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PUBLIC SAFETY COMMUNICATIONS FROM 9/11 TO KATRINA: CRITICAL PUBLIC POLICY LESSONS

HEARING

BEFORE THE

SUBCOMMITTEE ON TELECOMMUNICATIONS AND THE INTERNET

OF THE

COMMITTEE ON ENERGY AND COMMERCE

HOUSE OF REPRESENTATIVES

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CONTENTS

Page

Testimony of:
- Botterell, Art, Emergency Information Systems Consultant 103
- Boyd, David G., Director, Safecom Program Office, Science and Technology Directorate, Department of Homeland Security 62
- Hitch, Vance E., Chief Information Officer, Department of Justice 69
- Kramer, Harold, Chief Operating Officer, The National Association for Amateur Radio 112
- Martin, Hon. Kevin J., Chairman, Federal Communications Commission . 13
- Miller, Lt. Col. Thomas J., Deputy Director, Michigan State Police 98
- Roemer, Timothy J., Director of the Center for National Policy 94
- Trujillo, Tony, Chairman, Satellite Industry Association 107

Material submitted for the record by:
- Botterell, Art, Emergency Information Systems Consultant, response for the record 172
- Gyllstrom, Gregory W., Vice President/General Manager, Aftermarket, Visteon Corporation, prepared statement of 122
- Kelley, Edwin A.,Principal Engineer, Interoperable Wireless, prepared statement of 127
- Kramer, Harold, Chief Operating Officer, The National Association for Amateur Radio, response for the record 171
- Martin, Hon. Kevin J., Chairman, Federal Communications Commission, response for the record 173
- Miller, Lt. Col. Thomas J., Deputy Director, Michigan State Police, response for the record 183
- Roemer, Timothy J., Director of the Center for National Policy, response for the record 185
- Trujillo, Tony, Chairman, Satellite Industry Association, response for the record 186
- Vaughn, John, Vice President and General Manager, Wireless Systems, M/A-COM, Inc., prepared statement of 153

PUBLIC SAFETY COMMUNICATIONS FROM 9/11 TO KATRINA: CRITICAL PUBLIC POLICY LESSONS

THURSDAY, SEPTEMBER 29, 2005

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ENERGY AND COMMERCE,
SUBCOMMITTEE ON TELECOMMUNICATIONS
AND THE INTERNET,
Washington, DC.

The subcommittee met, pursuant to notice, at 1 p.m., in room 2322 of the Rayburn House Office Building, Hon. Fred Upton (chairman) presiding.

Members present: Representatives Upton, Stearns, Whitfield, Shimkus, Pickering, Fossella, Radanovich, Bass, Terry, Blackburn, Barton (ex-officio), Wynn, Towns, Gordon, and Stupak.

Staff present: Howard Waltzman, chief counsel, telecommunications and the Internet; Neil Fried, majority counsel; Kelly Cole, majority counsel; Will Norwind, policy coordinator; Jaylyn Jensen, senior legislative analyst; Anh Nguyen, legislative clerk; Johanna Shelton, minority counsel; and Peter Filon, minority counsel.

Mr. UPTON. Good afternoon. To me this seems like it is morning because we started a markup yesterday on refineries at 8 a.m. and we finished a little bit after midnight this morning so it was a 16-hour markup, passed by voice and many of us are still wondering which day it is. And we also have my friend and colleague, Mr. Markey, that serves on the Natural Resources Committee as well and they have got a major bill on the floor so we will be expecting members to come in and out. I apologize for the room. It is actually not a bad room. But we were scheduled for what we call the big house downstairs, 2123, but there is another subcommittee hearing on at the same time and they needed the video conferencing for that witness to appear from, I think, Louisiana or Alabama. So in an effort to maintain good relations with my chairman, I indicated that we would swap for this hearing.

Today's hearing is entitled "Public Safety Communications from 9/11 to Katrina: Critical Public Policy Lessons" which is designed to explore the issues of interoperability as they relate to our heroic first responders in public safety organizations. Interoperability is, at its core, the ability for various public safety groups to communicate with each other. To best equip our Nation's first responders to do their job, they must be able to communicate with one another, not just between fire, police, EMS in one jurisdiction, but also on the local, State, and Federal jurisdictions. For any disas-

trous event, it is our Nation's first responders who answer the call of relief. When citizens are forced to evacuate to protect themselves, it is our Nation's first responders who run the opposite direction into harm's way. For this very reason, interoperable communications are vitally important. For instance, on the morning of September 11, New York police officers were able to hear the radio warnings from helicopters that the North Tower of the World Trade Center was glowing red and most of the police officers exited the building safely, while dozens of firefighters who could not hear those same warnings, tragically perished when the tower collapsed. The radio communication system of the police was not compatible with the system that the fire department was using, consequently, no warnings could be heard and many, many lives were lost.

We were faced with some horrible lessons on 9/11 and we are here today to examine another disaster, Hurricane Katrina. Crisis communications during both of these tragic events failed. There is no doubt that achieving interoperability throughout our Nation has proven to be a monumental multi-faceted challenge and there are a number of reasons for this.

Two points which I think was most important include the availability of spectrum and funding issues. Back in 1997, Congress directed 24 megahertz of spectrum in the upper 700 megahertz band to be allocated to public safety. However, that spectrum is currently occupied by the broadcasters and will be until the transition to digital TV is complete. Chairman Barton and I, Ranking Member Dingell and Markey have spent countless hours working to free that valuable spectrum for public safety by crafting legislation setting a hard date for spectrum return as a vital and necessary step that must occur to make interoperability a reality, and we are committed to making it happen sooner rather than later.

The need for additional spectrum to replace old and antiquated equipment is another challenge for cash strapped State and local governments. According to information collected from grantees, total State expenditures for interoperable communication projects from the Department of Homeland Security Grant Program totaled nearly $1 billion in fiscal year 2004 alone.

Despite such large sums, Katrina showed us that we are still well behind the curve. What will it take to make interoperability a reality? How much more time, how much more money do we need to spend to make interoperability seamless? We cannot sit back for another natural disaster or another terrorist attack to strike. It has been 4 years since the attack of 9/11. And as Katrina made us all acutely aware, sadly we are far from where we need to be. But let me be clear, I recognize that this is a far bigger problem than simply a lack of funds or a lack of new equipment. Thousands of shiny new radios will not fix the problem if we don't have a strategic plan that allows all of these new radios to interact with each other. We need coordination among Government at all levels to ensure the equipment purchases of one municipality work with the jurisdiction next door. We need a national vision for funding equipment and technology. I plan to ask all the witnesses here today, who is going to fill that leadership vacuum? These are all the questions we need to answer, we must answer to ensure that our first responders can do their job. That is literally a matter of life and death.

Finally, I would like to welcome FCC Commissioner Chairman Kevin Martin to our committee. It is the first time he has appeared before us in his new capacity as Chairman. I thank each of our witnesses today. I also want to say is I have spent time with Chairman Martin. I particularly appreciate the work that he and all the commissioners did in reacting so swiftly to the deep-set problems that we saw with the hurricane. His folks, he and all the folks within the Commission worked many, many overtime hours through the weekends doing the things that they had to do to save lives and to get that equipment up and running, and for that, the Nation is eternally grateful. And I yield at this time to my colleague for an opening statement from the great State of Michigan, Mr. Stupak.

[The prepared statement of Hon. Fred Upton follows:]

PREPARED STATEMENT OF HON. FRED UPTON, CHAIRMAN, SUBCOMMITTEE ON TELECOMMUNICATIONS AND THE INTERNET

Good afternoon. Today's hearing is entitled "Public Safety Communications from 9/11 to Katrina: Critical Public Policy Lessons" which is designed to explore the issues of interoperability as they relate to our heroic first responders and public safety organizations.

Interoperability is, at its core, the ability for various public safety groups to communicate with each other. To best equip our nation's first responders to do their job, they must be able to communicate with one another, not just between fire, police, and EMS within one jurisdiction, but also among local, state, and federal jurisdictions.

During any disastrous event, it is our nation's first responders who answer the call of duty. As citizens are forced to evacuate to protect themselves, it is our nation's first responders who run the opposite direction—into harm's way. For this very reason, interoperable communications are vitally important. For instance, on the morning of September 11th, 2001, New York police officers were able to hear the radio warnings from a helicopter that the North Tower of the World Trade Center was glowing red, and most of the police officers exited the building safety—while dozens of firefighters, who could not hear these warnings, tragically perished when the tower collapsed. The radio communications of the police was not compatible with the system that the fire department was using, consequently, no warnings could be heard, and many lives were lost.

We were faced with some horrible lessons on 9/11, and we are here today to examine another disaster, Hurricane Katrina. Crisis communications during both of these tragic events failed. There is no doubt that achieving interoperability throughout our nation has proven to be a monumental, and multi-faceted, challenge and there are a number of reasons for this. The two problems I view as most important include the availability of spectrum and funding issues.

Back in 1997, Congress directed 24 Megahertz of spectrum in the Upper 700 Megahertz band to be allocated to public safety. However, that spectrum is currently occupied by broadcasters, and will be, until the transition to digital television is complete. Chairman Barton and I have spent countless hours working to free that valuable spectrum for pubic safety by crafting legislation setting a hard date for spectrum return. This is a vital and necessary step that must occur to make interoperability a reality and we are committed to making it happen—sooner rather than later.

Beyond additional spectrum, to replace old and antiquated equipment is another challenge for cash-strapped State and local governments. According to information collected from grantees, total State expenditures for interoperable communications projects from Department of Homeland Security grant programs totaled nearly a billion dollars in fiscal year 2004 alone. Despite such large sums, Hurricane Katrina showed us that we are still well behind the curve. What will it take to make interoperability a reality? How much more time and how much more money do we need to spend to make interoperability seamless? We cannot sit back for another natural disaster or terrorist attack to strike. It's been 4 years since the attacks of 9-11, and as Katrina made us all acutely aware, sadly, we are far from where we need to be.

But let me be clear—I recognize that this is a far bigger problem than simply a lack of funds or a lack of new equipment. Thousands of shiny new radios will not fix the problem if we don't have a strategic plan that allows all of these new radios

to interact with each other. We need coordination among government at all levels to ensure the equipment purchases of one municipality work with the jurisdiction next door. We need a national vision for funding, equipment and technology. I plan to ask all of the witnesses here today, who will fill that leadership vacuum? These are all questions we need to answer, we must answer, to ensure our first responders can do their job. This is literally, a matter of life and death.

Finally, I'd like to welcome FCC Chairman Kevin Martin to our Committee—this is the first time he's appeared before us in his new capacity as Chairman. And thank you to each of the witnesses for being here today. I look forward to hearing from all of you and learning the answers to my questions.

Mr. STUPAK. Thank you, Mr. Chairman.

Thank you for calling this critical hearing on the lack of interoperability communications for first responders. I would also like to extend a special welcome to Lieutenant Colonel Tom Miller from Michigan State Police.

Mr. Chairman, I would like to start with a quote. "It is important that we understand in the first minutes and hours after attack, that the most hopeful time to save lives and that is why we are focusing on the heroic efforts of those first responders. That is why we want to spend money to make sure equipment is there, strategies are there, communications are there to make sure that you have whatever it takes to respond." That was President George Bush in February 2002. I agree with his words 100 percent, but unfortunately there has been scant follow-through on these words. The communication equipment is not there. The strategies are incomplete and the money has not been spent. State and local Governments have received little guidance and fewer Federal dollars.

The inability of our first responders to communicate with each other is a problem known to most of us in this room for years, but was brought to the national spotlight beginning way back in 1995 with the Murrah Building, again on September 11, and most recently with the hurricanes. I wonder when this Congress will finally make a real commitment to first responder communications.

The 9/11 Commission agreed with those of us who called for a much larger Federal commitment. Their final report stated, and once again I would like to quote, "The occurrence of this problem at three very different sites is drawing evidence that compatible and adequate communications among the public safety organizations at the local, State, and Federal levels remain an important problem. Federal funding of such interagency communication units should be given high priority." Sadly, 4 years after September 11, the recommendations of the 9/11 Commission have fallen on deaf ears and the President has not kept his commitment. The 2 years after September 11, a mere $260 million was granted for interoperable communication grants at Department of Homeland Security. The President has never requested money again for the grants in Congress and it has never funded interoperability grants again.

While $260 million may be a drop in the bucket of the estimated $18 billion that full operability will cost, it was a start. In fact, the Administration has spent—excuse me. In fact, the Administration has a $10 billion plan to make its 80,000 Federal law enforcement agents interoperable, while there are over 75,000 first responders in my State of Michigan alone.

Frankly, given the lack of funding and the lack of planning, I was not surprised by the communication breakdown during and after Hurricane Katrina. I know that many in this room were not

either, but I am outraged at how little has been accomplished. Just as with September 11, during Katrina, helicopters could not communicate with rescuers on the ground. Just as with September 11, radio channels were overwhelmed with traffic. Just as with September 11, police could not talk to firefighters. Just as with September 11, those watching TV had better information than the first responders on the ground.

The Administration had the opportunity to learn a lot after September 11 but I am afraid they failed to listen. Then FEMA Administrator Brown said the agency failed to anticipate and I quote "The total lack of communication, the inability to hear and have good intelligence on the ground about what was occurring there." Perhaps Mr. Brown should have read the report published by the U.S. Conference of Mayors. According to their report released in June of 2004, more than 80 percent of America's cities are not interoperable with Federal agencies.

We are going to hear today about the need for spectrum and the need for plans, but all those things come down the road. The Administration says it will take over 20 years to become interoperable. We don't have 20 years. This committee needs to act this year on legislation, legislation I have introduced with Congressman Fossella and Congressman Engel.

I see my time is up, Mr. Chairman, so let me put the rest of my statement in the record. As you know, I have been on this issue for a long time and it is quite frustrating to have hearing after hearing and nothing happens. I am hopeful something will happen and happen this year.

Mr. UPTON. Thank you. Mr. Shimkus?

Mr. SHIMKUS. Thank you, Mr. Chairman.

I appreciate you calling the hearing. Obviously, we have a lot to talk about. I will just briefly address a piece of legislation that I am going to introduce along this—the companion legislation has already been introduced on the Senate side by Senators DeMint and Stevens, Nelson, and Inouye called the Warn Act which the basic premise is this. We do have our only real emergency broadcast system right now is the Free Over Air provided by our broadcasters. Telecommunications has changed dramatically as we all know, especially those of us who follow in this arena, and we have got to develop a way that we use all our telecommunications assets to broadcast immediate alerts. And we look forward to working with you, Mr. Chairman on that legislation and look forward to hearing.

I yield back my time.

Mr. UPTON. Mr. Gordon.

Mr. GORDON. Thank you, Mr. Chairman for calling this important hearing.

We saw an unprecedented collapse of communications on all levels in the wake of Hurricane Katrina. I am particularly concerned about the collapse of the 911 system. According to the FCC, 38 911 centers went down leaving citizens with no way to call for help and severely hampering rescue and relief efforts. Because the Legacy 911 System is not interoperable, once a local 911 center fails, there is no back up. The 911 system is a critical component of the Nation's emergency communication system. A 911 call is the first cry

for help and the first alarm. It is—it tells first responders where to go and what to expect when they get there.

We lost that link between citizens and first responders during by virtue of Katrina. And the 911 call center—well, excuse me. By virtue of our experiences there, we found that we lost those 911 centers and which they also frequently function as the dispatch center for fire, police, EMS, and all three in many areas. It would be a mistake to talk about interoperability issues for the first responders without also considering 911 call centers. They are an integral part of local emergency communication systems.

Along with Representatives Eshoo and Shimkus, I have introduced a bill several months ago that works toward an IP based emergency response system that would allow another 911 center to take calls if one call center fails. The IP based system would also empower 911 centers to share information and coordinate responses in the event of regional disasters. This bill also ensures that millions of people who use voice over the internet protocol phone service have full 911 e-911 services. I understand this hearing will focus on interoperability issues for the first responders; however, I hope the committee would at a later date address the Nation's 911 system so that we can also bring this to light.

Thank you, Mr. Chairman.

Mr. UPTON. Mr. Terry.

Mr. TERRY. Thank you, Mr. Chairman, for calling this hearing and our witnesses. Mr. Martin, thank you for being here.

I would agree with the facts on the accusations laid for by our friend from Michigan, Bart. They are serious voids and they have been identified as long as a decade ago before September 11 about the inoperability between our first responders. And I will tell you, I just spent 8 years on our city council and went through an upgrade of our emergency systems. We tried to get other agencies, other counties to join us in a total metropolitan communication so every sheriff, police, fire all of them could talk together and I will tell you what, it delayed it for almost 2 years just trying to get people, the other agencies to even sit down and talk with us.

The State of Nebraska has made interoperability one of the priorities of our homeland security that is the State plan. What happened? Instantly, the counties started fighting with each other. And so yes, we have a lot of hurdles to get over. Once we free up the spectrum, once again Chairman, we need to get the D-TV blow up. We need to get the action, the hard date, and move forward because a lot of this can be resolved, at least the technical aspects, with having more spectrum.

We are going to have to focus on the political part of this, too. With so many local agencies, we want to make sure that they remain autonomous but they are not going to become inoperable or interoperable if they won't go there. And so we have got to figure out how we do this, how we do it delicately. There are other issues not only of spectrum and equipment and technology and political cooperation but, you know, how do you keep the lights on when the lights are off everywhere else, so distributed energy certainly has to be a focus of this as well. There are just so many issues. That is why it is important we have hearings like this to kind of vent through some of those issues, the complexity of those issues.

And so I want to thank you, Chairman, and thank the panel. Yield back.

Mr. UPTON. Ms. Blackburn.

Ms. BLACKBURN. I will waive my opening statement and reserve my time for questions. Thank you, sir.

Mr. UPTON. Okay. Well that concludes our opening statements. I will make a motion that all members will have an opportunity to submit their opening statements as part of the record.

[Additional statements submitted for the record follow:]

PREPARED STATEMENT OF HON. CLIFF STEARNS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF FLORIDA

Thank you Mr. Chairman, for holding this hearing on our public safety communications infrastructure.

Today, it is easier for Americans to communicate than ever before, and information is incredibly easy to access. This has improved the quality of life for millions of Americans, but our reliance on communications might have a drawback: when disaster strikes and disables our communications infrastructure, people can't reach their loved ones or find out the latest news, resulting in inconveniences and dangers that can be especially painful.

Millions of Americans suffered from a massive breakdown in communications after Katrina hit the Gulf Coast. The disaster exposed the communications infrastructure in the area as extremely fragile. Yet many telecom providers dealt with the unprecedented situation in exemplary fashion.

The wireless industry quickly adapted by using mobile cell sites, VoIP services provided critical emergency communications, and the satellite industry's role in the aftermath of Katrina was also impressive.

I was also pleased to see that many of these private businesses offered free services for those who were in the affected areas.

While the industry continues to do its part to help Americans deal with disasters and maintain communications, it is imperative that Congress do what we can to improve our nation's ability to communicate during disasters, be they natural or a result of terrorism.

We can complete the DTV transition and allocate the critical spectrum for emergency services and first responders.

We can update our nation's telecom laws, which will provide the regulatory and legal certainty the industry needs to invest and innovate, and which will in turn undoubtedly result in even more effective and reliable communications technology.

We can promote interoperability, be it through some sort of legislation or in increased funding.

Perhaps even some sort of tax credits to help telecom firms recover from these recent disasters.

During this hearing, I hope to hear even more ways that we can help to improve disaster communications.

I look forward to the testimony of all the witnesses here today, especially Kevin Martin, who is before this subcommittee for the first time in his capacity as Chairman of the FCC, and who has provided excellent leadership during these critical times.

PREPARED STATEMENT OF HON. PAUL E. GILLMOR, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF OHIO

Mr. Chairman: Thank you for holding this hearing today to further investigate the growing need to make our first responder communication systems more interoperable.

After the horrific events of 9/11, we began to really see the need and importance of interoperable communications for our country's first responders. Yet today, we are here to discuss the problems that Hurricanes Katrina and Rita caused the brave men and women who, irregardless of self, charged into the disaster areas to provide aid to their family members, friends, and quite often, complete strangers.

One major obstacle that we continue to talk about is the release of the 700Mhz spectrum currently being utilized by television broadcasters to send their analog signal into American households. Mr. Chairman, I was pleased to see you and Chairman Barton taking decisive action to remedy this problem. The circulated staff draft

of the Digital Television Transition Act was a positive and fair step towards making this spectrum available—sooner rather than later. Yet, this is not the only answer to the issue of interoperability. Proper coordination among federal, state, and local entities is an equally important component in making sure that, when the spectrum becomes available, that no time is wasted in rolling out the new communications infrastructure to our firefighters, policemen, emergency medical technicians, and volunteer aid organizations.

Mr. Chairman, thank you again for holding this hearing and, finally, I would like to welcome all of our panelists here today and I look forward to your testimony on this timely issue.

PREPARED STATEMENT OF HON. BARBARA CUBIN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WYOMING

Thank you, Mr. Chairman.

I look forward to our hearing today on the status of America's emergency communications systems. Having just observed the 4th anniversary of the terrorist attacks of 9/11, and the disruption and damage of Hurricanes Katrina and Rita, this is a timely and appropriate topic.

As I'm sure our witness will demonstrate today, there is more to improved public safety communications than some grant money here, and a spectrum allocation there. A nationwide and coordinated effort is paramount.

Like many states, Wyoming is working on a statewide interoperable communications system. Our system is fairly unique, though, since it is a VHF-based system and does not reside in upper areas of spectrum that more urban and populous states use.

VHF signals are better suited for the vast open spaces we enjoy out west, and I am interested in learning from the experts assembled here about how this system can work in concert with other communications systems in the upper radio bands. Additionally, I would like to learn what the federal plans are for building out a communications network in the VHF band.

Interoperability and interference-free communication for our first responders is a worthy goal and I look forward to hearing testimony on where we are, how we got here and what is the best path going forward to achieve this goal.

Thank you again, Mr. Chairman for opening this dialog and look forward to hearing from our witnesses. I yield back the balance of my time.

PREPARED STATEMENT OF HON. MIKE FERGUSON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY

Thank you Chairman Upton for holding this hearing. The recent tragedy of Hurricane Katrina has not only highlighted the inadequacy of our crisis communications infrastructure, it brought the fore the need for Congress to act immediately.

Thanks to your commitment to moving DTV legislation this fall, we will have the opportunity to ensure that the 24 MHz spectrum dedicated to public safety use will finally be available to our first responders, who need it now more than ever.

A few weeks ago, I traveled down to Baton Rouge to help with the relief efforts. One of the things I packed with me were a few satellite phones to deliver to our colleague Bobby Jindal so his staff can make the critical communications necessary to help his constituents. In the immediate days after Katrina, these were among the only means of communication. Clearly, we need to do better.

I would like to briefly highlight the great work companies in my District have done to help the Gulf Coast region to help overcome these communications shortcomings. The Lucent Technologies and Bell Labs teams have drawn on their expertise in network disaster recovery, helping to re-establish vital communications services. In addition, they have provided on-site and remote technical support, and emergency, back-up and replacement equipment to more than a dozen of the Gulf Region's service providers.

AT&T has also pitched in, dispatching five Emergency Communications Satellite Units which are currently being used by the Louisiana State Police, the Louisiana National Guard, and others, and donating AT&T 35,000 AT&T PrePaid Phone Cards, each good for distribution to hurricane survivors by the Red Cross and Salvation Army. I am proud of both hometown companies have done and this subcommittee thanks you.

Now it is time for Congress to pitch in, to learn from past communications shortcomings and help ensure that we close the gap in communications among our first responders and achieve true interoperability. I look forward to hearing the views of

FCC Chairman Kevin Martin, our former colleague Tim Roemer, and the rest of the witness present today on how we meet that goal. I thank you for being here.

PREPARED STATEMENT OF HON. JOE BARTON, CHAIRMAN, COMMITTEE ON ENERGY AND COMMERCE

Mr. Chairman, thank you for calling this hearing today on public safety communications. The United States has seen some catastrophic events in the last five years that tested our crisis communications. Each time a crisis arrives, the first casualty seems to be the system that permits firefighters and police to communicate. Today we examine the progress being made to ensure that when the next crisis occurs, the emergency communications systems actually work.

Most recently, the collapse of communications occurred in New Orleans while thousands of people found themselves stranded at the New Orleans Convention Center. How much progress has been made since the September 11th terrorist attacks exposed major gaps in communications among federal, state and local officials more than four years ago? Not much, it seems.

On September 11, 1996, five years to the day before the 9/11 terrorist attacks, the Public Safety Wireless Advisory Committee released a report which stated that "unless immediate measures are taken to alleviate spectrum shortfall and promote interoperability, public safety will not be able to adequately discharge their obligation to protect life and property in a safe, efficient, and cost effective manner." And yet here we are and public safety is still grappling with inadequate spectrum and radios that do not communicate with one another. What I want to learn today is this: what on earth does Congress need to do to make sure public safety officials and first responders can talk to each other?

I already know that a big part of the answer is spectrum. I have spent months working on a bill to enact a hard date for the digital television transition so that the broadcasters will return spectrum in the upper 700 MHz band that Congress promised to public safety in 1997. With this spectrum, first responders across the nation could share common channels on which multiple local, state, and federal agencies could coordinate emergency response. We should not wait for another terrorist attack or natural disaster to remind us of the importance of giving public safety the tools they need to do their job.

Mr. Chairman, thank you again for holding this hearing. I look forward to working with you to ensure that this Committee does everything it can to ensure that first responders achieve communications interoperability.

PREPARED STATEMENT OF HON. ELIOT ENGEL, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW YORK

Mr. Chairman—As many of us were together until late last night, I will be brief in my remarks. I want to thank the new Chairman of the FCC for coming up as well as the other witnesses. Your views are most welcome.

There is no dispute from any quarter that public safety needs more spectrum—and they shall soon have it.

However, as we saw in New Orleans, even with that spectrum available—local and state public safety officials need the resources to utilize that spectrum.

I am proud to have co-authored legislation with Rep. Stupak and Rep. Fossella that will provide these resources.

I believe our bill is superior to others that have been introduced for two main reasons.

First, it is paid for by using revenue from the spectrum auctions. And I would add that it would be put into a trust fund unavailable to the annual appropriations process. Thus, we would not have to rely on an annual fight among competing priorities.

The second reason is the breadth of uses for the money. Our bill does not just provide new equipment—it allows engineering analysis and design to be done first. The fact is that the concrete canyons of Manhattan are vastly different from the plains of the Iowa. How radio signals operate in those areas is also vastly different. Then, of course our bill allows for equipment. But, finally it also allows the money to be used for training. This new equipment will have many features that enable not just police, fire and EMT personnel to speak to each other. This new equipment will allow local, state and federal officials to talk as well.

This is a welcome hearing. But, I would welcome more a quick mark up of our bipartisan legislation!

I yield back.

PREPARED STATEMENT OF HON. MIKE DOYLE, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF PENNSYLVANIA

Thank you Mr. Chairman.

It took the terrorist attacks of September 11, 2001 for most people to fully grasp how important it is for government, at all levels, to upgrade the communications systems used by first responders. The 9/11 Commission spelled it out for us, we need to make the 700 MHz band available as soon as possible, and we need to improve connectivity by encouraging the adoption of newly developed standards. We all know this, we just need to do it and do it right. Hurricane Katrina and its aftermath showed us that we have a long ways to go.

To me the interoperability question is the most important issue related to the allocation of digital spectrum. Our constituents want new digital television service, new wifi and wimax services, and all the other goodies that will undoubtedly unfurl once we've made additional spectrum available to private sector interests. However, no doubt more important then those new devices and services, our constituents want to know that when they call 911 in the middle of an emergency, they want to know that the people that come to save them will be able to communicate with one another so they can figure out how best to save them.

This is a national problem that requires a focused national solution. This committee has spent much of the last year hammering out the details of a DTV bill that will make the spectrum necessary for this transition. Many of the experts that will appear before us today—at every level of government and also within the private sector—have done the detailed planning it will require to implement a project of this magnitude. So now in many ways it is just a matter of implementation.

I believe it is incumbent upon Congress not only to ensure the availability of spectrum and the feasibility of plans, but also to ensure that our local first responders have the financial and technical wherewithal to implement interoperability. As the old saying goes, a chain is only as strong as its weakest link. I think that is appropriate in this instance because if an issue of national significance breaks out on a local level, all these plans and policies are for naught if we aren't all on the same page.

As I mentioned, the 9/11 attacks taught us many lessons about interoperability. It did not take long for us to figure out how to learn from that horrible day. Now, we have an opportunity to learn from what happened during and after Hurricanes Katrina and Rita. Those storms revealed different, but equally vital vulnerabilities about our systems of emergency communication.

Public safety radio towers were demolished; those that ran on batteries ran out of power, vital electronic components were flooded. What lessons can we learn? Do we need to fundamentally alter the design of our communications systems, at least in areas prone to hurricanes?

I look forward to hearing the views of our witnesses on these important issues. We must focus our energies on these problems and move expeditiously towards solving them. There is no more important issue before this Congress.

Thank you Mr. Chairman.

PREPARED STATEMENT OF HON. ANNA G. ESHOO, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

The public safety response to the terror attacks on 9/11 and the Hurricane Katrina disaster were, without a doubt, severely hampered by critical failures in government and public communications systems.

In New York and Washington, the responses to the terrorist attacks were handicapped by the inability of different segments of the law enforcement and public safety community to communicate over common networks and interoperable equipment. Government and the public were also severely limited by the near total failure of public telephone networks in the New York and D.C. areas immediately following the attacks.

This was particularly troubling in Washington because the area's physical communications infrastructure was not actually harmed when the Pentagon was attacked.

The public safety response to Katrina was particularly hampered by physical damage to the communications networks in the Gulf region. Above-ground telephone lines were knocked out, as were numerous wireless telephone towers.

