network. I will address each of these issues with some detail on the critical issues of funding and NG–911.

Liability Parity

S. 428 provides immunity from liability to PSAPs and providers of IP-enabled voice service and their third party providers to the same extent currently available for wireline and wireless service as provided by the Wireless Communications and Public Safety Act of 1999. It is important to note that the 1999 Wireless Act was passed before the widespread deployment of Phase I and Phase II wireless, an action that was deemed critical and applauded by both the 9-1-1 community and industry.

Past experience in the deployment of E–911 has shown that a lack of legal clarity on the issue of liability parity can lead to a lack of E–911 deployment and delays in the provisioning of E–911 service. Therefore, *NENA wholeheartedly supports the liability provision of S. 428*, which only Congress can provide at the Federal level. With that being said, while we are content with providing flexibility to the FCC to issue future rules on new technologies as they emerge, *we think it is a mistake to limit the liability parity provision of S. 428 to currently defined IP-enabled voice services*. We need to be forward thinking to ensure that every time a new service is given 9-1-1 obligations or needs to provide 9-1-1 for the public safety, we do not need to return to Congress and ask for a further extension of liability parity. That is not in anyone's best interest. Ideally, the liability section of the bill can be crafted in a manner that provides liability parity for current IP-enabled voice services and other appropriate services now and in the future. We have provided suggested language on this issue.

Funding: State and Local Authority Over Fees and Future Funding Issues

Maintaining current funding levels and providing funding for the development of the next generation 9-1-1 system is one of the most important issues for 9-1-1 today. The public safety community is extremely concerned by the immediate and growing impact of changes in the communications landscape that are leading to a loss of conventional 9-1-1 revenue through 9-1-1 fees and surcharges. Ten percent of households have abandoned their wireline service relying only on wireless service and millions are turning in their traditional telephone service for VoIP service with relative uncertainty in states as to how the traditional revenue from 9-1-1 fees on wireline service, collected at the local level, will be replaced.

NENA is keenly aware of the limitations of the current 9-1-1 system funding model and that changes will be needed to sustain service while also advancing toward an IP-based NG–911 system. While that may be the case, it is essential that Congress do nothing to compromise current state and local authority to impose and collect 9-1-1 fees on all services regardless of the type of technology involved. Some parties advocate for sweeping Federal action to replace the layered funding approach in the states that often imposes differing fees for different technologies and service areas. NENA has initiated a dialogue in a variety of forums on funding issues to sustain high quality 9-1-1 service today and advance 9-1-1 into the next generation. This issue needs to be thoroughly discussed and debated to identify effective solutions, but changes to 9-1-1 funding models are best handled within the states that know the intricacies of individual state and local 9-1-1 systems and fund-

ing needs. Thus, *NENA supports the current language in S. 428 confirming state and local authority to impose and collect 9-1-1 fees on IP-enabled voice services. Conversely, NENA opposes any efforts to preempt state and local authority over 9-1-1 fees.*

While we wish to preserve state and local authority over 9-1-1 fees, NENA also understands it is important to do more than just maintain the status quo. Efforts need to be made to not only determine how to sustain the current system but also how to advance to a NG–911 system. As the deployment of NG–911 will depend on identified funding sources, a clear solution must be identified for long term 9-1-1 funding issues in a parallel track with the technical evolution of the 9-1-1 system. Current funding models for 9-1-1 and other emergency services functions do not provide a good fiscal foundation for the envisioned NG–911 architecture. Today, funding for emergency communications and 9-1-1 assumes that individual agencies and professions (9-1-1, law enforcement, EMS, public health, emergency management, transportation, etc.) must bear all of the costs for their communications needs and that the communications needs of each of these professions is unique to the individual profession. Thus, funding for individual agencies and professions is fragmented and uncoordinated, leaving agencies often competing for the same funds and developing systems that are not interoperable. This is a mistake.

The NG–911 model envisions a system with shared networks, databases and applications in which the communications costs of public safety agencies are shared amongst all participants in the NG–911 system. This will result in less reliance on individual 9-1-1 centers paying for all aspects of the system at the local level, and will potentially reduce costs through sharing with many non-9-1-1 agencies. Providing guidelines and funding for the interconnection of IP-based emergency service networks to create a coordinated national IP emergency services infrastructure is a very important role for the Federal Government. The Federal Government should not dictate specific solutions; rather, it should provide grant money and clear guidelines to assist state and local governments in the implementation of IP emergency services networks and other needed elements to enable NG–911. Funding requirements should be tied to these guidelines, which is akin to the 1950s Federal Government program that designed and funded the creation of a national highway program. A similar effort is needed here.

Congress has already recognized the Federal role in funding 9-1-1 when it passed the ENHANCE 911 Act of 2004. I would like to make two points about that grant program. First, obtaining funding for the ENHANCE 911 Act grant program is critical to allow under-funded PSAPs, typically in low population areas as I mentioned earlier, to obtain the resources they need to upgrade their wireless E–911 capabilities and for necessary staffing and training needs. Even in areas that have 9-1-1 surcharge in place, such areas may never raise sufficient funds to deploy wireless or VoIP E–911 which is precisely why a Federal grant program was initiated. Thus *it is essential that funds be appropriated in the FY 2008 budget as requested by the E–911 Caucus*. Second, *the scope of the ENHANCE 911 Act should be expanded to broaden the eligible use of funds* to include not only wireless E–911 deployment, but also to foster the development and implementation of IP-based solutions that enable access to 9-1-1 from all technologies (including wireless). *S. 428 contains such a provision which we believe is of significant importance.*

Additionally, a direct appropriation to fund the 9-1-1 Implementation and Coordination Office created by the ENHANCE 911 Act should be provided to the Departments of Transportation and Commerce in the FY 2008 budget. The Office has been established but it has been unable to live up to its full potential without the necessary funding to staff the office and fulfill its Congressional obligations. Authorizing such support ensures little effectiveness without providing the appropriations to make the goals of the Office a reality.

The Future of 9-1-1 and Emergency Communications

Advancements in communications and network technologies are quickly blurring the lines of familiarity in the world of emergency communications and 9-1-1. No longer can we discuss 9-1-1 solely in the context of the public-switched telephone network (PSTN). No longer can we discuss the routing of 9-1-1 calls as being dependent on the use of the existing analog, circuit-switched telephone network. NENA started with "One nation—One number", and now we add, "any device, from anywhere, at anytime." As 9-1-1 and emergency communications continue to advance, it is critical that communications regulation at all levels of government evolve in a parallel fashion and is flexible enough to accommodate future advancements that have yet to be considered.

Already, nearly 100 million Americans are using some form of broadband Internet access offering exciting new communications possibilities. Voice over IP is no longer

just coming, it is here. WiFi and WiMax networks continue to expand. IP-enabled services are dynamic, competitive, innovative and most of all, an opportunity to improve all of our communications systems. Better, faster, cheaper technology and communications service is vital to American consumers and business, but it may prove even more vital for emergency communications.

An NG–911 system is not just a luxury, it is essential. Let me provide one example to explain why: Ensuring direct access to 9-1-1 for those who are deaf and hard of hearing and those with speech disabilities. A large and growing number of deaf individuals are replacing their traditional TTY's in favor of text messaging, IP-Relay Services and Video Relay Services. These text and video based technologies are very popular among deaf users, but they are not currently able to connect directly to 9-1-1 over the existing E–911 system due to limitations in the current system. This causes delays in access to 9-1-1 and will inevitably lead to unnecessary death or injury which is unacceptable in today's world of modern technology. So too are the youngest Americans increasingly communicating with text messaging and instant messaging. These technologies continue to gain in popularity and users will have a reasonable expectation that our 9-1-1 system will be able to accept communications to 9-1-1 from these devices.

There are other information and communications services currently available that 9-1-1 is ill-equipped to handle as well. Automatic crash notification (ACN) data from telematics service providers like OnStar; bio-chemical information from sensors in a subway system; video from bank cameras or video taken by a bystander to a vehicle crash; photos from a cell phone capturing the identity of a criminal. The data is available, but the 9-1-1 system simply is not equipped to receive it, much less seamlessly share the data with appropriate emergency response agencies. However, increasing public expectations are beginning to demand that we be able to receive text and multi-media messages over a system that was not designed to handle such data. With that reality in mind, NENA continues to make NG–911 one of our top priorities. We are pleased to be working on this important issue with our sister organization APCO and many other organizations like COMCARE, the Red Cross, and the United Way just to name a few.

As with any other effort of this magnitude, the transition to an IP-based NG–911 system will only happen if all parties work together in an open collaborative environment. NENA has taken numerous steps to address this topic including the development of a forty member public/private Next Generation Partner Program and the formation of a Next Generation 9-1-1 Transition Planning Committee focused on the development of a NG–911 System and PSAP Transition Plan. This effort is just one component of NENA's overall NG–911 Project Plan that will provide a detailed roadmap of present and future activities toward the transition to an NG system. Also, the first major NENA design standard for NG–911 system architecture is nearly complete.

Migrating to a fully IP-based next generation 9-1-1 system will certainly require some legislative and regulatory change. Issues of funding, jurisdiction, cost sharing, interoperability, and automatic location requirements for IP devices and networks are only a few areas that have to be addressed. The Federal Government has a key role to play in providing overall system coordination and funding where appropriate to assist efforts in the states to implement standardized IP-based emergency communications networks, much like the Federal Government did in the 1950s in establishing the Federal highway system. Therefore, *NENA fully supports section five of the IP-enabled Voice Communications and Public Safety Act requiring the National 9-1-1 Implementation and Coordination Office to provide a plan for the migration from today's 9-1-1 system toward an IP-enabled emergency network.*

9-1-1, Homeland Security and Interoperable Communications

One of the most discussed topics on Capitol Hill is the issue of interoperability. Yet, the discussion is consistently narrowly focused on "first responder" radio communications with no mention of 9-1-1 or other aspects of emergency communications. One might ask what 9-1-1 has to do with traditional first responder voice communications. In the past, it made sense to think of these issues separately as the technology and funding needed for such technology were independent issues. This is simply no longer the case within the context of next generation IP-based technologies. The same IP network that will allow a 9-1-1 center to receive voice, text, video and multi-media information from the emergency calling public should be the same network that enables increased information sharing, voice and data, on a variety of traditional and new devices among all aspects of the emergency response system.

It is for this reason that I have not referred to an IP-based 9-1-1 network. Rather, I have discussed an IP-based emergency services network in which 9-1-1 is just one

aspect. Additionally, these concepts must be considered as discussions proceed about the need for increased public safety spectrum and the creation of a nationwide public safety wireless broadband network. The same considerations previously discussed are equally relevant in the context of a wireless IP-based emergency services network. Whether wired or wireless, the network should achieve benefits for 9-1-1 and interoperable voice and data sharing among emergency response agencies and individuals. Additionally, it is important to note that some proposals being advocated would establish a wireless broadband public safety network where there is currently no such wireline connectivity. Thus, NENA believes that such proposals offer significant benefits to public safety communications, including NG–911, and should be adopted. Optimally, public safety will be given as much control as possible of such a network through the establishment of a public safety broadband trust who would manage decisions about the creation and management of such a network.

Whether wired or wireless, Congress, the Federal Government, state and local governments need to think holistically about 9-1-1 and emergency communications as part of one emergency response enterprise. As emergency communications technology advances toward a common IP-based platform, Federal funding, grant programs and homeland security policy should reflect this reality. Legislation should allow funds to be used for equipment, software and services that will enable the use of shared IP-based emergency service networks and services to enable next generation emergency communications.

Conclusion

Our nation's 9-1-1 system is a vital public safety and homeland security asset. Everyday 9-1-1 callers seek critical emergency assistance and are the eyes and ears helping others during emergencies in local communities and assisting with our Nation's homeland security. Modern communication capabilities offer an opportunity to improve the system as we know it, but they also offer challenges. The 9-1-1 community must embrace and react to change quickly, to better serve the American public, industry, and the mobile consumer in all emergencies. We need help from Congress to do so.

NENA supports S. 428 because it addresses current VoIP E–911 needs, including the issues of 9-1-1 funding and liability parity, and also includes language requiring a report on the migration to a fully IP-based NG–911 system and would allow EN-HANCE 911 Act grants to be used to fund the "migration to an IP-enabled emergency network".

As previously mentioned we believe a few minor modifications will improve the bill that will make great contributions toward public safety and security. On behalf of thousands of NENA members, 9-1-1 professionals and all involved in supporting their work, I thank you for your support and the opportunity to be here today.

The CHAIRMAN. I thank you very much, Mr. Barbour.
And now, may I recognize Ms. Sharon O'Leary?

STATEMENT OF SHARON O'LEARY, EXECUTIVE VICE PRESIDENT AND CHIEF LEGAL OFFICER, VONAGE HOLDINGS CORP.

Ms. O'LEARY. Thank you. Chairman Inouye, Vice Chairman Stevens, and members of the Committee, thank you for the opportunity to testify today.

My name is Sharon O'Leary. I am the Executive Vice President and Chief Legal Officer of Vonage Holdings Corp. My comments this afternoon will focus on S. 428, and specifically Vonage's experience in building and supporting our 9-1-1 system.

There is no higher priority within Vonage than delivering Enhanced 911 service to all of our customers nationwide. As the leading standalone provider of broadband telephone service, with over 2.2 million subscriber lines, we currently deliver Enhanced 911 to 95 percent of our customers. This is the fastest deployment of nomadic 9-1-1 service in this Nation's history. As many on this Committee know, Vonage offers consumers Voice over Internet Protocol service, which enables anyone to make and receive phone calls almost anywhere a broadband Internet connection is available.

Working with our partners in the public-safety community, the Vonage network completes nearly 1,000 9-1-1 calls every day. With the help of a dedicated operational staff, working 24/7, we handle all aspects of 9-1-1 delivery, including data collection, network management, call testing, and operational support for PSAPs.

Despite our tremendous efforts and progress achieved to support our customers in the public-safety community with 9-1-1, many challenges remain. S. 428 would significantly help overcome a number of these obstacles.

Specifically, S. 428 addresses two of the most important challenges for VoIP providers: first, access to the native 9-1-1 network; and, second, the liability parity among all communication providers.

Nomadic VoIP providers like Vonage need access to parts of the telephone network to complete a 9-1-1 call. Unfortunately, there are areas in the country where Vonage cannot gain access to these vital network elements. By including access provisions in the legislation, you ensure that the 9-1-1 system remains a public trust, not a tool to block competition.

Second, some 9-1-1 authorities are reluctant, or even refuse, to complete VoIP emergency calls, because they lack the legal safeguards that protect them from liability. These protections exist today for wireline and wireless emergency calls. In 1999, this Committee and Congress passed the Wireless Communications and Public Safety Act granting wireless carriers equivalent liability status to wireline services for all 9-1-1 calls. This same provision must be extended to VoIP. If Congress does nothing else to advance the rollout of 9-1-1, it should pass the necessary legal protections to ensure that public-safety call-takers and VoIP providers have legal parity when resolving emergency situations.

Vonage supports this legislation, and would suggest only minor changes to improve it:

First, the legislation should make it clear that the FCC has flexibility to clarify or alter its 9-1-1 rules. The current language can be read to limit the FCC's 9-1-1 rules to the status quo. As these rules were written almost 2 years ago, they only cover two-way interconnected VoIP services. Key parties remain absent from the requirements. Specifically, the FCC's current E–911 regulations apply to Vonage, but not certain other VoIP providers. While many VoIP providers interconnect with the public-switched telephone network in one form or another, they do not offer E–911 services to their customers. Codifying the existing 9-1-1 order, as S. 428 appears to do, may limit the Commission's authority to expand 9-1-1 to other VoIP providers and narrowly focuses on one aspect of 9-1-1 call delivery.

Second, in supporting a united 9-1-1 system, Vonage would urge the Committee to examine how S. 428 contemplates 9-1-1 fee remittance. Today, Vonage voluntarily remits 9-1-1 fees on a statewide basis in 23 states and is in the process of negotiating with many more. Our voluntary agreements have mirrored the manner in which most wireless companies pay 9-1-1 fees on a unified statewide basis. We believe this is the approach that makes the most sense for VoIP providers.

As drafted, section 4 requires VoIP providers to remit 9-1-1 fees according to the wireline fee structure. This would have the unintended result of encouraging fiefdoms of 9-1-1, rather than a ubiquitous system. By supporting fee remittance on a statewide basis, 9-1-1 fees are more likely to be spent the way they should, in support of the 9-1-1 system. Thus, we ask the Committee to consider mandating a statewide unified fee structure for the payment of 9-1-1 fees by VoIP providers.

Finally, I would like to comment on innovations in communications technology and how they interact with the Nation's 9-1-1 system. The mobility of any service presents a unique challenge to the present 9-1-1 system. This is true for wireless, it is also true for VoIP. The Nation's 9-1-1 system was built in 1968 to serve fixed and local communications. In our experience, this has been one of our biggest challenges. New service offerings, like wireless and VoIP, have been forced to retrofit their technologies to be backward-compatible. We shouldn't limit our vision to 1968. Vonage supports next-generation thinking, where 9-1-1 is the headlights, not the taillights, of our public-safety communications system.

In closing, I would like to be clear that we support the FCC's efforts to bring E–911 to VoIP services, and appreciate this Committee's efforts to assist in this process. As the recognized 9-1-1 leader of the VoIP community, we embrace public safety and the notion that Congress can help provide a forward path that is sensible for all parties involved and moves us forward toward a next-generation 9-1-1 infrastructure.

