AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

S. HRG. 110–1061

THE PRESENT AND FUTURE OF PUBLIC SAFETY COMMUNICATIONS

HEARING

BEFORE THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION UNITED STATES SENATE

ONE HUNDRED TENTH CONGRESS

FIRST SESSION

FEBRUARY 8, 2007

Printed for the use of the Committee on Commerce, Science, and Transportation

U.S. GOVERNMENT PRINTING OFFICE

39–473 PDF WASHINGTON : 2010

For sale by the Superintendent of Documents, U.S. Government Printing Office
Internet: bookstore.gpo.gov Phone: toll free (866) 512–1800; DC area (202) 512–1800
Fax: (202) 512–2104 Mail: Stop IDCC, Washington, DC 20402–0001

SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ONE HUNDRED TENTH CONGRESS

FIRST SESSION

DANIEL K. INOUYE, Hawaii, *Chairman*

JOHN D. ROCKEFELLER IV, West Virginia
JOHN F. KERRY, Massachusetts
BYRON L. DORGAN, North Dakota
BARBARA BOXER, California
BILL NELSON, Florida
MARIA CANTWELL, Washington
FRANK R. LAUTENBERG, New Jersey
MARK PRYOR, Arkansas
THOMAS R. CARPER, Delaware
CLAIRE MCCASKILL, Missouri
AMY KLOBUCHAR, Minnesota

TED STEVENS, Alaska, *Vice Chairman*
JOHN MCCAIN, Arizona
TRENT LOTT, Mississippi
KAY BAILEY HUTCHISON, Texas
OLYMPIA J. SNOWE, Maine
GORDON H. SMITH, Oregon
JOHN ENSIGN, Nevada
JOHN E. SUNUNU, New Hampshire
JIM DEMINT, South Carolina
DAVID VITTER, Louisiana
JOHN THUNE, South Dakota

MARGARET L. CUMMISKY, *Democratic Staff Director and Chief Counsel*
LILA HARPER HELMS, *Democratic Deputy Staff Director and Policy Director*
MARGARET SPRING, *Democratic General Counsel*
LISA J. SUTHERLAND, *Republican Staff Director*
CHRISTINE D. KURTH, *Republican Deputy Staff Director*
KENNETH R. NAHIGIAN, *Republican Chief Counsel*

CONTENTS

	Page
Hearing held on February 8, 2007	1
Statement of Senator Cantwell	46
Statement of Senator Carper	58
Statement of Senator Inouye	1
Letters, dated January 26 and 29, 2007 to Hon. Daniel K. Inouye in support of S. 385, the Interoperable Emergency Communications Act	2–3
Prepared statement	4
Statement of Senator Klobuchar	5
Statement of Senator McCaskill	52
Statement of Senator Snowe	55
Statement of Senator Stevens	5
Letters, dated November 28, 2006 and February 7, 2007 to Hon. Ted Stevens against reallocation of the 700 MHz spectrum	12
Statement of Senator Sununu	49
Statement of Senator Thune	61

WITNESSES

Billstrom, David, Chairman and CEO, National Interop, Inc.	30
Prepared statement	33
Desch, Matthew J., Chairman and CEO, Iridium Satellite, LLC	35
Prepared statement	37
Largent, Hon. Steve, President and CEO, CTIA—The Wireless Association®	26
Prepared statement	28
McEwen, Harlin R., Chairman, Communications and Technology Committee, IACP; Communications Advisor, MCC, NSA, MCSA; Vice Chairman, National Public Safety Telecommunications Council	14
Prepared statement	16
O'Brien, Morgan, Chairman, Cyren Call Communications	20
Prepared statement	22
Werner, Charles L., Fire Chief, Charlottesville Fire Department; on behalf of the International Association of Fire Chiefs	7
Prepared statement	8

APPENDIX

Cosgrave, Paul J., Department of Information Technology and Telecommunications, City of New York prepared statement	75
Globalstar, Inc., prepared statement	65
Letter, dated February 8, 2007 to Hon. Ted Stevens from Leroy Watson, Legislative Director, National Grange of the Order of Patrons of Husbandry	76
McCain, Hon. John, U.S. Senator from Arizona, prepared statement	65
Response to written questions submitted by Hon. Daniel K. Inouye to:	
David Billstrom	117
Matthew J. Desch	122
Hon. Steve Largent	114
Harlin R. McEwen	88
Morgan O'Brien	107
Charles L. Werner	78
Response to written questions submitted by Hon. Frank R. Lautenberg to:	
Harlin R. McEwen	93
Morgan O'Brien	111
Charles L. Werner	88

Page

Response to written questions submitted by Hon. Jim DeMint to Morgan O'Brien 112
Response to written questions submitted by Hon. Maria Cantwell to:
David Billstrom 119
Harlin R. McEwen 90
Morgan O'Brien 108
Charles L. Werner 87
Response to written questions submitted by Hon. Olympia J. Snowe to Hon. Steve Largent 116

THE PRESENT AND FUTURE OF PUBLIC SAFETY COMMUNICATIONS

THURSDAY, FEBRUARY 8, 2007

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

The Committee met, pursuant to notice, at 10:03 a.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. Good morning. Today's hearing will focus on the present and future of public safety communications. This is a matter of continuing importance to our Nation and to the men and women who risk their lives daily and provide Americans with emergency assistance.

In too many cities and counties across this Nation, our Nation's first providers struggle to talk to one another during natural and manmade disasters. Unfortunately, this problem is not new. More than a decade ago, a specially created Public Safety Wireless Advisory Committee reported on the need for immediate measures to alleviate spectrum shortfalls, and promote voice interoperability.

While we have made significant strides since that time, one need only look at our experience during 9/11, or after the Northeast blackouts of 2003, or Katrina. We know that we have a long way to go.

In 2005, this committee took an important step by creating a new $1 billion grant program to help fund new equipment and training necessary to improve communications interoperability. Regrettably, our efforts to make progress on this problem are being undermined by the Administration, which is using this money, already in the pipeline, to cover the $1.2 billion cut from the Department of Homeland Security grants that support State and local preparedness and firefighter assistance. I hope we can do better in this regard.

In the 110th Congress, I have begun by working with my colleagues Senator Stevens, Senator Kerry, Senator Smith, and Senator Snowe, by introducing this measure S. 385, the Interoperable Emergency Communications Act, which would eliminate current restrictions in the law that hinders some interoperability efforts and would provide the National Telecommunications and Information Administration with the needed guidance from Congress to ensure

the money is effectively disbursed. I hope that we move quickly on this bill in the coming weeks.

Today's hearing will also allow us to peer into the future of public safety communications. By now, even the casual observer recognizes our broadband networks are changing the way in which we communicate and exchange information.

While we hate to admit it, our children led the way, using the power of new technology to provide video and real-time information to our home and work computers, it does not take much imagination to realize how invaluable these capabilities could be to the first on the scene of an emergency.

My statement goes on a little longer, but I think we have the message.

I now would like to call upon the Vice Chairman of the Committee, Senator Stevens.

I would like to include in the record letters I received from the Hawaii Public Safety Committee in support of S. 385.

[The information referred to follows:]

CITY AND COUNTY OF HONOLULU FIRE DEPARTMENT
Honolulu, HI, January 26, 2007

Hon. DANIEL K. INOUYE,
Chairman,
Senate Committee on Commerce, Science, and Transportation,
Washington, DC.

Dear Senator Inouye:

On February 8, 2007, the Senate Committee on Commerce, Science, and Transportation will consider legislation to create a Public Safety Broadband Trust (PSBT). As Fire Chief of the Honolulu Fire Department, I support the concept of creating a nationwide, broadband network for public safety and ask that you also support this important issue.

During emergencies, fire, emergency medical services, and law enforcement personnel must have access to the most modern and reliable communications capabilities in order to communicate with each other and with state and Federal officials. The ability for public safety to have seamless, nationwide roaming capability on a hardened and secure broadband network is essential to meet our increased responsibilities in homeland security. This goal can be met if the public safety community has priority access to a nationwide, interoperable, next generation, broadband network that incorporates the latest technologies such as text messaging, photos, diagrams, and video not currently available on existing public safety land mobile systems.

To achieve this goal, we support legislation to create a PSBT to oversee management of this public/private network. The PSBT would hold the license for 30 MHz of broadband spectrum in the upper 700 MHz band, which is scheduled for auction later this year by the Federal Communications Commission. Without legislation, the one-time opportunity will be lost for public safety to have access to a broadband network immediately adjacent to the already-allocated 24 MHz of spectrum that will become available exclusively for our use in February 2009. The 24 MHz as well as the proposed public/private broadband network are necessary in order for public safety to meet its future obligations to the public.

Should you have any questions or comments, please call me. Thank you for your consideration.

Sincerely,

KENNETH G. SILVA,
Fire Chief.

COUNTY OF HAWAII FIRE DEPARTMENT
Hilo, HI, January 29, 2007

Hon. DANIEL K. INOUYE,
United States Senator,
Prince Kuhio Federal Building,
Honolulu, HI.

Dear Senator Inouye:

On February 8, 2007, the Senate Committee on Commerce, Science, and Transportation will consider legislation to create a Public Safety Broadband Trust. As Fire Chief of the Hawaii Fire Department and member of the International Association of Fire Chiefs, I wholly support the concept of creating a nationwide, broadband network for public safety and ask that you, too, support this important issue.

During emergencies, fire, emergency medical services, and law enforcement personnel must have access to the most modern and reliable communications capabilities in order to communicate with each other and with state and Federal officials. The ability for public safety to have seamless, nationwide roaming capability on a hardened and secure broadband network is essential to meet our increased responsibilities in homeland security. This goal can be met if the public safety community has priority access to a nationwide, interoperable, next generation, broadband network that incorporates the latest technologies such as text messaging, photos, diagrams, and video not currently available on existing public safety land mobile systems.

To achieve this goal, we support legislation to create a Public Safety Broadband Trust (PSBT) to oversee management of this public/private network. The PSBT would hold the license for 30 MHz of broadband spectrum in the upper 700 MHz band, which is scheduled for auction later this year by the Federal Communications Commission. Without legislation, the one-time opportunity will be lost for public safety to have access to a broadband network immediately adjacent to the already-allocated 24 MHz of spectrum that will become available exclusively for our use in February 2009. The 24 MHz as well as the proposed public/private broadband network are necessary in order for public safety to meet its future obligations to the public.

I would welcome any questions or comments you may have on this issue of utmost importance to America's fire service and all of public safety. Thank you for your consideration and support.

Sincerely,

DARRYL J. OLIVEIRA,
Fire Chief.

COUNTY OF KAUA'I FIRE DEPARTMENT
Lihu'e, Kaua'i, HI, January 26, 2007

Hon. DANIEL K. INOUYE,
United States Senator,
Prince Kunio Federal Building,
Honolulu, HI.

Dear Senator Inouye:

On February 8, 2007, the Senate Committee on Commerce, Science, and Transportation will consider legislation to create a Public Safety Broadband Trust (PSBT). As Fire Chief of the Kaua'i Fire Department, I support the concept of creating a nationwide, broadband network for public safety and ask that you also support this important issue.

During emergencies, fire, emergency medical services, and law enforcement personnel must have access to the most modern and reliable communication capabilities in order to communicate with each other and with state and Federal officials. The ability for public safety to have seamless. nationwide roaming capability on a hardened and secure broadband network is essential to meet our increased responsibilities in homeland security. This goal can be met if the public safety community has priority access to a nationwide, interoperable, next generation, broadband network that incorporates the latest technologies such as text messaging, photos, diagrams, and video not currently available on existing public safety land mobile systems.

To achieve this goal, we support legislation to create a PSBT to oversee management of this public/private network. The PSBT would hold the license for 30 MHz of broadband spectrum in the upper 700 MHz band, which is scheduled for auction later this year by the Federal Communications Commission. Without legislation, the one-time opportunity will be lost for public safety to have access to a broadband net-

work immediately adjacent to the already-allocated 24 MHz of spectrum that will become available exclusively for our use in February 2009. The 24 MHz as well as the proposed public/private broadband network are necessary in order for public safety to meet its future obligations to the public.

Should you have any questions or comments, please call me. Thank you for your consideration.

Sincerely,

ROBERT F. WESTERMAN,
Fire Chief.

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

Today's hearing will focus on the present and future of public safety communications. This is a matter of continuing importance to our Nation, and to the men and women who risk their lives daily to provide Americans with emergency assistance.

In too many cities and counties across this Nation, our Nation's first responders struggle to talk to one another during natural or manmade disasters. Unfortunately, this problem is not new. More than a decade ago, a specially-created Public Safety Wireless Advisory Committee reported on the need for immediate measures to alleviate spectrum shortfalls and to promote voice interoperability.

While we have made significant strides since that time, one need only look at our experience during the events of September 11, after the Northeast blackouts in 2003, and in the aftermath of Hurricane Katrina, to know that we still have a long way to go.

In 2005, the Commerce Committee took an important step by creating a new $1 billion grant program to help fund new equipment and training necessary to improve communications interoperability. Regrettably our efforts to make progress on this problem are being undermined by the Administration, which is using this money, already in the pipeline, to hide the $1.2 billion cut from the Department of Homeland Security grants that support state and local preparedness and firefighter assistance. I hope and trust that Congress can do better in this regard.

In the 110th Congress, I have begun by working with my colleagues Senators Stevens, Kerry, Smith and Snowe, by introducing S. 385—the Interoperable Emergency Communications Act—which would eliminate current restrictions in the law that hinder some interoperability efforts and would provide the National Telecommunications and Information Administration with needed guidance from Congress to ensure the money is effectively dispersed.

I hope that we will move quickly on this bill in the coming weeks.

Today's hearing also allows us to peer into the future of public safety communications. By now, even the casual observer recognizes how broadband networks are changing the way in which we communicate and exchange information.

Our children lead the way, using the power of new technology to provide streaming video and real-time information to our home and work computers, and increasingly, to mobile devices on-the-go. It does not take much imagination to realize how invaluable these capabilities could be to those first on the scene of an emergency.

Such technology could send streaming video to command posts in the aftermath of a hurricane, could assess environmental conditions faced by firefighters responding to a chemical fire, and could transmit the vital signs of injured victims to those providing emergency medical assistance.

To realize this future, we must prepare for it. This hearing raises some of the most important questions this committee will face:

- Do we as a nation have a broadband plan for public safety?
- Do our first responders have the resources, both in spectrum and in funding, to build and operate networks that will enhance emergency response capabilities?

Now is the time for this discussion. In February 2009, broadcasters will complete the digital television transition and will open significant amounts of new spectrum for commercial and public safety use. Our current plans for the use of that spectrum were adopted nearly a decade ago. Given the stakes, it is worth taking a fresh look.

While some parties, led by large wireless companies with a vested interest in the status quo, argue that this discussion will delay the digital television transition, let me put that fear to rest. This discussion will not change that date.

However, in the limited time remaining until the planned auction of DTV spectrum by January 2008, it is incumbent on the Congress and the Federal Communications Commission to understand the needs of our first responders and to ensure

that we, as a nation, have put in place a plan that will provide public safety with the capabilities they need in a broadband world.

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

Senator STEVENS. Thank you very much, Mr. Chairman. I applaud you for examining these public safety issues very early. We have had a focus on this subject for some time, and I want to join you in continuing with that focus.

This committee led the way that established the hard date for the transfer of the 24 megahertz of spectrum to public safety and allocated the $1 billion for interoperability grants last year as part of our DTV bill. The other public safety issues addressed by our committee were the creation of a wireless alert and warning system and the Tsunami Warning System. We allocated $43.5 million for E–911 and $100 million for the National Alert System, and funded the Tsunami Warning System.

Going forward now, I'm pleased that you have made interoperability one of the first bills we'll introduce this year, and I'm proud to join you in that regard. It will provide grant guidance for the billion dollars in interoperability grants that we provided last year. The funds will drive the public safety community forward in resolving the interoperability issues through planning, training, and equipment grants, as well as establishment of technology reserves throughout the country. You have also highlighted the 9-1-1 issues and agreed to mark up S. 93 next week. That also provides advanced borrowing authority so the $43 million for the 911 concept can be distributed to public safety before the DTV auction takes place.

The Cyren Call broadband trust is going to be one of the topics addressed here today. It sounds like something good in concept, and it could be good for public safety. I've had a considerable number of questions raised as to whether this broadband trust proposal may undermine the progress on the DTV transition and interoperability grant distribution. They have expressed fear that the program could undermine the funding we provided to public safety last Congress. I hope that we can have an opportunity to examine this now, and explore, with the proponents of that concept, alternative models that would not do what these people fear.

Thank you very much.

The CHAIRMAN. I thank you, sir.

Senator Klobuchar, would you care to make a statement?

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

Senator KLOBUCHAR. Thank you, Mr. Chairman. And thank you both for the work that you've done on this important issue.

I think when we—when it comes to interoperability, we can all agree on a common goal, that our law enforcement personnel should be able to talk to each other. We can agree on the priority of this goal, based on what we saw after—during 9/11 and after Katrina. And I believe we can agree on the urgency of this goal.

The question is, What's the most efficient and effective way to do this? And I will be coming to this just from my own experience as

the Chief Prosecutor in Hennepin County, Minnesota, which I did for 8 years, and that includes 1.1 million people, which is about a fourth of the population of our State, it's Minneapolis and 45 suburbs. And I'm very proud of the work that we did in our county, and actually the surrounding counties, and it can be a model as we look across the country. Much of the credit for this goes to Pat McGowan, my friend who's the former sheriff of Hennepin County and, I think, was Sheriff of the Year—right?—and he saw the need for interoperability as far back as—to make systems work together as far back as 1989. I remember he noted that every time the President came to town, we realized that we couldn't talk to each other. He would always tell me about one case in which a St. Paul cop was shot and several different police departments pitched in to find the killers. The helicopter pilot assisting in the search had to carry 12 different portable radios in his helicopter so that he could individually communicate with the different law enforcement people as this chase went on. And so, that's why he became such a strong proponent for a system that connects.

And the end result, this was actually before 9/11, was that our county had a cost-effective, fully interoperable police safety communications system, and now, building on that success, the nine counties that make up the Twin Cities area—it's almost half the state—are all interoperable.

I know we're going to hear a lot about spectrum allocation and the next generation of communications technology. All these are very important pieces of the interoperability puzzle, and I look forward to discussing them. But the Minnesota experience shows to me two other key challenges—divided turf and limited funding—and the ways to overcome them. Sheriff McGowan always used the word "moxie" to talk about it. He talked about how our local government had the moxie to allocate dollars to the purpose and to use the dollars in an efficient way. And this Congress needs to give incentives to promote that kind of moxie nationwide. A key aspect of this is support for local law enforcement and firefighters. This year, our county is rolling out an upgraded interoperable system that integrates data, as well as voice communication. The system was funded by a COPS program grant.

I'm looking forward to this debate, but I do think it is very important that we use an example that we had in our State. We were able to get this done, and I see no reason that we can't get this done for the rest of the country.

Thank you.

The CHAIRMAN. Thank you very much.

The committee is fortunate to have with us a full panel of experts and great leaders. We have the Fire Chief of Charlottesville Fire Department and the International Association of Fire Chiefs; Mr. Charles Werner; the Chairman of the Communications and Technology Committee of the International Association of Chiefs of Police, Mr. Harlin McEwen; the Chairman of Cyren Call, Mr. Morgan O'Brien; the President and CEO of CTIA—The Wireless Association®, Mr. Steve Largent; the Chairman and CEO of National Interop, Mr. David Billstrom; and the Chairman and CEO, Iridium Satellite, LLC, Mr. Matt Desch.

And, gentlemen, I welcome you all on behalf of the Committee.

May I now call upon Chief Werner?

STATEMENT OF CHARLES L. WERNER, FIRE CHIEF, CHARLOTTESVILLE FIRE DEPARTMENT; ON BEHALF OF THE INTERNATIONAL ASSOCIATION OF FIRE CHIEFS

Mr. WERNER. Thank you, Chairman Inouye, Vice Chairman—Mr. Stevens. Thank you all for the opportunity to be here today.

My name is Charles Werner. I'm the Fire Chief for the City of Charlottesville, Virginia. I also represent the International Association of Fire Chiefs' 12,000 members, and the comments that I make today are also representative of the—of APCO, as well.

Before I go into this actual testimony, I'd like to thank both of you individuals for your leadership and the legislation that you've put forward to help us with the funding, defining it, for the interoperability. So, thank you, on that note, first.

Your opening statements were interesting, as it leads into my testimony, because you talk about the much—much of the funds that have been put out there in dollars on top of dollars, and the efforts that continue to be out there, yet interoperability continues to plague us. And I think that's why today this discussion that we're having on the Public Safety Broadband Trust is so important, because it is a very forward-thinking idea that takes us into a whole new direction that I think economically will help the fire service and public safety in general.

And America's public safety agencies support legislation to create such a Public Safety Broadband Trust that creates an opportunity with 30 megahertz of spectrum. Important to note that it's not going to be just for public safety, but for commercial entities, as well, and that'll be an important note of my testimony later.

Ten years ago or more, the Public Safety Wireless Advisory Committee identified the needs of radio frequency spectrum for public safety. That was again reinforced in a report that followed the September 11th tragic incidents of terrorism. That report of—after 9/11—also found that radio frequencies allocated to public safety had become highly congested in many of the urban areas; second, the ability of agencies within and between jurisdictions to communicate with one another is limited; and, third, the public safety agencies lack the spectrum to implement advanced communications features. In addition, the Advisory Committee originally recommended that 95.5 megahertz of new spectrum was required to meet public safety needs to the year 2011. To date, without the help of what you've done for 2009, we wouldn't have seen any of that change.

In the 10 years since that report's come out, there have also been great advances in technology that will help us look in new and exciting ways, that will give us the ability, if we have broadband in place, that gives us transmission of video, blueprints, and other information, situational awareness, fireground accountability, biometrics, enhanced GIS mapping capabilities for building locations, critical infrastructure protection, target hazards, hydrant networks, transportation systems. You get the point, it goes on and on about what's out there. And some people have said, "Well, to date, public safety hasn't indicated how that is making any difference. You're not using it." It's because it's not affordable and dependable in a way that we can make use of it as we need to.

In order to meet public safety's communications requirements as defined by these dependent—independent assessments, Senator McCain has discussed and offered to write legislation to establish such a broadband trust, and we're very excited about that.

One thing important to note, this is about the Public Safety Broadband Trust. It's not about a Cyren Call proposal, or that company, it's about a trust that's overseen by public safety to help create a new network that is viable for public safety and funded by commercial effort.

On behalf of America's fire and emergency services, I encourage Congress to take advantage of this one-time opportunity—again, this very critical one-time opportunity—to create a nationwide public safety broadband network.

As I look back on my own personal experience, much as when referenced earlier about an interoperable system, in Charlottesville, Virginia, we have done a similar thing in our region. We have created an entirely full public safety interoperable system. Fourteen million dollars and $500,000 a year in maintenance fees is what it costs to put one of these systems in place. Keep in mind, as soon as that system is in place, it is what it is, it does not evolve, it does not become any better, it does not create any new opportunities. What that means is, if we don't change the current path that we're on, we will continue to spend millions upon millions—billions upon billions of dollars for systems that are really obsolete as soon as they come into operation. Nothing against what we have in our system today, but we've got to change this paradigm, and the governments can't continue to be funding these things, as they are.

This past week, I also heard some concerning reports that came out that said public safety doesn't need any more spectrum. Well, I'm sorry, all the reports that have looked into this thoroughly differ with that opinion. And I also have a little bit of frustration when people make those statements, and not once have they talked to public safety. They also reference—and I'll be brief, I'm finishing up—that we—that these other coalitions have plans for public safety. Now, up until now, we have heard nothing of these plans, we've had no interactions with it. So, I wonder how genuine these proposals are, and I ask you to look at the opposition to this proposal: What's in it for them, versus what's in it for us?

With that, I thank you for the opportunity to speak today.

[The prepared statement of Mr. Werner follows:]

PREPARED STATEMENT OF CHARLES L. WERNER, FIRE CHIEF, CHARLOTTESVILLE FIRE DEPARTMENT; ON BEHALF OF THE INTERNATIONAL ASSOCIATION OF FIRE CHIEFS

Good morning Mr. Chairman, and members of the Committee. I am Charles Werner, Fire Chief of the Charlottesville Fire Department in Virginia and a member of the Communications Committee of the International Association of Fire Chiefs IAFC). I am appearing today as the representative of the International Association of Fire Chiefs whose 12,000 members represent the leadership of America's fire and rescue service from small, rural, volunteer fire departments to the large, urban, metropolitan fire departments. Last year America's fire service responded to over 23 million fire and emergency calls covering incidents of structure fires, wildland/urban interface fires, emergency medical situations, hazardous materials incidents, technical rescues, and natural disasters. We are prepared, as well, to respond to the aftermath of terrorist attacks. I appear today to address a specific and growing com-

munications need for America's fire service—broadband technology. Our testimony also reflects the views of the Association of Public-Safety Officials International, Inc.

Public Safety Spectrum Needs

At the request of Congress, the National Telecommunications and Information Administration (NTIA) and the Federal Communications Commission (FCC) established the Public Safety Wireless Advisory Committee (PSWAC) to define and document the critical need for communications resources and the spectrum to support public safety through the year 2010. The final report was released on September 11, 1996. Three key problem areas were identified in the report:

- First, radio frequencies allocated to public safety had become highly congested in many, especially urban, areas. Usable spectrum for mobile operations is limited making it difficult to meet existing requirements much less to plan for future, more advanced communications needs.
- Second, the ability of agencies within and between jurisdictions to communicate with one another is limited. Yet interoperability is desirable for success in day-to-day operations as well as larger scale operations in dealing with both man-made and natural disasters.
- Third, public safety agencies lack the spectrum to implement advanced communications features. A wide variety of technologies—both existing and under development—hold substantial promise to reduce danger to public safety and achieve greater efficiencies in the performance of their duties. Specifically mentioned in the 1996 report were broadband data systems, video systems for better capabilities including use of robotics in toxic and hazardous environments, and better monitoring and tracking of both personnel and equipment.

To implement the requirements identified, the advisory committee determined that more spectrum was required, as follows:

- Immediately, 2.5 MHz of spectrum for interoperability from new or existing allocations.
- Within 5 years approximately 25 MHz of new public safety allocations are needed. The report suggested using spectrum from television broadcast channels 60–69 as soon as possible.
- Over the next 15 years (*e.g.,* through 2011) as much as an additional 70 MHz will be required to satisfy the mobile communications needs of public safety.

These were the needs and recommendations addressed in the PSWAC report of 1996. Then, in December 2005 the FCC sent a *Report to Congress on the Study to Assess Short-Term and Long-Term Needs for Allocations of Additional Portions of the Electromagnetic Spectrum for Federal, State and Local Emergency Response Providers.* This report was submitted pursuant to P.L. 108–458, The Intelligence Reform and Terrorism Prevention Act of 2004. In its conclusion, the FCC stated: "First, as to the operation and administration of a potential nationwide interoperable broadband mobile communications network based upon input from Federal, state, local and regional emergency response providers, emergency response providers would benefit from the development of an integrated, interoperable nationwide network capable of delivering broadband services throughout the country. Second, as to the use of commercial wireless technologies, while commercial wireless technologies and services are not appropriate for every type of public safety communication, there may now be a place for commercial providers to assist public safety in securing and protecting the homeland."

For the above stated reasons, the National Public Safety Telecommunications Council [a resource and advocate for public safety organizations in the United States on matters relating to public safety telecommunications] has filed comments with the FCC in support of reallocating 30 MHz of spectrum in the upper 700 MHz band, currently slated for auction, to create a public/private nationwide broadband network to be managed by public safety for the benefit of public safety. The filing states:

> "In an era where government preparedness is crucial, there is no nationwide public safety network to manage and coordinate response. There is no wide scale broadband technology capability to expedite analysis and information-sharing critical to emergency assistance, investigation and apprehension. Not only is the current public safety spectrum so congested as to constrain voice—much less permit broadband use for video and data, limited funding hinders the incremental improvements that can be made and which are only pursued on a system by system basis. That which is possible in communications today and what public safety agencies have available reflects an enormous divide. The re-

sult is tangible: slowed and hindered response across all services which puts lives at risk and property in danger.

"Although legacy systems will continue to play an important role in public safety communications, the opportunity presented by the yet to be auctioned 700 MHz channels is emphatic. Without this additional spectrum, there can be no national public safety network connecting all agencies. Using broadband technologies to transmit information across agencies and miles immediately will be the exception. Public safety communications will come up short in meeting its challenges."

The IAFC is a member of the governing board of NPSTC and an active participant in all of its proceedings. The IAFC fully concurs with the statements of support by NPSTC for the establishment of a nationwide, public/private, broadband network that will harness the innovative power of the private sector but be managed by public safety for the benefit of public safety.

Public Safety Broadband Requirements

In 1997, Congress addressed part of the issue of additional spectrum by directing the FCC to allocate 24 MHz in the upper 700 MHz band for use by public safety. As a result of the Deficit Reduction Act (P.L. 109–171), which passed last year at this time, this spectrum will finally become available for our use in February 2009. As was originally intended, it is to provide, for individual licensees, 12 MHz of voice channels and 12 MHz of wideband data channels. Fire and police departments are now in the planning process of building communications systems utilizing this new spectrum.

Broadband capability for public safety, identified in the 1996 PSWAC report, is a vital and growing need for fire and police agencies. It is the next step following the allocation and implementation of the 24 MHz designed to alleviate current spectrum congestion and provide interoperability. To meet the broadband need for public safety, the following requirements are established:

- A nationwide, broadband network covering 99 percent of the population, 65 percent of the land mass, most of the critical infrastructure, and a network that supports urban, suburban and rural communities.
- A network large enough to draw commercial support which is requisite for a nationwide network to be affordable for public safety.
- A network built using next-generation technology.
- A network built to public safety ruggedness specifications to ensure reliability under severely adverse conditions.
- A network governed by public safety.
- A network which ensures priority access for public safety.

Public Safety Uses of Nationwide Broadband Network

The Public Safety Broadband Trust proposal provides public safety with enormous potential that does not currently exist.

A hardened public safety network would make possible nationwide roaming and interoperability for public safety agencies at the Federal (*e.g.,* U.S. Coast Guard), state (*e.g.,* highway patrol), and local (*e.g.,* police, fire/EMS) levels. It would give public safety access to satellite services where terrestrial services either do not exist or are temporarily out of service. The network build-out would give rural areas—for the first time—broadband coverage and provide public safety there a communications tool that would be virtually impossible because of cost under any other scenario. In addition, this new network will protect nuclear power plants, dams, railroads and pipelines and other parts of the Nation's critical infrastructure in rural areas.

There are a number of technologies that are available today that fire departments would use—more will be developed, especially if an affordable broadband network is available. Some examples are:

- Transmitting video, photographs, blueprints and other information both to and from an incident command post.
- Advanced paging systems particularly useful for summoning volunteer firefighters/medics.
- Mesh enabled architecture (MEA) for non-GPS broadband location system.
- Fireground accountability systems—biometrics as well as location.
- Smart building downloads en route to an alarm.

- Enhanced GIS mapping capability for building locations, critical infrastructure, target hazards, water systems, transportation systems, *etc.*
- Personal Area Networks linking a portable radio carried by a firefighter to many useful and lifesaving accessories including a helmet video camera, video viewing device, health monitor, wireless self-contained breathing apparatus (SCBA) microphone and speaker, or a handheld computer.
- Vehicular Area Networks that could link a vehicle's radio to laptop computers, printers, remote headsets, bar code readers, and cameras.
- Medical video and high-resolution image transmissions from the scene of an incident to the emergency department of a hospital where physicians can assess patient status and give on-scene and en route treatment instructions.
- PDAs for fire department leaders or for all firefighters.

A One-Time Opportunity To Do the Right Thing

Senator McCain has announced his intention to introduce legislation to establish a Public Safety Broadband Trust. The trust will be composed of public safety organizations to hold a single license for 30 MHz of broadband spectrum to create a nationwide, public/private broadband network. The trust also will be the management group to oversee the policies, procedures and practices of the network. In other words, the public safety trust will run the network for the benefit of public safety.

The 30 MHz of spectrum that is being considered is immediately adjacent to the 24 MHz of spectrum allocated to public safety in 1997, and which will be available in 2009. This has considerable advantage over any other spectrum since radio communication devices can be dual purpose with the spectrum so close. This spectrum in the upper 700 MHz is also near existing public safety which is being relocated in the lower 800 MHz band.

This 30 MHz of spectrum is currently slated for auction. The Deficit Reduction Act of 2005 requires the FCC to auction this spectrum by January 2008. Without legislation taking this out of the auction and allocating it for the public safety trust, this one-time opportunity will be lost forever.

Call for Action

The Congress of the United States has a one-time opportunity, in the near term, to provide public safety with a nationwide, broadband network. In order to be affordable for public safety, the network would have to have viable commercial capacity of about 30 MHz of spectrum. The network would be built to public safety ruggedness specifications. A Public Safety Broadband Trust would be created to hold the single license from the FCC for the 30 MHz of spectrum and would oversee management of the network. While the network volume would be largely commercial, public safety agencies would use what it needed with a built-in priority status. Commercial use also ensures that sufficient capital will be available for maintaining the system and upgrading and refreshing newer technologies when they come along.

We urge the members of this committee to take the first action to create this Public Safety Broadband Trust by promptly reporting legislation to take 30 MHz from the pending auction and direct the FCC to reallocate it to public safety. We cannot suggest too strongly the urgent and identified need for broadband capability that public safety can use with assurance that it will work when needed, be available when needed, and is affordable. With a global war on terrorism being fought daily and homeland security interest at an all-time high, public safety, in defense of the homeland, should be operating on 21st century technology. Thank you for the opportunity to address the Committee. We appreciate your consideration of this most important public safety issue.

The CHAIRMAN. Thank you very much, Chief.

May I assure all the witnesses that their full statement and supporting documents and exhibits will all be made part of the record.

May I now call upon Chairman McEwen?

Senator STEVENS. Mr. Chairman, could you add to this, this letter we received from the Coalition?

The CHAIRMAN. Yes, sir. Without objection, the letter will be made part of the record.

[The information previously referred to follows:]

COUNCIL FOR CITIZENS AGAINST GOVERNMENT WASTE
Washington, D.C., February 7, 2007

Hon. TED STEVENS,
Vice Chairman,
U.S. Senate,
Senate Committee on Commerce, Science, and Transportation,
Washington, DC.

Dear Senator,

Attached please find a copy of a Federal Communications Commission filing submitted on behalf of the Council for Citizens Against Government Waste and the National Taxpayers Union. The filing expresses our concern regarding Cyren Call's proposal to reallocate a portion of the 700 MHz spectrum. We believe that the ill-conceived plan would have resulted in an unprecedented government giveaway and a significant setback for taxpayers.

As you move forward with this issue, please consider the fiscal impact of any legislation and do not undo the digital television (DTV) provisions of the Deficit Reduction Act passed in last Congress.

Thank you.

Sincerely,

THOMAS A. SCHATZ,
President.

NATIONAL TAXPAYERS UNION,
COUNCIL FOR CITIZENS AGAINST GOVERNMENT WASTE
Washington, D.C., November 28, 2006

Hon. KEVIN J. MARTIN,
Chairman,
Federal Communications Commission,
Washington, DC.

Dear Chairman Martin:

On behalf of the members of the National Taxpayers Union and the Council for Citizens Against Government Waste, we write to commend your rejection of Cyren Call's proposal to reallocate a portion of the 700 MHz spectrum. We believe that the ill-conceived plan would have resulted in an unprecedented government giveaway and a significant setback for taxpayers.

The Deficit Reduction Act of 2005 gave 24 MHz of spectrum in the 700 MHz band to public safety causes, which effectively doubled the amount of spectrum available for emergency communications systems. By providing for the public auction of other parts of the 700 z band, the Act encourages the divestiture of excess government assets while promoting a robust, market-driven communications sector.

Cyren Call's proposal would have given away for free the additional spectrum that could bring in billions of dollars for the Federal Treasury via the time-tested auction process. Past rounds of the Advanced Wireless Services spectrum auctions suggest that selling off portions of the 700 MHz spectrum could prove highly lucrative. This money could he used to decrease the budget deficit, thereby reducing the bill that taxpayers will ultimately have to settle.

We applaud your decision and stand ready to ensure that the future allocation of the spectrum serves the interests of American taxpayers and businesses alike.

Sincerely,

JOHN BERTHOUD,
President.

THOMAS SCHATZ,
President.

CITIZENS AGAINST GOVERNMENT WASTE—CYREN CALL REALITY CHECK, THE WAR ON WASTE: CHRONICLES OF WASTE, FRAUD AND ABUSE

Congressional Alert
February 6, 2007

With Congress's return there is ample opportunity for lobbyists and legislators to cause new headaches for taxpayers.

One company in particular, Cyren Call, is trying to overturn one of the positive actions taken by Congress last year. First, some history is useful.

In 2004, the Federal Communications Commission (FCC) adopted the "Consensus Plan," which will realign the 800 MHz spectrum to separate public safety systems from the commercial systems causing interference.

- Nextel offered to reduce interference by giving up some of its localized 800 MHz spectrum, valued at $1.6 billion, in exchange for nationwide 1.9 GHz spectrum which could have fetched billions more in a public auction.
- Nextel received nearly a multi-billion windfall at the expense of taxpayers and possession of valuable spectrum coveted by other communications companies.
- Nextel has asked for a delay of up to 2 years to complete the 800 MHz realignment.

Now the co-founder and several former senior executives of Nextel have formed Cyren Call and are trying to take a second bite out of the taxpayers.

The digital television (DTV) provisions of the Deficit Reduction Act of 2005 give public safety 24 MHz of prime spectrum in the valuable 700 MHz band and $1 billion in funding to help meet public safety's needs for interoperability with the remaining 60 MHz of the spectrum to be auctioned off for taxpayers' benefit.

- Cyren Call tried to urge the FCC to give away 30 MHz of the 60 MHz to fund a commercial network that would serve public safety. That would only benefit Cyren Call and its executives and financial backers at the expense of public safety and U.S. taxpayers.
- Rather than bidding billions of dollars at auction, Cyren Call is hoping to be paid to create this new network.
- The company claims it will make the U.S. Treasury "whole" with a funding scheme for the spectrum but the reality is that auctioning the spectrum is the law and the only way to serve taxpayers.
- The FCC rightfully rejected Cyren Call's petition and is now looking at how best to use the 24 MHz being allocated for public safety consistent with the DTV bill. Now Cyren Call is trying to get Congress to take up its plan and undo years of work on a carefully crafted compromise.

Telecommunications spectrum is an asset owned by U.S. taxpayers. Any time this asset is given away at no charge, potential revenue is lost.

Our first responders deserve to get their 24 MHz as soon as possible and taxpayers deserve the billions of dollars a spectrum auction would bring in. Cyren Call's proposal stands in the way of both and Congress must guard against it.

A SECURE NATIONAL BROADBAND NETWORK
AND THE PUBLIC SAFETY BROADBAND TRUST

The Nation does not have what it needs most in telecommunications capabilities—a secure national mobile broadband network that meets the needs of public safety but is also used and supported by the commercial sector.

In times of national and regional emergency, the network will provide the broadband communications that are essential to saving life and property.

During ordinary times, the network will provide truly national and secure communications capabilities to commercial users that do not now have such a system, including providers of the critical infrastructure on which the Nation's livelihood depends.

This is how it can be done:

- Remove 30 MHz (upper band) from the upcoming FCC auction of 60 MHz of recovered analog spectrum.
- Instead of auctioning a license to that 30 MHz spectrum, it should be assigned for an appropriate price to a non-profit corporation controlled by national public safety organizations—the Public Safety Broadband Trust Corporation (PSBT).

- PSBT will lease spectrum usage rights to commercial operators who will build out a secure national broadband network meeting public safety specifications.
- Public safety organizations will control the development of the network in order to ensure that it satisfies the requirements and needs of the public safety community.
- PSBT will hold and exercise the ultimate control over the license to the 30 MHz spectrum and will determine the network's technology, build requirements and the network's operating rules.
- Commercial subscribers that need a secure national network will use the network on a day-to-day basis along with public safety users who will retain priority access to the network.
- PSBT will fund the spectrum acquisition with the lease payments of the commercial operators and with the assistance of Federal loan guarantees, just like those that have been made available to other industries (airlines, shipping companies, pipelines).

The CHAIRMAN. Chief—Mr. Chairman?

STATEMENT OF HARLIN R. MCEWEN, CHAIRMAN, COMMUNICATIONS AND TECHNOLOGY COMMITTEE, IACP; COMMUNICATIONS ADVISOR, MCC, NSA, MCSA; VICE CHAIRMAN, NATIONAL PUBLIC SAFETY TELECOMMUNICATIONS COUNCIL

Mr. MCEWEN. Thank you, sir. Good morning. Thank you, Mr. Chairman and Mr. Vice Chairman and members of the Committee, for the opportunity to speak with you this morning.

I am the retired Police Chief of the City of Ithaca, New York, and I also am a retired Deputy Assistant Director of the Federal Bureau of Investigation here in Washington, D.C. I serve as the Chairman of the Communications and Technology Committee of the International Association of Chiefs of Police, a position I've held for more than 28 years. I also serve as the Communications Advisor for the Major City Chiefs Association, the National Sheriffs Association, and the Major County Sheriffs Association. And in addition to these organizations, today I'm speaking on behalf of the Association of Public Safety Communications Officials—International and the National Public Safety Telecommunications Council.

Senator Klobuchar, I want to just make the point that I've known Sheriff McGowan for many years. He's a wonderful professional. We're going to miss him, now that he's retired. But I worked closely with him in these matters of interoperability, so I know what you speak of.

I'm pleased to have the chance to discuss with the Committee today an exciting new opportunity for Congress to take steps that will pave the way to reduce the dependence on local and Federal tax revenues to maintain modern public safety communications systems. That is a proposal for a 700-megahertz nationwide public-safety broadband network. This proposed network can become a reality only if Congress authorizes creation of a public/private partnership controlled by the public safety community to hold a nationwide license for 30 megahertz of spectrum in the upper 700 megahertz band; and to further authorize us, the public safety community, to deploy this network, pursuant to a public-sector/private-sector partnership model. The wireless voice systems public safety personnel use today are among the most important tools they have to do their job in a safe and efficient manner. However, these systems have, in many cases, been underfunded, poorly maintained,

and generally not refreshed. As we look to the long-term future, we need to look at a new and better way to improve public safety communications.

The implementation of a nationwide public-safety broadband network can be the beginning of the end to the problem of public safety interoperability. We have been asking for funding support for years to help us upgrade and replace mission-critical land mobile voice systems that are built by different manufacturers, are of different vintages, are generally incompatible, and, in many cases, not compatible with the P25 standards, which are the only recognized national digital standards for land mobile public safety communications interoperability.

For those who argue that public safety already has enough radio spectrum to meet current and projected mobile requirements, I can only say that they purposely ignore the facts concerning public safety spectrum allocations and first-responder communications requirements. As an example, the cellular industry, represented by CTIA, has grossly misrepresented the spectrum issue. CTIA recently said, "Right now, the public service community utilizes 47 megahertz of spectrum to serve its public safety users. At the same time, there are wireless carriers that use roughly the same amount of spectrum to deliver voice, data, and advanced information services to many times that number of subscribers." Contrary to what the CTIA says, the real facts on spectrum allocations are that the commercial allocations for wireless communications add up to 528 megahertz, an amount more than ten times that for public safety.

In regard to the ninth notice of proposed rulemaking recently issued by the Federal Communications Commission, we have many concerns about the concept set forth in that proposal. The ninth NPRM suggests that a nationwide broadband network could be built using the 12 megahertz of spectrum currently allocated for local licensing of public safety wideband systems. This would take away from local licensing control the spectrum long promised for use by local agencies. In addition, we believe that the proposal is seriously flawed by failing to acknowledge the need for enough spectrum to attract investors to participate in a public/private partnership where private funds would be invested to build a nationwide network.

And, Senator Klobuchar, I want to make mention of the fact that in Hennepin County, three counties partnering with Hennepin County, for instance, are building a wideband system that would be in jeopardy if that particular proposal were to be followed.

I have dedicated most of my professional career to the advancement of public safety communications. From that perspective, I believe this Congress has an extraordinary time-sensitive opportunity. Approval of the Public Safety Broadband Trust and a public/private-sector partnership will catapult public safety to its rightful place in the forefront of communications capability while at the same time delivering broadband service to communities that continue to be bypassed by the commercial telecommunications industry. I hope you will share my belief that this is an opportunity that must be seized for the benefit of the entire public.

Thank you very much.

[The prepared statement of Mr. McEwen follows:]

PREPARED STATEMENT OF HARLIN R. MCEWEN, CHAIRMAN, COMMUNICATIONS AND TECHNOLOGY COMMITTEE, IACP; COMMUNICATIONS ADVISOR, MCC, NSA, MCSA; VICE CHAIRMAN, NATIONAL PUBLIC SAFETY TELECOMMUNICATIONS COUNCIL

Thank you, Mr. Chairman, and distinguished members of the Committee for the opportunity to appear before you today.

My name is Harlin McEwen and I have been actively involved in public safety for almost 50 years. My career has been in law enforcement and I also have been a volunteer firefighter. I am the retired Police Chief of the City of Ithaca, New York, and am also retired as a Deputy Assistant Director of the Federal Bureau of Investigation in Washington, D.C. I serve as Chairman of the Communications and Technology Committee of the International Association of Chiefs of Police (IACP), a position I have held for more than 28 years. I also serve as the Communications Advisor for the Major Cities Chiefs Association (MCC), the National Sheriffs' Association (NSA), and the Major County Sheriffs' Association. I am the Vice Chairman of the National Public Safety Telecommunications Council (NPSTC) and am a Life Member of the Association of Public-Safety Communications Officials-International (APCO). Today I speak on behalf of all of these organizations.