Much of this damage was unavoidable, so the failures were predictable. The question now is how do we address these failures to ensure a better result when the next attack occurs or when the next disaster hits.

I'm particularly interested in making sure we learn everything we can from these disasters because the San Andreas Fault runs the length of my District. The U.S. Geological Survey has estimated the probability of a 6.7 or greater magnitude earthquake in the San Francisco Bay Area between 2003 and 2032.

There are many steps Congress can and should take to shore up our communications infrastructure in response to what we experienced on 9/11 and the Gulf Coast disaster.

Many of the problems we observed in these disasters would be greatly alleviated if the huge swath of communications spectrum occupied by television broadcasters for analog transmissions were made available for public safety and advanced telecommunications services for the public.

I know that Chairman Barton and his staff are working hard to accelerate this process, and as I indicated in my recent letter to the Chairman, I'm eager to work with him to move this process forward.

The availability of the analog TV spectrum would help solve several critical communications problems. First responders have been promised 24 MHz of the released spectrum to build their communications capacity and to address critical problems of interoperability and system compatibility. All new communications equipment operating in the released spectrum bands is required to interoperate with all new and existing equipment in the 700-800 MHz band.

This spectrum will also become available for a variety of new, innovative wireless communications technologies, including WiMax broadband services that will provide high-speed broadband access to consumers without the vast deployment of costly, highly vulnerable fiber-optic cable networks.

One of the few success stories in the Gulf Coast disaster was the performance of 2-1-1 telephone services, particularly in Louisiana and Texas where they have statewide systems.

Governor Blanco and Governor Perry both designated 2-1-1 as the "go to" number to receive assistance, to volunteer, or to ask questions about the hurricane and its aftermath. When the 9-1-1 system in Louisiana experience widespread failures, 2-1-1 call centers were designated to handle emergency calls as well.

In Louisiana the call volume reached 8,000 calls per day statewide, and in Texas it reached 18,000 per day. The United Way sent trained 2-1-1 volunteers from around the country to staff the call centers in each state, and call centers around the country have been designated as the contact points for any evacuees in need of assistance of any kind.

I'm the lead Democratic sponsor (with Rep. Bilirakis) of H.R. 896, the Calling for 2-1-1 Act. This legislation authorizes $150 million for each of the first two years and $100 million for the subsequent three years to help implement and sustain 2-1-1 nationwide.

I strongly believe this legislation should be included in any hurricane relief legislative package, and Rep. Bilirakis and I have contacted Chairman Barton, Rep. Dingell, Speaker Hastert, and Leader Pelosi to urge them to do so.

In any disaster, location information for emergency callers is critical, and further enhancement of wireless E-911 capabilities is necessary. This is an issue Rep. Shimkus and I have worked on for several years, culminating in the passage of the ENHANCE 911 Act late last year.

A broader issue that arose on 9/11 and the Katrina disaster is the ability of the 911 system to remain in operation in major disasters. The September 11 attacks disabled a major telecommunications facility in lower Manhattan, and many public safety answering points (PSAPs) throughout the Gulf Coast were disabled by Katrina.

One of the integral features of IP-based technologies such as VoIP is the ability of the network to withstand attacks or failures on individual nodes in the network. In fact, the fundamental design feature driving DARPA's creation of DARPAnet and the Internet was to ensure the safe transport of data between mainframe computers at different strategic locations by creating alternate communication routes in case of a bomb attack and by decentralizing functions so that no single computer could be targeted.

In the aftermath of the Katrina disaster, New Orleans Mayor Roy Nagin and his staff were unable to make telephone calls out of the city for two days and then, only through a staff member's VoIP telephone. President Bush ultimately reached Nagin for the first time through the VoIP service.

Obviously, the migration of voice and data communications from the traditional telephone network will harden our communications networks in disasters such as these, and Congress should do everything in its power to facilitate this progress.

The communications failures of these disasters are but a few of the factors contributing to the chaos of 9/11 and the massive human tragedy we saw in the Katrina aftermath.

It's imperative for Congress to investigate thoroughly and learn from these breakdowns so we never experience a human disaster of this magnitude again.

The American people deserve no less.

PREPARED STATEMENT OF HON. JOHN D. DINGELL, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MICHIGAN

Mr. Chairman, thank you for holding this important hearing. The inability of first responders to communicate with each other during emergencies threatens the public's safety. It puts the lives of first responders and those in need of assistance at undue risk. Unfortunately, problems with interoperability are neither new nor rare. They occur daily, especially during multi-jurisdictional emergencies such as fighting large fires or searching for missing children. It is unfortunate that it takes large-scale tragedies such as the attacks of 9/11 or Hurricane Katrina to focus needed attention on this issue.

The damage caused by Katrina, the levee breaches, and the flood that ensued was unprecedented in scope and scale. As one public safety official put it, the devastation was so widespread that the biggest issue was not interoperability, but operability. As we heard in testimony from the Federal Communications Commission (FCC) earlier this month, the lack of commercial power was the primary issue affecting communications in the days immediately following the hurricane. Power was out for so long that batteries in public safety radios ran down and could not be recharged. Emergency generators that powered the infrastructure ran out of fuel and fresh supplies could not reach those responding to the disaster areas.

Having said that, large scale events such as Katrina are foreseeable. Losing commercial power during emergencies is foreseeable. It is therefore incumbent upon decision-makers to devote the resources necessary for public safety officials to communicate with each other whenever and wherever necessary.

Two years ago, a national task force made up of public safety, State and local government officials issued a report to provide guidance in achieving interoperability. The task force identified several key reasons public safety agencies cannot communicate, including incompatible and aging equipment, inadequate funding, lack of coordination and cooperation, and too little spectrum. Likewise, during a hearing in this Subcommittee last year on the problems with interoperability, a witness from the FCC testified that achieving interoperability requires an emphasis on more than spectrum, technology, and equipment issues—it also requires a focus on the organizational and personnel coordination necessary to make interoperability available in times of greatest need.

It is important that we address this complex problem with a comprehensive solution. Funding, spectrum, redundancy, coordination, and planning are all important pieces to the interoperability puzzle. They are all needed for true interoperability to become a reality. For example, in New Orleans, the public safety communications system was damaged by the flooding, but there was not adequate redundancy or planning to ensure continued communication. Additionally, in New Orleans, public safety has had access to additional spectrum in the 700 megahertz band for years. Adequate funding, however, was not available to purchase the necessary equipment to take advantage of that spectrum.

All levels of government must commit the necessary resources to solve this problem. The Federal Government must work in partnership with State and local officials to make true interoperability a reality. Nationwide, regional, and local planning and coordination must take place so that the lines of communication stay open during emergencies. Adequate funding must be provided to help pay for the enormous cost of updating public safety's old communications infrastructure with new, interoperable equipment. Likewise, Congress has already allocated to public safety 24 megahertz of spectrum in the 700-megahertz band. Congress must act this year to get this spectrum into the hands of public safety across the country by a date certain. It must do so, however, in a comprehensive manner that does not unintentionally harm consumers in the process and potentially delay the return of the spectrum.

I thank the witnesses for being here today, especially Lieutenant Colonel Tom Miller from the Michigan State Police. I look forward to hearing your comments about what steps are currently underway as well as what assistance is needed from Congress to make sure that first responders can adequately communicate with one another in times of public emergencies.

Mr. UPTON. Gentlemen, we are delighted that you are here and we are joined on our first panel by the Honorable Kevin Martin, Chairman of the Federal Communication Commission; Dr. David Boyd, Director of SAFECOM, Program Director of Science and Technology Director to the Department of Homeland Security; Mr. Vance Hitch, Chief Information Officer of the Department of Justice.

Gentlemen, your statements have been made part of the record in their entirety and we would like you to limit your remarks, opening remarks to no more than 5 minutes if you can.

And Chairman Martin, we will start with you, welcome. Is that button on?

STATEMENTS OF HON. KEVIN J. MARTIN, CHAIRMAN, FEDERAL COMMUNICATIONS COMMISSION; DAVID G. BOYD, DIRECTOR, SAFECOM PROGRAM OFFICE, SCIENCE AND TECHNOLOGY DIRECTORATE, DEPARTMENT OF HOMELAND SECURITY; AND VANCE E. HITCH, CHIEF INFORMATION OFFICER, DEPARTMENT OF JUSTICE

Mr. MARTIN. It is. Good morning, Chairman Upton and all the members of the committee. I appreciate the opportunity to be with you all today.

And as we all know, Hurricane Katrina and Hurricane Rita devastated the Gulf Coast region. People lost their homes, their businesses, and even their lives and our hearts go out to all of the survivors who are now struggling with putting their lives back together.

My statement today will focus on the effects of the recent hurricanes on the Nation's communications infrastructure. First, I will briefly discuss the immediate impact on communication services in the area and provide a status report. I will then describe the steps the FCC is taking both to facilitate the restoration of service and to provide support for evacuees. And finally, I will offer some initial lessons learned from this terrible tragedy.

The destruction that the hurricanes caused to the facilities of communications companies and the services upon which citizens rely was extraordinary. More than 3 million customer telephone lines were knocked down in Louisiana, Mississippi, and Alabama as a result of Hurricane Katrina. And as you can see on this first chart, the most significant damage was in the region colored red. The next most significant area colored yellow reached out more than 100 miles from where the storm initially landed. And the area in green sustained moderate damage and it reached out more than 300 miles from where Katrina initially hit. And the area of size demonstrates just how far reaching the impact was in terms of the damage to the communications infrastructure.

Now approximately 40 call centers, 911 call centers also went down as a result of the two hurricanes, 38 due to Katrina and two due to Rita. And approximately another 10 were damaged but were able to reroute their traffic. And as you can see in this next chart, the area in blue reflects the locations where the hurricanes knocked call centers out of service, and the area in red indicates where the call centers remain out of service today, all of those in the New Orleans area.

Local wireless networks also sustained considerable damage with more than 1,000 cell sites out of service. And as you can see in this next chart, over 20 million telephone calls did not go through the day after Hurricane Katrina struck. The number of failed calls peaked that day and then slowly decreased daily as service began to be restored. We also estimate that approximately 100 broadcast stations were knocked off the air. This chart follows the outage and restoration of radio stations. You can see that 80 percent of the radio stations in the Gulf Coast Region were knocked off the air that day that Hurricane Katrina hit. Since then, the stations have been coming back on the area each day and Hurricane Rita caused an additional 46 radio stations to be knocked off the air. And finally, hundreds of thousands of cable customers also lost their service.

Now, as a result of these service outages, it was extremely difficult for hundreds of thousands of people to receive news and emergency information and to communicate with their loved ones. Emergency workers and public safety officials had difficulty coordinating and it was at times like these that we are reminded of the importance in the ability to communicate.

Fortunately, the work to restore communication service began almost immediately. While considerable problems remain, the companies in the region have made meaningful progress. They have overcome significant obstacles including flooding, lack of power, dwindling fuel resources for generators and security to rebuild, reconnect, and broadcast. Now to the best of my knowledge, the current status is as follows. This chart demonstrates the spike in the number of customers who were out of service, which again fell significantly about a week after Hurricane Katrina. Approximately 2.5 million customer lines had been restored, leaving about 264,000 customers still out of service today. Fifty 911 call centers have been restored, two in Louisiana remain out of service and this chart demonstrates how the sustained damage kept many of the call centers out of operation for almost 9 days as a result of Hurricane Katrina when most became operational again.

Only one wireless switching center in the affected area is not operational now and over 1,200 cell sites have been restored, as you can see in this chart where out of service cell sites are marked in red, approximately 820 sites continue to be out of service, the majority within New Orleans and other areas of Louisiana. The size of the different pie graphs indicate the size of the markets, and the purple colors indicate where the cell sites were knocked out of service but have since come back into operation. You can see that cell sites were actually knocked down as far north as Hattiesburg.

As the next chart demonstrates, 70 percent of TV stations in the area were knocked off the air on the day after Hurricane Katrina. Since then, TV stations have been coming back on the air almost daily and 10 remain off the air today as a result of both hurricanes. Fortunately, satellite service providers did not experience damage to their infrastructure. They have helped to bridge some of the gaps left by many of these outages. They provided satellite phones and video links to law enforcement officials, medical personnel, emergency relief personnel, and news outlets.

Now the Commission has devoted significant time and resources to enable first responders to communicate and to facilitate companies' ability to quickly restore service. We have granted over 90 STA's, special temporary authority requests and more than 100 temporary frequency authorizations. We allowed law enforcement, for example, to use ultra wideband imaging systems to locate hurricane victims. We waive numerous rules to enable telephone companies to reroute traffic. From the beginning, the commissioners reached out to the impacted industries often numerous times a day to identify their needs and pass them along to FEMA and the National Communications System.

And finally, we have facilitated disaster relief efforts and fundraising efforts by temporarily reassigning the 1-800 number 1-800-RED-CROSS to the American Red Cross. At our recent open meeting, I also announced my intention for the Commission to take three major actions in an effort to continue to provide immediate relief to consumers and business and to enhance the Commission's planning response efforts.

First, I proposed $211 million in universal service funding to the disaster area. For all the people eligible for FEMA disaster assistance, we will provide support for wireless handsets in a package of 300 free minutes. We will also allow public and non-profit healthcare providers, including the American Red Cross, shelters to apply for support of their telecommunications needs. We will use the E-rate Program to help reconnect schools and libraries throughout the region. And we will allow carriers to use the High Cost Program to prioritize rebuilding of facilities damaged by the hurricanes.

Second, we are also establishing an independent panel of experts composed of public safety and communication industry representatives that we charge with reviewing the impact of Hurricane Katrina on the communications infrastructure and the affected areas.

And finally, I announced our intention to create a new Public Safety/Homeland Security Bureau to develop policies and rules to promote effective and reliable communications for public safety, national security, and disaster management.

While there is still much work for the Commission to do to facilitate restoration, I think it is important we take the time to learn from the tragedy. We need to assess what worked and what did not, what the Commission can do now to make our communications net work more robust, and I have three initial suggestions.

First, we need to ensure that the public has the tools necessary to know when an emergency is coming and to contact first responders. This involves several steps. We need a comprehensive alert system that allows officials at the national, State, and local level to reach affected citizens in the most effective and efficient manner possible. It needs to incorporate the internet and other advances in technology so that officials can reach large numbers of people simultaneously through different communications media.

We also need to ensure that providers comply with our 911 rules. The 911 system is critical to our Nation's ability to respond to a host of crises. This obligation to provide access to emergency operators should not be optional for any service provider.

We also need to ensure that Public Safety Answering Points are redundant. That Hurricane Katrina severed communication links to multiple PSAPs and to key facilities that handle local emergency and first responder calls. We need to establish redundant routing that will create a more resilient network to aid those public safety calls.

Second, I suggest we need to enable first responders to communicate seamlessly. We need to have an interoperable mobile wireless communication system that can be rapidly deployed anywhere in the country. Such a system must have two essential features. First, the system must be interoperable and must allow different organizations from different jurisdictions to communicate with each other immediately through both voice and data. This requires that there be a sufficient spectrum devoted to these purposes. It also requires that first responders have equipment capable of operating on multiple frequencies in multiple formats so that different systems can connect with each other. Properly implemented, a system with adequate spectrum and such smart radios would help to ensure that both data and voice are transmitted between agencies, instantly replacing the multiple lengthy calls that occur today.

The system must also be capable of rapid deployment and restoration using multiple flexible technologies and extremely mobile infrastructure. Smart radios can enable first responders to find any available towers or infrastructure on multiple frequencies, Wi-Fi and spectrum technologies can enable them to use limited spectrum quickly and efficiently. And mobile antennas which are capable of using both satellite and terrestrial technology should be used to establish communications as quickly as possible. The infrastructure could use inflatable antennas, cell towers on wheels, high altitude balloons, or other mobile facilities.

And my final suggestion is to enhance network resiliency. We need to ensure that all communications providers develop and adhere to best practices to ensure reliability in the event of a disaster and quick restoration of service in facilities in the event service is disrupted. We should take full advantage of IP-based technologies to enhance the resiliency of traditional communications networks. IP technology provides dynamic capability to the change and reroute telecommunications traffic within the network so that in the event of a systems failure within the traditional network, these technologies enable the service providers to restore service more quickly and to provide the flexibility to initiate service at new locations chosen by the customers.

I look forward to working cooperatively with the members of this committee, other Members of Congress, and my colleagues at the Commission to achieve these goals. We appreciate any guidance you may have on these issues and I thank you for the opportunity to be here today and look forward to answering your questions.

[The prepared statement of Hon. Kevin J. Martin follows:]

Written Statement of

Kevin J. Martin
Chairman
Federal Communications Commission

Hearing on
Public Safety Communications from 9/11 to Katrina:
Critical Public Policy Lessons

Before the
Subcommittee on Telecommunications and the Internet
Committee on Energy and Commerce

United States House of Representatives

September 29, 2005

INTRODUCTION

Good Morning Chairman Upton, Ranking Member Markey and members of the Committee. I appreciate the opportunity to be with you today. As we all know, Hurricane Katrina and Hurricane Rita devastated the Gulf Coast. People lost their homes, their businesses, and even their lives. Our hearts go out to all of the survivors who are now struggling with putting their lives back together.

My statement focuses on the effects of Hurricane Katrina and Hurricane Rita on the nation's communications infrastructure. First, I will briefly discuss the immediate impact on communications services in the area and provide a status report on the extent to which services have been restored. Second, I will describe the steps the Federal Communications Commission has taken both to facilitate the restoration of service and to provide support for evacuees. Finally, I will offer some initial lessons learned from this terrible tragedy.

IMPACT ON COMMUNICATIONS INFRASTRUCTURE

The destruction that Hurricane Katrina caused to the facilities of communications companies, and therefore the services upon which citizens rely, was extraordinary. More than three million customer telephone lines were knocked down in the Louisiana, Mississippi, and Alabama area. Significant damage was inflicted both on the wireline switching centers that route calls and on the lines used to connect buildings and customers to the network. Thirty-eight 9-1-1 call centers went down. Local wireless networks also sustained considerable damage with more than one thousand cell sites out of service. Over 20 million telephone calls did not go through the day after the hurricane. While we were not able to contact every station in the immediate aftermath, we estimate that approximately 100 broadcast stations were knocked off the air. Hundreds of thousands of cable customers lost service.

Hurricane Rita, which struck parts of Texas and Louisiana last weekend, also caused significant damage. It produced extensive flooding throughout the affected area, including many of the same parishes in Louisiana still working to recover from Hurricane Katrina. The hurricane left more than 80,000 consumers without telephone service, damaged more than 20 telephone company switches, and knocked out more than 250 cell sites in the vicinity of Beaumont, Texas and Lake Charles, Louisiana. In addition, at least five broadcasters went off the air in the affected area as a result of the hurricane's wind and flooding damage.

As a result of the communications breakdown, it was extremely difficult for hundreds of thousands of people to receive news and emergency information and to communicate with their loved ones. Emergency workers and public safety officials had difficulty coordinating. It was at times like these that we were reminded of the importance of being able to communicate. While no communications network could be expected to remain fully operational in the face of a direct hit from a category four or five hurricane, that fact was little consolation to the people on the ground.

Fortunately, the work to restore communications services began almost immediately. While considerable problems remain, the companies in the region have made meaningful progress. They have overcome significant obstacles – including flooding, lack of power,

dwindling fuel resources for generators, and security – to rebuild, reconnect and broadcast. After Hurricane Katrina, three radio stations in New Orleans continued to operate throughout the storm, and a fourth resumed operations within several hours of losing power. Wireline carriers were able to begin restoring service within five days, with significant improvement accomplished within a week, and wireless carriers began to restore service within two days, with substantial improvement by the first weekend. These extraordinary efforts were performed by employees, many of whom had suffered their own personal losses, yet still continued to work to restore services to all.

To the best of our knowledge, the status as of September 28, 2005 is as follows:

Wireline. More than 2,500,000 customer lines have been restored, leaving approximately 264,000 customer lines still out of service, including 238,000 in Louisiana, 22,000 in Mississippi, and more than 4,000 in Texas. Fifty 9-1-1 call centers have been restored; two in Louisiana remain out of service.

Wireless. Only one wireless switching center in the affected areas is not operational. Over twelve hundred cell sites have been restored. Approximately 820 cell sites continue to be out of service, the majority within New Orleans and other areas of Louisiana.

Broadcast. Seven television stations have come back on-the-air; ten remain off-the-air. Although we cannot determine exactly how many radio stations have been restored, we do know that 79 radio stations remain off-the-air.

Cable. Although the Commission has contacted all the cable operators in the affected areas, we cannot estimate exactly how many customers have had their cable service restored since the hurricanes. We do know that approximately 160,000 customers who lost their service as a result of Hurricane Katrina have had their service restored in the last three weeks. As of today, at least 445,000 customers remain without service as result of both recent hurricanes.

Satellite. 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.

COMMISSION ACTIONS TO SUPPORT RESTORATION

The Commission has devoted significant time and resources to enable first responders to communicate and to facilitate companies' ability to quickly restore services in the region. On August 30th, the Commission established an internal Task Force to coordinate hurricane response efforts. The Task Force's activities centered around three major goals: (1) Regulatory Relief for Industries; (2) Industry Outreach and Coordination with Other Federal Agencies; and (3) Assistance to consumers and evacuees. Hundreds of FCC employees have been directly involved in these efforts. The Commission stayed open seven days a week for three weeks following Hurricane Katrina in order to assist consumers, the industries, and other Federal agencies. We also were open last weekend to respond to requests arising from Hurricane Rita. I am extremely proud of the efforts and dedication of the FCC staff that have helped us in this

endeavor.

Summary of Commission Actions

The Commission has taken a number of steps to cut bureaucratic "red tape." Although a thorough discussion of the Commission's actions can be found in the appendix, I will discuss a few here. Almost immediately after Hurricane Katrina subsided, the Commission notified all communications providers of expedited treatment for requests of special temporary authority ("STA"). We have granted more than 90 STA requests and more than 100 temporary frequency authorizations for emergency workers, organizations and companies to provide wireless and broadcast service in the affected areas and shelters around the country. In most cases these requests were granted within 4 hours, with all requests approved within 24 hours. The Commission released several public notices and quickly adopted orders to provide temporary relief, and we waived numerous rules to enable telephone companies to re-route traffic, disconnect and reconnect lines, and switch long distance providers so that consumers' phone calls could get through. We have extended filing deadlines, construction requirements, and discontinuance of service rules for wireless licensees in the affected areas.

From the beginning, the Commission has reached out to the impacted industries – often numerous times a day – to identify their needs to pass along to the Federal Emergency Management Agency (FEMA) and the National Communications System (NCS). The Commission provides the critical information about the necessary resources to FEMA and NCS, who are responsible for ensuring that priority needs are met, and we update FEMA and NCS daily on these evolving needs.

In addition, critical information on operational status of communications companies is transmitted on a daily basis to the National Coordinating Center (NCC) for its Situation Reports. The Commission also has been coordinating with the Interagency Coordinating Council on Individuals with Disabilities, organized by the Department of Homeland Security, to ensure that the needs of the disability community are addressed in the coordinated federal relief efforts.

Finally, the Commission has worked closely with the communications industry to help identify resources for use by disaster response personnel. The agency both transmits this information to NCC and facilitates industry's communication with other federal officials. For example, we granted an STA to Time Domain for an ultra-wideband through the wall imaging system to help law enforcement authorities locate hurricane victims, and special temporary authority was granted to Intel to set up Wi-Max broadband communications systems to provide Internet service at Red Cross relief centers.

Consumers in the Gulf Coast, and evacuees to other areas, also need information and assistance, and the Commission has worked to provide that support. We have manned our toll-free consumer line 7 days a week to help individuals get access to critical information about telecommunications and broadcast services in the affected area. Consumers, industry, and other agencies also can access the Commission's special webpage that provides information on all of the Commission's actions, and provide other valuable information. Finally, we have facilitated disaster relief efforts and fundraising efforts by temporarily reassigning the toll free 800-number "1-800-RED-CROSS" to the National Chapter of the American Red Cross, as well as providing

temporary waivers to non-commercial radio and TV stations that wish to air Hurricane Katrina fundraising programming.

Proposal for Next Steps

At our recent open meeting, I announced my intention for the Commission to take three major actions in an effort to continue to provide immediate relief to consumers and businesses, and to enhance the Commission's planning and response efforts.

(1) Provide over $200 million of immediate relief to the affected areas

First, I proposed to provide $211 million in universal service funding to the disaster area. We will work through four existing programs to provide this support. We will use the Low Income Program to help those who have been cut off to reestablish their lines of communication. For all people eligible for FEMA disaster assistance, we will provide support for wireless handsets and a package of 300 free minutes for evacuees and people still in the affected area without telephone service. For all people eligible for FEMA disaster assistance, we also will provide support to pay the costs of reconnecting consumers to the network as the disaster-struck area is rebuilt.

Through the Rural Health Care Program, we will support those individuals providing emergency health care services in the region. We will allow public and non-profit health care providers, including American Red Cross shelters, to apply for support of their telecommunications needs. We will increase discounts from 25% to 50% for qualified providers in the area. To speed the delivery of support, we will modify the filing window for this Funding Year to allow health care providers to submit new or revised applications.

We will use the E-rate Program to help reconnect schools and libraries throughout the region. We will open a new Funding Year 2005 filing window for schools and libraries affected by Hurricane Katrina. We will treat schools and libraries struck by the hurricane at the highest level of priority (90%) for Funding Years 2005 and 2006. The Commission can authorize $96 million in E-rate funds for the approximately 600 schools and libraries in Louisiana, Mississippi, and Alabama hit by Hurricane Katrina. We will also allow schools and libraries serving evacuees to amend their Funding Year 2005 applications to account for the unexpected increase in population.

Finally, we will allow carriers to use the High Cost Program to prioritize rebuilding facilities damaged by Hurricane Katrina. We will allow telephone companies greater flexibility to use USF support to prioritizing rebuilding wire centers affected by the hurricane.

(2) Examine ways to improve network reliability and public safety communications in times of crisis

Second, I am establishing an independent expert panel composed of public safety and communications industry representatives that will be charged with reviewing the impact of Hurricane Katrina on the communications infrastructure in the affected area. The panel will make recommendations to the Commission regarding ways to improve disaster preparedness,

network reliability, and communication among first responders such as police, fire fighters and emergency medical personnel.

(3) Create a new FCC bureau to better coordinate our planning and response efforts when disaster strikes

Third, I announced my intention to create a new Public Safety/Homeland Security Bureau. The Bureau will coordinate public safety, national security, and disaster management activities within the FCC. The Bureau will develop policies and rules to promote effective and reliable communications for public safety, national security, and disaster management. It will have responsibility for issues including:

- Public Safety Communications, including 911 centers and first responders
- Priority Emergency Communications
- Alert and Warning of U.S. Citizens
- Continuity of Government Operations
- Disaster Management Coordination (*i.e.*, infrastructure reporting and analysis in times of disaster)
- Disaster Management Outreach
- Communications Infrastructure Protection
- Network Reliability and Interoperability
- Network Security

LESSONS LEARNED

While there is still much work for the Commission to do to facilitate the restoration of services in the Gulf Coast, I think it is important that we take the time to learn from this tragedy in order to improve our ability to serve the public in the event of another disaster. We need to assess what worked, what did not, and what the Commission should do now to make our communications networks more robust in the future. The planned expert panel will be tasked with answering some of these questions, but for now, I have three suggestions.

(1) Ensure that the public has the tools necessary to know when an emergency is coming and to contact first responders

We should take three steps to help ensure that the public has these critical and life-saving tools. First, we should have a comprehensive alert system that allows officials at the national, state and local levels to reach affected citizens in the most effective and efficient manner possible. It should incorporate the internet, which was designed by the military for its robust network redundancy functionalities, and other advances in technology so that officials can reach large numbers of people simultaneously through different communications media.

Second, we need to ensure that all providers comply with our 9-1-1 rules. The 911 system is quite literally one of life or death. It is critical to our nation's ability to respond to a

host of crises. The Commission has been working hard to minimize the likelihood of situations where users are unable to access it. The obligation to provide access to emergency operators should be not optional for any telephone service provider - regardless of whether that provider is wireless, wireline, cable or VoIP.

Third, we should ensure that Public Safety Answering Points (PSAPs) are redundant. Hurricane Katrina severed communications links to multiple Public Safety Answering Points (PSAPs), the key facilities that handle local emergency and first responder calls. Going forward, we need to establish a process to work with states and municipalities to improve the redundancy of critical communications links that serve PSAPs. As part of this effort, the Federal Government should take a lead role to facilitate and encourage cooperation among local jurisdictions to address mutual restoration and redundant routing that will help create a more resilient network to aid public safety first responders.

(2) Enable First Responders to Communicate Seamlessly

First responders need an interoperable, mobile wireless communications system that can be rapidly deployed anywhere in the country. Such a system must have two essential features. First, the system must be interoperable – it must allow different organizations from different jurisdictions to communicate with each other immediately, through both voice and data transmissions. This requires that there be sufficient spectrum devoted to these purposes. Equally importantly, it requires that first responders have equipment capable of operating on multiple frequencies in multiple formats, so that different systems can connect with each other. So-called "smart radios" are ideally suited to this purpose, as they can intelligently jump to different frequencies and formats as needed to establish communications. Properly implemented, a system with adequate spectrum and smart radios would help to ensure that both data and voice are transmitted between agencies instantly, replacing multiple, lengthy phone calls to multiple agencies.