[The prepared statement of Ms. O'Leary follows:]

PREPARED STATEMENT OF SHARON O'LEARY, EXECUTIVE VICE PRESIDENT AND CHIEF LEGAL OFFICER, VONAGE HOLDINGS CORP.

Chairman Inouye, Co-Chairman Stevens and members of the Committee, thank you for the opportunity to testify today. My name is Sharon O'Leary, I am the Executive Vice President and Chief Legal Officer at Vonage Holding Corporation. My comments this afternoon will focus on S. 428, the IP-Enabled Voice Communications and Public Safety Act of 2007 and specifically Vonage's experience in building and supporting our 9-1-1 system.

There is no higher priority within Vonage than delivering Enhanced 911 service to all of our customers nationwide. As the leading standalone provider of broadband telephone service with over 2.2 million subscriber lines, we currently deliver Enhanced 911 to 95 percent of our customers. This is the fastest deployment of nomadic 9-1-1 service in this Nation's history.

As many on this Committee know, Vonage offers consumers Voice over Internet Protocol or VoIP service, which enables anyone to make and receive phone calls almost anywhere a broadband Internet connection is available. Working with our partners in the public safety community, the Vonage network completes nearly one thousand successful 9-1-1 calls every day. With the help of a dedicated staff working 24/7, we handle all aspects of 9-1-1 delivery, including data collection, network management, call testing, operational support for PSAPs, and next generation 9-1-1 initiatives.

Despite our tremendous efforts and progress achieved to support our customers and the public safety community with 9-1-1, many challenges remain. S. 428 would significantly help overcome a number of these obstacles. Specifically, S. 428 addresses two of the most important challenges VoIP providers face in offering 9-1-1 to customers—(first) access to the native 9-1-1 network; and (second) liability parity among all communications providers.

Nomadic VoIP providers, like Vonage, need access to parts of the telephone network to complete a 9-1-1 call. Unfortunately, there are areas in the country where Vonage cannot gain access to these vital network elements. By including access provisions in the legislation, you ensure that the 9-1-1 system remains a public trust, not a tool to block competition.

Second, some 9-1-1 authorities are reluctant, or even refuse, to complete VoIP emergency calls because they lack the legal safeguards that protect them from liability. These protections exist today for wireline and wireless emergency calls, but not for VoIP calls. In 1999, this Committee and Congress passed the Wireless Communications and Public Safety Act, granting wireless carriers equivalent liability status to wireline services for all 9-1-1 calls. This same provision must be extended to VoIP. Unfortunately, there are instances today where PSAPs will not accept VoIP emergency calls without these same protections leaving some customers without access to critical emergency services.

Mr. Chairman, members of the Committee, the need for liability protection for PSAPs that accept VoIP 9-1-1 calls is just as important as it was for wireline and wireless services. If Congress does nothing else to advance the roll-out of 9-1-1 it should pass the necessary legal protections to ensure public safety call-takers and VoIP providers have legal parity when helping resolve an emergency. This important provision is already apart of S. 428 and we commend the Committee for its inclusion.

Vonage supports this legislation and would suggest only minor changes to improve it. First, the legislation should make it clear that the FCC has the flexibility to clarify or alter its 9-1-1 rules. The current language (Sec. 2) can be read to limit the FCC's 9-1-1 rules to the status quo. As these rules were written almost 2 years ago, they only cover two-way, interconnected VoIP services. Key parties remain absent from the requirements.

Specifically, the FCC's current E–911 regulations apply to Vonage, but not certain other VoIP providers. While many VoIP providers interconnect with the public-switch telephone network in one form or another, they do not offer E–911 services to their customers. Codifying the existing 9-1-1 order, as S. 428 appears to do, may limit the Commission's authority to expand 9-1-1 to other VoIP providers and narrowly focuses on one aspect of 9-1-1 call delivery.

Second, in supporting a unified 9-1-1 system Vonage would urge the Committee to examine how S. 428 contemplates 9-1-1 fee remittance (Sec. 4). Today, Vonage voluntarily remits 9-1-1 fees on a statewide basis in 23 states and is in the process of negotiating with many more. Our voluntary agreements have mirrored the manner in which wireless companies pay 9-1-1 fees—on a unified statewide basis. We believe this is the approach that makes the most sense for VoIP providers. As drafted, section 4 requires VoIP providers to remit 9-1-1 fees according to the wireline fee structure. This would have the unintended result of encouraging fiefdoms of 9-1-1 rather than a ubiquitous system. By supporting fee remittance on a statewide basis, 9-1-1 fees are more likely to be spent the way they should; in support of the 9-1-1 system. Thus we ask the Committee to consider mandating a statewide unified fee structure for the payment of 9-1-1 fees by VoIP providers.

Finally, I would like to comment on innovations in communications technology and how they interact with the Nation's 9-1-1 system.

The mobility of any service presents a unique challenge to the present 9-1-1 system. This is true for wireless; it is also true for VoIP.

The nation's 9-1-1 system was built in 1968 to serve fixed and local communications. Unfortunately, little has changed. New service offerings, like VoIP, have been forced to retrofit their technologies to be backward compatible. We shouldn't limit our vision to 1968. Vonage supports next generation thinking, where 9-1-1 is the headlights, not the taillights of our public safety communications system.

In closing, I would like to be clear that we support the FCC's efforts to bring E–911 to VoIP services and appreciate this Committee's efforts to assist in this process. As the recognized 9-1-1 leader of the VoIP community, we embrace public safety, and the notion that Congress can help provide a forward path that is sensible for all parties and moves us all toward a next generation 9-1-1 infrastructure.

In short, Vonage supports S. 428 and I want to thank the sponsors—Senators Nelson, Snowe as well as the E–911 Caucus Co-chairs Senators Clinton and Stevens for their leadership on 9-1-1 issues. We look forward to working with the Committee toward its passage.

Thank you.

The CHAIRMAN. Thank you very much, Ms. O'Leary.
And now, may I recognize Mr. Meer?

STATEMENT OF STEPHEN MEER,
CHIEF TECHNOLOGY OFFICER, INTRADO INC.

Mr. MEER. Good afternoon. And thank you, Chairman Inouye.

I am Stephen Meer, Chief Technology Officer and Co-Founder of Intrado. I appreciate the invitation to testify today on the topic of critical life-saving capabilities that America's citizens will continue to expect from our Nation's 9-1-1 system.

I would also like to take this opportunity to congratulate Senator Stevens in his new role as Co-Chair of the E–911 Caucus. It is truly an honor to have his guidance and years of experience in such a pivotal role.

Finally, I want to commend Senators Nelson and Snowe, along with their staffs, as well as Senator Clinton, E–911 Caucus Co-Chair, and her staff, for their tireless effort and countless hours of work on 9-1-1 issues, and for their sponsorship of S. 428. This legislation will make a significant contribution toward maintaining and improving emergency services.

For over a quarter of a century, telecommunications providers and public safety organizations have turned to Intrado for their emergency communications needs. Intrado provides the core of North America's 9-1-1 call routing, data management, and communications infrastructure, and is the central figure in the integration of multiple technologies that feed into the 9-1-1 system.

We employ many former first-responders and public safety communications professionals, as well as leading-edge engineering and operations experts. For example, I have served as a public safety call taker, dispatcher, communications supervisor, as well as a deputy sheriff and EMS responder. This combined experience provides those in our company with an insightful and appropriate perspective on the issues facing 9-1-1, as well as valuable foresight into why and how this system must evolve.

While Intrado supports the concepts of S. 428, we do have two policy suggestions:

First, continue the current system for qualifying entities for access to the 9-1-1 network. Unqualified access can create a risk for security and the integrity of the 9-1-1 network and its increasingly sensitive and interconnected data.

Second, the legislation should extend liability protection to all 9-1-1 providers, not just VoIP providers, particularly as the industry and public safety community move to next generation 9-1-1 services. There may be many forms of 9-1-1 communications, including pure data and video that may or may not include VoIP technology. Rather than having to address the liability protection issue again while the ink is still drying on this bill, we believe that a more efficient approach would be to extend the liability protection broadly enough to cover all forms of emergency communications.

With regard to the future of the 9-1-1 system, Intrado offers the following two thoughts:

First, any communications delivery system or device accessing 9-1-1 must be able to take advantage of the most advanced emergency assistance available. We must continue to ensure the Nation's emergency communications infrastructure has enhanced change-capacity, that it is resilient, secure, robust, and always available. As such, future policy must require that the 9-1-1 network be able to integrate new users, call services, and data into a single redundant and interoperable system. The careful planning and execution needed to migrate from the current infrastructure to

the next-generation infrastructure cannot be underestimated. We must not allow ourselves to be seduced by those who may claim that they have a simple magic solution to this complex environment.

Second, with the advent of new and converged technologies comes the possibility for real degradation of Enhanced 911 services. For many years, the traditional wireline E–911 system has provided emergency responders with the exact street address of the caller, enabling first responders to precisely and quickly locate the caller. With new technologies, the challenge becomes providing first responders with a meaningful address, including altitude, to help them know which door to kick in, should the need arise.

Such fundamental public-safety requirements are part of a comprehensive 9-1-1 call continuum, and must be included in any future policy in order to preserve this level of service. Intrado believes the solution lies in establishing an auto-location policy that is device- and technology-neutral to ensure that substantial modification is not needed every time a new device or new technology is introduced.

In conclusion, IP, or Internet Protocol, brings substantial benefits over current networks, but history tells us it won't be the end-all, as new technologies will eventually supplant it. We can't continue, as we s have, to deal with new technologies after they are introduced and thrust upon us. It is also vital for policymakers to quickly and clearly define the end-state compliance regulations and the associated timelines. Anything short of that kind of clarity risks having a shortage of willing participants and a likelihood of ill-placed and ill-timed investment in the 9-1-1 infrastructure.

Please know that we are more than willing to act as your resource in this matter, work along with the FCC and other agencies as policy is reformed in this area. Thank you, again, for the opportunity to testify here today, and I would be more than happy to answer any questions you may have.

[The prepared statement of Mr. Meer follows:]

PREPARED STATEMENT OF STEPHEN MEER, CHIEF TECHNOLOGY OFFICER, INTRADO, INC.

Good afternoon and thank you Chairman Inouye. I am Stephen Meer, Chief Technology Officer and co-founder of Intrado Incorporated. I appreciate the invitation to testify today on the topic of bringing critical lifesaving capabilities that America's citizens will continue to expect from our Nation's 9-1-1 system.

I would also like to take this opportunity to congratulate Senator Stevens in his new role as Co-Chair of the E–911 Caucus. It is truly an honor to have his guidance and years of experience in such a pivotal role. Finally, I want to commend Senator Nelson, Senator Snowe and their staffs for their tireless effort and countless hours of work. Their legislation, Senate Bill 428, will make a significant contribution toward maintaining and improving upon emergency services.

For over a quarter of a century, telecommunications providers and public safety organizations have turned to Intrado for their emergency communications needs. Intrado provides the core of North America's 9-1-1 call routing, data management and communications infrastructure and is a central figure in the integration of multiple technologies that feed into the 9-1-1 system.

Intrado is a unique company in that we employ many former first responders and public safety communications professionals as well as leading-edge engineering and operations experts. I, myself, have served as a public safety call-taker, a dispatcher, communications supervisor, as well as a law enforcement officer and EMS responder. This combined experience provides those in our company with an insightful

and appropriate perspective on the issues facing 9-1-1 today, as well as valuable foresight into why and how the system must evolve.

With respect to Senate Bill 428, Intrado extends its full support for the efforts behind this critical public safety legislation. It is our belief, however, that additional policy elements are needed to ensure that the integrity of the 9-1-1 infrastructure is preserved.

Qualified Access

While we applaud Congress for addressing access into the 9-1-1 network, we believe that the current system for qualifying entities works well and should largely be kept in place, but improvements for expediting access, once granted, could be made. This process, which involves the states, has ensured that the 9-1-1 network cannot be disabled or sabotaged by illegitimate or poorly managed enterprises or governments. Without standards, domestic or foreign service providers lacking appropriate systems practices could inadvertently gain access to America's 9-1-1 network. The consequences of failing to secure the infrastructure would not only impact citizens seeking assistance but would hamper efforts by first responders. Therefore, we recommend that Congress affirmatively ensure that the existing process for granting access into the 9-1-1 network be fundamentally maintained, regardless of the entity type seeking such access.

Liability Protection

Our second recommendation is the inclusion of liability protection for all 9-1-1 providers. Denial of the same statutory immunity is fundamentally unfair. It creates disparity that translates to a competitive and economic disadvantage and works as a disincentive to market entry. In order to encourage the migration to an IP-based system that will be able to accommodate all new and emerging technologies, a liability protection is a "must-have" for ensuring success.

In addition to these suggestions about the legislation, we offer the following:

Migration to an IP-Based 9-1-1 Network

Intrado's vision for the next generation system is guided by our long held conviction that any communications delivery system or device accessing 9-1-1 must be able to take advantage of the most advanced emergency assistance available. We must continue to ensure the Nation's emergency communications infrastructure has enhanced change-capacity and is resilient, secure, robust and always available. As such, future policy must require that the next generation 9-1-1 network be able to integrate new 9-1-1 call services, data and users into a single, redundant and interoperable system. The careful planning and execution needed to migrate from the current infrastructure to the next generation infrastructure can not be underestimated. We must not allow ourselves to be seduced by those who may claim they have the magic solution to this complex environment.

Automatic Location Service Requirements

Our final point addresses the immediate challenge of automatically identifying the precise location of a person requesting emergency services.

With the advent of new and converged technologies comes the possibility for real degradation in E–911 services. For many years, the traditional, wireline E–911 system has provided emergency responders with the exact street address of the caller, enabling first responders to precisely locate the caller. With new technologies, the challenge becomes providing first responders with a meaningful address, including altitude, to allow them to know which door to kick in. Such fundamental public safety requirements are a part of a comprehensive 9-1-1 call continuum and must be included in future policy in order to preserve this level of service. Intrado believes the solution lies in establishing policy that is technology and device neutral to ensure that it does not need to be substantially modified every time a new technology or device is introduced.

In conclusion, IP brings substantial benefits over current networks, but history tells us it won't be the end-all, as new technologies will eventually supplant it. We can't continue, as we have historically, to deal with new technologies as they are introduced and thrust upon us. If we deal only with VoIP, we'll be back here in 2 years addressing the same issues. It is vital for policymakers to quickly and clearly define compliance requirements of the desired end-state that includes specific timelines. Anything short of that kind of clarity risks having a shortage of willing participants and a likelihood of ill-placed and ill-timed investment in the 9-1-1 infrastructure.

Please know that we are more than willing to act as a resource as you explore policies that would meet your goals and objectives. Thank you again for the oppor-

tunity to testify here today. I would be more than happy to answer any questions you may have.

<div align="center">ATTACHMENT</div>

Automatic Location Services

Introduction

Technology advances in Voice over Internet Protocol (VoIP) and Internet telephony have generally strained the capabilities of the Nation's E–911/public safety infrastructure. While the industry has addressed the immediate challenge of dynamic location/routing of a VoIP caller who has "self-provisioned" their current location with their VoIP Service Provider (VSP), (as directed in the current Federal Communications Commission mandate for VoIP E–911),[1] the solution is not foolproof. VoIP callers may not know their current address, may not have a postal valid address, or may enter a false address in order to bypass the registration process. It is anticipated that the Commission will further extend the VoIP mandate to incorporate some level of "autonomous registration" and remove the VoIP caller from the equation of location determination (*i.e.,* use an objective technology-based approach to automatically identify the location of the caller). While Intrado is fully supportive of this approach, we encourage the Commission to take into account the recommendations laid out in this paper to ensure that our Nation's citizens continue to receive the level of emergency services that that they have come to expect, as well as to preserve the efficacy of the 9-1-1 infrastructure.

The challenge of automatic location will be exacerbated in coming years, as VoIP moves from a predominantly static environment to a mix of static, nomadic and mobile use environments (*e.g.,* VoWiFi, MESH WiFi voice networks, WiMAX) and end-user devices integrate location determination technologies and are capable of accessing multiple disparate networks. With the advent of these new and converged technologies, and absent the adoption of sound public policy for the short and long term, comes the possibility for a real degradation in E–911 services. The foundation of such public policy is the fact that the traditional E–911 system returns the exact address of the caller, enabling first responders to "kick open the door" if they believe there is an emergency situation inside a structure. In order to preserve, at a minimum, this same level of service with VoIP, wireless, converged technologies as well as technologies yet to be developed, public policy must continue to ensure that these fundamental public safety requirements form the basis for future Automatic Location Services rules, *i.e.,* the level of accuracy needed to locate a caller in distress must make it possible for a first responder to swiftly find the caller and render emergency assistance.

Intrado encourages the Commission to employ this rationale for the basis and end goal of all future Automatic Location Services policies. Also, Intrado asks the Commission to remain technology and device neutral, in order to allow the industry to develop the appropriate solutions and to ensure that such policy is applicable and pertinent law, regardless of the communications device used.

Background

For more than two decades, telecommunications providers, public safety organizations and government agencies have turned to Intrado for their communications needs. Intrado Inc., a subsidiary of West Corporation, provides the core of the Nation's 9-1-1 network and delivers innovative solutions to communications service providers (Wireline, Wireless and VoIP) and public safety organizations, including complex data management, network transactions, wireless data services and notification services. The company's unparalleled industry knowledge and experience reduce the effort, cost and time associated with providing reliable information for 9-1-1, safety and mobility applications. In addition, Intrado is continuing its leadership position to solve the challenge of automated location determination for VoIP via its recent trials in King County, Washington and New York City. It is this experience that provides Intrado the expertise to offer guidance to the Commission on future policy for Automatic Location Services.