When I first became a law enforcement officer in 1957, police vehicles had tube type 6 volt analog mobile radios that dimmed the headlights when we pushed the microphone button. In those days there were no hand-held radios. In my career I have witnessed many changes and advances in law enforcement and public safety communications. However, the advances for public safety have consistently lagged behind the advances of commercial services, primarily because of lack of funding and spectrum.

As you are aware, citizens rely upon their local and state police agencies, sheriffs' offices, fire departments, emergency medical services, and other emergency services like highway and public works and utilities to come to their assistance wherever and whenever needed. They respond whether it is a crime in progress, a civil disturbance, a building fire, a forest fire, an automobile accident, a health emergency, a natural disaster, or, as we learned on 9/11, a terrorist attack. Today, citizens assume that those first responders will get the call and will have the communications tools they need to address emergencies quickly and efficiently. Unfortunately that is not always true.

I want to applaud the efforts of this Committee and the Congress in voting to clear the television broadcasters from the long promised 700 MHz spectrum. This will help us improve public safety radio communications, both operability and interoperability. The major cities and metropolitan areas of this country are still in desperate need of additional land mobile voice channels and are anxiously waiting for this spectrum to become available. Your efforts to designate $1 billion derived from the auction of radio spectrum for public safety communications are also very much appreciated by the public safety community and will be very helpful. The introduction of S. 385 by Senators Inouye, Stevens, Kerry, Smith, and Snowe is also helpful in giving direction to NTIA with respect to the $1 billion grant program and we appreciate these efforts to have this funding program implemented in a timely fashion.

I am pleased to have the chance to discuss with this Committee an exciting new opportunity for Congress to take steps that will pave the way to reducing the dependence on local and Federal tax revenues to maintain modern public safety communications systems. That is a proposal for a 700 MHz nationwide public safety broadband network. This proposed network can become a reality only if Congress authorizes creation of a public/private partnership, controlled by the public safety community, to hold a nationwide license for 30 MHz of spectrum in the upper 700 MHz band and further authorize us to deploy this network pursuant to a public sector-private sector partnership model.

I have studied the issue of public safety telecommunications for decades. I have been actively engaged in the efforts of the Federal Communications Commission, other Federal agencies, state and local government entities and individual departments to identify law enforcement communications requirements and provide our first responders with the necessary tools to meet those needs. Substantial time and significant taxpayer dollars have been devoted to those efforts, yet in 2007 the public safety community still is far behind commercial users in terms of wireless functionality. Our public safety users who should have the best, most advanced, and most robust capabilities too often must rely on systems that are inadequate for their needs today, much less the expanded responsibilities with which they will continue to be charged in the future. Without a fundamental change in the way we approach emergency responder communications, specifically without allocation of the additional 30 MHz of spectrum and adoption of the approach embodied in the Public

Safety Broadband Trust (PSBT) proposal, I see no reason to ever expect substantial improvement.

The wireless voice systems public safety personnel use today are among the most important tools they have to do their job in a safe and efficient manner. However, these systems have in many cases been underfunded, poorly maintained and generally not refreshed. As we look to the long term future, we need to look at new and better ways to improve public safety communications.

The need for more efficient public safety data systems is growing and this has become the focus of much of our attention as we look to ways for public safety to take advantage of Third Generation (3G) and Fourth Generation (4G) technologies.

The implementation of a nationwide public safety broadband network can also be the beginning of the end to the problem of public safety interoperability. We have been asking for funding support for years to help us upgrade and replace mission critical land mobile voice systems that are built by different manufacturers, are of different vintages, are generally incompatible and in many cases not compatible with the P25 standards, the only recognized national digital standards for land mobile public safety communications interoperability.

It is critical to understand that this is a one-time-only opportunity to solve many of the public safety communications requirements of today and the future. We recognize this is not an easy decision for the Congress. You must choose between solving the public safety communications problem and making sure our citizens have good public services, or allowing the spectrum required by public safety to be auctioned to commercial companies who want to expand their services and increase their profits. It seems simple to us that by your approval of this important step for public safety you will be doing the right thing for America. It will begin to take the burden off the taxpayers who must build and maintain increasingly expensive public safety communications systems.

The benefits from a nationwide public safety broadband network as set forth in the Public Safety Broadband Trust proposal are as follows:

1. Broadband data services (such as text messaging, photos, diagrams, and streaming video) not currently available in existing public safety land mobile systems.

2. A hardened public safety network with infrastructure built to withstand local natural hazards (tornadoes, hurricanes, earthquakes, floods, *etc.*) that would include strengthened towers and back-up power with fuel supplies to withstand long-term outages of public power sources.

3. Nationwide roaming and interoperability for local, state, and Federal public safety agencies (police, fire and EMS) and other emergency services such as transportation, health care, and utilities.

4. Access to the Public Switched Telephone Network (PSTN) similar to current commercial cellular services.

5. Push-to-talk, one-to-one and one-to-many radio capability that would provide a back-up to (but not replace) traditional public safety land mobile mission critical voice systems.

6. Access to satellite services to provide reliable nationwide communications where terrestrial services either do not exist or are temporarily out of service.

For those who argue that public safety already has enough radio spectrum to meet current and projected mobile requirements, I can only say that they purposely ignore the facts concerning public safety spectrum allocations and first responder communications requirements. As an example, the cellular industry, represented by CTIA, has grossly misrepresented the spectrum issue as recently exhibited in their press release critical of Senator McCain's announcement that he would be introducing legislation to establish a new nationwide, state-of-the-art public safety broadband network. The CTIA statement said "the basic facts of the matter should compel this important debate to be about providing first responders with funding, access to equipment and coordination, not more spectrum". CTIA further stated "Right now, the public service community utilizes 47 MHz of spectrum to serve its public safety users. At the same time, there are wireless carriers that use roughly the same amount of spectrum to deliver voice, data and advanced information services to many times that number of subscribers. More spectrum is clearly not the answer".

Contrary to what the CTIA says, the REAL facts on spectrum allocations are as follows:

State and Local Public Safety Spectrum Allocations

Allocation	MHz
VHF Low Band (25–50 MHz)	6.3
VHF High Band (150–174 MHz)	3.6
UHF Low Band (450–470 MHz)	3.7
800 MHz Band (806–821/851–866 MHz)	3.5
800 MHz Band (821–824/866–869 MHz)	6.0
700 MHz Band (764–776/794–806 MHz)	24.0
Total Public Safety	47.1

Commercial Spectrum Allocations

Allocation	MHz
Cellular	50
Broadband PCS	120
AWS	90
Broadband Radio Services	190
Lower 700	48
Upper 700	30
Total Commercial	528

But even these numbers do not tell the real story or explain why existing public safety allocations cannot be used for broadband operations. Historically, the FCC has allocated individual channels, not contiguous channel blocks, for public safety use. These channels are immediately adjacent to channels allocated for taxicab companies, truck operators and other businesses. The channels typically are no larger than 25 kHz bandwidth and more frequently 12.5 kHz, or a tiny fraction of each 25 MHz cellular system authorization. This allocation approach has permitted numerous governmental entities to secure licenses for localized, individual purposes, but precludes the public safety community as a whole from consolidating enough contiguous channels to deploy 21st century broadband technology networks. There simply is not sufficient contiguous bandwidth to support the text messaging, building diagrams, photos, streaming video and other transmissions that will be as essential to law enforcement officers during these perilous times as the weapons they carry.

While the 24 MHz public safety allocation in the upper 700 MHz band is contiguous, even that spectrum is subdivided in various categories designed for mission critical voice communications on both localized and state levels, as well as for wideband data applications. And that spectrum allocation, first promised to the public safety community in 1997, was intended to address the unmet needs and identified deficiencies in the spectrum resources available to public safety more than a decade ago. New technologies and new services have since been developed to respond to the ever escalating commercial appetite for more useful and sophisticated mobile communications tools and solutions—and appropriate new commercial spectrum allocations have been made available to commercial network operators to bring those improvements to their customers. Likewise, over the past decade, public safety's needs for access to these advanced technologies, services, tools and solutions has not stood still—although, unfortunately, the amount of appropriate spectrum allocated to meet them has.

Allow me to emphasize these points by example, as the contrast between the spectrum resources available to commercial wireless network operators and to the public safety community could not be more striking. To begin with, commercial cellular and PCS licensees have access to large blocks of contiguous spectrum. Their allocations were specifically designed to support system architectures and technologies that would accommodate vast numbers of customers. To compare the number of subscribers that can be served on a 25 MHz cellular network with the number of police officers that can share a 12.5 kHz bandwidth channel, or even multiple channels, is as meaningful as comparing the size of watermelons to grapes. Compounding the imbalance is the absolute amount of spectrum that has been made available for commercial use in comparison to that which has been made available for public safety uses as detailed above. Just last year, the Commission made another 90 MHz of spectrum of Advanced Wireless Spectrum available for commercial operations,

again in large spectrum blocks and expressly authorized for commercial mobile broadband uses.

In fact, it is the success of the cellular/PCS model that has convinced us that public safety must have a 30 MHz spectrum block on which to deploy an advanced technology broadband network. That model has persuaded us that the public safety community must join together in the Public Safety Broadband Trust, rather than seeking individual licenses for individually designed and deployed systems, if we are to achieve our objective: seamless nationwide roaming capability on a 21st century broadband 700 MHz network that is built and operated to satisfy increasing and demanding public safety requirements.

I stated previously that a nationwide broadband network solution needed to address both spectrum and funding, and to address them both at the same time and in the same context. The latter is just as critical as the former and requires an innovative approach given the extraordinary costs associated with building and operating a truly nationwide broadband network. Unlike purely commercial systems that have the luxury of limiting coverage to areas of denser population and transportation corridors, public safety users must have communications capability wherever there are people or property to protect. This mandate has the important consumer benefit of ensuring that a broadband network designed to meet public safety needs will be available in suburban and rural communities that remain outside the areas of commercial broadband deployment. However, I have substantial experience in the traditional funding sources for public safety communications and see no realistic possibility that the necessary moneys will be made available even to build, much less maintain, operate and routinely upgrade a network of this scope if dedicated to purely public safety requirements.

The only solution that we consider viable is a public sector-private sector partnership as proposed in the Public Safety Broadband Trust. Under this approach, the PSBT would acquire a 30 MHz license at 700 MHz and would enter into leases of spectrum usage rights with commercial operators who would build a nationwide public safety network that: (1) would be paid for by commercial operators using excess capacity, not by the public safety community or the taxpayer; (2) would be licensed and controlled by public safety representatives to ensure public safety priority access; and (3) would be refreshed with the latest technical improvements, funded by the commercial participants.

We do not support what some would call a "hosted" public safety network. While the term may have somewhat different meanings to different people, at its core it puts mission critical, emergency response communications in a position of dependence with respect to the host commercial provider. Moreover, it undermines or even negates the essential nationwide character of the network. With all due respect to commercial operators that might now express support for hosted systems, there is nothing in the over 20-year history of commercial wireless systems that would validate their reliability or availability for mission critical public safety needs. That is not an arrangement that the public safety community could endorse.

In regard to the Ninth Notice of Proposed Rulemaking (NPRM) recently issued by the Federal Communications Commission, we have many concerns about the concepts set forth in that proposal. The Ninth NPRM suggests that a nationwide broadband network could be built using the 12 MHz of spectrum currently allocated for local licensing of public safety wideband systems. This would take away from local licensing control the spectrum long promised for use by local agencies. In addition we believe the proposal is seriously flawed by failing to acknowledge the need for enough spectrum to attract investors to participate in a public/private partnership where private funds would be invested to build a nationwide network.

By contrast, the partnership outlined in the Public Safety Broadband Trust creates a symbiotic and balanced relationship, but one in which public safety always remains in control. It represents a win-win opportunity if sufficient spectrum is allocated to accommodate both public safety and commercial usage. Public safety cannot fund this network on its own, but also must be confident that the network is built to hardened public safety requirements with priority access that is adequate to respond to emergencies. Commercial operators will lease the spectrum and build the network to public safety specifications, but only if there is sufficient excess capacity to permit meaningful commercial service on a regular basis. The technical data supports the conclusion that a minimum of 30 MHz is needed to serve these complementary requirements.

The many public safety organizations and agencies that have supported the PSBT approach recognize that it will require removing some of the 700 MHz spectrum that currently is scheduled to be auctioned. The PSBT proposal includes a plan to make the Federal budget whole. The PSBT would raise $5 billion to pay the U.S. Treasury for the spectrum, using the revenues from the commercial users and the

assistance of Federal loan guarantees similar to those that have been made available to industries such as airlines, pipelines and automobile manufacturers. This financing arrangement would ensure that other Federal public safety spending priorities, including the $1 billion for other public safety interoperable communications needs, would not be affected.

Let me add that I and other supporters of the PSBT also endorse the commendable work being done by local and regional organizations such as the Capitol Area Region Broadband Project with respect to broadband. To the extent their efforts bring about public safety communications improvements, it is important work that deserves support. But we must remain mindful that the results will be, at best, a patchwork of improved, but incompatible, non-interoperable networks at a daunting per unit cost. They are doing what they can in light of the regulatory and financial environment in which they must operate, but this Nation can and must do better.

I have dedicated most of my professional career to the advancement of public safety communications. From that perspective, I believe this Congress has an extraordinary time-sensitive opportunity. Approval of the PSBT and the public sector-private sector partnership will catapult public safety to its rightful place in the forefront of communications capability while at the same time delivering broadband service to communities that continue to be bypassed by the commercial telecommunications revolution. I hope you will share my belief that this is an opportunity that must be seized for the benefit of the entire American public.

The CHAIRMAN. I thank you very much.

May I now call upon Mr. O'Brien, Chairman of Cyren Call.

Mr. O'Brien?

STATEMENT OF MORGAN O'BRIEN, CHAIRMAN, CYREN CALL COMMUNICATIONS

Mr. O'BRIEN. Thank you, Mr. Chairman. Thank you, Mr. Vice Chairman and members of the Committee.

My name is Morgan O'Brien, and I am no stranger to controversy.

[Laughter.]

Mr. O'BRIEN. In 1987, I was a founder of a company then called Fleet Call, which became Nextel. And the relevance of the history of my experience and—at Fleet Call and Nextel—to today's deliberation is that Fleet Call and Nextel approached the FCC and argued strenuously that a more efficient use of spectrum, a different way of handling spectrum, would create a competitive opportunity to the cellular industry that was a duopoly. It would be fair to say that the response in 1987 from the established cellular industry, the wireless operations, and the wireless carriers, was violent. I understand well the process of innovation and introducing disruptive technology into an existing environment.

I think the success that Nextel accomplished illustrates vividly the point that competition, as opposed to competitors, is the guiding principle in the regulation of telecommunications. I know I'm preaching to the converted when I talk about competition to this committee, but the history of Nextel—which, for 18 years, I lived intimately—was that new competition and disruptive technology are never welcome, but they have a very beneficial effect.

At Nextel I also developed a high degree of confidence for the private sector—the willingness of the private sector to capitalize new ventures and the ability of a new venture such as Nextel to take on the establishment, build up market share, and be a long-time successful operation. I know that process. I know the elements. And I believe I see the same opportunity here.

Prior to the Nextel experience, and, in a certain way, a return for me to my roots, I had the privilege of working at the Federal Communications Commission in the 1970s, working in the area of spectrum management of private radio services, the key player in the private radio services being public safety. So, I began my career working for several years at the FCC, working on the same thorny issue that we're talking about today, and that was in the 1970s. Spectrum management is a more rational way of using and assigning frequencies for the most important users of radio communications frequencies, which is public safety.

The details of the proposal that Cyren Call has put forward to this committee and to the FCC are set out in my testimony and others, so I won't take the time to go through the details now. I just want to make one or two points of emphasis.

By far the most important element of our proposal is that 30 megahertz of spectrum be licensed to a not-for-profit Public Safety Broadband Trust broadly representative of the public interest—public safety interest at State, local, and Federal levels—throughout this country. I want to stress the implications of having that type of a licensee, something never before attempted, and the difference of a non-profit oriented license. The not-for-profit licensee would be sufficiently instructed by legislation and by the FCC to achieve certain objectives not in the commercial interest, but instead in the public interest. For example, providing the broadest possible coverage, even when the broadest possible coverage isn't the most economically rational thing to do. Providing a public-safety-grade build-out would not be economically rational but for a licensee such as the Public Safety Broadband Trust.

So, I draw your attention to the importance of awarding a license, figuring out a way to make that license available to the Public Safety Broadband Trust, and then following through the implications—the powerful implications—of how that type of licensee, working with the private sector—again, something unprecedented—can use the private sector and the willingness of the private sector to finance a next-generation network.

I'd like to make a last point—actually there are two last points. One, any effect of our proposal, or proposals like our proposal, that would delay the availability of spectrum based on the earlier legislation, in our view, would be a terrible mistake. Anything that would affect the billion dollars that's available—or will be coming available to public safety interoperability—again, would be a terrible mistake. No one at Cyren Call in any way would support that. So, if that were the unfortunate consequence, and a choice had to be made, the clear choice is not to affect those deadlines. That would be counter to the best interest of public safety and the public interest.

I want to say one final word about three aspects of competition. First and foremost, the disruptive and positive effect of a new player coming into the wireless industry at this point of time, I think, cannot be exaggerated. Competition is important, and protecting competitors is not important, as has been so often the case before.

Secondly, the use of competition is important. If a Public Safety Broadband Trust is created, to recruit and develop the best possible range of commercial operators to partner with public safety under

the guidance of public safety, the use of competition will be effective. And, third, and most painfully and most personally, I want to address the competition for the role that Cyren Call has sought. We are absolutely consistent with the logic of the Public Safety Broadband Trust making the right decision, looking fully and competitively to determine who would be the best partner, and the best manager in this type of relationship. We're prepared to go through that process. We would hope to win in that process. But, again, we look at the competition.

And I thank you very much, and I hope to have a chance to talk more in the questions.

[The prepared statement of Mr. O'Brien follows:]

PREPARED STATEMENT OF MORGAN O'BRIEN, CHAIRMAN, CYREN CALL COMMUNICATIONS

Good morning Chairman Inouye, Vice Chairman Stevens, members of the Committee. My name is Morgan O'Brien. I am the Chairman of Cyren Call Communications Corporation. Prior to forming Cyren Call last year, I spent eighteen years as a founder of Nextel Communications, Inc. I served most recently as Vice Chairman of Nextel prior to its merger with Sprint Corporation.

Historically, Congress and the FCC have treated the communications requirements of the public safety and commercial communities as separate and distinct. As a result, public safety increasingly has been left behind while commercial service providers have revolutionized the telecommunications capabilities of the Nation. The challenge before us today is how to correct this imbalance, since 9/11 taught us that we are all one nation facing a new threat. To meet this threat, public safety must have the same extraordinary capabilities that consumers already are beginning to enjoy on commercial broadband networks.

The Nation's emergency response providers are being asked to take on ever expanded duties with limited human and financial resources. Improved technology is key to enabling that workforce to keep pace with those responsibilities. This Committee has repeatedly recognized the importance of broadband for the general public. The Nation's most essential users, the individuals who protect our persons and property, also have a paramount need to access the almost mind-boggling capabilities that can be delivered on an advanced wireless broadband network. We must identify an approach that at last will permit public safety users to be at the forefront of this Nation's telecommunications revolution.

On April 27, 2006, Cyren Call filed a comprehensive proposal with the FCC in which it recommended the creation of a nationwide, wireless broadband network for public safety and commercial use employing an innovative public sector-private sector partnership and funding method. In my opinion, and as indicated by the public safety representatives who address you today, this shared 30 MHz governmental/commercial network at 700 MHz, described more fully below, is the only technically and financially viable solution for the following reasons:

- First, those who protect our lives and property should be using best-in-class, state-of-the-art wireless technology, and all too frequently they are not. Both spectrum and financial limitations act as barriers to that objective.
- Second, the Nation's public safety mobile capabilities must be upgraded as the FCC has reported on several occasions over the past few years. The public safety community's expanded responsibilities require a nationwide, interoperable broadband network at 700 MHz. Comments filed by thousands of public safety representatives in response to several recent FCC proceedings confirm that they embrace the idea of a 700 MHz broadband public safety network.
- Third, the realities of local, state and even Federal funding constraints make it clear that the public sector—on its own—cannot finance a broadband network with the necessary geographic coverage and technical capabilities. Indeed, earlier this week, the Administration proposed sharp cuts in FY 2008 grants for first responders. And even if such a network could be built with taxpayer dollars—a daunting assumption that requires the availability of tens of billions of dollars for that purpose alone—the ongoing cost of operating, maintaining and continuously upgrading it to keep pace with technological improvements vastly exceeds available public funding sources.

- Fourth, more than twenty-five years of commercial wireless deployment has also made it clear that no business case has emerged to induce commercial carriers to build out their networks beyond areas of relative population density, even though substantial spectrum has been made available for that purpose. Yet, the individuals in those communities still require police, fire, emergency medical and other vital governmental services. Moreover, they deserve access to the same wireless broadband technology that is transforming peoples' lives and their ways of conducting business in more urban markets.

The considerable time I have spent over the past years with police, fire, EMS and other emergency response providers, those serving rural, sparsely populated communities as well as those in major urban areas, has given me a deep appreciation for their truly unique communications requirements. Access to tomorrow's broadband devices will be essential, for example, to enable police officers to have real-time (streaming) video of a crime scene or major disaster as it unfolds. That type of situational awareness will give first responders a quantum leap in intelligence, a 21st century equivalent to body armor.

Just as important, it is becoming increasingly clear that the Nation needs a secure wireless broadband network to meet the needs of the critical infrastructure community, upon which our economy and well-being depend. Their access to a secure broadband network, in times of national threat or emergency will be a vital enhancement to the Nation's security.

At Nextel I had hands-on experience building a commercial wireless network from the ground up, while also converting operations from analog to digital technology. I know what is required to finance, deploy, operate, maintain and upgrade a top-quality, large-scale wireless network. Even with that experience, I do not underestimate the even greater challenge of building a nationwide broadband network to the more demanding public safety specifications and fully appreciate that the commitment, of necessity, is long-term. But it must be started now and started right. If public safety is to enjoy the advanced capabilities it needs and deserves, its wireless devices must be developed in conjunction with the right technology platform, not retrofitted to conform to a system built to less stringent commercial standards.

It is the combination of these factors that led to the creation of Cyren Call and its work with the public safety community in developing the concept of a governmental/commercial shared 30 MHz broadband network at 700 MHz, the license for which would be held by the Public Safety Broadband Trust (PSBT). The PSBT would consist of representatives of a broad variety of local, state and Federal Governmental entities and organizations. Excess capacity on the 30 MHz would be leased to commercial carriers for entirely commercial service in exchange for building, maintaining, operating and upgrading the network in accordance with specifications established by the PSBT. The PSBT proposal contemplates that public safety entities would pay for their own subscriber equipment and for system access. However, they would avoid the infrastructure costs that require extraordinary bond or other taxpayer measures, measures that take years to effectuate and, at best, provide individual organizations with equipment that already may be outdated by the time it is deployed, and which then cannot be upgraded for years or decades without additional taxpayer funding. Instead, the PSBT approach would mirror the commercial approach to network upgrades; public safety technology would be refreshed routinely in accordance with the demands of the consumer marketplace, although always consistent with the PSBT specifications as well. Public safety also would enjoy the cost economies of subscriber devices produced in volume for the broader consumer market, economies that continue to drive down the cost of cell phones and other wireless products.

The result would be a nationwide broadband network available to serve both public safety entities and the general public. It would not replace existing public safety voice facilities, but would provide access to a state-of-the-art system built specifically to public safety standards. On a day-to-day basis, the great majority of capacity would be devoted to commercial usage. While public and private wireless operations traditionally have been viewed as incompatible, the 21st century network contemplated in the PSBT proposal permits rational shared use. The first commercial subscribers are likely to be a combination of users such as utilities with more demanding public safety-like requirements and first adopters who want access to the most advanced technology available. However during emergencies, whether of a local, statewide, regional or even nationwide scope, increased access and capacity would automatically be dedicated for emergency response provider purposes on a scaled basis as dictated by the event. Of course, the rules of the road with respect to preemption would be established in advance by the PSBT so that those transmitting less critical communications would know to anticipate some disruption during

those events. Those with vital transmissions, network users at the local, state and Federal levels, would have immediate, seamless interoperability. Public safety agencies operating on their own systems in other bands also could be provided with interoperability through IP-based gateway patches that would reside on the network and use its IP backbone resources.

The operation of this network would represent a substantial challenge for commercial wireless veterans and will require careful oversight by the PSBT, whose members are not professional network operators. The legislation therefore permits, but most certainly does not require, the PSBT to hire personnel or enter into contracts with parties that bring skills critical to the network's success. Cyren Call believes it has the qualifications to take on important responsibilities vis-à-vis the network and has raised capital in anticipation of responding to any PSBT management services request for proposal. However, I will state here for the record what I have stated publicly and repeatedly since filing the proposal with the FCC in April 2006: Cyren Call is not asking for a guarantee of *any* ongoing role with respect to the PSBT or this 700 MHz spectrum. All such decisions will remain firmly in the hands of the PSBT, participation in which will be limited exclusively to public safety/governmental organizations.

Representatives of the Nation's police and fire officers have explained to the Committee their critical need for broadband capability on a national scale. They have described some of the functions that cannot be introduced on their current radio systems, but that would be available on a 30 MHz broadband network. Public safety officers are hampered today by not having access to features such as streaming video, large file downloads (*e.g.,* building diagrams and architectural plans), remote database access and multi-media messaging capability. And these are the capabilities that we already know are needed. The history of telecommunications teaches us that the introduction of improved technologies spawns applications and functionalities even beyond those originally anticipated. Who could have anticipated in 1983 when the first analog cellular system was activated that subscribers in 2007 would be using their "phones" to take pictures, watch television, read e-mails and maintain calendars? It is not possible to envision today all of the uses to which emergency response providers and commercial subscribers will put this broadband network since the only limits will be those of entrepreneurial ingenuity. However, a compelling advantage of this public/private broadband partnership is that public safety at last will enjoy the ongoing technical developments that now are taken for granted by subscribers on commercial networks. Competition in a fully competitive marketplace is a powerful engine for driving technological advances.

Technical improvements on this order require an appropriate spectrum platform. Yet critics of this governmental/commercial shared network claim that public safety does not need additional spectrum on which to deploy a broadband network. They argue that public safety could meet its needs by using its existing spectrum more effectively.

The proponents of such criticism either are woefully misinformed or are willfully disingenuous about the reality of public safety spectrum allocations. Most public safety spectrum is allocated in individual 25 kHz or 12.5 kHz channels. These channels are but a fraction of the spectrum awarded to each cellular and PCS licensee and, even then, are not contiguous to one another. Under rules and procedures established by the FCC, they are interleaved with channels used by a variety of non-public safety entities and must coexist with them. Even if the FCC were inclined to displace all existing public safety operations on this shared spectrum, those individual channels could not be cobbled together to create a block of contiguous spectrum adequate to support a broadband network. Suggesting otherwise is a deliberate attempt to mislead Congress and this Committee. The fact that this fiction originated from CTIA, the organization representing the wireless carriers who have made no secret of their appetite for the spectrum in question, speaks volumes.

The public safety community also has stated already that even the 12 MHz of contiguous public safety spectrum at 700 MHz proposed by the FCC for a nationwide broadband network is entirely inadequate for that purpose. They have determined that it would not provide enough capacity to accommodate all governmental broadband usage, much less provide excess capacity that would attract commercial partners.

It is for precisely this reason that the public safety community has embraced the fundamental premise of the PSBT legislation—a shared governmental/commercial 30 MHz broadband network is the only economically realistic vehicle for delivering broadband capabilities to local, state and Federal public safety users as well as to the American people that live beyond the outposts of commercial wireless deployment. If there is a better answer, one that addresses all of the technical and economic factors that must be integrated to produce a workable solution, its proponents

should be here, before this Committee, so that their proposal could be tested for cohesiveness and validity. The needs of public safety are urgent and immediate. They should not be deferred in the hope that this problem will resolve itself or that an easier solution will emerge. They most certainly should not be denied because of a previously enacted Congressional auction schedule.

Last week's oversight hearings also reaffirmed that this Committee and the FCC consider ubiquitous broadband deployment one of the fundamental challenges for our Nation's telecommunications policies. There is no question that state-of-the-art broadband technology should be delivered to all of our citizens, not just those in the more densely populated communities that support purely commercial deployment. Indeed, several Senators questioned whether there should be incentives for more expansive broadband deployment and how addressing this issue might impact the Universal Service Fund.

The shared governmental/commercial network proposed in the PSBT legislation represents a solution that requires neither governmental incentives nor USF moneys. Chief McEwen has explained the financial structure of the PSBT legislation. He has described how the Federal Treasury will be compensated for the 30 MHz of spectrum that would be allocated to the PSBT rather than auctioned.

The success of this approach is dependent upon two factors. First, the network must be conceived, organized and operated as a nationwide system with operations in more commercially attractive markets such as Los Angeles and New York defraying the cost of providing service in areas such as North Dakota, South Dakota, Arkansas, Mississippi, and West Virginia. The network must operate on the principle of coupling access to prime spectrum usage rights in commercially desirable markets with the obligation to build and operate, or contribute to the construction and operation of, the network in more sparsely populated and underserved markets. If not, it will be bound by the same economic barriers that, to date, have defined the geographic coverage of commercial wireless systems. Indeed, one of the PSBT's greatest challenges will be balancing public safety coverage requirements with the implacable economic realities of network costs.

Second, there must be sufficient capacity to support governmental usage while still attracting commercial interest. The former dictates that the network be built to hardened public safety specifications, substantially beyond the requirements of a typical commercial system, and that it have truly nationwide coverage through a combination of terrestrial and satellite service. The cost of deploying such a network is substantial. The commercial operators who will be building, maintaining, operating and improving it pursuant to their lease arrangements with the PSBT must be confident that there will be sufficient commercial capacity to support significant usage by a commercial customer base large enough to justify their investments.

Let me share with you a summary of the analysis that suggests 30 MHz is the *minimum* needed to support a viable network of this scope.

- *Terrestrial Coverage Cost:* Public safety must provide services wherever there is public to serve. A nationwide public safety broadband network is assumed to require a terrestrial build to 99.3 percent population coverage. The favorable propagation characteristics at 700 MHz help reduce costs of network construction, operation and maintenance vis-à-vis building out in a higher band, but even with the 700 MHz coverage advantages, it still is estimated that approximately 37,000 cell sites will be needed.
- *Satellite Coverage Cost:* Although the terrestrial build-out would cover 99.3 percent of the population, 35 percent of the Nation's land mass would not receive service from terrestrial sites. To ensure that public safety providers and the general public scattered throughout these sparsely populated areas nonetheless would have coverage, coverage that is not always available even today, and to guarantee a level of nationwide redundancy in the event of a catastrophe along the lines of Hurricane Katrina, satellite coverage will be an essential part of the network. Both terrestrial and satellite capabilities would be built into handsets so that emergency response providers will develop a full familiarity with both as part of their day-to-day radio operations.
- *Hardened Network Cost:* The occasional dropped call or network outage is an inconvenience, not a catastrophe, for a commercial subscriber. When a police or fire officer or an EMT loses communications, a life may be lost. Because of the responsibilities their personnel shoulder, public safety agencies require their communications systems to be built to significantly higher standards of reliability and redundancy than are the norm in commercial networks. Each of these elements adds cost to the network.
- *Operational/Maintenance/Upgrade Cost:* Economic analyses often focus on the cost of initial network deployment and fail to calculate the very substantial on-

going expenses associated with operating, maintaining and upgrading wireless systems. In fact, those costs can dwarf build-out expenses even when the up-front investment is significant. A 37,000 plus site network providing advanced capabilities to millions of public safety and commercial subscribers will have very significant operational and maintenance costs. Refreshing the network with technology upgrades as dictated by the marketplace and consistent with PSBT specifications will require additional financial commitments on the part of the commercial operators.

- *Estimated Usage:* The history of wireless communications is that subscriber usage invariably exceeds estimates. The spectrum efficiencies gained when improved technologies are introduced permit new applications that themselves prompt additional system utilization. The impact on network usage when public safety leapfrogs from voice-centric communications to streaming video and other spectrum-consuming applications will be extraordinary. And the data applications that drive broadband usage will only expand once this next-generation network is deployed. The viability of the network will depend, among other factors, on ensuring that it has sufficient capacity to support these more capacity-consuming applications while maintaining a public safety grade blocking rate.
- *Required Rate of Return:* Commercial operators have a financial obligation to their investors and/or shareholders. The potential rate of return associated with the shared governmental/commercial network described herein must justify the investment required to fund the elements identified above. This requires capacity that is adequate to accommodate local, state and Federal Government usage with enough excess capacity to support an economically remunerative commercial subscriber base as well. There is no viable business case for a shared 12 MHz nationwide broadband network. 30 MHz is the minimum allocation that will satisfy this purpose.

By scheduling this hearing, this Committee already has demonstrated its seriousness of purpose with respect to public safety communications requirements. It has been apparent for some time that the traditional response to a worsening situation, piecemeal financing of individual, incompatible systems serving individual needs, is prohibitively costly to taxpayers and does not address what clearly is a systemic problem.

The solution endorsed by the public safety community, creation of the PSBT and the assignment to it of a 30 MHz authorization designated specifically for deployment of a nationwide, advanced technology, interoperable, and secure wireless broadband network shared by governmental and commercial users, represents a unique opportunity to address both public safety and rural broadband needs. But time is not on the side of those who support this initiative. Its opponents recognize that actions taken by prior Congresses mean that the clock continues to tick down toward the auction deadline for this 700 MHz spectrum. A failure to act promptly will eliminate this solution by default and stalemate, and rob Congress of the opportunity to engage in reasoned decisionmaking on this vital national issue.

I urge Congress to embrace the comprehensive approach set out in the PSBT legislation and endorse a public/private partnership that will deliver wireless broadband service to all of the American public and provide public safety with the telecommunications capabilities needed to protect the safety of our citizenry.

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

And may I now call upon President and CEO of CTIA, Steve Largent?

STATEMENT OF HON. STEVE LARGENT, PRESIDENT AND CEO, CTIA—THE WIRELESS ASSOCIATION®

Mr. LARGENT. Thank you, Chairman Inouye and Co-Chairman Stevens and members of the Committee. Thank you for the opportunity to testify today.

I support the idea of an interoperable wireless broadband public safety network. One only has to look at the efforts between the industry and public safety on E–911, wireless priority service, wireless AMBER alerts, and, most recently, the WARN Act and emergency alerts, to know that this industry is serious about public safety. We will do our part in this instance, too.

I have several points to make to you today. First, Congress got it right a year ago, when it passed the DTV Act, setting a firm date for the full conversion to digital television and giving public safety agencies access to an additional 24 megahertz of spectrum in the 700-megahertz band. This will double public safety's spectrum inventory from pre-September 11th levels. Additionally, this committee was instrumental in providing a billion dollars in funding for interoperable communications to be drawn from commercial spectrum auction proceeds. The DTV Act promises an expedient transition to digital television, advanced wireless broadband services, and enhanced interoperability for our first responders. Now is not the time for change.

Second, interoperability challenges faced by first responders are not based on a lack of spectrum. Upon completion of the DTV transition, public safety will have 49.7 megahertz of spectrum to use for state-of-the-art voice and data services to serve approximately 3 million first responders. Cyren Call would have you believe that public safety networks will use that spectrum only to provide voice service and that more spectrum is needed for data. CTIA's largest carriers use, on average, the same amount of spectrum, yet provide both voice and broadband data services to more than 50 million customers each. This debate should not be about spectrum.

If the problem facing public safety is not spectrum, what is the problem? I offer that it is, as was said earlier, limited funding and divided turf. I don't dispute the need to improve interoperability and the broadband capabilities of our Nation's public safety communications system. If the Committee is looking for a model solution for how to deal with these challenges, I suggest you look to the effort of New York City. Under the leadership of Mayor Bloomberg, it has made great strides toward solving interoperability challenges that cost them so dearly on September 11th. Last September, New York City announced it had awarded a contract for a public safety broadband wireless network that will utilize 10 megahertz of spectrum in the 2.5 gigahertz band to provide enhanced, interoperable broadband services. Solutions addressing the needs of public safety are available today.

Third, Cyren Call's plan should be rejected. It's untimely, unwise, and unnecessary less than 10 months before the auction is expected to occur. The Cyren Call plan could have been debated during the period in which the DTV bill was crafted, but it was not. That was a 10-year period of time. The proposal is a giveaway that shortchanges the U.S. Treasury, potentially by billions of dollars. Additionally, the financing scheme set forth in Cyren Call's proposal effectively requires taxpayers to subsidize Mr. O'Brien's entry into the commercial space. Today, wireless industry is highly competitive, and there's no compelling reason to subsidize additional entry.

Fourth, if Cyren Call's proposal is not the solution, what is? The wireless industry accepts that it has a responsibility to provide expertise in what works and what doesn't work to solve public safety's interoperability needs. Accordingly, I am pleased to announce that the Silicon Flatiron's program at the University of Colorado, through a grant provided by CTIA, will host a 2-day joint experts meeting here in Washington, D.C., the week of April 9th. Dale Hat-

field, the respected former head of the Office of Engineering and Technology at the FCC, has indicated a willingness to lead this effort. Leaders from the public safety world will be invited to join experts from the commercial sector to discuss the best solutions for public safety. They will address broadband and interoperability, and specifically investigate use of CMRS technologies, unlicensed WiMAX, and Muni WiFi applications, solutions from New York and the Washington National Capital Region, reliance on a national systems integrator, as well as issues involving spectrum needs, costs, time to market, and complexity. I've spoken to several of our largest carrier manufacturer CEOs, and they have committed to have their leading subject-matter experts at the meeting. The goal is not another discussion, but real work toward the best solutions. Putting the best minds together can get us there.

What is needed from Congress is a continued commitment to the DTV transition and the interoperability grant programs. You can use your influence to help solve the leadership and turf battles that too often slow progress towards interoperability, and you can reject the false choice that one must be for Mr. O'Brien's plan to be for public safety, as that is not the case.

Thank you, and I look forward to your questions.

[The prepared statement of Mr. Largent follows:]

PREPARED STATEMENT OF HON. STEVE LARGENT, PRESIDENT AND CEO, CTIA—THE WIRELESS ASSOCIATION®

Chairman Inouye, Vice Chairman Stevens and members of the Committee, thank you for the opportunity to testify this morning on an issue that is of great significance to the wireless industry, but more importantly, critical to the security and safety of this country—the present and future of public safety communications.

As someone who was a Member of Congress on September 11th, 2001 and now as President of CTIA, I am keenly aware of the need for a national, interoperable wireless broadband public safety network. I am proud to say that the wireless industry has a long and proven track record of working with public safety agencies throughout the country to develop public safety and interoperability solutions. One only has to look at the collaborative efforts between the wireless industry and public safety on E–911, Wireless Priority Service, Wireless AMBER Alerts and, most recently, the WARN Act and emergency alerts to know that this industry is committed to developing a world class 21st century communications network. It is imperative that our Nation's first responders have access to the latest technology, such as broadband data and video capabilities that are now currently available in wireless handsets used by American consumers.

This Committee and Congress got it right a year ago when it passed The Digital Television Transition and Public Safety Act (DTV Act) setting a firm date for the full conversion from analog to digital television. The DTV Act represents years of careful consideration on the part of Congress, the FCC, NTIA, public safety, television broadcasters, and the wireless and technology industries. As a result of this landmark legislation, public safety agencies will have access to an additional 24 MHz of spectrum in the prime 700 MHz band doubling public safety's spectrum inventory as compared to pre-9/11 levels. Additionally, this Committee was instrumental in providing $1 billion in funding for interoperable communications from the auction proceeds of commercial spectrum.

As Chairman Martin and Commissioner Adelstein said last week before the Committee, the reallocation of the 700 MHz band is one of the most important undertakings before the Commission. I commend the FCC on taking the next crucial step with its notice of proposed rulemaking which solicits input from the best and the brightest as to how best to deploy an interoperable network utilizing the 24 MHz of prime spectrum.

Congress has made prudent decisions by setting a hard date for the DTV transition and by making funding available to public safety for interoperability grants. It is therefore crucial that the auction for this spectrum occur expeditiously. A timely auction will raise much needed funds for interoperability and make the promise of

wireless broadband a reality for the U.S. economy, consumers, and importantly, the millions of non-first responder government officials who rely on commercial networks to keep their cell phones and PDAs functioning during a crisis.

There is no dispute regarding the need to improve interoperability and the broadband capabilities of our Nation's public safety communications system; however, the Cyren Call plan or other proposals that stray from the path set by the DTV Act only serve to hinder and delay the transition.

It is the firm belief of CTIA and the wireless industry that now is not the time to alter the procedures set in place by the DTV Act. Congress and the FCC must remain committed to the current course, which promises an expedient transition to digital television, advanced wireless broadband services, and most importantly, enhanced interoperability for our first responders.

I would like to emphasize that the current interoperability challenges faced by first responders is not based on a lack of spectrum. Upon completion of the DTV transition as currently configured, public safety will have 49.7 MHz of spectrum (not including the 50 MHz that they have been allocated in the 4.9 GHz band) to use for voice and data services to serve approximately 3 million first responders. Cyren Call would have you believe that public safety networks will use that 49.7 MHz to provide only voice service to the 3 million first responders, and that more spectrum is needed for data. In comparison, three of our largest carriers use, on average, the same amount of spectrum, yet provide both voice AND broadband data services to over 50 million customers each, with two of them serving over 60 million. Commercial operators, using the same 50 MHz of spectrum, can provide voice and data service to 60 million Americans. The commercial wireless industry provides interoperable voice and data services to twenty times the number of customers as are served by public safety. This is not about spectrum.

Professor Jon Peha of Carnegie Mellon has studied the current fragmented approach to public safety communications, and has come to the conclusion that the current approach consumes more spectrum than it should. To date, the United States has assigned approximately 200 MHz of spectrum to the commercial wireless industry, and there currently are over 230 million subscribers. National wireless carriers in the U.S., on average, use 1 MHz of spectrum to provide service to one million customers. After the 700 MHz auction, public safety will have almost 50 MHz of spectrum to serve 3 million first responder subscribers. Public safety will have 16 times more spectrum, per user, than the average nationwide carrier does now, and again, this figure does not include the 50 MHz of spectrum that public safety has been allocated in the 4.9 GHz band. Even before the DTV transition, public safety currently has 8 MHz per million users. If spectrum is not the problem inhibiting a coordinated and cohesive interoperable public safety network, then what is the problem?

If the Committee is looking for an answer to this question, I would suggest the Committee should examine effort of New York City.

Last September, New York City announced it had awarded a five-year, $500 million dollar contract to Northrup Grumman to develop a public safety broadband wireless network. The proposed network will utilize 10 MHz of spectrum in the 2.5 GHz band, and is designed to enhance public safety by facilitating communication between first responders. The network will utilize Universal Mobile Telecommunications System (UMTS) technology from IP Wireless because of its inherent spectral efficiency, which reduces the network's need for spectrum while providing New York with a technology sufficient for its public safety wireless broadband requirements. According to IP Wireless, the system can deliver download data rates of 8 to 10 megabits with future versions capable of 30 megabits of download speed. These speeds can easily accommodate applications that first responders require.

Examples such as this illustrate that through the use of modern wireless technologies, the 24 MHz of 700 MHz spectrum that already is allocated to public safety is more than sufficient to meet the data rates and bandwidth requirements for an interoperable broadband service.

* * * * *

As I mentioned earlier, the DTV Act represents 10 years of painstaking deliberation on the part of policymakers and stakeholders. Mr. O'Brien had ample opportunity during those 10 years to put forth his Cyren Call proposal and have its merits debated before the DTV legislation was enacted. Instead, Cyren Call offered its proposed alternative approach in April 2006—two months *after* the legislation was signed into law.

In April of last year, Cyren Call filed a petition with the FCC requesting that an additional 30 MHz of commercial spectrum in the 700 MHz band be reallocated to construct a nationwide broadband emergency communications system to be used by

first responders. Cyren Call's business plan, and to be clear, Cyren Call is a for-profit business venture, proposes that the spectrum be deeded to a "Public Safety Broadband Trust" which would in turn lease the spectrum to commercial operators in exchange for their commitment to construct a national broadband network.

On November 3, 2006, the FCC dismissed Cyren Call's petition, noting that the venture is inconsistent with the DTV Act. Unwilling to take "no" for an answer, Mr. O'Brien and his team of lobbyists have begun seeking legislation based on the proposal the FCC rejected.

The Cyren Call proposal shortchanges the U.S. Treasury, and thus the taxpayers—potentially by billions of dollars. Under the terms of Cyren Call's proposal, the corporation is entitled to purchase a chunk of the valuable 700 MHz band on a no-bid, non-compete basis, for an amount "not to exceed" $5 billion. Many recent estimates suggest this is likely to be far less than the spectrum would fetch at auction. Additionally, the bill requires taxpayers to subsidize the corporation's below-market purchase of the spectrum by guaranteeing up to $10 billion of loans to the corporation, half of which can be used by the corporation to buy the public safety broadband license. The rest could be paid to the private sector entities selected by the corporation to lease the spectrum, in essence requiring the taxpayers to subsidize those entities as well. Despite a decidedly mixed track record in administering complex indebtedness issues in the NextWave case, the FCC would provide the loan guarantees.