Second, the system must be capable of rapid deployment and/or restoration. This requires the use of multiple, flexible technologies and truly mobile infrastructure. If 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. At the same time, we should use new technologies so that first responders can take advantage of whatever terrestrial network is available. Smart radios would enable first responders to find any available towers or infrastructure on multiple frequencies, and Wi-Fi, spread spectrum and other frequency hopping techniques would enable them to use limited spectrum quickly and efficiently. Additionally, mobile antennas – capable of using both satellite and terrestrial technology – should be used to establish communications as quickly as possible. This infrastructure could include inflatable antennas, cell towers on wheels, high-altitude balloons, or other mobile facilities. A system taking advantage of such measures would be capable of truly rapid deployment.

(3) Enhance Network Resiliency

We should ensure that all communications providers develop and adhere to best practices to ensure reliability in the event of a disaster and quick restoration of service and facilities in the

event service is disrupted. These best practices should address, among other things, maintaining service during extended commercial power outages through the use of back-up generators and equipment.

We also should take full advantage of IP-based technologies to enhance the resiliency of traditional communications networks. IP technology provides the dynamic capability to change and reroute telecommunications traffic within the network. In the event of systems failure within the traditional network, greater use of these technologies will enable service providers to restore service more quickly and to provide the flexibility to initiate service at new locations chosen by consumers.

CONCLUSION

I look forward to working cooperatively with members of this Committee, other Members of Congress, and my colleagues at the Commission to achieve the goals outlined above. We would appreciate any guidance you may have on these issues. Thank you for the opportunity to testify, and I would be happy to answer any questions you may have.

Appendix A

FCC Hurricane Katrina and Hurricane Rita Relief Efforts
As of September 28, 2005

The Commission continues its work to assist consumers, industries, and other Federal agencies with Hurricane Katrina and Hurricane Rita relief efforts. Below is a list of FCC actions taken since the start of these disasters. The list is arranged by service with state-specific actions noted separately. Public Notices and other decisions can be viewed on FCC-established Hurricane Katrina webpage (http://www.fcc.gov/cgb/katrina/) and the Hurricane Rita webpage (http://www.fcc.gov/cgb/rita/).

WIRELINE

General FCC Actions:

- FCC released an STA to SBC and its affiliates to allow the company to reroute traffic around damaged facilities to restore service as quickly as possible in the areas affected by Hurricane Rita (9/24/05).

- FCC granted an STA to Kaplan Telephone Company to operate facilities transmitting on cellular frequency Block B and frequencies available under Part 101 of the Commission's Rules at various sites located within CMA458, the Louisiana 5 - Beauregard RSA. Facilities will be used to restore communications facilities damaged as a result of Hurricane Rita (9/24/05).

- FCC granted a temporary waiver of a variety of procedural rules relating to the Universal Service Fund to carriers, state commissions, and other program beneficiaries, such as schools and libraries. Accordingly, affected entities in the hurricane-affected areas may postpone filing numerous USF forms, payments, and data, allowing affected parties adequate time to file appropriately (9/21/05).

- FCC granted a temporary waiver of Commission rules that require BellSouth and other incumbent LECs to provide advance notice and waiting periods before certain network changes may be implemented to help speed restoration of network services (9/21/05).

- FCC granted an STA giving BellSouth temporary authority to provide interLATA (long distance) services using its internal corporate network in order to relieve its over-burdened separate affiliate, BellSouth Long Distance (9/13/05).

- FCC granted a temporary waiver for certain carrier change requirements to allow customers whose long distance service has been disrupted by Hurricane Katrina to be connected to an operational long distance provider (9/5/05).

- FCC granted a temporary waiver of the FCC's rule for aging residential numbers for customers in the affected areas. Waiver of this rule will allow carriers, upon request, to disconnect temporarily customers' telephone service to avoid billing issues, and reinstate the same number when the service is reconnected for customers in the affected areas (9/4/05).

- FCC assisted LaFourche Telephone Company's restoration of long distance service (9/4-9/5/05).

- FCC provided BellSouth with information necessary to port the Mississippi Department of Wildlife's 800 number from Sprint to BellSouth because Sprint's facilities used to provide that number are down (9/4/05).

- FCC granted an STA for Verizon to use 4 microwave POPs in Baton Rouge to restore damage due to the hurricane (9/3/05).

- FCC granted the emergency request of the American Red Cross for reassignment of the toll free number 1-800-RED-CROSS to help in the disaster relief and coordination effort for the multi-state area affected by the hurricane (9/2/05).

- FCC provided authority to NeuStar (the North American Telephone Number Administrator) and other service providers to use local number portability technology to reroute telephone traffic to switches unaffected by the hurricane (9/1/05).

- FCC granted a 60-day extension to carriers operating in Louisiana, Mississippi, or Alabama for the filing of Form 477 local competition and broadband data. This extension also applied to carriers that rely on personnel, facilities, or records located in these states (9/1/05).

- FCC reached out to VoIP service providers in Alabama, Louisiana, and Mississippi to determine whether adjustments were needed in the filing deadline for VoIP E911 status report due September 2, 2005 (8/31/05).

WIRELESS

General FCC Actions:

- FCC granted an STA to Mississippi Power Company to operate an 18 GHz microwave link in the Gulf of Mexico Area of its service territory for emergency repair work necessary because of hurricane-related damages (9/27/05).

- FCC issued a Public Notice that provides information to wireless licensees in the affected areas about STAs, FCC points of contact for various radio services, rule sections addressing "emergency communications," and a the temporary waiver of application filing deadlines (e.g., renewals, construction notifications, discontinuance notices, etc.), construction requirements, and discontinuance of service requirements (9/24/05).

- FCC released a Public Notice to list the names and contact information of the FCC-certified frequency coordinators for land mobile radio operations and coordinating bodies for microwave radio operations (9/24/05).

- FCC granted an STA to PetroCom to use the 3700-4200 and 5925-6425 MHz bands to restore its digital backhaul operations to a new location (9/23/05).

- FCC granted an STA to SkyTel Corp. for operation in the 3.65 GHz band in support of Hurricane Katrina relief efforts to provide temporary wireless Internet communications to various relief groups, federal, state and local government agencies ,and businesses in the greater disaster areas left by Hurricane Katrina. The STA was granted for fixed and mobile operations in and around Biloxi, New Orleans, and Mobile. The Biloxi operational request required coordination with NTIA (9/21/05).

- FCC granted an STA to Chevron USA, Inc. to use frequency in the Gov/Non-Gov M941 – M944 shared band for the purpose of restoring communications capabilities damaged by Hurricane Katrina (9/15/05).
- FCC modified the STA previously granted on 9/2/05 to Verizon for Rivada to allow leasing of spectrum to Ericsson on behalf of Northcom (9/9/05).
- FCC granted an STA to the North Carolina Forestry Commission to operate VHF mobile units in the disaster area (9/8/05).
- FCC released a Public Notice to list the names and contact information of the FCC-certified frequency coordinators for land mobile radio operations and coordinating bodies for microwave radio operations (9/7/05).
- FCC released a Public Notice to ensure that wireless service providers do not improperly disconnect consumers displaced by the hurricane because they are unable to pay their bills (9/7/05).
- FCC granted an STA to Florida Power and Light to use 900 MHz frequencies in Louisiana, Mississippi, and Alabama for electric power maintenance and restoration (9/7/05).
- FCC granted an STA to Detroit Edison to use VHF and UHF frequencies in hurricane-affected areas (9/7/05).
- FCC informed amateur radio operators that they have the authority to make transmissions necessary to meet essential communication needs and facilitate relief actions and that prior FCC approval is not required (9/1/05).
- FCC issued a Public Notice that provides information to wireless licensees in the affected areas about STAs, FCC points of contact for various radio services, rule sections addressing "emergency communications," and the temporary waiver of application filing deadlines (e.g., renewals, construction notifications, discontinuance notices, etc.), construction requirements, and discontinuance of service requirements (9/1/05).
- FCC granted STA to BellSouth to use GMRS radios (commercially available walkie talkie-type radios that require licenses) in support of restoration of communications facilities in Florida, Alabama, Louisiana, and Mississippi (8/31/05).
- FCC granted an STA to Detroit Edison Company to operate on eleven VHF mobile frequencies in Florida in support of restoration of electrical service to areas affected by Hurricane Katrina (8/31/05).
- FCC granted an STA to Ameren, a utility services company licensed in the Industrial Radio Service, to operate outside its licensed area of operation due to hurricane relief (8/31/05).

Louisiana-Specific Actions:

- FCC granted STAs to Verizon to use 13 microwave paths (10 and 18 GHz) in New Orleans, LA, to restore communications due to damage from Hurricane Katrina (9/22/05).

- FCC granted an STA to Verizon to use an 18 GHz microwave path in New Orleans, LA, to restore communications due to damage from Hurricane Katrina (9/21/05).
- FCC granted an STA to Current Electric Company in Metairie, LA, to operate 6 GMRS radios for electric service repair (9/20/05).
- FCC granted an STA to Verizon to use 6 microwave paths (18 and 10 GHz) in the New Orleans, LA area to restore communications due to damage from Hurricane Katrina (9/16/05).
- FCC granted an STA to Chevron USA, Inc. to use frequency pair 451/456.3125 MHz in Plaquemines County, LA, to replace communications lost in Chevron's Venice offshore loading facilities when Nextel's facilities sustained damage (9/16/05).
- FCC granted an STA to the State of Louisiana to use twenty 700 MHz frequency pairs in New Orleans, LA, to replace all first responder's public safety communications (9/16/05). These channels are in addition to those 700 MHz channels authorized under their state license.
- FCC modified the STA previously granted on 9/3/05 to Verizon to use 4 microwave POPs in Baton Rouge to restore damage due to the hurricane (9/15/05).
- FCC granted an STA to Cingular Wireless LLC to operate on PCS spectrum at two sites located in Columbia and Monroe, LA, to provide critically needed communications services in support of the relief effort from Hurricane Katrina (9/14/05).
- FCC granted an STA to BellSouth to operate two microwave paths on 18 GHz microwave and fixed satellite service frequencies as part of emergency radio systems that help restore BellSouth's telecommunications to the New Orleans area (9/14/05).
- FCC granted an STA to Chevron USA, Inc. to use a single base frequency 451.1125 MHz and five mobile frequencies in Plaquemines County, LA, to replace communications lost in Chevron's storage facility when Nextel's facilities sustained damage (9/14/05).
- FCC granted an STA to Amoco Production Company to use frequency 153.335 MHz within 40 KM of the Mandelville, LA, area for restoration of petroleum facilities (9/12/05).
- FCC granted an STA to the State of New Jersey to operate a repeater and 200 mobiles on 806/851.3375 MHz in New Orleans for law enforcement assistance (9/12/05).
- FCC granted an STA to Texas Utilities to operate station WPFM603 in Louisiana (currently operation is limited to Texas only) for restoration of utilities (9/12/05).
- FCC granted an STA to Chevron to operate 900 MHz microwave links from the coast at Leeville, LA, and Coden, AL, to offshore platforms in the Gulf of Mexico (9/9/05).
- FCC granted an STA to Motorola to use channels licensed to Saint John the Baptist Parish and Jefferson Parish in New Orleans for public safety; the Parishes' systems are not operational due to storm damage, and the Parishes have consented to Motorola's request (9/9/05).

- FCC granted an STA to Chemtura Corp. for one base frequency and ten mobile frequencies in the 460 - 470 MHz band in the Saint Charles County, LA area (9/9/05).

- FCC granted an STA to the California Highway Patrol to operate portable and mobile radios in support of other law enforcement and relief agencies in Louisiana (9/6/05).

- FCC granted an STA to Duke Energy to operate an 800 MHz system near Tangipahoa Parish in Louisiana (9/6/05).

- FCC granted an STA to LifeCom/Air Methods to set up a control center with mobile radio communications in the 460 MHz band in the New Orleans area for disaster relief (9/6/05).

- FCC granted an STA to Alltel to operate a 17-watt short range cellular system in direct support of the FEMA Director. The system will operate initially from Baton Rouge and will later be moved to the New Orleans Superdome (9/3/05).

- FCC granted an STA to Cingular wireless to operate on microwave frequencies at on 6 GHZ microwave frequencies at 21 sites in Louisiana (9/2/05).

- As part of a Public Notice in the 800 MHz proceeding initiating "Wave 2" negotiations in the 800 MHz rebanding process, FCC granted a request from the 800 MHz Transition Administrator to move Louisiana from Wave 2, which begins in October 2005, to Wave 3, which begins in January 2006. This will enable public safety entities in Louisiana to focus on immediate public safety needs (9/2/05).

- FCC granted Alcatel an equipment authorization for a new digital microwave radio system that will be deployed by Verizon Wireless in Baton Rouge and the southern Louisiana area for transport facilities to replace equipment lost in the hurricane (9/1/05).

Mississippi-Specific Actions:

- FCC granted an STA to Clearwire to allow operation in BTA 042 (Biloxi-Gulfport-Pascagoula, MS) to permit service in and around Biloxi, MS, and to the Hancock Medical Center in Bay Saint Louis, MS, to provide Internet services and computers for access by victims (9/16/05).

- FCC granted an STA to Sea Tow International to use Marine VHF channel 7 in Harrison County, MS, and marine channel 8 in Hancock County, MS, to provide marine rescue and recovery services (9/14/05).

- FCC granted an STA to an amateur radio operator providing communications services to the American Red Cross in Ocean Springs, Mississippi, to operate on High Frequency bands that he could not otherwise use (9/11/05).

- FCC granted an STA to the California Highway Patrol to operate portable and mobile radios in support of other law enforcement and relief agencies in Mississippi (9/6/05).

Alabama-Specific Actions:

- FCC granted an STA to Regional Paramedical Services to operate on 5 VHF public safety channels in southern and central Alabama to facilitate movement of hurricane victims and medical supplies (9/22/05).

- FCC granted an STA to the Marengo County Commission in Demopolis, Alabama, to operate on two VHF public safety frequencies (156.12 and 159.12) for mobiles and base stations within the county (9/8/05).

Tennessee-Specific Actions:

- FCC granted an STA to a Red Cross office to use GMRS frequencies to provide security and support in Knoxville, TN (9/7/05).

Texas-Specific Actions:

- FCC granted and STA to Motorola to use frequency pairs 896/935.4500, 896/935.4750, 897/936.4250, and 899/938.4000 MHz for the restoration of service in refineries and chemical plants in the Port Arthur and Beaumont, TX areas due to the impact of Hurricane Rita (9/26/05).

BROADCAST AND CABLE

FCC Actions:

- FCC issued a Public Notice that extends the deadline for television broadcast stations to make retransmission consent/must carry elections on cable and satellite systems in certain designated market areas affected by Hurricane Rita (9/28/05).

- FCC released a Public Notice to help radio and television stations resume and maintain broadcast operations to residents of the affected areas by outlining streamlined instructions to apply for STAs and by waiving requirements that stations notify the FCC within 24 hours of using emergency antennas (9/24/05).

- FCC released a Public Notice to assist cable television and other multichannel video programming distributors in the affected areas by outlining streamlined instructions to apply for STAs to install temporary facilities or modify existing facilities and by waiving certain technical requirements (9/24/05).

- FCC granted an STA for silent authority to WLVV-AM, WLVV, Inc., Mobile, AL (9/15/05).

- FCC released a Public Notice to extend retransmission consent/must carry elections in areas affected by Hurricane Katrina (extension from October 1, 2005 to November 15, 2005) (9/14/05).

- FCC granted an STA for silent authority to two LPTV stations: W30ID, New Orleans, and W36CU, Gulfport (9/12/05).

- FCC granted an emergency authorization to the Houston Independent Media Center for use of a low power FM system on 95.3 MHz to broadcast emergency information to evacuees housed in the vicinity of the Astrodome from an area adjacent to the Astrodome (9/11/05).

- FCC granted an application from Austin Airwaves to operate stations on 94.9, 95.3, and 99.5 MHz to broadcast emergency information to evacuees inside the Astrodome (9/5/05). As of 9/8/05, Harris County officials have suspended use of these stations within the Astrodome.

- FCC released a Public Notice to remind video program distributors of the need to make emergency information regarding Hurricane Katrina evacuation and relief effort accessible to persons with hearing and vision disabilities (9/9/05).

- FCC granted an extension for the FCC Cable Horizontal and Vertical Ownership Limits Proceeding Reply Period (9/8/05).

- FCC released a Public Notice to extend the Auction No. 84 settlement period for certain mutually exclusive AM auction applications and for the submission of Section 307(b) showings; extension given from September 16, 2005 to October 31, 2005 (9/7/05).

- FCC created database to capture information about AM/FM/TV broadcasters impacted by the hurricane (9/4/05).

- FCC released a Public Notice waiving certain noncommercial educational (NCE) rules to permit NCE television and radio stations in the New Orleans area to simulcast and rebroadcast commercial station programming (9/2/05).

- FCC compiled information regarding the radio and television broadcast operations in Louisiana, Mississippi, and Alabama through direct calls and e-mails to over 150 AM/FM/TV broadcasters in the area; continually updating information and referring needs to other federal agencies (9/1/05-Present).

- FCC granted waivers to the following non-commercial FM and TV stations to permit them to air fundraising programming to aid disaster relief efforts (9/1/05-present):
  - Association of Public Television Stations, for all its member public television stations to permit interruptions in regular programming for fundraising
  - National Public Radio, on behalf of its affiliates, to permit interruptions in regular programming for fundraising for victims and for NPR affiliates directed affected by the hurricane
  - National Federation of Community Broadcasters, on behalf of its 183 member stations, to permit interruptions in regular programming for fundraising
  - KXPW-LP, Georgetown, TX – two week fundraising effort
  - WITF-FM, Harrisburg, PA, for one-minute fundraising spots, from 9/9/05 to 9/30/05
  - WBGO, Newark, NJ, for four-hour benefit concert from Lincoln Center, to air 9/17/05
  - Arkansas Educational Television Commission on behalf of its five-station network
  - Greater Cincinnati Television Educational Foundation to permit fundraising by WCET-TV
  - KRFC(FM), Fort Collins, CO, to permit the broadcast of an 8-hour benefit concert on 9/3/05

- Grand Valley State University, Michigan Association of Public Broadcasters, and Michigan Public Radio Network, on behalf of Michigan NCE radio and television stations to permit interruptions in regular programming for fundraising
- KATB(FM), Anchorage, AK, to permit interruptions in regular programming to air pre-produced 30- and 60-second segments supporting the North American Mission Board's Disaster Relief efforts, running from 9/2/05-9/9/05
- WACC-LP, Enfield, Connecticut, to promote and air coverage of a fundraising car wash to be held on 9/10/05; proceeds to be donated to the American Red Cross
- WRNK-LP, Lanett, Alabama, to make announcements requesting that listeners drop off certain items (bottled water, personal hygiene items, etc., but not cash or other money) from 9/6/05-9/8/05; donated items will be taken to the New Life Family Church in Biloxi, MS
- WHCF-FM, Bangor, ME, to conduct an on-air fundraiser soliciting pledges for Operation Blessing International, a relief agency based in Virginia Beach, VA
- KTIS-FM, Minneapolis, MN, to participate in a fundraising campaign with at least 24 other stations in the market on 9/9/05; funds raised will be given to the Red Cross
- KULA-LP, Ili'ili, American Samoa, to permit KULA-LP to broadcast a fundraising program to benefit disaster relief efforts on 9/8/05
- WVUA-FM, Tuscaloosa, AL, to permit the station to promote a fundraising concert to be held on 9/9/05; this is a periodic fundraiser for the station – in this instance, 25% of the proceeds will be donated to the Red Cross
- KBCS-FM, Bellevue, WA, to permit the station to air fundraising requests to help rebuild NCE station WWOZ, New Orleans
- WETD, Alfred, NY, to permit the station to air a live broadcast of a "Coins for Katrina Benefit Concert" on 9/11/05
- Public Radio Partnership, on behalf of WFPL(FM), WUOL-FM, and WFPK(FM), Louisville, KY, for a one-day fundraising effort on 9/24/05 for Goodwill and the Coalition for the Homeless

o FCC released a Public Notice to help radio and television stations resume and maintain broadcast operations to residents of the affected areas by outlining streamlined instructions to apply for STAs and by waiving requirements that stations notify the FCC within 24 hours of using emergency antennas (8/31/05).

o FCC released a Public Notice to assist cable television and other multichannel video programming distributors in the affected areas by outlining streamlined instructions to apply for STAs to install temporary facilities or modify existing facilities and by waiving certain technical requirements (8/31/05).

Louisiana-Specific Actions

o FCC granted an STA to St. Bernard Parish, LA, to operate two TIS stations on 660 kHz to inform returning evacuees of emergency information such road conditions, location of medical aid stations, etc. (9/27/05).

- FCC granted an STA for silent authority to WBOK-AM, Christian Broadcasting Corporation, New Orleans, LA (9/15/05).
- FCC granted an STA for silent authority to WDSU-TV and WDSU-DT, Hearst-Argyle Television, New Orleans, LA (9/15/05).
- FCC granted an STA for silent authority to KMRL-FM, White Dove Fellowship, Buras, LA (9/14/05).
- FCC granted an STA for silent authority to WTUL-FM, Tulane Educational Fund, New Orleans, LA (9/14/05).
- FCC granted tolling pursuant to Section 73.3598(b)(1) via letter to American Family Association, extending the period to construct KSUL-FM, Port Sulphur, LA, by at least six months (9/14/05).
- FCC granted 90 additional construction days via letter to Star Over Orlovista, permittee of WEUS(AM), Orlovista, FL (9/14/05).
- FCC granted an STA for silent authority to WHNO-TV, CH 20, New Orleans, LA (9/13/05).
- FCC sent a letter to Equity Offices, in Louisiana, to expedite entrance by station staff to WUPL-TV facility located in Jefferson Parish, LA (9/13/05).
- FCC granted an emergency authorization pursuant to the Salvation Army to operate an emergency FM station on 107.9 MHz to broadcast to residents and recovery workers in New Orleans, LA (9/12/05).
- FCC granted an STA for WWOZ(FM), Friends of WWOZ, Inc., New Orleans, LA, to remain silent; station has been silent since August 27, 2005 (9/9/05).
- FCC granted an STA for WVUE and WVUE-DT, LA, licensed to Emmis Television, to remain silent (9/8/05).
- FCC granted an STA for WWL-DT (WWL's digital station), New Orleans, LA, licensed to Belo Corporation, to remain silent (9/8/05).
- FCC granted an STA for WTIX-AM, WTIX, Inc., New Orleans, LA, that ceased operations on August 29, 2005, to remain silent (9/7/05).
- FCC granted an STA for WTNO-LP, New Orleans, LA, licensed to Tiger Eye Finance, Inc., to remain silent (9/7/05).
- FCC granted an STA for WWNO(FM), New Orleans, LA, to operate from its licensed site with an emergency antenna and reduced power (9/7/05).
- FCC granted an STA for stations licensed to American Family Association in Louisiana that ceased operations on August 28, 2005, to remain silent (9/6/05).
- FCC granted an STA to WUPL(TV) of Slidell, LA, to remain silent for 60 days (9/1/05).

Mississippi-Specific Actions:

- FCC expedited grant of program test authority and covering license for major facilities upgrade to WBBN, Taylorsville, MS, providing greatly increased coverage area (9/13/05).
- FCC granted an STA to permit Mississippi Public Broadcasting, licensee of NCE station WMAH-TV, Biloxi, MS, to rebroadcast September 11 NFL games of the New Orleans Saints and Green Bay Packers (9/8/05).
- FCC granted an STA to Hancock County Emergency Management to operate an emergency FM station on 103.5 MHz to broadcast to the Bay City-Wavelend-Shoreline Park, Mississippi area; we understand this to be the only station operating in the area (9/8/05).
- FCC granted an STA for stations licensed to American Family Association in Mississippi that ceased operations on August 28, 2005, to remain silent (9/6/05).
- FCC granted an STA for WFMM(FM), Telesouth Communications, Inc., Sumrall, Mississippi, to remain silent after it went silent on 8/29/05 (9/6/05).

SATELLITE

General FCC Actions:

- FCC granted 2 STAs to MCI to operate up to 200 VSAT remote terminals to facilitate communication restoration efforts and/or carry network traffic of terminals that have been damaged by Hurricane Katrina and/or Rita in the conventional Ku-Band (9/28/05).
- FCC granted an extension of an STA to Iridium to provide MSS service in the 1616-1618.25 MHz band on an unprotected non-interference basis (9/23/05).
- FCC granted an STA to Stratos to operate a Ku-band hub earth station in connection with its VSAT authorization (9/21/05).
- FCC granted Harris the authority to operate twelve temporary-fixed earth stations to transmit voice and data communications between points in the Gulf Coast Region and various agencies in Florida in their disaster relief efforts (9/21/05).
- FCC granted an STA to Loral Skynet to position 20 VSAT remotes at various sites for use by FEMA in conjunction with its relief efforts (9/20/05).
- FCC granted an STA to BBC News to use 1.2 Meter temporary -fixed Ku-Band antenna to provide news coverage of the Hurricane Katrina aftermath (9/19/05).
- FCC granted an STA to PetroCom for use of a C-Band antenna to restore its digital backhaul operations from the Gulf of Mexico (9/13/05).
- FCC granted an STA for Maritime Telecommunications Network to use 5 conventional Ku-band earth stations for communications in the area affected by the hurricane (9/10/05).
- FCC granted an STA to Viasat to operate conventional Ku-Band VSAT to provide Internet access service to FEMA (9/7/05).

- FCC granted an STA to BJ Services to operate conventional Ku-Band VSAT remotes to reinitiate Internet access services lost by Katrina (9/7/05).
- FCC granted an STA to ARD German Television to use a suitcase antenna on a German satellite newsgathering truck to provide news coverage (9/5/05).
- FCC granted an STA to Maritime Telecommunications Network to operate 5 satellite dishes providing transportable Internet access (9/4/05).
- FCC granted an STA to MTN to offer satellite Internet access on 3 government-run cruise ships (9/4/05).
- FCC granted an STA to Canada TV to use a transportable satellite news gathering truck (9/3/05).
- FCC granted an STA to Iridium to use spectrum owned by Globalstar to increase Iridium's capacity (9/2/05). Iridium has turned on its equipment on this frequency and no interference problems have been reported.
- FCC granted an STA to Loral Skynet for authority to use a satellite dish transportable on a Humvee to provide free VoIP and Internet access at the site of the relief efforts (9/2/05).
- FCC released a Public Notice to help satellite and submarine cable providers maintain operations to emergency communications services in the affected areas by outlining streamlined instructions to apply for STAs (9/1/05).
- FCC granted an STA to Independent Television News to use satellite spectrum to serve a transportable news gathering truck from London in support of hurricane relief (9/1/05).

Louisiana-Specific Actions:

- FCC granted an STA to VSL Networks to use a Ku-band antenna to provide service to Motorola in support of the Louisiana state police (9/7/05).

Mississippi-Specific Actions:

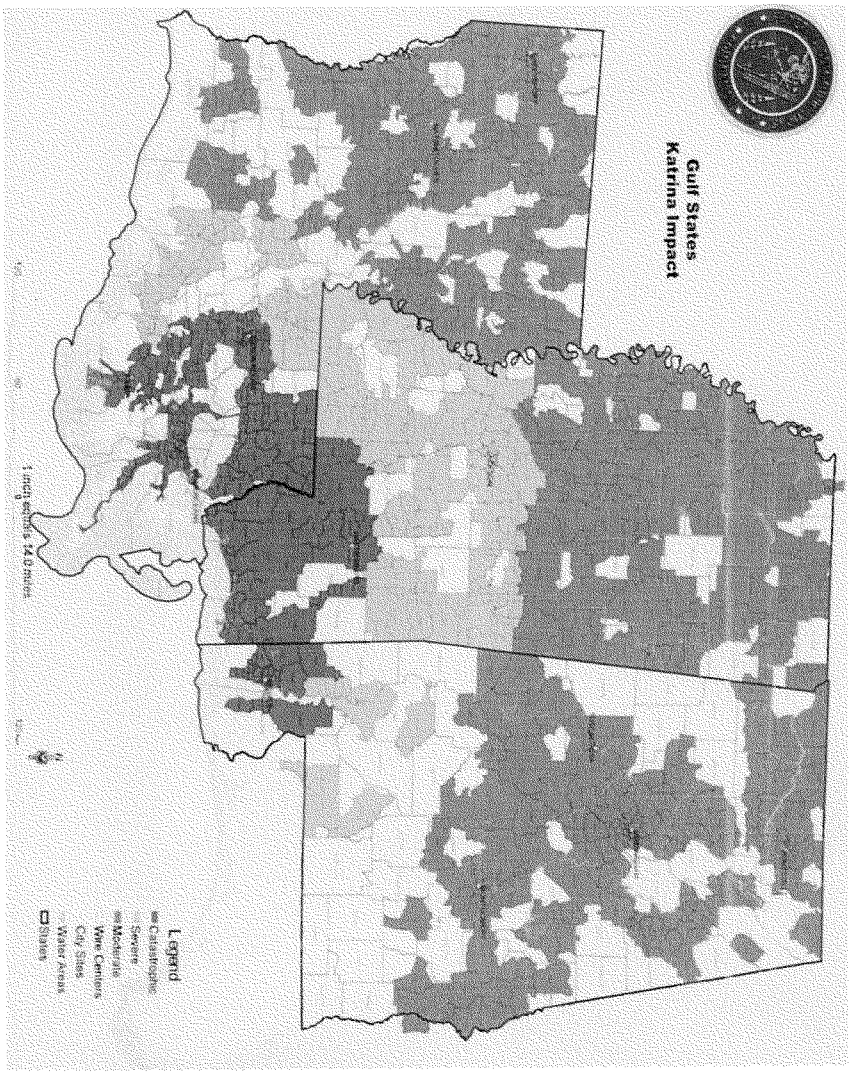
- FCC granted an STA to Telenor Satellite Services to operate one 1.8 meter temporary fixed C-Band antenna to communicate with NSS-7 @ 2.2 W.L. at Camp Barron Point, MS (9/16/05).
- FCC granted an STA to permit Telenor Satellite Services to operate a 2.4 meter temporary fixed C-Band antenna on a hospital ship at Bay St. Louis, MS (9/9/05).