Purpose

The purpose of this paper is to provide future policy recommendations for Automatic Location Service requirements and conditions applicable to telecommunications (traditional and non-traditional) service providers for communication devices

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[1] *IP-Enabled Services; E–911 Requirements for IP Enable Service Providers,* WC Docket No. 04–36; WC Docket No. 05–196, First Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 10245 (2005).

where an end-user has an expectation of emergency communications. For purposes of this paper, a communication device is a device that: (1) enables real-time, two way voice and/or data communications; and (2) permits users to initiate and receive communications from another device.

Proposed Policy Guidelines

Framework: Recognizing the evolution of existing telecommunications technologies and the dramatic impacts that new technologies have on the 9-1-1 system, there is a clear need to provide public safety with the ability to respond to the specific location of an end-user trying to reach emergency services regardless of device, technology or access method being used. Sound public policy, both short and long term, must: (a) continue to ensure that the level of accuracy needed to locate a caller in distress is that which makes it possible for a first responder to swiftly find the caller and render emergency aid; and (b) provide clear guidance about the intended end result of the policy such that the businesses who are expected to abide by the policy, and those who invest in them, have a predictable means for meting out and measuring their efforts and investments. Policymakers can debate the time-frames for such location-accuracy requirements, but the underlying principles for the policy are constant.

Intrado acknowledges there are numerous challenges and dependencies to implementing its proposed guidelines. To that end, these guidelines represent a desired goal for the 9-1-1 system while recognizing there is clearly a migratory approach required when addressing precise location delivery from disparate networks and end devices. The recommendations also take into account factors that are critical to ensuring a successful migration, thus providing the public safety community with the most precise location available in order to serve the public's emergency services needs.

The following guidelines are segmented into two primary use case environments: indoor and outdoor. As the use of end devices and associated technologies becomes more transparent between fixed and mobile environments, there is a need to determine an approach that provides first responders with the most appropriate information to locate the end-user trying to reach emergency assistance. To that end, Intrado believes that whenever possible a "dispatchable" street address is the most suitable location information to enable rapid and efficient emergency response. Address information is still preferred over the alternatives until such time as the supporting infrastructure (*e.g.,* GIS) is able to provide an equivalent level of the accuracy.

Indoor—Location Guidelines

Definitions

- *"Acceptable Location for Indoor Usage"*—an address that has level of accuracy acceptable to the first responder(s) which must include as part of the address the location within the address (such as apartment, suite, floor or room number); [2]
- *"Access Point"*—a wired or wireless network access or termination point that provides voice or data connectivity to an end-user device.

Indoor Location Recommendation: For those locations that are a public or private structures that can uniquely be identified by a dispatchable address; including, but not limited to houses, apartments, offices, and businesses, service providers must be able to provide the (i) call back number or the equivalent based on the applicable technology, (ii) other defined attributes including end-user's name, type of communication device and service provider, and (iii) an Acceptable Location for Indoor Usage (as defined above).

Critical Success Factors

1. Automatic Location of all End-User Devices

It is recognized that the Commission will be providing guidance relative to the elimination of a VoIP end-user's manual intervention for providing the end-user's location for emergency services. The impediments to providing such a transparent and ubiquitous service are addressed with more specificity below.

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[2] Not to be confused with an Acceptable Location For Indoor Usage but rather for use as back-up location information if an acceptable address is not available, it may be appropriate to use x, y, z coordinates and an uncertainty value of the location coordinates which provide an equivalent level of precision to the acceptable address. From a policy perspective, anything less than an Acceptable Location For Indoor Use should be considered insufficient.

Location Determination Technology (LDT)—Intrado considers LDT as specific technologies that can be utilized to determine the location of a communication device of an end-user and potentially the location of Access Points that connect the communication device to the service provider network. There are a variety of technology approaches to location determination that are either currently developed or in development. Each approach has its own strengths and weaknesses and generally aligns to different use case environments. While the achievement of the desired goal for precise location will in part depend upon the full maturation of these various location technologies, it is believed that each can play a role in supporting a migration path to that goal. Specific considerations around LDT that must be contemplated in establishing this migration path include:

- The LDT ability to integrate with the end-user or other network access devices. Depending on the specific LDT approach, this may require software and/or hardware based integration efforts.
- The LDT ability to provide ubiquitous network coverage for end-user or other network access devices. Depending on the LDT, unique infrastructure deployments maybe required to support acceptable location determination coverage.
- The ability for a Z coordinates (altitude) to be determined in accordance with the proposed guidelines. Altitude should be provided as above ground level of the location from the Z coordinate to be usable to first responders. While technologies exist today to attain a Z coordinate, they still must integrate into LDT and supporting infrastructure (*e.g.,* GIS) solutions.
- The public safety community's ability to accept and translate a Z coordinate to achieve an Acceptable Location for Indoor Use.
- The ability for a network to automatically discover the addition or movement of an Access Point serving a communication device within the service provider's network. For some LDT approaches, an understanding of the location of the Access Point is a critical component to enable precise location determination.
- The service provider's ability to leverage LDT information and translate to an Acceptable Location for Indoor Usage.

2. Ecosystem Adoption and/or Integration

As LDT evolves and functionality becomes more readily available, service providers and equipment manufacturers will play an active and important role in driving adoption and integration of communication devices, customer premise equipment, or physical Access Point(s) within the service provider's network. This complex integration requires coordinated planning, with consideration to manufacturing lead time required for technology integration.

3. Location of a Cellular (CMRS) Caller

Cellular adoption continues to exceed expectations; with this rapid growth, its use cases have evolved to include pervasive indoor use as a wireline service supplement or replacement. Given this evolution, the existing FCC requirements for cellular location accuracy are not adequate to address the proposed guidelines. Cellular location capability must evolve to support the stated goals above with respect to delivery of Acceptable Location for Indoor Use. Intrado acknowledges the significant investment already made to meet the existing FCC requirements for cellular location and that this infrastructure can continue to support the migratory path to the desired goal of these proposed guidelines.

4. Public Safety

Intrado acknowledges that the public safety community operates in disparate environments with different needs and capabilities. The proposed guidelines are intended to enhance public safety's ability to respond in a dynamic and evolving technology environment. It is critical that the public safety community is actively engaged in the refinement and adoption of these guidelines.

5. Privacy Considerations

Most state laws permit the use of private subscriber data (*e.g.,* telephone number, service address, etc.) in connection with rendering emergency services, and such laws provide that a subscriber's 9-1-1 call for help is deemed consent to utilize such data for that purpose. Analogies may be drawn with respect to new technologies. If location determination solutions attendant to new technologies require, for example, registration prior to an emergency call, the Commission is well-equipped to address these potential issues involving privacy. While these and other factors are critical to achieving the desired goal of these proposed guidelines, Intrado believes that certain technologies can be deployed and leveraged to support initial phases of their

implementation. For example, in a converged network deployment with multi-mode communication devices and associated Access Points, correlations to an Acceptable Location for Indoor Use can be made. Intrado encourages the Commission to engage industry providers, in order to obtain additional input regarding this issue.

Outdoors—Location Guidelines

Definitions

- *"Acceptable Location for Outdoor Usage"*—an address that has a level of accuracy acceptable to the first responder(s) that includes the address of an Access Point and the X, Y, Z coordinates of the communication device and an uncertainty value of the location coordinates.
- *"Access Point"*—a wired or wireless network access or termination point that provides voice or data connectivity to an end-user device.

Outdoor Location Recommendation

For those locations that are not in a defined structure and cannot be uniquely identified by an address; including but not limited to P.O. boxes, rural routes, parks, roads, fields, and cars, service providers must be able to provide: (i) call back number or the equivalent based on the applicable technology, (ii) defined attributes including end-user's name, type of communication device and service provider, and (iii) the Acceptable Location for Outdoor Usage for the communication device and an indication of the coverage area of that Access Point (i.e. radius of a cell site or outdoor 802.x access point).

Critical Success Factors

Intrado believes that all the previously stated indoor success factors also apply to the location guidelines for outdoor use with an additional requirement which takes into account the mobile characteristics of an outdoor use case:

Direction Tracking

This is defined as the ability to track in real-time such factors as direction, velocity, trajectory etc., which may be indicative of mobile situations that require the public safety community or first responder to track the movement of an end-user. Clearly, inclusion of such real-time mobile data will require enhancements to critical infrastructure elements and support processes.

Implementation for Indoor and Outdoor Location Guidelines

It is Intrado's belief that the acceptable address guidelines as defined above will only be achieved as technology evolves and market dependencies are addressed in a unified and coordinated effort. Additionally, Intrado believes it is realistic to address short term solutions while encouraging stakeholders to move rapidly toward the desired goal of a more robust Automatic Location Service. To avoid the degradation of the existing 9-1-1 system, the implementation of such short term solutions must not hinder the development and deployment of solutions to support the proposed guidelines.

Conclusion

Intrado appreciates the opportunity to share with the Commission our perspective on this complex and important issue of Automatic Location Services. In order to support technology advances, a new paradigm must be adopted regarding location as well as its application within a broad range of technologies and end-user behaviors. Intrado's perspective is founded in the belief that it is paramount to ensure the safety and well-being of the public by enabling rapid and accurate response of public safety. As a nation, we must continue to preserve the efficacy and integrity of the 9-1-1 system by employing policy guidelines that provide first responders with the most appropriate information to locate an end-user trying to reach emergency assistance. A rapid and accurate response depends on a thoughtful and measured approach by all stakeholders who must be prepared for the advances in technology occurring in today's environment. Intrado believes that it is vital for the Commission to quickly and clearly define compliance requirements of the desired end-state to support investment and development of appropriate technologies and solutions. All interested parties must know with clarity what is expected of them by way of technical location performance as well as the date(s) by which those requirements will be mandated. Anything short of that kind of clarity risks having a shortage of willing infrastructure participants and a high likelihood of ill-placed and/or ill-timed investment in infrastructure. Intrado urges the Commission to promptly "put a stake in the ground" about the ultimate system location requirement, even if a phased approach is adopted.

LEAVING NO PSAP BEHIND

LEVERAGE A NEXT-GENERATION 9-1-1 SYSTEM TO SUPPORT MOBILE COMMUNICATIONS

By Stephen Meer, Intrado

Today's 9-1-1 network is solely dedicated to enabling citizens to request emergency assistance by connecting a caller to a call-taker. The current system performs this single mission quite well, day in and day out.

However, a next-generation emergency response infrastructure can more effectively support 9-1-1's broader mission—both call taking and subsequent dispatch operations—and be leveraged to more directly support a wide range of additional critical public-safety communications needs, including mobile emergency voice and data communications. As public-safety agencies develop migration plans to upgrade their legacy 9-1-1 infrastructure, it is imperative to make sure the radio-based needs of mobile responders are accommodated as well.

In the current operating environment, the 9-1-1 network is on standby most of the time, prepared to provide access to emergency assistance on demand. A flexible next-generation operating environment can allow the emergency response community to use this excess capacity to support legacy voice radio communications needs, without adversely impacting 9-1-1's life-saving mission. It also can support transporting and sharing of radio-based data communications, with the right information automatically provided at the right time, directly to the right responder.

Further, such a system can improve collaboration among a wider set of emergency responders by minimizing the limitations resulting from the current operating environment's heavy reliance on premises-based systems. As a result, the capabilities of all users, regardless of their technical sophistication, can be elevated.

The opportunity is to deploy a next-gen platform that lets current operations to continue non-stop throughout the network but also offers new capabilities, regardless of the geographic location of the technology or the level of technical sophistication available to a specific jurisdiction.
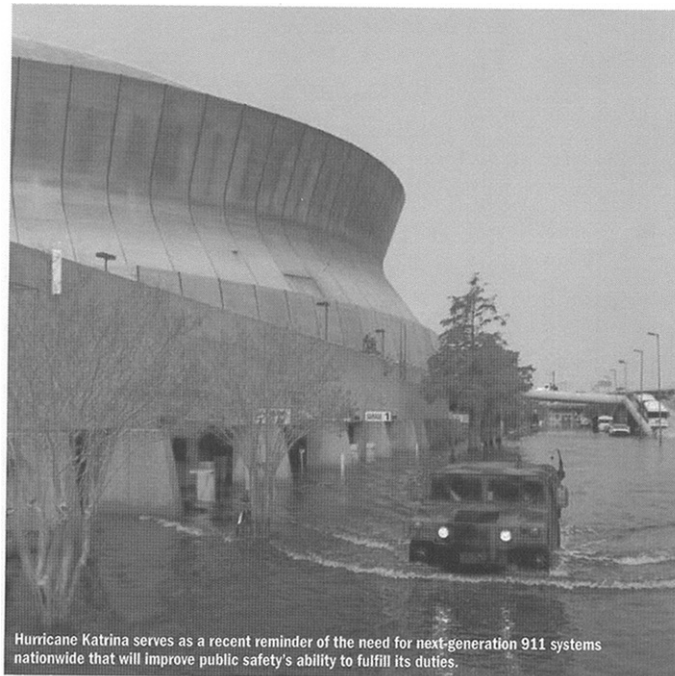
Hurricane Katrina serves as a recent reminder of the need for next-generation 911 systems nationwide that will improve public safety's ability to fulfill its duties.

Hurricane Katrina provides a real-world example of why such a technology migration is necessary and how a fully optimized next-generation emergency response network can help improve interoperability and operational flexibility.

From a technology perspective, one of the most interesting stories to come out of Katrina was the ability of public-safety and technology officials for the City of New Orleans to piece together an IP communications network in a hotel room. The ready availability of such a network to all public-safety agencies in the area could have dramatically improved the ability of emergency responders to do their jobs.

This could have been the case regardless of a specific agency's level of technical sophistication or the functional limitations of premises-based infrastructure. The only caveat is that the system must be designed, deployed and maintained to the same performance levels as required for the current 9-1-1 network.

In such a network, feature functionality is delivered via a secure IP connection, not a technically isolated, proprietary message-delivery system. Theoretically, if a public-safety communications center became inoperable—as was the case for several agencies in the aftermath of Katrina—personnel could have quickly reestablished operations anywhere using secure data links.

Emergency dispatch and response operations could have seamlessly continued without pause. By implementing a system that allows common equipment to be geographically redundant and separated from the users, public-safety officials have a higher degree of operational flexibility than provided in the current premises-based approach.

In addition, a network-based services-delivery platform enables the most advanced feature functionality to be available to all responders based on their authorized level of network access. With costs shared among multiple jurisdictions, and the network itself managed on behalf of public safety by a next-gen 9-1-1 service provider, economies of scale can be realized. Using network-based intelligence, all participating agencies benefit from cutting-edge technology without having to undertake expensive upgrades one at a time, jurisdiction by jurisdiction, while laboring to ensure continued compatibility.

During Katrina, a next-generation network also could have been leveraged to support more effective collaboration between a broader set of users, such as FEMA and National Guard personnel. This is possible because network system access is based on standard interfaces and authorization layers, not specific premises-based or in-vehicle equipment. With functionality provided through the network, getting the right information to the right responder at the right time—as contextually appropriate—is a matter of gaining authorized connectivity to a managed, secure and reliable IP-based system.

A specific example of where a next-generation system could have improved emergency response during Hurricane Katrina is in the challenges Federal and emergency personnel from other jurisdictions faced trying to locate a specific address. Even had rescue personnel been familiar with the area, it was difficult to find addresses because many street signs were knocked down or underwater. Armed with more contextually relevant information—specifically text-based driving instructions or latitude/longitude coordinates, delivered through the optimized emergency response network—mobile responders may have been able to get to many places faster.

However, we must consider what it takes to deploy a robust and integrated set of IP-based applications as the technical foundation from which next-generation emergency mobile communications can operate. The entire public-safety community—and the public that it serves—expects that emergency communications will be operational 24 hours a day, every day.

Clearly, a robust IP-based next-generation 9-1-1 network must address this expectation. An effective next-generation 9-1-1 system that relies on IP must maintain the public-safety standards of security, reliability, performance and availability required of any life-safety system.

Local public-safety agencies interested in ensuring that their mobile emergency communication needs are integrated into a next-generation operating environment without adversely affecting the delivery of emergency services would be well-served to follow the current operating model.

Like the current 9-1-1 system, the next-generation system must be deployed over a dedicated, secure and highly reliable IP infrastructure. This system must be managed by an experienced and trusted 9-1-1 service provider, such as the incumbent local exchange carrier (ILEC), on behalf of multiple local governments. Strict rules and standards will need to define which personnel and organizations are granted network access.

Should a migration to IP not be part of a particular ILEC's overall strategy, there are other companies with the required expertise to help a community cost-effectively make the migration to IP-based 9-1-1, leveraged to also support the needs of emergency responders that rely upon mobile technology.

Next-gen 911 has the ability to elevate the capabilities of all communications centers and improve collaboration among mobile responders, in addition to supporting expanded 9-1-1 functionality. But it must be designed and maintained to the same high performance standards as the current 9-1-1 network. Local public-safety communication center officials and state 9-1-1 coordinators can serve as good resources in determining the best alternative for your jurisdiction.

The CHAIRMAN. Thank you very much, Mr. Meer.

May I recognize Senator Stevens?