Another concern the Committee should examine is the rural component, or lack thereof, associated with the Cyren Call proposal. This plan offers little for those who live in the more sparsely populated areas of our country. Since coming on board at CTIA 3 years ago, one of the issues about which I hear most frequently from Members of Congress is the need for more wireless services in rural America. The DTV Act, as enacted, promises to remedy this problem by enabling CTIA member companies to bring wireless broadband service in America's rural communities more quickly.

* * * * *

This Committee and Congress should be justifiably proud its accomplishment of in enacting the DTV Act, which allocates 24 MHz of spectrum for public safety; provides an estimated $7 billion for deficit reduction; and sets aside $1 billion for interoperability grants. The quicker these grants are dispersed, the quicker public safety can address their interoperability needs. Unfortunately, Cyren Call's proposal puts all the aforementioned at risk.

Now, just 12 months before the DTV conversion is to be completed, is not the time for Congress to be changing the rules of the game, particularly since Mr. O'Brien had ample opportunity before the DTV bill was enacted to come forward with his proposal.

What is needed by this Committee and Congress is a continued commitment to see this through. Mr. O'Brien offers you the false choice that one must be for his plan to be for public safety. I am here to tell you that is not the case, and to pledge that the wireless industry stands ready to work with public safety to construct efficient, interoperable networks for the health and welfare of our citizens.

Thank you and I look forward to your questions.

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

May I now call on Chairman Billstrom?

STATEMENT OF DAVID BILLSTROM, CHAIRMAN AND CEO, NATIONAL INTEROP, INC.

Mr. BILLSTROM. Chairman Inouye, Vice Chairman Stevens, members of the Committee, I'm deeply honored to be here today speaking on interoperable communications from the front lines.

My name is David Billstrom. I am a public safety communications executive with a 25-year history in the computer industry, radio communications, and venture capital, but I'm also a first responder. I've been a first responder for over 25 years, first as an EMT, then in sheriff search and rescue, and now as one of the 27,000 volunteer firefighters in the Pacific Northwest. So, I'm in the unusual position of being part of the interoperability problem and, I hope, part of the solution.

I'm going to try to talk about three things today: why interoperability is so expensive, what's wrong with the plans underway in almost every State, and why Google provides the key to effective public safety communications.

First, why is it expensive? If we continue on the current path to interoperability solutions, I can guarantee that in 5 years, if you invite me back, we'll be back talking about this problem. The political, policy, and media coverage of interoperability is dominated by the equipment issue. And as anyone who knows me can tell you, I love equipment. But as a volunteer firefighter, I have a responsibility to tell you that it's not about the equipment. The secret is that standard operating procedures, training, and other people issues are just as important. The FCC report on Katrina came to the same conclusion.

But the emphasis on equipment is understandable. It's tangible. You can touch it. It's concrete. And, in fact, we've asked our radio equipment vendors to—for their help solving our problem, and those radio vendors have done their best to give us a good answer—in their own understandable business interests.

In the last several years, at the direction of Congress, many States have reviewed their needs. They've generally proposed completely new statewide systems. Those systems will be state-of-the-art, best-of-breed, and very effective. They'll also be the most expensive radio systems ever devised. In one State, the construction costs worked out to $65,000 per user, and then the cost of the radios, $3,500. Why does it matter to the Committee? With every State I've met with, they plan to ask Congress to pay for most, if not all, of these statewide systems. How much are we talking about? In Washington State, $600 million; Oregon, $561 million for phase 1; Florida's system was $900 million; and New York started construction on a $2 billion system. A good working number for a statewide interoperability system, as designed, is $1 billion each. This is a $50–$100 billion problem. And here's the kicker, that price does not include radios for the local public safety agencies. It's for the State, for the dispatch centers, for the towers, and for radios for the State public safety agencies, not the locals.

This committee already knows that 72 percent of all firefighters are volunteers, 79 percent of all police officers work for local police departments, and virtually all EMTs are local. Eighty percent of our first responders work for local agencies. It goes without saying, they can't all afford to buy new radios.

The approach is upside down. We should be building radio systems first to accommodate the nearly 2 million local first responders, then the State and Federal responders, not the other way around.

But I have good news. First, imagine if your cell phone only worked when you called other people using the same kind of cell phone on the same network. So, a Verizon customer couldn't talk to a Sprint. Imagine if you couldn't access Google through Dell computers, only HP. It would be ridiculous in a commercial world, but that's exactly what we deal with in the public safety world. For example, that $3,500 police radio in Seattle, Washington; if you take it to Portland, Oregon, it won't work.

Wireless carriers and Internet providers have already solved this fundamental problem of interoperability, because they had to. The same core idea of the Internet backbone and the desire to communicate—indeed, the same technology—is going to solve our problem. The U.S. military is already using a technology called IP Radio to connect together very different radios all over the world for over 4 years. Philosophically, they have solved our problem. And, like Google and Yahoo!, the technology is absolutely independent of the hardware. There are several companies offering IP Radio. The market's led by two companies: a small company, Twisted Pair Solutions, and a slightly larger company, Cisco.

And it's not just the U.S. military leading the way. A pilot project of IP Radio known as OPSCAN, in Washington State, is a DHS-funded public safety system. It uses an IP Radio technology to connect together 41 different local, State, and Federal agencies, three Indian tribes, and first responders from Canada. The scope of this system is comparable to a small State, but at a fraction of the cost.

IP isn't magic, and it can't do everything, but it will win the marketplace of ideas, because it's open, standards-based, and affordable. It's not closed, proprietary, or massively expensive.

We also have an opportunity. In Washington State, we will soon face the daunting task of being prepared for the 2010 Olympics just over the Pacific Northwest border with Canada. Senator Cantwell has been on the front lines of helping us be prepared for this event, and everyone, from the Washington State Patrol to my own fire chief in San Juan County, is grateful.

We need to be prepared, and we need interoperability. First responders in the region will be ready to roll for emergencies, except that their radios do not work with the new radios already being carried by the Federal responders. And if a typical radio system is built, they won't be able to use that either.

Respectfully, I'd like to offer three suggestions for the Committee.

First, mandate the use of IP Radio technology when funding interoperable communications such as the $1 billion. We must support the hard work of the States, but we can't ask every first responder in the country to buy a new radio. Let's build statewide systems that accommodate their existing radios.

Second, when funding the expansion of a radio system, require those systems to accommodate IP Radio technology. You'll soon discover two or three proprietary vendors won't like that very much, but 2 million first responders will.

Third, consider taking advantage of the opportunity presented by the 2010 Olympics and build an IP Radio system that serves the needs of the local first responders first, instead of last.

I also want to applaud Chairman Martin, of the FCC, for his comments last week to this committee in which he called for, as I have here, IP Radio technology as an immediate interoperability solution. He stated that if funds were available now, the entire country could be covered within 4 years. And I agree.

Thank you.

[The prepared statement of Mr. Billstrom follows:]

PREPARED STATEMENT OF DAVID BILLSTROM, CHAIRMAN AND CEO, NATIONAL INTEROP, INC.

Mr. Chairman, Mr. Vice Chairman, and members of the Committee. Thank you very much for the opportunity to speak today.

My name is David Billstrom, and I am a public safety communications consultant with a long background in radio communications, the computer industry and in venture capital. I've also been a first responder for over 25 years. First as an EMT, then sheriff's search and rescue for many years, and one of 27,000 volunteer firefighters in the Pacific Northwest.

I want to give you just a few high-level observations on public safety communications—from my somewhat unusual position of being both part of the problem, and I hope, part of the solution.

I'm going to talk about three things: why interoperability is expensive, what's wrong with the plans underway in almost every state in this country, and why Google provides the key to effective public safety communications.

Why Is Interoperability Expensive?

If we continue on the current path to interoperability solutions, I can guarantee you that 5 years from today, if you invite me back, we will still be talking about the problems with interoperability.

That is because both historically and currently, questions of interoperability assume that we have an equipment problem that calls for completely new radio systems and new radios. I believe this is because we're relying upon the same equipment suppliers that we have used for years.

And these equipment suppliers have a vested interest in "solving the problem" with more radio equipment.

The focus on new equipment is understandable. Equipment is tangible, it's concrete, you can touch it. And of course we always need better equipment, and more of it.

But an equipment-centric approach is very, very expensive. Which means it will take years.

Statewide Interoperability Systems

The good news is that in the last several years, hard-working committees called "SIECs", or State Interoperability Executive Committees—in more than half of all the states have analyzed the needs of public safety and proposed new statewide systems that provide interoperability.

These new statewide systems will be state-of-the-art, best-of-breed, and very effective.

The problem is, they are also the most expensive radio systems ever devised when calculated on a per-user basis.

In one state, the cost was approximately $65,000 per radio user to build the proprietary system. Additionally, it will cost more every year to operate it. With 14,000 users in this system, it is quite lucrative for equipment suppliers.

Why does this matter to this Committee? Because most of the states I have met with plan to ask you, the Federal Government, to pay for most if not all of their new system.

How much are we talking about?

In Washington State, we have an initial estimate of $600 million. Our Governor in Oregon has just proposed $561 million for the *first phase* of the system there, which is likely to run past $1 billion when complete.

Florida already has a $900 million system and New York has started on their $2 billion system.

The math is fairly easy—if we continue in this direction there is a $50 to $100 billion funding requirement for interoperability for state agencies.

But the news gets worse.

The problem is, these statewide systems are designed for, and provided to, state agencies—not local public safety agencies.

And, as you may know, 72 percent of the one million-plus firefighters in the United States are volunteers. About 79 percent of all 800,000 law enforcement officers in the Nation work for local police departments. Nearly all EMTs are with local agencies. In fact, only 20 percent of the Nation's first responders work for state or Federal agencies. All of the others are with local agencies.

And in general, local public safety agencies do not have the funds for new radios compatible with these new statewide proprietary systems. I know my fire department does not.

So what we have are new statewide radio systems that most of our firefighters, EMTs, and police officers will not be able to afford to use.

The approach is upside down. We should be building public safety communication systems that first accommodate the 1.8 million local first responders, and then the 200,000 state and Federal first responders, rather than the other way around.

Open and Closed Systems

You may be wondering how we can accomplish this. This is where Google comes in . . .

It is a simple issue—open versus closed systems. Imagine if you could only access Google if you were on a Dell laptop, because IBM laptops didn't work with Google.

That might sound absurd, but that's exactly the current state of first responders in the Pacific Northwest—a police radio from Seattle, Washington does not work on the Portland, Oregon system—that is the world that proprietary systems create.

The more proprietary—the less interoperable.

Google and Yahoo! and all Internet businesses thrive because the services they provide run on every type of computer made, world-wide.

The same idea—indeed, the same technology—is going to solve the problem of public safety communications.

I can make this prediction because I can simply look at how the U.S. military has addressed this very same issue.

Starting more than 4 years ago the military has been deploying a technology called IP Radio to allow field radios, fixed telephones, encrypted command radios, laptops, and satellite radios to all interconnect. From the battlefield across the seas to the command centers right here.

And, this is a *technology,* not a single product from a single equipment vendor.

Like Google and Yahoo!, this technology is absolutely independent of the hardware used.

"IP Radio" means sending and receiving radio traffic on Internet hardware. It works by connecting together existing radio systems. Users on one system can talk to users on another system.

I will even go this far: if the public safety community operated with the command structure of the U.S. military, we wouldn't be having this discussion today because firefighters, EMTs and police officers throughout the U.S. would *already* be interoperable using IP Radio.

Now you can see why it is not radical for me to predict that *open, standards-based software will revolutionize public safety communications.*

And, this technology can dramatically cut the cost of those $1 billion statewide radio systems.

To put it simply, this means our first responders will be able to use any radio they can afford—even the radios they already have—and be interoperable with all of their state and Federal colleagues.

I respectfully submit that this Committee can make interoperability more effective, immediately, by mandating the use of open standards, software-based radio systems.

And where proprietary, hardware-centric systems are already in place, you could mandate full and open connectivity from those proprietary systems to the new open standards, software-based radio systems.

Finally, I want to applaud Chairman Martin of the FCC for his comments last week to this Committee. He suggested that if sufficient funds were made available now for fixed and portable IP Radio networks, then interoperability could be functional throughout most of the Nation within 4 years. I agree with him wholeheartedly.

If I could leave you with a central message today, it would be this:

First, let's not assume that the traditional suppliers of radio systems with proprietary technology will offer the most desirable solutions.

Second, if we want true interoperability, we need to move to an open, device-independent, standards-based, software so that the majority of our first responders can be included.

Third, IP Radio, already embraced elsewhere, will meet several of our most critical needs immediately. And save lives. And we may actually be able to afford it.

Thank you. I welcome your questions.

The CHAIRMAN. I thank you very much, Chairman Billstrom. And now may I call on Chairman Desch?

STATEMENT OF MATTHEW J. DESCH, CHAIRMAN AND CEO, IRIDIUM SATELLITE, LLC

Mr. DESCH. Good morning, Chairman Inouye, Vice Chairman Stevens, and members of the Committee.

My name is Matt Desch, and I am Chairman and CEO of Iridium Satellite, LLC. And I want to thank you for this opportunity to appear before you to discuss the state of our Nation's emergency communication network.

Nearly a year and a half has passed since the disaster wrought by Hurricanes Katrina and Rita, but the images of those days in August and September 2005 are not easily forgotten. The Committee's efforts since then to ensure that our communications infrastructure is fully capable before, during, and after disasters is to be applauded.

The FCC's around-the-clock work during Katrina to ensure that communication providers had the resources necessary for the recovery effort is also to be applauded. From assisting us in obtaining additional spectrum to facilitating Customs entry of additional handsets, they worked in an efficient, cooperative, and professional manner. We want to thank the Commission for these efforts, and we believe that the FCC's Homeland Security Bureau will work closely with communication providers to develop even more successful emergency communications solutions.

Iridium's network is uniquely suited to the communication needs of first responders. Iridium satellite phones, like the one I have in front of me, require two things to complete a call. One is a charged battery, and two is a little bit of instruction, similar to the instruction needed when you purchase a new phone or a PDA.

Unlike other systems, the Iridium system does not require cell sites or other infrastructure on the ground. The network can be available anyplace, anytime, anywhere, including in the air and at sea, far from shore, which is why the U.S. military relies on us for its communication needs in Iraq and around the globe, and why we were chosen to provide the communication network, for example, for the U.S. Tsunami Warning System.

As part of our global coverage, we are the only mobile satellite provider to cover both Hawaii and all of Alaska, with significant ground facilities in both States. And, it's Iridium's experience with disaster communications that leads us to support S. 385, the Interoperable Emergency Communications Act.

The challenge now is to provide our first responders with both a redundant and an interoperable emergency communications network. S. 385, introduced by you, Mr. Chairman with the support of Vice Chairman and Senators Kerry, Smith, and Snowe, takes on this challenge.

The bill addresses two important lessons learned from these recent disasters: one, the need to create a strategic communications reserve to have communications equipment pre-positioned and ready to use in an emergency; and, second, the need to study the creation of a national emergency back-up communications system and the use of satellite communications as an element of that system.

We believe that it's time for the Nation to create communication reserves and to develop a national backup communications system that includes a significant satellite component.

Recent disasters make the need for S. 385 abundantly clear. The lack of communications equipment pre-positioned in the Gulf Coast region hampered the relief efforts there and made communication problems there worse than they should have been. Satellite networks were often the only networks available to first responders after Katrina. Iridium and other satellite providers stripped their stocks bare to send equipment to the Gulf Coast, bringing it in from around the globe. Even so, we had to turn down or limit requests for equipment from public safety organizations.

Beyond the lack of readily available equipment, a core problem is the lack of an integrated communications plan that embraces satellite. As FCC Chairman Martin said less than a month after Hurricane Katrina made landfall, "If we learned anything from Hurricane Katrina, it is that we cannot solely rely on terrestrial communications." When the National Guard, the Red Cross, utility workers, search-and-rescue officials, and even local phone companies obtained satellite phones, they told us they were able to carry out their missions more effectively. For example, the Red Cross deployed nine specially-designed emergency response vehicles to the Gulf Coast, each equipped with ten satellite phones and portable VSAT dishes. The First U.S. Army division relied on Iridium satellite phones for their basic voice and data communication needs while they were deployed in the region. Louisiana's firefighters had constant contact with their headquarters through their Iridium phones, even when they were standing in the knee-deep waters of New Orleans.

Satellite communications, and, in particular, satellite phones, have proven their value in an emergency. No matter the damage on the ground from a disaster, including floods, earthquakes, tornados, and manmade catastrophes, first responders can go about their duties knowing that their satellite communications system is available.

September 11th revealed the need for communications interoperability. Hurricane Katrina did not diminish the need for interoperability, but it made clear the overriding need for redundancy. Now, over a year after the Gulf Coast disaster, the challenge of establishing a truly effective system still confronts us. If first responders do not have communications equipment when they need it and where they need it, any system will be ineffective. A strategic communication reserve that provides for advance placement of equipment is a necessary step.

The Federal Government can also implement several additional steps to strengthen the Nation's emergency communications. One, you could expand the grant program created last year that gave money to hospitals to purchase satellite communications equipment. Two, you should consider the development of nonterrestrial emergency communication backup systems for Federal buildings. And, three, the Federal Government should make additional money available to public safety agencies to make sure that they're adequately trained to use their communication equipment as an integrated part of their response protocol.

I'd like to thank this committee for your efforts towards creating more robust emergency communications. And I think, bills like S. 385, will begin to shape the discussion.

Thank you for your time.

[The prepared statement of Mr. Desch follows:]

PREPARED STATEMENT OF MATTHEW J. DESCH, CHAIRMAN AND CEO, IRIDIUM SATELLITE, LLC

Good morning Chairman Inouye, Vice Chairman Stevens, and members of the Committee. My name is Matt Desch, and I am the Chairman and CEO of Iridium Satellite, LLC. Iridium played a vital role in providing emergency communications after Hurricane Katrina, and I am very grateful to be here today to talk to you about the state of the Nation's emergency communications network. Nearly a year and a half has passed since the disaster wrought by Hurricanes Katrina and Rita, but the images of those days in August and September of 2005 are not easily forgotten. I want to applaud the Committee for its continuing efforts to ensure that the Nation's communications infrastructure is prepared before, during, and after disasters.

During Katrina, the effect of satellite communications was greatly enhanced by the swift actions of the Federal Communications Commission. The FCC worked around-the-clock to ensure that providers had the resources available to assist in the recovery effort. From assisting us in obtaining additional spectrum to facilitating customs entry of additional handsets, they worked in an efficient, cooperative, and professional manner. I want to thank the Commission for these actions, and I believe that the development of the Homeland Security Bureau within the Commission is an important step toward ensuring more effective emergency communications in the future.

Iridium's network is uniquely suited to the communications needs of first responders and the military. In fact, the Iridium's system configuration is particularly effective in an emergency. Our network includes more than 66 orbiting satellites, ensuring that *every* location in the U.S. and world, including both Hawaii and all of Alaska, is served by an Iridium satellite every minute of every day. Iridium is the only communications system that has this universal coverage. We also have significant ground facilities in both Hawaii and Alaska.

We are the primary mobile satellite telephone provider to the U.S. military and thousands of Iridium handsets are in use everyday by our soldiers, marines, sailors, and airmen in Iraq and around the globe. We also serve as the communications backbone for the Nation's tsunami warning system in the Pacific Ocean. Iridium delivers essential services to users who need communications access to and from remote areas where no other form of communication is available, including in the air and at sea far from shore.

Through a satellite phone handset or small data device, a first responder is able to access our communications network that is positioned hundreds of miles above the planet, where it is always on and always ready. Unlike any other network, Iridium's system does not have to rely on vulnerable ground infrastructure to connect calls, which means that destruction of the terrestrial communications infrastructure will not render our system inoperable. Iridium's satellite phones require two things to complete a call: (1) a charged battery; and (2) instruction similar to the instruction needed when you purchase a new phone or PDA. Iridium is also interoperable with other communications devices such as land mobile radio through off-the-shelf technology. And it is Iridium's experiences with disaster communications that leads us to offer our wholehearted support of S. 385.

Communications are the essential backbone of any disaster response system. If our first responders, public safety personnel, and medical professionals cannot talk to one another over a functional, effective, and secure network when a disaster strikes, needless lives will be lost and needless destruction of property may occur. Unfortunately, the very events that can so adversely affect our communities—whether they be natural or man-made, hurricanes or floods, or bombs or bullets—also often disrupt the basic infrastructure with which we communicate. The present emergency communications system for the Nation remains vulnerable, even as its limitations were revealed both by the September 11th attacks and by the 2005 Gulf Coast hurricanes. Major strides have been made in the last year and a half, but the challenge for the future is to provide our first responders with both a *redundant* and an *interoperable* emergency communications network that is available when they need it, where they need it. By taking steps to ensure that first responders have

the proper communications equipment ready for a disaster, this Committee can also spur business adoption of appropriate back-up emergency communications equipment.

S. 385, the Interoperable Emergency Communications Act introduced by you Mr. Chairman with the support of the Vice Chairman and Senators Kerry, Smith, and Snowe, is a needed and necessary step toward this goal. Iridium is proud to give this bill its support. This bill embraces two lessons learned from our Nation's recent disasters that will dramatically strengthen the national emergency communications system: (1) the need to create strategic communications reserves in various locations around the Nation so that communications equipment is pre-positioned and ready for use when a disaster strikes; and (2) the need to explore the creation of a national emergency communications back-up system for the Nation, including an evaluation of the use of a non-terrestrial, satellite-based communications component for that backup system (which Iridium believes should be a significant component of such back-up system). This Committee should act quickly to report S. 385. Doing so will address two of the most obvious problems with the country's emergency communications capabilities.

Satellite's Role in Emergency Communications

Satellite communications networks were often the only communications network available to first responders in the Gulf Coast region in the days immediately following the destructive hurricanes of 2005. Hurricanes Katrina and Rita destroyed most of the terrestrial communications systems used throughout the Gulf Coast. Telephone wires simply vanished, and wireless towers had to have extensive repairs when the storms had passed before they were fully-functional. Even temporary communications solutions such as fixed-line phones on vehicular platforms, trucked-in cell towers, and hastily-wired emergency shelters took days and sometimes weeks to deploy. But there was never enough equipment for all affected communities, even when these stop-gap measures became available. Iridium and other providers stripped their stocks bare to send equipment to the Gulf Coast, bringing it in from around the globe. Even so, mobile satellite providers had to turn down requests for equipment from public safety organizations, and give other public safety organizations, including the House Sergeant-at-Arms office, less equipment than they requested. The lack of available communications equipment pre-positioned in the Gulf Coast region hampered relief efforts and made the communications problems in the region worse than they should have been.

Beyond that, a core problem in the emergency communications in the Gulf Coast was the lack of an integrated emergency communications plan that embraced satellite communications. As the Chairman of the FCC informed this Committee less than a month after Hurricane Katrina made landfall, "[i]f we learned anything from Hurricane Katrina, it is that we cannot rely solely on terrestrial communications. When radio towers are knocked down, satellite communications are, in some instances, the most effective means of communicating." In the midst of this catastrophe, emergency personnel came to rely on satellite phones and other non-terrestrial services for their vital communications needs. The reason for that reliance was clear—more and more first responders found that satellite provided voice and data access when other networks simply could not. In fact Sulfur, Louisiana's firefighters had constant contact with their headquarters through their Iridium handsets, even while standing in the knee-deep waters of New Orleans.

What worked in the Gulf Coast immediately after the hurricanes was satellite, which became a vital communications link that first responders found necessary as they went about saving lives. Satellites provided the redundancy, ubiquity, and resiliency that were unavailable from land-based networks. The National Guard, the Red Cross, utility workers, search and rescue officials, and even local phone companies turned to mobile satellite phones and terminals in the minutes, hours, and days after the hurricane struck. For example:

- The Red Cross deployed 9 specially-designed Emergency Response Vehicles to the Gulf Coast, each equipped with 10 satellite phones and portable, tripod mounted VSAT satellite dishes.
- The First U.S. Army Division, based on its disaster recovery experience in Florida and other locations in the United States, relied on Iridium satellite phones while deployed to the Gulf Coast for their basic voice and data communications needs, knowing that other terrestrial options would be inoperable.
- Air evacuation teams used the Iridium communications system to track helicopters when they were in the air and to transmit data on incoming patients. According to the President and CEO of Air Evac Lifeteam, which deployed to the Gulf Coast in the hours after Katrina hit: "We knew where our ships were

at all times. We were able to send and receive text messages in real-time when other modes of communication failed—our crews and our communicators were able to exchange timely information, which enhanced both the safety and the effectiveness of our mission."

Today, the private sector is working with Iridium to provide a more permanent emergency communications capability for their operations. And that capability is reliant upon the redundancy and effectiveness of satellite communications. Two current Iridium projects illustrate this fact:

- Iridium's communications network is being used as the backbone for a new system that provides in-flight, on-demand medical assistance during airborne emergencies. The network provides flight crew with a direct link to physicians who have been specially-trained in remote airborne diagnosis and treatment.
- MedStar Health, the primary Washington, D.C. hospital operator, has chosen the Iridium system to serve as its corporate backup emergency communications provider. Iridium phones will be deployed throughout MedStar's medical network to ensure that communications services will be available at all times. According to Dr. Christopher Wuerker of MedStar, "As a vital community medical services provider, it is critically important that we have redundant layers of backup communications." Iridium equipment is also used in MedStar's medical transport helicopters to provide tracking and voice communications systems.

The move to satellite communications equipment for emergency situations makes perfect sense—widespread and catastrophic damage on the ground, or the remoteness of a particular location, simply does not impact a satellite communications network located in space. No matter where disaster occurs, mobile satellite communications equipment can be immediately available for critical communications needs. Satellite communications systems also offer first responders and public safety personnel the interoperability they so desperately need. The satellite industry is already offering interoperable communications options to first responders.

Satellite communications, and in particular satellite phones, have proven their value in an emergency. Where they are available and used as part of an integrated emergency communications plan, they provide first responders with an effective and redundant communications capability from the moment a disaster strikes. No matter the damage on the ground from a disaster, including flooding, earthquakes, tornados, and man-made catastrophes, first responders can go about their duties with the knowledge that they will have all the information they need provided through a satellite communications system. Unfortunately, the current lack of readily-available satellite communications equipment and the lack of an integrated plan for their deployment and use continue to hamper the Nation's emergency communications system.

The Future of Emergency Communications for the Nation

The realization that the American communications system was not ready for a disaster was never more evident than on September 11th, when stories surfaced about the lack of interoperable equipment available to the heroes who responded to the catastrophe at the World Trade Center. Hurricane Katrina reinforced that realization 4 years later, revealing not only that the American emergency communications system lacked interoperability but that it also lacked redundancy. Now, over a year after the Gulf Coast disaster, the challenge of establishing a truly effective national emergency communications system still confronts us. S. 385 embraces that challenge.

No matter how successful any particular emergency communications system is, if it is not in the hands of first responders or ready in times of need, it will never be as effective as it could be. The key for the Nation is to, in the immortal words of the Boy Scouts, "Be Prepared." Iridium, like other communications companies, stands ready to answer the call in an emergency. When Hurricane Katrina struck, Iridium personnel worked overtime to get Iridium phones into the hands of those first responders who lacked operable communications equipment. But these efforts were hampered by the same infrastructure destruction that made other communications systems inoperable and the need to transport equipment across the Nation to the disaster area.

The efforts were also hampered by the economic reality that in times of emergency, there is never a large enough stock of equipment to get it in the hands of everyone that needs it. A strategic communications reserve that provides for advanced placement of communications equipment is a necessary step in the development of a national emergency communications plan. The grants established in S. 385, which provide for up to $100 million total for strategic placement of commu-

nications equipment across the Nation, will make available the funds necessary to make sure that communications equipment is ready and available when needed where needed.

The basic reality of the present national emergency communications system, however, is that it is over-reliant on terrestrial systems, the same systems that were proven fallible along the Gulf Coast. This is not an issue of equipment availability or even interoperability; it is an issue of redundancy and effectiveness. That is why Iridium supports the measures outlined in S. 385 to study the development of a national emergency communications backup system. We also thank the Chairman and the Vice Chairman, and the other co-sponsors of the bill, for including satellite communications systems in the study of that backup system. For it is satellite communications that offers the best chance of creating a "resilient interoperable communications system for first responders." It is beyond time for the Nation to consider creating a national emergency communications backup system. And Iridium is committed to assisting that study in any way possible.

The Federal Government can also implement additional steps to strengthen the state of the Nation's emergency communications system. Iridium would like to see the Federal Government expand the grant program created last year which gave money to hospitals in the Gulf Coast states to purchase satellite communications equipment for use during emergencies. This program will bring vitally-needed communications equipment to these hospitals, but there is no reason to limit the program to the Gulf Coast. Other hospitals need these communications links for the times when other communications alternatives may not be available. Having this equipment could literally be the difference between life and death.

The Federal Government's own communications networks are also in dire need of a backup system. The communications network for Capitol Hill and in Federal Government buildings around the Nation is almost exclusively reliant on terrestrial communications systems. If a disaster on the magnitude of Hurricane Katrina ever struck Washington, D.C., the Federal Government could very well be without basic voice and data communications in the minutes, hours, and days immediately following the disaster because the local terrestrial communications infrastructure has been destroyed. Iridium believes that the Committee should consider the development of a non-terrestrial emergency communications backup system for Federal buildings. Much like the MedStar system, an emergency backup based on satellite communications would provide the Federal Government with the safety and security of knowing that communications would be available in a time of need.

Finally, training is a vital component of any emergency communications system. It is not enough to simply give a first responder a satellite phone, or any other communications device, and tell them to "go to your job." Modern emergency communications systems are so much more than a means of voice communication. For instance, the real-time data transmission available over the Iridium system can put a host of information at the hands of a first responder, particularly if they are deployed to areas they are not already familiar with or into situations that are continually in flux. We need to make sure that first responders understand the immense capabilities of the equipment that they are given and can incorporate and use those capabilities when they are in emergency situations. The Federal Government should make money available to public safety agencies to ensure that they are adequately trained to use their emergency communications equipment as an integrated part of their response protocol.

Conclusion

I would like to thank this Committee for its efforts toward creating a more robust emergency communications network for the Nation. As we have seen time and time again, effective emergency communications is essential during a disaster. This Committee has made emergency communications a priority, and bills like S. 385 will begin to shape the type of emergency communications system that will be available to our first responders when even the most devastating natural or man-made disaster confronts us. Strategic deployment of communications equipment will ensure that equipment is ready the minute disaster strikes. And a national emergency communications backup system, particularly one that contains a non-terrestrial component, will provide first responders with the redundant communications systems they need to do their job efficiently and effectively.

I can assure the Committee that each Iridium employee takes seriously the vital role that we play as the piece of the Nation's communications infrastructure that never goes down. To that end, we continue to add functionality based on the lessons learned from each disaster recovery operation and on the recommendations of public safety personnel. We also continue to work with the FCC to ensure that we have the necessary spectrum to expand and improve our system. Our Nation's emergency

communications system is getting better, but we have not yet embraced all of the lessons learned from America's recent disasters. We can all do more to assist our first responders, and Iridium, with its satellite phones and communications network, stands poised to aid in any way necessary. Thank you again for letting me testify before you today, and I will be happy to answer any questions you might have.

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

And now I would like to thank the panel and call upon Senator Stevens for a round of questions.

Senator STEVENS. Well, thank you very much, Mr. Chairman. And I hope the Committee and everyone—will excuse me for going back a little bit in history before we consider this problem.

Howard Baker used to say, "If you don't toot your own horn, no one's going to toot it." When I was the solicitor in the Interior Department, I found that the oil and gas leases that were released were put into a little box, and they allowed people to have an opportunity to participate in the drawing that took place. And they would draw a name out of a hat, and that name got the lease, and they turned around and sold it for a couple of million dollars to the oil industry. I was very surprised when I got on this subcommittee, this Commerce subcommittee here on communications, to find that when spectrum became available because of a failure or otherwise, the same thing was taking place, lottery. Twenty-five bucks and you had your chance to get a piece of spectrum. And at times, that was sold for $100 million.

Joined by my friend, we provided the concept of auctioning the spectrum. I remember too well the day that we got the first auction, and it was about $18 billion. And I called the FCC Chairman and said, "Don't you have, over there, one of those reward systems so that anyone that makes a suggestion that increase income to the government—he gets a share?" And he says, "Yes, we do." And I said, "Where's my check?"

[Laughter.]

Senator STEVENS. And he said, "You're not a government employee."

[Laughter.]

Senator STEVENS. But, in any event, what I'm saying is, this spectrum as most of you have said, is public. We passed an Act that allocated the income from when this spectrum is sold. The first part of it goes to a general reduction of the deficit—over half of it. The first responders for interoperability got the next billion dollars. But we also allocated money to the analog converter box program, to the New York City 9-1-1 digital transition problems, the low-power TV transitional digital-to-analog conversion, the low-power transfer to upgrade program, the national alert and tsunami warning program, the 9-1-1 program enhancement, and Essential Air Service Program interoperability.

So, what you've suggested now, as I see it, is that we have about, I think, 84 megahertz here. You have 24 already. I'm told there are 60 left to auction. You're suggesting that 30 of it be turned over to this trust, and that the trust then would operate that and make it available to the various initial responders. I think the most serious problem in the country today is interoperability and assuring

that we have total interoperability in all forms for the areas that you represent.

But I have some serious questions about this. You made the statement, Mr. O'Brien, "If this disturbs the $1 billion, it disturbs the allocation system, then we shouldn't do it." But, by definition, it's going to. We predicted we would have at least $10 billion in income from this spectrum. I'm told it could be much more. But if you take half of it out and then we end up with a situation where half the spectrum is not subject to being controlled in the public interest in the future by this program we've already allocated, we're going to have to change the existing law. We will have to take money away from system interoperability, the analog converter box, all those other things, and those programs are planned on taking part of this money, too.

I don't understand, in view of the fact you have 24 megahertz already allocated to public safety, why we should turn another 30 megahertz over to a trust. That can be used for public safety to lease it to the public sector. This is creating a new FCC, isn't it, Mr. O'Brien?

Mr. O'BRIEN. Senator, let me answer your question, please.

First of all, we propose that the Public Safety Broadband Trust be created by legislation—it will require legislation—and that that legislation authorize——

Senator STEVENS. I know—I've only got 5 minutes. Now, tell me, won't it have the impact I said?

Mr. O'BRIEN. No, sir, it won't.

Senator STEVENS. Why?

Mr. O'BRIEN. Because we're proposing that the Public Safety Broadband Trust pay $5 billion for that spectrum——

Senator STEVENS. But you're——

Mr. O'BRIEN.—so that there won't——

Senator STEVENS.—assuming that that's——

Mr. O'BRIEN.—be a shortfall.

Senator STEVENS. What if it would auction for a lot more?

Mr. O'BRIEN. The point is——

Senator STEVENS. No, no, we have a series of proposals already in law, where the money goes. I believe we propose we'll get something like, a minimum, $10 billion—most people think it'll be $15 billion, according to CBO. If we give half of it to you, the most we could possibly get would be $5 to $7.5 billion. The first billion goes to you, anyway. We have to cut out at least half of the people already expecting, under the law, a portion of that income, right?

Mr. O'BRIEN. My understanding of the CBO number is that it's slightly higher than $10 billion, and that's why we're proposing meeting $5 billion by raising money in the——

Senator STEVENS. Well, but——

Mr. O'BRIEN.—private capital markets, so that none of those programs would be affected.

Senator STEVENS. CBO's projection of the first auction was $7.5—$750 million; $18 billion came in. Now, you're saying that we're going to locked in by the CBO estimate? But if you cut the spectrum in half, I believe the total will be less, because you're going to be leasing your spectrum in competition with the people that want to bid. I really believe you—I can't take any more time.

I guess I'll get back another time, Mr. Chairman. But I do think, you know, the idea is great. We have to find a way to deal with interoperability. But we also have to think first of preserving the right of the public to have the full control over this spectrum in the future. Yours would take half of the spectrum and turn it over to a trust, which we would never get back into the FCC.

Mr. O'BRIEN. Well, but, Senator, if the spectrum is auctioned, it's gone forever.

Senator STEVENS. No, it isn't.

Mr. O'BRIEN. The spectrum is——

Senator STEVENS. It's only gone until someone gives up or fails or anything. All of this stuff came back because of a change in policy. What if there's a change in technology? I'm told there is a change in technology coming. And the broadband people can tell you more about that.

Mr. O'BRIEN. Well, but I believe—I'm—it's always been my understanding that the spectrum that's auctioned is pretty much gone to the licensee, unless the licensee misbehaves.

Senator STEVENS. I'll close——

Mr. O'BRIEN. And——

Senator STEVENS. When I was a kid, I invented one of those radios that you have to dial. We'd go 5 degrees this way and 5 degrees that way in order to find the point where we could catch the radio. Okay?

Mr. O'BRIEN. Yes.

Senator STEVENS. It took 10 degrees to pick up on a crystal set. Now, you take 1 degree of spectrum and it's divided into 10 already, maybe 100 with some new technology. I believe spectrum is going to continue to increase in value if we use it properly and keep the control at the FCC.

Mr. O'BRIEN. Well, but so do I. With all due respect, I think that the proposal to put the spectrum in a Public Safety Broadband Trust, which is controlled long term by representatives of State and local and Federal; is a much better return to the public.

Senator STEVENS. I've got to disagree with you. Spectrum is subject to license. It is public property. We have never given it away. We've never sold it completely. We've provided the right to use it if the licensee has a license. But he does not have ownership of this property. You would get ownership of this property under this proposal.

Mr. O'BRIEN. No, Senator, we're proposing that the rights—the licensee rights, the Public Safety Broadband Trust, would be identical to the licensee rights of any other licensee, and——

Senator STEVENS. That's not what your statement says. You say you continue to lease it when you're not using it. Today, if you're not using part of your spectrum, FCC can come in and have an opportunity to bring about sharing of that. That could not happen under your proposal.

Mr. O'BRIEN. There is no aspect of our proposal which would change the relationship between the FCC and the licensee, sir.

Senator STEVENS. I've taken too much time. I'll come back.

The CHAIRMAN. Thank you very much.

Senator Klobuchar?

Senator KLOBUCHAR. Thank you, Mr. Chairman. And thank you, Mr. McEwen, for your kind comments about our retired sheriff and the good work he has done on interoperability.

I just wanted to follow up a little on what Senator Stevens was asking about, in a more narrow question, and then a bigger one. I know that the proposal that's being discussed—the spectrum, Senator McCain's proposal, would have mixed public safety and commercial use. And I just wanted people to talk a little bit about that idea, if you see problems with it, what are the strengths and weaknesses of mixing the use with the spectrum?

Mr. MCEWEN. Well, first of all, let me just say that the concept here that we are supporting, the public safety community is supporting, is that this spectrum would be allocated to the public safety community under this proposal as a trust. That means that it's in the same category, Senator as any other kinds of allocations. I mean, it's never—it never belongs to anybody, it's always the public's—it has control over it. But the fact is that, in this particular case, the concept is that this spectrum would be managed by public safety. We would have a controlling interest in the board of directors of the trust. And the commercial interests would then build and manage this under our direction and control.

The idea here is that the commercial spectrum—the spectrum would be actually used primarily—a lot of the spectrum would be used by the commercial interests, with public safety always having access to it and priority whenever they needed it. That's the concept with getting private investors to build this network. We have no money, we have no—if we depend upon you to fund this, it'll never happen, because you don't have the unlimited resources that we would need to build this. You know, we've talked about how many billions of dollars it might cost——

Senator KLOBUCHAR. But wouldn't a piece of this also involve a loan?

Mr. MCEWEN. Pardon?

Senator KLOBUCHAR. Wouldn't a piece of this also involve a loan from the Government? No?

Mr. MCEWEN. Yes, but——

Senator KLOBUCHAR. You were——

Mr. MCEWEN.—the point is that the spectrum is worth some money, as the Senator—Senator Stevens has just referred to. What it's worth, I'm not quite sure. But—$5 billion, whatever—but the fact is, that value of that spectrum doesn't go away. If something happens that, in some way, this fails, that spectrum still belongs to the public. We—I mean, you don't give that spectrum away.

Mr. O'BRIEN. May I——

Senator KLOBUCHAR. Jump right in, then Mr. O'Brien.

Mr. O'BRIEN. All right, certainly. May I clarify just a couple of things?

The first one is the beauty of where technology is taking us in next-generation wireless technology. The so-called fourth generation, which is IP-based, allows on a software basis different quality of service, so you can share capacity between public safety and commercial, while always preserving the primary interest of public safety. And so, it breaks through the classic problem that, when spectrum is reserved for public safety, there's some amount of lack

of utilization of it, while public safety is, sort of, waiting for the next big event. This solves that problem by saying the capacity that's generated on the system is always available first to public safety, but then to commercial, so that you get the maximum utilization of it, using the technology.

The second point is that we are proposing not loans, but loan guarantees, to the Public Safety Broadband Trust. By using the leverage that's created when it gets this license, it can go into the capital markets and actually raise the money. So, the $5 billion is not a loan. It's raised in the capital markets, but to lower the cost of borrowing it, we're asking, or proposing, that there be loan guarantees to the Public Safety Broadband Trust. And that's just to acquire the spectrum. The build-out would not be loans. The build-out would be investment—private capital investing in a next-generation wireless network.

Senator KLOBUCHAR. Thank you.

Mr. LARGENT. Senator, I'd just like to say that—first of all, that some people have viewed our testimony here today as being adversarial with public safety. And I just want to say, first and foremost, it is not adversarial. We don't have that kind of relationship with public safety, because we believe in what they do. We were up here on the Hill for the last several years to ensure that the DTV transition bill actually was passed into law, so that public safety got the billion dollars that Congress already enacted, that we get this spectrum to use for public safety. They're getting 24 megahertz in the current language of the bill, and that doubles what they have today. And it's contiguous spectrum that they can do a lot of things with. And so, I would just say that, up front, there's not the conflict that many have perceived between CTIA and our membership and public safety. But what we're trying to do is ensure that what Congress has set out to do—and I would mention that what they have done is deliver 24 megahertz of spectrum to public safety, which is a significant piece of spectrum, and they have applied a billion dollars to start this process for public safety. And those were two——

Senator KLOBUCHAR. But how much do you think it would cost to make—I mean, there are—some estimates are $15 billion. The President's going backward in his budget on this. I mean, how much do you think this would really cost?

Mr. LARGENT. That's—I have no idea. And the billion dollars, I'm saying, is just a downpayment to get them started. And they're going to need more money in the future. And we admit that. But these are two really key suggestions that were made by the 9/11 Commission—24 megahertz is what public safety needed, and a billion dollars to get them started—those were the exact increments that the 9/11 Commission made for public safety. And this Congress has delivered that for public safety.

Now, they're talking about delivering broadband and all these other types of things. And I think there's additional spectrum that could be available for public safety in the future. But it's wrong to—I think it's wrong to take something off the table that took 10—over 10 years to get passed through Congress, the DTV transition bill, take it off the table and try to rejigger it now right before the auction is to be held later this year. That's going to create some significant problems.

Mr. O'BRIEN. Senator, let me just take 1 minute and try to explain why I think this is such a compelling necessity for Congress to consider there now.

The proposal we've laid out, for the first time, creates a self-sustaining business model for public safety communications now and into the future. Yes, it requires spectrum. It requires spectrum, which has a tremendous value. Nobody would disagree with the tremendous value of the spectrum. But we find compelling the observation that today, in doing their jobs, men and women in the first-responder services have devices which their lives sometimes depend on and which all of us sitting here know are inferior. Our proposal is not to create interoperability, except as a byproduct. Our proposal is to bring public safety first responders to the forefront of wireless communications. It cannot be done without spectrum. It cannot be done without significant money—billions of dollars. We can walk through with you the model. We can show you dollars and cents, and what it will take to cover 99.3 percent of the U.S. population. It is somewhere in the neighborhood of $20 billion. The capital markets, the private capital markets, we are confident, will support that type of a build-out on a shared-spectrum basis. This is a unique opportunity. There is obviously a misunderstanding between myself and Senator Stevens on how we propose this spectrum go to the Public Safety Broadband Trust. I hope I will be able to clarify that misunderstanding. But I can't not take the opportunity to say: focus on the money. Where is the money coming from to bring these devices to the men and women who are risking their lives? It will not come, it is not coming, it hasn't come, from any level of government, and it's not going to come from there. And it hasn't come from the commercial wireless sector, which has had 25 years to address it. They have not addressed it. It is not their function to address it. It is their function to make money for the shareholders of their companies, which is a fine thing, but very different from what we're discussing.

Thank you so much.

Senator KLOBUCHAR. Thank you.

The CHAIRMAN. Thank you so much.

Senator Cantwell?

STATEMENT OF HON. MARIA CANTWELL, U.S. SENATOR FROM WASHINGTON

Senator CANTWELL. Thank you, Mr. Chairman. And thank you, panelists.

It seems to me that we're talking about the same things here, but we're talking about two different approaches. One is this top-down spectrum issue, and, in the meantime, you're over there bootstrapping a model that is, getting this done today. I am curious about how far you think that we can go with RoIP to successfully build the interoperability. You seem to be saying, "Don't get so hung up on the hardware. Focus on the software interoperability solution." So, if IP packets are delivered up to satellites and down to microwave dishes and then down to handheld communication devices, and there is an IP wrapper there, and it can be secure, isn't what you're discussing right now, that's taking place in various

parts of the State, the interoperability that we need, regardless of spectrum, regardless of devices?

Mr. BILLSTROM. That's right, Senator. The concept of IP Radio is really orthogonal to the issues of spectrum. And, as you just described, there are the issues of how communications occurs at the very lowest level, at the hardware level.

If I was making a criticism, it was over the traditional trunking radio technology, that is proprietary and closed, that the P25 program has attempted to address. But, unfortunately, P25 is not standard across the United States yet, and those proprietary systems are still in place.

IP Radio offers——

Senator CANTWELL. Is that part of Homeland Security? Is that what you're saying?