COORDINATION WITH NTIA

- FCC assisted with NTIA's grant of STAs for the U.S. military to use 75 frequencies.
- FCC granted an STA to Intel Corporation for operation in the frequency band 3650 - 3700 MHz to provide wireless services for relief center located at Kelly Air Force Base, Texas (9/8/05).

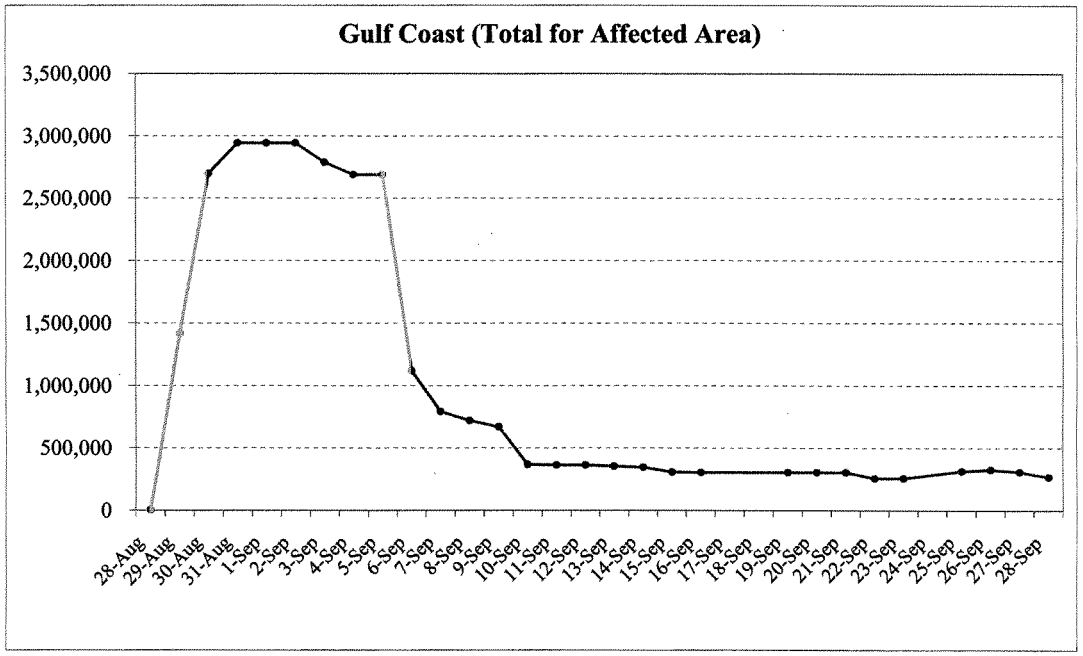
- In coordination with NTIA, FCC granted an STA to Intel Corporation for operation in the frequency band 3485.5 - 3585.5 MHz to provide wireless services for relief center located at Kelly Air Force Base, Texas (9/8/05).
- In coordination with NTIA, FCC granted an STA for Intel to set up a WiMax system in the area from Biloxi and New Orleans to provide Internet connectivity to 225 Red Cross Disaster Centers (9/3/05).
- In coordination with NTIA, FCC granted an STA request from Time Dominion for authorization to use high power ultra-wide band equipment for through-the-wall imaging system operations (9/2/05).

Appendix B


Gulf States
Katrina Impact
Legend
Catastrophic
Severe
Moderate
Wire Centers
City Sites
Water Areas
States
1 inch equals 14.0 miles

Federal Communications Commission

Consumers Out of Service

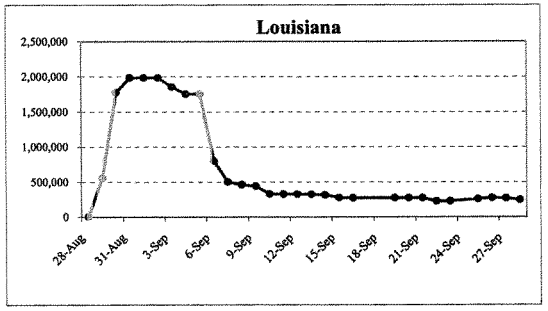


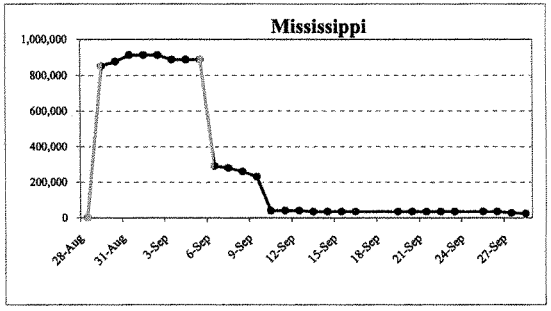
The Gulf Coast comprises the hurricane-affected areas of Louisiana, Texas, Alabama and Mississippi.
Starting Sept. 16, daily Hurricane Katrina data are collected only Monday through Friday. Weekend data are estimated.

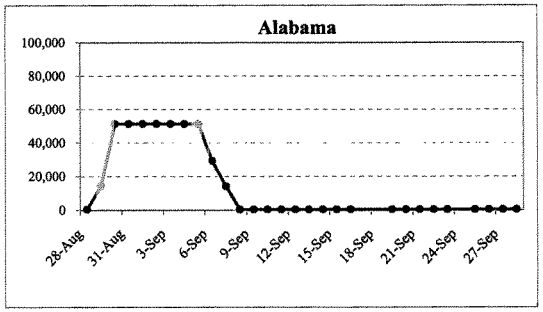
Source: Official FCC Network Outage Reports.

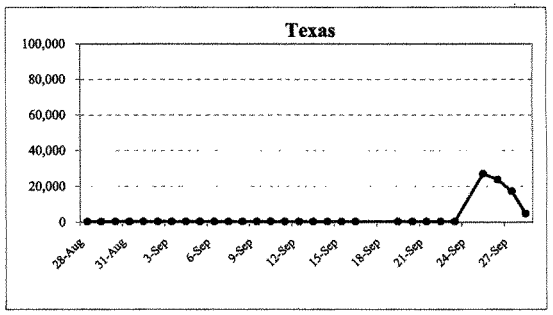
Federal Communications Commission

Consumers Out of Service









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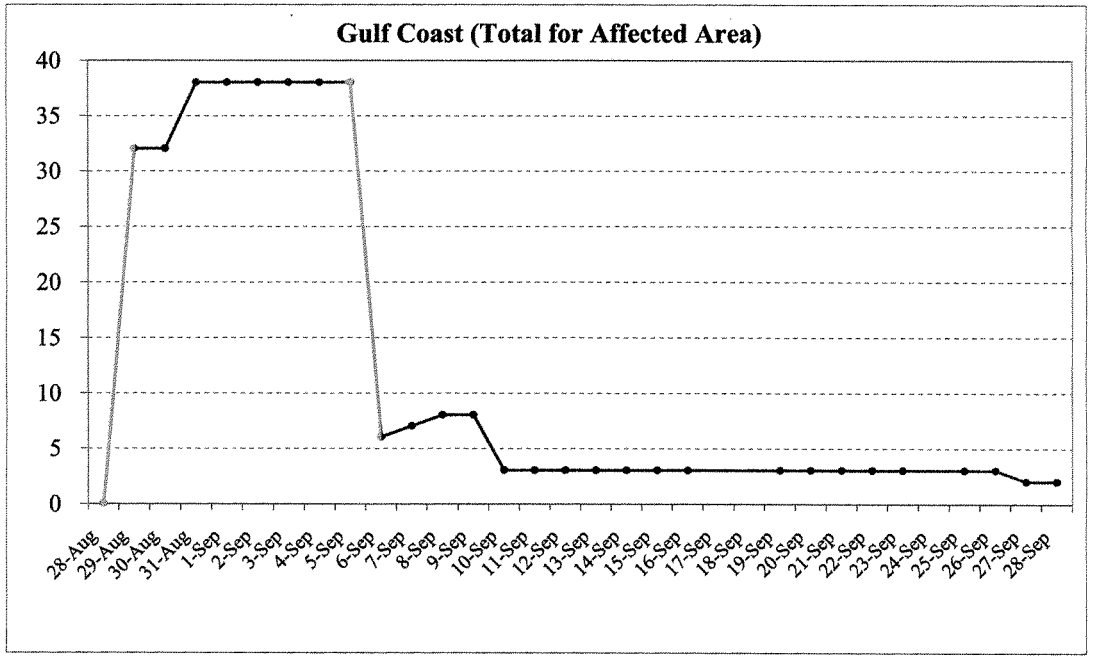
Federal Communications Commission

911 Call Centers Out of Service



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Federal Communications Commission

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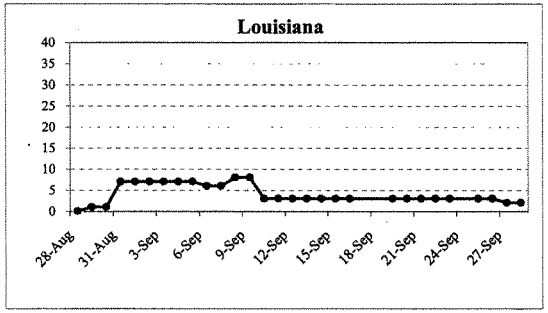

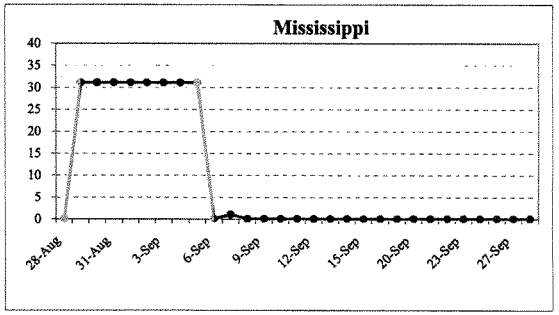

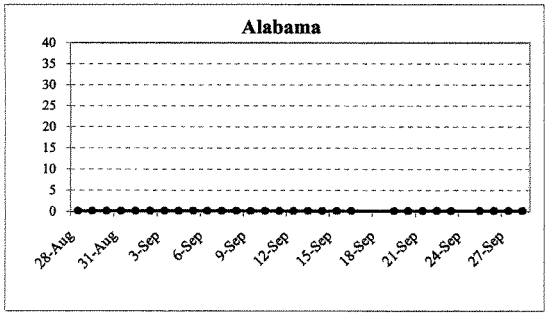

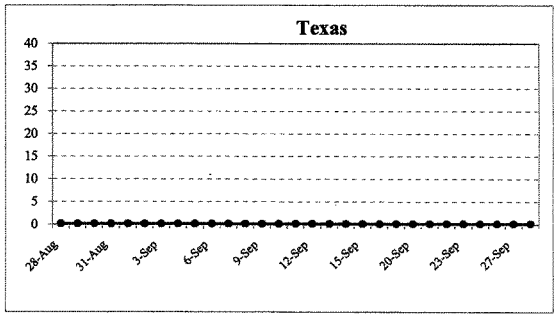

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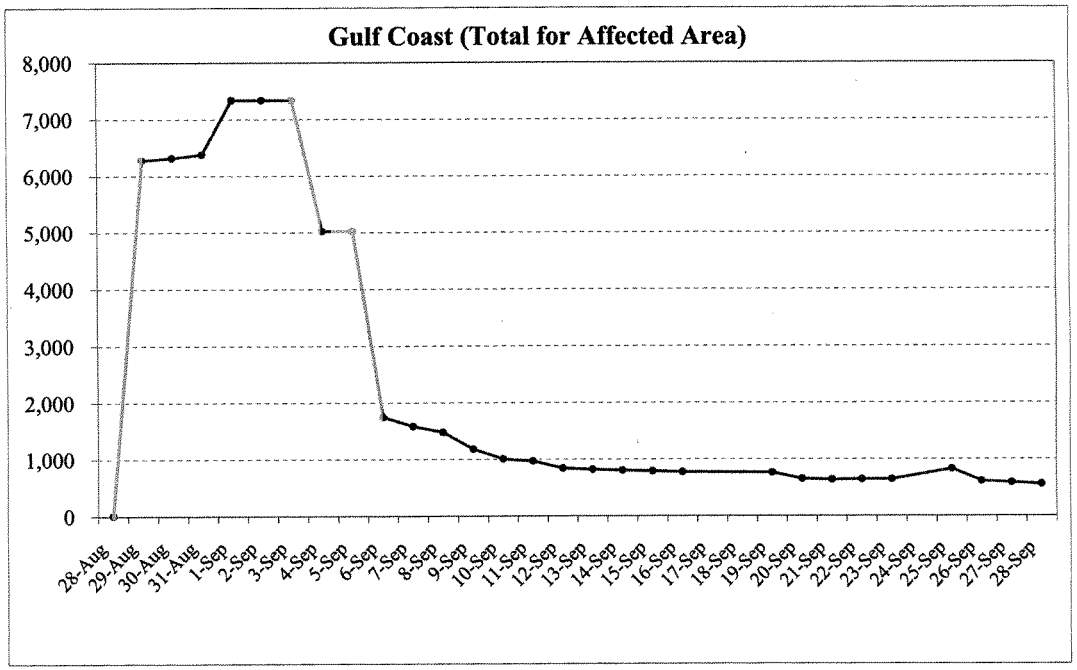
Source: Official FCC Network Outage Reports.

Federal Communications Commission

High Capacity Long Distance Links Out of Service



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Federal Communications Commission

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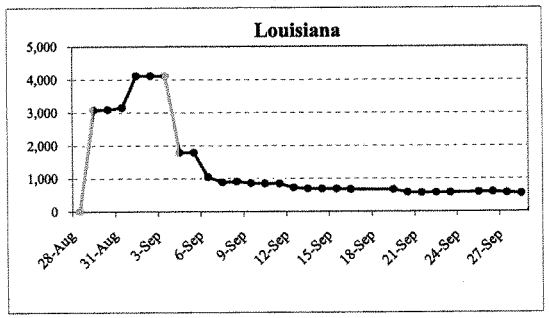

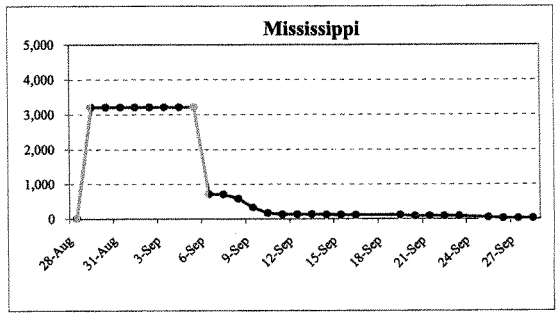

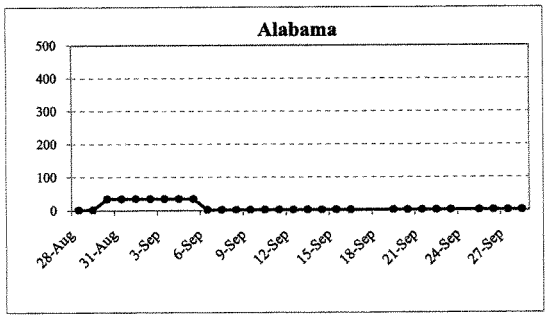

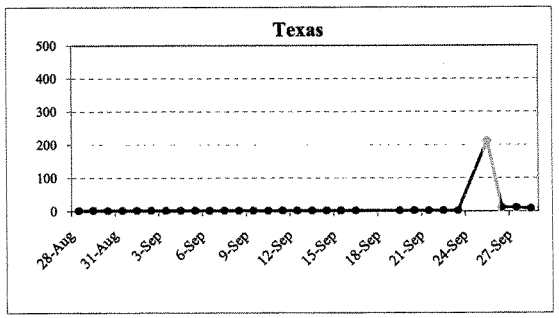

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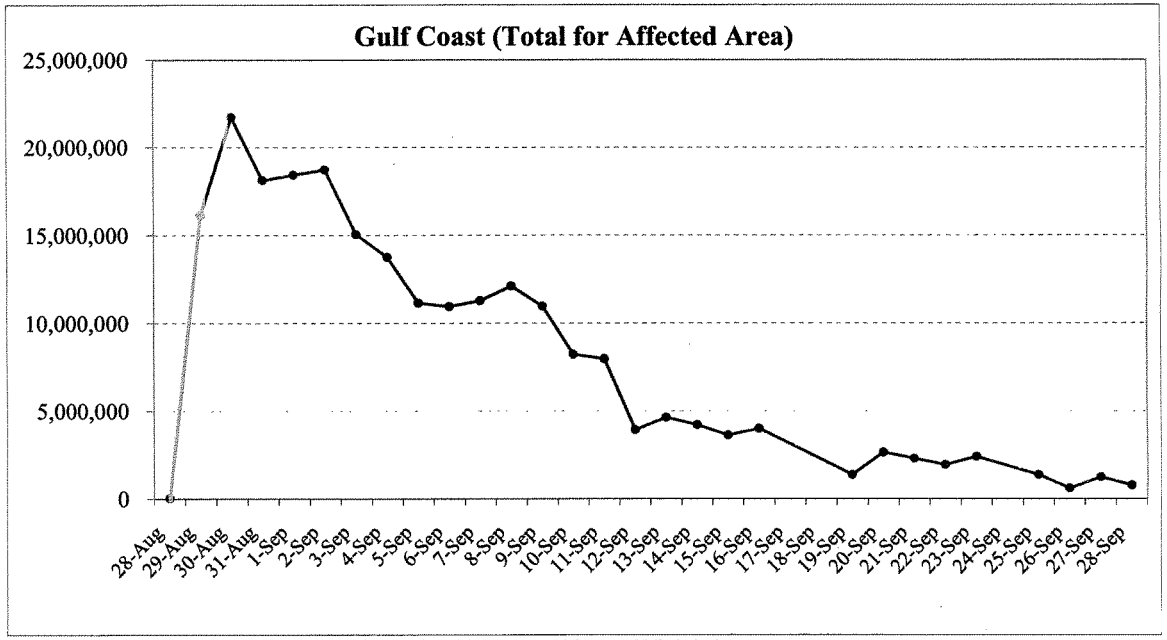
Source: Official FCC Network Outage Reports.

Federal Communications Commission

Daily Failed Calls



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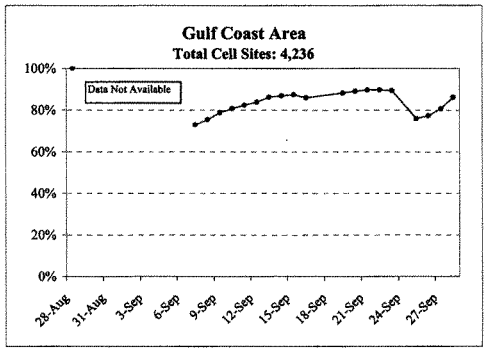
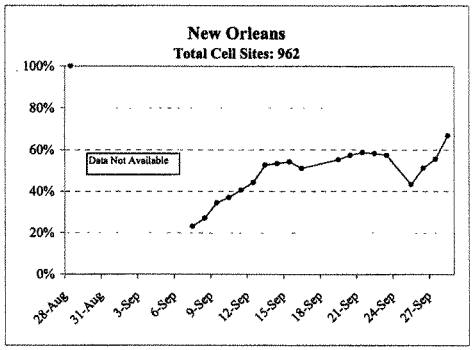
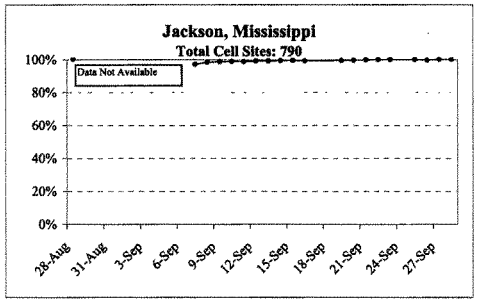
Source: Official FCC Network Outage Reports.

Federal Communications Commission

Wireless Network Status - Percentage of Cell Sites Operational







The Gulf Coast Area was revised to include hurricane-affected areas of Louisiana, Texas, Alabama and Mississippi.

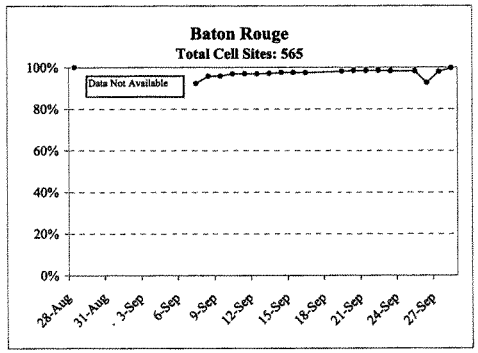
Starting Sept. 16, daily Hurricane Katrina data are collected only Monday through Friday. Weekend data are interpolated.

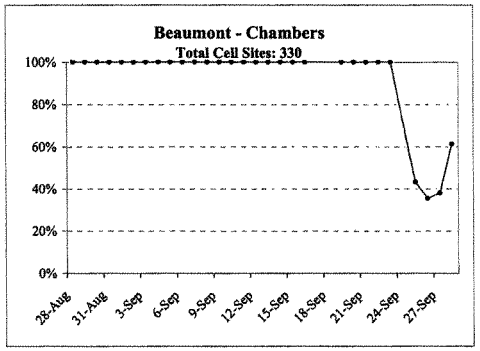
The number of cell sites has changed. Some carriers have decommissioned cell sites. Also, some carriers changed their market definitions (in their outage reports) after Hurricane Rita.

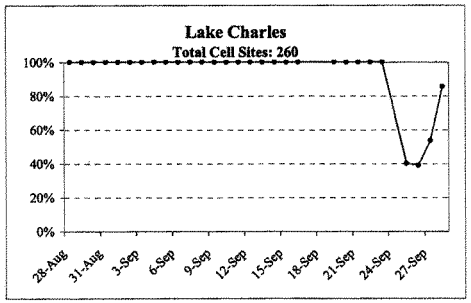
Source: Unofficial information reported by affected companies after Hurricanes Katrina and Rita.

Federal Communications Commission

Wireless Network Status - Percentage of Cell Sites Operational







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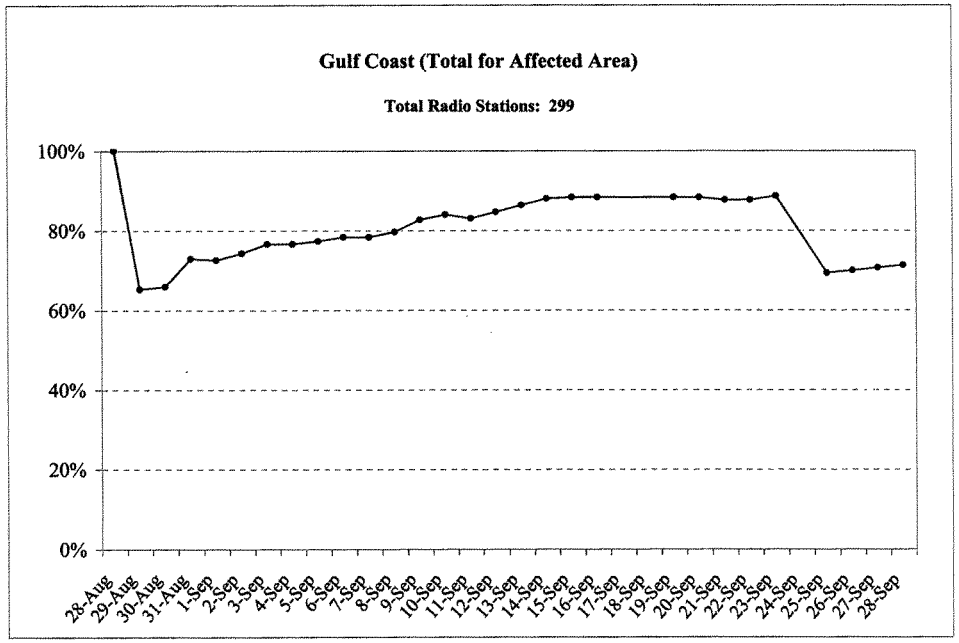
Federal Communications Commission

Radio Stations on the Air



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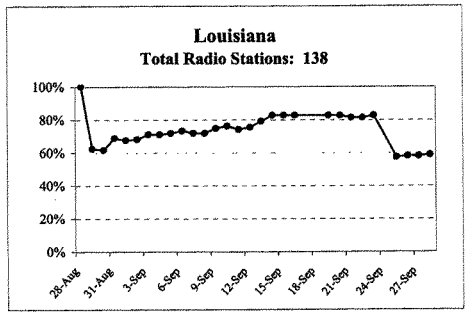
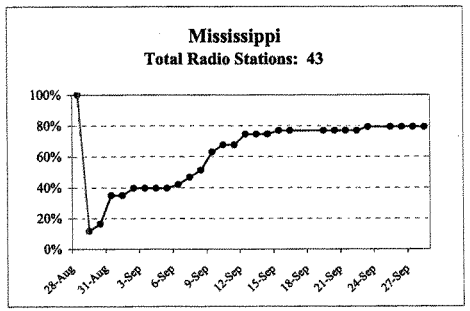
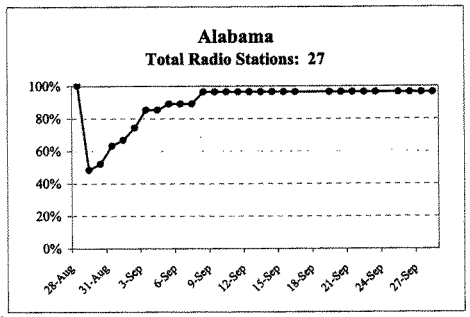
Source: Unofficial information reported by affected companies after Hurricane Katrina.

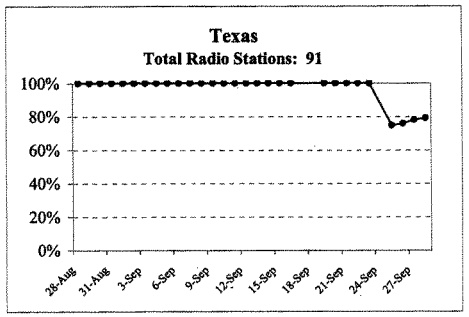
Federal Communications Commission

Radio Stations on the Air









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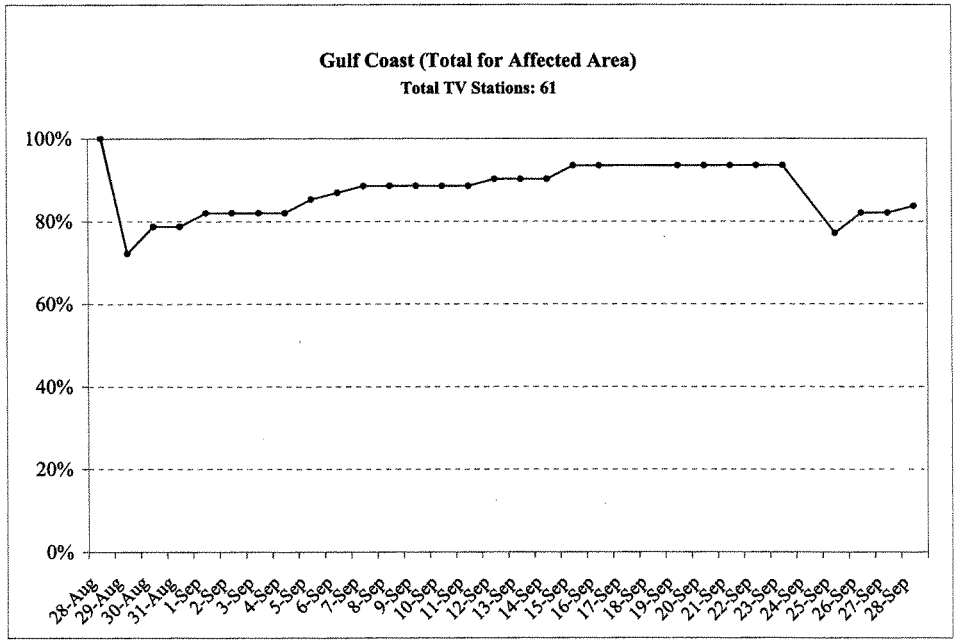
Source: Unofficial information reported by affected companies after Hurricane Katrina.