Senator STEVENS. Mr. Hatfield, I'm known for blundering into things, but recent announcements have been made about sunspots and emissions from the sun. We've got a system that's GPS-oriented. Have you been able to determine whether that's going to have an impact on this E–911 concept?

Mr. HATFIELD. That's a little bit about—outside my immediate area of expertise, but it is true that forms of solar radiation can have an impact. My impression is that it's—the errors that you get are relatively small compared to the current location accuracy requirements. But, I confess, that's not an area I've looked at in any great detail.

Senator STEVENS. OK. Do any of you know whether this concept of information being transmitted not being accurate—is totally related to GPS, or is it related to other factors? We have this study that I've just seen that indicates that there's a problem. I don't know if it's a technological problem or a problem in implementation by the public-safety officials or communications providers. Have you all seen this recent study we've just got news of today?

Ms. McCarley, do you know about that?

Ms. MCCARLEY. Yes. And I think—because wireless Phase II is not—is technology neutral, there are several technologies in play, in terms of delivering accuracy information to PSAPs, the Commission clearly acknowledged that those technologies had variances in their capability in the way that they developed the rule. The rule for handset technology is far narrower than the rule for network technology. So, there are a number of factors that come into play there, in terms of determining the accuracy delivered to the PSAP.

Senator STEVENS. Thank you.

What's a reasonable timetable for the transition to move into a national IP-enabled 9-1-1 system? Anyone have any suggestions?

Ms. MCCARLEY. That's a very difficult question, because I think that's very technology-dependent. But we're certainly doing everything that we can to expedite that and will move that forward as quickly as possible. The major concern, I think, is to make sure that as we move into that IP environment, we keep the standard 9-1-1 feature set—there are certain features that are inherent to 9-1-1 that we would need to make sure we migrate with us into that IP world. So, if there's anything that will cause us to pause and make sure that we research some of those issues more thoroughly, it's that feature set that supports 9-1-1 and the delivery of emergency services to the citizen.

Senator STEVENS. Mr. Meer, do you have any comment on that?

Mr. MEER. I do. Intrado has been working for quite some time on IP-based 9-1-1 and Next Generation 9-1-1. The underlying principles and the components of it, from Intrado's view, will be moving out into the world later this year, with first calls happening before

the end of this year. Of course, then we have a scaling issue and an adoption and rollout situation, as well as all the issues of the competitive landscape and the funding that go with that. But we believe that the fundamental technology components are certainly available; as we speak, they're coming to the reality.

Senator STEVENS. My last question would be, are the people involved in this, the parties involved in it, focusing on the rural areas, such as our State of Alaska, in terms of this next-generation of 9-1-1 and E–911? Or are you just focusing on the areas of potential hurricanes, like Florida or are you looking at the whole country from the point of view of rural America's being served by this, as well as those in concentrated areas?

Ms. MCCARLEY. I don't believe that we have the luxury of not focusing on the rural areas. The citizens in the rural areas of America deserve the same level of service as those people in the urban areas. So, certainly, we must address those issues for the people in the rural areas of America.

Mr. BARBOUR. I would agree, too, Vice Chairman, that we've got to approach this in a holistic viewpoint. You know, no matter where a citizen lives in this Nation, if they have a call for help, we want to make sure that call gets answered, either on a traditional 9-1-1 system or the Next Generation 9-1-1 system.

Senator STEVENS. Are any of you familiar with any kind of intersection of this next generation 9-1-1 concept with the locator beacons on small planes and aircraft that go down? We do have a locator beacon, but I'm not sure that they're connected into the 9-1-1 system. I think they're dependent upon triangulation right now.

Mr. MEER. So, in the next-generation 9-1-1 world, we're really looking at extending the call continuum. Where today 9-1-1 is a voice caller to a call-taker, we're really looking at extending it to many more devices, whether they be data-oriented or video-oriented, and carrying that through in a way that we can integrate many more pieces into it. So, those beacons, for example, the output of that can be integrated in, or somebody's pacemaker that is embedded with a radio device could be automatically calling for help as a situation is unfolding. So, one of the promises of this IP world is much more of the interconnected relationship of all of the public-safety adjunct technology and devices that can come together, so we're very excited about that.

Senator STEVENS. Have you looked into that, Mr. Hatfield?

Mr. HATFIELD. I was just going to comment that—I want to emphasize that when we talk about this, there are two critical areas. One is rural areas, where, if you only have one cell tower, it sort of follows that you can't triangulate; and so, that's a really difficult issue. I suggested perhaps some sort of a hybrid satellite and network-based solution might help solve that problem.

And then the other thing I'd like to emphasize, again, as I touched on in my testimony, this indoor location problem, as people move further indoors to use their VoIP service or their wireless service, we have problems. We have problems, because, as I said in my testimony, that satellite signal is very weak, oftentimes, compared to the cellular signal; and so, therefore, you can't be located. So, I think we've got a fundamental problem, as a Nation, to make sure that we can locate people when they're indoors.

Senator STEVENS. Well, as I said in the beginning, thank you all for your interest. This is very vital to our area that's one-fifth the size of the United States. We've got to find a way to keep up with this technology as it develops.

Thank you very much.

The CHAIRMAN. Thank you very much.

May I now recognize Senator Sununu?

STATEMENT OF HON. JOHN E. SUNUNU,
U.S. SENATOR FROM NEW HAMPSHIRE

Senator SUNUNU. I apologize. I thought Senator Snowe was next. I just have a couple of questions.

First and foremost, about the number of PSAPs that are out there—Mr. Hatfield. You talked about the advancement of the E–911 network, as a whole, and the idea of building that network, and basing it, in part, in IP technology. How many PSAPs does that really mean we need? Do we need 1,000? Do we need 2,000 or 3,000? Or is it a network that should be constructed in a much more efficient way?

Mr. HATFIELD. That's an excellent question. If I'm correct, I believe there are about 6,000 PSAPs today. And, of course, if you look at a large company, for example, that handles some volume of calls like this, you find that oftentimes they have much fewer number of answering locations, which suggests, just a little bit, that there might be some efficiency gained. But the difficulty is, there's local knowledge and things like that associated with that call-taking and dispatching capability that I think you have to factor in. In other words, it's not a pure economic-efficiency argument; there are other issues, as well. And there are other people at the table who can probably address those a little bit——

Senator SUNUNU. Six-thousand main PSAPs? Talking about principal PSAPs, not backups?

Mr. HATFIELD. Yes, I believe that's correct.

Senator SUNUNU. You know, New Hampshire's a relatively small state, but we're effectively served by one PSAP, and it works effectively. We have two backups. And I think that would, you know, speak to the belief that, you know, we could be doing this much more efficiently. When I say "efficiency," I'm not talking just in terms of dollars, but in terms of performance of the network, as well.

Mr. Meer, did you want to add something to that?

Mr. MEER. I was going to just suggest that history has also shown that the location for call-taking and for dispatching and working with the emergency responders is also an important component of that. So, while there may be some right-sizing of it, you want to make sure and look at the broader system, not just the call-handling component of that.

Senator SUNUNU. But do you believe that's been done within the current system? Do you think we've reached a point where you can say that both the location and the numbers speak to a pretty rational and efficient system right now?

Mr. MEER. I think there are changes that happen every day, and I think it's certainly not as efficient as it could be at this point.

Senator SUNUNU. Anyone want to add—yes, sir? Mr. Barbour?

Mr. BARBOUR. I would just say, in Johnston County, North Carolina, we've sort of experienced what you're talking about. Four years ago, we had four different answering points, and now we've consolidated into one. So that—and I think having it all under one roof is making a more effective and efficient manner.

Senator SUNUNU. And, in terms of performance, though——

Mr. BARBOUR. Yes.

Senator SUNUNU.—I mean, the needs, the response times, you feel those are being met, as well or better than they were before?

Mr. BARBOUR. Yes. You know, the right hand knows what the left hand's doing in the environment that we're working in now.

Senator SUNUNU. Yes?

Ms. McCARLEY. I think it's important to remember, too, that the goal of 9-1-1 is not just to get the call answered, but to get the caller to a source of assistance. And the first responder infrastructure across America, as Mr. Hatfield mentioned, is vested in local governments. So, more than just the PSAP facilities, we have to think about the way we exchange information with those first responders.

Senator SUNUNU. Ms. O'Leary, I've been provided with some statistics that show, of those customers in America that depend on traditional wireline services, 3 percent don't have access to E–911; of those that depend on Voice over IP, less than that, only 2.4 percent don't have access to E–911. Obviously, that's a good performance, and not all of those customers, unfortunately, are Vonage customers—unfortunately for you, anyways.

[Laughter.]

Senator SUNUNU. But I do want to talk about your experience and those customers that right now don't have E–911 capability, although I was certainly pleased that, over a relatively short period of time, we're down to less than 3 percent. But what portion of your remaining customers that don't have access to E–911, are denied those capabilities as a result of a lack of access to a component, a portion, of the 9-1-1 network?

Ms. O'LEARY. Well, we're talking about 5 percent for our network, and I think it's a combination of access and liability parity, because what happens is, you may not be allowed access to certain aspects of the network, because the other parties who are supposed to be providing those accesses are not compelled to do so, and have no requirement to do so. But then, when you get down to the individual PSAP level, there are PSAPs that will not enter into arrangements with us for E–911, because of the liability issues around that.

Senator SUNUNU. Can you try to quantify those two portions, roughly? How much of it has to do with access? How much of it has to do with liability?

Ms. O'LEARY. I would say three-quarters are access, and about one-quarter is liability parity.

Senator SUNUNU. I think that's important to know. I mean, anytime you get down to the last 2 or 3 percent of trying to get access, it's not easy. Given that we've had wireline services for a long, long time in America; the fact that 3 percent still don't have access to E–911 in wireline speaks to how difficult and challenging it can be. But I think it's important that we understand that access and li-

ability are two things that we absolutely need to address if we're going to solve this problem.

Thank you.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you very much.

Senator Snowe?

STATEMENT OF HON. OLYMPIA J. SNOWE, U.S. SENATOR FROM MAINE

Senator SNOWE. Thank you, Mr. Chairman. And thank you for holding this hearing on a very critical issue.

And I'm very pleased to join Senator Nelson in introducing this legislation, because I don't think that technology should define public-safety issues and issues of a matter of life and death. Hopefully, we can develop a seamless system that is sustainable, predictable, and certain, irrespective of what technology one uses in any part of the country. And I know it is a challenge, but I think it's one that is necessary. And obviously, I think, the FCC did take an important step forward in that process, and now we have to ensure that the legislation that we pass will encompass all of the issues that you have addressed here, as well today.

And I know our legislation, I think, addresses some of the gaps that exist with the FCC order. And the thing that you, Ms. O'Leary, are saying, that if the FCC's order is just codified, that that would not be enough, because it wouldn't allow for flexibility to expand the system or develop a new system. Is that correct?

Ms. O'LEARY. Well, I think what I was talking about was that it needs to encompass all of the participants in that process. So, for example, the FCC's order covers interconnected VoIP providers, but, on the same retail shelves where Vonage's devices are being sold, you have other VoIP providers right next door that are marketing themselves as alternative telephone services that do not have access—or are not required to provide access to 9-1-1.

Senator SNOWE. And so, in looking at our legislation, what would you recommend in how we, you know, address that issue, or modify the language? Do you have any ideas in that regard?

Ms. O'LEARY. I can certainly look at the specific language. I have not studied it as closely as I would like to, to be able to answer that question. But I can tell that you that there's also a lack of a compulsion around the other players, such that you have the native 9-1-1 network providers who are not compelled in any respect to provide access to their network, and then with regard to the PSAPs also being compelled in some fashion to connect with VoIP providers. But I would be happy to look at the language.

Senator SNOWE. Yes, and I certainly would like to get a feeling from members of the panel, in terms of what the recommendations for priority changes in this legislation are that you think are essential, either modification of language or additional provisions. And I know that each of you have suggested some issues.

Can we start with you, Mr. Hatfield? Is there anything in the legislation that we have proposed that you would suggest should be different?

Mr. HATFIELD. No, I don't think so. I've not looked at it in enough detail to be able to comment. I do like, very much, the no-

tion of providing Congressional impetus for the next-generation 9-1-1 network, though. I was very pleased to see that language in the bill.

Senator SNOWE. Ms. McCarley?

Ms. MCCARLEY. I think what we'd like to do is take a much closer look at the legislation and submit some written comments to you.

But certainly the liability issues are huge. The impetus toward next-generation 9-1-1 is certainly needed. But we'd like to study that in more depth and get back to you.

Senator SNOWE. Mr. Barbour?

Mr. BARBOUR. Along the same lines, I would like to see us broadening the scope of liability parity, not only to address VoIP service, but whatever the service is, coming in the future that's going to be accessing the 9-1-1 system, so that we don't have to go through this situation again. Let's go ahead and take care of it this time.

Ms. O'LEARY. I do have one other point I'd like to make, and that is with regard to the request for a unified statewide funding system. We are in a particularly interesting situation, in that there were only six—I think six states that had enabling statutes that allowed us to pay into their 9-1-1 fee structure. And now, as we go out, we have to negotiate on a state-by-state, sometimes locality-by-locality, situation, and it would be very helpful for us to have that raised up to the State level so that we could have one unified structure across all 50 States.

Senator SNOWE. And Mr. Meer?

Mr. MEER. I echo Mr. Barbour's comments. I think, in general, we should be looking at the future of telecom, and not specifically limiting any of the discussion here just to Voice over Internet Protocol, but really look at the broader issue of communications as it evolves for the foreseeable future so that we don't have to visit, not just liability, but any of the other issues that may come up.

Senator SNOWE. Well, you know, I couldn't agree with you more, and especially, what I think, really prompted this issue is, you know, making a distinction between telecommunication and information services. At this point, it should be not defined about how they're classified, but, rather, what technology people are using for public-safety questions, or using a 9-1-1 network of some kind. And I think it does have to be flexible, and I think the real key is going to be developing the next-generation plan.

How long do you think that that would take? If we require that, as we do in this legislation, how long would that take, in terms of, implementation, to have a uniform system across this country that's flexible and irrespective of technology?

Mr. MEER. Well, certainly from Intrado's view, we believe that there are pieces of it that will start rolling out even before the end of this year. Certainly, there is broad industry consensus work to be done, and some standards work, and other of the mechanical issues that are required because of the detail it takes to move forward. And certainly one of the largest challenges is, is we don't have the luxury of turning this off on Sunday night and waiting 6 months and turning it back on, so this has to operate in an environment through transition, where new and old work side by side,

and then we emerge with a future environment—next-generation environment at the end, which adds some time to it.

But we certainly feel like the industry is moving. There's a number of initiatives moving forward, both in the consensus world and from the manufacturers, to begin to move things. And I think you see activity happening already.

Ms. McCARLEY. I think it's important to remember, too, that backward compatibility is certainly going to be an issue. And, because of the funding structures and funding as it exists today, allowing agencies to migrate their technology so that they can do that based on the funding that they have available, is important.

Mr. BARBOUR. And I would just say NENA, as well as APCO, is working together on this issue to try to expedite the rollout, through the Project 41 that APCO has, the next generation partners program that NENA has, as well as the transitional planning committee that we both have. We're trying our best to get it out as quick as possible.

Senator SNOWE. I appreciate it. Thank you very much.

And thank you, Mr. Chairman.

The CHAIRMAN. Thank you.

Senator Nelson?

Senator NELSON. Thank you, Mr. Chairman.

Thank you, all, for your testimony. It's going to help us on the legislation Senator Snowe and I have filed.

Mr. Hatfield, you were preparing a report, and you said, in your statement, earlier, that you gave us some of the tentative conclusions from the study. I want to see the finished study and your final conclusions. Tell us, why was the study canceled, and at what stage was it canceled?

Mr. HATFIELD. First of all, I don't know—I was never told why the study was canceled. I was at the stage where I had my preliminary—I had divided my report into findings and recommendations, and I had briefed the Commission staff on what my tentative findings and tentative recommendations would be. In the short-term time thereafter, the study was terminated. So, there's not a report in existence today, although my testimony essentially reflects where I was at the time that I stopped working.

Senator NELSON. Well, what does it take for you to finish the study?

Mr. HATFIELD. Time and money. No. Time.

Senator NELSON. Well?

Mr. HATFIELD. I don't mean to be flip, but——

Senator NELSON. Do you need to have the specific authorization from the FCC to do that?

Mr. HATFIELD.—no, I think there is, I have been very free here today to talk about the report and what I did. I think I can go ahead and complete it on my own.

Senator NELSON. Well, then, with the Chairman's permission, I'm going to pursue this with you, if for no other reason—and in a personal, one-to-one relationship between you and me—because I'd like to see the results of your study.

Let me ask the panel, What are the risks if we fail to pass this bill?

Ms. McCarley. I think the risks are slowing down the advancement of 9-1-1. And as we've said here today, each member of this panel has articulated the importance of 9-1-1 to the American people. It's their lifeline to the service providers that provide them emergency assistance when they need it the most. So, you know, legislation that would support the advancement of the 9-1-1 system is critically important.

Senator NELSON. If this bill were not to pass, what impact is it going to have on the development of the next generation IP 9-1-1? Ms. O'Leary?