Mr. BILLSTROM. Yes.

Senator CANTWELL. And so, Homeland Security is still favoring hardware technology that is—doesn't have the interoperability IP capabilities——

Mr. BILLSTROM. They——

Senator CANTWELL.—that might be so universal.

Mr. BILLSTROM. That's correct. And, in their defense, they've not been presented with an opportunity that's different. So, there really is no other alternative for them today.

Senator CANTWELL. So, where would you——

Mr. BILLSTROM. If a public safety agency wants to buy a new radio, and if they need to support more users or more capability, their choices are fairly limited.

Senator CANTWELL. So, where would you go from here, then, on taking RoIP interoperability to the next level?

Mr. BILLSTROM. I would——

Senator CANTWELL. What are the barriers in breaking that down? And what do you think, specifically, of Mr. O'Brien's idea?

Mr. BILLSTROM. I think the idea of a new carrier is a very exciting one, and I'm not qualified to comment on it. I see pros and cons to both. I also see IP Radio as something we can do immediately as an interim step, at least, if not a method of integration for all of the different radio technologies. I can, in fact, imagine a world where we have old trunking radio systems still being used by a city, new technology of the type that Cyren Call is discussing, and military radios, all of which need to interoperate. And the only way to connect all three of those technologies right now is IP Radio, and the military is already doing it.

Senator CANTWELL. Could you just explain the cost differential, from the bootstrap model up, versus——

Mr. BILLSTROM. Sure, I've heard an estimate as low as $300 million to provide interoperability across the entire United States within the next 4 years.

Senator CANTWELL. And——

Mr. BILLSTROM. That's obviously less than the cost of a single State as they've already been done.

Senator CANTWELL. I think you said a billion dollars per State was what you were saying——

Mr. BILLSTROM. Roughly a billion is a good number.

Senator CANTWELL. So, I'd be curious about the barriers that you think that we need to break down so that we can continue those bootstrap models of existing technology and using RoIP, because it seems to me that if it's worked in so many other things, and it's working for the military now, that it holds great promise. And I should say, to be specific, I think what you're trying to say is more that open-architecture software has the——

Mr. BILLSTROM. Absolutely.

Senator CANTWELL. Is that correct?

Mr. BILLSTROM. Absolutely. Open architecture has changed the world of computing and has touched everyone in this room, but it hasn't, in public safety.

Senator CANTWELL. Well, thank you. Before I go on to Mr. O'Brien could you just comment on where we are with the Canadians on this 800 megahertz issue and what we need to do? Do we need to get the State Department to move faster on this—working with the Canadian Government on resolving this issue for the 2010 Olympics?

Mr. BILLSTROM. Yes. Not everyone in this room may be aware of it, but in the radio industry, when we try to license a new channel, just a single new channel for one radio anywhere along the Canadian border, the time that it takes to get that license through the FCC and then through Canada and enable a public safety agency to go on the air is measured in years. It's measured in years. In fact, applications made this week would probably not be finished until after the Olympics were over.

Senator CANTWELL. Thank you. So, we have to, obviously, work with the State Department.

Mr. O'Brien, did you want to add comment there?

Mr. O'BRIEN. I'd like to just clarify one thing. Senator Software used to improve the interoperability of existing systems is a fantastic idea and the best possible use of the money. It's something Congress should be spending a lot of time and attention on, and they have. But a software solution to tie together existing systems doesn't correct the failings of the system. They can't boost the performance of the basic device. So, if somebody has a 1980s-technology two-way radio in their hand when they go into an emergency, all the software interoperability solutions in the world can only achieve tying them back in. It can't improve the functionality. Our focus is on improving the functionality and bringing data and video-type services to improve situational awareness as people head into dangerous situations which is a very different thing. And, of course, yes, it's more expensive.

Senator CANTWELL. I mean, yes, Mr. O'Brien, I haven't reached a conclusion about your proposal. But I am saying this, that if the SAFECOM program in the Department of Homeland Security is favoring hardware technology that isn't going to help us on interoperability, that's a much cheaper problem to solve and allows us to bootstrap the existing service. I can guarantee you, when you have to think about the Olympic Peninsula or Alaska or Hawaii, and they have to think about tsunamis and things that are happening on a day-to-day basis, or could happen, or Mount St. Helens, or Mt. Ranier, you really want to do all that you can, now, immediately, on this issue, until——

Senator STEVENS. Would the Senator yield just for a second?

Senator CANTWELL. Yes.

Senator STEVENS. The problem is, when they get the local governments, the State governments, they award it to the lowest bidder. The reason the military has one is, there's federalization. Unless you federalize it, the lowest bidder is still going to buy it, whether——

Senator CANTWELL. Well, I'm happy to work with the Senator from Alaska on this issue, and figure out how we can make sure that the hardware purchases, going forward—and, again, the—probably one of the lower-cost elements of the system can be upgraded to IP solutions. So, I thank the Chairman.

The CHAIRMAN. Thank you very much.

Senator Sununu?

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

Senator SUNUNU. Thank you, Mr. Chairman.

It's a very interesting hearing. And I think we can all stipulate that we're all for public safety and we're all for interoperability and we're all for our local first responders. But somehow, like anyone else, I feel a need to make that absolutely clear for the record.

[Laughter.]

Senator SUNUNU. Let me begin just by picking up on one of the points made by Senator Stevens, and that is, one of the overriding concerns of any proposal like this is its timing and the potential delay that it can have on choices and decisions and legislation that has been implemented or passed after being negotiated over a 10-year period. The potential costs of changes to that path are very significant. They can be financial. Senator Stevens talked about the change in the distribution methodology for these resources if we're not going to have an auction, if we're not going to have the same anticipated collection of revenues. It will have real implications on funding streams for equipment and upgrades and first-responder technology.

Second is the impact to the market. The competitive implications of making a decision not to put spectrum in the hands of the private sector. And that also has public safety implications, real public safety implications, because that private-sector-controlled/used spectrum is used by both consumers and existing public safety responders. It's commercial spectrum—but they use it for public safety purposes. And anyone who's ever called 911 can attest to that. I mean, that is part of our public safety infrastructure, but that 911 call, most of the time, is being initiated on a commercial spectrum being carried by a private sector operator. And a delay in putting more spectrum into the hands of the commercial operators does ultimately have an impact on the quality of those networks that have some public safety function.

Next, we have an existing 24 megahertz of spectrum that we are committed to putting in the hands of public safety. That's good, and that's important, and I have supported legislation to put that into the hands of public safety even faster. And there's a little bit of tension between public safety advocates and the broadcasters about getting that spectrum into the hands of public safety faster. But I

think it's a tough choice, but one we should make and one we should continue to push for. But the question is, How can we make sure that 24 megahertz of spectrum is used as effectively as possible? And I think that's an area where we need to focus much more attention before just making a decision to throw even more spectrum at the public safety arena. We want to make sure we're using it effectively. I think the FCC has done the right thing in putting out a notice of proposed rulemaking, to say, "Look, are there ways that we can use this 24 megahertz we've allocated more effectively and more efficiently?"

And I want to begin on that point, because I think it was Mr. McEwen who, in his testimony, talked about the proposed rulemaking at the FCC. In your testimony, you argued that using the 24 megahertz that have been allocated for public safety would take away, from local licensing control, the spectrum long promised for use by local agencies. But it's certainly my sense, from watching this debate, that local licensing efforts has really led to a pretty inefficient use of some of the spectrum that's out there. So, why shouldn't we expect more efficiency from those public safety operators, rather than just casting more spectrum into their domain? That's a question for you, Mr. McEwen.

Mr. MCEWEN. Yes, OK. Well, thank you, Senator.

First of all, I want to thank you and the members of the Committee that have supported giving us the 24—or making available to us the 24 megahertz of spectrum. Let me give you a quick history.

First of all, you—you, the Senate, and the Congress—directed the FCC, more than 10 years ago, to give us that spectrum. OK? So, when you say you're concerned about that we use it efficiently, let me tell you, we've had 10 years to figure out how we're going to use it, and we don't have it yet. OK? And, like you said, you have supported giving that to us as soon as possible. Right now, the law says 2009. That's the earliest. So, we've had lots of time——

Senator SUNUNU. But my——

Mr. MCEWEN.—to figure out how to——

Senator SUNUNU.—point isn't the efficiency of spectrum you haven't received. I'm talking about the efficiency of spectrum that's already in the hands of public safety.

Mr. MCEWEN. You're talking about the other spectrum——

Senator SUNUNU. Sure——

Mr. MCEWEN.—other than the 24.

Senator SUNUNU.—spectrum that's being used now. And I think it's fair to say that it is not necessarily being used as effective and as efficiently as possible. What's the spectrum that's in public safety hands now, 40 megahertz, give or take?

Mr. MCEWEN. No, it's 23, other than——

Senator SUNUNU. So——

Mr. MCEWEN.—the 24.

Senator SUNUNU. Well, no——

Mr. MCEWEN. But the point is—the point is, I would respectfully disagree with you. There are lots of people who haven't had experience in public safety communications that would say that we don't use that——

Senator SUNUNU. It's 25 megahertz.

Mr. MCEWEN.—spectrum——

Senator SUNUNU. Twenty-five megahertz.

Mr. MCEWEN. Right. You know, there are lots of people that would say we don't use that efficiently. The problem is that generally there are academicians and people who have a reason not to think that we ought to have more spectrum. I mean, I would be glad to have discussions with you or anybody else, and I believe that if you were to think about it carefully, from what we would tell you, you would find that isn't necessarily true.

Senator SUNUNU. And my point isn't an argument for not making more spectrum available. As I have pointed out——

Mr. MCEWEN. Right.

Senator SUNUNU.—I have voted much more aggressively than many other members of the U.S. Senate to make that available to you sooner.

Mr. MCEWEN. Yes, you have.

Senator SUNUNU. The real question, though, is, What can we do to ensure an improvement in the efficiency, both of the spectrum, the 25 megahertz public safety currently has access to, and the 24 that's going to be allocated?

Mr. MCEWEN. Let me——

Senator SUNUNU. And my point is, those are questions that are probably more important to address, soon and effectively, than deciding whether to make another 30 megahertz available.

My time is limited, so—I apologize. I know a couple of you wanted to comment on that, but I'd like to move to another area that I think is very important.

Senator Cantwell spoke very effectively about the importance of looking at existing technology, IP technology, in particular. Mr. Billstrom, I enjoyed your testimony. And Senator Cantwell and I have worked to try to make sure that, of the billion dollars that's being allocated as a part of this—funds that will come from the auction of spectrum can be used, but doesn't have to be used for implementation of IP communications solutions. And the only issue I have with Senator Cantwell's remarks is, she talked about this as a bootstrap operation, and I think that can have very positive connotations, but, at the same time, we've got to recognize that these IP networks are incredibly robust. We cannot shy away from that. And they're only going to improve over time. And we saw what a positive impact they had in the wake of Hurricane Katrina. And, Mr. Billstrom, you obviously have much more firsthand experience than I or anyone on this committee. So, I would like to hear from you a little bit as to whether you think it's a good idea to use some of that billion for a purchase of IP technologies and to what extent you think that those IP systems are useful and will be useful for more rural areas, because, you know, they don't always have access to some of the backbone that makes these systems work.

Mr. BILLSTROM. That's right. Both the military, overseas, but also the National Guard, domestically, are using IP Radio technology to provide connectivity into areas that have absolutely no infrastructure at all. So, that's a good model for rural communities that don't yet have Internet broadband access. Technology such as satellites, point-to-point digital microwave, many of the pieces of

the puzzle that are used by the cellular industry can also be used here, which is—one of the things I didn't speak about in my testimony, is that almost all, if not all, of the hardware used in IP networks is the same hardware that is used in this building, for this—for the computers in this building and the computers in the military. We can use off-the-shelf commercially available equipment for that, which lowers the cost and separates the software from the hardware, which gives us much more flexibility as time goes on.

We've already seen the cost of satellite units drop by at least a factor of 200 percent in the last 3 years. Others can comment more specifically to that. So, there are plenty of opportunities there.

There's another area that sometimes come up, which is a concern about security. I am not an encryption expert, but the DOD that's deployed IP Radio in Iraq and Afghanistan presumably have addressed this issue.

Senator SUNUNU. Let me close, Mr. O'Brien, by returning to you on this point, because I think you said something that was a little bit misleading in reference to the work that's being done in this space. You talked about the first responder, with a 1980s radio, that somehow, an IP system isn't going to help the first responder with a 1980s radio. But neither is what you're proposing. And I want to do something about the person with the 1980s technology, but setting up a system that has video capability or data capability, which isn't going to make any difference to the person with the 1980s radio technology if it's not compatible with the network that you're building. So, there's going to be an issue with compatibility and equipment upgrades in order to take advantage of modern IP networks that might have video or data capability, but that's going to exist, regardless, for all of those first responders that rely on equipment that's analog or outdated or in need of an upgrade.

The CHAIRMAN. Thank you very much.

Senator McCaskill?

STATEMENT OF HON. CLAIRE MCCASKILL, U.S. SENATOR FROM MISSOURI

Senator MCCASKILL. First, I want to thank the panel, and I particularly want to thank the representatives from the Chiefs of Police and the Chiefs of Fire Departments. I'm a former prosecutor, and as a very young prosecutor, because my father was a volunteer firefighter, I asked to take over the arson specialty. And so, Steve Westerman is here, who is the Fire Chief from Eastern Jackson County Fire Protection District, which was in my area where I was the arson prosecutor. And 30 years ago, I was trying to explain to his folks how important it was not to break down that door until they checked to see if it was locked, because it was kind of hard to make those circumstantial arson cases if we didn't know whether the door was locked or not before they broke it down fighting the fire.

It's very difficult for me to question any testimony coming from your two organizations because of my background. I want to congratulate the City of Kansas City, and particularly Chief Smokey Dyer, on an incredible response to a chemical explosion that we had in Kansas City yesterday, a major chemical explosion, very near downtown Kansas City, 18,000 gallons of foam were used yes-

terday afternoon. We're talking about a major evacuation in a major metropolitan area, and we had no injuries. It was a remarkable showing of skill by our Emergency Operations Center in Kansas City, and I didn't want to get to my questions before I congratulated Chief Dyer, my old friend Smokey, and all of the professional first responders in Kansas City for that incredible job.

I want to ask Mr. O'Brien—I'm assuming this proposal is predicated on the idea that it will make a profit.

Mr. O'BRIEN. Actually—sorry, Senator—let me divide it into two pieces. A Public Safety Broadband Trust, which plays the major role in this operation, would be not-for-profit. The commercial partners that would come in to a relationship with the Public Safety Broadband Trust and build out to the specifications of the Public Safety Broadband Trust would be expecting to make a return on their investment. That's the fuel that keeps this whole thing running.

Cyren, or whoever is selected to be the manager, would expect to have a negotiated arrangement with the Public Safety Broadband Trust to get a return on investment also. So——

Senator MCCASKILL. Well——

Mr. O'BRIEN.—hopefully I've got that——

Senator MCCASKILL. Right. I think that was a long way of saying that this proposal will produce a profit, correct? I mean, you have great experience in this field, in terms of putting together a private enterprise effort that eventually became one of the largest and very successful wireless providers in this country.

Mr. O'BRIEN. Right.

Senator MCCASKILL. I'm assuming you've gone into this with a business model that will provide bottom-line positive activity, in terms of profit.

Mr. O'BRIEN. Right. And, even more importantly, I think, is to use that to fund the buildout of a next-generation public safety system. It's a teaming up of the public interest with a private—a series of private—partners. If you don't have an opportunity for those commercial operators to make a return on their investment on building out the network, well, then, of course, as you understand, they won't build out the network.

Our role, my role, is far more to just tee up this debate than it is to duplicate or replicate what I'm very proud of, which is the success of Nextel. I mean, Nextel was a very different opportunity, a very different business in a different time. But, yes, we set out for the shareholders of Nextel to try to take spectrum, use spectrum more efficiently, and generate value out of that proposition. And we were successful, as you say.

Senator MCCASKILL. I guess my question is, if, ultimately, this entire proposal will be—will provide that, "return on investment," or, you know, to put it bluntly, "profit," why not just bid on the spectrum when it comes up at auction?

Mr. LARGENT. Could I answer your question, Senator?

Senator MCCASKILL. Sure.

Mr. LARGENT. I think the—your question is the question that our commercial providers are asking themselves. Why would they pay to build a premium system that public safety needs and then pay a premium to the person that—the in-between person, between

public safety and them, to build out the system? And then they've got to pay to build the system, itself. So, there's a lot of cost that goes into building this system, and a premium that would go to the interloper, if you will, between public safety and the commercial folks that would use it. And I just don't think—I think this industry is so competitive that the cost of building that system—that there would be no return from the investment. And so, that's why I really think there are some questions about the model that's constructed here, that there would be a healthy return. And——

Senator MCCASKILL. But——

Mr. LARGENT.—there's a lot of skepticism about that.

Senator MCCASKILL. But let me ask a question. I'm——I want to make sure I understand this. Am I correct that this proposal assumes that commercial providers will build out the network when it comes to a small community like Lebanon, Missouri, as opposed to Kansas City and St. Louis? Well, what happens if those commercial providers don't step up and build that out? Aren't we still going to be looked to, to provide that important capability for rural America and rural Missouri?

Mr. MCEWEN. Can I answer——

Senator MCCASKILL. Sure.

Mr. MCEWEN.—that, Senator? Let me give you a little different perspective from a public safety perspective, not a Morgan O'Brien perspective or a CTIA perspective. We look at this differently than was just described by Mr. Largent. We look at it that we're going to—this spectrum is not going to be Mr. O'Brien's spectrum, it's not going to be the commercial—they're not going to own this. This will be managed—it'll be in a trust that public safety will manage. OK? He described the business model. I don't want to get into that, because that's not my area. But the fact is that you do have to have investors who will make a profit, who will build out the network, or we would have to then ask the Congress again to fund more and more and more. So, that business model is there.

But the difference is that this spectrum would be managed by public safety, not by the commercial interests, and it would be our interest to build out—for instance, in answer to your question, in these rural areas—the commercial companies that now are in existence don't have a commercial need. They can't find it profitable for them to build out in some of those areas. It isn't viable for them. However, we need it. We need that service in those rural areas, and the public needs it. This would pay for that extension.

I envision taking one of the commercial, or more of the commercial, providers that are in existence today, take a Verizon, a Sprint/Nextel, a T-Mobile, either a combination of them or one of them—actually, we would be looking to take their nationwide network and improve it, build it out, harden it. We would invest in it. We wouldn't have to build a whole new network. The concept here, you know, is pretty simple. From our perspective, it's a little different. The problem is that right now the industry—Verizon and others—don't want to talk with us about that, because they want the spectrum for their own commercial purposes. If the spectrum is allocated for public safety, we would then be trying to negotiate with the commercial providers to either—as one of them, for a nationwide network, or having regional parts of it, to build this out.

Senator MCCASKILL. So, you'd be doing your kind of own mini-auction.

Mr. MCEWEN. Absolutely. Absolutely. And we would be building it to our needs, hardening the network, which the commercial interests haven't done a good job of, making it more reliable, more redundant. It would serve our interests, which are different than theirs, and would serve the public's interest much better than it does today.

Senator MCCASKILL. It's just—you know, and I—I'm out of time, but I do—it's a hard concept for me to get my arms around, that we will take something that is—could be auctioned on a—in a public sale and then have those resources available to do what we need to do to help first responders. As a government function, that we would, in fact, embrace a hybrid, which is a profit-making venture, to someone who hasn't had to compete to get that, that's difficult for me.

I thank you all very much.

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.

Obviously, it's a dual challenge, in terms of—I mean, it's absolutely vital that we have, you know, our first responders having the kind of equipment and the ability to communicate. Having been down to visit during—in the aftermath of the disaster of Hurricane Katrina, and watching the Coast Guard, for example, they didn't have interoperability in the communications, but they—you know, they're a can-do operation, they were able to overcome that. And so, it's no question that, with our—you know, our policemen and the firefighters, they need to have the capacity to do that. But the question is, How do we achieve these dual goals? And, you know, for the last 10, 20 years, where we think—we view the spectrum as a public entity. So, this is unusual. It's a precedent, from the standpoint of transferring to a private-sector entity, in addition to the potential for the loss of revenues by virtue of doing it in this instance, in the manner in which you are recommending, Mr. O'Brien.

How—I want to ask Mr. Werner and Mr. McEwen, with respect to the 24 megahertz—because currently it's for radio. If the FCC changes the rule to include that use for broadband, could that be accomplished?

Mr. MCEWEN. Yes. Right now, the 24 megahertz—as I said, we've had 10 years to figure out how we're going to use this, and we don't have it yet, so we've got lots of time to do that. The 24 megahertz right now, under current rules, is segmented into two 12-megahertz blocks. Twelve megahertz of that is designated for mission-critical voice. That is mission-critical to the major metropolitan areas of this country. The big cities, like New York, Chicago, Miami, they have no more voice spectrum; they need it desperately. So, that was something that we asked the Congress to give us years and years ago, and we would hate to have you take that away from us. That's in—that's pretty sacrosanct, from our

perspective. The other 12 megahertz was intended for data. Originally, when we put the recommendations to the FCC for the rules, it was to be wideband data, because nobody had heard much about broadband data. Today, we have recommended to the FCC that they change the rules to allow that to be used for either broadband or wideband, and it would be chosen by the local regions in your area of the State. So, that is intended to be done that way. That isn't a different problem.

The problem here is taking that 12 megahertz and trying to build a nationwide network. As far as we can understand, there isn't enough spectrum there to attract the kind of investors to build this without having to, again, come back to you to fund it.

Senator SNOWE. I see. So, you're saying that is the only way to have an interoperable deployment of broadband to all areas of the country.

Mr. MCEWEN. That's right. It would be a——

Senator SNOWE. So, it is not possible, under the 24 megahertz, with the 12 that you're saying would be set aside?

Mr. MCEWEN. That's our opinion. I mean, we believe that that isn't sufficient, number one, to serve the needs of both commercial and private/public safety. Without the investment, we have no money to build a nationwide network, Senator. And that's the big problem here, is that the commercial people don't offer us any commercial—any kind of a model that would pay for this, other than to come back to you, sitting here today, to continue to fund that. I mean, this is a great way to take it off the backs of the taxpayer.

Senator SNOWE. Mr. Werner?

Mr. WERNER. Just add to that. The other problem that we run into with the current system is that we are forced to stovepipe our systems based on the current model. The Public Safety Broadband Trust would allow, at much larger economy of scale—which means we, as first responders, would now be able to buy devices on a common network that's commercial, and be able to see the evolution of the new technology that we are constantly behind. Without that economy of scale, even if we were able to take the 12 megahertz and make it a nationwide network, we still would not have the volume to create the opportunities to buy radios at what we think are affordable and reasonable prices, which we are very much having difficulty now.

And just—along with that same with the network, when you talk about the IP Radios, I don't think any of us here have any argument that IP Radios are in our future. The difference that—the really big difference here that you see, that this network offers, is, we don't have the network in place that the military has in place, which is very expensive. If we did have such a network of 700 megahertz that strengthened—the IP Radios suddenly become a much more viable solution for us to use on an everyday basis. And we see the partnerships.

And with the satellite, the proposal that Cyren Call has written, that we are looking at as Public Safety Broadband Trust, also embraces satellite technology that says we realize that it can't be terrestrial all the time, because of the failures and the redundancy.

So, I think that what this does is, it creates an opportunity that is self-sustaining on a commercial market, that has the volume of

scale that continues the ability to evolve new technology, as opposed to us buying radios that are obsolete as soon as we buy them.

Senator SNOWE. Mr. Largent, how do you respond to that? Because I think it is the question, What is the guarantee that if we go through the traditional route that you are going to extend this network to rural areas? As I understand, under Mr. O'Brien's proposal, we are talking about covering 99 percent of our population within the next decade. It is a concern, for those of us who represent rural areas, as to whether or not we're ever going to get this service. What would the wireless industry do to guarantee braodband deployment and public safety services in rural areas?

Mr. LARGENT. Well, Senator, I'm not sure you were here for my opening statement, but I mentioned there that we are conducting a seminar—not a seminar, but a—putting our heads together with the public safety community to try to figure out, What are the best ways that we can put this puzzle together? And it'll be the first time that we've ever done that. We're going to conduct that in—I think it's in April—April 9th—the week of April 9th. And we'll conduct that kind of discussion.

But the important thing is, is that Congress has acted. They've delivered 24 megahertz in the 700-megahertz spectrum, for public safety. We still think that there's a possibility to use the 12 megahertz to deliver a broadband service for public safety in the space that you've given them already. We don't need to go back and rework it.

Senator SNOWE. In all parts of the country?

Mr. LARGENT. In all parts of the country——

Senator SNOWE. In all——

Mr. LARGENT.—that's right.

Senator SNOWE. In all?

Mr. LARGENT. Absolutely.

Senator SNOWE. They obviously disagree on that question.

Mr. O'BRIEN. Yes. Senator, may I just take 1 minute?

Senator SNOWE. Yes.

Mr. O'BRIEN. It's a critical imperative to get the benefits of broadband into rural America. We see only one way. I don't think a seminar conducted by CTIA is going to reverse 25 years of ignoring rural America by wireless. And it's not because commercial wireless is heartless, it's because they are driven by the necessity to earn a return on the investment they make.

The beauty of—the reason we're so anxious to have you take a close look at—this proposal is that it will bring broadband to rural areas, because the Public Safety Broadband Trust will be able to take a national view of meeting certain objectives. And the primary objective—our suggestion—is that the Public Safety Broadband Trust should extend coverage to rural America, where it has not been, and to have it paid for by the overall economics of a nationwide system. This is new. This is disruptive.

This is, with all due respect, not going to be solved at a seminar run by Dale Hatfield or Albert Einstein. It's about the money. Where do you find the money? If this Congress and the State and local jurisdictions are willing to fund billions of dollars a year of losses in rural America, then that solves the problem. But I don't

believe they are. Twelve megahertz of spectrum won't support a solution such as ours. It's math, not politics. It's math. You need to have sufficient critical mass of spectrum to attract the investment, to solve this problem, and to bring broadband to rural America.

We urge the members of this committee to consider this. It is complex. It is complex. But take into consideration that virtually every public safety organization that has looked at this—virtually every one—is supporting this. This is a crying-out-for-help signal. We are sending men and women into dangerous situations every day, knowing that their devices are inferior. How can we, as a country, continue to do that? We have a solution. I understand that the legislation was put on the books a year ago. That can't possibly mean that the legislation can't be improved by this committee and this Congress. It can't mean that.

Senator SNOWE. Thank you, Mr. Chairman.

Thank you.

The CHAIRMAN. Thank you very much.

Senator Carper?

STATEMENT OF HON. THOMAS R. CARPER, U.S. SENATOR FROM DELAWARE

Senator CARPER. Thanks, Mr. Chairman.

I think this is the second or third hearing I've attended as a new member of this committee. And I was joking with one of my colleagues, Senator Pryor—I said, "It was only last year I learned how to spell VoIP, now I've got to learn how to spell RoIP."

[Laughter.]

Senator CARPER. Well, hopefully I'll come along.

I—in my old job, as Governor, I—we actually, in Delaware, put in place an 800-megahertz system, started doing it about—almost 10 years ago. We came into some money and decided to spend it on other things, put in a system that would allow our police and fire and paramedics and National Guard and other first responders to communicate. Took a while to perfect the system, and we had problems with the remote parts of our State, the parts that stick out into the ocean, and we had problems communicating with first responders when they were in buildings—big buildings. But we finally worked it out, put a lot of repeaters in on these towers, and finally got a pretty good system. The folks from Motorola were good. They didn't give up, and we wouldn't let them give up. And we put some money of our own, and took a little bit of Federal money, too, to pump in, to make it work. So, that's, sort of like, the perspective that I bring to this argument.

And I say that as a preface to a question I'm really going to ask you all, and give you about a minute to respond to this question, if you will. I missed your opening statements. I'd be lying if I said I'm going to go home and read them. And——

[Laughter.]

Senator CARPER. maybe I should. Others will tell you they're going to home and read them. I'll tell you the truth—I'm not.

What—that's why I hire these smart staff people—what I would like to ask each of you—just a minute apiece—give me a 1-minute takeaway, just, kind of, tell me, out of your testimonies—it's impossible for me to remember everything you're going to say, but maybe

a 1-minute takeaway from each of you for a guy who's a recovering Governor.

Mr. WERNER. OK. We need new technology. You, going through the experience of 800-megahertz radio system, know how difficult and complex that is, and you know that once you put all that money into it, that it is what it is; it doesn't change, it doesn't evolve. In 10 years, you'll be forced to replace that infrastructure that you have in place, which will be millions and millions of dollars. And just that example of New York City that Mr. Largent referenced earlier, their system, for New York City alone, is $500 million—funded by the Federal Government, by the way. Now, if you're going to give Charlottesville, Virginia, that umpteen million dollars, or the State of Virginia, I don't really have any more discussion with you. I'm OK with that. I don't think that's going to happen.

The other thing is, we're continually—the way the—the way it's set up now, it's forced to stovepipe the current systems, not to make them system-of-systems or a nationwide network. And, again, we're faced with the expensive nature of the radios, because of a limited competition for public safety, because of the economy of scale. Change the network, make it available to everybody, increase the technology, it evolves, it's self-sustaining. It looks to me like it makes perfect sense.

Senator CARPER. All right. Thanks, Mr. Werner.

Mr. McEwen, give me your best 1-minute.

Mr. MCEWEN. I'll give you a quick 1-minute.

You talked about the new 800—or the 800-megahertz system in Delaware. That's a voice system, mission-critical voice system. It's very good. It's getting better all the time. I know the people that run it in Delaware, so I'm familiar with it.

This is a data system with voice capability. People are talking about Internet protocol, Voice-over-IP. You have that capability in a broadband network, but it's primarily to bring us new capabilities in a broadband way and have interoperability and roaming throughout the whole country. It's a big difference. It's a revolutionary change. We will never have the money—there's no money that I know of, in this Congress or any other place, to build this kind of a network and to have a nationwide opportunity like this. And I will tell you, if you talk to your people back in Delaware, they will tell you they think this is the right thing to do.

Senator CARPER. All right, thank you.

Mr. O'Brien, 1 minute, please.

Mr. O'BRIEN. Yes, Senator, and thank you.

"Nearly miraculous" is the way I describe wireless services today and on the near horizon—nearly miraculous and transformational. It's hard to exaggerate what they have done and will do. Our plea is to figure out a way, which can only happen here, it can only happen in this committee—figure out a way to make those capabilities available to the men and women who never calculate the reward, but always are willing to take any risk to try to save life or property. Give them those devices.

Senator CARPER. I think the last time I heard someone use the term "nearly miraculous," they were describing my election to the U.S. Senate.

[Laughter.]

Senator CARPER. Miracles do happen.

Mr. Largent?

Mr. LARGENT. Senator, I would just say that we applaud Congress for passage of the DTV Transition Act that designated 24 megahertz to public safety, a billion dollars to begin the investment in their system. We don't think that that'll be the last money that they'll need; they'll certainly need more. But it's a good start. And I would just say that we need to keep that course on this particular spectrum.

The debate that they raise is a worthy debate that needs to be aired out in Congress, it needs to be talked about among the experts in the field. And we're proposing to do that, in April, as I mentioned. But our message to you is really that we need to keep this ship going in the same direction on the 700 megahertz, and get that auction to occur so that they can begin building out their 24 megahertz for public safety and that the commercial sector can begin building out its 60 megahertz.

Senator CARPER. Thanks.

Mr. Billstrom?

Mr. BILLSTROM. Senator, I've never done anything in 1 minute, so——

[Laughter.]

Senator CARPER. Well, give it a shot.

Mr. BILLSTROM.—I'm going to give it a shot.

The—what, mostly, has been discussed today is really what I would call operability. And what I testified on today was interoperability. And my focus is fairly pragmatic, and it's also immediate. So, there are the systems like the one in your home State that are 800 megahertz, and closed. We can't take a radio from another city and use it in Delaware. Not right now. And we have rural areas that have 1980s—in fact, some have 1970s-technology radios.

We're suggesting IP Radio is a solution for connecting all those together for interoperability. It's not necessarily for operability.

Senator CARPER. Thank you.

The last word.

Mr. DESCH. And last, but not least, the poor satellite guy here, who's got a slightly different approach here, in that—not in the middle of this debate about what's interoperability or the best way to allocate spectrum, which is an interesting discussion, but still represent that the systems, even the current system, after 25 years, only, still, is built out to over 65 percent of our country. The key message that came out of Katrina and Rita wasn't interoperability. It—that was a big issue—but was the fact that the systems didn't work for hundreds of miles and there wasn't any other solution.

So, we represent just the opinion here that S. 385, which you're supporting, is a great first step to redundancy, which is an important thing. Don't forget that there are other solutions that fit together, interoperate—RoIP is a great solution, and we use it, and make the systems work—but, in these systems, don't forget the satellite component.

Senator CARPER. Good.

Mr. DESCH. Thank you.

Senator CARPER. Thank you all very much, that was helpful. Thank you.

Thanks, Mr. Chairman.

The CHAIRMAN. Thank you very much.

Senator Thune?

STATEMENT OF HON. JOHN THUNE,
U.S. SENATOR FROM SOUTH DAKOTA

Senator THUNE. Thank you, Mr. Chairman, for holding this hearing. Thank you, to our panel. Thank you, to the first responders and the members of your organization, for the great work that you do out there.

I'm, as is Senator Carper, new to this Committee, so it's a steep learning curve, and I appreciate it when you use small words and big print. As my tech-savvy teenage daughters always refer to it as "back in the day." I don't remember the crystal-set era, but I do remember a time when we didn't have near the options in technology available to us, even in a state like South Dakota. And I grew up in a small town of 600 people, where, at the time, we had one TV station and none of the things that we're talking about, in terms of the avenues to the world that our kids have today.

That's why I want to hone in a little bit on some of the points that have been discussed earlier with regard to the impact of this proposal and other approaches to reaching rural areas.

In South Dakota, the State Department of Homeland Security tells us that we have 90-percent interoperability with regard to voice. The next step, obviously, is broadband. And I also want to know, as I've listened to the discussion back and forth, what will best accomplish the objective of providing that sort of broadband interoperability for our first-responder community in South Dakota. And so, as you have batted that back and forth here, I find that to be of great interest and want to continue to hear from you about any additional light that you can shed on that particular subject.

Mr. O'Brien, I do have a question—a couple of questions that are maybe more of a practical variety regarding the Cyren Call plan. One has to do with whether or not public safety communications would be prioritized over typical private customers' communication. The way I understand it, that would mean a call between a firefighter and their headquarters would be prioritized over a call between teenage sweethearts, for example. And I guess my question is, Would that technology be reliable? And has it been tested extensively?

Mr. O'BRIEN. Senator, let's talk about a couple of different things. A network—a fourth-generation wireless network such as we propose—has three major functionalities. One is voice, one is data, and the other is video. For purposes of focusing on your question, we are proposing that mission-critical voice—and it doesn't sound, from your hypothetical, like you are referring to mission-critical voice—would continue to be carried on existing technologies until such time as public safety determines that Voice-over-Internet Protocol has achieved a level of robustness that they want to move to it. I personally predict that will not be so very far down the road because I have confidence in where technology is going. But, I make an important distinction between mission-critical voice

and data and video capabilities, which are otherwise not possible on traditional land mobile systems. These advanced data and video capabilities would never be possible on traditional systems in a rural State such as yours.

I do want to focus attention on—particularly for rural States—the benefits of creating a Public Safety Broadband Trust and allowing that trust to take a national point of view about broadband deployment. For the first time ever, this will be a not-for-profit driven perspective to look at coverage—extensive coverage—as its first design criteria and will solve—it's the only model I've seen that has any chance of solving—the 25-year-old problem that commercial wireless cannot deploy in areas where they cannot earn a return on those facilities. That's the rural dilemma. We're trying to address it.

Senator THUNE. Second question, a follow-up to that, would a customer choose a communications provider where a connection could be preempted at any time by a public safety need?

Mr. O'BRIEN. If we are fortunate enough to see our vision come true, that will be one of the most interesting parts of the marketplace test of this kind of a concept. When you think about the functionalities—the features and functionalities—of the network we are proposing, built to public safety grade, we believe there are large numbers of commercial customers that will value those capabilities just like the police value them. We believe that commercial customers will go on that system knowing that, based on certain well-articulated protocols, under certain circumstances public safety will have priority. Think about it in terms of when you're driving down the highway and a siren goes off behind you. You move over to make way for a higher-priority use. We believe that same concept is well within the potential of having a marketplace success.

Mr. LARGENT. Senator, if I could respond to your question, I think your question is a good one. And the commercial operators that are members of our association are asking themselves the same question, How do we get return on our capital when we're coerced, forced, to build towers in rural South Dakota, where there's no return on our investment? Are they going to—is this trust fund going to force us to build towers there because we build out in New York, and we'll just take the offset—the capital from New York and put it in South Dakota? And I just don't see that that's realistic, that—you'll end up with the same problem that existed 5 or 10 years ago with our industry, where we were building out in the major metropolitan areas, but not in rural America. But now, as you know, we're extending into rural America, and our coverage is much, much better today, but getting better every year.

Mr. MCEWEN. Mr. Largent just makes a very good point, and that emphasizes what I've been saying right along. He's saying, "How can we be coerced or forced to build out into these rural areas?" Well, that is the whole point, that is exactly what we're telling everybody. We need this coverage in those areas where they will not provide it, because they are not going to be coerced or forced to do it. We would do it with private investors' money, and we would provide the public with better service and service that we need now that they don't give us.

Mr. LARGENT. I just don't see where the private investor return—gets a return on his capital, building in areas that are not profitable in the first place, which is why I think taking the 12½ megahertz—the 12 megahertz that Congress has already set aside in the DTV transition, and saying that's for broadband—and there's no commercial interest in that, it's for broadband—and we're going to build that out, and it's going to cost money for the Federal Government. It's going to cost money to build that out, no question about that. But we think we have the expertise in that area to lend to public safety to help do that in the most expeditious and expedient and least expensive way.

Mr. O'BRIEN. Senator, we have the most powerful system on Earth for determining whether ideas like this can succeed. In the marketplace when presented with an opportunity to participate in the next-generation Public Safety Broadband Trust wireless network, in every fiber of my being and all of my experience, I am sure that numerous commercial operators—whether they happen to be current operators who belong to CTIA or not—numerous operators and numerous entrepreneurs will step up for the right, for the privilege, of participating in that network.

Obviously, I can't prove it. It's something that sits out there in the future. But all of my experience suggests—all of my experience raising money on Wall Street, all of my experience operating a network—suggests yes, that is exactly what will happen. There's the ability within the Public Safety Broadband Trust to subsidize the rural buildout with the more lucrative buildout in the major markets. That's the very thing that fuels this idea.

Again, I urge you to please give us an opportunity to come in and explain it more to you or your staff. It is somewhat complicated, but it is very compelling as you get into it.

Senator THUNE. Mr. Chairman, I thank you. I'm anxious to hear more about—that particularly with regard to the data and other advanced communications and how that becomes more readily available in rural areas.

But you've all done a good job of making your points for your respective points of view today, and it's helpful. All of us who represent rural areas are very interested in this subject and how best to accomplish the objective we all have in mind.

So, thank you for your testimony, and we'll continue to keep the discussion going. Thanks.

The CHAIRMAN. Thank you very much.

There is a vote pending now, but I'd like to call upon Senator Stevens for the last question.

Senator STEVENS. Well, I hope, Mr. Chairman, that all the members here at this panel will agree to meet with Dale Hatfield to discuss interoperability solutions.

I want to call your attention to what has been deployed now by the Michigan National Guard. It is a vehicle that has an in-vehicle software solution to enable the integration of advanced electronics communications equipment, security/counterterrorism features, and other technologies. This vehicle includes the capability of providing radio communications interoperability through a switch that allows the first responders to talk to each other via dissimilar communications systems, which include municipal safety radio, State and Fed-

eral radios, military radios, land lines, cellular, satellite, and whatever, all means of communications.

Now, I think this conference could step out of the box and stop talking about who gets spectrum and talk about how we meet the needs of these first responders now. This vehicle is—working right now for Michigan. And it's on a demonstration phase right now. And I urge you to think about that, going to that meeting and discussing interoperability solutions, not allocation of spectrum.

And, again, respectfully, Mr. O'Brien, no matter what you say, you're asking us to create a new subdivision of the FCC, giving complete control over what amounts to, 54 megahertz, with only 30 going out to the industry, as a whole. That is, to me, impossible for us to do, fiscally. We should not it do from the point of view of substance either.

Thank you.

The CHAIRMAN. Thank you very much.

As I indicated, there's a vote pending.

I will not be asking questions now, but I will be submitting them to all of you. And I hope that you can respond to them.

The record will be kept open for 2 weeks. If you have any addendums, new exhibits, or new statements, please submit them. And I hope that you will respond to my questions, written questions.

Thank you very much. The Committee is adjourned.

[Whereupon, at 12:05 p.m., the hearing was adjourned.]

APPENDIX

PREPARED STATEMENT OF HON. JOHN MCCAIN, U.S. SENATOR FROM ARIZONA

I am pleased that the Committee is focusing on this very important issue. In fact, I would go so far as to say that there may be no more important issue facing this committee than the issue of public safety interoperable communications.

The 9/11 Commission's Final Report states that: "Command and control decisions were affected by the lack of knowledge of what was happening 30, 60, 90, and 100 floors above." To remedy this problem, the 9/11 Commission recommended the "expedited and increased assignment of radio spectrum to public safety entities." Congress did so *belatedly* last year when it finally set the date of February 17, 2009, for the availability of 24 MHz of spectrum to public safety after years of wrangling with the National Association of Broadcasters.

However, public safety has long stated that 24 MHz is not enough to remedy this crisis. On September 11, 1996, 5 years to the day *before* the 9/11 terrorist attack, the Public Safety Wireless Advisory Committee released its final report, which stated that "Over the next 15 years, *as much as an additional 70 MHz of spectrum* will be required to satisfy the mobile communication needs of the public safety community. The currently allocated public safety spectrum is insufficient to meet current voice and data needs, will not permit deployment of needed advanced data and video systems, does not provide adequate interoperability channels, and will not meet future needs under projected population growth and demographic changes." If only we had listened to the public safety community in 1996, we may not have had the lapses in command and control communications during September 11, 2001.

Over 10 years later, public safety is still grappling with inadequate spectrum and radio communication systems that do not communicate with one another. And Congress sits here debating the issue.

That is why last week I announced plans to introduce legislation to provide more spectrum to public safety for an interoperable national broadband network. The network, which would be created by providing an additional 30 MHz of radio spectrum in the upper 700 MHz band to public safety, would allow first responders seamless nationwide roaming capability and real-time transmission of data. I invite any member of this Committee to join me in drafting this legislation and helping move it through the legislative process swiftly.

I fought for many years to clear the 700 MHz spectrum for first responders and I do not intend to allow the February 2009 date to be delayed, contrary to media reports. Additionally, I have long believed in a competitive marketplace for spectrum, and I do not intend to change my views now. Therefore, I ask that the wireless industry, the public safety community and others review the legislation when it is introduced and start a dialog with each other and legislators so we can work together to remedy our Nation's interoperable dilemma that has deadly consequences.

The Federal Government has made strides in developing a comprehensive, interoperable emergency communications plan, establishing equipment standards, funding the purchase of emergency and interoperable communications equipment, and belatedly making additional radio spectrum available. But none of this is enough. We must do more. We are at a watershed moment where we can provide more of the 700 MHz spectrum to solve our national public safety communications crisis and greatly enhance our emergency preparedness. If we do not act now, this valuable spectrum will be auctioned off and this opportunity will be lost forever.

I look forward to working with my colleagues to move legislation through the Committee and I thank the Chairman for holding this important hearing today.

PREPARED STATEMENT OF GLOBALSTAR, INC.

Globalstar, Inc. ("Globalstar") submits the following written testimony for the formal record being compiled in connection with the February 8, 2007, hearing of the

Senate Committee on Commerce, Science, and Transportation ("Committee") on "The Present and Future of Public Safety Communications." As one of the main providers of reliable communications to the Gulf Coast states during and in the aftermath of Hurricane Katrina, and an active participant in the proceedings of the Federal Communications Commission ("FCC") and its Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks ("Independent Panel")[1] Globalstar believes that it is well positioned to advise the Committee and the FCC on additional steps that may be taken to ensure that the Nation's communications infrastructure is prepared for future emergencies.

I. Background

Globalstar is now in its seventh year of providing mobile satellite service ("MSS") voice and data services. Globalstar's services are currently available in all areas of the world, except central and southern Africa, Southeast Asia, and the Indian subcontinent, areas in which Globalstar is in the process of negotiating to expand coverage. Globalstar is one of only two FCC-licensed companies that provide MSS using battery-powered handheld and vehicle-mounted phones. Globalstar's MSS phones are "operable" with each other and with any other communications device that is connected to a public switched telephone or wireless network anywhere, including wireline, cellular, and interconnected specialized mobile radio and private systems. As a result, a Globalstar user can communicate via satellite with any other Globalstar user and with anyone on or connected to the worldwide public switched telephone network. A significant and growing number of Globalstar's customers are first responders and other public safety officials who rely, with increasingly frequency, on Globalstar's products and services to meet their day-to-day communications needs, and, more importantly, to ensure that they have operable communications systems during times of emergency.