Federal Communications Commission

Television Stations on the Air



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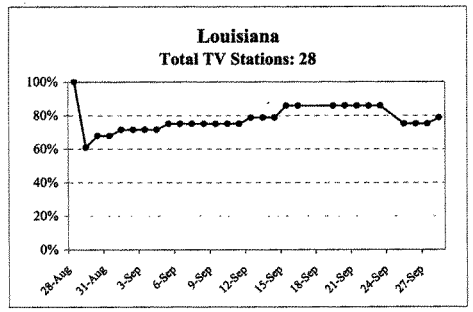
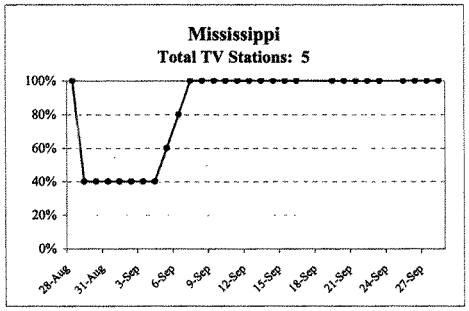
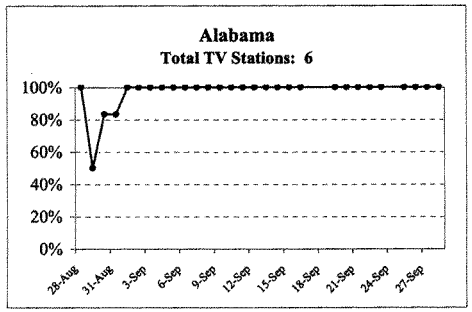
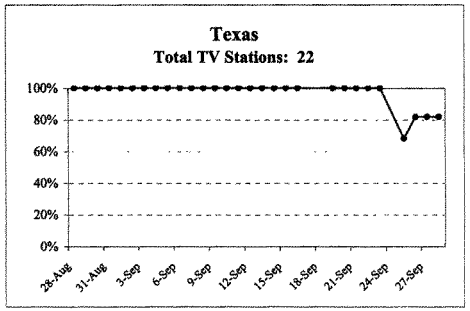
Federal Communications Commission

Television Stations on the Air









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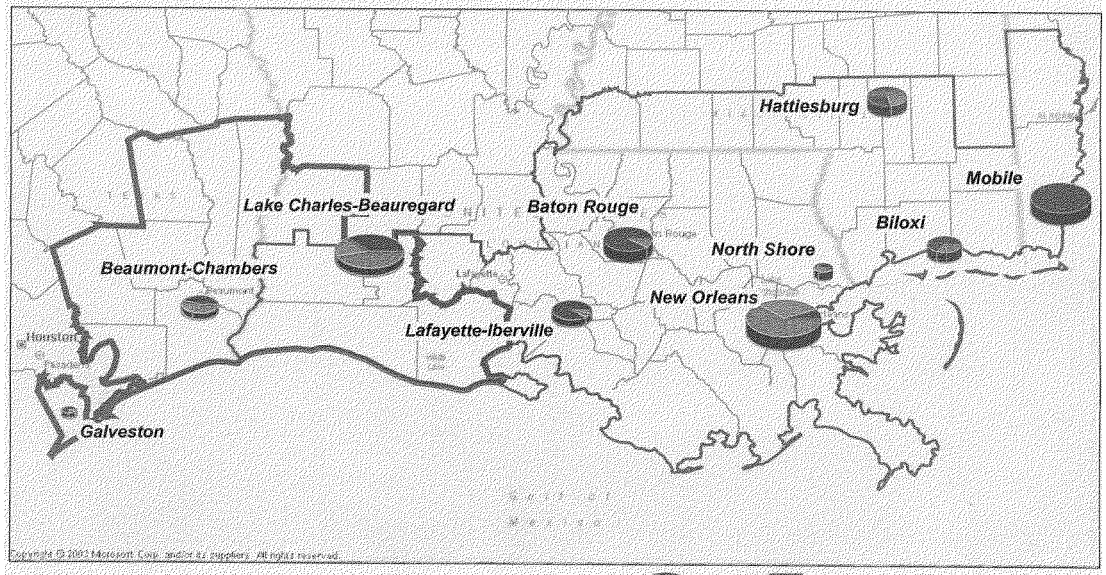
Federal Communications Commission

Cellular Site Status

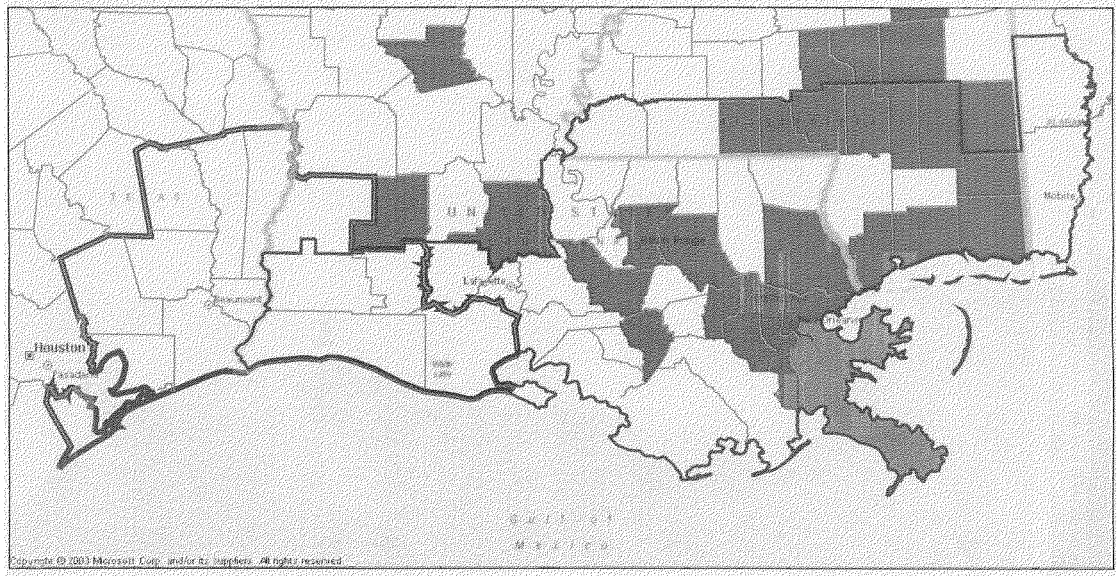


Market Size

- On-Air
- Off-Air
- Restored on or after 9/7 to On-Air Status (Purple)
- Katrina Declared Primary Disaster Areas (Red)
- Rita Declared Primary Disaster Areas (Blue)

Federal Communications Commission

911 Call Center Status



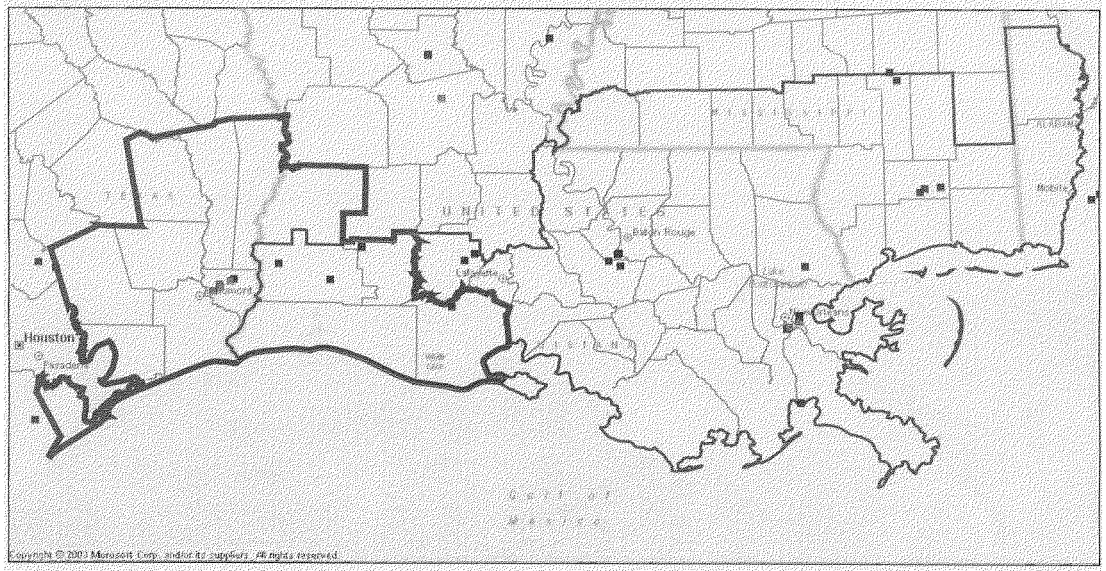
SOURCE: Official Federal Communications Commission Network Outage Reports

Status

- Out of Service as of 9/28 (Red)
- Experienced Service Outage on or after 8/29 - Currently In Service (Blue)
- Katrina Declared Primary Disaster Areas (Red)
- Rita Declared Primary Disaster Areas (Blue)

Federal Communications Commission

TV Station Status

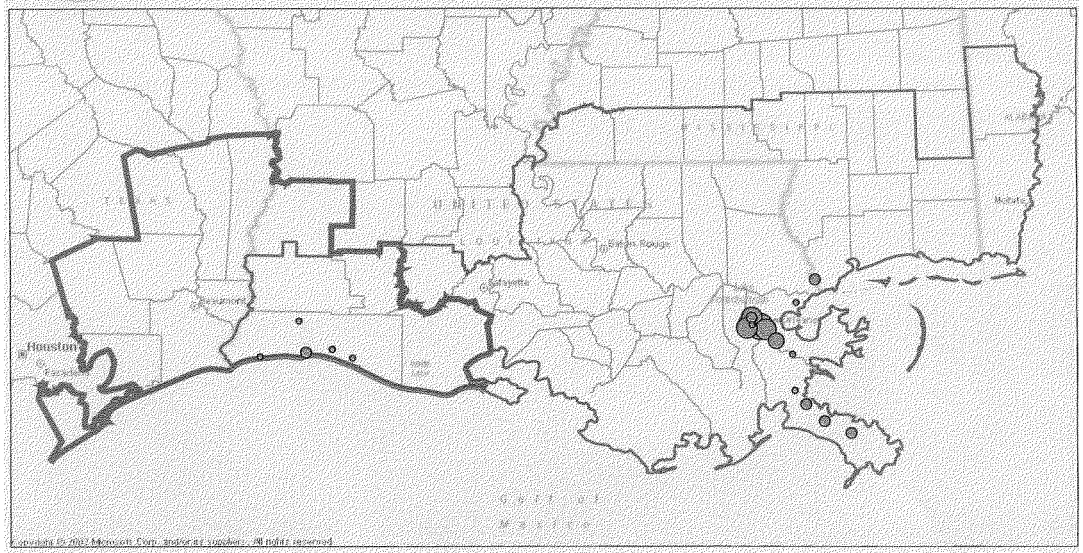


Station Status

- Off-Air (Red)
- On-Air (Green)
- Katrina Declared Primary Disaster Areas (Red)
- Rita Declared Primary Disaster Areas (Blue)

Federal Communications Commission

Central Offices Not In Service



SOURCE: Official Federal Communications Commission Network Outage Reports

Katrina Declared Primary Disaster Areas (Red)

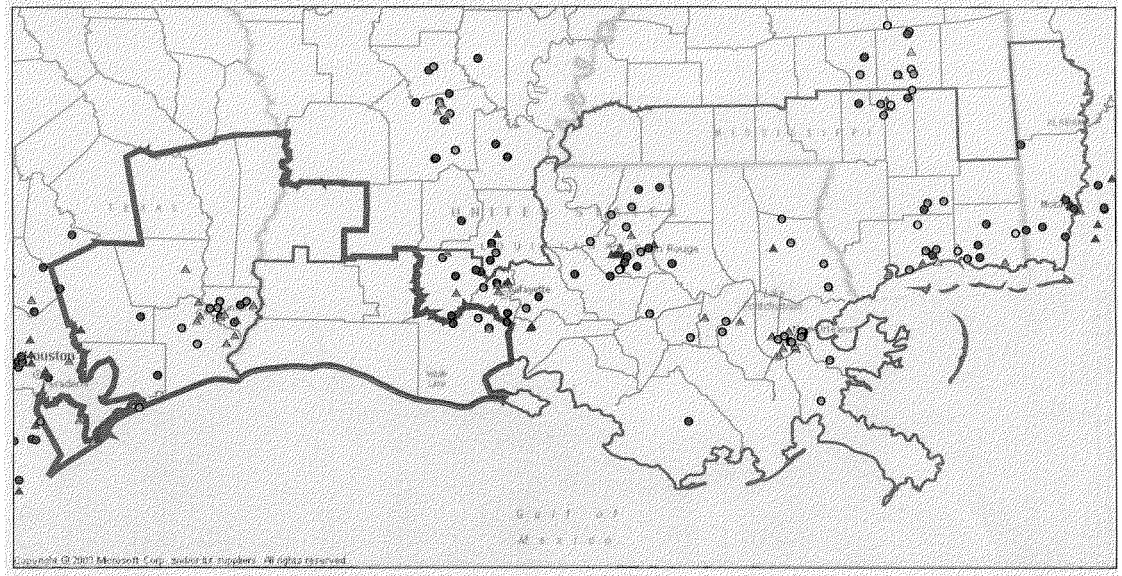
Rita Declared Primary Disaster Areas (Blue)

Affected Consumers

- 236 - 1000
- 1001 - 5000
- 5001 - 10000
- 10001 - 30000
- 30001 - 50000

Federal Communications Commission

Initial Post Katrina/Rita AM and FM Radio Station Status



* Stations "On-Air, Backup Power*" are generally operating transmitters at reduced power levels.

Katrina Declared Primary Disaster Areas (Red)

Rita Declared Primary Disaster Areas (Blue)

FM Station Status

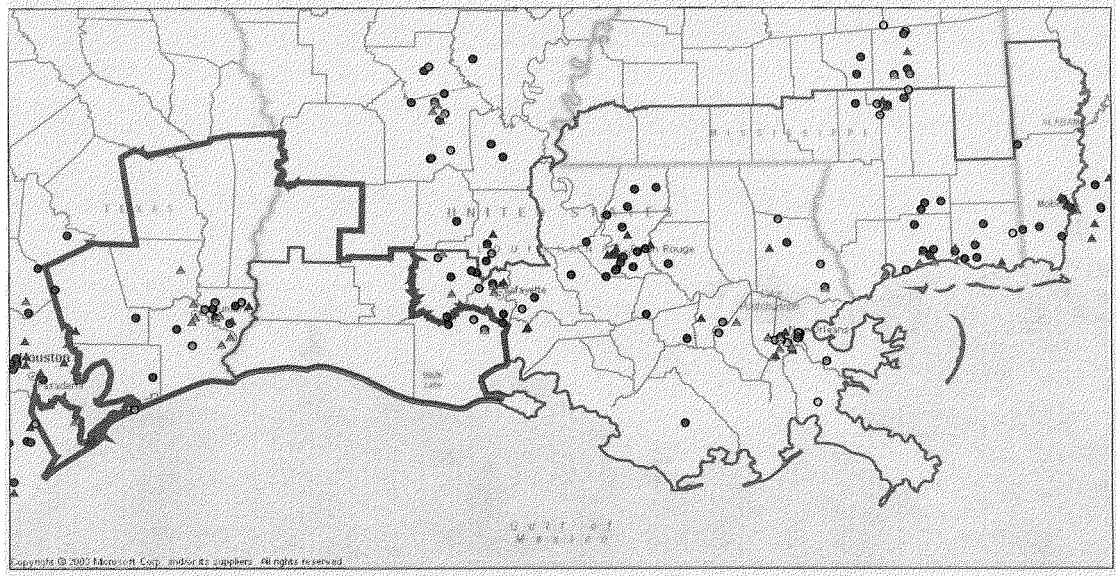
- Off-Air (Red)
- On-Air (Green)
- On-Air, Backup Power* (Yellow)

AM Station Status

- Off-Air (Red)
- On-Air (Green)
- On-Air, Backup Power* (Yellow)

Federal Communications Commission

AM and FM Radio Station Status



* Stations "On-Air, Backup Power**" are generally operating transmitters at reduced power levels.

Katrina Declared Primary Disaster Areas (Red)

Rita Declared Primary Disaster Areas (Blue)

FM Station Status

- Off-Air (Red)
- On-Air (Green)
- On-Air, Backup Power* (Yellow)

AM Station Status

- Off-Air (Red)
- On-Air (Green)
- On-Air, Backup Power* (Yellow)

Federal Communications Commission

TELEPHONE NETWORK OUTAGE INFORMATION

Gulf Coast (Total for Affected Area)

	28-Aug	29-Aug	31-Aug	3-Sep	6-Sep	9-Sep	12-Sep	15-Sep	20-Sep	23-Sep	24-Sep	25-Sep	26-Sep	27-Sep	28-Sep
Consumers Out of Service	0	1,414,000	2,941,000	2,786,000	1,114,000	665,500	359,000	303,000	301,000	253,000	*	310,900	323,100	305,100	263,850
911 Call Centers Out of Service	0	32	38	38	6	8	3	3	3	3	*	3	3	2	2
High Capacity Long Distance Links Out of Service	0	6,270	6,373	7,333	1,740	1,171	831	778	641	636	*	818	603	576	549
Daily Failed Calls	0	16,100,000	18,100,000	15,020,000	10,920,000	10,940,000	3,900,000	3,590,000	2,610,000	2,372,000	*	1,336,667	567,000	1,210,000	737,000

Louisiana

	28-Aug	29-Aug	31-Aug	3-Sep	6-Sep	9-Sep	12-Sep	15-Sep	20-Sep	23-Sep	24-Sep	25-Sep	26-Sep	27-Sep	28-Sep
Consumers Out of Service	0	550,000	1,980,000	1,850,000	795,000	435,500	320,000	270,000	268,000	220,000	*	251,200	266,800	262,000	238,000
911 Call Centers Out of Service	0	1	7	7	6	8	3	3	3	3	*	3	3	2	2
High Capacity Long Distance Links Out of Service	0	3,070	3,140	4,100	1,040	851	710	678	568	563	*	577	584	557	533
Daily Failed Calls	†	†	†	†	†	†	†	†	†	†	*	†	†	†	†

Mississippi

	28-Aug	29-Aug	31-Aug	3-Sep	6-Sep	9-Sep	12-Sep	15-Sep	20-Sep	23-Sep	24-Sep	25-Sep	26-Sep	27-Sep	28-Sep
Consumers Out of Service	0	850,000	910,000	885,000	290,000	230,000	39,000	33,000	33,000	33,000	*	33,000	33,000	26,200	21,600
911 Call Centers Out of Service	0	31	31	31	0	0	0	0	0	0	*	0	0	0	0
High Capacity Long Distance Links Out of Service	0	3,200	3,200	3,200	700	320	121	100	73	73	*	31	10	10	10
Daily Failed Calls	†	†	†	†	†	†	†	†	†	†	*	†	†	†	†

Alabama

	28-Aug	29-Aug	31-Aug	3-Sep	6-Sep	9-Sep	12-Sep	15-Sep	20-Sep	23-Sep	24-Sep	25-Sep	26-Sep	27-Sep	28-Sep
Consumers Out of Service	0	14,000	51,000	51,000	29,000	0	0	0	0	0	*	0	0	0	0
911 Call Centers Out of Service	0	0	0	0	0	0	0	0	0	0	*	0	0	0	0
High Capacity Long Distance Links Out of Service	0	0	33	33	0	0	0	0	0	0	*	0	0	0	0
Daily Failed Calls	†	†	†	†	†	†	†	†	†	†	*	†	†	†	†

Texas

	28-Aug	29-Aug	31-Aug	3-Sep	6-Sep	9-Sep	12-Sep	15-Sep	20-Sep	23-Sep	24-Sep	25-Sep	26-Sep	27-Sep	28-Sep
Consumers Out of Service	0	0	0	0	0	0	0	0	0	0	*	26,700	23,300	16,900	4,250
911 Call Centers Out of Service	0	0	0	0	0	0	0	0	0	0	*	0	0	0	0
High Capacity Long Distance Links Out of Service	0	0	0	0	0	0	0	0	0	0	*	210	9	9	6
Daily Failed Calls	†	†	†	†	†	†	†	†	†	†	*	†	†	†	†

The Gulf Coast comprises the hurricane-affected areas of Louisiana, Texas, Alabama and Mississippi.
Starting Sept. 16, daily Hurricane Katrina data are collected only Monday through Friday. Weekend data are estimated.
Daily Hurricane Rita data are not available for September 24th, and were estimated.
* Data not available.
† Failed calls are reported by hurricane event, not by state.

Source: Official FCC Network Outage Reports.

Federal Communications Commission

WIRELESS NETWORK STATUS

Gulf Coast (Total for Affected Area)

Total Cell Sites: 4,236

	28-Aug	29-Aug	31-Aug	3-Sep	6-Sep	9-Sep	12-Sep	15-Sep	20-Sep	23-Sep	24-Sep	25-Sep†	26-Sep	27-Sep	28-Sep‡
Cell Sites Operational	4,604	*	*	*	*	3,626	3,856	4,021	4,096	4,109	*	3,492	3,553	3,709	3,647
Percentage	100%	*	*	*	*	79%	84%	87%	89%	89%	*	76%	77%	81%	86%

New Orleans, LA

Total Cell Sites: 962

	28-Aug	29-Aug	31-Aug	3-Sep	6-Sep	9-Sep	12-Sep	15-Sep	20-Sep	23-Sep	24-Sep	25-Sep†	26-Sep	27-Sep	28-Sep‡
Cell Sites Operational	1,412	*	*	*	*	485	623	763	808	808	*	610	721	782	641
Percentage	100%	*	*	*	*	34%	44%	54%	57%	57%	*	43%	51%	55%	67%

Jackson, MS

Total Cell Sites: 790

	28-Aug	29-Aug	31-Aug	3-Sep	6-Sep	9-Sep	12-Sep	15-Sep	20-Sep	23-Sep	24-Sep	25-Sep†	26-Sep	27-Sep	28-Sep‡
Cell Sites Operational	790	*	*	*	*	779	782	785	786	789	*	786	786	790	790
Percentage	100%	*	*	*	*	99%	99%	99%	99%	100%	*	100%	99%	100%	100%

Baton Rouge, LA

Total Cell Sites: 565

	28-Aug	29-Aug	31-Aug	3-Sep	6-Sep	9-Sep	12-Sep	15-Sep	20-Sep	23-Sep	24-Sep	25-Sep†	26-Sep	27-Sep	28-Sep‡
Cell Sites Operational	673	*	*	*	*	645	652	656	661	660	*	610	622	658	562
Percentage	100%	*	*	*	*	96%	97%	97%	98%	98%	*	98%	92%	98%	99%

Beaumont - Chambers, TX

Total Cell Sites: 330

	28-Aug	29-Aug	31-Aug	3-Sep	6-Sep	9-Sep	12-Sep	15-Sep	20-Sep	23-Sep	24-Sep	25-Sep†	26-Sep	27-Sep	28-Sep‡
Cell Sites Operational	322	*	*	*	*	322	322	322	322	322	*	139	114	122	202
Percentage	100%	*	*	*	*	100%	100%	100%	100%	100%	*	43%	35%	38%	61%

Lake Charles, TX

Total Cell Sites: 260

	28-Aug	29-Aug	31-Aug	3-Sep	6-Sep	9-Sep	12-Sep	15-Sep	20-Sep	23-Sep	24-Sep	25-Sep†	26-Sep	27-Sep	28-Sep‡
Cell Sites Operational	260	*	*	*	*	260	260	260	260	260	*	104	101	139	222
Percentage	100%	*	*	*	*	100%	100%	100%	100%	100%	*	40%	39%	53%	85%

* Data not available for these dates.

† Initial reports from some wireless carriers need verification.

‡ The number of cell sites has changed. Some carriers have decommissioned cell sites. Also, some carriers changed their market definitions (in their outage reports) after Hurricane Rita.

The Gulf Coast Area was revised to include hurricane-affected areas of Louisiana, Texas, Alabama and Mississippi.

Starting Sept. 16, daily Hurricane Katrina data are collected only Monday through Friday. Weekend data are interpolated.

Source: Unofficial information reported by affected companies after Hurricanes Katrina and Rita.

Federal Communications Commission

BROADCASTER STATION STATUS

Gulf Coast (Total for Affected Area)
Total Radio: 299 Total TV: 61

	28-Aug	29-Aug	31-Aug	3-Sep	6-Sep	9-Sep	12-Sep	15-Sep	20-Sep	23-Sep	24-Sep	25-Sep	26-Sep	27-Sep	28-Sep
Radio Stations on Air (Confirmed)	299	195	218	229	234	247	253	264	264	265	*	207	209	211	213
Percentage	100%	65%	73%	77%	78%	83%	85%	88%	88%	89%	*	69%	70%	71%	71%
TV Stations on Air (Confirmed)	61	44	48	50	53	54	55	57	57	57	*	47	50	50	51
Percentage	100%	72%	79%	82%	87%	89%	90%	93%	93%	93%	*	77%	82%	82%	84%

Louisiana
Total Radio: 138 Total TV: 28

	28-Aug	29-Aug	31-Aug	3-Sep	6-Sep	9-Sep	12-Sep	15-Sep	20-Sep	23-Sep	24-Sep	25-Sep	26-Sep	27-Sep	28-Sep
Radio Stations on Air (Confirmed)	138	86	95	98	101	103	104	114	114	114	*	79	80	80	81
Percentage	100%	62%	69%	71%	73%	75%	75%	83%	83%	83%	*	57%	58%	58%	59%
TV Stations on Air (Confirmed)	28	17	19	20	21	21	22	24	24	24	*	21	21	21	22
Percentage	100%	61%	68%	71%	75%	75%	79%	86%	86%	86%	*	75%	75%	75%	79%

Mississippi
Total Radio: 43 Total TV: 5

	28-Aug	29-Aug	31-Aug	3-Sep	6-Sep	9-Sep	12-Sep	15-Sep	20-Sep	23-Sep	24-Sep	25-Sep	26-Sep	27-Sep	28-Sep
Radio Stations on Air (Confirmed)	43	5	15	17	18	27	32	33	33	34	*	34	34	34	34
Percentage	100%	12%	35%	40%	42%	63%	74%	77%	77%	79%	*	79%	79%	79%	79%
TV Stations on Air (Confirmed)	5	2	2	2	4	5	5	5	5	5	*	5	5	5	5
Percentage	100%	40%	40%	40%	80%	100%	100%	100%	100%	100%	*	100%	100%	100%	100%

Alabama
Total Radio: 27 Total TV: 6

	28-Aug	29-Aug	31-Aug	3-Sep	6-Sep	9-Sep	12-Sep	15-Sep	20-Sep	23-Sep	24-Sep	25-Sep	26-Sep	27-Sep	28-Sep
Radio Stations on Air (Confirmed)	27	13	17	23	24	26	26	26	26	26	*	26	26	26	26
Percentage	100%	48%	63%	85%	89%	96%	96%	96%	96%	96%	*	96%	96%	96%	96%
TV Stations on Air (Confirmed)	6	3	5	6	6	6	6	6	6	6	*	6	6	6	6
Percentage	100%	50%	83%	100%	100%	100%	100%	100%	100%	100%	*	100%	100%	100%	100%

Texas
Total Radio: 91 Total TV: 22

	28-Aug	29-Aug	31-Aug	3-Sep	6-Sep	9-Sep	12-Sep	15-Sep	20-Sep	23-Sep	24-Sep	25-Sep	26-Sep	27-Sep	28-Sep
Radio Stations on Air (Confirmed)	91	91	91	91	91	91	91	91	91	91	*	68	69	71	72
Percentage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	*	75%	76%	78%	79%
TV Stations on Air (Confirmed)	22	22	22	22	22	22	22	22	22	22	*	15	18	18	18
Percentage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	*	68%	82%	82%	82%

* No data available

The Gulf Coast Area comprises the hurricane-affected areas of Louisiana, Texas, Alabama, and Mississippi.

Starting Sept.16, daily Huricane Katrina data are collected only Monday through Friday. Weekend data are interpolated.

Because many broadcasters are operating on back-up power at this time, their service availability is likely below pre-hurricane levels.

Source: Unofficial information reported by affected companies after Hurricane Katrina.

Mr. UPTON. Thank you again.

Dr. Boyd, welcome.

STATEMENT OF DAVID G. BOYD

Mr. BOYD. Good afternoon and thank you, Mr. Chairman and members of the Committee, for the invitation to speak to you today.

Interoperability requires, before all else, operability as Hurricane Katrina demonstrated in the absence of a reliable network across which respondents within an agency can effectively communicate with themselves. Interoperability is both irrelevant and impossible. Some seem to believe the introduction of new technologies alone can solve our interoperability problems but adding equipment addresses only part of what a fully robust, reliable, and interoperable public safety communication system requires. For example, when we lose towers, first responders have only their mobile or portable units available so range is dramatically reduced and control of the incident is severely compromised. Portable units permit some short-range communications until the proprietary battery packages begin to fail and cannot be recharged because the chargers are typically attached to the power grid. 911 centers are tied to the wired telephone network and so is the cellular system which depends on cell phones that also use propriety batteries. No single fix alone can address all of these elements.

Many solutions have been offered and many claims have been made for each solution and all have a role, but none is a silver bullet. Satellite phones are extremely useful for command elements but often hopelessly impractical for individual first responders. The required training and signals can be blocked by vegetation, buildings, terrain, and even weather. They also use batteries that need recharging. And a first responder in the middle of a rescue or up to his armpits in flood water will find the antenna hard or impossible to aim. Van or trailer mounted communication systems dropped into the incident nearly always offer significantly less coverage than the original system and may require significant training to use. And all of these without solid prior planning and appropriate training will add to the difficulties of achieving interoperability once interoperability is achieved.

We believe that what we have developed to support interoperability can also help first responders successfully navigate any communications emergency. We of the public safety community have identified six key building blocks required to achieve interoperability. Governance, that is the political issue you addressed, sir; standard operating procedures; technology, training and exercises; routine use of interoperable systems; and cost cutting. Of all of these is the sixth and most important element, a high degree of leadership, planning and collaboration with a commitment to and an investment in sustainability across all regions. To help public safety agencies, and especially the policy levels of Government, understand the interrelationship of all of these factors, we developed a tool we call the interoperability continuum and if you have not seen it, I will be happy to provide you a copy. This planning tool explains how all these elements interrelate and it makes clear that

all of these elements need to be addressed not during an emergency.

Interoperability is not a new issue. It was a problem in Washington, DC, when the Air Florida flight crashed into the Potomac in 1982, in New York City when the Twin Towers were first attacked in 1993, in 1995 when the Murrah Building was destroyed in Oklahoma City, and in 1999 at Columbine. Too many public safety personnel cannot communicate by radio because their equipment is still incompatible or the frequencies they are assigned to are different and they have not got bridging technologies available. They operate on 10 different frequency bands and they run communication systems that are often proprietary and too often 30 or more years old. Over 90 percent of the Nation's public safety wireless infrastructure is financed, owned, operated, and maintained by the more than 60,000 individual local jurisdictions, police, fire, and emergency services that serve the public. National efforts to fix the problem have historically been erratic, uncertain, and until recently uncoordinated. Worse, the efforts have too often been designed without the direct involvement of the people with the greatest stake in effective communications, the first responders. The attacks on September 11, 2001 made clear all of this had to change.