Ms. O'LEARY. I'd be happy to answer that. You can see—I think we're a real, live case of what the risks are. The FCC compelled us to roll out E–911 in 120 days. We would have been happy to do that if we hadn't run into the access issues and into the individual issues we ran into with the PSAPs around liability parity and the fear that they were going to be pulled into some awful 9-1-1 suit. And so, we're 95-percent compliant today, but, I'll tell you, that came with a lot of feet on the street and a lot of individual, you know, hand-to-hand combat and negotiation to get us there. And I think that we are the real-life example of what would happen if you failed to do that, because I think that there are some wonderful technologies on the horizon, but if they're going to be compelled to offer E–911, then why make it difficult for them, and why put our citizens at risk?

Senator NELSON. Other than what Mrs. McCarley said, if we fail to pass this bill, how is it going to impact the availability of 9-1-1 to VoIP customers?

Ms. O'LEARY. From Vonage's perspective, it's not going to impact us at all, because we're continuing to proceed, and we're going to get to 100 percent, we're hoping, by the end of the summer.

Senator NELSON. Anybody else?

Ms. McCarley?

Ms. McCARLEY. I'd just like to point out, too, that the demographics of 9-1-1 are changing. You know, 2 years ago, I guess, in my home area, Fort Worth, Texas, in Tarrant County, 40 percent, roughly, of the 9-1-1 calls came from wireless phones. Today that percentage is about 67 to 70 percent in most of our areas. The increase in the number of folks who use VoIP to dial 9-1-1 is increasing exponentially. So, I think we have to take into consideration the rapid change in the customer base, those people who dial 9-1-1, and the devices they use to do that.

Senator NELSON. Anybody else?

Mr. BARBOUR. I would just add, I agree with what Wanda was saying. You know, our society now is becoming a more nomadic society, and they're no longer dialing 9-1-1 from their home environment, they're out on the road, they're at their place of business, they're at their place of recreation. And there are devices they're going to be having in their possession that we need to ensure, when they press that panic button, that 9-1-1 receives that panic call.

Senator NELSON. Mr. Meer?

Mr. MEER. The importance of Voice over IP at this moment is that even some of the incumbent providers that are using other technologies today are quickly moving toward the use of Internet

protocol in their environments, whether it be wireline or traditional wireless. And certainly as the gap between the technology that's used to provide service to the consumer and the technology that's used to provide 9-1-1, as that gap gets larger and larger, it represents more monumental efforts and an incremental slowing of the ability to keep up. So, when Ms. McCarley speaks of "it would slow down the progress of 9-1-1," I guess I would categorize it as a little bit broader than that, and that is, the gap is growing, and we're more quickly losing the battle with each new technology that comes out, and we need to get to a system that has more change capacity, more robustness, more security, so that we can be on a level playing field to move as technology moves across the board.

Senator NELSON. Mr. Hatfield?

Mr. HATFIELD. I'd just like to reiterate again that these changes that we're talking about have also impacted, because our current system has generally been aimed at locating people when they're outdoors rather than indoors. So, I just keep coming back to that, because I think that's a fundamental change that we need to take into account.

Senator NELSON. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you very much.

Ms. Klobuchar?

STATEMENT OF HON. AMY KLOBUCHAR, U.S. SENATOR FROM MINNESOTA

Senator KLOBUCHAR. Thank you, Mr. Chair. It's good to be here today.

My background is in telecommunications, I first dealt with this as a lawyer; and then when I became a prosecutor, I saw another side of the work that you do. Some of the issues that we had in the rural parts of our State early on, when it was hard to trace where the 9-1-1 calls were coming from, and then a particular use to us as prosecutors as the evidence that we had from the 9-1-1 calls, particularly in domestic abuse cases, where we would have victims that would later get scared to testify, and the 9-1-1 calls helped us to build our case. So, I have a lot of respect for the work that you do in this area.

First of all, I want to say, this next generation that Senator Snowe was talking about is incredibly important as we move forward, but I was curious—Dr. Hatfield, in your report, you talked about—that the FCC maintain its oversight of the rollout of E–911 services and the next generation of services. And could you explain why you think that's important? And maybe others would like to comment, as well.

Mr. HATFIELD. I believe what you're referring to is that I am suggesting that we have more publicly available information on the actual accuracies of which people are being located. Generally speaking, that information is not available. Now, there are obviously very sensitive and proprietary issues involved. But what I was suggesting is that, somehow, by aggregating the information, we would have a much better idea of whether things are getting better or are they getting worse. Are they getting better in rural areas? Are they getting better in urban areas, and so forth? Without that—there's

an old management adage, you know, "You can't manage what you don't measure." And I think that's true here, as well.

Senator KLOBUCHAR. Yes, I would agree. And you're right about the sensitivity of the information, but there must be a way to do it, where you wouldn't have to identify individual cases.

Would anyone else like to comment on this issue?

Ms. McCarley?

Ms. MCCARLEY. I think, in years past, accuracy information was kind of a nonissue, because you had hardwired phones, and the accuracy was extremely explicit to an address, a specific address, particularly in rural America. Now accuracy means locations that are on mountains, in forests, snowmobilers, and people in national parks. Being able to find people where they are, when they need help, is extremely important. And the more accurate the information we get, the less time we have to spend searching, and the more lives we can save.

Mr. BARBOUR. You know, if you can imagine the call-taker and the caller when they're calling in an emergency, you know, a mother calling in that her child is choking, and they're not at home, they're in their car. And when they dial 9-1-1, and they've been trained that, "9-1-1 knows where I am. I just have to dial 9-1-1. They're going to know where I am, they can get help to me"—and then when they realize that the 9-1-1 center doesn't know where they are, that increases the frustration and the anxiety that that caller is experiencing. So, accuracy is just as important as getting a response to the call to the person that's in trouble.

Senator KLOBUCHAR. And to follow up on that, in your example, would be, you know, if they're calling somewhere, and the people don't know how to do it. I mean, I've heard there are issues with funding for training and equipment in rural areas. Do you want to talk a little bit about that and how we could solve that?

Mr. BARBOUR. Funding's always an issue. You know, guidance through grants to help the rural areas, you know, the mechanism's in place now for them to do their funding. But the numbers just aren't there in a lot of the parts of rural America. So, some leadership, some guidance, and maybe open up some grants through the ENHANCE 911 Act, I believe—you know, that was passed, but hasn't been funded, if we could get that funded, I think it would be a huge step in achieving this.

Senator KLOBUCHAR. Ms. McCarley?

Ms. MCCARLEY. I don't think you can underestimate the impact of people. And this week is National Public-Safety Telecommunications Week, the week that we honor those people who man the 9-1-1 centers and take those calls every day. They require a lot of training. And the more sophisticated our technology becomes, the more we have to migrate our workforce. So many times, in the agencies where they do business, the first thing that gets cut, in terms of funding, are the training dollars. And that's almost the last thing that should be cut. So, any assistance that we could get for the training of those folks. APCO also has Project RETAINS, which explores how we solicit, we train and keep valuable people on the job. And that's extremely important. Once we get them, we need to keep them.

Senator KLOBUCHAR. Ms. O'Leary?

Ms. O'LEARY. I just wanted to go back to the auto-location comments that were made earlier. As the only service provider up here, I just want to provide some words of caution. I think that Vonage has proven that we are all for giving our customers greater access to public safety, but I would urge that the mandates or obligation to provide an auto-locate function not get out in front of the technology that's available. And I would defer to my esteemed colleague at NENA with regard to making sure that whatever devices are out there are capable of doing what you're asking them to do before anybody's mandated to provide that function.

Senator KLOBUCHAR. Thank you very much.

The CHAIRMAN. I have one question. I'm fascinated by the benefits of high technology. However, I'm a technology moron. I know very little. But one thing I'm aware of, somebody will have to pay for the benefits of high technology. My question is, is the current funding mechanism adequate to pay for the next-generation 9-1-1 systems, or do we need alternative systems to pay for it?

Please.

Ms. McCARLEY. That's a very good question. And I'd like to stress, too, that the funding mechanism for 9-1-1 is essentially, in many ways, broken, because, as new technology comes onboard, we have to—you know, we've always relied on exchange access line fees. That doesn't work any more for the new technologies that are being rolled out. So, the 9-1-1 community is continually looking at ways that we adjust our funding mechanism to account for some of these new technologies. And certainly the number of dollars that it will take to research, develop, and deploy new 9-1-1 systems that will accommodate new technologies is far beyond anything across the U.S. that we currently have funding for today.

The CHAIRMAN. Does this bill provide any answers?

Ms. McCARLEY. I think it's certainly a valid start. And, you know, we absolutely have to take a serious look at how we fund those services, not only today, but in the future.

The CHAIRMAN. So, the fees that appear on the telephone bill, at the present time, would not be adequate.

Ms. McCARLEY. Actually, no, because the fees that appear on your telephone bill apply to your exchange access line. A VoIP provider doesn't have an exchange access line, so there's a different funding mechanism there. Wireless phones, they're not an exchange access line; there's a different fee structure there. And then, we see new wireless devices come in, like the devices that are not a monthly fee, but a number of minutes-of-use time. That's an entirely different scenario of funding. So, we have to address the issue of how we collect fees to support those callers who call from those kinds of devices. So, every new technology that comes on the horizon has to be addressed through our funding mechanisms in order that we keep 9-1-1 current and moving forward.

The CHAIRMAN. Any other views?

Yes?

Ms. O'LEARY. I absolutely agree with making sure that there's adequate funding for any new 9-1-1 technologies, and for putting those technologies in place. But I would be cautious about—I would look very closely at the fees that are currently being collected, and how they are being spent, and whether or not they are being spent

on the 9-1-1 system that we have, and whether or not they could be reallocated to the new next generation of 9-1-1.

I would also argue that, with new technologies, in many instances the costs go down. I think it goes to what Senator Sununu was talking about earlier, in terms of greater efficiencies with the new technologies. And I would urge that we not just create another funding mechanism for the sake of creating another funding mechanism, without it being thoughtful, in terms of what we've got and where we need to go.

Mr. MEER. I feel compelled to speak on the issue of costs going down. There's a lot of talk that the use of Internet Protocol and Voice over IP will lower the cost of 9-1-1. And, at the end of the day, I think there are some aspects of the costs that will go down, but, as the overall system becomes more complex, as there are more system participants, as there are more speed of evolution and introduction of new technologies and costs to keep the system up, as there are more participants that you need to coordinate amongst and do project and program management, I don't believe the costs go down. I believe they change dramatically; things that we used to pay for go away. But ultimately the system is bigger and more complex, and there are more participants. And so, we need to find ways to work more efficiently. But the net-net is, that there will be more costs paid by the American public to have similar levels of features as the system becomes more and more complex.

Mr. BARBOUR. I would echo what each one of the panel members have said. You know, back in my home county, in Johnston County, one of the fastest-growing counties in North Carolina, we're seeing our landline or our wireline revenue decrease while our call volume is increasing. And, you know, only one can relate that to wireless or VoIP subscribers increasing. So I urge you to secure funding to assure that 9-1-1 does not go unanswered.

And I want to thank Vice Chairman Stevens for his leadership earlier this year in securing the $43½ million in this area, as well as urge what else can be done to make sure, in this year's fiscal year, that we fund the ENHANCE 911 Act.

The CHAIRMAN. In other words, just the passage of this measure will not suffice.

Mr. BARBOUR. That's correct.

The CHAIRMAN. If you do have suggestions on how we can adequately fund the next generation, I hope you will submit them to us, because, you know, we can have all the benefits, bring up the hopes of our folks, but if you can't pay for it, it's just a dream. So, I would appreciate if you would take some time and come forth with suggestions, and we'll look at them very seriously, because I don't think we can go into a markup to pass a bill that has no future unless you have money. So, can you do that for us?

Mr. BARBOUR. Yes, we'll be glad to.

And NENA, just like you, Mr. Chairman, you know, we look forward to the funding debate, because it's in our interest to ensure that the funding mechanism is in place to ensure that this technology's there, whether it be technology, people there—quality, trained people—because 9-1-1, as President McCarley said, you can no longer just go and hire people off the street; it's so technology-dependent, it takes several months to train someone just to learn

the technology. It's no longer answer a phone and push a button in the 9-1-1 system, and it's not going to do anything but get worse as technology increases. So, funding is key, and we will definitely do that.

The CHAIRMAN. Thank you very much.

Senator STEVENS. It seems to me we're dancing around the head of a pin. The wire systems, the customer has paid for this, and now we're going to VoIP, where it's to be a system that really is a part of the Internet system. But very clearly we can't envision that we'll annually have an appropriation to pay for E–911 services for everyone who wants them on any kind of system, other than the wire and fixed legacy systems. If you listened to what the Chairman said, we need some suggestions. And whoever has VoIP at least is paying the provider of the Internet services. Somehow or other, we've got to find a way to have people pay for this service, or it's not going to be sustained very long.

So, I do think we have to put on our thinking caps and figure out how to get it, and spread it out as broadly as possible, so it's as small as possible, but someone's going to have to collect that money. And I hope that you'll come back to us with some suggestions.

Thanks.

The CHAIRMAN. We'll get the money, won't we?

[Laughter.]

Mr. BARBOUR. Yes.

The CHAIRMAN. With that, the hearing is adjourned.

[Whereupon, at 3:50 p.m., the hearing was adjourned.]

APPENDIX

PREPARED STATEMENT OF HON. FRANK R. LAUTENBERG, U.S. SENATOR FROM NEW JERSEY

Mr. Chairman, thank you for holding today's hearing on this important subject. 9-1-1 is a lifeline in an emergency, especially for victims of domestic violence. That is why it is absolutely critical that 9-1-1 call centers have immediate and accurate information about the caller's location. Far too often, that is not the case.

Take Misty Kirk of Cherokee County, Oklahoma. 9-1-1 operators listened for 27 minutes and 34 seconds while Ms. Kirk's ex-husband beat her in front of her two young daughters. Ms. Kirk had called 9-1-1 from her cell phone, but in Cherokee County, as in 40 percent of counties nationwide, the 9-1-1 operators did not have the technology to get her location. This is simply unacceptable and we must take steps to improve the system.

I am proud that one hundred percent of New Jersey's counties provide "Enhanced 911" services. But we need to make sure that 9-1-1 call centers can locate every caller, whether she is calling from Bergen County, New Jersey or Cherokee County, Oklahoma, and whether she is calling on a cell phone, a traditional landline phone, or over the Internet.

I appreciate the Chairman's leadership on this issue, and I look forward to the testimony of our witnesses.

Thank you Mr. Chairman.

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PREPARED STATEMENT OF SKIP SPEAKS, CHIEF EXECUTIVE OFFICER, ROSUM CORPORATION

Chairman Inouye, Ranking Member Stevens, Members of the Committee. My name is Skip Speaks, and I am Chief Executive Officer of Rosum Corporation. Thank you for the opportunity to submit testimony on the subject of VoIP and the future of 9-1-1 services. 9-1-1 is a subject that affects all users of telephony services, and arguably all citizens, in some way or another, and I appreciate the Committee's thoughtful review of this important public safety issue.

Rosum was founded in 2000 for the precise purpose of developing reliable location technology that works indoors and in urban canyons. Our founders come from the GPS world—our Chairman and co-founder, Dr. Jim Spilker, was one of the original architects of the GPS constellation. Our founders intimately know the strengths of the GPS, and in turn know of its shortcomings in urban and indoor environments. Rosum uses analog and digital terrestrial television signals for position location, signals which can be thousands of times stronger than GPS indoors and which were designed to deliver TV programming to indoor receivers. Rosum works by detecting those signals, at far weaker levels than required to deliver picture, and measuring their time-of-flight from transmitter to receiver, much as you would with GPS. In sum, Rosum transforms the broadcast TV infrastructure into a high-power, multi-channel GPS equivalent, right here on the ground. The TV infrastructure is distributed and robust to disaster, and is already used for emergency services such as the Emergency Alert System (EAS). The National Association of Broadcasters received commendation after its role in preserving communications in the wake of the Gulf State hurricanes of 2005.

Rosum has also combined TV with GPS signals for what we call "hybrid" positioning that utilizes the best available signals in a given location. This combines satellite GPS signals with terrestrial TV signals. TV is highly correlated with urban and suburban areas; conversely, GPS is strongest in more rural, open areas. The combination of the two gives us the best of both.

In rigorous all-indoor testing in various cities across America, we consistently deliver accuracy that meets or exceeds the FCC's E–911 requirements. Today our infrastructure has approximately 60 million people under coverage, with further plans to expand our coverage footprint in metropolitan areas of the U.S. this year.

Living Up to 9-1-1's Success

9-1-1 is arguably a case where industry success has created high expectations. Since its inception in 1968, 9-1-1 has conveyed peace of mind. One can expect that a 9-1-1 call made over the traditional home phone connected by copper wire will result in first responders going to the right address. The challenge before us is to deliver comparable service to the consumer, regardless of the technology they have chosen.

When I was with Ericsson's Wireless Infrastructure division, we designed and built many of the systems used in wireless communications in this country today. We responded to Craig McCaw's challenge of being able to dial a person, not a place, and made that vision a commercial reality. We also dealt with the issue of helping our carrier customers comply with E–911 requirements. It is with some confidence, therefore, that I can say the wireless industry has spent substantial time and resources working to address E–911, but I can say with equal confidence that there is still work to be done, and that we can and must do better.

As such I support Federal Communications Commission Chairman Kevin Martin's recent comments on the need for more accurate location of E–911 calls from mobile devices. I also thank this Committee for its attention today.

In-Building 9-1-1

The subject of today's hearing is VoIP and the Future of 9-1-1 Services. What I would like to do is present several trends in the consumer telephony market today that illustrate an overarching need for "In-Building 9-1-1", or 9-1-1 that works indoors, regardless of the technology or service used to make the 9-1-1 call.