Globalstar's services proved their value to first responders and other public safety entities by operating without interruption throughout the Gulf Coast during Hurricane Katrina and in its aftermath. Because of those services, thousands of first responders and other public safety officials whose other means of communication had been destroyed were able to communicate among themselves and with the outside world. Many state and local governments also now seek to ensure that Globalstar's satellite phones are made an essential component of their emergency response plans. For example, Haley Barbour, Governor of Mississippi, stated that, "as a result of Globalstar's performance [during Hurricane Katrina], [Globalstar's] satellite phones are now a part of the State Emergency Response Team deployment package for future emergencies."[2] In addition, the press and the public have recognized the immense value of Globalstar's services in meeting the communications needs created by disasters such as the Gulf hurricanes.[3] President Bush has personally praised Globalstar's role in the hurricane response.[4] Building on lessons learned in 2005, and by request from certain Federal agencies, Globalstar prepositioned equipment in distribution centers in anticipation of the 2006 hurricane season in the Southeastern United States, and will do the same again this year.

The effectiveness of Globalstar's MSS services in such stressed conditions rests on the fact that—as an MSS system—Globalstar's satellite constellation is largely unaffected by ground-based disasters that can disrupt terrestrial services. But this effectiveness reflects also the reliability of Globalstar's products, distribution channels, and customer service. Not surprisingly, those who have relied on Globalstar's services during recent disasters and emergencies uniformly have praised them.[5] As a result, a significant and increasing number of Globalstar's customers are Federal agencies that have chosen Globalstar to meet their communications needs because

---

[1] *See* Recommendations of the Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks, *Notice of Proposed Rulemaking,* EB Docket No. 06–119, FCC 06–83 (June 16, 2006) ("*Katrina Panel NPRM*").

[2] *See* Letter to Kevin J. Martin, FCC Chairman, from Haley Barbour, Gov. of Miss. (Dec. 21, 2005) ("*Barbour Letter*").

[3] *See, e.g., Crisis on the Gulf Coast: When Satellite Was the Only Game in Town,* VIA SATELLITE, Jan. 2, 2006 ("Globalstar doubled its capacity to make calls to landline phones, increased its active spectrum allocation via special temporary authorities granted by the U.S. Federal Communications Commission (FCC), and allocated gateway coverage footprints to increase capacity in the affected area to manage the unprecedented surge in users"); Paul Davidson, *Satellite Phones Provide Critical Link to Outside World,* USA TODAY, Sept. 6, 2006 (noting that Globalstar "sold more than 11,000 phones and leased 1,000 more" immediately following Hurricane Katrina); *Satellite Phones Critical to Katrina Relief Efforts,* SATELLITE WEEK, Sept. 5, 2006 (noting that Globalstar saw "increased usage . . . from response agencies at all levels" in the aftermath of the hurricanes).

[4] *See* Letter from President George W. Bush to Globalstar (Nov. 21, 2005).

[5] *See e.g., Barbour Letter, supra* at n. 3.

they recognize Globalstar's reliability as a service provider.[6] For example, in 2006 the Department of Defense amended its policy regarding the procurement of satellite communications equipment, making it easier for individual components of the Department to procure Globalstar voice and data products for unclassified communications in the United States. In doing so, DOD recognized that "recent developments related to disaster relief in the United States indicate a need to broaden the available base of MSS for unclassified operations."[7]

Globalstar has been granted authority to integrate an Ancillary Terrestrial Component ("ATC") into its MSS system, and currently is the only MSS licensee capable of seamlessly incorporating ATC into its existing, first-generation MSS system.[8] Globalstar is in the process of conducting engineering analyses and meeting with potential business partners regarding ATC technologies and services. The realm of possible MSS/ATC services continues to expand as technologies evolve, and once deployed, Globalstar's ATC network will bring significant benefits to Globalstar's public safety (and other) customers. In light of these benefits, in July 2006 Globalstar filed a Petition for Rulemaking to expand its ATC authority to encompass its entire spectrum assignment.[9]

Globalstar has participated extensively in the FCC's Independent Panel's activities. Globalstar submitted written comments recounting its experience in the aftermath of Katrina in advance of the Independent Panel's second meeting, and on March 6, 2006, Globalstar's Chairman and Chief Executive Officer traveled to Jackson, Mississippi, to testify before the Panel in person.[10] Globalstar's comments and the written testimony of Globalstar's Chairman and Chief Executive Officer are attached at Exhibits 1 and 2.

II. Specific Recommendations

Globalstar agrees with those witnesses who advocate a multi-prong approach to ensuring that first responders have reliable satellite communications networks at their disposal in advance of future emergencies. Specifically, Globalstar makes the following recommendations based on its own experiences during past hurricanes and other natural disasters:

1. *Training.* Globalstar has observed that, although they had the foresight to stock Globalstar phones and other satellite communications equipment, some first responders had not received adequate training in the proper use of the equipment. This lack of training accounted for a sizable number of communications failures during the first 48 hours after Hurricane Katrina. While in some cases, first responders simply had failed to keep the handset batteries charged, in other instances they did

---

[6] Among other Federal agencies, for example, Globalstar currently provides service to: The U.S. Department of Homeland Security; U.S. Department of Justice; U.S. Federal Emergency Management Agency; U.S. Secret Service; U.S. Federal Bureau of Investigation; U.S. Customs Service and Border Protection; U.S. Drug Enforcement Administration; U.S. Department of Defense; U.S. Northern Command; The Army National Guard; U.S. Coast Guard; U.S. Marine Corps; National Security Agency/Central Security Service; Federal Bureau of Prisons; Defense Intelligence Agency; U.S. Department of State; U.S. Environmental Protection Agency; Federal Aviation Agency; National Aeronautics and Space Administration; U.S. Department of Transportation; U.S. Department of Health and Human Services; U.S. Dept of the Interior; U.S. Department of Transportation Federal Highway Administration; and the National Nuclear Security Administration.

[7] *See* Globalstar Press Release, *Globalstar Applauds Updated DOD Policy Regarding the Procurement of Satellite Handsets*, May 18, 2006, available at *http://www.globalstar.com/en/news/pressreleases/press_display.php?pressId=407.*

[8] *See* Order and Authorization, Globalstar, LLC, *Request for Authority to Implement an Ancillary Terrestrial Component for the Globalstar Big LEO Mobile Satellite Service (MSS) System,* 21 FCC Red 398 (2006). Globalstar already has proven the ease with which ATC services can be integrated into its MSS system in a series of demonstrations in New York and Washington in the summer of 2002, conducted pursuant to its ATC experimental license (Call Sign WC2XXD). In those demonstrations, Globalstar used a transportable base station no larger than a suitcase and modified Telit 550 dual mode Globalstar/GSM phones to enable demonstration participants to place calls to anywhere in the world through the base station and the satellite system into the public switched telephone network. *Id.* at ¶ 16.

[9] *See* Globalstar Petition for Expedited Rulemaking to provide Ancillary Terrestrial Component Services in its Entire Spectrum Allocation (filed June 20, 2006) ("*Globalstar Petition for Expanded ATC Authority*"). *See also* Consumer and Governmental Affairs Bureau Reference Information Center Petition for Rulemakings Filed, Report No. 2784 (Jul. 27. 2006). To date, the FCC has not acted on Globalstar's Petition.

[10] *See* Comments of Globalstar submitted to the Federal Communications Commission Independent Panel Reviewing the Impact of Hurricane Katrina, Pub. Notice DA 06–57 (Jan. 27, 2006) available at *http://www.fcc.gov/eb/hkip/PubCom/Globalstar.pdf*; Statement of James Monroe III, Chief Executive Office, Globalstar, LLC, before the Federal Communications Commission Independent Panel Reviewing the Impact of Hurricane Katrina, at 2–3 (Mar. 6, 2006) available at *http://www.fcc.gov/eb/hkip/GSpeakers060306/ACT1050.pdf.*

not realize that satellite phones require a clear line of sight between the handset and the satellite in order to function effectively. Accordingly, Globalstar believes that it is essential that first responders and other emergency personnel receive proper training on the operation of satellite equipment, and that such training be updated on an ongoing basis as technologies evolve. Such training could be organized for local, state and Federal level first responders under FEMA, and Globalstar is actively engaged in training and outreach initiatives with its public safety customers so that they are prepared when the next emergency occurs.

2. *Deployment Plans.* In reviewing its experiences during Hurricane Katrina and other emergencies, Globalstar has found that first responders often do not have pre-emergency deployment plans in place that they can invoke in advance of an actual emergency. As a result, Globalstar had difficulty determining where to send its phones and other equipment for staging into disaster areas. In the case of Hurricane Katrina, only through repeated contacts with FEMA and other officials was Globalstar ultimately advised where to send it equipment, which resulted in significant delays in the delivery of Globalstar equipment into the hands of those who needed it. In order to avoid this problem in the future, Globalstar believes that it is vital that first responders, preferably through cooperation at both the state and Federal level, establish a plan to deploy operable equipment in advance of an emergency. Globalstar also recommends that such plans ensure military (*i.e.,* National Guard) assistance to transport emergency communications equipment into the affected area faster and more efficiently.

3. *Funding Mechanisms.* During and in the aftermath of Hurricane Katrina, Globalstar found that although many local and state first responders already had operable Globalstar phones for emergencies, in a number of cases they either did not know how to activate their service through their local or state government procurement agency, or did not have funding readily available for procurement. This lack of available funding mechanisms often resulted in delays before Globalstar service could be activated, leaving first responders with little or no communications capability. Globalstar believes that, in order to overcome the difficulties that first responders might have in securing budget approval to pay for multiple service subscriptions for phones that they might not use on a day-to-day basis, local, state and Federal agencies should examine whether there are ways that they might improve their contracting methods and/or pool their emergency communications funds to ensure that they are prepared for future emergencies. For example, first responders could seek to share the cost of communications equipment on a statewide (or nationwide) basis and, consequently, receive volume discounts on their minutes of use. Globalstar also has launched special pricing and service plans to ensure that Globalstar's services are cost effective for first responders with limited communications budgets.[11] Globalstar believes that the FCC should encourage other communications providers to do the same.

4. *State of-the-Art Equipment.* In Globalstar's experience, because of budget and other procurement constraints, first responders often do not have the same state-of-the-art equipment that its large commercial customers have. There are a number of relatively new communications products for first responders available from Globalstar and other satellite service providers. For example, during Hurricane Katrina, Globalstar's technicians developed and sent to FEMA four transportable Globalstar Emergency Communications System "picocells"—transportable units about the size of a large ice chest that are configured with Globalstar Fixed Access Units ("FAUs") and GSM cellular picocells. When combined with a small PC not much bigger than a laptop, these units essentially create a small local area network that is capable of handling six simultaneous cellular-to-satellite calls, five simultaneous cellular-to-satellite calls, and one 9.6 kbps data "call." Other satellite-based products that could be of great value to first responders include narrow bandwidth video, solar-powered phones and satellite backhaul infrastructure for cell phones and other portable communications equipment. Local, state and Federal agencies and commercial operators must work together to develop and deploy new solutions for emergency preparedness.

5. *Health Care Communications.* Finally, Globalstar believes that it is vital that the FCC take additional steps to ensure that not only first responders, but also members of the medical community have access to reliable, redundant, state-of-the-art communications equipment fur use during times of emergency. Globalstar provides satellite communications services to approximately 1,100 hospital and other health care facility subscribers, many of which have multiple Globalstar phones. In

[11] *See, e.g., Globalstar Launches Emergency Satellite Rate Plan,* Press Release of March 2, 2006, available at *http://www.globalstarusa.com/en/about/newsevents/press_display.php?pressId=62.*

addition, Globalstar has taken concrete steps to ensure that its services are made available to additional hospitals and other health care providers that normally might not seek out satellite equipment due to cost constraints.[12] But still today, many hospitals and other health care centers only have terrestrial communications networks at their disposal, leaving them ill-prepared in the event of future natural or manmade disasters.

III. Conclusion

Globalstar respectfully submits the above recommendations to aid the Committee and the FCC in their efforts to facilitate interoperability among first responders and to ensure that the Nation is prepared for future emergencies.

Exhibit 1

FEDERAL COMMUNICATIONS COMMISSION INDEPENDENT PANEL REVIEWING THE IMPACT OF HURRICANE KATRINA

Comment of Globalstar, LLC
Public Notice DA 06–57
January 27, 2006

In the aftermath of Hurricane Katrina, Globalstar was one of a very small number of telecommunications companies serving the Gulf Coast region whose services were not disrupted. We are one of only two FCC-licensed companies that provide mobile satellite services ("MSS") using battery-powered handheld and vehicle-mounted phones. Our MSS phones are "operable" with each other and with any other communications device that is connected to a public-switched telephone or wireless network anywhere, including wireline, cellular, and interconnected specialized mobile radio and private systems.[1] As a result, a Globalstar user can communicate via satellite with any other Globalstar user and with anyone on or connected to the worldwide public-switched telephone network. Globalstar's services proved their value to first responders and other public safety entities by operating without interruption throughout the Gulf Coast during the hurricanes and in their aftermath.

In his Written Statement of September 29, 2005, before the House Subcommittee on Telecommunications and the Internet Committee on Energy and Commerce ("September 29 Hearing"), Chairman Kevin Martin noted:

> Fortunately, satellite service providers did not experience damage to their infrastructure. They have helped to bridge some of the gaps left by the outages by providing satellite phones and video links to law enforcement officials, medical personnel, emergency relief personnel, and news outlets.

The Chairman's comment is absolutely true, but it fails to capture the vital role that satellite phones and data terminals played in the days, weeks, and months following Hurricanes Rita and Wilma, as well as Katrina. MSS is not a service that is "nice to have" or a "bridge service" that will make do until terrestrial services are restored. To the contrary, MSS is an increasingly essential service for legions of government and non-government customers who require communications during emergencies or in remote areas or who simply want telecommunications capability that they know will work under virtually all conditions.

We here provide a summary of Globalstar's response to the Hurricane Katrina emergency.

- In advance of Hurricane Katrina:
  - Prepositioned phone inventory to strategic locations
  - Re-allocated coverage footprints of Texas and Florida Gateway earth stations to increase capacity in Gulf region
  - Trained network operations team to monitor usage patterns in real-time to manage anticipated traffic increase effectively

---

[12] For example, in 2004 the Iroquois Healthcare Association (IHA) used grant funding to purchase one in-hospital telephone, one portable telephone and one laptop computer with an Internet connection through Globalstar for each of 29 hospitals in 12 counties to provide redundant communications for use during times of emergency. See Signal—Armed Forces Communications and Electronics Association, April 1, 2004 (Volume 58; Issue 8), 2004 WLNR 15277393.

[1] In his testimony at the September 29 Hearing, Satellite Industry Association Chairman Tony Trujillo presented a comprehensive review of the role and importance of the satellite industry to emergency preparedness. We incorporate Mr. Trujillo's testimony by reference.

- Immediately after Hurricane Katrina:
  - Donated about 100 phones each to the Governors of Louisiana and Mississippi
  - Activated and deployed roughly 10,000 additional phones within 1 week to FEMA and other state and Federal agencies
  - Activated and deployed some 2,000 simplex data terminals so that FEMA and other agencies could reliably track their mobile and fixed assets such as generators and trailers
  - Doubled the capacity for Globalstar calls to landline phones
  - Within 24 hours increased available network access by 60 percent
  - Continuously reallocated gateway capacity and coverage to maintain service quality in Gulf region
  - Developed and deployed four new transportable Globalstar Emergency Communications System "picocells," which mate GSM cell phones with a Globalstar fixed phone for backhaul to create a small Local Area Network (see attached news release)

We have attached as an Appendix a public version of our principal e-mail reports to the FCC staff between August 30 and September 22, 2005.

Even though Globalstar's calling increased *566 percent* in the week following Katrina compared with the week preceding Katrina, we were able to maintain our quality of service to ensure that FEMA and other first responders had adequate service. Our efforts were recognized by public officials, including President George Bush and Mississippi Governor Haley Barbour, as well as national publications such as the *Wall Street Journal* (in its edition of November 3, 2005).

The point that must not be lost amid public officials' concern about the lack of "interoperability" among the heritage private radio systems licensed to police, fire, and other first responders is that MSS systems already provide "operability" for public safety, national security, and disaster management. Globalstar proved this during two consecutive hurricane seasons—2004 and 2005. The Commission can support the satellite industry and assist its fellow government agencies by helping to increase awareness of the communications capabilities already available via satellite and by encouraging agencies to coordinate among themselves to develop contingency plans using phones and networks that *will* always work during emergencies.

Respectfully submitted,

GLOBALSTAR, LLC.

Globalstar, LLC—Appendix to Comment

SELECTION OF GLOBALSTAR STATUS REPORTS TO FCC
FOLLOWING HURRICANE KATRINA

8/31/05

Here is some additional information about Globalstar's response to the hurricane emergency. Per our conversation, our gateway earth stations are not in the hurricane zone, and we have no outages at all on our system. The gateways serving the hurricane area are in Sebring, Florida and Clifton, Texas. I have attached the coverage maps that we submitted with our Sebring license application, which is currently pending. We are operating Sebring under STA granted July 13.

At this time, we are working from California and Canada (unfortunately, our Gulf States distribution manager based in southern Mississippi lost his home and has not been able to "be on the scene" for us), primarily with FEMA and also with Senator Landrieu's office. The emergency escalated so suddenly yesterday that state agencies are still reacting.

Globalstar distributes phones and service through a network of dealers and its own 800 number and website. As to phones, in the last 36 hours or so we have shipped 500 phones from our warehouse here in California to FEMA at FEMA's designated location. In addition, dealers and individual customers calling the 800 number have ordered another 1,400 phones. (We normally activate about 2,000 phones in the U.S. in an entire month.) These phones are activated and shipped as ordered from our provisioner, Unigistics. While the vast majority of our U.S. phones are Globalstar/CDMA phones manufactured by QUALCOMM, we also have a supply of Globalstar/GSM phones manufactured by our Italian vendor, Telit, which are distributed primarily in Europe. We have been shipping the latter as well, and we are modifying our network to serve them.

With respect to the network, we have taken the steps necessary to increase capacity to accommodate the much greater than anticipated call volume. Specifically:

1. We will triple the Globalstar/GSM capacity of the Sebring gateway by Friday Sept. 2.
2. We will increase the PSTN interconnect capacity at Clifton by 50 percent by Friday Sept. 2 and again by another 50 percent (of original capacity) by Sept. 9. This will allow us to avoid blocked calls and busy signals.
3. We will increase Globalstar/GSM capacity of the Clifton Gateway 2.5 times by Friday Sept. 2.
4. We will increase the overall airlink capacity at Clifton by 50 percent by Sept. 9.
5. We will continue to make adjustments as necessary to meet demand.

[We] will keep you informed about developments in the Globalstar System as they occur. Please do not hesitate to contact [us] by phone or e-mail.

* * * * *

9/1/05

Further to the information that [we] sent you this morning—

One of the two T1 trunks connecting the Sebring, Florida, and Clifton, Texas, Gateways went down after the hurricane. Half of our GSM capacity riding on that trunk was lost. Our Operations Department quickly rearranged our U.S./Canada network configuration and freed up some capacity on the remaining trunk. The arrangement now allows us more GSM call capacity than when we had both trunks up.

As to phone sales, we received orders for another 2,750 phones today. Our provisioning company has added staff to activate phones and will work through the weekend. They can now activate about 1,400 per day (versus a typical 80 per day), which will cause a few days' backlog because of the unprecedented number of orders. We have asked whether they can add additional temporary staff. Our Canadian phone battery supplier has placed orders for battery components and will be significantly increasing its production of batteries. The supplier currently has sufficient inventory for the next couple of weeks.

We have donated 100 phones to the States of Louisiana and Mississippi.

[We] will provide you with an update tomorrow.

* * * * *

9/2/05

Open Letter From the Desk of JAY MONROE
Chairman and CEO Globalstar, LLC

As the tragedy in the Gulf continues to develop, our thoughts and prayers are with those affected. Beyond our concern we are working to ensure that Globalstar provides needed communications to help save lives and property as the country bands together to help the victims of this unparalleled event.

The physical damage to the region has widely affected land-based communications, resulting in many response organizations turning to Globalstar satellite service. We have planned and trained for this kind of situation, but the magnitude of the crisis is staggering, and many have asked us what we are doing in response. Here are some highlights:

Satellite Phone Deliveries

Globalstar is working closely with emergency organizations to get as many units activated and into the hands of these groups so the phones aid recovery teams.

- Within the first week of this disaster, Globalstar, our dealers and clients have deployed over 10,000 phones to the Gulf Coast region.
- Globalstar has donated the use of 100 phones to the States of Louisiana and Mississippi.
- We continue to work closely with FEMA and the American Red Cross.
- We are deploying over 15 times the normal volume of equipment, primarily to response agencies, in order to help the region.

Network Quality

Globalstar was designed from the start to provide reliable service regardless of events on the ground. Our network team is monitoring usage to ensure that we ef-

fectively manage the sudden increase in system usage. Over the past several days, we have:

- Doubled capacity for Globalstar calls to landline phones
- Increased active Globalstar spectrum allocation to handle increased volume
- Re-allocated gateway coverage footprints to increase capacity in the Gulf area
- Continually monitored usage to accommodate regional usage increases

As with all telecommunications systems there may be instances where calls cannot be completed during periods of intensified usage. These occurrences are being minimized with our initial efforts, and our work is ongoing to ensure maximum network availability during this crisis.

Customer Care

Globalstar is providing full support with many employees working well beyond scheduled hours in the United States and Canada. While current wait times and activation times may be longer than normal, every caller who waits will be answered.

Contact

If you would like to purchase Globalstar products please call 1–877–728–7466. For existing customers who may have questions, contact Globalstar Customer Care at 1–877–452–5782. Media inquiries should be directed to John Dark, Senior Marketing Manager, Globalstar at 408–933–4413.

On a personal note, my home is in New Orleans and most of my family lives there. None of us have received a reliable report on the condition of our houses and neighborhoods, and all of us are among the displaced at this time. While it is great solace to know that Globalstar is an important tool in aiding relief workers and individuals in the area, I will share with you my deep anguish over the losses we are all experiencing.

Sincerely,

JAY MONROE,
Chairman and CEO,
Globalstar, LLC.

* * * * *

9/8/05

For the last several days Globalstar has been recording more than 20,000 calls and 60,000 minutes per day through our Clifton, TX, Gateway and an additional 2,500 calls and 7,500 minutes through Sebring, FL. We believe that the majority of these are FEMA calls although we cannot be certain.

FEMA has ordered several thousand of our "AXTracker" simplex data modems. The AXTracker is a battery-operated, self-contained telemetry device designed for asset tracking and fleet management in remote regions. We understand that FEMA is using these to keep track of its emergency equipment in the field such as portable generators.

Our network seems to be functioning properly. We had one problem with a two-circuit private line provided by Sprint connecting Sebring and Clifton. One circuit went down at the beginning of last week. We contacted NCS and our Sprint sales rep and got the circuit back up quickly.

* * * * *

9/20/05

Globalstar has constructed two of its planned four "Globalstar Emergency Communications Systems" (GECS) and hopes to ship the two to FEMA (or other government agencies) by tomorrow. There are two components: (1) A water-resistant crate about 3.5 x 2 x 1.5 feet houses six Globalstar fixed access units (FAUs). The GECS fits in the back of a pickup truck or SUV or in a small boat. The FAUs will be connected by 30-foot cables to their antennas, which can be placed anywhere there is line of sight to the satellites. The user can plug any six telephones into the FAUs through standard RJII jacks. The crate must be connected to a 110V power source. (2) A cellular GSM picocell, which is a device about the size of a dinner plate two inches thick. Two picocells can be connected to the FAUs through a small PC not much bigger than a laptop. The PC provides all the functionality of a cellular base station. The picocell is manufactured by Intelcomm. Additional picoccells could be added by adding more ports on the PC.

When two picocells are connected to the FAUs through the "base station," the whole unit is capable of processing fifteen simultaneous cellular-to-cellular calls (es-

sentially creating a small local area network) or six simultaneous cellular-to-satellite calls, or a combination. Initially, Globalstar will provide preprogrammed GSM SIM cards with special phone numbers. Eventually, we will work out the network connectivity so that any GSM cell phone can be used with the GECS. All of the GECS equipment can carried by two people and set up wherever there is a 110V power source.

* * * * *

9/22/05

As you know, Globalstar's principal U.S. Gateway is in Clifton, Texas, near Waco. Right now, the National Weather Service is showing that Rita will track fairly close to Waco. We do not expect any adverse effects from rain or flooding. Clifton is currently providing the primary coverage in the Katrina area. Our contingency plan provides for expanding the coverage in Sebring, Florida and the two Canada Gateways if we have to shut down Clifton briefly. This will "stretch" the other three Gateway coverage areas, which could result in a reduction in the length of time that any given call can be maintained in the area normally covered by Clifton. However, there will be no total loss of service anywhere. We can execute the contingency plan with about 90 minutes' advance notice.

[We] will keep you apprised of developments as they occur.

[We] don't yet have anything specific to report regarding the provision of additional emergency phones to the Texas Gulf coast except that we have our established relationship with FEMA and will continue to work cooperatively.

Exhibit 2

FEDERAL COMMUNICATIONS COMMISSION INDEPENDENT PANEL REVIEWING THE IMPACT OF HURRICANE KATRINA

Statement of JAMES MONROE III
Chief Executive Officer
Globalstar, LLC
March 6, 2006

Chairwoman Victory and distinguished Members of the Panel. I very much appreciate the opportunity to appear before you on behalf of Globalstar. Globalstar is one of the original "Big LEO" mobile satellite systems licensed by the Federal Communications Commission more than a decade ago. Like the rest of the telecommunications industry, we suffered through the doldrums of the business recession that began in 2000. We entered chapter 11 bankruptcy in 2002, and the pundits, the terrestrial wireless industry and even many of our regulators gave us up for dead. But our loyal and dedicated employees and, most importantly, our customers, did not give us up for dead. Why not? Because we provide a unique suite of products and services that government and industry have come to rely upon in remote areas of the globe and during the emergencies that routinely disable terrestrial wireline and wireless communications for a period of time.

We all know that Hurricane Katrina was a an extraordinary event with an unusually disruptive impact on the land-based telecommunications infrastructure. We also all know that Government's response to the emergency was not acceptable to the public or to its elected officials. My presentation today will address, first, Globalstar's response to the emergency as we experienced it and, second, our recommendations to ensure a faster and better coordinated response if and when the next such event occurs.

In the aftermath of Hurricane Katrina, Globalstar was one of a very small number—perhaps fewer than five—of telecommunications companies serving the Gulf Coast region whose services were *not* disrupted. We are one of only two FCC-licensed companies that currently provide mobile satellite services, or "MSS," using battery-powered handheld and vehicle-mounted phones. Our satellites serve the Southeast United States with the aid of our Gateway satellite Earth stations near Waco, Texas, and Sebring, Florida. Because our satellite constellation is located 850 miles above the Earth's surface, as long as either one of those ground stations is undisturbed, our customers in the Gulf Coast area can obtain uninterrupted service even when all terrestrial communications in the area are unavailable.

Much of the debate among telecommunications policymakers following Hurricane Katrina concerned the lack of "interoperability" among proprietary radio systems used by local, state and Federal police, fire and rescue and other emergency assistance agencies, which I refer to collectively as "First Responders." This lack of interoperability is indeed a problem that these agencies and state and Federal regulators

have been attempting to solve for years. However, the lack of interoperability was *not* an impediment for those agencies that had MSS phones at their disposal during and after the hurricane. This is because MSS phones, which use globally-allocated radio spectrum, and which do not rely on the terrestrial infrastructure to function effectively, are "operable" with each other and via satellite with any other communications device that is connected to the public switched telephone network or to a wireless network anywhere.

If I may, I would like to summarize briefly Globalstar's actions both before and immediately after Hurricane Katrina came ashore.

In advance of Hurricane Katrina, we—

- Prepositioned our phone inventory to strategic locations such as Baton Rouge;
- Re-allocated the coverage footprints of our Texas and Florida Gateway earth stations to increase our capacity in the Gulf Coast region; and
- Prepared our network operations team to monitor usage patterns in real-time to manage the anticipated traffic increase effectively.

Immediately after the hurricane moved out of Louisiana and Mississippi, we—

- Within 24 hours, increased available network capacity in the affected areas by 60 percent;
- Donated about 100 phones each to the Governors of Louisiana and Mississippi;
- Within about 1 week, activated and deployed roughly 10,000 additional phones to FEMA and other state and Federal agencies;
- Activated and deployed some 2,000 simplex data terminals so that FEMA and other agencies could reliably track their mobile and fixed assets, such as generators and trailers;
- Doubled the capacity for Globalstar calls to landline phones;
- Continuously reallocated Gateway capacity and coverage to maintain service quality in the Gulf Coast region; and
- Developed and sent to FEMA. four new transportable Globalstar Emergency Communications System "picocells," which mate GSM cell phones with a Globalstar fixed phone for backhaul to create a small, self-contained local area network.

Even though Globalstar's calling increased a staggering *566 percent* in the week following Hurricane Katrina, compared with the week preceding, we were able to maintain our quality of service to ensure that FEMA and other First Responders had uninterrupted communications capability. Why were we able to do this? Because *we were prepared*.

I do not mean to imply that everything worked smoothly—it did not. No company or government agency can anticipate each potential point of failure during a calamity. Even if we could, the cost of designing hardware and software and preparing ourselves for the unthinkable would be cost-prohibitive. We design our equipment and procedures to work properly "nearly all the time." This does not mean that we cannot take steps to reduce the points of failure.

With that in mind, I would like to share with you Globalstar's observations and recommendations based on our experience, not only with Hurricane Katrina, but also with Hurricane Wilma some weeks later and with the series of hurricanes that struck Florida during 2004.

First, we found that some First Responders, who had the foresight to stock Globalstar phones and other satellite communications equipment, had not received adequate training in proper use of the equipment. This lack of training accounted for a sizable number of communications failures during the first 48 hours after the hurricane. In some cases, First Responders simply had failed to keep the handset batteries charged, just as we at home might fail to keep fresh batteries in our flashlights in the event of a power failure. Others did not realize that satellite phones require a clear line of sight between the handset and the satellite in order to function effectively. Accordingly, it is essential the First Responders and other emergency personnel receive *proper training* on the operation of satellite equipment. There is no reason that such training cannot be organized for local, state and Federal First Responders under FEMA, and Globalstar is actively engaged in training and outreach initiatives with its public safety customers so that they are prepared when the next emergency occurs.

Second, we found that First Responders generally did not have pre-emergency deployment plans that they could invoke in advance of the actual emergency. As a result, Globalstar had difficulty determining where to send our phones and other

equipment for staging into the disaster area. Only through repeated contacts with FEMA and other officials were we ultimately advised to send our equipment to staging areas—primarily Baton Rouge. In order to avoid this problem in the future, it is vital that First Responders, preferably through cooperation at both the state and Federal level, publish a *plan to deploy operable equipment* in advance of an emergency. We also recommend that any such plan ensure military—for example, National Guard—assistance to transport emergency communications equipment into the affected area faster and more efficiently.

Third, we found in many cases that although local and state First Responders already had operable Globalstar phones for emergencies, they either did not know how to activate their service through their local or state government procurement agency, or did not have funding readily available for procurement. It is understandable that First Responders might not be able to secure budget approval to pay for multiple service subscriptions for phones that they might not use on a day-to-day basis; however, if local, state and Federal agencies were able to improve their contracting methods and *pool their emergency communications funds*, they could share the cost statewide, or even nationally, of emergency preparedness and could, consequently, receive volume discounts on their minutes of use.

Fourth, we found that First Responders often did not have the same state-of-the-art equipment that our large commercial customers have. There are a number of relatively new solutions for First Responders available from Globalstar and other satellite service providers. As I noted previously, Globalstar's technicians developed and sent to FEMA four transportable Globalstar Emergency Communications System "picocells." This product is quite similar to an ancillary terrestrial component, or ATC, product that we intend to develop now that the FCC has authorized us to implement ATC. Other satellite-based products that could be of great value to First Responders include narrow bandwidth video, solar-powered phones and satellite backhaul infrastructure for cell phones and other portable communications equipment. Local, state and Federal agencies and commercial operators must *work together to develop and deploy new solutions for emergency preparedness.*

In summary, we recommend that First Responders train their employees on the proper use of equipment, deploy emergency equipment in advance of a disaster, work together to share resources and funding, and work with industry to procure and maintain, state-of-the-art equipment.

That concludes my prepared statement. I respectfully refer the Panel to Globalstar's written statement submitted on January 27 for additional detail about Globalstar's response to Hurricane Katrina. Thank you.

PREPARED STATEMENT OF PAUL J. COSGRAVE, COMMISSIONER, DEPARTMENT OF INFORMATION TECHNOLOGY AND TELECOMMUNICATIONS, CITY OF NEW YORK

New York City strongly commends the Senate Commerce Committee for addressing our concerns with the $1 billion public safety interoperability grant program that the Committee established last year. In the recently proposed "Interoperable Emergency Communications Act" (S. 385), which provides the National Telecommunications and Information Administration (NTIA) with additional guidance on how to allocate the $1 billion in interoperability funding, the Committee removes a counterproductive linkage between funding eligibility and the use of specific spectrum.

Last year, Congress expedited the release of $1 billion in grants to state and local public safety agencies to support the deployment of interoperable public safety communications systems. While applauding Congressional recognition of the need for such funding, the City of New York was greatly troubled that such grants would be directed solely toward a newly reallocated portion of the wireless spectrum. As Mayor Bloomberg made clear in Senate testimony and a separate letter (attached), this statutory preference for newly allocated public safety spectrum would not serve the interests of high-risk cities like the City of New York.

New York City, however, urges the Committee to go further. A provision in S. 385 would not permit interoperability grants to be provided directly to localities. Especially in the Nation's highest risk areas, wireless public safety communications systems are funded and deployed by municipal agencies. In the initial hours after an event, state agencies are unable to play a significant role in emergency response in major metropolitan areas. Indeed, New York City has been a leader in the development of public safety communications. New York City has already invested more than $1 billion in our own public safety infrastructure, including a commitment of well over $0.5 billion to upgrade our interoperable voice and data networks since the September 11, 2001 attacks.

Unfortunately, S. 385 would effectively prohibit interoperability grants from being provided directly to the agencies that need them most: *local first response agencies in high-risk urban areas*. In particular, the bill would require the Assistant Secretary of NTIA to distribute the grants on the basis of the USA PATRIOT Act formula, including a states-only distribution and a minimum to each state of 0.75 percent, which consumes 40 percent of the funds without any consideration of risk. It is New York City's view that the USA PATRIOT Act formula effectively shifts funds away from high-risk areas, which the 9/11 Commission recommended be the basis for all homeland security grant allocations. Furthermore, the requirement that funds be distributed to states only ensures that the communications needs of state agencies will be given preference over the needs of municipal agencies, which are in fact the first responders to all urban emergencies. For example, New York State's interoperable communications network applies mainly to State agencies—participation by local agencies is "optional." While we intend to be interoperable with the state's new network, our day-to-day first responder communications would overwhelm the state's system.

I appreciate this Committee's efforts in the area of public safety interoperability, including its responsiveness to New York City's initial concerns. However, the City of New York respectfully, *but most urgently*, requests that S. 385 be modified to address the issues outlined above.

THE NATIONAL GRANGE OF THE ORDER OF PATRONS OF HUSBANDRY

Washington, DC, February 8, 2007

Hon. TED STEVENS,
Vice Chairman,
U.S. Senate Committee on Commerce, Science, and Transportation,
Washington, DC.

Vice Chairman Stevens:

Attached is a copy of the National Grange's November 28, 2006 filing with the FCC supporting the decision to dismiss a petition by Cyren Call to create a Public Safety Broadband Trust. The National Grange believes this proposal to alter the digital television (DTV) provisions of the Deficit Reduction Act of 2005 (DRA 05) will he harmful to rural areas and represents a setback in Congress' effort to provide our public safety professionals with a reliable and interoperable communications infrastructure.

With the inclusion of DTV provisions within the DRA 05, Congress took a definitive step to bring our Nation's television broadcast services into the digital age while freeing up valuable spectrum in the 700 MHZ band for new commercial telecommunications services as well as dedicating a block of 24 MHZ of spectrum for our first responders. As you can see in our filing to the FCC, this represented a thoughtful compromise among numerous stakeholders.

The new commercial applications resulting from the auction of the 700 MHZ band represent an opportunity for traditionally underserved rural communities to benefit from more expansive and consistent advanced telecommunications services. The Cyren Call proposal directly threatens the application of those services. The National Grange respectfully asks for your continued support and swift implementation of the DTV provisions within the DRA 05, including an expedited auction of the 700 MHZ spectrum.

Sincerely,

LEROY WATSON,
Legislative Director,
National Grange of the Order of Patrons of Husbandry

Enc.
Cc:

Chairman DANIEL K. INOUYE
Hon. JOHN D. ROCKEFELLER IV
Hon. JOHN F. KERRY
Hon. BYRON L. DORGAN
Hon. BARBARA BOXER
Hon. BILL NELSON
Hon. MARIA CANTWELL
Hon. FRANK R. LAUTENBERG
Hon. MARK PRYOR
Hon. THOMAS R. CARPER
Hon. CLAIRE MCCASKILL

Hon. AMY KLOBUCHAR
Hon. JOHN MCCAIN
Hon. TRENT LOTT
Hon. KAY BAILEY HUTCHISON
Hon. OLYMPIA J. SNOWE
Hon. GORDON H. SMITH
Hon. JOHN ENSIGN
Hon. JOHN E. SUNUNU
Hon. JIM DEMINT
Hon. DAVID VITTER
Hon. JOHN THUNE

THE NATIONAL GRANGE OF THE ORDER OF PATRONS OF HUSBANDRY
Washington, DC, November 28, 2006

Hon. KEVIN J. MARTIN,
Chairman,
Federal Communications Commission,
Washington, DC.

Re: RM–11348

The National Grange, the Nation's oldest general farm and rural public interest organization, opposes the proposal made by Cyren Call for the creation of a Public Safety Broadband Trust, that would he a free give-away of portions of the 700 MHZ band of spectrum. The National Grange believes that Congress has already taken the necessary action, in the Deficit Reduction Act of 2005, (DRA 05) to allocate an additional 24 MHZ of the 700 MHZ band to first responders for interoperable communications. We strongly believe that the Cyren Call proposal would not be in the best interest of family farmers and other residents of rural communities who currently lack adequate commercial access to advanced telecommunications technologies and who currently face disruptions from the transition to digital TV broadcasting. We also believe that Cyren Call's proposal would undermine, not aid, Congress' effort to provide first responders with the timely, reliable communications systems they need, as recommended by the 9/11 Commission. As such the National Grange supports the decision by the Federal Communications Commission to dismiss Cyren Call's petition on this matter.

By including digital TV (DTV) provisions in the DRA 05, Congress set in motion a plan to advance the Nation's conversion of its TV broadcast services to new digital technology. This will free up vast amounts of high-quality spectrum in the 700 MHZ band, a portion of which will be made specifically available for public safety uses. This plan is entirely consistent with the recommendations made by the 9/11 Commission. The National Grange believes that the transition to DTV will be especially disruptive for rural communities that lack access to competitively priced satellite or cable television services and that continue to rely on over-the-air broadcasting to receive television programming. Nevertheless, the National Grange has supported the DTV transition provisions of the DRA 2005, in part, because the Congress, in its wisdom, allocated a significant portion of the newly available spectrum to become available for additional commercial telecommunications applications. These new commercial applications of spectrum hold out a promise of more robust, more reliable and more consistent service coverage for rural and fanning communities that are currently underserved by existing advanced telecommunications technologies.

The National Grange believes that the provision of new spectrum in DRA 05 for use by first responders is a critical step in meeting their interoperable communications needs in times of natural and manmade crises. Funds for these programs, as well as other programs to facilitate the transition to DTV, will come from the public auction of the remaining spectrum in the 700 MHZ band vacated by TV broadcasters. The DRA 05 provides up to $1.5 billion for digital set top converter box subsidies that will ease the transition to digital TV for rural consumers. An additional $1 billion will be provided to help public safety agencies better deploy and use interoperable communications systems. Additional funds are also provided for a unified national alert system ($156 million) and enhanced 911 services ($43 million).

The National Telecommunications and Information Administration (NTIA) will administer these grant programs. The National Grange has already opened a dialogue with NTIA to explore ways that we can use our network of nearly 2,800 local and county Grange chapters across the United States to assist in implementing a public service education program in rural America to facilitate the transition to DTV in 2009. Delays in implementing the provisions of DRA 05 related to the DTV transition that might arise from further reconsideration of the Cyren Call proposal

would complicate and disrupt our efforts to train and mobilize our volunteer resources in rural communities across the Nation to participate in public service educational campaigns regarding the DTV transition. Other non-profit and civic organizations are preparing similar commitments of resources to assist with this transition in rural communities as well. Given the disproportionate impact that the DTV transition will have on rural communities and the clear necessity for public service educational programs to address those impacts, we believe that further delays in the implementation of the DTV transition provisions would be directly contrary to the legislative intent of the DRA 05.

The National Grange also believes that, in this instance, auctions are the right way to allocate spectrum to commercial telecommunications service providers. Auctions raise billions for the Treasury, and ensure that economic and technical value—not political favoritism—determines the highest and best use of the spectrum. The FCC's own data clearly indicates that, given reliable access to these technologies, consumers in rural areas are increasingly turning to wireless technologies to serve their communications needs. Rural consumers recognize the convenience, mobility, efficiency and security that wireless technologies can provide. The National Grange believes that market demand for advanced telecommunications services in rural communities, coupled with appropriate discretionary oversight of commercial applications of new telecommunications technologies and services by state and Federal regulatory agencies, is more likely to result in greater effective allocation of spectrum resources to serve rural and farming communities than the Public Safety Broadband Trust advocated by Cyren Call.

Under current law, this spectrum auction must occur by January 2008, but the National Grange believes that there is no compelling reason to postpone the spectrum auction until then. The sooner this auction occurs, the sooner critical public funds can be used for DTV transition programs, for enhanced investment in first responder networks and interoperability and for deficit reduction. In addition the sooner this spectrum auction occurs, the sooner that spectrum resources can be made commercially available for deployment of advanced telecommunications services in rural and farming communities.

Recently, Representative Nancy Pelosi eloquently stated the House of Representative's order of business when the Democrats gained the majority. At the top of the list was enactment of all the recommendations made by the 9/11 Commission. Another point she made was that no program shall advance if it increases the Federal deficit. Implementation of the DRA 05, as written, supports both of these goals by improving public safety communications and by providing additional resources to the U.S. Treasury for deficit reduction.

In sharp contrast, Cyren Call's proposal would only advance its own interests, potentially at the expense of family farmers and rural residents who live in communities that are currently underserved by advanced telecommunications technologies and services. It would derail Congress's carefully thought-out plan and current time line for the conversion to digital TV. It would delay the timely allocation of spectrum for public safety communications and other important public benefits.

Thank you for your consideration of the views of the National Grange in opposition to Cyren Call's proposal for a Public Safety Broadband Trust. The National Grange believes that the public interest will best be served if the FCC implements, as enacted, Congress's well-orchestrated digital TV provisions outlined in the DRA 05. These provisions will result in new commercial applications of spectrum that hold out a promise of more robust, more reliable and more consistent service coverage for rural and farming communities that are currently underserved by existing advanced telecommunications technologies.

Sincerely,

LEROY WATSON,
Legislative Director,
National Grange of the Order of Patrons of Husbandry.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. DANIEL K. INOUYE TO CHARLES L. WERNER

Question 1. Both CTIA and the FCC suggest that a national broadband network can be built on 12 of the 24 megahertz that public safety is currently expected to receive following the DTV transition. Why do you believe an additional 30 megahertz is needed? What effect would an additional allocation have on the use of other public safety bands?

Answer. The International Association of Fire Chiefs (IAFC) is a governing board member of the National Public Safety Telecommunications Council (NPSTC) which

has commented on the Federal Communications Commission (FCC) PS Docket No. 06–229, WT Docket 96–86, Ninth Notice of Proposed Rule Making regarding this issue. I have attached a copy of this document, which completely answers your question.

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	PS Docket No. 06–229
Implementing a Nationwide, Broadband, Interoperable Public Safety Network in The 700 MHZ Band	)	WT Docket 96–86
	)	
The Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010	)	

COMMENTS OF THE NATIONAL PUBLIC SAFETY TELECOMMUNICATIONS COUNCIL

The National Public Safety Telecommunications Council (NPSTC) submits these comments in response to the Commission's Ninth Notice of Proposed Rulemaking (Ninth NPRM) in the above proceedings.[1] The Ninth NPRM proposes rule changes that the Commission believes would promote deployment of a centralized public safety nationwide broadband network utilizing the 12 MHZ wideband segment channels in the 700 MHZ band currently allocated to local and state agencies through the regional planning process. The network would encompass Internet Protocol based system architecture and be administered by a nationwide licensee.

It has become increasingly apparent to NPSTC that deployment of a nationwide public safety broadband network is enormously important for emergency responders at all levels of government: local, state and Federal. It will be an essential tool for addressing the expanded domestic defense and emergency response obligations of all public safety agencies. Such a proposal is not a substitute for present land mobile assignments, including the current 700 MHz narrowband spectrum, that provide for public safety mission critical voice communications. However, a data network will serve growing critical needs if it meets the expectations that the 700 MHz public safety segment has portended; it must encompass advanced data services that will also include Voice over Internet Protocol (VoIP) capabilities that will provide a vital backup to public safety mission critical land mobile voice systems; it must conquer the historical public safety challenge of satisfying the most critical communications requirements with highly limited or no resources; and it must be available to all agencies, small or large, wealthy or poor, rural, suburban or urban.