Since September 11, significant progress has been made in interoperability thanks to the priorities both the Administration and Congress have placed on it. In 2001, SAFECOM was established as a Presidential Management Initiative, the first time interoperability had ever been addressed at that level. In 2004, the Department established the Office of Interoperability and Compatibility to further strengthen and integrate interoperability and compatibility efforts. And in the Intelligence Reform Act, Congress gave it a legislative charter.

While fixing the Nation's interoperability problem will require a sustained effort, we recognize that we cannot wait to move things forward. That is why SAFECOM has initiated the number of near term initiatives, including working with the National Institute of Standards and Technology to accelerate the development of standards, the Interoperability Continuum I mentioned earlier, and the development of statewide planning tools, RapidCom, which was a program to establish command level emergency interoperability across 10 high threat areas, the national statement of requirements, the public safety architecture framework, creation of a P-25 performance testing program, development of coordinated grant guidance which for the first time is included in all Federal grant programs, creation of a national baseline and identification of public safety spectrum needs.

This Nation is heavily invested in an existing infrastructure that is too often inadequate to the basic communications requirements of individual agencies and not interoperable. We must continue to pursue a comprehensive strategy that takes into account technical and cultural issues associated with improving interoperability which recognizes the challenges associated with incorporating legacy equipment and practices in a constantly changing technology and cultural environment in which encourages strong local leadership in ensuring that the needs of the front line of emergency response, the first responders are met. Though many challenges re-

main, we believe we have accomplished a great deal in the barely 2 years DHS has managed this program. We are confident that with your continued support and the assistance of our many Federal, and in particular State and local partners, we will continue to move toward a world where lives and property are never lost because public safety agencies are unable to communicate or lack compatible equipment and training resources.

And I would be happy to answer any questions you have, sir.

[The prepared statement of David G. Boyd follows:]

PREPARED STATEMENT OF DAVID G. BOYD, DIRECTOR, OFFICE FOR INTEROPERABILITY AND COMPATIBILITY, SYSTEMS ENGINEERING AND DEVELOPMENT, DIRECTORATE OF SCIENCE AND TECHNOLOGY, DEPARTMENT OF HOMELAND SECURITY

INTRODUCTION

Good morning and thank you, Mr. Chairman and Members of the Committee, for the invitation to speak to you today.

Today's testimony will focus on SAFECOM, a communications program of the Office of Interoperability and Compatibility (OIC), which resides in the Office of Systems Engineering and Development, Science and Technology Directorate, Department of Homeland Security (DHS). SAFECOM provides development, testing, evaluation, guidance, research and assistance for local, tribal, state, and Federal public safety agencies working to improve public safety response through more effective and efficient interoperable wireless communications. (By public safety we mean fire, police, emergency medical services, emergency managers, and others who have emergency response missions). Although SAFECOM is working with practitioners to develop long-term strategic initiatives without which the nation will never solve the interoperability problem, we all know terrorists, natural disasters and other emergencies will not wait for a comprehensive national solution so the program has been designed with near-, mid- and long-term goals.

Communications interoperability refers to the ability of public safety agencies to talk across disciplines and jurisdictions via radio communications systems, exchanging voice and/or data with one another on demand, in real time, as authorized. Unfortunately, the nation is heavily invested in an existing infrastructure made up largely of systems that are too often incompatible. To change this, efforts within the Federal government to address the interoperability problem are being coordinated by SAFECOM and incorporate the needs of local, state, and Federal practitioners. But there are no immediate, silver bullet fixes to the financial, technical and cultural challenges that face us. As the Government Accountability Office (GAO) acknowledged in a July 2004 report, communications interoperability is a long-term problem with no one-size-fits-all solution.

PUBLIC SAFETY COMMUNICATIONS ENVIRONMENT

Interoperability is not a new issue; it has plagued the public safety community for decades. It was a problem in Washington, D.C., when the Air Florida flight crashed into the Potomac in 1982. It was a problem in New York City when the Twin Towers were first attacked in 1993. It was a problem in 1995 when the Murrah Building was destroyed in Oklahoma City, and in 1999 at Columbine. The reality is that today, too many public safety personnel cannot communicate by radio with personnel from other agencies or disciplines because their equipment is still incompatible, or the frequencies they are assigned are different. They operate on 10 different frequency bands and run communications systems that are often proprietary, and that are too often 30 or more years old, in an era when the technology lifecycle is only 18 to 24 months. Over 90% of the nation's public safety wireless infrastructure is financed, owned, operated, and maintained by the more than 60,000 local jurisdictions that provide emergency services to the public and only a very tiny fraction of this funding is Federal. National efforts to fix the problem have historically been erratic, uncertain, and—until recently—uncoordinated. The attacks on September 11, 2001, made clear this had to change.

Since September 11, 2001, significant progress has been made to improve communications interoperability for the public safety community. Yet it is apparent that more must be achieved. Much of this progress can be attributed to the priority that both the Administration and Congress have placed on solving the problem of communications interoperability. In 2001, SAFECOM was established as a Presidential Management Initiative and charged with strengthening interoperability at all levels

of government by coordinating Federal programs, initiating a comprehensive standards program, and developing a national architecture. In 2004, the Department established OIC to further strengthen and integrate interoperability and compatibility efforts to improve local, tribal, state, and Federal public safety preparedness and response. OIC was directed to:

- Identify and certify all DHS programs that touch on interoperability;
- Support the creation of interoperability standards;
- Establish a comprehensive research, development, testing, and evaluation (RDT&E) program for improving public safety interoperability;
- Integrate coordinated grant guidance across all DHS grant making agencies that touch on public safety interoperability;
- Oversee the development and implementation of technical assistance for public safety interoperability;
- Conduct pilot demonstrations;
- Create an interagency interoperability coordination council; and
- Establish an effective outreach program.

LONG-TERM VISION

Practitioners helped SAFECOM articulate a long term vision for interoperability which projects that, not later than 2023, first responders will operate on a national system-of-systems using standards-based equipment that provides the capability to respond to an incident anywhere in the country, using their own equipment, on any network, and on dedicated public safety spectrum. They will be able to communicate with each other as authorized via voice, data, and video on demand and in real time. Making this vision flesh will require work in five critical success areas, including:

1. A common set of guidelines and criteria for public safety communications systems in conjunction with a national architecture framework;
2. Coordinated testing and evaluation processes to ensure communications equipment meets critical requirements;
3. Standardization of equipment fortified by interim grant guidance measures;
4. Coordinated spectrum policy that meets the needs of the public safety community; and
5. Certification of state communications plans.

None of these initiatives will be accomplished overnight, but many of them are already beginning to strengthen interoperability in the public safety community.

NEAR-TERM INITIATIVES

While fixing the nation's interoperability problem will require a sustained effort, we recognize that we must quickly ensure sufficient interoperability at all levels of government to meet emergencies of any kind. To do this, DHS and SAFECOM has initiated a number of near-term initiatives, including development of the Interoperability Continuum, development of statewide planning tools, execution of the RapidCom Initiative, publication of a national statement of requirements, creation of a conformance testing program, development of coordinated grant guidance for inclusion in every Federal grant program, creation of a national baseline, identification of public safety spectrum needs, development of emergency response plans for immediate communications capabilities, and coordination with Office of State and Local Government Coordination and Preparedness' (SLGCP) Interoperable Communications Technical Assistance Program (ICTAP).

Statement of Requirements and a National Architecture Framework

Interoperability plans to support responses to an incident need to be developed based on a common set of guidelines and criteria for public safety communications systems and these should be aligned with a national architecture framework. Only when these guidelines are universally recognized and followed will first responders and the larger public safety community be able to communicate effectively. To that end, SAFECOM published Version 1.0 of the first ever comprehensive Public Safety Statement of Requirements for Communications and Interoperability (SoR). Developed with public safety practitioner input, the SoR defines the functional requirements for public safety communications. Subsequent versions will further refine these technical requirements so that industry will have a blueprint to which to build technologies that address public safety's needs. This SoR also serves as the basis for developing a national architecture framework for communications interoperability. SAFECOM is working to develop a Public Safety Architecture Framework (PSAF) that, with the SoR, will serve as a tool to help the nation's first responder agencies understand the technical requirements and national migration path toward

fully interoperable communications systems without imposing requirements that stifle innovation.

Coordinated Testing and Evaluation of Equipment

The next step in achieving national communications interoperability is the development of coordinated testing and evaluation processes to ensure communications equipment meets the critical needs of first responders. Public safety is faced with many complex procurement decisions and frequently has to hope that the equipment they buy will do what it claims. To ensure that public safety is able to truly trust the claims made by vendors, communications equipment needs to be tested and evaluated based on first responder needs and capabilities. To do this, SAFECOM created a testing and evaluation working group to help ensure that methodologies for testing and evaluation of interoperability products are technically sound and comparable across testing laboratories. The working group members are practitioners and subject matter experts from law enforcement, fire services, and emergency medical services. These members help review and develop test criteria and serve the program by determining which products should be evaluated. S

National Baseline of Public Safety Communications

The National Interoperability Baseline study will provide the nation's first statistically significant, quantitative measurement of the current state of public safety communications interoperability. The development of the survey methodology was initiated in January 2005 and the resulting study will provide an understanding of the current state of interoperability nationwide upon completion. Additionally, it will serve as a tool to measure future improvements made through local, state, and Federal public safety communications initiatives.

The survey instrument developed for Interoperability Baseline will allow SAFECOM to identify areas with interoperability shortfalls, track the impact of Federal programs and measure the success of these programs, establish an on-going process and mechanism to measure the state of interoperability on a recurring basis, and develop an interoperability baseline self-assessment tool for local and state public safety agencies.

Coordinated Spectrum Policy That Meets the Needs of Public Safety

Radio spectrum is a finite resource—there is only so much available and it is shared by public safety, radio broadcasters, government users, and other commercial and private consumers. The large demand for this resource can lead to overcrowding, which, in turn can cause delays in or disruption of communication for public safety. The Federal Communications Commission has allocated certain frequencies to public safety, but these allocations are fragmented, creating challenges for communications among different agencies and jurisdictions. In the Intelligence Reform and Terrorism Prevention Act of 2004, Congress required the Federal Communications Commission (FCC) in consultation with DHS and the National Telecommunications and Information Administration (NTIA) to conduct a study to assess the spectrum needs for local, state, and Federal first responders, which is due in December 2005. SAFECOM is currently assessing public safety spectrum needs in support of the President's national spectrum management initiative. DHS, in consultation with the Department of Commerce and other relevant agencies, is developing a Spectrum Needs Plan out of these assessments which will be delivered to the President by the end of November 2005.

Certification of State Communications Plans

Interoperability requires, before all else, simple operability—that is, communications within the local agency. As Hurricane Katrina demonstrated, in the absence of a reliable network across which responders within an agency can effectively communicate, interoperability is both irrelevant and impossible. Strengthening and ensuring basic level public safety communications capabilities, therefore, is the first task. But progressing from agency-specific operability towards multi-jurisdictional and multi-disciplinary interoperability requires attention to more than technology.

Some believe the introduction of new technologies alone can solve our interoperability problems. But adding equipment addresses only one part of what a fully robust, reliable, and interoperable public safety communications system requires. With input from the public safety community, we have identified five key building blocks required to achieve interoperability. Governance, Standard Operating Procedures (SOP), Technology, Training and Exercises, routine use (Usage) of interoperable systems, and regular Maintenance must all be present for interoperability to be possible. To help public safety agencies and especially the policy levels of government understand the interrelationship of all of these factors, we developed a tool called the "Interoperability Continuum." This planning tool explains how all these

elements relate to each other. For example, if a city within a region procures new equipment it may have a technical interoperability capability, but unless it has also conducted exercises to test procedures (and find points of failure) and concepts of operation, and developed policies agreeable to the entire region, it is unlikely the new equipment can be effectively integrated into regional interoperability plans. As states develop their emergency communications plans, we recommend that they address all the elements of the Interoperability Continuum.

Statewide Planning Tools

Statewide communications plans are often unsuccessful because the top-down approach fails to consider the requirements of the first responders who are the primary users and who control the most of the wireless infrastructure.

In 2004, SAFECOM partnered with the Commonwealth of Virginia and the Department of Justice to develop a strategic plan for improving statewide interoperable communications for the state. The effort was based on SAFECOM's "bottom-up," locally-driven approach. The planning process included six regional focus group sessions, which culminated in a final strategic planning session. The focus group sessions captured perspectives from numerous local public safety representatives throughout the Commonwealth; these perspectives were used in the final strategic planning session in which recommendations for key initiatives were developed as part of a statewide strategic plan for improving public safety communications and interoperability.

Based on lessons learned from the Virginia planning process, SAFECOM published the Statewide Communications Interoperability Planning (SCIP) Methodology as a model for integrating practitioner input into a successful statewide strategic plan to every state. The SCIP Methodology serves as one approach for states to consider as they initiate statewide communications planning efforts.

We are also implementing Section 7304 of the Intelligence Reform and Terrorism Prevention Act of 2004 (Public Law 108-458), which authorized the Secretary of Homeland Security to carry out at least two Regional Communications Interoperability Pilots (RCIP). In accordance with the congressional criteria for determining the location of the pilot sites, as well as criteria outlined by the program itself, SAFECOM selected the State of Nevada and the Commonwealth of Kentucky as RCIP locations. SAFECOM, in coordination with the Office of State and Local Government Coordination and Preparedness' Interoperable Communications Technical Assistance Program (ICTAP), is helping both states implement the SCIP methodology.

Building on lessons learned from the SCIP Methodology and earlier SAFECOM initiatives, the RCIP projects will help us identify models for improving communications and interoperability that take into account the wide range of challenges across the nation. When the projects are complete, Nevada and Kentucky will each have improved interoperability plans and we will be able to use the lessons learned to better develop or strengthen replicable tools and methodologies which will be made available to public safety practitioners, as well as to local and state governments. An interim report regarding the progress of the pilot projects has been submitted to Congress. A final report will be provided to Congress in June 2006.

We believe statewide emergency communications plans are fundamental to an effective response to a catastrophic event. As states continue to develop their own plans, SAFECOM recommends that they do so in coordination with SAFECOM methodologies and guidance.

RapidCom

On July 22, 2004, President Bush formally announced the RapidCom initiative, a program designed to ensure that a minimum level of public safety interoperability would be in place in ten high-threat urban areas by September 30, 2004.

In coordination with the Office of State and Local Government Coordination and Preparedness (OSLGCP), the Department of Justice's 25 Cities Program, and the DHS Wireless Management Office, SAFECOM worked closely with public safety leaders in ten high-risk urban areas centered in Boston, Chicago, Houston, Jersey City, Los Angeles, Miami, New York, Philadelphia, San Francisco, and the Washington Metropolitan Area to assess their communications interoperability capacity and needs, and to identify and implement solutions. In keeping with the SAFECOM "bottom-up" approach, local officials drove the design and implementation of solutions in their jurisdictions.

With the on-time completion of the RapidCom project, incident commanders in each of the urban areas now have confirmed they have the ability to adequately communicate with each other and their respective command centers within one hour of an incident.

Interoperable Communications Technical Assistance Program (ICTAP)

A key component in achieving interoperable communications across the nation is providing on-site technical assistance to states and urban areas. SLGCP funds ICTAP, a technical assistance program designed to enhance interoperable communications between local, state, and Federal first responders and public safety officials. The program provides free support to states and urban areas with the goal of enabling local public safety officials to communicate across disciplines and jurisdictions via radio communications systems, exchanging voice and/or data with one another on demand, in real time, as authorized.

CONCLUSION

These initiatives are only part of what the SAFECOM program has undertaken to advance communications interoperability across the Nation. This nation is heavily invested in an existing infrastructure that is too often inadequate to the basic communications requirements of individual agencies and not interoperable. We must continue to pursue a comprehensive strategy that takes into account technical and cultural issues associated with improving interoperability, which recognizes the challenges associated with incorporating legacy equipment and practices in constantly changing technology and cultural environments, and which ensures that the needs of the front line of emergency response—the first responders—are met. Though many challenges remain, we believe we have accomplished a great deal in the short time DHS has managed this program.

We are confident that with your continuing support and the assistance of our many Federal partners, we will continue to move towards a world where lives and property are never lost because public safety agencies are unable to communicate or lack compatible equipment and training resources.

APPENDIX I: OIC AUTHORITIES FROM THE INTELLIGENCE REFORM AND TERRORISM PREVENTION ACT OF 2004

Congress, with the passage of the Intelligence Reform and Terrorism Prevention Act of 2004 (PL 108-458) less than a year ago, gave OIC and SAFECOM legislative authority to carry out its responsibilities. Before passage of this act, responsibility for addressing interoperability was spread across three different agencies. Section 7303 of the Act directed SAFECOM to:

- coordinate with other Federal agencies to establish a comprehensive national approach to achieving public safety interoperable communications;
- develop, with Federal agencies and state and local authorities, minimum capabilities for communications interoperability for Federal, state, and local public safety agencies;
- accelerate voluntary consensus standards for public safety interoperable communications;
- develop and implement flexible open architectures for short- and long-term solutions to public safety interoperable communications;
- identify priorities for research, development, and testing and evaluation within DHS and assist other Federal agencies in doing the same with regard to public safety interoperable communications;
- provide technical assistance to state and locals regarding planning, acquisition strategies, and other functions necessary to achieve public safety communications interoperability;
- develop and disseminate best practices to improve public safety communications interoperability;
- develop appropriate performance measures and milestones to measure the nation's progress to achieving public safety communications interoperability;
- provide technical guidance, training, and other assistance to support the rapid establishment of consistent, secure, and effective interoperable communications capabilities in the event of an emergency in urban and other areas determined by the Secretary to be at consistently high levels of risk from terrorist attack; and develop minimum interoperable communications capabilities for emergency response providers.

APPENDIX II: TOOLS AND METHODS BASED ON LOCAL AND STATE PILOTS

- **Communications Tabletop Exercise Methodology,** a process for a communications-focused tabletop exercise replicable across urban areas.
- **Tabletop Exercise After-Action Report,** a template for capturing key findings and identifying gaps following each tabletop exercise.

- **Interoperability Pocket Guide,** a process for creating an area-specific interoperability pocket guide to ensure local public safety officials are aware of current capabilities available in their areas.
- **Templates for Improving Interoperability,** including governance charter, standard operating procedure (SOP), and memorandum of agreement (MOA) templates to help communities improve interoperability.
- **Operational Guide for the Interoperability Continuum—Lessons Learned from RapidCom,** which outlines the importance of each element of the Interoperability Continuum, provides common challenges to consider when working towards improved interoperability, and recommends key actions to increase an area's capabilities.

Mr. UPTON. Thank you very much.

Mr. Hitch, welcome.

STATEMENT OF VANCE E. HITCH

Mr. HITCH. Thank you. Good afternoon.

Mr. UPTON. I think you want to just hit the button. There you go.

Mr. HITCH. Can you hear me now? Okay.

Good afternoon. Thank you for the invitation to speak with you today. I am the Chief Information Officer of the Department of Justice and I have held this position since April of 2002. And my testimony today will describe the Department of Justice's efforts since 9/11/01 to improve interoperable wireless communications within DOJ, as well as within our law enforcement partners in other Federal, State, and local agencies. I will in particular focus my attention on the Integrated Wireless Network Program, which is a program that my office manages and is key to our law enforcement mission.

Although most metropolitan areas have some inter-agency communications capabilities, they are limited and do not meet the requirements in all circumstances. Further, much of the non-urban areas of the country have even less. Events such as Hurricane Katrina highlight the fact that most public safety communication systems are highly dependent on commercial or public infrastructures such as electric utilities, telecommunications, natural gas, and so forth. When these core infrastructure systems fail or are overwhelmed, the agency communication systems are badly degraded or fail as well.

DOJ is committed to helping to improve interoperability across the entire law enforcement and Homeland Security communities. DOJ has several ongoing programs that are designed to address particular aspects of the communications interoperability issue. Today I am focusing on the Integrated Wireless Network Program. However, before I do so, I just want to mention briefly a couple of related programs. Through the Office of the Community Oriented Policing Services, known as COPS, DOJ awarded $150 million in grants in 2003 and 2004 to 37 jurisdictions to improve public safety interoperability through voice interoperability and data sharing projects. Earlier this month, COPS awarded another $92 million to an additional 25 localities. Also through the Communications Technology Program, the National Institute of Justice has granted over $90 million to practitioners, universities, industry standards bodies, and vendors to develop interoperability solutions for State and local law enforcement.

Finally, as an adjunct and interim measure under the IWN Program, my office has partnered with State and local officials in 25 cities to connect existing Federal, State, and local agency systems together. DOJ has coordinated each of these three initiatives with SAFECOM Program managed by the Department of Homeland Security in which you have just heard from.

I now want to focus on the IWN Program, Integrated Wireless Network. IWN is a partnership between the Department of Justice, Homeland Security, and Treasury to implement a consolidated nationwide communication system for Federal law enforcement and homeland defense agents. IWN will support approximately 80,000 Federal agents in all 50 states and U.S. territories. Based on the Government's preliminary engineering estimates, IWN will require installation of communications infrastructure at approximately 2,500 locations around the country.

IWN will replace the antiquated systems currently supporting Federal agencies including the FBI, DEA, ATF, U.S. Marshals, the Secret Service, ICE, and the Border Patrol. Using a variety of interoperable technologies, the IWN will address Federal agency requirements to communicate across agencies and with State and local law enforcement partners. The IWN will also facilitate Federal use of emerging communications technology such as voice over IP and wireless streaming video. Finally, IWN will allow DOJ, DHS, and Treasury to address these requirements in the most resource efficient means possible.

The genesis of the IWN Program was a mandate from the Department of Commerce, the National Telecommunications and Information Administration, NTIA, to cut in half the amount of radio spectrum used by Federal agencies for each land mobile radio channel. To meet the NTIA "narrowband" mandate, as it is known, Federal agencies have to replace their legacy radio systems. The IWN Program began at the Department of Justice in 2000, Treasury joined us in November of 2001, and DHS joined us in March of 2003.

To date, the IWN Program has developed functional and management requirements, conducted a technical assessment and market research into potential products and services, and deployed several pilot systems to assess technology options and gain lessons learned on managing multi-agency systems. We currently are conducting the procurement for the development, deployment, and operation of a nationwide IWN system.

IWN will address the following lessons we have learned from operations of the existing legacy systems, achievements from our 25 cities interoperability projects, and the results of IWN pilots that we have run in Salt Lake City, San Diego, and Seattle. First of all, deploying and operating effective communication systems is a very complex endeavor. The systems must adapt to each agency's unique business requirements and must be tailored to the geographic region being supported. Second, interoperability must be addressed regionally or locally. Agencies and officers usually need to communicate with compatriots from other agencies operating in the same general area. Third, a prerequisite for improving interagency communications is the development of successful partnerships among participating agencies. And fourth, joint systems such as IWN pro-

vide a number of opportunities to achieve significant cost efficiencies. In addition, the prime lesson learned from Hurricane Katrina is that we must carefully address survivability as we build and deploy IWN in the future.

In closing, we believe that the IWN Program is an example of good Government and best practices. We expect to realize significant operational benefits from the IWN, including communication services that are more secure, more reliable and accessible to Federal agents over a greater geographic area than is available today. The system will also provide inherent interoperability between the IWN agencies and will facilitate communication with officials from other Federal, State, and local law enforcement agencies. Better communications will facilitate better mission coordination and collaboration, which in turn will make our law enforcement and homeland security personnel more effective in stopping crime and protecting the Nation.

Thank you for your time this afternoon and I will be happy to answer any questions you may have.

[The prepared statement of Vance E. Hitch follows:]

PREPARED STATEMENT OF VANCE E. HITCH, CHIEF INFORMATION OFFICER, U.S. DEPARTMENT OF JUSTICE

Good afternoon and thank you, Mr. Chairman and Members of the Committee, for the invitation to speak to you today.

I am the Chief Information Officer for the Department of Justice. I have held this position since April 2002. My testimony today will describe efforts the Department of Justice has undertaken since September 11, 2001, to improve interoperable wireless communication within the Department of Justice, as well as between the Department and our law enforcement partners in other federal, state and local agencies. I will focus particular attention to the Integrated Wireless Network (IWN) program, which is a program that my office manages.

Interagency communications is a priority issue for the Department of Justice and we recognize that such capability is also a top priority for the public safety community at large. DOJ's ability to protect this country and stop crime (including terrorism) is heavily dependent on working closely with other federal, state, tribal and local agencies. Such working relationships cannot be achieved unless we can interconnect agency communications systems. Similarly, we consistently hear this same message from law enforcement partners in other federal agencies as well as at the state, tribal and local level. Indeed, the need for interagency communications has been widely recognized among the law enforcement community for at least two decades.—The terrorist attacks on September 11, 2001, and the subsequent analysis of what occurred during and in response to the attacks, highlighted in a very public way the communication deficits facing the country as a whole and the law enforcement and homeland security communities in particular.

Although most major metropolitan areas have some basic capability to link agency communications systems together to communicate in emergency situations, much of the country's existing capabilities are limited and do not meet the requirements for all circumstances. Further, most of the nation's interoperability capabilities exist only in our major cities. Much of the non-urban areas of the country have little interagency communications capabilities. In addition, events such as Hurricane Katrina highlight the fact that most of our public safety wireless communications systems (federal, state and local) are highly dependent on commercial or public infrastructure (e.g., electric utilities, telecommunications services, etc.). When these core infrastructure systems fail or are overwhelmed—as was the case during Hurricane Katrina—the agency communication systems are badly degraded or fail as well.

The Department of Justice is committed to supporting the improvement of interagency communications among the law enforcement community. DOJ has several ongoing programs that are designed to address particular aspects of the communications interoperability issue. The one I want to focus on today is the Integrated Wireless Network Program, an initiative to improve federal tactical law enforcement and homeland security communications capabilities. However, before I talk about IWN

in detail, I first want to stress that the Department's efforts are not one-dimensional—in addition to addressing specific DOJ communications requirements through IWN, the Department also has contributed to addressing communications issues at the state and local level too.

Through the Office of Community Oriented Policing Services (COPS) program, DOJ awarded $150 million in grants in 2003 and 2004, to 37 jurisdictions to improve public safety interoperability. The projects funded by COPS include voice interoperability and data information sharing to large and small population centers across the nation. Earlier this month, COPS—awarded another $92 million to 26 localities to address public safety interoperability. Through the Communications Technology (CommTech) Program, the National Institute of Justice—has granted over $90—million to practitioners, universities, industry standards bodies and vendors in order to develop interoperability solutions for state and local law enforcement. CommTech efforts span five different disciplines: research and development, integrated product test & evaluation, pilot programs, standards development, and outreach and technical assistance. Finally, as an initial step in the development of the IWN, DOJ has partnered with state and local officials in 25 cities across the country to augment or implement multi-agency emergency communications capabilities. This effort—which we call our 25 Cities Interoperability Program—has sought to achieve interoperable communications by connecting existing federal, state and local agency systems together. DOJ has made a concerted effort to coordinate across each of these three initiatives, and also with the SAFECOM program managed by the Department of Homeland Security.

I now want to focus on the Integrated Wireless Network (IWN) program. IWN is a partnership between DOJ and the Departments of Homeland Security and the Treasury to implement a consolidated nation-wide communications system in support of the federal agents and officers engaged in the conduct of the law enforcement and homeland defense missions of the three Departments. The scope of the IWN is significant. When fully implemented, IWN will support approximately 80,000 federal agents and officers in all 50 states and the U.S. territories. Based on the government's preliminary engineering estimates, the IWN will require installation of communications infrastructure at approximately 2,500 locations around the country.

The IWN will replace the antiquated and functionally limited existing systems currently supporting federal agencies including the Federal Bureau of Investigation, Drug Enforcement Administration, Bureau of Alcohol, Tobacco, Firearms and Explosives, U.S. Marshals Service, U.S. Secret Service, U.S. Immigration and Customs Enforcement, and U.S. Customs and Border Protection. In doing so, the IWN will address federal agency requirements to communicate across agencies, and with state and local law enforcement partners. The IWN also will facilitate federal use of emerging communications technology (such as Voice over Internet Protocol, and wireless streaming video). Finally, IWN will allow DOJ, DHS and Treasury to address these requirements in the most resource-efficient means possible, thus reducing the dollars, staff time and radio spectrum needed to meet federal agency communications requirements.

The genesis of the IWN program was a mandate from the Department of Commerce, National Telecommunications and Information Administration (NTIA), to cut in half the amount of radio spectrum used by federal agencies for each land mobile radio channel [For reference, see 47 U.S.C. 903(d).]. Land mobile radio is the technology most law enforcement and public safety agencies (federal, state and local) use for tactical communications systems. The practical effect of the NTIA "narrowband" mandate was a requirement for federal agencies to replace their legacy radio systems. In 2000, as a cost avoidance measure, DOJ decided to build one system rather than replace the six separate systems in place at that time. A similar decision was made by officials at the Department of the Treasury. In August 2001, DOJ and Treasury officials began discussing a joint project. Initial agreement was reached on September 7, 2001, and the two departments signed the first memorandum of understanding for the IWN in November 2001. The Department of Homeland Security joined the partnership when it was created in March 2003.

The September 2001 terrorist attacks on New York and the Pentagon changed the focus of the IWN program from compliance with the NTIA narrowband mandate to improving the mission effectiveness of the communications system, of which interagency communications is a key aspect.