Looking at the consumer telephony market today, there are four major trends or changes that draw a larger overall picture.

1. *Growth in wireless-only subscribers.* Depending on the city, roughly 5 to 20 percent of households are now wireless-only, meaning that household uses its wireless handset not just as a mobile phone while on the go, but also as a primary home line. For Detroit, it is 19 percent. For Tampa, it is 15 percent. For Boston, it is 10 percent. In San Diego, where I live, it is also 10 percent. Those percentages may seem small, but they are forecast to grow. In numerical terms, Detroit's 19 percent corresponds to 280,000 households; Tampa's 15 percent corresponds to almost 180,000 households; Boston's 10 percent corresponds to 195,000 households; and San Diego's 10 percent corresponds to 105,000 households. These are numbers that make you stand up and take notice.

This trend is most notable among the 18–24 demographic, of which 38 percent is wireless-only. This means that this trend will likely continue to grow. For these subscribers, their wireless phone is both their mobile phone and their home phone. The boundary between the two is blurring.

2. *Data showing the majority of wireless calls and wireless 9-1-1 calls are now made indoors.* The Network Reliability and Interoperability Council (NRIC), a wireless industry standards group, in its NRIC VII final report in 2005, recommended that only 5 percent of E–911 tests be conducted indoors "because no data currently exists that defines the actual number of wireless 9-1-1 calls made from indoors and because of practical limitations of location technologies currently deployed." That data now exists. Recent data indicates that 60 percent of wireless calls are made indoors and the majority of wireless 9-1-1 calls are made from indoors. Here again, the boundary between the wireless phone and the home phone is growing blurry. Further, location technologies, such as Rosum's, designed from the ground up to deliver reliable location indoors also now exist.

3. *Growth in residential VoIP subscribers.* As of Q4–2006, there were 9.5 million residential VoIP subscribers in the United States. VoIP services offer a new freedom to the consumer—the ability to place calls from anywhere a broadband connection can be found. This enables a new form of "nomadic" telephony, which chiefly takes place indoors.

Here, too, industry has spent substantial resources addressing E–911 implementation at a laudable speed. The VoIP industry is to be commended for addressing this public safety issue head on, without delay. Industry took an approach different than the automatic location approach taken in wireless—that of asking customers to self-provide their location, which, once verified, is then stored in a database and used to route the 9-1-1 call to the proper public safety answering point. This bypassed the handset upgrade cycle necessary in wireless to get E–911-capable handsets in the hands of consumers. While industry is to be praised for the speed with which it has implemented E–911 service, it remains that some subscribers may not know their exact address, or may forget to update it after changing locations. Thus, the manual update model used today will face difficulty scaling over time, or in coping with more frequent nomadic usage. Here too, I will say that regardless of the tech-

nology or service they have chosen, consumers should expect rapid and accurate response to 9-1-1 calls, without the need for manual updates.

4. *New home base stations that augment residential wireless coverage.* Home base stations or "femtocells" promise to alleviate residential wireless coverage issues by putting a mini base station in the home. Wireless subscribers can use their same wireless handset in the home. Calls are carried out over the Internet and then connected to carrier networks. For 9-1-1 purposes and subscriber activation purposes, base stations must be automatically locatable indoors. GPS, used in wireless both for E–911 and for network synchronization, will not work in indoor environments. As these devices are generally deployed where wireless coverage is poor, cellular network-based location technologies also cannot be used for 9-1-1.

Conclusions

Looking at these trends, it is clear that there is increased diversity in services available to the consumer, and that the definition of what we once called the home phone has broadened. If 9-1-1 calls are made over these new services and devices, they will likely be made from indoors. It is this general need for indoor location capability that I referred to earlier as "In-Building 9-1-1", or 9-1-1 that works indoors, automatically. Further, while I have referred to four market trends here, the advance of technology ensures that new technologies will come to market. As such, policy that can incorporate new technologies will help us avoid our current situation of reacting to new services once they are already in the market.

Choice presents the consumer with added flexibility, improved quality of service, and potential cost savings. From a 9-1-1 perspective, this diversity of options represents a challenge. But as the boundaries between home, wireless and Internet telephony blur, it is clear that consumers should not have to sacrifice safety in choosing one option over another. There is every reason for consumers to expect rapid and accurate response to 9-1-1 calls, whether made indoors or out, regardless of the technology they have chosen.

Thank you for your time and attention.

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PREPARED STATEMENT OF JOHN MURPHY, PRESIDENT AND CEO, VECTOR SECURITY INC. ON BEHALF OF THE ALARM INDUSTRY COMMUNICATIONS COMMITTEE

My name is John Murphy and I am President and CEO of Vector Security, headquartered in Pittsburgh, Pennsylvania. Vector Security provides burglar and fire alarm services to over 170,000 homes and businesses across the country. I am submitting this testimony on behalf of the Alarm Industry Communications Committee (AICC) which is comprised of the major organized associations in the security alarm industry—the National Burglar and Fire Alarm Association (NBFAA), the Central Station Alarm Association (CSAA), and the Security Industry Association (SIA), as well as a number of national alarm monitoring and alarm equipment manufacturers. I serve as President of the Central Station Alarm Association.

Alarm Consumer VoIP Notification

The AICC is pleased to have this opportunity to share with the Committee some of the problems and concerns the industry is currently experiencing when Voice over Internet Protocol (VoIP)/broadband phone service is installed. Let me begin by saying the security alarm industry welcomes new technologies such as VoIP phone services. In fact, many security alarm companies, including my own, are already availing themselves of this cost effective technology. However, as the Committee and the FCC have noted, while many VoIP providers are advertising their services as being virtually the same as utilizing traditional landline phone services, there are significant differences.

A primary issue of concern is the need to ensure that consumers who select VoIP phone service have access to emergency services on which they have come to rely, including 9-1-1 emergency services and services provided by alarm companies. At the very least, consumers should be informed that if they choose VoIP, they may not have access to 9-1-1 or that their alarm services may not work. Consumers also should be informed that, unlike traditional facilities-based phone service providers, VoIP services may not work in the event of an electrical outage if the consumer and the VoIP provider have not installed the necessary power back-up systems. This means that even if a VoIP provider offers 9-1-1 services, if an electrical outage occurs, the lack of an alternative power source will result in the consumer not having access to emergency 9-1-1 services or, for that matter, alarm security services.

For the burglar and fire alarm industry, we have learned, to our dismay, that alarm services often are disconnected or impaired when VoIP service is installed. Over the past 3 years as more and more consumers have elected to utilize VoIP

services, we have been experiencing a steady increase in consumer complaints regarding the loss of service. The reason for this is quite simple. The twenty-six million alarm systems currently installed in this country utilize phone lines to transmit a signal to a central monitoring station when an alarm is trigged. When the central station receives that signal, we then contact the customer to ascertain whether an emergency has occurred. If we do not get a satisfactory reply, then the appropriate local emergency service provider is contacted—whether it is the police, fire, emergency medical service or, where appropriate, the local 9-1-1 dispatcher—and alerted of the need for emergency assistance.

Unfortunately, what we have learned is that when the consumer installs VoIP phone services on their own or when a cable TV provider installs a VoIP phone service, all too often the alarm system is disconnected without the consumer's knowledge. In New Jersey alone, the state alarm regulatory board is currently receiving 16 consumer complaints a week regarding lost alarm services.

Of the twenty-six million alarm systems currently in use in this country, approximately half of those installed since the mid-1990s, are capable of being self-tested on a monthly basis. In homes and businesses protected by systems that can be self-tested, the consumer could be without alarm service for up to thirty days. In the case of the 50 percent of systems installed prior to the mid-1990s, the consumer will never know that they don't have alarm security services until an emergency occurs and there is no response.

The industry's nightmare is that someone who is depending upon us to protect their life or property will not receive the life-saving emergency services they depend upon. This concern is heightened by the realization that many senior citizens rely upon us to dispatch emergency medical services in the event of a health crisis.

In most instances, we can make alarm services compatible with VoIP phone service if we know the consumer has chosen broadband phone service. However, the conumdrum is that unless we know that our customer has changed his phone service to VoIP, we cannot remedy the problem.

To address the problem, most alarm companies, through billing inserts and other notices and publications, have advised their customers of the potential loss of alarm services if VoIP phone service is not properly installed. We have advised them to both test the alarm system and contact us should they decide to utilize VoIP phone services. However, in all too many instances, despite our efforts, consumers do not think about their alarm and health monitoring services when they decide to change to VoIP.

We also have worked with a number of facilities-based providers such as Time Warner who install VoIP phone services for their customers and have been successful in educating them on how to make alarm and VoIP phone services work together. We also talked extensively with Vonage and after a year of talks and effort, Vonage did place a notification on the bottom of their home web page which apprised consumers of what they needed to do to make sure that their alarm system worked when they install VoIP phone service.

While we want to compliment Vonage for working with us, we believe that the consumer is still not receiving adequate notice. This is because the notice Vonage included is at the bottom of the page and requires the consumer to seek out the information *i.e.,* know he has a problem. Rather, we believe that VoIP providers should take the responsibility of asking the consumer whether they have alarm services and if so then tell them what they need to do to ensure that their systems are compatible with their new phone system. Since virtually all consumers are activating their VoIP phone systems online through their computers, this could easily be done through a series of questions starting with: Do you have an alarm system? If the answer is yes, then they would be told what they need to do to ensure the system continues to work.

However, even with our limited success with Vonage it would be virtually impossible for us to reach individual agreements with the hundreds of companies that currently offer VoIP phone service and the untold number of companies that may offer such service in the future.

We have also raised these issues with the FCC in comments filed with the Commission and in meetings. While we believe the FCC has been receptive to our concerns, it is unclear whether the FCC has the jurisdiction to require VoIP providers to affirmatively notify consumers before they install or activate VoIP phone service. That is why we are seeking your help to insure that our customers, if they change their phone service, will continue to have the alarm security and emergency services they currently depend upon.

Our solution would be one of simple transparency and notice. What we are proposing is notification to the consumer before VoIP phone service is installed and/or number activation occurs that:

- If he/she has alarm or emergency health alert services, those services must be tested;
- Their alarm company needs to be notified they installed VoIP; and
- To insure that alarm signals continue to work in the event of a power outage, twenty-four hour battery backup is required.

Since most consumers are purchasing VoIP equipment from consumer electronics stores and self installing that equipment, we strongly believe that the same consumer notifications should be included in any instructions accompanying equipment sold or provided directly to consumers.

While we appreciate that last year the Committee included the notice requirement we are seeking at the point of number activation or installation by a service provider in your telecommunications rewrite bill and that Senator Stevens included the same language in his universal service fund bill this year, we urge the Committee to take the additional step of requiring that notice be included in the instructions that accompany equipment sold or provided directly to consumers.

Attached is a copy of the proposed language for VoIP Consumer Notification which includes both; notification on the equipment sold directly to consumers as well as notification at the point of installation or number activation.

Alarm Monitoring Licensure Reciprocity

I also want to take the opportunity at this point to bring to the Committee's attention another issue of concern to the alarm industry. When the 1996 Telecommunications Reform Act passed, alarm monitoring was provided in a much different manner than it is today. At that time, alarm monitoring was predominately provided to the consumer on an intra-state basis. The 1996 Act which led to a dramatic reduction in the cost of long distance phone service changed all that. As result, the industry has moved from local monitoring to providing monitoring services on a regional and national basis.

For example, in 1996, the largest alarm company in the world had one hundred and twenty-six central monitoring stations. Today, even with significant customer growth, that company only has five central monitoring stations to serve approximately six million customers across the Nation. These new efficiencies have allowed us not only to provide better service, but also to hold the line on the cost of monthly monitoring services.

As currently implemented, state and local regulation of alarm monitoring operates to impede the efficiencies that regional and national monitoring can provide. Currently, 16 states regulate alarm monitoring services. In addition, many localities also regulate alarm monitoring. For instance, while the State of Wisconsin does not regulate monitoring, the cities of Madison and Milwaukee do. Similarly, Nevada does not regulate alarm monitoring, but Las Vegas does.

What this means for alarm monitoring companies is that in many cases to be allowed to transact business in a state that requires licensing, individuals need to travel to that state in order to complete the testing requirement for the license. They may also need to make repeat trips in order to meet renewal requirements. In addition, various levels of employees also need to be fingerprinted and go through background checks. For Vector Security this has meant that my senior staff has been fingerprinted more than 100 times over the past year or so. I myself have been fingerprinted nearly twenty times in the last 6 months. Each time, the FBI has had to check our fingerprints as well as conduct a background check. Given the national security demands on the FBI, the alarm industry thinks repeated fingerprint and background tests are not in the country's best interest.

We would like alarm monitoring licensing to be treated in a manner similar to acquiring a driver's license. Once individual basic skills and rules are determined to be adequate, it is lawful to drive from state to state. We would like to see an approved license to monitor being honored by all states. At the same time, we recognize and support the right of individual states and jurisdictions to require monitoring companies to register, pay licensing fees and be subject to disciplinary action should they not conduct business in a manner that is deemed proper in a given state.

Not only is it costly, but it is also very time consuming for national and regional monitoring companies to get each new employee certified in every jurisdiction which requires licensure. To make matters worse, we are often placed in the position of having to ascertain whether a monitoring employee is certified in a jurisdiction from where an alarm is going off. Since we know that every moment we delay in responding to an emergency can mean the difference between life and death, having to make sure that you are certified in the jurisdiction from which the alarm is coming places our customers needlessly at risk.

Similarly, we are concerned that given the many Federal, state, and local buildings we monitor as well as the numerous "at risk" sites we serve such as ports, oil refineries, banks, and water reservoirs, we believe everyone—alarm companies, their consumers, as well as state and local governments—would benefit from a more efficient and effective licensing system for those companies who provide monitoring services across state or local jurisdictional lines.

At the same time, we believe that consumers are losing out because restrictive state or local licensing requirements such as requiring a physical presence in a given jurisdiction is acting to reduce consumer choice in many areas. This in turn leaves them with few if any alternatives to a service provider they may not be satisfied with. Essentially what we are witnessing is a state and local regulatory process that has evolved over the past decade that is not keeping pace with the technical and business efficiencies that resulted from the 1996 Act.

After years of study of the various state laws and industry consultation, we have come up with a solution that we believe will not only improve the certification process, but will also make it much more effective and efficient. Our proposal would continue to leave the responsibility of licensing at the option of the states or local jurisdictions, but the Federal Government would establish a national model for monitoring licensure.

Under our proposed model, the national standard would require: (1) a criminal background test: (2) fingerprinting; (3) verification that the applicant is not being treated for chemical, alcohol, or narcotics abuse; (4) participation in a recognized national or state training program; and (5) retention of training and employee records. If a state adopted these rules and the alarm monitoring company was either headquartered in that state or had a significant business presence in that state then the monitoring company could become licensed in that state. This license would have to be honored by any state which decides that a monitoring license is required. Under our proposal, states would retain the right to discipline or revoke a license issued by another state if they can show cause.

The monitoring company would still be required to apply for a license in each state that has licensing, pay all fees being charged, and comply with any state rules requiring business registration. However, if they were licensed in a state which adopted the national model licensure procedures, then they would not be required to travel to any other state in which they are seeking reciprocity.

The industry's proposed license reciprocity system would eliminate an arcane ad hoc regulatory system that has not kept pace with the dynamic changes that have occurred over the past 10 years. In many cases, our proposal would result in the upgrading of state licensure standards, while at the same time provide states with the authority to regulate whether a company was meeting the national standards. In addition, our proposal would not interfere with the ability of states to impose appropriate fees on those providing alarm monitoring services in their jurisdiction.

We thank the Committee for listening to our concerns and welcome the opportunity to work with you to make sure that consumers do not inadvertently lose the alarm services that they have come to depend upon to protect their life, safety, health, and property.

Analog (AMPS) To Digital Cellular Alarm Sunset

Finally, I would like to bring to the Committee's attention a serious problem the alarm industry is facing with the FCC Analog Cellular (AMPS). Sunset order which goes into effect on February 18, 2008. The alarm industry has installed approximately 1,000,000 analog cellular systems across the country. These units are used as primary and back-up burglar and fire alert monitoring systems as well as for home health monitoring. Wireless alarm systems are used because of the fear that an intruder or arsonist will, if possible, cut the telephone line in an attempt to disable an alarm system. In many instances, insurance companies require the consumer to use two methods of monitoring protected premises, especially in the case of vulnerable businesses such as banks and jewelry stores or those facilities that are targets for attack. Similarly there are tens of thousands of medical alert devices that are dependent upon analog cellular-based monitoring services.

Despite the fact that the original FCC Sunset order was issued on February 18, 2003, only recently has the industry had the capacity to install digital cellular alarm systems. Starting shortly after the FCC issued its order in 2003, alarm monitoring companies and those who manufacturer alarm monitoring equipment began meeting in an effort to develop digital cellular equipment. However, because alarm systems must meet an extremely high reliability standard and receive the Underwriters Laboratory seal of approval, it took time to develop a working prototype. That process took until late 2005, but alarm equipment manufacturers did not have their products available for sale until April of 2006. At the same time, it took AT&T/Cingular

until October of 2006 to announce that they had a unified cellular network which was capable of transmitting digital alarm signals. Then in the fourth quarter of 2006, the only two suppliers of digital alarm radios began to experience product problems and had to initiate recalls. In November of 2006, the industry filed a petition with the FCC formally requesting that the AMPS deadline be extended 2 years to provide us with time to replace existing AMPS radios. This was followed by AT&T/Cingular network readiness problems in January of 2007.