NPSTC believes that these attributes translate to five principles which the Commission must address if it is to provide a meaningful response to the current public safety communications situation: universal access by all agencies, sufficient spectrum to ensure commercial investment and public/private coexistence on a shared data network, a modern data network built to public safety standards and able to accommodate changing requirements, a governance structure ensuring public safety community control and standards and protection of mission critical voice spectrum from interference. We do not believe these attributes can be realized if public safety is limited to the 12 MHZ of its existing 700 MHZ allocation as proposed in the Ninth NPRM. Also, we do not believe that secondary use of the narrowband spectrum provides any meaningful spectrum supplement for broadband use because the areas of the country where there will be the greatest demand for broadband are the same areas where the narrowband voice channels will be fully utilized once the spectrum is cleared and systems are implemented. We also have serious questions regarding the near-term viability of the cognitive technologies that would be necessary for such broadband/narrowband spectrum sharing.

---

[1] Implementing a Nationwide, Broadband Interoperable Public Safety Network in the 700 MHZ band and In the Matter of the Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010, *Ninth Notice of Proposed Rulemaking*, PS Docket No. 06–229, WT Docket 96–86, FCC 06–181 (December 20, 2006).

The Commission, Congress, Administration, public safety and private interests now have a short opportunity to enact and structure a nationwide broadband network that will satisfy the five principles identified above. Unless these principles prevail, the opportunity will be lost and public safety communications will deteriorate further, with many agencies left behind. Set forth below is NPSTC's path to a nationwide broadband network that will improve communications dramatically and bring the unity that is vitally necessary to public safety operations.

The National Public Safety Telecommunications Council

NPSTC serves both as a resource and advocate for public safety organizations in the United States on matters relating to public safety telecommunications. NPSTC is a federation of public safety organizations dedicated to encouraging and facilitating, through its collective voice, the implementation of the Public Safety Wireless Advisory Committee (PSWAC) and the 700 MHZ Public Safety National Coordination Committee (NCC) recommendations. NPSTC explores technologies and public policy involving public safety agencies, analyzes the ramifications of particular issues, and submits comments to governmental bodies with the objective of furthering public safety communications worldwide. NPSTC serves as a standing forum for the exchange of ideas and information for effective public safety telecommunications. The following 13 organizations participate in NPSTC:

American Association of State Highway and Transportation Officials
American Radio Relay League
American Red Cross
Association of Fish and Wildlife Agencies
Association of Public-Safety Communications Officials—International
Forestry Conservation Communications Association
International Association of Chiefs of Police
International Association of Emergency Managers
International Association of Fire Chiefs
International Municipal Signal Association
National Association of State Emergency Medical Services Officials
National Association of State Telecommunications Directors
National Association of State Foresters
National Association of State Telecommunications Directors

Several Federal agencies are liaison members of NPSTC. These include the Department of Agriculture, Department of Homeland Security (SAFECOM Program and the Federal Emergency Management Agency), Department of Commerce (National Telecommunications and Information Administration), Department of the Interior, and the Department of Justice (National Institute of Justice, CommTech Program).

Current Proposals Addressing Broadband

The Ninth NPRM is the most recent in a series of Commission proceedings that address the optimal use of this critical portion of the spectrum. In addition to this proposal for deployment of a nationwide broadband public safety network, the Commission also has open proceedings in which it is examining the structure of the 700 MHz public safety allocation, the reallocation of certain 700 MHz guard band segments and service rules for the yet-to-be auctioned 700 MHz commercial allocation. These converging proceedings present a pivotal opportunity to propose the 700 MHz capacity needed to support an economically viable, sustainable, nationwide, broadband public safety network, if sufficient spectrum is made available to do so. By examining these proposals one can discern a path that reflects the principles identified herein and that will thereby unify public safety communications while providing commercial interests a viable opportunity to invest in and use the network.

The Commission first began to explore how to provide broadband capability for public safety from the current 700 MHz wideband and guard band segments while preserving local discretion in choosing whether the spectrum would be utilized for broadband or wideband applications.[2] Public safety input to that proceeding was

[2] In the Matter of the Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010, *Eighth Notice of Proposed Rulemaking*, WT Docket 96–86, FCC 06–34 (March 21, 2006) and In the Matter of Former Nextel Communications, Inc. Upper 700 MHZ Guard Band

clear that the Commission needs to provide the option to choose wideband or broadband solutions within the current 700 MHz data spectrum as requirements dictate. Under the Access Spectrum/Pegasus proposal,[3] the current 4 MHz B Block guard band would be eliminated, with 3 MHz placed in the public safety segment and 500 kHz paired channels moved to the A Block guard band, which would be relocated adjacent to the spectrum added to the public safety segment. This spectrum is from two sources: of the 52 B Block licenses, 42 are held by the Commission as a result of the 800 MHz reconfiguration, having originally been licensed to Nextel, with the remaining 10 licenses held by Access Spectrum, Pegasus, and others, who seek compensation for relinquishing these licenses.

A consensus among public safety organizations has emerged embracing the Access/Pegasus proposal while recognizing its inherent limitations. NPSTC believes this proposal should be adopted, regardless of the licensing structure ultimately chosen for the existing data spectrum because it helps minimize interference to the 700 MHZ narrowband voice spectrum. However, even with the reconfiguration that Access Spectrum and Pegasus have proposed, the resulting spectrum is still far short of that needed for a nationwide broadband network and the regulatory structure proposed by the Commission would not support deployment of such a network. As noted above, local officials need the discretion afforded by the regional planning process to use the current 700 MHZ data segment for either broadband or wideband operations, as addressed in responses to the previous Eighth NPRM. It preserves for local officials, whose governments must assume associated capital and operating costs, the decision whether to pursue a more resource-demanding broadband network or more cost efficient wideband network. The discretion is particularly important to rural agencies facing large coverage and topology challenges where the costs for local governments makes implementation of wideband coverage more achievable than the advanced services broadband will provide.

By contrast, any nationwide broadband network, of necessity, must be uniform in design and deployment. It must be available to all agencies; otherwise it will not unify public safety but further divide it. For this reason, it must be in addition to, not a replacement for, the systems that will be deployed on the current 700 MHZ wideband segment, as enhanced by the Access Spectrum/Pegasus proposal.

It is in this context that NPSTC, and the public safety community, has embraced the Public Safety Broadband Trust (PSBT) proposal.[4] The PSBT proposes that 30 MHZ of the yet-to-be auctioned spectrum in the upper 700 MHZ band be committed to public safety communications for a nationwide interoperable broadband network. A trust, organized, populated and controlled by the public safety community, would be established to administer these channels and develop funding sources to build and maintain the network. To that end, private entities would lease access to the spectrum from the trust in a shared government/commercial environment; the leasing revenue would fund building, maintaining and upgrading the network and also repay monies borrowed against Federal loan guarantees to compensate the Treasury for foregone auction revenue. The PSBT would establish the technical parameters of the network to ensure public safety standards, pervasive interoperability among agencies and open architecture. It presents a governing body embracing public safety representation and a management structure promoting public/private spectrum use.

Critically, the PSBT approach presents a path toward a nationwide public safety broadband network because it addresses the systemic under-funding of government radio systems on an ongoing basis. It will be able to do so, however, only if there is sufficient spectrum to attract commercial interest to invest in a shared government/commercial network. The shared environment that would emerge provides adequate spectrum to protect all interests and a funding base to construct and maintain the network, a forceful incentive for coexistence. It is this essential element that is absent in the Ninth NPRM which proposes only 12 MHZ of already allocated public safety 700 MHZ spectrum for this critical purpose.

NPSTC recognizes that the PSBT concept will require Congressional approval not to auction the 30 MHZ of the 60 MHZ of commercial 700 MHZ spectrum. It will

---

Licenses and Revisions to Part 27 of the Commissions Rules, WT Docket No. 06–169 and Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements through the Year 2010, WT Docket No. 96–86, *Notice of Proposed Rulemaking (NPRM)*, FCC 06–133 (September 8, 2006).

[3] Access Spectrum and Pegasus are current holders of 700 MHZ guard band licenses.

[4] Consumer and Governmental Affairs Bureau Reference Information Center, *Petition for Rulemakings Filed*, Report No. 2794, RM 11348, Part 27, Cyren Call Communications Inc., In the Matter of Communications Reallocation of 30 MHZ of Corporation 700 MHZ Spectrum (747–762/777–792 MHZ) from Commercial Use (October 30, 2006), Dismissed, *Order*, DA 06–2278 (November 3, 2006).

require Congressional enactment allowing the PSBT to borrow monies to pay the Treasury the revenues that would have come from auction. While the concept is opposed by commercial interests that seek to purchase the spectrum, the PSBT proposal presents the best path to unify public safety services, its premise being to offer a new, exciting and achievable path to solving the challenges of future public safety communications.

The Ninth NPRM has some of the same characteristics as the PSBT. However, there are also several important and decisive differences. Most critically, instead of 30 MHZ, the nationwide network proposed in the Ninth NPRM would consist of only 12 MHZ. With a spectrum segment so small, it provides no realistic means to build and maintain an advanced broadband network. Its pay-as-you-go format continues the status quo in a sector that is perennially under-funded. Its Commercial Mobile Radio Service (CMRS) model approach ignores and would dangerously compromise the diversity, redundancy, security and universal obligations of public safety communications. Its reliance on cognitive technologies is untested in any public safety scenario.

The inadequacy of spectrum in this proposal culminates in its most serious flaw. NPSTC is firmly convinced that commercial interests will have no incentive to invest in the network. NPSTC has made inquiries of private interests regarding commitments to invest and use the spectrum under the circumstances proposed by the Ninth NPRM. Responses were negative and premised on the lack of adequate spectrum to coexist with public safety given the preemptible status of commercial service on the network. The use of 12 MHZ simply will not provide even the capacity to accommodate the enormous expansion of domestic defense and emergency responsibilities of local, state, and Federal Government agencies, much less present viable opportunities for shared commercial usage.

Without commercial investment to support the build-out and maintenance of the network, the burden will fall to state and local governments under the pay-as-you-go format. Faced with ever-increasing burdens to protect our homeland this is neither realistic nor achievable. Under the Ninth NPRM concept no nationwide public safety broadband network will ever be built. Deploying and maintaining a nationwide broadband network consistent with public safety standards, generating revenues to assure universal access, promoting public/private use and possessing the ability to respond to emergent circumstances requires a focused and accountable structure that the Ninth NPRM cannot deliver.

The Opportunity

NPSTC believes that within the PSBT concept, the Access Spectrum/Pegasus guard band proposal, and the Ninth NPRM is a path to a nationwide public safety broadband network that will improve quality and coverage and unify public safety. The path embraces universal access, sufficient spectrum to ensure commercial investment and participation, capital and operational resources ensuring an enduring modern nationwide broadband network and a governance structure ensuring public safety community control, emergency response standards and management expertise and efficiency. The foundation for the path is the dedication of spectrum that is adequate to support the initiative.

This path requires action by the Congress, Administration and the Commission. The public safety controlled PSBT must have the requisite statutory or regulatory authority to assume daily management of the spectrum, finance the deployment and pay the Treasury for the value of spectrum intended for auction, with discretion to take such action as necessary to respond to expanded or emergent needs, all subject to the Commission's regulatory authority and to Congressional oversight.

The interests of all parties desiring access to the 700 MHZ band can converge to secure this short-lived opportunity. Public safety can be convinced to embrace a shared environment if the nationwide broadband network is available to all agencies for the full range of uses and environments that agencies encounter daily and if operations are protected. Private investment and commercial use will ensue where adequate capacity and reliability is present. An accountable PSBT can ensure through supervision and incentive, that cognitive radio technology is eventually possible in both public and commercial environments, subject to appropriate testing. For the first, and perhaps last time in our history, adequate spectrum resources combined with concepts the Commission has under consideration make a nationwide public safety broadband network possible.

Summary

NPSTC recognizes the reality that the expectations and economic value of those pursuing the yet to be auctioned 700 MHZ band compete with providing a nationwide public safety broadband network. The Commission's Ninth NPRM initiated an

examination of how these seemingly competing objectives can be reconciled. NPSTC believes that the core principles enumerated above set the proper course and that these interests can ultimately converge.

NPSTC's plea is that the interests involved and the consideration by the Congress, the Commission and the Administration comprehend another reality. Current public safety operations are complex and difficult, hindered by lack of resources, where dangerous delays and disruption lurk. Congestion of public safety communications channels pervades virtually every urban and suburban area. The improvements a nationwide public safety broadband network will afford will make an enormous difference to the effectiveness of deterrence, response and investigation. The greatest and most definitive benefit will accrue to the citizen who desperately needs help when confronted with an emergency.

Respectfully submitted,

VINCENT R. STILE,
Chair,
National Public Safety
Telecommunications Council.

February 26, 2007

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	PS Docket No. 06–229
Implementing a Nationwide, Broadband, Interoperable Public Safety Network in The 700 MHZ Band	)	WT Docket 96–86
	)	
The Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010	)	

REPLY COMMENTS OF THE NATIONAL PUBLIC SAFETY TELECOMMUNICATIONS COUNCIL

The National Public Safety Telecommunications Council (NPSTC) submits these reply comments addressing the Commission's Ninth Notice of Proposed Rulemaking (Ninth NPRM) in these proceedings.[1] The Ninth NPRM proposes a centralized interoperable public safety national broadband network that will be shared with commercial interests. It proposes to use the 12 MHZ wideband segment currently allocated to the public safety service in the 700 MHZ band.

The benefit and need for a public safety broadband network is endorsed by cellular carriers, equipment manufacturers, public safety agencies and organizations. While embracing this essential objective; the comments diverge regarding how to attain the goal. The divide centers on whether public safety agencies need additional spectrum. Cellular carriers, pursuing the remaining 60 MHZ of the 700 MHZ band through the auction process, oppose any additional allocation; asserting that public safety's current allocation is adequate.

NPSTC believes that additional spectrum is crucial to meeting public safety's expanded responsibilities. It is critical to the technical and economic viability of the Commission's proposal. The Commission should reject the static position that denies the enormous expansion of domestic defense and emergency response responsibilities. It should pursue a path providing additional spectrum for a broadband network capable of delivering improvements paralleling today's challenge.

Summary of Comments

Interests supporting the Ninth NPRM's premise that 12 MHz is sufficient for a public/private network include cellular carriers, broadband equipment providers and

---

[1] Implementing a Nationwide, Broadband Interoperable Public Safety Network in the 700 MHZ band and In the Matter of the Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010, *Ninth Notice of Proposed Rulemaking*, PS Docket No. 06–229, WT Docket 96–86, FCC 06–181 (December 20, 2006).

their trade associations.[2] Several oppose any additional spectrum for public safety communications.[3] These interests also recommend relocating current public safety narrowband voice channels but object to the proposal of guard band licensees to provide additional channels to public safety.[4]

In contrast, public safety agencies and other interests state that 12 MHZ is inadequate to support public safety operations and cannot additionally accommodate commercial interests, reflecting, as APCO indicates, the proposal's "fatal" flaw.[5] Many public safety comments emphasized that eliminating the wideband channels diminishes the options and flexibility afforded to local officials.[6] Secondary operation by commercial interests on the 12 MHZ public safety segment was strongly challenged.[7] The guard band licensee proposal to provide public safety additional channels was endorsed.[8] Several comments challenged the ability of the commercial radio service (CMRS) model to meet public safety standards of universal coverage, redundancy, diversity and reliability.[9] Several parties noted that the Public Safety Broadband Trust (PSBT), in contrast to the Ninth NPRM, is a viable technical and economic proposal.[10]

Equipment manufacturers Dataradio, M/A Com and Motorola discussed the importance of flexibility for local operations and addressed these requirements in the context of band alignment. Northrop Grumman stated that the viability of the proposal is so tenuous it would delay access to the 700 MHZ band. Cyren Call reiterated its PSBT proposal that would use 30 MHZ of the yet to be auctioned 700 MHZ band for a public/private broadband network; Frontline Wireless proposed that a new E Block of 10 MHZ be established from this spectrum to serve public safety agencies and carriers.

NPSTC's position is more than a simple plea for additional spectrum for public safety. It recognizes the technical challenges pervading the band yet the opportunities and efficiencies presented by broadband technology. We have pursued policies throughout the 700 MHz proceedings that promote not only the coexistence of services but a complementary environment benefiting all interests. While our review of the comments is biased toward those presenting positive contributions to public safety's challenges, an important element is the benefits that can accrue across all users.

Additional Spectrum is Integral to a Nationwide Public Safety Broadband Network

Assertions that public safety has adequate spectrum are insulated from the reality facing the Nation's emergency services. The cellular deployment experience has neither the history nor the challenges and should not serve as the justification to deny public safety additional spectrum. No commercial carrier has channels spread over ten frequency bands that vary widely in propagation characteristics, and often needing the use of multiple bands simultaneously at an incident scene. Nor has any carrier faced an almost 50 year history of regulatory direction to reduce channel size, a direction counter to broadband delivery. In their comments for this proceeding, the Consumer Electronics Association and High Tech DTV Coalition have made reference to the Criterion Economics paper released on February 6, 2007 and entitled "Improving Public Safety Communications: An Analysis of Alternative Approaches." This paper, prepared at their expense, was developed to primarily support their assertions that public safety does not need more spectrum and distorts facts concerning the history and intended purpose of the 24 MHz of public safety spectrum allocated by Congress in the Balanced Budget Act of 1997. We urge the Commission to review the March 7, 2007 report of Cyren Call Communications entitled "Setting the Record Straight: A Critique of Criterion Economics' Improving Pub-

[2] Comments of Verizon Wireless, AT&T, MetroPCS Communications, Alcatel-Lucent, the Cellular Telecommunications Internet Association (CTIA) and Consumer Electronics Association (CEA).

[3] Comments of AT&T, MetroPCS Communications, CTIA and CEA.

[4] Comments of Verizon, AT&T, Alcatel and CTIA.

[5] Comments of the City of Philadelphia, Region 22 Planning Committee, Metropolitan Washington Airports Authority, Association of Public Safety Officials, International (APCO), Northrop Grumman, GEOCommand, RCC, Spectrum Coalition and Cyren Call.

[6] Comments of the City of Philadelphia, Region 22 Planning Committee, Dataradio, M/A Com, Motorola, Northrop Grumman, Spectrum Coalition and APCO.

[7] Comments of the Telecommunications Industry Association.

[8] Comments of Region 39 700 MHZ Committee, Region 22 Planning Committee, Dataradio, Access Spectrum/Pegasus, Missouri Highway Patrol, Frontline Wireless.

[9] Comments of Dataradio, Northrop Grumman, RCC, Spectrum Coalition.

[10] Comments of APCO, Region 22 Planning Committee.

lic Safety Communications: An Analysis of Alternative Approaches."[11] In our view this paper does an excellent job of explaining the true history of public safety communications and the vast difference of needs between public safety and commercial systems.

Unlike the cellular carriers, public safety agencies face widely varying geographic and population requirements where they must provide service. Broad geographic areas must be covered efficiently for a small number of users, requiring relatively high power handsets or other mobile receivers as compared to the cellular environment. Public safety cannot tolerate denied access, garbled transmissions or dropped calls. These values translate to substantially higher standards of reliability for the infrastructure and equipment. The cost is not only additional investment, which is consistently under funded, but often results in diminishing of network capacity. The result is an achieved value and not an indication that public safety uses its spectrum inefficiently.

Added to this environment is that today's first responder works in a world transformed by the September 11, 2001 attacks and the recent hurricanes. The 9/11 Commission's recommendation of additional public safety spectrum was not misinformed but grounded on the enormous enlargement of state and local government responsibilities. It recognized the widening gap between the responsibilities of local, state and Federal agencies for domestic security, emergency preparedness and radio resources. Of the many policy and technical decisions faced by the Commission in this proceeding, the amount of spectrum dedicated to public safety is the key to meeting these challenges.

The current structure of the public safety services, including the 700 MHZ public safety allocation, provides local governments, who must pay for the networks capital and operating costs, wide discretion. This is consistent with the national framework committing the management and financing of public safety responsibilities to local government. Contentions that the CMRS history should be either a model showing inefficient public safety spectrum use or the path to deliver public safety services are wrong. Instead, what emerges is a blind allegiance to commercial control of the remaining 60 MHZ of 700 MHZ and a deep discounting of what this spectrum can provide to emergency response.

Failing to Provide Additional Spectrum While Eliminating Current Flexibility and Discretion in the 700 MHZ Public Safety Segment Presents Significant Risks

Removing the 12 MHZ from its intended use and mandating a broadband network will come at significant cost and create substantial risk. It will remove local officials with primary responsibility for public safety from determining how radio resources should assist their operations. Comments in support of the Ninth NPRM ignore that wideband is appreciably more affordable and effective for many agencies, especially in less densely populated areas. This is particularly critical when the only funding comes from local, state and Federal taxpayers. The comments also improperly discount the proposal of the guard band licensees to increase flexibility and discretion to shape communications to respond effectively.

The importance of the guard band licensee proposal is in what it provides and in its underpinnings. It adds crucial flexibility allowing local agencies to choose more cost efficient wideband channels or the expanded services accompanying broadband. Underlying the proposal is an extensive technical analysis demonstrating its ability to protect against interference between and among services while promoting more efficient use for public safety and commercial users. It presents a fundamental premise of how services cannot only coexist but complement one another.

Significantly, contrary to comments urging only the relocation of the public safety narrowband channels to obtain purported adjacent channel compatibility, the guard band licensee proposal resolves challenges from Canadian broadcast operations to U.S. border agencies. The opposing comments do not, and in failing to do so present severe interference challenges to border agencies in the use of the 700 MHZ narrowband voice interoperability channels.

The risk accompanying simply redesignating the 12 MHZ as broadband becomes more profound by the uncertainty of private sector participation and investment. Its fragile and tentative state is starkly shown as not one commercial interest filed a comment stating that it will use the band or invest in it. Similarly, no comment supporting the proposal addressed or refuted the several objections that commercial broadband operations, with secondary authority throughout the public safety seg-

[11] *"Setting the Record Straight: A Critique of Criterion Economics' Improving Public Safety Communications: An Analysis of Alternative Approaches"* prepared by Cyren Call Communications Corporation (March 7, 2007).

ment, present serious interference challenges, particularly to public safety's narrowband voice channels. Much diluted local discretion, substantially increased interference challenges, and an economic model that is not viable, go in a direction opposite of the important goal of an interoperable broadband network providing advanced services to all agencies.

The Justification for Additional Spectrum

NPSTC urges the Commission to pursue assisting public safety in efforts to rescue spectrum from the yet to be auctioned 700 MHZ. We do not believe a viable network can be deployed and used without it.

The path commences with adopting the guard band licensee proposal to add channels to the public safety segment. It requires analyzing not only coexistence but how infrastructure and equipment across various services can complement one another to the benefit of all. The PSBT proposal is at the forefront of how to approach this challenge. The Frontline Wireless proposal should also be given further close examination. While we are waiting for additional details from the proponents, we believe there are a number of issues that, from our perspective, need to be addressed. Under the Frontline proposal, the selection of the operator for a nationwide public safety broadband network would not be made by public safety and not by Congress or the FCC; rather it would be a matter of who puts the highest dollar number on the table. It seems to us that a vitally important decision is being left to chance. Without regard to whether this operator understands the unique requirements of public safety, the operator would be given exclusive rights to share capacity on public safety's 12 MHZ. If the operator runs into financial trouble, public safety could be sitting across the table bargaining with an operator with the sole objective of recovering the highest percentage of their money. The Frontline proposal seems to permit the outcome that if no agreement is reached after negotiations with public safety, the E block licensee would then have the chance to build out "commercial only" facilities on whatever basis it chooses, thus defeating the purpose of the "set aside" in the first place. The commercial operator would be the spectrum licensee of the E block, the system operator, and it would have the exclusive right to access the public safety spectrum on a shared basis. This combination would give too much negotiating leverage when it bargains with public safety to discuss shared facilities. Particularly since it has a great chance of keeping and using the spectrum if no deal is reached, the winner will have no incentive to bargain in good faith with public safety.

NPSTC urges the Commission to cross the barrier so clearly delineated in the comments and move public safety and commercial interests to higher standards. What is presented is the opportunity to provide the spectrum resources parallel to the magnitude of responsibility public safety faces while preserving the opportunities to commercial interests the band presents.

Conclusion

NPSTC urges the Commission to address the need to provide public safety agencies at all levels of government the additional spectrum in the 700 MHZ band required for a viable nationwide broadband network that can assist all agencies. It should reject the myth of those challenging the needs of public safety and who would prefer to keep the value of that spectrum for their own interests.

Respectfully submitted,

VINCENT R. STILE,
Chair,
National Public Safety
Telecommunications Council.

March 12, 2007

Question 2. The President's FY 2008 Budget for the Department of Homeland Security proposes to reduce State and Local Preparedness Grants by over 30 percent from $2.7 million to $1.9 million and to reduce Firefighter Grant Assistance by over 50 percent, from $662,000 to $300,000. Chief Werner, could you briefly discuss the impact these cuts would have on state and local first responders?

Answer. The President is requesting $300 million for the Assistance to Firefighters Grant Program (commonly known as the "FIRE Act"), a 2.4 percent increase from the Administration's proposal last year. The President is also requesting $0 for the Staffing for Adequate Fire and Emergency Response (SAFER) Act grant program. These proposed funding levels represent a significant decrease from the $547 million for FIRE and $115 million for SAFER that Congress appropriated for FY 2007.

In addition, the President requested $250 million for grants through the State Homeland Security Grant Program (SHSGP). This request also represents a significant decrease from the $525 million appropriated by Congress for FY 2007.

The IAFC urges Congress to fully fund the FIRE and SAFER Act grant programs. According to the U.S. Fire Administration's report, "Four Years Later—A Second Needs Assessment of the U.S. Fire Service," there are still major shortages in the basic requirements of America's fire service. For example:

- An estimated 42 percent of volunteers serving in communities with less than 2,500 people serve in departments that are involved in structural firefighting but have not formally trained all involved firefighters in those duties.
- An estimated 36 percent of fire departments are involved in delivering emergency medical services (EMS) but have not provided formal training in those duties to all involved personnel.
- An estimated 65 percent of fire departments do not have enough portable radios to equip all emergency responders on a shift.
- An estimated 60 percent of fire departments do not have enough self-contained breathing apparatus (SCBA) to equip all firefighters on a shift.
- An estimated half (48 percent) of fire departments do not have enough personal alert safety system (PASS) devices to equip all emergency responders on a shift.

It is important that the FIRE and SAFER grant programs be fully funded to meet these basic needs.

In addition, we have concerns about the proposal in the President's budget to limit the use of FIRE grant funding for training, equipment and personal protective gear. The President has proposed this change in prior fiscal years, however each time Congress made sure that the funds could be used for all hazards and for all types of programs, including wellness and fitness, fire prevention, public education, and modifications of facilities for the health and safety of personnel, as the original legislation intended. We urge Congress to continue to make sure that FIRE grant funding can be used for all of the legislatively-authorized categories.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. MARIA CANTWELL TO CHARLES L. WERNER

Question 1. Are you aware if manufacturers of P25 compliant radios have any discretion with respect to conforming to the standard? If so, what features of P25 radio are subject to manufacturer's discretion?

Answer. To my knowledge, if a radio is to be P25 compliant, there is no discretion to conforming to the standard.

Question 2. To the best of your knowledge, have there been instances where certain features of P25 compliant radios from one manufacturer were not interoperable with P25 compliant equipment from another manufacturer?

Answer. Not that I am aware but recently, radios that were supposedly P25 compliant were found not to be through NIST tests. It is a complicated standard and it is even harder for the lay public safety responder to understand and validate.

Question 3. Is there a conformance test for P25 radios that is available today for manufacturers?

Answer. I believe that NIST has developed a test to validate compliance. I recommend that you contact Mr. Derek Orr at NIST regarding additional information about P25.

Question 4. Have there been emergency situations you are aware of where a first responder has stated a preference for using analog radios instead of digital radios?

Answer. Yes, while the digital radios offer many new functional and safety features as well as more efficient use of spectrum, analog offers a clearer voice audio during many fireground operations. Loud noises can create interference and potentially unintelligible audio voice in digital radios.

Question 5. Do you see a role for analog mutual aid channels in the large scheme of achieving interoperable communications?

Answer. Many are in operation today and will be into the foreseeable future. Bridge technology is available and in operation today to connect disparate systems in a planned mutual aid environment.

Question 6. Is there a standard for public safety personnel to exchange data? For exchanging video? Should any standards developed be open standards? What is the danger of not having open standards?

Answer. There are standards being developed (Emergency Data Exchange Language—EDXL) as part of the Global Justice initiative. They are open standards which are crucial to future success and interoperability between devices.

Question 7. Many communities rely on the Department of Homeland Security's SAFECOM guidance in guiding purchase and requests related to facilitating interoperable communications. Do you believe that historically DHS has focused too much on hardware solution? Do you believe that DHS guidance in the past has chilled local governments from pursuing IP-based solutions?

Answer. SAFECOM has developed a "Continuum" to describe the route to interoperability. Technology is only a part of that solution. The first effort, and probably the most significant, is governance. As to IP-based solutions, the technology at this time is not advanced sufficiently to be useful for voice mission-critical public safety wireless radio communications. This also includes the fact that the wireless networks are not made to the reliability and redundant standards of public safety systems. However, a wireless network that is designed under the guidance of the Public Safety Broadband Trust may lead to a network appropriate for these technologies.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. FRANK R. LAUTENBERG TO CHARLES L. WERNER

Question 1. Can you provide the Committee with an update on the costs and status of interoperable systems in the existing public safety spectrum bands?

Answer. There are approximately 55,000 public safety communications operations in the United States. Each one is different with different operational requirements and at different levels of financial ability. The status of interoperable systems in the existing public safety spectrum bands is available from SAFECOM from a recently completed survey of public safety agencies.

Question 2. Has the public safety community conducted studies showing the condition of interoperability nationwide today, matching that interoperability to existing spectrum allocations, and how much additional spectrum is needed overall?

Answer. The SAFECOM Baseline study on interoperability, recently completed, provides information on status of interoperability today. The Public Safety Wireless Advisory Committee Report submitted to the FCC and NTIA on September 11, 1996 provides detailed information on how much additional spectrum is needed overall for public safety. I referred to this report in my testimony.

Question 3. The new broadband network that is envisioned would need enough capacity for both government and commercial use. In any given day, how much capacity would need to be dedicated to public safety vs. commercial use? Would public safety's capacity needs on this network likely increase as time went by?

Answer. I think on a daily basis, the demand would be much like that of the commercial market. During a serious incident a much higher demand would be needed for the initial time immediately following an incident/event.

I think that the increased use will occur but such that the technology and network will increase but similar to that of the commercial subscriber model.

Question 4. What are some of the special needs of public safety that are not available on existing commercial networks?

Answer. The primary reason public safety does not use voice on commercial networks is that commercial networks are generally not built to the hardened status that public safety communications networks are and that public safety priority for its mission-critical status is not assured. Additionally, the commercial network has a drop rate of 2 percent which is much higher than mission critical voice systems of public safety. However a new Public Safety Broadband Trust guided network may well change that paradigm.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. DANIEL K. INOUYE TO HARLIN R. MCEWEN

Question 1. Both CTIA and the FCC suggest that a national broadband network can be built on 12 of the 24 megahertz that public safety is currently expected to receive following the DTV transition. Why do you believe an additional 30 megahertz is needed?

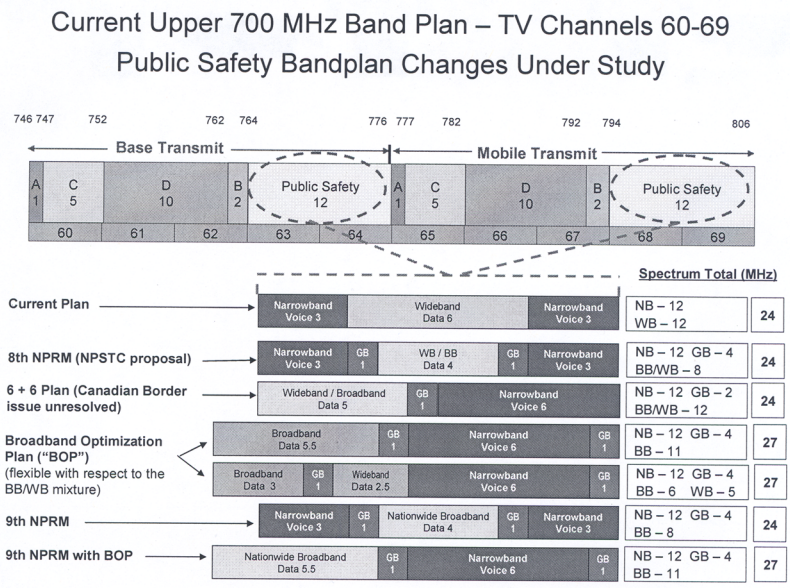
Answer. First, it is important to understand the background of the 24 MHz of spectrum assigned to public safety in the upper 700 MHz band.

In 1995, the Federal Communications Commission (FCC), in concert with the National Telecommunications and Information Administration (NTIA), established the Public Safety Wireless Advisory Committee (PSWAC) to provide an assessment of

the communications needs of public safety agencies through the year 2010. On September 11, 1996, PSWAC released a report setting forth the current and future spectrum needs of public safety. Among the findings of the PSWAC report was that 97.5 MHz of new public safety spectrum was needed by 2010, including 25 MHz within 5 years (*i.e.,* by 2001).

As a result of the PSWAC report, Congress directed the FCC (in the Balanced Budget Act of 1997) to allocate no later than January 1, 1998, 24 MHz of radio spectrum between 746 and 806 MHz (to be recovered from television channels 60–69 as a result of the implementation of digital television). The FCC then reallocated for public safety use, television channels 63, 64, 68, and 69. On August 6, 1998, the FCC created the Public Safety National Coordinating Committee (NCC) under the authority of the Federal Advisory Committee Act (FACA). The purpose of the NCC was to recommend rules for the use of the 24 MHz of spectrum in the 700 MHz band.

The NCC, in its final report in July 2003, recommended that half of the new spectrum (12 MHz) be designated for urgently needed public safety narrowband voice channels, and that the remaining 12 MHz be designated for wideband data channels. Since then, significant advances in technology have made it desirable to add the option of using broadband data channels. To accommodate this there are several new plans currently under study by the FCC.



A proposal known as the Public Safety Broadband Trust has been made to allocate 30 MHz of additional spectrum for public safety (from C and D blocks) to be assigned to a Trust that would be controlled by public safety and would enter into public/private partnerships to deploy a nationwide broadband public safety network that would also be used for commercial broadband communications.

The current 24 MHz of spectrum already allocated for public safety is not sufficient for such a nationwide broadband network because:

1. Half of the spectrum (12 MHz) is allocated for urgently needed narrowband voice and is already licensed and being used by public safety agencies in areas where there are no competing television broadcasters. Many other agencies have this spectrum in the planning process and plan to use it once the television broadcasters have vacated the spectrum in February 2009.

2. The wideband data channels are designated for local and state licensing and are being planned for local, regional and state use. As an example, one contract already has been approved for a three-county wideband system in Minnesota.

3. The 12 MHz of spectrum designated for data channels is not sufficient in capacity to support both public safety and commercial services such as proposed for the Public Safety Broadband Trust (PSBT). There must be sufficient spectrum for commercial investors to be able to offer reliable commercial services that would not regularly be disrupted by public safety pre-emption. Without commercial investors public safety has no funding mechanism to build a nationwide broadband network.

Question 1a. What effect would an additional allocation have on the use of other public safety bands?

Answer. Most of the existing public safety allocations below 512 MHz are highly fragmented on very narrow channels that are interleaved with users such as construction companies, taxicab fleets and tow truck operators. While entirely unsuitable for broadband applications, they were designed to and do meet a wide variety of mission-critical public safety voice communications requirements that are integral to the ongoing responsibilities of public safety officials. The nationwide advanced technology interoperable broadband network under consideration is not expected to replace these legacy voice systems, at least for the foreseeable future, in part because IP-based voice facilities need more testing and performance improvement (particularly in the area of latency) before they will be deemed to satisfy the rigorous reliability requirements of emergency response providers. As individual public safety entities elect to migrate more of their traffic to the proposed broadband network, it is not unreasonable to expect that *some* of the narrowband voice channels could be abandoned and returned to the Commission. However, this is all based upon an assumed build-out of a *nationwide* broadband network such as proposed in the Public Safety Broadband Trust.

Question 2. The President's FY 2008 budget for the Department of Homeland Security proposes to reduce State and Local Preparedness Grants by over 30 percent from $2.7 million to $1.9 million and to reduce Firefighter Grant Assistance by over 50 percent, from $662,000 to $300,000. Mr. McEwen, could you briefly discuss the impact these cuts would have on state and local first responders?

Answer. The states and localities are depending on the DHS grant programs to assist with improving operable as well as interoperable public safety communications systems. Unfortunately many of today's public safety systems are older analog systems that are close to the end of their useful lifecycles. These communications systems are inadequate to handle the tremendous demands that are made of public safety in their everyday duties as well as disastrous or catastrophic events such as a terrorist attack or a major natural disaster. These inadequacies are not remedied by software solutions that simply connect incompatible networks together. The budget cuts that were proposed will delay upgrading systems and will put both first responders and the citizenry at additional risk. There is general agreement that bringing all the Nation's public safety systems into the 21st century must be a priority and that it will take time under the best of circumstances. Given this fact, I regret the cuts to the DHS grant programs. The justification offered for the cuts has been unpersuasive.

First, the interoperability funds in the NTIA Public Safety Interoperable Communications (PSIC) Grant Program were intended to accelerate the use of the new 700 MHz frequencies. By reducing other DHS programs to offset the NTIA funding it leaves public safety with no net gain. It is robbing Peter to pay Paul. Finally, to claim that there is unused funding in the pipeline is misleading. Virtually all that funding is allocated to projects underway but not completed. Congress should recognize that when it appropriates funding for public systems there will be a time period during which the systems are planned, procured and installed.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. MARIA CANTWELL TO HARLIN R. MCEWEN

Question 1. Are you aware if manufacturers of P25 compliant radios have any discretion with respect to conforming to the standard? If so, what features of P25 radio are subject to manufacturer's discretion?

Answer. The P25 Standard contains mandatory core elements that assure interoperability but also allows for manufacturer unique features to encourage innovation and the development of new applications while maintaining interoperability with other P25 radios. P25 radios are tested for compliance at a feature level. All P25 radios need not be capable of all the features defined by the P25 standard. There are core features that must be included to enable interoperability in the standard P25 mode. There are other features that are "optional" but must meet the standard if included. Finally, P25 allows for the inclusion of other features that

have not been standardized, but no features that are not standard can impede the intended interoperability functionality.

Question 2. To the best of your knowledge, have there been instances where certain features of P25 compliant radios from one manufacturer were not interoperable with P25 compliant equipment from another manufacturer?

Answer. The P25 standard is a very lengthy and complex set of documents and over time it has become apparent that different manufacturers in good faith have interpreted certain specific details differently.

There are over 100 localities and 15 states that are operating P25 systems. Many agencies have successfully tested and certified radios on their systems from competitive manufacturers. Among the jurisdictions currently using multiple vendor radios are the States of Alaska, Arkansas, and Colorado, as well as the City of Phoenix.

The national public safety organizations are working with the National Institute of Standards and Technology (NIST), the Department of Homeland Security (DHS) SAFECOM Program, the Project 25 Steering Committee and the manufacturers represented by the Telecommunications Industry Association (TIA) to address the known issues and are in the process of developing new testing and certification procedures to address these issues.

Question 3. Is there a conformance test for P25 radios that is available today for manufacturers?

Answer. A conformance test process was begun in April 2005, and we are hopeful that it will be completed by the end of 2007. NIST, with the support of SAFECOM and the P25 Steering Committee, is developing a comprehensive P25 Conformity Assessment Program. Although a number of the conformance testing procedures are complete, there are a number of "key interfaces" that collectively comprise the P25 standard, and not all interfaces have received complete and uniformly agreed technical definitions, nor have all of the identified test protocols been fully developed.

Aspects of the P25 standard unfortunately are highly technical in nature, and the processes of standards development and definition and of the formulation and application of testing protocols are not easily condensed into concise, easy to communicate summary form. The topics addressed in the prior answers are treated in more detail in a number of documents available on the Internet that may be helpful to you, Senator Cantwell, and others on the Committee who may desire additional background information on these topics. The Commonwealth of Virginia (through the efforts of its State Interoperability Executive Committee) provides a good, summary (yet fairly detailed) overview of the P25 standard, its relevance to public safety communications, and a status summary of conformance testing and validation, along with links to more formal, technical documents, all of which can be accessed at *http://www.interoperability.virginia.gov/P25.html*.

Question 4. Have there been emergency situations you are aware of where a first responder has stated a preference for using analog radios instead of digital radios?

Answer. While digital systems generally offer better performance over a broader range of conditions, much greater flexibility, and more efficiency than analog, some public safety organizations, particularly fire fighters, have continued to prefer analog. Many smaller agencies are still using analog systems and are not able to afford replacing them. Clearly the future of communications will be dependent upon digital systems and the public safety community has been working to make sure that new digital systems meet their mission-critical needs.

Question 5. Do you see a role for analog mutual aid channels in the large scheme of achieving interoperable communications?

Answer. Yes. Public safety has a significant investment in analog mutual aid communications. They are useful not only from an asset perspective but also from a Mutual Aid/Incident Command System perspective. A Mutual Aid response is built on communications interoperability and written agreements that pre-determined resources (human and equipment) respond to numerous scenarios.

Also, some analog mutual aid channels have been "harmonized" across national borders with Canada and Mexico. Current FCC rules require 800 MHz NPSPAC radios be capable of analog mutual aid operation on five specific 800 MHz channels.

Analog mutual aid channels have also been identified in VHF and UHF bands. The FCC has also designated interoperability (Mutual Aid) channels in the 700 MHz band that operate in the digital P25 mode.

Question 6. Is there a standard for public safety personnel to exchange data? For exchanging video? Should any standards developed be open standards? What is the danger of not having open standards?

Answer. There are no specific standards for public safety data exchange today. Public safety would prefer to use open standards wherever possible. Certainly, data exchange standards are important. Examples of this in today's environment are e-

mail and instant messaging. These examples show that while the applications can be different and perhaps proprietary, it is possible to develop information exchange standards so that different end-user applications interface in an effective manner.

Question 7. Many communities rely on the Department of Homeland Security's SAFECOM guidance in guiding purchase and requests related to facilitating interoperable communications. Do you believe that historically DHS has focused too much on hardware solution? Do you believe that DHS guidance in the past has chilled local governments from pursuing IP-based solutions?

Answer. I support the current SAFECOM guidance and the preference it shows for open standards. Open standards are the key to accomplishing true interoperability. For these reasons, I believe that the current DHS guidance is appropriate as it allows for flexibility for state and local first responders to choose the technology solutions that best address their needs.

The P25 standard has been critical in facilitating interoperability between systems from different vendors and injecting competition into the handset marketplace. Regardless of whether we are discussing hardware or software, open standards are crucial, and their necessity is affirmed in the SAFECOM guidance. There is a role for IP but there is work to be done to make it totally acceptable for mission-critical use.

For example, a January 13, 2007, National Security Telecommunications Advisory Committee (NSTAC) Report to the President stated the following regarding IP-based solutions:

> "Today's various IP gateways do not interoperate in part because of conflicting VoIP protocols. Furthermore, they often support only a basic audio patch to the different access networks; to improve end-to-end services and achieve interoperability between these IP gateways, it will be necessary to drive the adoption of interoperable protocols for transporting emergency communications services across IP networks."

Another example goes into more detail. On August 22, 2006, I attended a meeting hosted by the National Institute of Standards and Technology (NIST), Office of Law Enforcement Standards (OLES), in conjunction with DHS SAFECOM. Also in attendance were key stakeholders from various Federal agencies and states, as well as a number of public safety vendors, including M/A-COM, Motorola, Cisco, and Twisted Pair. We were brought together to discuss the role of IP-based solutions for public safety. While the public safety participants discussed the attractiveness of the cost of IP-based systems, we identified limitations such as:

- A lack of standards profiles
- Security related to:
  - Privacy and integrity of messages
  - Authentication and authorization of users
- Reliability
  - Concerns about IP in mission-critical situations

At the end of the session, the entire group reached the following conclusions about the limitations of IP-based solutions:

- "You can't just dump VoIP into an existing network and expect it to work."
- Most public safety agencies do not often have the staff or funding to continuously upgrade and manage their systems to meet the requirements.
- IP doesn't automatically mean interoperability.
- Government officials need further education on the relationship between the strengths and limits of VoIP:
  - Just because this area involves Internet Protocol does not mean it is using the Internet.
  - VoIP is part of some LMR solutions.
- Radio-to-radio in the absence of infrastructure is critical to public safety:
  - Everything is secondary to voice.
- IT and IP product and applications life cycles tend to be much shorter than public safety funding cycles for communication systems.

For these reasons, I believe that the current DHS guidance is appropriate and Congress should let the public safety community, working with SAFECOM, determine whether the guidance needs to be revised.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. FRANK R. LAUTENBERG TO HARLIN R. MCEWEN

Question 1. Can you provide the Committee with an update on the costs and status of interoperable systems in the existing public safety spectrum bands?

Answer. The recent Baseline Survey conducted by the DHS SAFECOM Program gives some indication of the status and progress of interoperability in public safety communications. The results can be found at *http://www.safecomprogram.gov/SAFECOM/baseline/*.

Question 2. Has the public safety community conducted studies showing the condition of interoperability nationwide today, matching that interoperability to existing spectrum allocations, and how much additional spectrum is needed overall?

Answer. No. The public safety community does not have the funding or resources to do such a study.

Question 3. The new broadband network that is envisioned would need enough capacity for both government and commercial use. In any given day, how much capacity would need to be dedicated to public safety vs. commercial use? Would public safety's capacity needs on this network likely increase as time went by?