To date, the IWN program has developed a comprehensive set of functional and management requirements, conducted a technical assessment and market research into products and services that may provide the basis for the IWN system, and deployed several pilot systems to assess technology options and gain lessons learned on managing multi-agency systems. At present, the Department of Justice—on be-

half of the three-department partnership—is conducting a procurement for the development, deployment and operation of a nationwide IWN system.

The IWN has been greatly influenced to date (and will continue to be influenced) by a number of lessons learned by DOJ, DHS and Treasury. The sources of these lessons include the experiences gained through operation of the existing individual agency systems, achievements from our 25 Cities Interoperability projects, and results of IWN pilots in Salt Lake City, Utah, San Diego, California and, most recently, Seattle, Washington. From these experiences and pilots, we have learned the following:

- Deploying and operating effective communications systems is a complex endeavor. Public safety communications systems in general are complicated because they must be flexible in order to support the complex business processes of an agency that must address or respond to a wide range of non-routine situations. Multi-agency systems add a layer of complexity because each agency has its unique business processes or functional requirements. In addition, wireless communications systems have to be tailored to the geographic region being supported (this is a key distinguishing factor between wireless systems and all other IT). As a consequence, wireless communications systems such as IWN can employ common architectures and standards, but cannot be developed and deployed in a "cookie cutter" manner.
- Interoperability must be addressed regionally or locally. While the federal government and its agencies can provide a national perspective to communications issues, interoperability, especially as it pertains to law enforcement, is essentially a "local" issue. Agents and officers usually need to communicate with compatriots from other agencies operating in the same general area. Further, because every region has a unique mix of government structures and communications resources in their "embedded base," no one solution can be appropriately imposed uniformly across the country. Instead, what is needed is a set of solution options that can be applied in varying combinations to address the specific communications needs of each region.
- A prerequisite for improving interagency communications is the development of successful partnerships among agencies in a particular region. As DOJ officials have worked to implement our interoperability initiatives, we have observed that good interoperability solutions start with good partnerships. To the credit of state and local government, we have witnessed across the country a tremendous collaborative spirit among law enforcement agencies. This collaborative spirit at the local level has served as the foundation for success. Indeed, where DOJ has been able to help improve interagency communications, we have simply enhanced the efforts that already were initiated locally. In the rare instances where we have encountered challenges achieving consensus across prospective partners, interoperability efforts have been slowed considerably.
- The collaborative projects have a multiplier effect. We have observed that the efforts to bring agencies together to work on a joint project have tended to foster better working relationships between agencies beyond the project itself. We have seen this specifically in the Seattle IWN pilot. Partnerships forged in developing that joint system have carried over into other operational areas among several of the federal agencies participating in the Seattle pilot.
- Joint systems such as the IWN provide a number of opportunities to achieve cost efficiencies. Examples of such efficiencies include increased purchasing power and reducing the aggregate quantity of communications infrastructure and overhead expenditures (e.g. site and circuit leases, infrastructure maintenance, and system administration personnel). Such projects also tend to be more open to leveraging facilities and services of other joint ventures. As an example, in the Seattle and Utah IWN pilots, we were able to obtain microwave connectivity services from the respective states. Doing so is saving the federal government substantial sums of money we would otherwise have paid for similar services.

DOJ, DHS and Treasury are also garnering lessons learned from Hurricane Katrina. Katrina had a devastating effect on most public safety communications systems in southern Louisiana and Mississippi. All of DOJ's legacy (non-IWN) systems in this region were either disabled or substantially damaged either as a result of the storm itself (wind and flood damage), or because the systems were dependent on local electricity, natural gas and telecommunications services that all were disabled during or shortly after the storm. Each of our components was able to re-establish emergency communications capabilities within days of the storm. However, based on this experience, the IWN program is reassessing requirements for how the IWN is built and deployed. We will also look at strategies for reducing dependence on utility services that are at risk of damage or failure during a storm—or a terrorist attack.

We believe the IWN program is an example of good government and best practices. IWN will provide management efficiencies through consolidation of departmental resources and the elimination of overlapping federal systems. As an example, by consolidating program management and system acquisition activities, the IWN program allows DOJ, DHS and Treasury to avoid a significant portion of the overhead costs the government would incur if each Department were to acquire services independently.

More importantly, we believe the IWN is an example of how government can achieve mission enhancement through the appropriate use of information technology. Specifically, the three IWN partners expect to realize several significant operational benefits from the consolidated system. The most significant of these will be communication services that are more secure, reliable and accessible to federal agents over a greater geographic area than what is available today to each individual agency. Further, the IWN will provide inherent interoperability between the agencies that are regular users of the system, because each agency will be operating on common infrastructure and technology and will have preprogrammed inter-operability "talk groups" established for cross-agency communication. The system also will have a number of mechanisms (e.g., gateways, system-to-system interconnections, etc.) by which IWN users can communicate with officials on other federal agency systems and those of the state and local law enforcement agencies, as well as mechanisms to reconstitute wireless communications systems through the use of ad hoc deployable systems.

A point worthy of note is that the shared nature of the IWN further facilitates inter-operability by bringing together DOJ, DHS and Treasury officials for the planning, development and operation of the system, thus conditioning the agencies to work together at a number of levels—from executive management to field office staff. Likewise, we anticipate that our efforts to incorporate inter-connectivity capabilities with other federal, state and local agency systems into the IWN will also facilitate building of inter-agency partnerships for mission purposes.

So what does IWN represent in the "big picture?" The Department of Justice believes that the capabilities of the IWN—and the collateral benefits of joint project ownership and management—will result in better communications within DOJ, DHS and Treasury, among the federal agencies broadly, and ultimately across the law enforcement and homeland security communities as a whole. Better communications will facilitate better mission coordination and collaboration, which in turn will make our law enforcement and homeland security personnel more effective in stopping crime and protecting the nation.

In closing, I want to assure you that DOJ recognizes that the federal law enforcement community is only a small piece of the overall public safety community. Nonetheless, we also understand that we have an obligation to lead by example. Toward that end, from this point forward, the communications systems we implement will be connected to those available to state, tribal and local agencies. Further, the IWN is an example of the type of collaboration needed to improve interagency communications, and is representative of our commitment to achieve this objective across the country. These are core principles of the Integrated Wireless Network program.

Thank you for your time this afternoon. I will be happy to answer any questions you have.

Mr. UPTON. Okay, thank you. Thank you all.

At this point, we will have Members ask questions and dialog with our panel.

Certainly comments that you have testified today underscores the need as I see it that we pass our Transition to Digital Bill as quickly as we can, knowing that it will free up a lot of that spectrum and be able to give it to our first responders. And in conjunction with that, I have been working with Chairman Barton and members on both sides of the aisle to give an added boost for money for interoperability as part of that spectrum sale. Once we are able to complete that, I look forward to seeing such an amendment passed and wind its way through the Congress.

But I have to say, Mr. Hitch, and I again appreciated your testimony. When you talk about IWN, the new program we are working with 25 different cities——

Mr. HITCH. Yes.

Mr. UPTON. [continuing] did one of those cities happen to be New Orleans?

Mr. HITCH. Yes, sir, one of them was New Orleans.

Mr. UPTON. And how did it work? Where are we on the timeline in terms of getting it started?

Mr. HITCH. The 25 cities program is an adjunct to the IWN Program; the 25 cities are in various states of completion. Unfortunately, New Orleans is in the last phases and it is not going to be—it was not planned to be completed for another 6 months.

Mr. UPTON. I saw an article in the Chicago Tribune last week, you received $6 million to fund emergency response system, regional emergency response system, regional emergency response system connecting New York City to surrounding areas will be created with a $6 million Federal grant addressing a flaw identified by the September 11 Commission. A grant from the Department of Justice will be used to create a regional command and control radio frequency for police, fire, and emergency officials in New York City, as well as surrounding counties in New York and New Jersey. How much money is in that pot that allowed $6 million to go to New York and how much is left, and where are we in terms of seeing such programs available? Is that part of the IWN?

Mr. HITCH. Mr. Chairman, actually the 25 cities initiative is really an adjunct to the IWN Program. The IWN Program is really intended to be the next generation radio system for the law enforcement community in the Federal Government, primarily Justice and Homeland Security. We wanted to—when we got approval from our congressional appropriators—to set aside some money for the 25 Cities Interoperability Project so that we could make some progress in the short term. So it actually was not a lot of money. It was on the order of $25 to $30 million for the 25 cities. And in many cases, some significant improvements have been made where the projects have been fully implemented. As I said, it is in the very early stages of implementation. Of the 25, I think about six or seven have actually completed the implementation, and the rest of the 25 are due to be completed over the next 12 months.

Mr. UPTON. Well, I just know I was reading the Washington Times earlier this week and Asa Hutchinson had a wonderful bit piece earlier talking about the importance of interoperability, and I am going to ask unanimous consent to make that part of the record.

[The article follows:]

THE WASHINGTON TIMES

[Published September 28, 2005]

COMMUNICATIONS DISCONNECT

By Asa Hutchinson

As hearings begin on how to improve U.S. emergency preparedness after Hurricane Katrina, Congress must give serious and immediate attention to a major, recurring and needless public-safety problem: inability of first responders to communicate with each other during a catastrophe.

This "crisis of interoperability" came horrifyingly to light on September 11, 2001. After the first World Trade Center tower collapsed, more than 100 New York City firemen died because their radios could not receive the police band call to evacuate the second tower. Soon it was discovered that police, fire and other emergency de-

partments in municipalities and counties around the nation could not talk to one another as they converged in Lower Manhattan.

This electronic "Tower of Babel" was seen again during last year's hurricanes in Florida. The hurricanes hit widespread areas and required response efforts from many jurisdictions, most of which in the rush of rescue couldn't communicate to each another over their department systems.

In the days following Katrina, it became clear most jurisdictions in both the Gulf region and the nation as a whole have taken little or no action to address interoperability issues. The reason is not lack of will so much as lack of funds. Replacing existing first-responder systems with state-of-the-art equipment is a huge financial challenge for any locality. Ensuring municipalities nationwide make this transition requires a new funding plan.

Now many in Congress urge a rapid response, at last, to this need of first-responders. Sens. John McCain, Arizona Republican, Susan Collins, Maine Republican, and Joseph Lieberman, Connecticut Democrat, Reps. Jane Harman, California Democrat, and Curt Weldon, Pennsylvania Republican, have all provided leadership on this issue. One approach, advocated by Mr. McCain and others, would accelerate freeing parts of the wireless radio spectrum previously allocated for public safety use but not yet available.

Broadcasters now use this spectrum to transmit analog television signals. It is in the highly valuable 700 MHz section of the spectrum. Together with an adjacent larger swath, these frequencies are slated to be vacated when stations move to digital television (DTV) transmission in 2009.

Mr. McCain's plan would speed this transition. Moving broadcasters out, moving public safety in, and auctioning the remainder will be highly complex, but could begin earlier than now scheduled. Spectrum engineers agree the McCain plan will provide more than enough additional frequencies for first responders' needs. But it will not end the interoperability crisis.

The inability of first responders to communicate in crises is only minimally due to inadequate bandwidth. Mostly it is a matter of inadequate radios and other devices. More frequencies won't help when agencies can't pick up one another's signals.

Municipalities will need to coordinate their purchases, seeking technologies that allow cross-agency communications that don't interfere with the communications of others. All the tens of thousands of police, fire and rescue organizations must receive upgraded software or replace their mobile devices, and very few public safety agencies are able to afford that. National costs are estimated in the billions of dollars.

Simply, Congress will need to provide first responders with not just more radio frequency spectrum but more money. Without new funds to pay for communications upgrades, giving local agencies additional spectrum will prove fruitless.

New funding need not mean new federal taxes or borrowing. Congress can and should use the spectrum auctions to fund interoperability. The DTV transition plans anticipate auctioning the rest of the 700 MHz band to licensed wireless service providers of both voice and broadband applications.

For technical reasons, this section of 700 MHz spectrum is unusually valuable. An auction could raise billions, funding both public safety interoperability and the television set-top converter boxes necessary for older TV sets to receive DTV signals after broadcasters vacate the analog spectrum.

The Federal Communications Commission is preparing to auction a section of Defense Department airwaves next year, but most of those proceeds are already earmarked for other uses. Congress should look to the broadcast spectrum to fund interoperability, and it should direct the FCC to move up the DTV transition to early 2008.

As Hurricane Katrina showed, America's public safety interoperability problem remains unsolved. Though the issues surrounding this crisis are complex, the solution can be simple. As it begins post-Katrina hearings, Congress has the tools to end the interoperability crises once and for all.

Mr. UPTON. Chairman Martin, we applaud your work again in establishing a new Public Safety/Homeland Security Bureau to be in charge of the interoperability issues. What duties specifically related to interoperability will be tasked and how much money do you expect for this new department? What are your staffing needs? How quickly do you think that it is going to be up and running?

And do you expect to see standards and protocols established that other communities across the country might be able to utilize?

Mr. MARTIN. Well, certainly, we are certainly trying to address the standards issue and potentially even the establishment, not only of technical standards, but of standard practices for planning purposes is one of the things that they would be able to explore and address. As far as the staffing of the new bureau, I would hope to be able to pull the staffers that are working on it in the different areas of the agency today. So that you have for example people in the Media Bureau that work on things like the Emergency Alert System, people in the Wireless Bureau that might work on 911 issues and I think to consolidate them all into one place.

Mr. UPTON. Are you able to do all of that administratively? Do you need any assistance from us?

Mr. MARTIN. No, we will have to go through, work with Congress in getting their approval. Whenever we do a major reorganization of the Commission, that would always work through Congress in doing it so that is what we would do through that normal process and also have to make sure the Appropriations Committee was fully apprised and supportive. So we are just actually beginning that process and it was only an announcement of our intention to do that, to work with Congress to do that.

Mr. UPTON. Well I know we would like to help and as we look at legislation in the near future if there is something that we can do, we should be communicating, obviously, to make sure that it is bipartisan, and do all that we can.

I see that my time is expired so I yield to my friend again from the great State of Michigan, Mr. Stupak.

Mr. STUPAK. Thank you, Mr. Chairman.

Director Boyd, I have been trying to get information from DHS, Department of Homeland Security on home much money is being spent because every time we try to get money for interoperability, we are told that it has to go through the grants that the State's receive from Homeland Security. So I have been down the floor a couple times. I am still looking for the information for 2002, 2003. Could you go back to DHS and tell them to give us that information? It sure would help us out a lot.

Mr. BOYD. Sure, I will be happy to take that message back, sir.

Mr. STUPAK. Okay. I understand that DHS and DOJ are soliciting bids for $10 billion to make your 80,000 Federal law enforcement officials interoperable. It does not include emergency workers or health workers. What is DHS's estimate of trying to achieve full operability between local, State, and Federal first responders?

Mr. BOYD. That is one of the questions we are routinely asked and it is really hard to answer and let me explain why. We think we can achieve emergency level interoperability that is the kind of interoperability you need to address an emergency pretty quickly and that, in fact, has occurred in a number of places around the United States already. If you have cooperation from all of the political elements, they are willing to sign on——

Mr. STUPAK. Well isn't that what your job is supposed to be——

Mr. BOYD. Yes, sir, and that is what we are working on. And, in fact, that is why we produced this. In the course of the RapidCom effort for example——

Mr. STUPAK. Well the estimates we have seen it is going to be 20 years. It is still going to be 20 years to get full interoperability in this Nation between the State, local, and Federal?

Mr. BOYD. You are probably talking about the 2023 number that you sometimes will hear.

Mr. STUPAK. I have not heard anything else different so——

Mr. BOYD. Well the 2023, well let me explain the 2023 number because I know exactly how it came about. The 2023 number comes from a meeting we had with public safety where we said look, we would like to find out what is the ideal. What is the perfect future you would like to have? The public safety guys said, okay, let us slap a number on the wall arbitrarily and let say it is going to be 2023 and let us say what would the world look like in 2023. No one ever intended to set 2023 as a date when you arrive at full interoperability.

Mr. STUPAK. Well give me your best estimate then, when will it be fully interoperable between local, State, and Federal first responders?

Mr. BOYD. In at the emergency level, I think that can be done probably within the next 3 to 5 years. And I think you can achieve that in most of the major areas really fast if you have a commitment. In the RapidCom cities——

Mr. STUPAK. Commitment of what, resources, financial resources?

Mr. BOYD. Well that is what I want to explain. In the RapidCom cities, the 10 cities we have pulled together——

Mr. STUPAK. Right.

Mr. BOYD. [continuing] we were able to establish command level interoperability within an hour to address an incident about the size of the Twin Towers. We did that roughly in 150 days. In fairness not we did, we helped facilitate each of these localities in doing it because ultimately they have to do it. And we did that without any new resources. We did that based on what they already have in place. Most of the technical requirements, the kinds of equipment you need are available if communities are willing to build governess agreements and decide how it is they are going to work together to be able to establish that level of interoperability. Now full interoperability we define as meaning I can take the radio that any public safety officer has——

Mr. STUPAK. Right.

Mr. BOYD. [continuing] deploy him anywhere and it will work in that system. That is going to take a lot longer.

Mr. STUPAK. For your filibuster you mean. I got a couple of questions. Let me move on. Interoperability in your testimony you said the methodology was initiated in 2005 and sort of implies that the study has not begun even though it is supposed to be finished by 2005. Has the study begun?

Mr. BOYD. No, the study now is we have——

Mr. STUPAK. When it is going to begin?

Mr. BOYD. As soon as we get through the requirements for the Paperwork Reduction Act and we have all the responses in the first 60-day period that has to be posted. We will make those adjustments and then there is another 30——

Mr. STUPAK. So 2006 maybe, hey?

Mr. BOYD. So we think by summer of next year will have the——

Mr. STUPAK. Summer of next year, okay.

Let me ask you this. You mentioned stated communication plans in your testimony. You explained the criteria you encourage States to use when making their plans. Are the States required to submit plans and are the States required that their plans be certified?

Mr. BOYD. When it involves Federal funding, funding that comes through the office of State, local Government Coordination Preparedness——

Mr. STUPAK. Sure.

Mr. BOYD. [continuing] that is part of the selection criteria and they have to submit plans to ODP. But remember that more than 97 percent of these systems are funded locally, it is not Federal money.

Mr. STUPAK. But do they have to be certified? These plans, they have to submit plans but my impression is the plans have to be certified. My question is if they have to be certified in order to get Federal funds, do they or not?

Mr. BOYD. Well they have to be—you have to address that to ODP to ask exactly what the rules are for how they decide whether the plan is going to meet their requirements for funding.

Mr. STUPAK. Are they going to have to be certified in order to do it? Can you answer that question, Mr. Hitch?

Mr. HITCH. I am not from ODP, I am from the Department of Justice.

Mr. STUPAK. Right.

Mr. HITCH. For each DOJ grant that is issued, there are specific requirements. We do require that they follow the SAFECOM methodologies and procedures. We require interoperability. I don't know about on a specific grant whether certification——

Mr. STUPAK. Well if you follow your interoperability guidelines code sphere, isn't one of your interoperability guidelines, it is a thing we use in Michigan quite a bit. It is a lot cheaper, a lot quicker, interfaces and everything works but it is not in your guidelines so is Michigan going to be denied if they use code sphere to get interoperability in interface communication systems because——

Mr. BOYD. It is not in the guidelines because the guidelines are not written in a way that would prevent them from deploying that kind of system if they want to. The guidelines are intended to point at a way to move forward nationally toward our goal of the system of systems. One of the things we have made very clear is that you are not going to have a single system.

Mr. STUPAK. I agree and I mentioned the guidelines, I said certified. Mr. Hitch said required so they do not have to be required just as long as they have something to resemble those guidelines? I am trying to get this down because the State's are saying we are getting denied and the money is not being pushed over as quickly as it should be.

Mr. BOYD. Okay. Well I cannot speak to that part. I can tell you that for the grants that came in particular out of the COPS office for example, we were part of that process and so the guidance and compliance with the guidance which is fairly general it says if you are going to be developing a digitally trunk system, then you ought

to consider P-25 but it does not say you have to because we understand there are times when you do not do that. And we helped to develop that criteria and applied that criteria in the selection process in the COPS grants and then earlier in 2003 in the FEMA grants. The ODP grants are block grants so the guidance becomes a recommendation to the State.

Mr. STUPAK. Thank you, Mr. Chairman.

Mr. UPTON. Welcoming the chairman of the full committee, Mr. Barton.

Chairman BARTON. Thank you. And I want to thank each of you gentlemen for appearing today, especially Mr. Hitch. I know you had to rearrange some things and I appreciate you being here.

I want to commend you, Chairman Martin for the steps that the FCC has already done. I read your testimony and you and the Commission's efforts in terms of the Rural Health Program, the E-rate Program, and the High Cost Reconstruction Program I think are excellent. I wish we were getting a little bit more publicity about what you are doing.

I did have a question about you on the decision to create a new bureau in the FCC, this Homeland Security Bureau. Why do you think that is necessary as opposed to the organizational structure that you have right now?

Mr. MARTIN. Well as I mentioned to Chairman Upton, many of the issues are still being dealt with across different aspects of the Commission and within the different bureaus so while we do have an office that focuses on Homeland Security that interacts with FEMA, it does not actually have interaction into the policy process for example on the Emergency Alert System. That is still handled out of the Media Bureau or whether or not wireless 911 issues should be handled and that is done out of the Wireless Bureau. And I think actually trying to coordinate and have one group of people focused on public safety and homeland security will produce a more consistent policy and processes across the different sectors of the industry. So just like we have an Enforcement Bureau that enforces all of our rules and enforces the rules against media companies and telecommunications companies hopefully in a more consistent way, I think the way thing is true of public safety and homeland security.

Chairman BARTON. Can you do that with the existing staff and existing resources?

Mr. MARTIN. I do not think it will require any additional staff and resources. I think that it will be pulling staff and resources from the existing bureaus that are working in a more disparate way and putting them all and locating them all in one area.

Chairman BARTON. And can you do that without any change in existing statutory authority?

Mr. MARTIN. We do not end up having to seek a change in the statute but we do end up having to come to Congress for approval when we do a major reorganization of the Commission so we do have to work with Congress to make sure they are approving of any of the proposed processes as we go forward.

Chairman BARTON. Let me ask a question about your testimony on seamless interoperability. The gist of it appears to be that the FCC thinks these smart radios are the way to go. Is that some-

thing as we move our new Telecommunication Bill which we hope to do in the next month or so that we should set a standard in the law to cut out all the bickering and everything that has been going on or do we set some general parameters and leave that up to the various State and local officials and Federal officials to determine what is best for each particular area?

Mr. MARTIN. Well I think that the use of smart radios or software defined technologies, software defined radios are able to more efficiently use the spectrum that they have so I think that that is something that depends upon the other aspects of when they will get both the spectrum that they could be able to use and when they would have the resources to be able to buy new radios. So obviously though, I think that we need to do—to take all the steps we can to make sure that those local public safety officials have some additional resources. And I think that smart radios means that they can do less with—they can do more with less spectrum. So I think it is possible that they could end up addressing it in that way but whether or not we should require that in the upcoming rewrite of the Telecommunications Act depends in part on how many other resources they are going to get to be able to purchase new radios and what spectrum will be made available to them.

Chairman BARTON. Mr. Hitch or Dr. Boyd, do either of you have an opinion on that last question I asked the chairman?

Mr. BOYD. My experience is that the public safety communities intensely interested in better technologies that can meet those requirements but it is a very conservative group. So it is going to require that it be available for them and that they get a chance to see it piloted in use. And then my expectation is that these new technologies that offer so many new features are going to become some of the things they are going to look to but they are going to ask for that proof up front and I think that will forthcoming as the software defined radio and is IP based and so on mature in this environment.

Mr. HITCH. Certainly that is the kind of technology that we are looking to implement as part of IWN and we have already implemented it in the pilots that we have done. So we would encourage it and it would make it easier for interoperability to work with local organizations that have similar technology. It is not impossible to do it otherwise and we will do it but it makes it much more efficient.

Chairman BARTON. Well, I do not know what the will of the committee is, but, you know, I am very disappointed to learn that we still have a problem in interoperability 4 years after 9/11. And I am not saying that a statutory of standard is the preferred solution but it is an optional solution. It is something we are going to be looking at.

Thank you, Mr. Chairman. I have got another hearing downstairs on the environmental consequences of Katrina so I am going to have to excuse myself, but thank you for holding this hearing.

Mr. UPTON. Thank you. Thanks for keeping us up late last night, too.

Mr. Wynn?

Mr. WYNN. Thank you, Mr. Chairman.

Dr. Boyd, I want to understand some process aspects of this problem of interoperability. First of all, did your department do a prioritization of the country in terms of high risk areas and the degree of interoperability in high risk areas relative to terror and areas prone to natural disasters and interoperability relative to that? Because I think the one thing we understand is that this cannot all happen at once. So my question goes to who is going to be first in line and have you made those kind of determinations, New York, Washington, DC, natural disaster prone areas along coastal regions, those kind of things.

Mr. BOYD. My office does not make that kind of prioritization but the secretary has made very clear that he wants a risk based process that begins to look at how you can allocate resources best across what the real risks are. That is one piece of the issue.

Mr. WYNN. Okay. So somebody in homeland security has done that risk analysis and established the priorities?

Mr. BOYD. For interoperability the—first, let me explain how you are looking at a couple of different things. The ordinary security initiative which allocates money to the urban area cities is allocated against threat and there was a threat calculus to do that. I cannot provide you all the details on how that is done because that is in another office——

Mr. WYNN. Is interoperability on a parallel track with that?

Mr. BOYD. Interoperability, we look at interoperability as a national issue. My office does not provide direct funding to support——

Mr. WYNN. So it may be that they are on one track of national priorities and you are on a different track in terms of interoperability?

Mr. BOYD. No, I don't think so. Let me make a clear distinction here. The money that comes under the Urban Area Security Initiative or the WAT grant money is defined in formulas by Congress.

Mr. WYNN. By risk.

Mr. BOYD. The interoperability funding that was specifically for interoperability also had to be allocated according to rules set by Congress.

Mr. WYNN. Most problem money is based on a risk analysis. That is what you said. I am just asking you is the interoperability money on a parallel track with that risk analysis? In other words, are the high risk areas that are getting the grant money for preparedness also getting money for interoperability?

Mr. BOYD. DHS does not have any money specifically for interoperability.

Mr. WYNN. Okay, all right. Which brings me to my second question, have you done an assessment of local capabilities? In other words, you have got an analysis here, a risk base analysis here, have you determined whether or not your high risk areas, what the capabilities of your high risk areas are?

Mr. BOYD. We have a study called the baseline study under way now which is intended expressly to try to answer that kind of question. There is no place in the United States you can go to and say what is the status of interoperability anywhere in the United States or across the country and that is why the baseline study will be the first attempt to do that.

Mr. WYNN. When will that be completed?

Mr. BOYD. It should be complete by summer of next year.

Mr. WYNN. Okay. Now as the chairman said that is somewhat disappointing given the 4 years that have passed. Here is my situation. I represent two suburban counties outside of Washington, DC, probably second highest risk area for purposes of terrorism. I happen to know that there are limited capabilities in terms of one of those counties. One of those counties would be necessary for evacuation, it is the location of many Federal facilities. My concern is have you ascertained what that county's capabilities are vis-à-vis interoperability so that you can determine whether if something happens at NIH or at Census and Census is in a county with fewer resources that you are going to get them interoperable as soon as possible. Have you made those kind of determinations?

Mr. BOYD. My office of four Federal officials is focusing on building tools that that county will be able to use to make that assessment and on conducting the baseline studies so that they can collect that.

Mr. WYNN. They can use to make an assessment. They already know they do not have the money. They do not have 800 megahertz radios much less smart radios.

Mr. BOYD. They will have—okay, but they are going to have to do some kind of assessment of their own to figure out what it is that is required there.

Mr. WYNN. They have assessed—my time is money. They have assessed, they know they do not have the money. You want interoperable system. They are in the second highest risk area, they house Federal facilities, what are we going to do to help them get, become interoperable with the District of Columbia, the Federal agencies, et cetera? Otherwise if somebody hits the Census Bureau in Suitland, Maryland you are going to have a mess on your hands.

Mr. BOYD. Well most of the national capitol region, in fact, has established and experimented with having demonstrated a couple of interoperability capabilities. My first was in Justice and first got involved in interoperability some years ago. We created a system based on the Alexandria Police Department which was used on 911 to support and to be able to provide the kind of monitor you needed in this region. You are not—if you are asking what is the funding going to be that goes——

Mr. WYNN. I am just saying they do not have the radios and unless that issue is addressed, it is going to be hard to read interoperability.

One last question because I think my time is just about up. You mentioned several times and I think you did, too Chairman Martin, the proprietary nature of some of this equipment and suggested that that was a barrier to interoperability. Is that the case?

Mr. BOYD. It is and it can be in many cases because it can make it impossible for different systems to communicate with each other.

Mr. WYNN. How do we overcome that?

Mr. BOYD. We have a standards process under way with the National Institute of Standards and Technology expressly to address that. In October, next month, just a few days, the fixed station interface will go to ballad in the standards community so we expect that standard will be available almost immediately. That will then

be incorporated in the Standard Grid Guidance and we in January, the ISSI interface which is the interface that manages the trunking system which is probably the most central piece of the standards should be completed and we expect it to be balloted and approved somewhere around March and then it will also be incorporated in the coordinating grant guidance.

Remember in the United States, the standards process is a consensus based standard process among all of the industry players and we have been able, in fact, to give you an idea how astonishing it is that we are able to produce those standards in just the next few months, it took about 15 years to produce the first volume of P-25 standards. We are going to be able to do these next two pieces very, very quickly.

Mr. WYNN. Thank you, Mr. Chairman.

Mr. UPTON. Mr. Shimkus?

Mr. SHIMKUS. Thank you, Mr. Chairman.