A number of public safety associations have filed letters in support of the industry's request for a delay. They include the Association of Public-Safety Communications Officials (APCO), Fraternal Order of Police, International Fire Chiefs Associations, National Safety Council, National Crime Prevention Council, Home Safety Council, and various women's shelters and laws enforcement departments.

Simply stated, it would be impossible for the alarm industry to replace the existing 1,000,000 analog units between now and February 18 of next year. This will place hundreds of thousands of individuals who are dependent upon analog systems at risk.

In an effort to remedy this problem, the industry has proposed a rolling geographic shutdown of the current analog cellular service. This would allow us to concentrate equipment and manpower to address the problem. But so far we have been stonewalled by the analog cellular carriers.

Because the potential impact is so great, we are urging the Congress to step in and to support an up to 2 year delay in the implementation of the FCC's Sunset Order or at the very least to impose a geographic rolling shutdown that will better allow us to replace existing AMPs radios.

The industry remains prepared to work with the Committee on all of these issues and welcomes the opportunity to talk further with you.

ATTACHMENT

Proposed VoIP Notification Draft 4-13-07

"(c) IP-ENABLED EMERGENCY RESPONSE SYSTEMS.——

"(1) NOTICE PRIOR TO SALE OF EQUIPMENT NECESSARY TO CONNECT VOIP SERVICES.—Any instructions accompanying equipment that is sold in interstate commerce and necessary to connect VoIP service shall contain a clear and conspicuous warning to ensure proper functioning of emergency response systems that—

"(A) such customer should arrange with his or her emergency response system provider, if any, to test such system after installation;

"(B) such customer should notify his or her emergency response system provider as soon as the IP-enabled voice service is installed; and

"(C) a 24 hour battery backup is required for customer premises equipment installed in connection with the IP-enabled voice service in order for the signaling of such system to function in the event of a power outage.

"(2) NOTICE PRIOR TO INSTALLATION OR NUMBER ACTIVATION OF VOIP SERVICE.—Prior to installation or activation of an IP-enabled voice service for a customer, an IP-enabled voice service provider shall provide clear and conspicuous notice to the customer that—

"(A) such customer should arrange with his or her emergency response system provider, if any, to test such system after installation;

"(B) such customer should notify his or her emergency response system provider as soon as the IP-enabled voice service is installed; and

"(C) a 24 hour battery backup is required for customer premises equipment installed in connection with the IP-enabled voice service in order for the signaling of such system to function in the event of a power outage.

"(d) NO EFFECT ON TAX LAWS.—Nothing in this section shall be construed to modify, impair, supersede, or authorize the modification, impairment, or supersession of, any State or local tax law.

"(e) DEFINITIONS.—In this section:

"(1) EMERGENCY RESPONSE SYSTEM.—The term 'emergency response system' means an alarm or security system, or personal security or medical monitoring system, that is connected to an emergency response center by means of a telecommunications carrier or IP-enabled voice service provider.

"(2) EMERGENCY RESPONSE CENTER.—The term 'emergency response center' means an entity that monitors transmissions from an emergency response system.

"(3) FACILITIES-BASED.—The term 'facilities-based' includes an IP-enabled voice service provider with control and operation within a local access transport area of—

"(A) communications switching and routing equipment;

"(B) long-haul trunks; or

"(C) local transmission facilities.

"(4) IP-ENABLED VOICE SERVICE.—The term 'IP-enabled voice service' means the provision of real-time 2-way voice communications offered to the public, or such classes of users as to be effectively available to the public, transmitted through customer premises equipment using Internet protocol, or a successor protocol, for a fee (whether part of a bundle of services or offered separately) with interconnection capability such that the service can originate traffic to, and terminate traffic from, the public-switched telephone network."

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RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. MARIA CANTWELL TO DALE N. HATFIELD

Question 1. Are there technologies other than GPS that can be used for an E–911 type service? Globally, who are the leaders in researching these alternative approaches? Do any of these technologies offer the potential of addressing the in-building location issue you raised?

Answer. Yes, there are technologies other than GPS that can be used for E–911 type services. Indeed, some carriers currently use a network-based location solution that triangulates among the individual cellular carrier's towers to estimate the location of the caller's handset. There are also solutions that combine GPS with that solution. Such a combination is often referred to as a "hybrid" solution. In addition, a number of other solutions exist and are being promoted by various vendors. These vendors include Rosum Corporation, S5 Wireless, Skyhook Wireless, and others.

With regard to the last two parts of this question, I am not familiar enough with the research and development going on in the rest of the world to be able to respond with confidence. Indeed, in the report that I was preparing for the Federal Communications Commission and in my prepared testimony, I proposed that the agency seek the advice of an independent group of scientists and engineers (*e.g.,* through the National Research Council or a formal advisory committee) in order to ascertain the current state-of-the-art in location technologies for in-building use and to make recommendations on how the Nation might move ahead to address the in-building location issue. If this approach was adopted, the expert group would be tasked with assessing the advantages and disadvantages of the various technological solutions including the ones utilized currently and the ones proposed by the vendors mentioned earlier.

Question 2. From your experience, how important is an E–911 system's absolute accuracy as compared with the speed it can route an incoming call to where it needs to go? Are there significant system design tradeoffs?

Answer. This is a very perceptive and important question—one that I do not think has been addressed adequately. I would note that accurate location information is important to two respects: first it is important to ensure that the emergency call is routed to the correct public safety answering point (PSAP) and second, and more obviously, it is important to the dispatcher and first responders who must quickly deploy resources to the location from which the call actually originated. Unfortunately, accurate subscriber location information may not be immediately available when the wireless 9-1-1 call is originated and, as the question indicates, the accuracy of the measurements may improve over time. Because accurate information may not be immediately available, it is my understanding that the carriers typically route 9-1-1 calls to the correct PSAP based on Phase I (what cell tower or antenna is handling the call) rather than Phase II (the estimated latitude and longitude or X–Y coordinates) location information. The current rule for how fast the location information must be delivered to the PSAP was established years ago before we had the benefit of extensive experience with actual systems in the field. So my belief is that there are significant system design tradeoffs involved in both the routing decision and in the decision of how long to wait until the X–Y information is provided

to the call taker. It is my further belief that these tradeoffs should be explored by the Commission and expert groups in an appropriate proceeding.

Question 3. Today—and even more so in the future—there will exist electronic devices with communications features that can call 9-1-1, but where there is no consumer expectation that they should be used for calling 9-1-1. Do you believe that in the future any device capable of dialing 9-1-1 be required to provide its location? What difficulties do you envision in the creation of the necessary database? How would the legacy equipment issue be addressed?

Answer. This is an important question and one that it is being addressed in the context of the planning for the Next Generation 9-1-1 (NG–911) network. I agree that, as a general rule, any device that is capable of being dialed to reach 9-1-1 should be required to provide its location. It is my understanding that at the Virginia Tech tragedy, students tried to send text messages to 9-1-1 which is not an unreasonable thing to try to do since one can send text messages to other devices which have an ordinary ten digit telephone number associated with them. It is my further understanding that the experts that are working on the NG–911 network have included requirements to handle 9-1-1 calls from more modern end user devices such as PDAs with communications capabilities. With the NG–911 network, I do not think creating the necessary databases would be a major impediment. I believe the legacy equipment issue is very much device dependent and therefore I am unable to address the legacy question in general.

Question 4. One county in Washington State tested the accuracy of its E–911 system with the intention of providing useful feedback to local PSAPs and carriers servicing the region. In response, the carriers challenged the design of experiment and measurement techniques for the locations where the accuracy fell short of what is required. Would a common testing methodology for location accuracy address this type of situation? Should there be one testing methodology for all handset-based E–911 and one testing methodology for all network-based E–911, or just a single testing methodology covering all E–911?

Answer. Based upon both my original (2002) report and my more recent work in the E–911 area, I believe that it is critical that testing methodologies be standardized and that such tests be conducted according to the standard and in an open, transparent, and verifiable fashion. Since the FCC seems to be moving in the direction of a single accuracy standard for both network and handset-based solutions, I believe a single testing methodology would be appropriate.

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RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. FRANK R. LAUTENBERG TO DALE N. HATFIELD

Question 1. Have you identified significant problems with the accuracy of location technology when cell phones are used indoors?

Answer. Yes. I regard the in-building location question as the most significant issue raised in my second study for the Federal Communications Commission. GPS satellite signals coming from great distances above the Earth tend to be much weaker than the signals received by a cellular handset from a relatively nearby tower. This means that while a person in a building may be able to complete an emergency call to the PSAP, the location information may be unavailable because of the comparatively weak signals from the satellite. This issue has grown in importance as people increasingly shift their telephone service from landlines to wireless.

Question 2. What recommendations do you have for mobile phone users who call 9-1-1 from indoors?

Answer. Mobile phone users should always be prepared to give/confirm their location information to call takers when they dial 9-1-1. Consumers should also be made better aware of the limitations of 9-1-1 location technology in the wireless environment—especially when they plan to rely entirely upon wireless devices for basic voice telephone services.

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RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. MARIA CANTWELL TO WANDA S. MCCARLEY

Question 1. What States are doing a good job of transitioning to E–911? How are your organizations taking the lessons learned from these States and getting that information to those States who are struggling?

Answer. Most states with and without state coordination are doing well on landline and wireless E–911 efforts, but some states that are not doing well often lack alternative funding methods (*i.e.,* wireless surcharge, adequate general rev-

enue, strict limitations on traditional wireline funding, and allowable fee imposition on alternate technology access to 9-1-1). The states that are doing a good job on transitioning to wireless E–911 are Texas, Virginia; and perhaps you could say Rhode Island (small state with a statewide program).

APCO publishes and maintains on its website a state by state funding report citing the legislation currently in place, which can be used by other states for comparison and even suggestive purposes for legislative review and consideration. APCO has conducted and published a report on the funding issues in advance of VoIP and now other potential alternate access to emergency services via 9-1-1.

Question 2. Next Generation 9-1-1 is being discussed as a national effort while 9-1-1 and E–911 have traditionally been considered local programs. What do you envision will be national versus local with respect to Next Generation 9-1-1? What will a national 9-1-1 information backbone accomplish? Has your organization been working with the Department of Transportation's contractor that is developing specifications for the Next Generation 9-1-1 system?

Answer. It will be very challenging to implement a national NG–911. The purported ability of NG to mix voice and data and provide the ability to move large diverse amounts of data to other than PSAP's is a promise that "if" fulfilled will drive NG across the country. But the transitional planning needed to bridge the gaps between the large well funded PSAPs and the small PSAPs will require a national plan and national funding. The undefined costs both initial and recurring as well as the hidden costs of maintaining in-house technical capability at the PSAP could put a strain on many small and mid-size agencies that lack proper funding mechanism to purchase and maintain these systems.

The enthusiasm for NG–911 is based in part on a promised expansion of data interoperability between disparate systems to better manage events, resources assigned or committed as well as overall situational awareness critical to responder safety. NG systems should assure that they are capable of "connecting" to legacy systems which in most places within the country will remain in place for some years to come.

Potentially, if done correctly, the backbone could demonstrate the actual benefits of the proposed network, help identify costs to all subscribers, provide proof of concept, and test the ability to merge with legacy systems, as well as document the end-user responsibility and new requirements to successfully utilize the network. The national backbone could provide a means to give interoperability to calls to 9-1-1.

USDOT is reportedly planning to test a solution in a real PSAP environment, which is long overdue and critically important since the commitment of funding and proposed development is based only on assumptions. APCO has pushed to become a part of the input to the USDOT NG–911 program by being represented and participating in focus groups and forums.

Question 3. How are you preparing your membership for the transition to Next Generation 9-1-1? How are you planning to support the development of nationwide standards with your diverse membership?

Answer. APCO established Project 41, as well as state, regional and national conferences, and publishes monthly magazine articles to be pro-active in preparing our members and industry for the transition to Next Generation 9-1-1. APCO is the only ANSI accredited standards developing organization (SDO) for public safety communications and continues to be involved with have been involved with ESIF/ATIS, NIEM and other groups to develop standards and models for this purpose.

APCO is also partnering with NENA developing a PSAP Survivability MATRIX that could be used by PSAPs to determine where they are today and how they can survive in the future.

Question 4. What is the ideal size for a PSAP in terms of population served? With over 6,000 PSAPs, can Next Generation 9-1-1 be implemented efficiently, particularly when some PSAPs receive only a few calls a day or have very small service territories?

Answer. There is no ideal size for a PSAP. The choice of service capability within any community is at the local level. Until clear evidence can be documented regarding the significant benefit of the proposed network and related systems, the chance at improvement balanced against the undefined costs for local government may and is likely to cause incremental migration over time to the goal of Next Generation 9-1-1 being implemented efficiently. However, it is becoming increasingly obvious that the 2–3 position PSAPs of today are not cost efficient or able to keep up with technology. NG will no doubt drive consolidation but not too many people touting NG are talking about that part.

Question 5. From your experience, how important is an E–911 system's absolute accuracy as compared with the speed it can route an incoming call to where it needs to go?

Answer. Both are very important but getting the correct location is everything even if it means giving up 20–30 seconds to get an accurate location.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. FRANK R. LAUTENBERG TO WANDA S. McCARLEY

Question. Domestic violence victims are told to call 9-1-1 in an emergency, but when they call from a cell phone or use VoIP, it's often impossible to get automatic, accurate information on the caller's location. Has APCO developed standards for call center professionals to get detailed location information from callers? Should that be the first question that call center professionals ask, as opposed to asking what the emergency is?

Answer. Yes, APCO has developed standards for call center professionals. The standard for asking "what is your emergency" to "where is the emergency" has already shifted and APCO International trains over 5,000 call takers a year through its Telecommunicator Training programs to ensure this is the first question asked by a call taker. All else is of little value if the location of the crises remains undefined.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. MARIA CANTWELL TO JASON BARBOUR, ENP

Question 1. What States are doing a good job of transitioning to E–911? How are your organizations taking the lessons learned from these States and getting that information to those States who are struggling?

Answer. There are currently fourteen states (and the District of Columbia) in which 100 percent of counties have Public Safety Answering Points (PSAPs) that are capable of receiving wireless Phase II E–911 information. Those states are CT, DE, FL, ME, MD, MA, MI, MN, NH, NJ, RI, TN, VT and WA. Unfortunately, nearly twenty-five states still have more than twenty-five percent of their counties without PSAPs that are Phase II ready.

Through the learning experience of deploying Phase II in the states, NENA has developed numerous items to assist those who have not yet deployed. We have developed three documents which are designed to help PSAPs who wish to request Phase II service from carriers. They include a form to submit to each wireless provider, along with two other documents explaining the package. This PSAP Readiness Checklist package was developed about 4 years ago with the involvement and approval of NENA, APCO, the major wireless providers and others within an industry group known as the Emergency Services Interconnection Forum (ESIF). The materials are available as follows:

Introductory material:

- *http://www.atis.org/esif/docs/Final-Documents/Phase-II-Readiness-Checklist-Package.doc*

PSAP Readiness Checklist:

- *http://www.atis.org/esif/docs/Final-Documents/Phase-II-Readiness-Checklist-Form.xls*

PSAP Readiness Checklist Appendix:

- *http://www.atis.org/esif/docs/Final-Documents/Phase-II-Readiness-Checklist-Appendix.doc*

Additionally NENA has also developed NENA Operational standards and Operations Information Documents (OID) to assist with Phase II implementation which can be downloaded by anyone at no cost. The NENA OIDs are as follows:

NENA Wireless Phase I & II Features and Functions Operations Information Document 57–501

The NENA Wireless Phase I & II Features and Functions OID defines how E–911 Phase I and Phase II should work in a best practice operational environment, given the current technology limitations. Topics discussed within Phase I include call back number, cell site/sector location, standard ALI data formats and troubleshooting. Topics discussed within Phase II include call back number, location data,

standard ALI data formats, uncertainty factor/confidence factor, re-bid/location updates, Phase II ALI interface and troubleshooting.

NENA Wireless Phase I/II Planning & Implementation Checklist & Modules OID 57–502

The NENA Wireless Phase I/II Planning and Implementation Checklist and Modules OID was approved by the NENA Operations Committee leadership, May 24, 2004. It is intended to serve as a best practice for deployment of wireless E–911 Phase I and Phase II. Its primary goal is to set expectations and improve communications among the many parties in the deployment process.

Steps in the process include:

- Determining whether or when to proceed with Phase I or Phase II deployment,
- Establishing the initial contact with the 9-1-1 service provider,
- Making the proper notifications,
- Organizing the initial planning meeting,
- Completing the call routing sheets and addressing database issues,
- Establishing an ALI delivery standard,
- Establishing a GIS system,
- Testing the initial deployment of the system, and
- Dealing with post-deployment issues.

NENA operational standards regarding wireless E–911 are available at *http://www.nena.org/pages/Content.asp?CID=23&CTID=5* and include such subjects as Wireless E–911 Overflow, Default and Diverse Routing, PSAP Geographic Information Systems (GIS) and Wireless Call Routing and Testing Validation.