Answer. That is difficult for me to answer, given the varied daily needs of public safety. Cyren Call Communications has developed a white paper entitled Public Safety Broadband Capacity Analysis that may be helpful to understanding the answer. I have attached a copy for your reference. *See Supplemental Attachment* on page 86.

Yes, it is envisioned that public safety's capacity needs on this network would likely increase as time went by.

Question 4. What are some of the special needs of public safety that are not available on existing commercial networks?

Answer. Public safety needs are measurably different from the needs of commercial users. A dropped call on a commercial network is inconvenient, however, on a public safety network, it can mean life or death. Public safety networks must operate at near 100 percent reliability 24/7. Public safety radios must work every time in mission-critical situations.

For this reason, public safety spectrum cannot be compared to commercial use in that a public safety network must be able accommodate peak traffic flows, without failing or delay, during an emergency. A public safety officer can never hear, "all systems busy, please try your call again later." Public safety networks are designed to accommodate peak usage demand during major emergencies. Peak demand at an incident can require 3–10 times the number of resources required on an average day.

The communications needs of public safety are also dramatically different from a commercial user. Public safety officers must be able to connect to the network, as well as directly to each other. This usage pattern for public safety radios is referred to as "talk around." This is where the officers communicate radio-to-radio without going through a network. This can be critical at times when many officers converge on an incident.

Public safety also requires near ubiquitous network coverage. Public safety users must communicate throughout their jurisdictions, including the most rural areas and require 95 percent or more geographic coverage. There is not currently a single commercial service in the United States that can provide that level of coverage.

Further, police radios are "in-use" at levels that far exceed the average commercial user. In the course of the day, a police radio is often in a monitor mode, listening to calls to other officers to see if they need assistance. As many as 50 officers can be monitoring a single channel at the same time. A typical police officer's radio in the monitor mode is equivalent to a long conference call with 50 to 70+ people listening. Typically public safety is in this mode 30–50 percent of the time. This is equivalent to over 4,000 "cell phone" minutes per officer per month, which is 10 times the "typical" usage.

When we compare the cost of public safety systems to commercial cellular systems we must take into account the fact that public safety radios are used 24 hours a day, 7 days a week for an average of 7 years before replacement. The average life of a cell phone is significantly shorter.

Public Safety needs a hardened network with infrastructure built to withstand local natural hazards (tornadoes, hurricanes, earthquakes, floods, *etc.*) that would include hardened towers and backup power with fuel supplies to withstand long term outages of public power sources. For the most part, commercial networks do not offer that level of service or reliability.

Supplemental Attachment

PUBLIC SAFETY BROADBAND CAPACITY ANALYSIS

Introduction

The future of telecommunications is moving toward the ubiquitous carriage of information via IP-based telecommunications systems. Wireless services are part of this evolution as all voice, data, and video will soon be sent and received via IP based radio access that is an integral portion of this future all IP network environment.

To fully understand the radio spectrum requirements of this future network, Cyren Call performed an analysis of the capacities a public safety-grade wide area wireless broadband network will have to support to ensure that public safety can leverage and utilize the advanced capabilities required to meet its mission of providing protection and safety for the citizens of the United States.

Background

Public Safety has recognized that the specific spectrum allotments that will support wireless broadband technology for its needs must be identified and set aside now to ensure that it is available for the future. It is generally agreed by the Congress of the United States, FCC, NTIA, commercial industry, and the scientific community that spectrum is a finite resource. To ensure the many competing interests for this resource have sufficient allocations for their specific requirements, Congress and the FCC agree that each need be weighed against the benefits a specific allocation can provide for overall common good of the United States.

To this end a determination of what is sufficient spectrum for a given entity or services provider becomes an exercise of peering into the future and using the best available information to assess what impacts technology change will have on its needs.

What is known is that as wireless services have evolved to incorporate services beyond basic voice, spectrum with increasingly larger channel sizes are required to deliver advanced capabilities and provide the level of performance demanded by these services. This has caused a competition for spectrum to arise with many entities vying for its share of the spectrum pool.

Public safety is no exception, it is in competition with the wireless commercial operators for spectrum to support its mission. This has raised the debate not only as to how much spectrum public safety will require to implement broadband services but in an era of fiscal constraints, how it will be able to sustain and keep evergreen the technology base required to have services available now and into the future.

Scope

As outlined above there are many facets to the current debate over public safety's broadband requirements and what will be required to ensure these capabilities are available for its use. This analysis was undertaken to determine not only the sufficiency of current spectrum allotments to support wireless broadband technologies for public safety but also what would be required for a public/private partnership that enables public safety to evolve and maintain a desired level of service now and into the future.

This focus provides the boundaries for this analysis and the underlying assumptions used in the capacity calculations. Two spectrum positions were analyzed to determine the requirements of public safety and also a public/private partnership. These were:

- 12 MHz—6 MHz by 6 MHz paired
- 30 MHz—15 MHz by 15 MHz paired

Assumptions

In this section the major assumptions used in the analysis are outlined. Specific assumptions that are critical to the methodology of the analysis are highlighted in context with the use of the assumption.

General

This study assumed a national network view. The national network assumed 37,000 cell sites required to provide coverage and capacity to meet the requirements of the baseline user population, their profiles, and offered services. Due to the scope, magnitude, make-up and varying sizes of public safety jurisdictional entities within the U.S. specific case by case sample studies for jurisdictions in large dense urban, suburban, rural, and highway corridor environments will be the basis for future studies to assess individual jurisdictional needs. Incidents/events of various scales

were a key component of this study to assess capacity and performance requirements for these types of occurrences.

Analysis Period

A period of 10 years was used in this analysis, from 2008 to 2018. By using a full 10 year study period considerations such as technology and applications evolution and maturity, services adoption, gains in spectral efficiency, convergence and concurrent use of services, and increasing demands for mobility could be employed to assess the demands that would be placed on the network.

Network Technology

Today there are three major wireless technologies considered to be on migratory and evolutionary paths to what is envisioned will be the technology deployed for the 3G+ or 4th wide area mobile next-generation networks in the study period. These are:

GSM > UMTS > HSPA > LTE

WiMax > LTE

EVDO Rev A/B > LTE

Long Term Evolution or LTE is a term used to describe the envisioned technical characteristics that will be required for these next-generation wide area mobile networks. This analysis blended and used common technical stated evolutionary characteristics across all three technology tracks such as OFDM–MA and MIMO,[1] flat IP core network architectures, mature IMS/SAE services delivery and management, VoIP-based push to talk, and other attributes to normalize the capacity and performance assumptions that will be available to provide broadband services.

Radio Access Layer

The radio link for a given sector was characterized using the following design assumptions from HSPA+ as this provides a conservative estimate for modeling rather than using the stated objectives for 3GPP LTE:

Channel Size: 5 MHz

Reuse Factor: 3/1

Uplink Capacity: 11.5 Mbps

Downlink Capacity: 28 Mbps

Broadband Network User Population

It is estimated that by 2018 there will be less than 3 million public safety personnel and that the U.S. population will be 300+ million. A conservative and high estimate of 3 million public safety users and 32 million critical infrastructure and enterprise users was assumed as the user population for this network in 2018.

Services

The following table depicts the services that were characterized that would be provided by the network for this study.

[1] OFDM–MA: Orthogonal Frequency Division Multiplexing—Multiple Access, MIMO: Multiple Input/Multiple Output.

Type	Category	Sub-category (where applicable)	Capacity Mgmt. Ref. ID	Service description	Example	Service level designator	RAN Service Rqmt. Throughput rate		E-E/1-Way Delay (ms)
							(Kbps)	(Mbps)	
Voice	PS Tele-Services [P25]	PTT	TSP–1	Individual-Direct	1:1 or Walkie Talkie	Guaranteed	24	0.024	<150
			TSP–2	Group	Talk Groups	Guaranteed	24	0.024	<150
			TSP–3	Broadcast	1:N or 1:1 for Dispatch	Guaranteed	24	0.024	<150
			TSP–4	Un-addressed	1: All Devices on Channel	Guaranteed	24	0.024	<150
				Open Channel	All Devices on Channel	Guaranteed	24	0.024	<150
		Monitoring	TSM–1	Individual-Direct	Unit/Device level	Guaranteed	24	0.024	<150
			TSM–2	Group	All Units/Device assigned to group	Guaranteed	24	0.024	<150
			TSM–3	Channel	All Units/Device on channel	Guaranteed	24	0.024	<150
			TSM–4	Scanning	All Units/Devices on selected channels	Guaranteed	24	0.024	<150
		Alerting	TSA–1	lndividual-Direct	Unit/Device level	Guaranteed	24	0.024	<150
			TSA–2	Group	All Units/Devices assigned to group	Guaranteed	24	0.024	<150
			TSA–3	Audible Emergency	Individual device/assigned units to a group	Guaranteed	24	0.024	<150
			TSA–4	Silent Emergency	Unit/Device level	Guaranteed	24	0.024	
	CMRS	Network Based	CMR–1	Local	Local M–M/M–PSTN	Predictive	24	0.024	<150
			CMR–2	Long Distance	Long Distance M–M/M–PSTN	Predictive	24	0.024	<150
			CMR–3	Conferencing	Voice	Predictive	24	0.024	<150
			CMR–4	CLASS Features	Call Forward, Call Wait, Trace, *etc.*	Predictive	24	0.024	<150
			CMR–5	Voice Mail	Traditional Voice Mail Services	Predictive	24	0.024	<150
Data	Media	Photo	DMP–1	Image Transfer	Stills, Slide Show	Best Effort	144	0.144	1000
	Messaging	SMS	DMT–1	Text	Both basic and enhanced (rich text) SMS	Best Effort	14.4	0.0144	4000
		E-Mail	DMT–2	Enhanced Text	Text w/attachments—various includes M-Media	Best Effort	14.4	0.0144	4000
	FTP	Bulk Data	DFT–1	Reporting	Form based data transfer	Best Effort	64	0.064	1000
			DFT–2	File Transfer	Various file type/sizes	Best Effort	64	0.064	2000
	Sensor	Telemetry	DSR–1	Bio-Metrics	Personnel physiology reporting/mgmt.	Guaranteed	28.8	0.0288	<50
			DSR–2	Environmental	Temperature, Moisture, etc.	Predictive	14.4	0.0144	4000
			DSR–3	Situational Awareness	Intrusion Detection, Wireless Fence, alarm	Guaranteed	28.8	0.0288	<500
			DSR–4	Vehicle Telemetry	Vehicle Sensors—Speed, Crash, Engine, *etc.*	Predictive	64	0.064	1000
	Location Based	Reporting	DLB–1	Person	Individual location tracking	Guaranteed	14.4	0.0144	<250
		Reporting	DLB–2	Vehicle	Vehicle location tracking	Guaranteed	14.4	0.0144	1000
		Bulk Data	DLB–3	GIS Thematic	Thematic Maps (*e.g.,* Hurricane Track Flooding)	Best Effort	64	0.064	4000
		Reporting	DLB–4	Sensor	Location of Sensor both fixed and temporary	Best Effort	14.4	0.0144	4000
		Reporting	DLB–5	Robotic	Location of Robotic Elements/devices/machines	Best Effort	14.4	0.0144	<500
	Work Force Mgmt.	Personnel Mgmt.	DFM–1	Normal/Daily	Daily Assignment via form based data	Best Effort	64	0.064	1000

		Personnel Mgmt.	DFM–2	Incident/Event	Event personnel assignments, accounting, *etc.*—Interactive form	Predictive	64	0.064	1000
	Asset Mgmt.		DAM–1	Normal/Daily	Daily mgmt & tracking of assets—assignment/status form based	Best Effort	64	0.064	4000
			DAM–2	Incident/Event	Event/Incident mgmt. and tracking of assets—assignment/status form based	Best Effort	64	0.064	4000
	Robotics		DRS–1	Control	Remote Control/mgmt. of robotic devices	Guaranteed	64	0.064	<250
			DRS–2	Data	Robotic gathered/assembled data	Predictive	varies on type		varies
Video	Media	Video	DMV–1	Real-Time	Broadcast Quality—Uni-Directional—24–30 fps	Guaranteed	1000	1	<500
			DMV–2	Real-Time	Basic Quality—Uni-Directional—15 fps	Predictive	500	0.5	1000
			DMV–3	Streaming	Store and Forward—Uni-Directional—8–10 fps	Predictive	300	0.3	1000
			DMV–4	Conferencing	Multi-participant Video + Voice + Media – Bi-Directional—15 fps	Guaranteed	770	0.77	<150

Services Note

It was assumed that all services have a failure point based on excessive delay. For example:

- It may be acceptable to wait a minute for a file transfer, but it may not be acceptable for that file transfer to take 30 minutes.
- Service throughput is determined by the most demanding aspect of the service which is generally session initiation and set-up.
- Utilizing strict average throughput would underestimate usage especially with concurrent sessions (voice with video).

Methodology

The high level methodology used to determine the number of subscribers supported for various spectrum positions was as follows:

- Characterize the Services
- Define Subscriber Types
- Assign Service Usage to Subscriber Types
- Determine the Available Throughput
- Capacity Calculations
  - Public Safety
  - Critical Infrastructure
  - Commercial

Each step is further explained in the subsequent sections.

Characterize the Individual Services

For the purposes of this analysis it was assumed that subscribers would utilize services in three broad categories, namely: Real Time Services, Best Effort Services, and Streaming Services. Within each category, specific services were assigned, as follows:

Real Time Services

Push-to-Talk (PTT)

Telephony (Voice)

Monitoring—ability to listen to ongoing group communications

Alerting—ability to alert other users that communication is desired

Best Effort Services

File Transfer—Transfer of large files to or from some data repository

Messaging—Ability to send multi-media messages to one or more users

Location—Transmission to or from the network containing information about the physical location of the user

Sensor-based data

Streaming Services

Streaming Video—The ability to transmit or receive continuous video

Define Subscriber Types

The following user profiles were developed and incorporated as the subscriber types for this study:

Public Safety: Blended profiles for police, fire, and EMS personnel

Critical Infrastructure: Medical, Energy/Power, Water, Food, Transportation

Enterprise: Large enterprise [business] entities

Assign Service Usage to Subscriber Types

Independent Service Usage

For each subscriber type, a service profile was assigned that specified how much of each service that subscriber type would utilize on average. It was assumed for this analysis that public safety would not be using this service for its primary voice system, and would instead rely on it for mission-critical and routine broadband applications. Critical infrastructure and commercial users would use the system for voice, and this was factored into the model. Usage was assigned for uplink and downlink separately.

Aggregate Service Usage

Once each subscriber type had the individual service profiles assigned, an aggregate service profile was created. This aggregate service profile was used to characterize the average network utilization of that particular type of subscriber (Public Safety, Critical Infrastructure, or Commercial).

The specific usage assumptions and aggregate service profile for each subscriber type are listed in the appendix.

Determine Available Throughput

This analysis uses a generic, technology independent, throughput to determine available capacity. The throughput values are correlated to available radio spectrum. Although the available throughput is technology independent, the quantitative initial estimate is based on stated LTE standards for spectrum positions of 30 MHz (paired 15 MHz) and 12 MHz (paired 6 MHz).

The effect of radio propagation over distance on the effective throughput—

- As the radio channel deteriorates, the throughput decreases.
- The radio channel deteriorates as the distance increases from the cell center (a function of radius).
- It is assumed that the user distribution in a cell site is random (evenly spread out within the area of the cell).
- The diagram below shows the calculations for the average effective data rate for an omni-directional cell divided into three regions: inner, middle and outer rings. An ideal user distribution model would utilize a continuous distribution model, rather than the discrete 3 section model shown below. However, the radio modulation schemes do not adjust continuously, but rather discretely in a finite number of steps. It is clear that the average effective throughput is significantly less than the peak throughput and this is an initial estimate at quantifying the derated throughput.

	Entire Cell	Outer	Middle	Inner
Radius	1.000	1.000	0.660	0.330
User Distribution	100.00%	55.56%	33.33%	11.11%
Users	100.0	55.6	33.3	11.1
Throughput Rate Modifier	-	15%	40%	100%
Avg Effective Data Rate	32.78%	of peak throughput		

Estimate the impact of other system effects that impact throughput:

- Packet Loss (radio and otherwise)
- Retransmissions due to Packet Loss
- Lower Layer Packetization Efficiencies (Layer 2 Framing, *etc.*)
- Computational Delays and Inefficiencies
- The cumulative effect of these inefficiencies is estimated to reduce the available throughput by 20 percent

Result: The effective available throughput for the average user. Below are the analysis results for the throughput at 30 MHz. The same process would be used for other spectrum positions.

	Uplink Throughput (kbps)	Downlink Throughput (kbps)
RF Efficiency	33%	33%
Packetization Efficiency	80%	80%

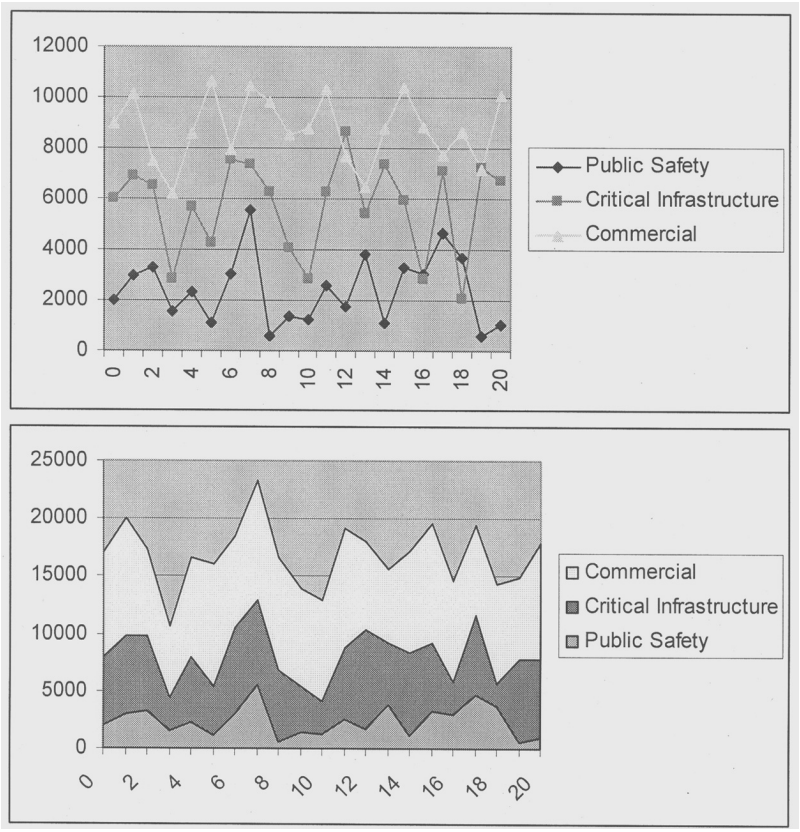
Capacity Calculations

Sharing Spectrum

The system being modeled is one with the ability to prioritize traffic and in this system Public Safety has priority access to all capacity. If Critical Infrastructure or Commercial users are utilizing capacity that is needed to serve Public Safety, the system will throttle the capacity available to Critical Infrastructure and Enterprise users, and make it available to Public Safety on an immediate, as needed basis.

Critical Infrastructure users will also have priority. However it is lower than Public Safety, but it is higher than commercial users. Thus after Public Safety capacity needs are met, Critical Infrastructure users are served.

Enterprise users utilize the remaining capacity. Note that capacity that has been set aside to ensure Public Safety and Critical Infrastructure usage experiences less blocking but also provides service for the enterprise users. Enterprise users are only affected by capacity in use, and would only be blocked from having access to additional capacity if Public Safety and Critical Infrastructures are generating a high demand on the system. The diagrams below illustrate the concept.



The first diagram shows a hypothetical level of traffic for the three types of users. The second diagram is the additive capacity of that usage. In this hypothetical example, there would have been no blocking if the capacity of the system was at least 25,000 kbps. It is illustrative to look at the blocking effects as the capacity of the system is constrained.

Capacity Level	PS Blocking	Crit Inf Blocking	Comm Blocking
25,000	None	None	None
20,000	None	None	Minor
15,000	None	None	Moderate
10,000	None	Minor	Major*
5,000	Minor	Major**	Total**

* Note that even though Critical Infrastructure is blocking, some commercial traffic can still get through.

** Note that a substantial amount of Critical Infrastructure traffic still is passed by the network, and that there may be cases where some commercial traffic can squeeze in as well. None of this traffic impacts the service levels of Public Safety.

It is clear from the diagram that Public Safety users would benefit with an extremely high availability system (from a congestion/capacity stand point), and that sizing of the system is dependent more upon the enterprise user base, and to a lesser extent, critical infrastructure grade of service.

Per Cell Capacity Calculation

To determine the number of subscribers supported for a given throughput, the number of concurrent average services for the available capacity was calculated. Once the number of concurrent simultaneous sessions is known, one can apply statistical modeling with the desired grade of service calculations. In this analysis, Erlang B and Poisson distribution modeling was used with various grades of service, depending on the subscriber type. The result is the effective number of simultaneous sessions (users) that provides the desired grade of service. The average effective load or the average subscriber was calculated previously, and the effective number of sessions, with effective load per user can be used to determine the total number of users that could be supported within a cell.

Network-Wide Capacity Calculation

In order to extrapolate a per cell calculation to the entire network, usage modeling assumptions need to be made. Specifically the distribution of the subscribers/users across the cells needs to be taken into account. For this analysis the business modeling assumptions were taken from the Cyren Call business model using an even distribution of users across the network. The following depicts analysis of a 30 MHz (15 × 15 paired) spectrum position.

Public Safety Calculation

The capacity to support Public Safety is limited only by the average available throughput of the system. Therefore by using the services and usage levels of a typical Public Safety subscriber the total number of Public Safety subscribers can be determined.

The table below summarizes the calculation for Public Safety.

Public Safety			Max Subs	
	Blocking	Limited by	Sector	Nationwide
Full Spectrum Utilization	0.001%		164.66	6,977,092
	1.000%	Uplink	237.61	10,068,249
	2.000%		252.11	10,682,864
		Throughput Required (kbps)		
# of PS Users	Blocking	Uplink	Downlink	
3,000,000	0.001%	3243	3189	
	1.000%	2161	2186	
	2.000%	2053	2095	

From the table one can see that the model predicts that the network with 30 MHz could support between nearly 7 million to nearly 11 million Public Safety users for varying grades of service (blocking). However, the maximum number of Public Safety users that would be expected to be supported would be 3 million. Note that, by the nature of giving Public Safety priority, that this network at 30 MHz would provide essentially Public Safety with non-blocking service.

Having calculated the Public Safety utilization one can then determine the amount of capacity that is left over for other users. For the purposes of this model, it was assumed that 3 million Public Safety users were utilizing the network, and any remaining capacity unused by them would form the basis of subsequent calculations.

Critical Infrastructure Calculation

For this analysis, it was assumed that Critical Infrastructure would require a better grade of service than Commercial users, but that it would not need to be as robust as for Public Safety, and that planning for 1 percent blocking was reasonable. To determine the available capacity for Critical Infrastructure, it was first necessary to determine the Public Safety capacity requirements at 1 percent blocking. Note that this is not the grade of service Public Safety has, but that the amount of capacity needed to maintain Public Safety at 1 percent blocking can not be utilized by Critical Infrastructure users. One must account for the fact that unused Public Safety capacity is available to Critical Infrastructure users, and that it is the actual usage of Public Safety that impacts the remaining capacity, not the capacity set aside to maintain high grades of service (as discussed in the Capacity Overview section). For this model it was assumed to be a reasonable approximation that Public Safety capacity usage at 1 percent blocking would be capacity that was unusable by Critical Infrastructure. The analysis is summarized in the table below.

Critical Infrastructure				
Critical Infrastructure Blocking	1.00%			
			Max Subs	
	Blocking	Limited by	Sector	Nationwide
Filling Left Over Spectrum	1.000%	Uplink	281.70	11,936,510
	2.000%		297.86	12,621,535
		Throughput Required (kbps)		
# of Crit Inf Users	Blocking	Uplink	Downlink	
6,000,000	1.000%	1978	2672	
	2.000%	1862	2567	

As shown in the table, the analysis showed that nearly 12 million Critical Infrastructure users could be supported in 30 MHz (15 MHz paired). However, the Cyren Call business analysis expects the Critical Infrastructure users to number approximately 6 million subscribers.

Commercial Calculation

The commercial capacity is calculated in a similar manner. It is assumed that Commercial users would receive the nominal blocking of most other cellular systems, namely 2 percent. Thus the capacity available for Commercial users would be that which is left over from Public Safety and Critical Infrastructure usage also at 2 percent. The analysis results are below.

Commercial				
Commercial Blocking	2.00%			
	Blocking	Limited by	Sector	Nationwide
Filling Left Over Spectrum	2.000%	Uplink	620.01	**26,272,059**

The analysis shows that with 3 million Public Safety users, and 6 million Critical Infrastructure users, there is enough network capacity to serve about 26 Million commercial users at typical cellular service levels with a 30 MHz (15x15 paired) spectrum position.

Summary of Results

Using the methodology described above, the following spectrum positions were analyzed. It was found that a 12 MHz (6x6) allotment would not care for a 2.9 million public safety user base using an even distribution national network model.

As was shown in the more detailed overview of the analysis, a 30 MHz (15x15) would meet the criteria to offer public safety grade prioritized service and still enable sufficient capacity to be provided to critical infrastructure and enterprise subscribers.

Spectrum Allocation	Supported Population Public Safety	Support Population Critical Infrastructure	Supported Population Commercial
12 MHz paired [6 x 6]	1.2M	N/A	N/A
30 MHz paired [15 x 15]	3.0M	6.0M	26.3M

APPENDIX A

The following tables provide user individual and aggregated service assumptions used in the analysis.

Table A.1 Public Safety

	Uplink Service Mix		Number of Calls	per Unit of Time (peak time)	Calls/Hour	Duration (seconds)
Real Time	PTT	Voice - PTT	0	hours	0	36
	Telephony	Voice - Telephony	0	hours	0	90
	Monitoring	Voice - Monitoring	0	hours	0	90
	Alerting	Voice - Alerting	0	hours	0	90
Best Effort	File Transfer	Data - File Transfer	2	hours	2	90
	Messaging	Data - Messaging	4	hours	4	20
	Location	Data - Location	4	hours	4	1
Streaming		Streaming - Video	1	days	0.04166667	8100

	Downlink Service Mix		Number of Calls	per Unit of Time	Calls/Hour	Duration (seconds)
Real Time	PTT	Voice - PTT	0	hours	0	36
	Telephony	Voice - Telephony	0	hours	0	90
	Monitoring	Voice - Monitoring	0	hours	0	90
	Alerting	Voice - Alerting	0	hours	0	90
Best Effort	File Transfer	Data - File Transfer	3	hours	3	90
	Messaging	Data - Messaging	8	hours	8	20
	Location	Data - Location	4	hours	4	1
Streaming		Streaming - Video	1	days	0.04166667	8100
			numbers reflect multicast			

Table A.2 Critical Infrastructure

	Uplink Service Mix		Number of Calls	per Unit of Time (peak time)	Calls/Hour	Duration (seconds)
Real Time	PTT	Voice - PTT	2	hours	2	36
	Telephony	Voice - Telephony	2	hours	2	90
	Monitoring	Voice - Monitoring	0	hours	0	90
	Alerting	Voice - Alerting	0.5	hours	0.5	90
Best Effort	File Transfer	Data - File Transfer	1	hours	1	90
	Messaging	Data - Messaging	3	hours	3	20
	Location	Data - Location	3	hours	3	1
Streaming		Streaming - Video	1	days	0.04166667	3600

	Downlink Service Mix		Number of Calls	per Unit of Time	Calls/Hour	Duration (seconds)
Real Time	PTT	Voice - PTT	1	hours	1	36
	Telephony	Voice - Telephony	1.5	hours	1.5	90
	Monitoring	Voice - Monitoring	4	hours	4	90
	Alerting	Voice - Alerting	2	hours	2	90
Best Effort	File Transfer	Data - File Transfer	0.25	hours	0.25	90
	Messaging	Data - Messaging	3	hours	3	20
	Location	Data - Location	1	hours	1	1
Streaming		Streaming - Video	3	days	0.125	1800
			numbers reflect multicast			

Table A.3 User Services - Commercial

	Uplink Service Mix		Number of Calls	per Unit of Time (peak time)	Calls/Hour	Duration (seconds)
Real Time	PTT	Voice – PTT	1	hours	1	36
	Telephony	Voice – Telephony	1.5	hours	1.5	90
	Monitoring	Voice – Monitoring	0	hours	0	90
	Alerting	Voice – Alerting	0.25	hours	0.25	90
Best Effort	File Transfer	Data - File Transfer	1	days	0.04166667	90
	Messaging	Data – Messaging	3	hours	3	20
	Location	Data – Location	1	hours	1	1
Streaming		Streaming – Video	3	days	0.125	1800

	Downlink Service Mix		Number of Calls	per Unit of Time	Calls/Hour	Duration (seconds)
Real Time	PTT	Voice - PTT	1	hours	1	36
	Telephony	Voice - Telephony	2	hours	2	90
	Monitoring	Voice - Monitoring	1	hours	1	90
	Alerting	Voice - Alerting	1	hours	1	90
Best Effort	File Transfer	Data - File Transfer	1	days	0.04166667	90
	Messaging	Data - Messaging	3	hours	3	20
	Location	Data - Location	0.25	hours	0.25	1
Streaming		Streaming - Video	0.25	hours	0.25	1200
			numbers reflect multicast			

Table **B.1 - Public Safety Aggregation**

Public Safety

	Uplink Service Mix		Arrivals (per sec)	Intensity (Arrivals*Duration) (Erlangs)	Service Usage (kbps)	Service Throughput (kbps)
Real Time	PTT	Voice - PTT	0	0	0	19.07
	Telephony	Voice - Telephony	0	0	0	11.85
	Monitoring	Voice - Monitoring	0	0	0	10.54
	Alerting	Voice - Alerting	0	0	0	42.40
Best Effort	File Transfer	Data - File Transfer	0.000556	0.05	2.906667	58.13
	Messaging	Data - Messaging	0.001111	0.022222	0.018673	16.81
	Location	Data - Location	0.001111	0.001111	0.008933	8.04
Streaming		Streaming - Video	1.16E-05	0.09375	15.12594	161.34
	Aggregate	**per carrier**		**0.167083**	**18.06021**	
	Downlink Service Mix					
Real Time	PTT	Voice - PTT	0	0	0	19.07
	Telephony	Voice - Telephony	0	0	0	11.85
	Monitoring	Voice - Monitoring	0	0	0	10.54
	Alerting	Voice - Alerting	0	0	0	42.40
Best Effort	File Transfer	Data - File Transfer	0.000833	0.075	4.36	58.13
	Messaging	Data - Messaging	0.002222	0.044444	0.037347	16.81
	Location	Data - Location	0.001111	0.001111	0.008933	8.04
Streaming		Streaming - Video	1.16E-05	0.09375	15.12594	161.34
	Aggregate	**per carrier**		**0.214306**	**19.53222**	

Table B.2 Critical Infrastructure Service Aggregation

Crit Infra

	Uplink Service Mix		Arrivals (per sec)	Intensity (Arrivals*Duration) (Erlangs)	Service Usage (kbps)	Service Throughput (kbps)
Real Time	PTT	Voice - PTT	0.000556	0.02	0.381333	19.07
	Telephony	Voice - Telephony	0.000556	0.05	0.5925	11.85
	Monitoring	Voice - Monitoring	0	0	0	10.54
	Alerting	Voice - Alerting	0.000139	0.0125	0.53	42.40
Best Effort	File Transfer	Data - File Transfer	0.000278	0.025	1.453333	58.13
	Messaging	Data - Messaging	0.000833	0.016667	0.014005	16.81
	Location	Data - Location	0.000833	0.000833	0.0067	8.04
Streaming		Streaming - Video	1.16E-05	0.041667	6.722639	161.34
	Aggregate	**per carrier**		**0.166667**	**9.700511**	
	Downlink Service Mix					
Real Time	PTT	Voice - PTT	0.000278	0.01	0.190667	19.07
	Telephony	Voice - Telephony	0.000417	0.0375	0.444375	11.85
	Monitoring	Voice - Monitoring	0.001111	0.1	1.054	10.54
	Alerting	Voice - Alerting	0.000556	0.05	2.12	42.40
Best Effort	File Transfer	Data - File Transfer	6.94E-05	0.00625	0.363333	58.13
	Messaging	Data - Messaging	0.000278	0.005556	0.004668	16.81
	Location	Data - Location	0.000278	0.000278	0.002233	8.04
Streaming		Streaming - Video	3.47E-05	0.0625	10.08396	161.34
	Aggregate	**per carrier**		**0.272083**	**14.26324**	

Table B.3 Commercial Service Aggregation

Commercial

	Uplink Service Mix		Arrivals (per sec)	Intensity (Arrivals*Duration) (Erlangs)	Service Usage (kbps)	Service Throughput (kbps)
Real Time	PTT	Voice - PTT	0.000278	0.01	0.190667	19.07
	Telephony	Voice - Telephony	0.000417	0.0375	0.444375	11.85
	Monitoring	Voice - Monitoring	0	0	0	10.54
	Alerting	Voice - Alerting	6.94E-05	0.00625	0.265	42.40
Best Effort	File Transfer	Data - File Transfer	1.16E-05	0.001042	0.060556	58.13
	Messaging	Data - Messaging	0.000833	0.016667	0.014005	16.81
	Location	Data - Location	0.000278	0.000278	0.002233	8.04
Streaming		Streaming - Video	2.78E-05	0.008333	1.344528	161.34
	Aggregate	**per carrier**		**0.080069**	**2.321363**	
	Downlink Service Mix					
Real Time	PTT	Voice - PTT	0.000278	0.01	0.190667	19.07
	Telephony	Voice - Telephony	0.000556	0.05	0.5925	11.85
	Monitoring	Voice - Monitoring	0.000278	0.025	0.2635	10.54
	Alerting	Voice - Alerting	0.000278	0.025	1.06	42.40
Best Effort	File Transfer	Data - File Transfer	1.16E-05	0.001042	0.060556	58.13
	Messaging	Data - Messaging	0.000833	0.016667	0.014005	16.81
	Location	Data - Location	6.94E-05	6.94E-05	0.000558	8.04
Streaming		Streaming - Video	6.94E-05	0.083333	13.44528	161.34
	Aggregate	**per carrier**		**0.211111**	**15.62706**	

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. DANIEL K. INOUYE TO MORGAN O'BRIEN

Question 1. One issue that continues to vex policymakers is the buildout of wireless services in rural areas. Could you discuss this issue, and how either the proposal suggested by the FCC or the Public Safety Broadband Trust proposal would address these concerns?

Answer. Because first responders must go everywhere problems and disasters occur, their communications capabilities must precede them. This is why it's critical for any nationwide platform to be ubiquitous across the United States, including rural locations. The Public Safety Broadband Trust proposal ("Proposal") includes a terrestrial cell site buildout deep into our Nation's rural locations—to cover areas with a population density as low as 5 persons per square mile, well beyond areas covered by the commercial carriers. That terrestrial network build would be supplemented and supported by a satellite overlay network, both to cover areas where the terrestrial network would not extend and to provide a redundant communications capability should the terrestrial network become inoperable. In the process of assigning to commercial entities leases of usage rights to its licensed spectrum, the Public Safety Broadband Trust would have, as one of its core mandates, assuring that the network is built out and service is provided in the more sparsely populated, underserved areas of our nation, as well as in the more densely populated urban market areas. Given the strong overlap and identity of interests between the Public Safety Broadband Trust and rural residents—the former being committed to make sure first responders have state-of-the-art communications wherever they must go, the latter being anxious to obtain a bridge across the digital divide that separates them from the personal and commercial benefits carried by access to modern, broadband communications services—there are real incentives and true motivation to add confidence that the buildout to rural America will happen. No other proposed alternative offers the safeguard of having the license to the spectrum in the hands of the Public Safety Broadband Trust, a non-profit, non-stock entity controlled by public safety organizations, or the powerful combination and alignment of motivations and incentives needed to achieve a meaningful rural network buildout.

Question 2. Many opponents argue that failing to auction 30 MHz of spectrum necessarily results in a spectrum giveaway. Mr. O'Brien, some have criticized your plan as a "spectrum giveaway" that would allow you to personally profit rather than compete through an auction. How do you respond to this charge?

Answer. Despite misinformation to the contrary, it should be emphasized that neither Cyren Call nor any private, for-profit entity will be receiving a license to any spectrum if the Proposal is implemented. Rather, under that proposal the Public Safety Broadband Trust itself would be awarded and would hold the license to this 30 MHz of spectrum in the 700 MHz band. The Public Safety Broadband Trust—a non-profit, non-stock entity controlled by public safety organizations—would have the normal spectrum license rights granted to any other FCC licensee—and, like other licensees, would be subject to FCC oversight and, consistent with numerous provisions contained in the draft legislation that public safety has endorsed and is attempting to have introduced, to significant ongoing Congressional supervision. The "spectrum giveaway" characterization is seriously flawed on at least two grounds. First, the spectrum license would be awarded and held for the principal benefit of America's public safety community, and licensed spectrum that has been made available for similar purposes in the past never has been regarded as "given away." Rather, it is provided for the use of our first responder personnel to enable them to have the tools they require to safely and effectively discharge their critically important roles—protecting and preserving our lives and our property. For that reason, and with ample justification, such spectrum licensed to and for the benefit of public safety cannot be regarded as a "giveaway." Second, as the draft legislation makes clear, the Public Safety Broadband Trust would pay (with money borrowed in the capital markets, backed by government loan guarantees) an amount to the Treasury for the award of that spectrum license, both to compensate for the loss of auction revenues attributable to that spectrum and to assure full funding for the purposes enumerated in the Deficit Reduction Act of 2005 (which, when that legislation was adopted, was assumed to be supplied by 700 MHz spectrum auction proceeds). Cyren Call will not "profit" from the award of a spectrum license to the Public Safety Broadband Trust, or from the payment made for that spectrum license. The Proposal contemplates that an entity would be retained by the Public Safety Broadband Trust to fulfill important roles in the public/private partnership structure, roles in which both knowledge and experience in the commercial wireless industry and in the world of public safety communications should be crucial ingredients and qualifications. Although neither Cyren Call nor any other entity has an

entitlement or commitment to be awarded any of those roles, Cyren Call intends to apply for those roles, and expects that it would need to compete aggressively with other for-profit applicants in an open and fair process—as expressly provided in the draft legislation—to win the award of any or all of those roles. To clarify further, Cyren Call proposes that neither it nor whoever else might be chosen instead for that role would participate in any way as a commercial operator lessee of the spectrum. This prohibition is suggested to avoid any conflict of interest that might develop between what is best for the Public Safety Broadband Trust and the for-profit interests of the commercial operator(s).

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. MARIA CANTWELL TO MORGAN O'BRIEN

Question 1. My understanding is that you propose to solve the interoperability problem by having all public safety organizations eventually migrate over to the 700 megahertz spectrum. Even if the proposal is successful, this new network will not be built out for a decade or more. Does your proposal address the issue of improving interoperability of first responders in the near and intermediate term?

Answer. As catastrophic events of the recent past have shown, there is an immediate need to make sure that public safety narrowband voice communications networks are made interoperable, particularly on a regional basis, as soon as possible. The government must continue to supply the leadership and funding to make voice communications for first responders—over their existing legacy systems already in place and operating today—truly interoperable. The Public Safety Broadband Trust proposal ("Proposal") first and foremost addresses problems that relate to the future communications capabilities that need to be made available to public safety personnel—and takes a common sense approach in assuring that those capabilities will be provided in a way that also assures their interoperability. As a result, public safety personnel at all levels of government—state, local and Federal—will be provided access to a uniform, next-generation, open standard, nationwide platform permitting them to enjoy the highest possible level of communications interoperability. As important as interoperability will be in this new setting, it is equally important and exciting to appreciate that these new communications capabilities will deliver to first responders the large file data and streaming video capabilities that they do not have today. Imagine a burning building on the Elliot Bay waterfront in Seattle—firefighters set up video cameras from multiple angles and enter the edifice with streaming video capabilities on their helmets—and all this information is sent back in real-time to a team in a command center, making decisions based upon a comprehensive "situational awareness." In addition, as burn victims are raced to Harborview Medical Center, effective treatment is performed en route as doctors in the emergency room monitor vital signs and injuries through streaming video and high-speed wireless transmission of medical and diagnostic test results. Now imagine that this capability is replicated all across America. All of this is possible, but only if a broadband network designed for public safety is created, with the proper financing stream to support its operation.

It is true that construction of this network will require—as every national wireless network before it has required—some fairly significant period of time. Even though that network build likely will reach many of our Nation's largest urban centers (and a number of other areas) in the first three build years, the Proposal does not contemplate or advocate that the ongoing efforts to achieve interoperability for public safety's existing legacy voice networks be abandoned or slowed down. The Proposal and the next-generation public safety network it seeks to implement does not involve the diversion of one penny of the $1 billion in public safety interoperability funding authorized by Congress—in fact, the mechanisms set forth in the draft legislation to provide payment to the Treasury for the spectrum license to be awarded to the Public Safety Broadband Trust were crafted specifically to assure that the needed funding for that and other programs and uses would be available on the timetable and in the amounts indicated by Congress. Nor does the Proposal recommend or even suggest that public safety's access to its long-promised and long-awaited 24 MHz of spectrum in the 700 MHz band—especially the channels included in that allocation that have been identified specifically for interoperability purposes—be delayed 1 second beyond the Congressionally-mandated DTV transition deadline in February 2009. Although the committed interoperability funding, as well as the additional spectrum designated expressly for interoperability uses, will provide significant assistance to the public safety community in achieving interoperability on their current legacy voice systems, others (in Congress and elsewhere) have noted that this problem has eluded solution, although it has been recognized

and diagnosed, and funding for solutions have been provided, for at least a decade. Aspects of the public safety broadband network outlined in the Proposal include components—notably an IP-based core backbone and "interoperability gateway" access points to the network—that (as they become available in particular areas) also could make significant contributions to a comprehensive approach to solve public safety's existing legacy voice system interoperability challenges.

Question 2. Wireless carriers are currently rolling out what is referred to as third generation or 3G networks. The rollout has taken longer than originally thought, in part for technical reasons and in part for business reasons. My understanding is that the Cyren Call proposal is based on what is referred to as fourth generation technology. I have heard that the reason the network requires the 30 megahertz is for technical reasons—to ensure the most efficient re-use of the spectrum. I have heard that the reason the network requires 30 megahertz is for business reasons. Why does your proposal require the 30 megahertz of bandwidth? Has there been a technical risk assessment performed on the feasibility of rolling out a fourth generation network nationally?

Answer. The Proposal includes the creation of a public-private partnership by which public safety controls the spectrum assets and collaborates with commercial entities (as lessees of usage rights to the licensed spectrum) to construct the network. In exchange for building the network, these commercial entities will be permitted to have shared use of the network and to make the network's excess capacity available to the commercial customers that they will serve, though public safety users always will have priority access to the network's capacity, up to and including the full capacity of the network if required in times of crisis. This vision for the future of public safety communications will: provide public safety with an evergreen platform that will evolve with technology; create a funding mechanism so that government financial support for the network build is unnecessary; and at last provide public safety with the benefits of the scale economies of a commercial wireless business environment, thereby lowering both their costs of obtaining wireless services and the cost of public safety communications equipment. Using data from current wireless carrier operations and network usage and other assumptions that we believe reasonable and consistent with publicly available data sources, our modeling shows that for such a shared public safety/commercial network, 30 MHz of spectrum is needed to support not only public safety's sporadic, critical incident-driven significant network capacity needs, but also the projected "ordinary course" communications needs of the sizable commercial subscriber base that is required to provide the bulk of the revenue to meet network costs (both capital and operating). An insufficient amount of spectrum—such as the 12 MHz suggested in the FCC's December 2006 Notice of Proposed Rulemaking—will attract neither commercial network builders nor their investors, and so the network will not be built. Also, next generation technologies require a sufficient amount of spectrum to support the bandwidth-intensive capabilities and transmission speeds especially important to first responders.

Capacity calculations for a mobile radio network involve many factors and result in a complex engineering exercise. No single factor by itself can be used to determine what capacity requirements for a network ultimately will result from an engineering analysis. This is especially true for an IP-based 4G mobile network design that must consider the variance of capacity needs for public safety (normal to extreme emergency events) coupled with a high-performance commercial service offering.

The key elements that factor into these types of analyses are:

- Offered service performance requirements (throughput, latency, jitter, *etc.*)
- Elasticity behavior of IP networks vs. Time Division Multiplexing (TDM) based networks
- Services mix used by the subscriber (*e.g.,* voice, video, data, messaging)
- Subscriber densities per cell site and cell site sector
- Subscriber peak busy usage (the greatest concentration of users projected to be attempting to access the network at a given moment in time)
- Blocking rate (especially with mixed use where public safety will differ from commercial)
- Frequency re-use factor (trade-offs on a per-site basis for efficiency and performance)
- Extreme emergency usage and capacity requirements

There are other variables but the aforementioned are the key factors which influence the results of a 4G mobile network capacity analysis. Capacity results from

this type of analysis are translated into an uplink/downlink Mbps requirement per cell site/per sector. From this calculation normalization the stated capacity of the competing technologies is then used to derive a bits per hertz performance capacity that the 4G technologies will theoretically deliver. As there are efficiency gains and detractors for technology types (*e.g.,* OFDM–MA), these must be factored in as well. The end result is that one determines a technology can deliver "X" capacity per MHz and assess that capacity delivery outcome against a capacity analysis that has determined a "Y" capacity need. From this information, one derives the overall amount of spectrum required for the envisioned design. Cyren Call determined, based on the above factors, that 30 MHz was the minimum required for its stated design requirements and business model mixed subscriber (public safety and commercial) use cases.