Additionally, NENA received a grant from the U.S. Department of Transportation to stimulate wireless Phase I and Phase II implementation throughout the U.S. and to monitor wireless E–911 implementation in the states. Two products of the Wireless Implementation Program are now available. The first product, the Wireless Deployment Profile, is the result of a six-month survey conducted by NENA. State and county 9-1-1 coordinators provided information on readiness of states, counties and PSAPs for wireless E–911. The information from the survey is accessible via a "point and click" map combined with tabular data for each county. A user can simply click on the state and zoom to a county and view tabular data about the E–911 status of that county. That information, and several national reports comparing state progress in wireless E–911 deployment, is available at *http://nena.ddti.net/*. While the grant has expired, NENA continues to actively monitor E–911 implementation and updates the figures monthly. This information has proven to be very valuable as decisionmakers in states consider whether or not to invest in wireless Phase I and Phase II.

The second product was a result of additional work done by NENA to estimate the costs to complete Wireless Phase II for those counties/PSAPs that do not currently have Phase II. A survey was completed to estimate costs to complete Phase II. We then applied those costs to the number of counties of varying sizes to determine the total cost to complete Wireless Phase II as of June 2006. Those estimates are widely used by GAO, USDOT, and public safety organizations as the approximate cost to complete Phase II. Obviously, as more counties become Phase II capable, the remaining costs are reduced, but there still remain significant costs to complete Phase II, especially in rural areas of the country.

As a result of the DOT contract, NENA was also able to conduct several Critical Issues Forums (CIF) where we presented information to PSAP managers and administrators on the wireless E–911 implementation process. Since there is no longer funding available through the DOT contract, travel to states and regions that are lagging in E–911 deployment has diminished significantly. NENA would do more direct hands-on outreach if a funding source existed to pay for such efforts. We do still provide information to our members in a variety of forums and try to attend most or all of the NENA Chapter events to provide information on this and many other topics.

Similar efforts are also ongoing concerning VoIP E–911 implementation. NENA has held several free webinars on the subject for our members and has developed a VoIP E–911 implementation Operations Information Document which is available at *http://www.nena.org/media/files/NENAVoIPDeploymentOIDfinal060606a.pdf*.

Question 2. Next Generation 9-1-1 is being discussed as a national effort while 9-1-1 and E–911 have traditionally been considered local programs. What do you envision will be national versus local with respect to Next Generation 9-1-1? What will a national 9-1-1 information backbone accomplish? Has your organization been

working with the Department of Transportation's contractor that is developing specifications for the Next Generation 9-1-1 system?

Answer. NENA has spent a significant amount of time analyzing current jurisdictional roles concerning 9-1-1. This has been a focus of the NENA Next Generation Partner Program which recommended that a general consensus suggests that the Federal Government should primarily play a role of coordination and provide initial funding to states to develop emergency service IP networks; states should manage such networks and coordinate NG–911 system implementation and operations efforts at the state level; while 9-1-1 operations and call-taking continue to be managed at the local level.

The Federal Role

As we move toward IP-enabled emergency service networks, providing guidelines and funding for a national IP emergency services infrastructure that is coordinated at the state level is the most important role for the Federal Government. This will come in the form of physical infrastructure, along with the coordination of national standards, system interfaces and overall system architecture. The Federal Government should not dictate specific solutions; rather, it should provide detailed guidelines for state and local governments to meet when implementing IP emergency services networks and NG–911 systems. Funding requirements must be tied to these guidelines. Additionally, there is a need to update Federal and state laws and regulations to enable NG–911 to become a reality. Current laws are based on legacy technology and business relationships and need to be reviewed and revised to reflect changes in technology.

It is important to distinguish the different roles various Federal agencies have regarding emergency communications in general and 9-1-1 in particular. All 9-1-1 specific functions at the Federal level should be managed by the joint NHTSA/NTIA national Implementation and Coordination Office (ICO) when it is established. While the ICO should be focused on national 9-1-1 specific coordination efforts, other efforts that focus on developing a national emergency services internetwork (a "system of systems") that includes 9-1-1 need to be continued. This internetwork needs to include but not be limited to 9-1-1. Developing stand-alone 9-1-1 IP networks should be avoided. Economies of scale will be created through the use of shared and managed IP networks in which 9-1-1, law enforcement, public health networks and others operate on a shared IP backbone.

The FCC: Increased 9-1-1 Directive Influence and Coordination

In addition to its existing role as a telecommunications regulatory body, the FCC should be responsible for convening and providing guidance to all constituents involved in emergency communications system development. As a matter of policy, the FCC should be more proactive and place a higher priority on 9-1-1 and emergency communications than it traditionally has done in the past. (The FCC's charge in the NRIC VII process to look more broadly into 9-1-1 and emergency service issues generally is a step in the right direction) In doing so, the FCC should seek out all available on-going work and perspectives before they undertake rulemaking, and it should be a priority of the FCC to closely coordinate its actions with all entities affected by a ruling, including appropriate non-government organizations, as well as others in the Federal Government.

9-1-1 and Homeland Security: Need to Increase Awareness and Voice of 9-1-1

It is also important to note that 9-1-1 has not been recognized as a "first responder" by the Federal Department of Homeland Security and thus has not been as integrated into homeland security discussions and initiatives as much as it should. Most outside of public safety assume that 9-1-1 is represented on equal footing with other first responder groups such as police, fire and EMS when it comes to homeland security. Unfortunately, this typically has not been the case at the national and state level. Leaders in homeland security and 9-1-1 need to work together to fix this oversight.

The Role of the State

As we move toward a system of IP-based 9-1-1 and emergency service networks, a significant shift in the responsibilities between state and local government should be considered. It is perhaps most important that states be responsible for managing technical interfaces and requirements for PSAPs to access IP networks and maintaining the overall security and maintenance of the system. The state should be a central point in a hierarchical system where all 9-1-1 calls are routed over an IP network. Based on the location of the call, the call would then be routed to the correct local PSAP. Thus, most vendor relationships concerning call routing issues

would be managed at the state level, taking the responsibility off of local PSAPs who often do not have the time or expertise to manage these relationships. Similar to the Federal role with states, state governments should not dictate specific solutions at the local level, but should provide detailed guidelines that local governments must meet when connecting to statewide IP emergency services networks. Funding requirements should be tied to meeting these guidelines. Existing state legislation will need to be updated based on the continuing evolution of technology in most, if not all, states to allow this policy measure to become a reality.

For this model to be effective, emphasis needs to be placed on the importance of establishing a single, recognized central 9-1-1 planning or administrative function in every state. This state 9-1-1 entity should not be based on a particular technology (*e.g.,* a wireless 9-1-1 board), but should instead cover all aspects of 9-1-1.

The Local Role

While routing the 9-1-1 call to the right PSAP via an IP-enabled 9-1-1 network and NG–911 system should become the responsibility of the state, answering that call and providing the best possible response should remain the role of the local PSAP. That is, while call delivery should be the role of the state, assurance of service delivery (answering 9-1-1 calls from any device and properly dispatching the appropriate response) should be the primary role of the local PSAP. 9-1-1 service will still be locally managed and maintained. This is not to suggest that local governments cannot manage their own private IP networks that are linked to state and national networks. Those local jurisdictions that have the funding, technical knowledge and desire to manage and operate local/regional private networks will have the ability to do so as long as they are in conformance with national standards and operated in a manner consistent with overall system requirements set by the state.

Maintaining and managing information contained in databases that can only be obtained at the local level, such as the current master street address guide (MSAG) for fixed addresses should remain the responsibility of local government. Additionally, more and more IP services are being offered (*e.g.,* wireless hotspots, WiFi and WiMAX networks) in cities across the country. Whether owned by a private entity or government, the physical location of known wireless access points, should be continually updated and provided in databases accessible to appropriate call-routing entities. Data collection and maintenance of this information should be done at the local level and provided to a state entity that is managing the statewide emergency services network to enable the appropriate routing of 9-1-1 calls. Providing the known civic address of such access points with a 9-1-1 call is ideal, but depending on the coverage area of wireless networks, providing latitude and longitude coordinates with the call may be necessary as well. As callers are increasingly wireless regardless of technology type, this is a critical issue.

NENA is working very closely with Booz Allen Hamilton, the prime contractor to the Department of Transportation for their NG–911 Project. NENA is a subcontractor to Booze Allen Hamilton and is heavily involved in the work of the project.

Question 3. How are you preparing your membership for the transition to Next Generation 9-1-1? How are you planning to support the development of nationwide standards with your diverse membership?

Answer. The transition to NG–911 is a top priority of NENA and is infused into all that we do. It was the main topic of discussion at our recent conference in June and will be a highlighted topic at state Chapter events throughout the year. In fact NENA has established a "NG–911 Project" which consists of numerous moving parts that all must work together cohesively for NG–911 to effectively become a reality (see *http://www.nena.org/pages/ContentList.asp?CTID=65*) and the Overall Status sub page. Some of these moving parts NENA controls directly. Others we are involved with but do not manage. And there are other ongoing initiatives that we simply monitor but are not closely engaged in. All of these elements are considered part of the NENA NG–911 Project.

Some specific efforts we have initiated or are involved in to prepare our membership for the transition to NG–911 include the development of NG–911 technical and operational standards and information documents through our technical and operations committees; the creation of a new NG–911 Transition Planning Committee (NGTPC) open to interested NENA members; the development of the NENA NG Partner Program (see *http://www.nena.org/pages/ContentList.asp?CTID=14*); participation in the U.S. DOT NG–911 Project with regular reporting to the NENA membership on progress made; the development of an NG–911 education course; extensive education from national NENA to the state NENA chapters, as well as Alliances with the Voice on the Net (VON) Coalition and APCO concerning NG–911.

On the standards front, the NENA Technical and Operations committees have made the development of national NG–911 standards a top priority. Participation

on a NENA standards committee is open to any interested party and includes a broad spectrum of players from all aspects of the communications industry together with 9-1-1 technology/database vendors, 9-1-1 system service providers and PSAP leaders. NENA has made a concerted effort to expand the participants in our committees to industries and companies beyond the traditional telephone companies that have been predominant in the NENA standards work of the past.

NENA also has relationships with other organizations, including the Alliance for Telecommunications Industry Solutions (ATIS), the Internet Engineering Task Force (IETF)—which sets Internet related and communications standards worldwide; as well as cooperative efforts through an informal coalition of approximately 20 international communications SDOs. NENA is in the process of finalizing the first version of a very detailed NG–911 architecture and interface standard (known in short as i3). Other work leading to NENA standards, such as NG–911 database management, is in progress. NENA is also leading an effort to bring together all of the various groups involved with N-1-1 services (2-1-1, 3-1-1, 5-1-1, 7-1-1, 8-1-1, 9-1-1) and toll-free hotlines (suicide prevention, poison control) to identify needed technical standards to enable the seamless sharing of information among all of the various N-1-1 and 800 number services.

Question 4. What is the ideal size for a PSAP in terms of population served? With over 6,000 PSAPs, can Next Generation 9-1-1 be implemented efficiently, particularly when some PSAPs receive only a few calls a day or have very small service territories?

Answer. The answer to this question depends if you are asking about today's 9-1-1 or NG–911. Today, many large PSAPs are seriously understaffed which can result in delayed or long call answer times. Thus if you over-consolidate, this problem can be exacerbated because governments cut budgets by cutting personnel. The challenge of adequately training and retaining qualified staff is a serious issue and consolidation does not necessarily solve the problem. While appealing on the surface, over-consolidation can actually have negative service impacts. On the other hand, having too many PSAPs can be economically and operationally inefficient. Of course, it is imperative that 9-1-1 telecommunicators have enough local knowledge to be able to recognize local landmarks and to be able to effectively dispatch based on the information provided by the caller. Having a PSAP jurisdiction that covers too large an area can make this a serious problem. Also, if the initial call is answered at a level higher than the dispatch level and is then transferred to someone else at a more local level to dispatch, some calls can take longer to respond to than would otherwise be the case.

The drive to consolidate is generally economically motivated. In NG–911, technical consolidation of network and other system components will be what provides potentially significant cost benefits to numerous parties, including service providers and government. Thus, technological change may realize cost savings rather than physical consolidation of centers. Policies to adopt the right balance are needed.

In NG–911, prior to a calltaker answering a 9-1-1 call, the system knows many more important details to help improve service and response than are known today. These can include the caller's precise/general location, the caller's language preference, possibly the caller's medical history and vital signs and other related details, and much more.

These known details can be used to both help route to call takers responsible for special geographic zones, call takers with special skills such as other languages and other special call type handling skills. The call takers do not need to be physically co-located in the same building as long as they are logically linked under the same command structure. This is all part of the virtual PSAP concept that NG–911 enables. This dramatic change in call taking capabilities and processes can increase life-saving possibilities and reduce the negative factors related to the current number of PSAPs, including providing cost-savings benefits for parties involved ranging from providers to government.

Yes, NG–911 can be implemented efficiently with over 6,000 PSAPs. As we move toward a system of IP-based 9-1-1 and emergency service networks, a significant shift in the responsibilities between state and local government should be considered. It is perhaps most important that states be responsible for managing technical interfaces and requirements for PSAPs to access IP networks and maintaining the overall security and maintenance of the system. The state should be a central point in a hierarchical system where all 9-1-1 calls are routed over an IP network. Based on the location of the call, the call would then be routed to the correct local PSAP. Thus, most vendor relationships concerning call routing issues would be managed at the state level, taking the responsibility off of local PSAPs who often do not have the time or expertise to manage these relationships.

Question 5. From your experience, how important is an E–911 system's absolute accuracy as compared with the speed it can route an incoming call to where it needs to go?

Answer. Having the most accurate location information possible with a 9-1-1 call is very important. Similarly, it is always important not to hold up the call from getting to the PSAP since a significant amount of callers will disconnect after approximately 10 seconds of the call being unanswered (thus a NENA standard exists to have all calls answered within 10 seconds for ninety percent of all calls). For wireless calls, a balance needs to be struck to ensure that the calls can be routed to the right PSAP based on the actual location of the caller (preferred to calls being routed faster but based only on cell sector rather than an actual location).

During the first 30 seconds of a wireless 9-1-1 Phase II call, location information can improve significantly, dependent on existing technologies in place today. While it is quite important to know enough location details to be able to route to the correct PSAP, call delivery should not be delayed because of existing technology limitations. The improved accuracy available in the first few seconds of the call, after it is delivered to the PSAP on a timely basis, can be utilized when needed, to appropriately assist in handling an emergency incident.

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RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. MARIA CANTWELL TO STEPHEN MEER

Question. In your testimony, you describe the need for the Next Generation 9-1-1 network to be IP-based. Do you believe that this Next Generation 9-1-1 network will rely exclusively on GPS for determining location or is it possible that there may be other technologies employed?

Answer. It is Intrado's belief that there will be a multitude of technologies employed, such as RFID, wiremaps, and hybrid technological solutions, to determine the location of a person in need of emergency assistance. GPS is only one type of location technology that will be utilized; however, it will not be the only one since it cannot guarantee an accurate and precise address that includes all the elements required to locate a person requesting emergency services. For example, utilizing GPS as the only Location Determination Technology (LDT) will not consistently provide first responders with "Z," otherwise known as altitude and this data includes a person's exact apartment number or unit number. Such information is critical for the first responders to be able locate a person in need of assistance on a timely basis. To state it another way, when 9-1-1 calls are made from indoors, we will always need to know what door the caller is behind. We recognize that there will be no single LDT that can provide this precise address information to first responders; rather, the ultimate solution will employ a combination of many location technologies utilized in the Next Generation 9-1-1 network for location determination.

In addition, Intrado considers LDT as specific technologies that can be employed to determine the location of a communication device of an end-user and potentially the location of Access Points that connect the communication device to the service provider network. There are a variety of technology approaches to location determination that are either currently developed or in development. Each approach has its own strengths and weaknesses and generally aligns to different use case environments. While the achievement of the desired goal for precise location will in part depend upon the full maturation of these various location technologies, it is believed that each can play a role in supporting a migration path to that goal. Specific considerations around LDT that must be contemplated in establishing this migration path include:

- The LDT ability to integrate with the end-user or other network access devices. Depending on the specific LDT approach, this may require software and/or hardware-based integration efforts.
- The LDT ability to provide ubiquitous network coverage for end-user or other network access devices. Depending on the LDT, unique infrastructure deployments maybe required to support acceptable location determination coverage.
- The ability for a Z coordinate (altitude) to be determined in accordance with the proposed guidelines. Altitude should be provided as above ground level of the location from the Z coordinate to be usable to first responders. While technologies exist today to attain a Z coordinate, they still must integrate into LDT and supporting infrastructure (*e.g.,* GIS) solutions.
- The public safety community's ability to accept and translate a Z coordinate to achieve an Acceptable Location for Indoor Use.

- The ability for a network to automatically discover the addition or movement of an Access Point serving a communication device within the service provider's network. For some LDT approaches, an understanding of the location of the Access Point is a critical component to enable precise location determination.
- The service provider's ability to leverage LDT information and translate to an Acceptable Location for Indoor Usage.

Finally, Intrado recognizes that the evolution of existing telecommunications technologies and the dramatic impacts that new technologies have on the 9-1-1 system, there is a clear need to provide public safety with the ability to respond to the specific location of an end-user trying to reach emergency services regardless of device, technology or access method being used. Sound public policy, both short and long term, must: (a) continue to ensure that the level of accuracy needed to locate a caller in distress is that which makes it possible for a first responder to swiftly find the caller and render emergency aid; and (b) provide clear guidance about the intended end result of the policy such that the businesses who are expected to abide by the policy, and those who invest in them, have a predictable means for meting out and measuring their efforts and investments.

More information can be found in the Automatic Location Services white paper that Intrado filed along with its hearing testimony.

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