In terms of risk and the viability of deploying a next-generation 4G network, Cyren Call has built a detailed plan that takes into account the execution and funding challenges required to build and operate the network. From a schedule and profitability perspective, it is a viable plan and consistent with the state of the wireless industry today. 4G is not a radically new concept or network but is an evolution of the technologies deployed today.

Question 3. The proposal includes $10 billion in U.S. Government loan guarantees. If it takes longer to build out the network or the commercial operator does not sign up enough customers early on to generate the revenues required to service the loans, what is the exposure to the U.S. government? In the end, might the U.S. taxpayer be footing the bill to build out a commercial network?

Answer. The primary purpose of the government guaranteed borrowing authority granted in the draft legislation to the Public Safety Broadband Trust ("Trust") is to enable that organization to raise sufficient funds in the capital markets to pay the Treasury for the award of a license to the 30 MHz of spectrum. So, the Federal Government itself (and derivatively, the U.S. taxpayers) will be the initial and largest beneficiary of that borrowing authority. Moreover, the draft legislation expressly provides that the license will be pledged as collateral security for the guarantee obligations. It is true that a significant liquidity problem in the future cannot be ruled out (for the commercial lessees any more than for the commercial carriers they may compete against), which could result in payment defaults on the Trust's borrowings, and then in turn on a call on the guarantees. Although those cannot be characterized as happy circumstances, at least the spectrum license could be repossessed and the spectrum could then be made available for other purposes, including to provide purely commercial services, with the funds received from any future auction of a license to this spectrum devoted to repay any payments made on the government guarantees. The certainty associated with such an outcome is traceable to the structure of the Trust. First, it is a non-profit, non-stock corporation, meaning there are no shareholders or others with a claim on any "residual value" that might be argued to exist in the licensed spectrum. Second, it is highly unlikely that (following a payment default and related call on the guarantees) the Trust would have any significant creditors other than the issuer of the guarantees—*i.e.,* the government—and certainly would have no other secured creditors, since the spectrum license will be the Trust's only asset. Finally, only the Trust would have licensee status—all other parties would have only contractual rights—and the Board of the Trust will be originally constituted by, and could be changed only by, Federal legislation (in contrast to a for-profit entity license holder—which would have the "bundle of rights" that licensee status confers on it, and whose governing body would be selected by its shareholders—and possibly by other groups, *e.g.,* holders of hybrid debt/equity instruments and even true creditors, who may have rights to appoint directors or otherwise be represented on the governing body of an entity if the entity defaults on amounts owed to those groups). In short, in contrast to the very complex and conflicting collection of interests that bubble to the surface in a liquidity crisis (or even an insolvency scenario—the example in this vein being presented by the NextWave debacle), the cast of relevant characters here would be far more limited and predictable, thereby realistically shortening the time (and increasing the assurance of the relation) between the occurrence of the undesired circumstances and the implementation of the desired consequences.

It is also important to note that the government loan guarantees would cover only money borrowed by the Public Safety Broadband Trust. The commercial lessees would not be entitled to make their own government guaranteed borrowings, nor would the Trust borrow money on behalf of those commercial lessees. In fact, it is expressly contemplated in the Proposal that one of the critical obligations to be undertaken by a commercial lessee is the obligation to finance the network build out in its leased area. To the extent that the Trust would borrow money not related to the acquisition of its spectrum license, those borrowings first would need to be ap-

proved by the Trust's Board, and then would need to be for purposes approved in the draft legislation, which could include the funding of research and development activities for products or services expressly for the public safety users of the network, for providing financial assistance to enable more widespread use of the network by public safety users (*e.g.,* to provide subsidies or financial assistance to law enforcement, fire service or emergency medical services personnel in areas that may not have the resources to make such payments themselves—such as reservations or economically depressed areas), to pay (in whole or in part) to extend terrestrial network coverage to areas not assigned to any commercial lessee, and (less significantly) for the Trust's own operating expenses. Moreover, as the borrowing authority sought in the draft legislation extends until December 31, 2020, there is no reason to think that all borrowing would occur in the early years, or that most of the non-spectrum license related borrowing would occur before views as to the network's viability could be based on a significant period of actual network operations.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. FRANK R. LAUTENBERG TO MORGAN O'BRIEN

Question 1. You have noted that commercial wireless broadband networks do not meet public safety's needs today. What needs does public safety have that are not met with current commercial networks, and what assurance is there that the new network would meet these needs?

Answer. Public safety's communications needs are many and as a nation we continue to put life and property at undue risk by not addressing them comprehensively. Two general matters are solved by the Public Safety Broadband Trust proposal ("Proposal"). First, this solution will put public safety in control, nationally, of their communications capabilities and provide them with a state-of-the-art network that can be refreshed over time as new technologies and capabilities are developed. This, for the first time, puts public safety at the head of the table in terms of telecommunications innovation—and today that means providing them with the enhanced communications capabilities—specifically, access to data-intensive applications, such as remote access to databases, large file transfer and real-time video applications—that only a next-generation mobile broadband network can deliver. Additionally, a public/private partnership will create the right combination of incentives on all sides to create the kind of network needed by public safety. Perhaps most importantly, the Proposal will leave public safety in the ultimate position of control, as the Trust (which is controlled by public safety) alone will hold the license of the spectrum used in the network, while assuring that that network is self-funding, costing the American taxpayer nothing to construct and generating a reliable and consistent ongoing source of revenue (largely from significant commercial usage of the network) that eliminates the need for public safety to go to all levels of government, hat in hand, each year, first looking for the money to build, and then looking for the additional money to support, their communications systems.

Second, commercial wireless networks cannot and will not meet the needs of first responders. First responders need a public safety-grade system that has the coverage, reliability, redundancy and functionality to respond in emergency situations wherever they might be. Commercial wireless carriers operate their networks as required to comply with the conditions of their licenses—which frankly do not require those carriers to orient their activities very much differently than they willingly would do anyway—and otherwise operate them to maximize their returns. So commercial wireless carriers offer commercial service with coverage holes, with 98 percent call completion rates, and with commercial grade construction standards (hours' long battery back-up power at cell sites, limited backhaul redundancy, limited duplication of core network elements) not necessarily because they could not cure those situations and still make a profit, but because they can make bigger profits by leaving those situations uncured. Since the existing carriers have no incentive to take actions that would lower their returns, we think it unlikely that they will restructure or retrofit their networks to meet public safety's stringent needs and requirements. So the Proposal was designed to create something that first responders don't have today: a robust, hardened, interoperable network that provides broadband capabilities that they can depend on when they need it most, while still leaving enough attractive commercial potential to present commercial lessee applicants with the opportunity to earn an acceptable rate of return.

Question 2. How much would it cost to build a nationwide broadband network that meets public safety's coverage and other needs, and how much more costly would this be than building a broadband network based on current commercial standards?

Answer. Cyren Call estimates the cost to build a public safety-grade network could total approximately $20 billion over 10 years. Cyren Call further estimates that about 30 percent of that total (or, using $20 billion as the relevant total figure, about $6 billion) would be attributable to meeting public safety needs in terms of network redundancy, reliability and enhanced coverage. However, it is important to note that many of these extra expenses also should be regarded as drivers of additional revenues—and not just from the public safety and allied (*e.g.,* critical infrastructure users) communities—either directly (*i.e.,* if the public safety-grade network has coverage in locations where the commercial networks do not, it likely will have customers and generate revenues from those areas that the commercial networks do not) or indirectly (*i.e.,* a network exhibiting enhanced reliability and redundancy—more "up time"—may encourage users to drive more "high-value" traffic over it, such as encrypted communications and other premium applications).

Question 3. The new broadband network that is envisioned would need enough capacity for both government and commercial use. Are you confident that a commercial entity would build the network, and how much of the network would need to be available for commercial use to encourage a company to build it? In any given day, how much capacity would need to be for public safety vs. commercial use?

Answer. A commercial entity would build the network, under an arrangement that would provide it with the right economic incentives to do so. Our research and discussions with investors indicate that there is a genuine appetite in the market to fund the public safety broadband network. We believe that, in addition to the public safety user base for which it intentionally would be designed, the network also would be attractive to a significant customer base composed of users in the critical infrastructure industries, as well as to a large number of high-end commercial customers that would be attracted to the network not only for its ubiquitous coverage features but also for the security, reliability and other benefits of a hardened communications network. In order for the business case to work, however, 30 MHz is needed to provide sufficient capacity for both public safety and commercial user groups. It is also important to note that the Public Safety Broadband Trust provides the most efficient use of radio spectrum under these circumstances, whereby sufficient spectrum is available to public safety when it is needed in emergency situations on a priority basis and the balance is made available for commercial use. On any given day—assuming absence of a truly catastrophic public emergency situation—the commercial use of the network should be more significant than the public safety use of the network, and the number of commercial users being supported on the network will be far more than the number of public safety users. In our modeling exercises, we have projected that the network—at full coverage build in 2018—would generate sufficient capacity to meet (simultaneously) the communications needs of a total customer base of 35 million, comprised of 27 million commercial users, 6 million critical infrastructure users and 2 million public safety users. Of course, when the urgent communications needs of public safety require that they be able to claim a greater share of network resources and available capacity, the priority assignment that automatically is given to public safety traffic on the network will assure that they can—in the most extreme circumstances—pre-empt all other traffic on the network, if required.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. JIM DEMINT TO MORGAN O'BRIEN

Question 1. In your testimony, you explained at length the benefits of your proposal to the public safety community. During the Committee's hearing, we also discussed the fact that your proposal is a for-profit venture. Does Cyren Call have outside investors, and if so, could you share with the Committee the information you furnished to potential investors regarding possible returns on their investments?

Answer. Cyren Call has derived most of its financial support—apart from initial start-up funding amounts supplied by its founders and a small group of "friends and family"—from investments made in Cyren Call by a number of venture capital firms. Both leading up to those investments and subsequently, in regular review sessions, Cyren Call has shared with those firms (and has sought and received their input on) the business and financial models that Cyren Call has created to describe and depict the overall shared public safety-commercial broadband network business and its financial characteristics.

In the simplest terms, the depiction of the overall network business, and its presentation in the related financial model, is an amalgamation of two distinct, but inter-related businesses and financial models: (1) a business, and related financial model, that pertains only to the commercial network operator(s) ("Lessee(s)"); and

(2) a business, and related financial model, that pertains only to an entity referred to as the PSBT Authorized Agent/Public Safety Liaison Agent ("Agent"; this is that role that Cyren Call intends to seek for itself). The amalgamation of these two distinct, but inter-related businesses, and the resulting related composite financial model, we refer to as the "eco-system." We characterized and presented the business in this way because it would be essential for any investor to focus not only on whether the Agent's business plan and prospects appeared reasonable, sensible and viable, but also whether the overall network business of the Lessee(s) (in which context the Agent's business activities would occur and on which they would depend) also had a plan and prospects that appeared reasonable, sensible and viable.

Wherever possible, we have attempted to verify that our financial model is based on or is consistent with publicly available information on matters such as current industry trends, analysts' forecasts, equipment manufacturers' estimates on costs, and published data concerning performance capabilities of evolving technologies which are not yet available for commercial deployment. We also have engaged in some degree of cross-extrapolation from other industries or businesses that we considered to be similar or related to the domestic commercial mobile wireless industry such as wireline broadband networks, existing wireless high-speed networks in the U.S. and wireless broadband networks in other countries. The assumptions that are reflected or incorporated in our business plans and in the related financial models include a number of important topics, such as:

- Addressable market sizes and compositions
- Subscriber penetration rates
- Product and service adoption rates
- Product and service pricings
- Subscriber profiles
- Network capacity utilization rates
- Technology performance and availability
- Network and subscriber equipment costs
- Funding timing and availability

We have prepared presentations that summarize the key points of the business plans and of the related financial models described above. Those presentations include the derivation of un-levered internal rates of return for the respective businesses of the Lessee(s) and the Agent that comprise the eco-system over the ten-year period of time covered by the models. We have shared those presentations with governmental bodies (such as personnel in the Congressional Budget Office), with staff personnel from various Members of Congress, and with members of the media, although we have done so in face-to-face meetings that permitted us to supply additional explanatory detail. We would, of course, be willing to deliver the same type of presentation to you and/or your staff, as well as to any other members of the Committee or their staffs, much as we have done and continue to do for other Members of Congress.

Question 2. It seems as though your entire business plan is based on Congress passing legislation to grant 30 MHz to the Public Safety Broadband Trust in the next several months. What happens to Cyren Call if the DTV transition and auction goes forward as planned?

Answer. The company's founders and employees came together around the commonly-held vision of making this shared public safety-commercial mobile broadband network business plan a reality, and the commonly-held belief that this was a task worthy of the effort. The financial outcome to the company might be no different if Congress passed legislation granting the requested 30 MHz to the Public Safety Broadband Trust (PSBT), and the PSBT then decided to select someone other than Cyren Call as Agent, than if the Congress failed to act and the auction went forward as currently legislated. We continue to believe that the DTV transition itself should occur on the same timetable and with the same end results—*i.e.,* the commercial TV broadcasters vacating the upper 700 MHz spectrum they currently occupy by the February 2009 deadline, and the Treasury receiving sufficient aggregate proceeds, in exchange for the award of licenses to the 60 MHz of 700 MHz spectrum, to meet all related existing budget allocations and spending commitments—regardless whether Congress adopts legislation to implement the Public Safety Broadband Trust proposal or whether Congress fails to act and the 700 MHz spectrum proceeds to commercial auction as contemplated under existing legislation.

Cyren Call is led and staffed by talented persons, and as much as an innovative business concept and a well crafted business plan undoubtedly played a role in Cyren Call's ability to attract investment capital, the human resources associated

with formulating that plan and seeking to have it implemented played a large role as well. With those resources, if its focus must be re-directed away from the business plan and the vision it has been pursuing and advancing for the past year, Cyren Call can turn its attention to investigating other opportunities that may hold the prospect of an interesting business and the potential for a return on its investors' capital. But we remain focused on what we perceive as a critically important goal—putting public safety at the forefront of the next generation of the wireless broadband technology, product and service evolution.

In any case, Cyren Call believes it is more important to consider the outcome for public safety should Congress not act to provide them with the means to acquire the necessary financing to create, and the assurance of ultimate control over, a mobile broadband network built to meet their needs. If Congress does not act, we believe that our first responders will lose the last realistic opportunity to gain access to a reliable privately funded business case for, and ultimate control over, the public safety-grade broadband network that they need and deserve. If the only spectrum that is both available now and uniquely suited to such a purpose is auctioned for purely commercial use, the critical ingredient necessary to create a viable, privately funded and self sustaining interoperable, public safety-grade broadband network will forever be lost—and such a regrettable outcome could come to pass all too soon. When the next disaster strikes America and our first responders cannot communicate among themselves or access advanced technology that could save American lives—including possibly yours or a member of your family—we will carry that burden as a nation. Congress has the choice of perpetuating the *status quo* or creatively using opportunities present today to solve our country's public safety communications problems once and for all. The clock ticks relentlessly and a decision must be made quickly.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. DANIEL K. INOUYE TO HON. STEVE LARGENT

Question 1. Opponents of the Public Safety Broadband Trust (PSBT) proposal claim that it would delay the February 2009 DTV transition deadline. However, the auction of the remaining 30 MHz could proceed in January 2008, allowing the analog switchover to occur as planned in February 2009. Mr. Largent, could you explain why you believe the Public Safety Broadband Trust proposal will delay the February 2009 DTV transition deadline?

Answer. The Digital Television Transition and Public Safety Act requires the auction of 60 MHz of spectrum in the 700 MHz band. The Congressional Budget Office (CBO) estimated that the auction would result in a net increase of auction receipts of $10 billion. The Public Safety Broadband Trust (PSBT) proposal would prevent the Federal Communications Commission (FCC) from auctioning 30 MHz of that spectrum.

Rather than simply reduce the net increase of auction receipts by half of CBO's estimate, the PSBT proposal would result in an even greater reduction in net auction proceeds because the PSBT proposal may result in potential auction participants opting to lease spectrum from PSBT rather than bid at auction. Thus, there would be even less than $5 billion in net auction proceeds. In addition, reducing the amount of spectrum in the 700 MHz band available for commercial use would likely cause the FCC to reduce the number of large-block licenses, which yield greater receipts as compared to smaller-block licenses on a per-MHz basis. And the loan guarantees required by the PSBT would reduce the net auction proceeds even further.

The Digital Television Transition and Public Safety Act mandates that $7.363 billion of the net auction proceeds be transferred to the general fund of the U.S. Treasury. In addition, in accordance with that legislation and the Call Home Act of 2006, $1 billion of the net auction proceeds must be used to establish a grant program to assist public safety entities in the acquisition of, deployment of, and training for the use of certain interoperable communications systems, and that money must be allocated no later than October 1, 2007. Furthermore, up to $1.5 billion of the net auction proceeds must be available to assist consumers in the purchase of over-the-air digital-to-analog converter boxes.

Even assuming that, under the PSBT proposal, a $5 billion payment would have to be made to the Treasury for the right to manage the PSBT, with the decrease in auction proceeds resulting from: (1) the absence of 30 MHz from the auction and (2) the availability of spectrum for lease by the PSBT, there would not be enough money to pay for the converter box program. The absence of the converter box program would jeopardize the February 17, 2009 transition date because Members of Congress would likely be unwilling to require broadcasters to turn off analog signals

without Federal assistance to purchase converter boxes. With the decrease in net auction receipts caused by the PSBT, Congress would also be unable to fund the other initiatives, such as the assistance provided to New York broadcasters and the low-power television and translator conversion program, that are viewed as necessary for a smooth and timely completion of the digital television transition.

Question 2. Mr. Largent, you state that public safety has more than enough spectrum to build and operate a network that will support broadband applications, and you specifically note that the FCC has allocated 50 megahertz to public safety in the 4.9 gigahertz band for broadband applications. Do you believe it is economically feasible to build a nationwide broadband network in that band?

Answer. The FCC has worked closely with the public safety community to adopt regulations for the 4.9 GHz band that will create opportunities for affordable broadband networks in that band. The FCC determined "that the 4.9 GHz band will be able to accommodate a variety of broadband applications, including technologies and operations requiring varying bandwidths and operations that are both temporary and permanent in nature." In November 2004, the FCC promulgated rules that will allow wireless manufacturers to leverage technology already available in the commercial wireless sector in order to provide reliable, affordable, and interoperable broadband equipment to our first responders. As industry watchers have noted, the "potentials are enormous" for use of this new technology.[1] Numerous companies have already rolled out or begun development on 4.9 GHz-compatible equipment, as well as designing mesh network systems that will increase signal penetration and system redundancy.

Brookline, Massachusetts has already taken the first step in installing a 4.9 GHz system, contracting with wireless providers to create a network that will allow immediate access to police reports and crime incidents, provide remote video surveillance, and do geographic information system (GIS) mapping. The city expects to achieve 95 percent signal penetration on the street and 90 percent in buildings—despite the numerous hills, trees, and old apartment buildings dotting the landscape—and to manage costs by eventually merging with commercial WiFi networks in the area. The Brookline system provides an example of the potential for interoperable broadband networking in the 4.9 GHz band.

Question 3. One issue that continues to vex policymakers is the buildout of wireless services in rural areas. Could you discuss this issue, and how either the proposal suggested by the FCC or the Public Safety Broadband Trust proposal would address these concerns?

Answer. There is no reason to believe that the FCC's current auction regime—which encourages the highest and best use of spectrum licenses—will not result in buildout to rural areas. Licensees have a strong incentive to obtain the maximum return from their use of spectrum, including that portion of the spectrum serving sparsely-populated areas of the United States. Currently, 98 percent of Americans live in counties served by at least three wireless providers, and the FCC recently concluded that "CMRS providers are competing effectively in rural areas."

Significantly, the PSBT proposal does not guarantee increased buildout to rural areas or alter the market forces that will inevitably drive or hinder rural buildout. The PSBT proposal covers only 99.3 percent of the U.S. population—the same percentage that already has access to wireless services. Furthermore, as Morgan O'Brien has recognized, the PSBT proposal depends on the assumption that commercial wireless providers will find it profitable to build out the network in rural areas. This assumption is not a guarantee, nor is it unique to the PSBT: it is simply a recognition of the market trends that are already enhancing wireless communications coverage in rural America. While Mr. O'Brien has theorized that the same carriers that will build the PSBT in densely-populated areas will subsidize deployment in rural areas, there is no guarantee that carriers that would build parts of the PSBT network in more-populated areas would build networks in rural areas if they currently already are not building in those areas.

To the extent that the PSBT proposal depends on economies of scale and redistributive policies to decrease the costs of buildout in rural areas, the same advantages are present in the FCC's current proposal to allocate 12 MHz of the current public safety spectrum in the 700 MHz band to one national licensee that would manage national public safety broadband development, enhancing first responder-industry relationships and making money through a program of leasing access to the public safety spectrum to commercial interests on a preemptible basis. Like the

[1] Computer Assisted Pre-Coordination Resource and Database System, Nat'l Institute of Justice, *4.9 GHz Frequency Database Module, http://caprad.nlectc.du.edu/caprad/f__main .Public49?p__cOpt=3* (Mar. 14, 2007).

PSBT proposal, the FCC proposal also does not provide any guarantee that current market trends combined with an enhancement of the public safety community's increased purchasing power will result in rural buildout. It does, however, pursue this goal without disrupting the hard-fought regime of the Digital Television Transition and Public Safety Act, which provides sufficient spectrum to public safety while also providing 60 MHz of new spectrum for commercial use in rural areas.

Beyond the issues related to the PBST, let me make clear that CTIA recognizes the desirability of ubiquitous coverage in rural areas. The wireless industry is spending billions of dollars to improve network coverage, capacity, and quality across the United States. The Federal Universal Service Fund has played an important role in improving rural access to wireless service, and as coverage expands, more and more residents of rural areas are turning to wireless to meet their communications needs. Unfortunately, the failure of the Federal Communications Commission to address wireless carrier petitions for Universal Service support in a timely manner effectively denies Universal Service funding to wireless carriers, depriving consumers in these rural areas the full benefits of competition. Universal service support mechanisms should be administered on a competitively- and technology-neutral basis. Senator Stevens' Universal Service bill, S. 101, would impose a six-month deadline for consideration of these petitions. CTIA supports this provision of S. 101.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. OLYMPIA J. SNOWE TO HON. STEVE LARGENT

Question 1. If Congress chooses to go ahead with commercial auctions of the full 60 megahertz of spectrum from the digital television (DTV) transition—instead of dedicating 30 megahertz to the proposed "Public Safety Broadband Trust"—what guarantee is there that commercial wireless carriers will build out their wireless broadband networks in rural areas?

Answer. There is no reason to believe that the FCC's current auction regime—which encourages the highest and best use of spectrum licenses—will not result in buildout to rural areas. Licensees have a strong incentive to obtain the maximum return from their use of spectrum, including that portion of the spectrum serving sparsely-populated areas of the United States. Currently, 98 percent of Americans live in counties served by at least three wireless providers, and the FCC recently concluded that "CMRS providers are competing effectively in rural areas."

Significantly, the PSBT proposal does not guarantee increased buildout to rural areas or alter the market forces that will inevitably drive or hinder rural buildout. The PSBT proposal covers only 99.3 percent of the U.S. population—the same percentage that already has access to wireless services. Furthermore, as Morgan O'Brien has recognized, the PSBT proposal depends on the assumption that commercial wireless providers will find it profitable to build out the network in rural areas. This assumption is not a guarantee, nor is it unique to the PSBT: it is simply a recognition of the market trends that are already enhancing wireless communications coverage in rural America. While Mr. O'Brien has theorized that the same carriers that will build the PSBT in densely-populated areas will subsidize deployment in rural areas, there is no guarantee that carriers that would build parts of the PSBT network in more-populated areas would build networks in rural areas if they currently already are not building in those areas.

To the extent that the PSBT proposal depends on economies of scale and redistributive policies to decrease the costs of buildout in rural areas, the same advantages are present in the FCC's current proposal to allocate 12 MHz of the current public safety spectrum in the 700 MHz band to one national licensee that would manage national public safety broadband development, enhancing first responder-industry relationships and making money through a program of leasing access to the public safety spectrum to commercial interests on a preemptible basis. Like the PSBT proposal, the FCC proposal also does not provide any guarantee that current market trends combined with an enhancement of the public safety community's increased purchasing power will result in rural buildout. It does, however, pursue this goal without disrupting the hard-fought regime of the Digital Television Transition and Public Safety Act, which provides sufficient spectrum to public safety while also providing 60 MHz of new spectrum for commercial use in rural areas.

Beyond the issues related to the PBST, let me make clear that CTIA recognizes the desirability of ubiquitous coverage in rural areas. The wireless industry is spending billions of dollars to improve network coverage, capacity, and quality across the United States. The Federal Universal Service Fund has played an important role in improving rural access to wireless service, and as coverage expands,

more and more residents of rural areas are turning to wireless to meet their communications needs. Unfortunately, the failure of the Federal Communications Commission to address wireless carrier petitions for Universal Service support in a timely manner effectively denies Universal Service funding to wireless carriers, depriving consumers in these rural areas the full benefits of competition. Universal Service support mechanisms should be administered on a competitively- and technology-neutral basis. Senator Stevens' Universal Service bill, S. 101, would impose a six-month deadline for consideration of these petitions. CTIA supports this provision of S. 101.

Question 2. In lieu of creating a "Public Safety Broadband Trust," what is the wireless industry's solution to providing public safety with a nationwide broadband network?

Answer. CTIA and its members fully support the creation of an interoperable wireless broadband public safety network. The challenges faced by first responders are not based on a lack of spectrum, however. CTIA's largest carriers use, on average, 50 MHz of spectrum—almost the same amount of spectrum used by public safety agencies to provide voice and data service to 3 million first responders [1]—to provide both voice and broadband data services to more than 50 million customers each.

The challenge of building a nationwide public safety broadband network derives from the balkanization of public safety spectrum, the resulting lack of interoperability, and the inability of local jurisdictions to work together to coordinate frequencies or to achieve economies of scale. CTIA has submitted comments in support of the FCC's current proposal to remedy these problems by allocating 12 MHz of the current public safety spectrum in the 700 MHz band to broadband interoperability. Under the FCC proposal, one national public safety licensee would be responsible for allocating, managing, and building out the public safety broadband network. This licensee would also work with the commercial wireless industry by leasing access to commercial interests on a preemptible basis, thereby gaining additional funds and cooperative partnerships with commercial entities.

CTIA believes that the commercial wireless industry can and should provide the public safety community with invaluable information and expertise to improve efficiency and interoperability of the existing public safety spectrum. To this end, CTIA is sponsoring a program through which leaders from the public safety world and experts from the commercial sector can come together to find the best solutions to our first responders' broadband and interoperability needs. CTIA members have already committed themselves to this important effort, which begins on April 9, 2007.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. DANIEL K. INOUYE TO DAVID BILLSTROM

Question 1. Mr. Billstrom, in your testimony, you note that the military has moved to IP radio technologies. Are these same technologies currently available to local first responders, and if so, what are the major obstacles preventing wider adoption? How can we promote greater coordination among local first responders?

Answer. Chairman Inouye, your questions get to the heart of the issue before us. Yes, the very same technologies used by the U.S. military are available now for first responders at the state, county and local level throughout the United States.

This is not really a "new" technology; it is only "new" to public safety. As you know, Voice-over-IP also known as "VoIP" has existed in commercial form, embedded in many telecommunication products, for more than a decade. The variant of this technology used for military and public safety radio communications, Radio-over-IP ("RoIP") is more than 5 years old—a very long time in the technology world. Production implementations of RoIP are used every day, 24/7, for mission-critical applications throughout the U.S. military—including with special forces—and in certain applications by the U.S. Coast Guard. These systems are, in many cases, available for inspection and review by public safety officials.

At this point there are numerous vendors offering ROIP. We generally recommend to public safety agencies that they pursue software-only ROIP vendors in order to avoid the trap of proprietary hardware. It is my understanding that both the Department of Defense and the U.S. Coast Guard have deployed software-only ROIP solutions, but obviously I cannot speak for any of these users.

---

[1] This does not include 50 MHz of spectrum allocated to public safety in the 4.9 GHz band, which some public safety officials have argued is better suited to high-speed, broadband public safety applications.

There are two obstacles to wider adoption by the public safety community. First, many "new" technologies in public safety are first acquired with Federal grant dollars. Despite SAFECOM recommendations consistent with the use of ROIP, most potential grant applicants in the public safety community are uncertain whether a request for grant funding for ROIP will be favorably regarded by grant program officers. It would help if Congress provided direction to DHS, NTIA, HHS (and other Federal agencies with grant programs) that Federal grant programs should consider ROIP grant requests.

It would be a tremendous improvement just to achieve a "technology neutral" position for grant dollars—as the current perception is heavily lopsided toward "buy more radios from traditional radio manufacturers." That is an approach that obviously isn't working, and is quite expensive relative to the software alternative.

The other obstacle to adoption by the public safety community is more controversial. The traditional vendors of vertically-integrated radio systems for public safety actively discourage the use of ROIP by public safety in many ways, but most outrageously by opposing any attempt to connect their proprietary communication systems with ROIP from other vendors.

By "vertically-integrated" I mean radio communication systems that are manufactured by a single company, and by the use of patented and/or trade secret protected technology, prohibit the use of radios made by any other company on their systems. Motorola, for instance, makes fine products, some of the best in the world, but the trunking radio systems they sell to public safety (and have installed throughout the United States in many of our largest metropolitan areas) do not permit the use of radios from any other manufacturer. This is a classic example of a vertically-integrated product—public safety agencies must purchase the system, including repeaters, dispatch consoles, and all of the radios in the system, from a single (often sole-source) supplier. Although vertically-integrated systems are no longer available in the computer industry (IBM was the best-known example) because they were superseded by the open market approach, they are status quo in public safety for radio systems.

The disadvantage of vertically-integrated radio systems when used in public safety is that the radios are fundamentally *not* interoperable, since every radio on a system must be provided by the system's sole manufacturer. It would be as if Dell laptops could only send e-mail to other Dell laptops; e-mail destined for a HP laptop wouldn't get through. The result is that if you must send e-mail to someone with a Dell, you must buy a Dell laptop even if you already own an HP laptop. I know public safety officials with two or even three radios mounted in their vehicle in order to overcome a similar limitation imposed by the radio system manufacturers.

It is my opinion that most of the current public safety radio system manufacturers are strongly motivated to avoid or even prevent interoperability, in order to preserve their proprietary market position. From my business background I find this impressive; as a first responder I find this deplorable.

In the same way that these radio system manufacturers have absolutely prohibited the use of radios made by any other manufacturer in their vertically-integrated systems, they have also prevented their radio systems from being interconnected with ROIP technology made by any other company.

Wider adoption of ROIP by public safety would be encouraged if DHS refused to fund any radio system purchases (or even upgrades) if the radio system was not open to ROIP technologies, specifically including ROIP products from vendors other than the radio system manufacturer.

Question 1a. Are these technologies sufficiently robust and reliable?

Answer. The answer is simple, Radio-over-IP ("RoIP") is as robust and reliable as the computer network equipment used to implement the technology.

Even with this fundamental axiom, I have seen some confusion and misunderstanding regarding "reliability" and even "security" of ROIP. This is surely because these critics are confusing "public safety grade" IP networks with the DSL Internet connections many of us use to check e-mail at home. It is completely different. A network can be completely closed, secure, and protected from disruption. The Department of Defense, the U.S. Coast Guard, and many private and public corporations have billions of dollars at stake as well as millions of lives on their computer networks. These organizations use secure and redundant IP networks on a 24/7 basis. The equipment used to install and operate those networks is the exact same equipment used in ROIP systems. Public safety grade IP networks are not only reliable and robust, but they are *more reliable* and *more robust* than the proprietary radio systems built by traditional radio manufacturers.

This is because there are more users—millions of more users world-wide—for secure computer networks than there are police and fire radio users. History shows that technology innovation is driven most effectively when millions of users push

the products and technology to its limits, and vendors are inspired to drive quality up and costs down. The serious customers of IP networks such as military services, governments, and corporations, have driven technology innovation and reliability in IP network equipment for decades now. The resulting competitive market (unlike the sole-source market of traditional public safety radio system manufacturers) has led to higher quality and lower price.

Not only is ROIP more robust and more reliable, it is generally less expensive than traditional radio systems.

I will reiterate my testimony in front of your committee: RoIP is not perfect and does not solve all public safety communication problems, but it is a tremendous step forward toward increased interoperability. And it is affordable.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. MARIA CANTWELL TO DAVID BILLSTROM

Question 1. Mr. Billstrom, thank you for making the trip across the country from that other Washington to be with us today. You have an ideal background to speak to the issues the Committee is exploring at this hearing. You are the CEO of a high-tech company that provides systems integration services for public safety organization and you are yourself a first responder in your local community in the San Juan Islands.

As you may know, a number of Washington State public safety officials in the counties closest to Canada have expressed concerns regarding Nextel's re-banding of public safety radios within the 800 megahertz public safety band. In particular, for the re-banding to be successful on our side of the border, there needs to be corresponding changes on the other side of the border we share with Canada and a revision to our existing treaty. Putting on your hat as a first responder, are you concerned about the slow progress the State Department is making with its Canadian counterpart with respect to modifying the existing treaty addressing this spectrum issue? How important is it to get this done in a timely manner as the region prepares for the 2010 Winter Olympics in Vancouver?

Answer. Thank you Senator Cantwell for your kind remarks, and thank you for the opportunity to respond to these important questions.

Even without the 2010 Winter Olympics in Vancouver approaching, this is an important issue for public safety responders in Washington, and in all States along the Canadian border with the United States. With the Olympics, this important issue has become a critical factor in the ability for first responders in the region to be ready.

The problem is that radio systems—antennas on mountain tops and tall buildings—take time to design, manufacture, and install. Almost all of the equipment used in a radio system is highly specific to the radio frequency used. As a consequence, a new radio system needs to know which frequencies it will use more than a year before the system is to be used.

The 800 MHz Rebanding is a complex and difficult issue, but at the highest level, the program is a mandatory change of every 800 MHz public safety radio system in the United States. In a program approved by the FCC, argued in the courts, and in development for years, every public safety radio system using 800 MHz in the United States must be re-built and re-deployed on new frequencies. The program is behind schedule, in part due to the inability to acquire new frequencies for the public safety agencies on the border with Canada.

It has always been difficult to acquire frequencies for public safety agencies in Canadian border areas (which reach down from the border farther south than Seattle). In fact, the Blaine, Washington police department doesn't even have one frequency approved, they are forced to use radios from the U.S. Border Patrol since they cannot have their own.

The slow, and sometimes impossible, process of coordinating frequencies with Canada has impeded the safety of public safety personnel for years. Now it is preventing the 800 MHz Rebanding program from forward progress.

Because it takes time to install new radio systems, and the new systems must be built for the exact frequencies approved by the U.S. and Canada, the 800 MHz Rebanding needs to resolve frequency allocation with Canada immediately. I cannot provide an exact timeframe, but I would estimate that if the logjam with Canada is not broken within the next 4 to 6 months, it will be impossible to complete the 800 MHz Rebanding before the Olympics. This in turn will endanger public safety responders and the general public.

Question 2. Let me shift to the OPSCAN project funded by the Department of Homeland Security that coordinated communication of over forty local, state, tribal,

and Federal agencies operating in the Olympic peninsula. My understanding is that the project relied on a microwave backbone, mutual aid bases, Radio-over-Internet-protocol technology, gateway devices, and really focused on tying together legacy communications systems operating in different frequency bands. Would you say the key to the project was new hardware or open standards-based software? Based on your experience, do you believe that OPSCAN is a successful model for addressing the legacy equipment issues facing public safety agencies in numerous jurisdictions across the country?

Answer. Yes, OPSCAN is a model for public safety agencies across the country for the simple and incredibly important reason that it dramatically improved interoperability by using ROIP (or IP Radio) without requiring a single first responder to buy a new radio.

This is because OPSCAN ties together existing radio systems, and the radio users in any one of those radio systems simply keeps using their existing radio, on their existing system, but can reach radio users on other radio systems.

OPSCAN was an ambitious project, with at least three major objectives: to improve coverage, to improve reliability, and to improve interoperability.

Coverage was improved by adding new radio towers. Reliability was improved by installing ROIP as the method of controlling base station and repeater radios. As discussed in my answer to Chairman Inouye's question about reliability, the use of industry-standard IP network hardware in the OPSCAN radio network increased OPSCAN's reliability. The digital microwave backbone was improved, with redundancy, to host the IP network. The OPSCAN objectives of improving coverage and reliability are typical of what is needed with many of the public safety radio systems across the U.S., particularly in rural and suburban areas.

OPSCAN's interoperability objective was met when the ROIP system incorporated the radio system of participating public safety agencies (47 agencies so far). Not only can radio users on any one system reach radio users on the other system(s), but 911 and dispatch centers throughout the region can all access the radio systems on the network. "Interoperability" between dispatch centers is perhaps more important than interoperability between radio users in the field.

In my experience, I have never heard of a radio system upgrade of this scope—that is, with 40+ agencies and a wide geographic area—that didn't require all of the participants to buy new radios for every officer, every vehicle, and every dispatch center. By using standards-based software and standards-based IP network hardware, this radio system upgrade was accomplished without requiring a massive mobile and handheld radio purchase.

This is a model for interoperability that is within the scope of most state (and even some county) budgets across the United States.

Question 3. As you know in the Pacific Northwest, we are all very excited about the economic potential of the 2010 Olympics in Vancouver British Columbia. This event presents a number of challenges with respect to coordinating land, air, and sea communications across local, state and Federal agencies in two nations. In your view, what does San Juan and other border counties need to do with respect to interoperable communications in order to prepare for the 2010 Olympics and all of the expected visitors?

Answer. This is an excellent question, and not only is this a very real issue for the 5–6 counties that will be directly impacted by the huge influx of welcome visitors over many months, but it also serves as a model for any high-impact, high-volume tourist event in the U.S.

First, the aforementioned logjam between the U.S. and Canada on the authorization of new frequencies in the 800 MHz band for public safety must be resolved completely within the next 4–6 months in order for construction required by the 800 MHz Rebanding to begin, and then finish prior to the Olympics.

Second, the 5–6 counties in the region should receive immediate funding for a ROIP (or IP Radio) system implemented across the region, and incorporating Federal U.S. agencies and of course provincial and national Canadian agencies. This should be an OPSCAN-like system, although there is no longer enough time prior to the Olympics to build new radio towers for coverage (OPSCAN suffered lengthy delays due to tower construction).

Third, a comprehensive training program should be conducted throughout the region so that the first responders that make up the bulk of the response to any critical incident associated with the Olympics (or the influx of visitors to the Olympics) will have the interoperable communication skills. While Federal funding has been provided for training and drills in the most recent 2 years, it has primarily benefited the readiness of large metropolitan areas. The 5–6 counties in the region affected by the Olympics are primarily rural and small towns, with much of public safety

emergency response provided by volunteers. We need to get communications training to those volunteers.

I know my colleagues in San Juan County are ready for emergencies; they respond every day and provide professional service. But in the past several years, the Federal agencies around them such as the U.S. Coast Guard, Immigrations and Customs Enforcement, Federal Bureau of Investigation, and other DHS responders have all acquired new radios and new radio systems. These new, proprietary systems are incompatible with the radios used by first responders in most of the region affected by the Olympics. Without an OPSCAN-like IP Radio system to interconnect the existing first responder radio systems with the new Federal radio systems, we face the potential for another massive failure of first responder communications as seen on 9/11 and during Katrina.

With the I–5 freeway corridor passing through small towns and rural countryside for most of its length between Vancouver and Seattle, and with the Washington State Ferry System passing through the rural San Juan Islands, we must prepare our rural and small town first responders with interoperable communications—but not by buying all of them new radios.

Question 4. Is there a standard for public safety personnel to exchange data? To exchange video? Should any standards developed be open standards? What is the danger of not having open standards?

Answer. There is extensive discussion on the topic of standards for (digital) data exchange among public safety agencies, but there is no "open" standard. As I have outlined previously with the open standards used in IP networks, an open standard for public safety data exchange will encourage participation by many providers and vendors, which in turn encourages innovation and drives costs down.

Without open standards, we will face the usual monopoly, or at best duopoly, of a single vendor's proprietary standard. This will keep costs up, and leave quality and product features at a mediocre level at best. There is also an aspect of "interoperability" with data standards, including video, that would impede the exchange of crucial information during an emergency, in the same way that public safety voice radio communication interoperability is impeded today by the dominance of mutually-exclusive proprietary radio systems.

Question 5. Many communities rely on the Department of Homeland Security's SAFECOM guidance in guiding purchase and requests related to facilitating interoperable communications. Do you believe that historically DHS has focused too much on hardware solutions? Do you believe that DHS guidance in the past has chilled local governments from pursuing IP-based solutions?

Answer. I find it awkward to criticize an agency that has provided essential and valuable funding for public safety agencies, but it is an objective truth that the first years of SAFECOM guidance focused on the relatively obvious solutions, from the relatively obvious traditional communications vendors. Understandably, those traditional radio system vendors, with decades-long experience and track record with hardware, proposed hardware solutions.

It is not an accident that one of the first innovations for public safety interoperability came from a defense contractor—an "interoperability switch" that could be used at the emergency scene. I think it is notable that this solution did not emerge from traditional radio system manufacturers. These interoperability switches (also called "gateways") are hardware-intensive solutions, and have numerous limitations, but play an essential role. SAFECOM has recommended gateways for some time, which was appropriate given the resistance to interoperable radios. At the time, it was well-known in the public safety community that gateways could be acquired easily in DHS grant programs.

During the past 2 years SAFECOM has essentially been silent on the topic of software generally, and IP Radio (or ROIP) software in particular. This should be surprising to everyone, as the U.S. continues to lead software innovation in all sectors, and in nearly all industries, relative to every other country. Where is the comprehensive review of software technology as it applies to Homeland Security, and to interoperable communication? I believe that there is a faulty, but widespread belief that communications is a "hardware" problem despite extensive evidence to the contrary, including but not limited to the U.S. as a leader of VoIP phones used in both business and residences.

And yes, SAFECOM has negatively influenced the use of IP-based solutions by local governments. Let me be clear; it isn't that SAFECOM needed to endorse or promote ROIP technology (it hasn't). The issue is that the program has largely remained silent on the issue, which has had the same effect as condemning it.

Local governments already perceive new technologies as risky, which is a healthy perspective. However ROIP is only "new" to public safety; it has been in use for

sometime in the military. We can't expect local governments to be aware of technology deployments in the military and Coast Guard, and use that information to guide their decisions, but I do think we should expect DHS to do exactly that.

Thank you again for the opportunity to comment.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. DANIEL K. INOUYE TO MATTHEW J. DESCH

Question. Mr. Desch, in your testimony, you discuss the role that satellite communications can play in improving the redundancy of emergency communications capabilities. Is cost the major obstacle to more redundant communications systems? Are there other obstacles?

Answer. I do not believe that cost is the major obstacle to the deployment of redundant communications systems. Iridium and other satellite communications providers pride themselves on their efforts to offer first responders redundant communications solutions at reasonable prices. Iridium, for example, continues to bring satellite handsets to the market at prices that make satellite an affordable option for first responders and public safety personnel, as well as for the private sector. In fact, Iridium prides itself on its partnerships with government agencies, like the Department of Defense, and the private sector to develop redundant devices and services. Iridium is committed to continuing to do so, as our recent partnership with Raytheon demonstrates—offering public safety an integrated interoperable and redundant communications package.

Instead, one of the most significant obstacles to a redundant communications system for public safety is the lack of funds for the purchase of these devices. Public safety organizations often function within very limited budgets and lack the means to purchase interoperable and redundant communications systems. This Committee has already taken great strides toward ensuring that first responders have the funds necessary to purchase advanced, interoperable, and redundant communications equipment. The $1 billion you allocated in the DTV Act was a good first step in this direction, and the additional provisions in S. 385 that allow for the purchase and pre-positioning of communications equipment and communications service, including satellite, will help make sure that first responders will have access to redundant communications equipment. Both policymakers and public safety concede, however, that $1 billion is not enough to guarantee that all the public safety organizations in the Nation can purchase satellite-based devices for those times when terrestrial networks are ineffective or inoperable.

Another significant impediment to the development of a truly effective redundant communications network for our Nation's first responders has been the lack of an integrated emergency communications plan that embraces satellite. The communications failings on September 11 prompted an examination of the need for communications interoperability amongst first responders. It was not until the communications failings caused by the Gulf Coast hurricane disaster, however, that the Nation realized that communications redundancy for first responders was also needed in our emergency communications planning. Any truly effective national emergency communications plan must include both interoperability and redundancy—interoperability is fruitless when the terrestrial communications networks that the interoperable system is built on no longer exist.

This need for an integrated national emergency communications plan has been embraced by this Committee and this Congress. The Department of Homeland Security communications reforms passed last fall in the Department's Fiscal Year 2007 Appropriations bill direct the Department to begin exploring and developing this national plan. Iridium strongly supports the provisions in S. 385 that direct the FCC to study the development of a national emergency communications back-up system, particularly because that study must include an examination of the use of satellite communications for such a system. Satellite is the only logical choice for that back-up system because it is the communications fail safe for first responders, and I hope that the FCC will conclude as much if the study is conducted.

The benefit of development of this national communications plan does not stop with first responders. As the public sector begins to acknowledge the need for redundant communications solutions in emergency situations, the private sector will do so as well. Iridium has already begun to partner with private corporations, like MedStar Health, to develop devices that will function in worst-case scenarios. I believe that other private sector organizations will follow the government's and public safety's lead once satellite redundancy is embraced as part of a national emergency communications plan.

○