You know, since we have been here, we have seen the attacks of September 11 terrorist attack. Now we see this, you know, this natural disaster of almost historic proportions. I have mentioned this to my colleagues before. I serve on the NATO Parliamentary Assembly. Sam Nunn has come around with a strategic exercise called "Black Dawn" where the hypothesis is a small grade nuclear blast over Brussels, Belgium, mass casualties, mass destruction. Are we taking into consideration at this time the affects of electromagnetic pulse and how harm communications equipment. And if we are not, don't you think we should? Yeah, why don't we start, yes, sir.

Mr. HITCH. We work with public safety to do it because in fairness you need to understand that the kind of guidance and direction we offer is built within the public safety community. We tell them you have to plan for worst case scenarios and it does not matter whether you launch the system because of a major EMP pulse or because of a Katrina. You have to plan for worst case scenarios and then work back from that. It is very, very difficult to address the massive loss of communications facilities if you have not thought through these things.

In my days when I was a career soldier, I can remember the boss saying that when you are in the fight is the wrong time to figure out how to handle the fight. You need to have done this in advance. You need to have planned it up front and you need to have thought through all the way to the very worst possible case, and then you need to have thought of how many things can aggravate that even further and how could I think through all of those pieces not necessarily because I am going to be able to put something in place to fix it right now but so I at least know what I am going to have to go do, and I will at least have some notion of how I am going to approach the answer.

Mr. SHIMKUS. Kevin?

Mr. MARTIN. Well I think that we do need to end up having to have a public safety system that can be—that is not only interoperable it can be reestablished quickly and I think that involves having to have some kind of mobility in the antennas at the end of the line, antenna infrastructure. Some of the cellular providers are talking about trying to use cell towers on wheels that they can roll

in even if their cell towers have been destroyed and that they would be capable of not only plugging back into the land line network but also be sending traffic over satellite so aggregating traffic on the ground and then using satellite capability which should not be destroyed in the same way. There has also been talk about having inflatable antennas and, you know, they can be dropped even from, potentially from airplanes and so they can be reestablishing communications quicker. So I think we have got to have a system that as I said not only is interoperable but can—is capable of being reestablished and is mobile very quickly.

Mr. SHIMKUS. I think the public policy debate that we are going to be experiencing when we deal with the DTV issue and I am not one that likes to legislate science but we have to make sure we have some standards so that when the Federal Government is assisting in the purchase of equipment that it meets the interoperability standard or in essence the harden standard.

You know, I fear we buy all this communication equipment and then there is an electric magnetic pulse that wipes out the communication equipment that we have got safely protected. They pull it out and all the things are fried or there is in the atmosphere an airburst that knocks out the satellite system. Don't you—somehow we need to be addressing this and I am not sure how we go about it other than ask you all and then find out through the process do we need a worst case scenario? But when we do that, also it is a higher cost, it is at a higher cost which means you have in essence less deployment, slower but you have more issues. And that is the issue that we have to wrestle with. Anyone want to add or comment on that?

Let me just end with saying just thank you for coming. I am going to work with my colleagues in the Senate along with the Committee on trying to address other emergency notification systems across the communication spectrum. I hope you all will take a look at that and if there is any advice and counsel you want to give us on that, we would be welcome to receive it.

Thank you, Mr. Chairman, I yield back.

Mr. UPTON. Ms. Blackburn.

Ms. BLACKBURN. Thank you, Mr. Chairman.

I want to thank all of you for being here today and giving us your time on this. It is the communications and what took place as we went through Hurricane Katrina is very important and I am looking forward to hearing from each of you as we move forward as to what your lessons learned are.

I have said in the initial hearings that we have had whether it was financial management, whether it was the initial response, I find it incredible and being on the ground in Mississippi following this storm, I found it absolutely incredible that you were unable to talk to individuals that live there. I found it absolutely amazing that we were without cellular service. That we were without basically any kind of service, hard wired phone service, that cable was down. I understand in some areas of Mississippi it is going to be a year before that infrastructure gets put back in place. And I—so one of the things that is quite amazing is that nobody seemed to have a plan for what you were going to do with the emergency communications when everything failed. People did not even have

a plan for how you were going to refill the generator once the generator ran out of gas. And I—that is of tremendous concern.

And one of things that I want to focus on is what we are going to do as we rebuild this infrastructure. As you have cell towers that are down, as you have cable systems that the infrastructure is destroyed, as we know there are new technologies available for data, for voice, for video, what are the plans going to be and how is that going to be approached?

There was an article I found, I guess it was weekend before last in the Weekend Journal. I do not know if any of you saw this. Mr. Martin, you are smiling so I guess that possibly you did it. But we have got folks that are holed up over in the Superdome, they are in New Orleans, they do not have any communications, nothing is working, nobody is on the same frequency with their radios and one guy remembers he had set up a VOIP account. So as you look at how you are going to handle all of this, I think that knowing that that is something that needs to be considered. What are your different components, what is going to comprise your overall plan when you talk about all of your interoperability issues and the different templates that you are going to use.

So I thank you. I know I have gone around the horn and I have vented a little bit. And I know that you all probably will seemingly lose your patience with some of us Members of Congress. Dr. Boyd, you are smiling and I think you have kind of lost your patience. I promise I am not going to get your last nerve. Maybe your next to last nerve, sir, but not the last one. But, you know, we definitely want to be certain that the communications issue is addressed in a very thoughtful manner. My parents in Southern Mississippi still do not have telephone. They have cable from time to time and the cell towers work about 15 percent of the time, other than Nextel it seems to go through fairly regularly.

Okay, Chairman Martin, may I ask you a question, please? What—let us talk about the 700 megahertz band. What can we do for our first responders by clearing broadcasters out of that 700 megahertz band and would that affect the overall communications plan? Is there a—do you have a template? Are you thinking forward exactly how you would set that up if you cleared that spectrum and if you were to put folks onto that?

Mr. MARTIN. Well, in the 700 megahertz band there has been 24 megahertz of that spectrum that has been dedicated to public safety uses. A certain percentage of that is already being and allocated and indicated that it should be used specifically for interoperability, so about a little more than 2.6 megahertz of that should be used for interoperability specifically. In addition to that as a result of 9/11 Commission's report and congressional legislation last year, the Commission owes a report to Congress in December about whether public safety, whether that is an adequate amount of spectrum for all public safety uses or not. And the—we have begun gathering a record and giving public safety the opportunity to comment. And there is a record that has been developed public safety some have indicated they could use another 10 to 30 megahertz of spectrum out of that 700 megahertz band that they could be using for other issues not only interoperability but other public safety uses. So we have definitely allocated a certain percentage of it al-

ready for public safety. We have already allocated or indicated a certain percentage of that will definitely be used for interoperability and we have—we are studying now and we will have a report in December about whether even additional spectrum should be provided to public safety.

Ms. BLACKBURN. Okay. Let me ask you one more thing on that. You were talking about an additional 10 to 30 and you have talked about the public safety. Are you including in this an interface with military in any way or are you just looking at first responders?

Mr. MARTIN. It is just—when we are talking about that it is just first responders.

Ms. BLACKBURN. Just first responders.

Mr. MARTIN. But they do end up interacting with other people that would be coming into an area which at times could be military but we are not addressing——

Ms. BLACKBURN. But you are not addressing that component at all.

Mr. MARTIN. [continuing] providing any spectrum to the military, no.

Ms. BLACKBURN. All right. I just wanted to clear that because we continue to hear more about the relationship between military components and first responder components since we look at national disasters. Do you think that is something you should put on your plate and look at or not?

Mr. MARTIN. The interaction between first responders and the military you mean?

Ms. BLACKBURN. Yes, an extra allocation there or may be considering that allocation.

Mr. MARTIN. Well we certainly—like I said, we are considering it and it is whether or not we should be providing them any additional spectrum beyond what they have already been given. I do not think we consider specifically the military, any particular military applications in the first responder program.

Ms. BLACKBURN. That is fine.

I have got 1 minute left. Dr. Boyd, I am going to come to you. You are saying it is going to take 2 years to get the study done so then we can start thinking on the process if I am understanding you right. Correct, sir?

Mr. BOYD. Well, not 2 years. This summer we should be finished.

Ms. BLACKBURN. Okay. So this summer you would have your study done?

Mr. BOYD. That is correct.

Ms. BLACKBURN. All right, okay. You know, we have asked you this question and you have been kind to take the time to answer it. I just am going to ask you if you will, sir, to list your goals and a timetable of where you think you are going to be when. You have thrown around several different dates. You are saying 3 to 5 years, you know, as we talk about responding to national disasters, I would love to have an idea if we are closer to 3 years or if we are closer to 5 years.

And also if you agree with Mr. Hitch that interoperability is a local issue. I think that we are all concerned. We are concerned for our communities and if you are going to be the one providing guid-

ance, I would certainly love to see stated goals and stated timetable.

And with that, Mr. Chairman, I will yield back.

Mr. UPTON. Okay. Go ahead, Dr. Boyd.

Mr. BOYD. Okay, well, and in fact you did not hit any nerves but you did tickle my funny bone.

When I talk about 3 to 5 years to achieve emergency level interoperability, that is not a technology issue, it is not even a matter of when equipment goes into place, it is experience in helping communities figure out how to build governess processes talking about how they begin to build the kind of partnerships that work together.

In 1993, I initiated the first interoperability program I was involved in while I was in justice. It took about 30 days to implement the technical piece. It was fairly permanent but it worked and it provided for interoperability in every agency in the county. It took 2 years for us to get all the agencies, Federal, State, and local in the county to agree that they were even interested in being part of it. So when I talk about 3 to 5 years, I would start with the point that for the most part, if it is applied and if people are committed, most of the equipment and the technologies are available now. They exist, they can largely be bought fairly inexpensively to allow that command level of interoperability. It is not the smoothest, it is not the prettiest kind of interoperability but it can meet emergency requirements.

The hard nut to crack, the very hard nut to crack and typically when I use this continuum to talk about all the pieces that have to go together depend on two things. One is technology is only one of the tracks. It is only one of the six lanes. And I will talk about governess last because that is the tough nut to crack because that means we have to get sheriffs who many not like to talk to each other or fire chiefs who do not want to deal with the police chiefs or city council's that do not want to share money or are afraid that it may cost something on—that may cause a problem in their control of the peace. So you have to be able to build a process starting from the bottom up so that everybody has a stake, everybody has a reason to be a part of it. And we have been, I think every successful in doing that but unfortunately, I have to tell you it is not a simple process. Getting people to agree on things like this is a really tough challenge because it involves making some concessions about control and authority.

Mr. UPTON. Thank you.

Mr. Whitfield?

Mr. WHITFIELD. Thank you, Mr. Chairman.

And I just have a few brief questions I would like to ask Chairman Martin and certainly appreciate his being here this morning, as well as Dr. Boyd and Mr. Hitch.

Chairman Martin, when I read your September 15 press release about Universal Service Funds going for assistance in the New Orleans and Mississippi Katrina devastated area, it reminded me of the number of hearings that we have had here in Congress particularly with the Energy and Commerce Committee on the Universal Service Fund, E-rate, and so forth. And all of us, I think acknowledge that that has been a tremendously successful program that

has benefited the entire country in many ways. But we also hear criticism from these various hearings that we have had and I guess the oversight an investigation subcommittee is going to be issuing an E-rate report that will be going to Chairman Upton's committee to take whatever action they may want to take. But in some of these hearings there has been criticism or at least concern about the coordination, the communication, the planning between the FCC and USAC, the Universal Service Administrative Company. And they are, at least there seems to be, some perception that there are some problem areas there in those areas that I have mentioned, the communication, planning, policy, and so forth. I would like to get your perspective on that.

Do you perceive that there is a problem there? I notice for example that you announced this $211 million in Universal Service Funds and I am assuming—did you all talk to USAC about that before making the announcement, did you sit down and work that through together or not?

Mr. MARTIN. Well we certainly sought information from them in order to ascertain what would be the best way to end up trying to do that and what an estimate of some of those costs could end up being. For example, talking about how many schools are in that area that have received funding and what is the high cost funding that has gone to those states. We did not, we have not talked in the specifics about some of the orders that are front of the commission implementing data but of course those are—there are some more coordinating with them after the Commission has adopted the order of course and we have received input from them on some of the concerns they have had and tried to address that in our order about how it would work. But I think that a lot of the focus in the past about for example some of the concerns related to E-rate have been on some of the auditing issues that have occurred in the past and on some of the distribution of funds. And I think that the Commission has tried to work with USAC to make sure that as an appropriate oversight, I think the Inspector General has been very involved in that as well. He has, on some audits that have already occurred, he has worked out with USAC to coordinate to do an extensive additional number of audits going forward. I think about 700 audits is the plan for them to end up doing of different Universal Service recipients to make sure that they are using funding appropriately. So I do think that there needs to be a close coordination and auditing of what is going on with the funds.

What we are doing with our response from Hurricane Katrina is actually just allowing for schools in that area to apply for funding through the Universal Service process but they will still have to meet the same accountability constraints that any school does whenever they are applying for funding. So there would not be any exemption from that as going forward, it is just a question of what schools would be in the area and what would be an estimate of what could be the impact on the fund for that.

Mr. WHITFIELD. If you were speaking at a rotary club say in Hopkinsville, Kentucky and you were going to explain your relationship with the administrator of the Universal Service Fund, what your joint responsibilities are to each other, how would you explain that?

Mr. MARTIN. Well there is an unusual relationship and I think there has actually been a couple GAO studies that occurred in the 1990's that was looking at the way USAC was structured and even had some questions that were raised about how that should end up functioning. But the Commission is actually the policymaking governmental entity deciding that—what would be the policies for the distribution of those resources and I think USAC would be described as administrative in the sense that they would be, not be making policy judgments but rather would be handling the administration of applications that are coming in and then dealing with whether they met the criteria that we had established as a policy perspective to distribute that money. So they both are coordinating the collection of the resources from the telecommunications companies and then coordinating the distribution of those but they don't have any independent policy authority so that they can only do so in relation to the rules so to speak or priorities that the Commission establishes as the appropriate governmental entity. So they can not make policy, they can just administer the fund.

Mr. WHITFIELD. And who is the primary liaison between say your office and USAC?

Mr. MARTIN. Well I think it depends somewhat on what aspect of it. For auditing purposes for example it is the Inspector General's Office that takes the lead on that. For some of the management issues it would be the Managing Director's Office. For the policy issues, it would be the people in the telecommunications, the wire line, Telecommunications Bureau that is set up and made those policy decisions. So it depends on if it is a policy decision, a management decision, or an auditing one.

Mr. WHITFIELD. Thank you, Mr. Chairman.

Mr. UPTON. Mr. Pickering?

Mr. PICKERING. Thank you Mr. Chairman.

I want to first follow up on some questions that Chairman Barton asked on whether we need to address legislatively some type of requirement to reach the interoperability standards. Having seen where we were on 9/11 and then all of the focus and all of the recommendations of hoping to achieve interoperability among our communication networks and first responders and equipment, the tragedy is that we really have not made that much progress. And in my own State of Mississippi, the first really 3 to 4 days after the storm, we had an essentially no communications capability. Governor Barber talked about how he had a satellite phone and his Adjutant General of the National Guard had a satellite phone, his emergency response, the MEMA official had a phone but it worked so unpredictably and erratically that they basically had no communication other than like civil war, he would send runners. And that was the means of communication during the most critical time to save lives, protect lives, and respond. No ability to coordinate, no ability to help people because you have no communication. And no real progress since 9/11 to Katrina 2005.

So I would like to know legislatively should we put a process together that would give you Dr. Boyd and Chairman Martin and the others in the community a chance to have a voluntary standard adopted within a deadline and failure to do so would then require a mandatory process to the FCC or Homeland Security or the ap-

propriate agency so that one way or the other we will have an interoperability standard within a time certain given the industry and the community their first shot at it to do it as it should be done but failure to do so will not justify 5 years from now still not having the progress that we should have after 9/11 and Katrina. And would you all agree that that would be a good forcing catalyst to give you deadlines to work this out by yourself and failure to do so would require a Federal action deadline and requirement to have the standards in place? Mr. Martin?

Mr. MARTIN. Well I certainly think that it is helpful in the sense that you would make sure that everyone was compliant. I think it has got to be not just a technical standard but the protocol standards as well. I mean for example one of the things that we discovered in response to the hurricane is that when 911 call centers go down, there is not even a standard protocol for where they send those emergency calls. And so the very first thing we started doing as Hurricane Rita was approaching the Gulf Region was just calling all the 911 centers the 2 days before and telling them they at least need to establish a protocol of if they are physically damaged, where do those 911 calls, where should they be rerouted to and have you told the telephone companies where to go. And I think that some kind of requirements to establish like I said not just technical standards but standard protocols could end up being appropriate. That is one example where we made some real progress by trying to reach out to do that.

Mr. PICKERING. I think everybody knows what needs to be done. We want to define the problem. We have much better technologies. We are beginning to have the spectrum available. My question is very straightforward. Do you need deadlines, legislative deadlines to give you a voluntary process to get the job done by that deadline? Failure to do so will then start a process to the FCC or through Homeland Security that it will be done for the Nation, if it is not done on a voluntary basis. Would that be a good way to make sure that we get this job done? Dr. Boyd?

Mr. BOYD. If I can. The current standards process is driven by the public safety community through the Association of Public Safety, let me explain that, communications officers. The reason I think it is imperative that we stick with that——

Mr. PICKERING. I understand the process. I understand the issues but we still have not—it has been since 9/11 and we still have not done—it sounds like you are on your way from what you said earlier about the process and what is about to happen over the next 6 months. So my hope is that you are successful in the current process to get it done. But let us say 6 months from now, a year from now it is still not done. Some disagreement, proprietary, for whatever reason you still have—you have had your process but you still have not reached the agreements necessary to give us interoperability standards that we need. At that point, would it not be helpful to have a legal requirement for all participants to force them to either voluntarily reach agreement or that they will be required by law to do it?

Mr. BOYD. Well——

Mr. PICKERING. And there are many legislative examples of what we have had to get the standards in place and we have always

given industry the first shot on a voluntary basis. That would be the preferable way. But failure to do so still, our country could not if we have an EMP, another hurricane four or five, another terrorist attack over the next year, we do not want to be looking at lessons learned if it is the same one that we failed to do something about.

So my question, again, legislatively, should we give you a year to do it with your existing process? Failure to do so would be required by law that somebody will be responsible, accountable, and required to do that.

Mr. BOYD. Well that is why I have to defer to the Department for legislative issues but I will tell you that one of the reasons things have moved forward where they have now is that I was—is that I told industries some months ago that it is our preference that they develop the standard, but if they don't, we will.

Mr. PICKERING. Do you have the legal authority to do that?

Mr. BOYD. As far as we are concerned, working with the public safety community and then applying it in the common grant guidance. We have that authority.

Mr. PICKERING. You have incentives through the grants?

Mr. BOYD. Yes.

Mr. PICKERING. Is that enough?

Mr. BOYD. Well, we don't have the authority to impose requirements on systems not purchased with Federal money.

Mr. PICKERING. I think you have answered my question. I think that we need to give everybody a chance to do it right themselves, and then we need to give a legal backstop that it will be done, shall be done, and it will be done by a day certain.

Mr. UPTON. Mr. Martin.

Mr. MARTIN. Well, no, I was just going to say, I can't speak to SAFECOM's—whether they will be able to get that done within any particular timeframe, but I do agree that deadlines are often helpful in public safety issues to get them done. I think we see that in the context of 911 as well. I think that is how you make a lot of progress, by telling people they don't have it done voluntarily within a certain timeframe, you have to end up doing it. And that is what we see with Voice over IP and wireless. So I think that is critical.

Mr. PICKERING. For both of you and for the first responder community, I would ask you all to work with Chairman Upton and Chairman Barton and the committee to have a process that would give the current process the time that they need to do it on a voluntary basis, but with a legal backstop and process that will ensure and give confidence to the country that it is going to be done.

Mr. Chairman, how much time have I gone over?

Mr. UPTON. These lights are right in my eyes, but it looks like about 3 minutes over.

Mr. PICKERING. Mr. Chairman, thank you for your patience, and I will come back and ask some other questions in another round.

Mr. UPTON. Okay. Well, I know that we were just alerted that we are expecting votes on the House floor about 3:30, so I am hoping that we can finish with this panel. I might say that a number of members have communicated with me that they would like to propose sending some written questions to you, so we will try to

get those assembled up and get them to you by the end of tomorrow, maybe. If you can respond by the end of next week, that would be very appreciated.

Ms. Blackburn, do you have one quick question you want to ask?

Ms. BLACKBURN. I do have a question for Mr. Hitch, and I will tell you, Mr. Chairman, in the interest of time and knowing that we are going to the floor for votes, these are questions about the integrated wireless network, and flexibility with that and expense. I will submit those in the interest of time. Thank you, sir.

Mr. UPTON. Mr. Radanovich, did you have questions to ask?

Mr. RADANOVICH. To Chairman Martin, you know, the FCC is responsible for distributing spectrum to State, local, and public safety agencies. Why has the distribution spectrum been done on kind of a seemingly random basis, and why hasn't interoperability been the goal from the beginning?

Mr. MARTIN. We have provided quite a bit of spectrum for public safety, about 50 megahertz at the 4.9 gigahertz, and some additional public safety spectrum was just allocated when we were rebanding the 800 last year. But the most significant piece of spectrum that has been given to public safety recently is in the band, as Chairman Upton talked about, is in the band that is currently used by the broadcasters. So I mean, it is not that some of that isn't anticipated, including the interoperability, it is that but some of the spectrum that we have provided to them and that Congress has provided to them is in a band that is already currently used and that will be vacated in the context of the digital transition for television.

Mr. RADANOVICH. All right, thanks.

Mr. UPTON. Well, that concludes panel No. 1. Thank you, gentlemen, for your testimony, and we look forward to working with you in the days ahead.

We will take about a 2-minute recess and let——

Mr. PICKERING. Mr. Chairman, could I just——

Mr. UPTON. Go ahead.

Mr. PICKERING. Just real quickly. I will have some additional questions for the panel concerning satellite policy, your universal service funds for the affected areas, and plans for deployable systems, whether it is high altitude or balloons that we can pre-position and replace networks.

You know, interoperability is fine, but if you don't either have satellite or a replacement system, interoperability doesn't mean anything. And so I would like to work with all the members of the panel to try to have a greater confidence that we will have capabilities and interoperability in cases of crisis and natural disaster.

Thank you, Mr. Chairman.

Mr. UPTON. Okay. We will take about 2-minute recess and allow the nameplates to be changed, and we will get started.

Thank you.

[Brief recess.]

Mr. UPTON. Let me get started. We might—so only I get to ask questions so—I say in jest to my good Michigan Police, State Police Officer, you might want to arrest this guy, he is a big Notre Dame fan and 2 weeks ago——

Mr. ROEMER. What was the score of that game, Fred?

Mr. UPTON. It is called luck of the Irish. We are joined by my—our formal colleague and for me the—my former member from the adjacent district and friend, Tim Roemer who is the Director of the Center for National Policy and was a member of the 911 Commission. Mr. Tom Miller, Lieutenant Colonel of the Michigan State Police, Mr. Art Botterell. Is that correct, Botterell, Emergency Information Consultant from California, welcome. Aren't you glad that our hearing did not go in—or our mark up did not go into today which would have canceled this hearing. Mr. Tony Trujillo, Chairman of the Satellite Industry Association, and Mr. Harold Kramer, CEO of the American Radio Relay League and again we appreciate the work of all of your members as we dealt with this terrible storm earlier this month. As you know, our rules are such that your testimony is made part of the record in its entirety. We would like you to spend no more than 5 minutes discussing as an overview your statement.

And Mr. Roemer, you are recognized for 5 minutes. Welcome back.

STATEMENTS OF TIMOTHY J. ROEMER, DIRECTOR OF THE CENTER FOR NATIONAL POLICY; LT. COL. THOMAS J. MILLER, DEPUTY DIRECTOR, MICHIGAN STATE POLICE; ART BOTTERELL, EMERGENCY INFORMATION SYSTEMS CONSULTANT; TONY TRUJILLO, CHAIRMAN, SATELLITE INDUSTRY ASSOCIATION; AND HAROLD KRAMER, CHIEF OPERATING OFFICER, THE NATIONAL ASSOCIATION FOR AMATEUR RADIO

Mr. ROEMER. Thank you, Mr. Chairman.

An honor to be before this very distinguished panel. And an honor to be with some of the brave and courageous people that serve our country on the front lines.

Mr. Chairman, you have graciously entered my statement into the record, I appreciate that. I also appreciate the service with you a democrat and republican that worked together often times on fiscal and education issues. It is nice to be back and see you and see other Members of this Committee.

Mr. Chairman, I guess the message from the 9/11 Commission is pretty simple. We have threats to our country, people that want to kill our citizens not just over there in Iraq, Madrid, London, Indonesia, but right here, New York, potentially Michigan, Indiana, California. The people on the front lines like these brave people here with me today need all the equipment they can possibly get to communicate and fight the enemy. They do not have it. They need more.

Right after 9/11 when I served in this distinguished body, Members of Congress were then provided with some equipment to better communicate. "Blackberries" were provided in many of the budgets for people in Congress to make sure they could communicate, get to their committee assignments, have discussions between each other, make sure the Intelligence Committee operated. These people still need some of that same kind of equipment. We need to get that to them.

Let me give you a couple examples of what the 9/11 Commission found as to some of these problems. We found all kinds of compel-

ling instances of bravery and courage; people going into burning buildings and rescuing people. They might have rescued more. We might have saved more of the Fire Department chiefs, officers, police officers, emergency personnel if they would have had public radio spectrum to better communicate.

At 9:59 in the morning on 9/11, 4 years ago, a general evacuation order was given to firefighters in the North Tower. The South Tower had collapsed, a place that held up to 25,000 people had been diminished to cement, steel, and ash. The people then in the North Tower, many of the chiefs in the lobby did not even know that the other tower had collapsed or else they might have been able to get more people out more quickly. We had comments from people saying such things as we did not know it collapsed. Somebody actually said, Mr. Chairman that people watching TV had more information than we did in the lobby on 9/11 in the North Tower. People on TV in Florida or California knew more than our first responders onsite in New York City. We cannot let that continue. We have got to do more. We cannot make it like a general in Iraq who needs reconnaissance and maps and intelligence. We try to provide them all we possibly can. So too should we provide these officers, these emergency personnel all the intelligence, all the communication, all the equipment that they possibly need.

Mr. Chairman, then we had a disaster happen in the southern part of our country in New Orleans where we had other communication problems. In New Orleans, there were three neighboring parishes were using different equipment on different frequencies. They could not communicate. We had National Guard in Mississippi communicating by human courier, not by radio frequencies, and we had helicopters up in the air looking at our own citizens on the roofs of their homes in New Orleans screaming and yelling for help but they could not talk and the helicopters with the boats and the water to try and find out who was rescued, who was not, and who needed help.

We can and we must do better. The 9/11 Commission has recommended that Congress provide as quickly as possible the public radio spectrum of 700 megahertz so that these first responders can indeed do their job. We don't lose their lives. We don't lose American citizen's lives and we have better interoperability, better strength in these communications, and have this communication be able to have a deeper capability as well.

I would just conclude, Mr. Chairman with a quote from one of my favorite founding fathers, John Adams.

Mr. UPTON. I was hoping it was Bob Davey.

Mr. ROEMER. Bob—no, it was not. It could be Charlie Weiss but he is not quite that old as the coach of the Fighting Irish. John Adams said this, he said, "We cannot guarantee success, we can do something better, we can deserve it." Congress will never prevent every future terrorist attack. There is no way that they can. But working democrats and republicans to provide this radio spectrum to our first responders, we can deserve to give them, they deserve the best protection they possibly can get. Let us get this done as quickly as possible.

Thank you very much, Mr. Chairman.

[The prepared statement of Timothy J. Roemer follows:]

PREPARED STATEMENT OF TIMOTHY J. ROEMER, DIRECTOR, CENTER FOR NATIONAL POLICY

Chairman Upton, Ranking Member Markey, Members of the Subcommittee on Telecommunications and the Internet:

- It is an honor to appear before this distinguished panel today to discuss an issue of great importance to the security of our nation.
- As we learned on 9/11, the new threats we face are not confined to distant battlefields—they can materialize here, on the streets of America.
- Now we are all on the front lines. If terrorists strike again on American soil, it will be local emergency responders—police, firefighters, and emergency medical technicians—who will answer the call.
- I would like to talk about our investigation into events of 9/11, as described by the 9/11 Commission in its report. Those events dramatically illustrate the need for the reform we're here today to discuss.

POOR COMMUNICATIONS—FIRST RESPONDERS AT THE WTC

The response at the World Trade Center on September 11 was the largest single emergency response in our nation's history. Hundreds of firefighters, NYPD, and Port Authority Police converged on Lower Manhattan to participate in the rescue.

What we learned in our investigation is that our first responders did not have the communications they needed or deserved.

Firefighters had a particularly difficult time communicating with one another and with their commanders.

As an FDNY chief in the North Tower told us: "One of the most critical things in a major operation like this is to have information. Unfortunately, we didn't have a lot of information coming in."

The fire chiefs in the North Tower lobby didn't have any reports of what the NYPD helicopters overhead had seen.

They didn't know the extent of the damage to the building over their heads.

They didn't know the condition of the stairwells.

They couldn't get updated information from FDNY dispatch, where dozens of calls were pouring in from civilians on the floors above them. That information would have been extremely valuable to them.

Another chief in the North Tower lobby that day told us that people watching on TV had better information than he did.

Without real-time information, the chiefs were at a huge disadvantage. They were like generals on a battlefield without reconnaissance, intelligence, or even a current map.

Without real-time information, many fire department units were told simply to head up the stairs and report back via radio.

As the units in the both towers climbed higher, their radio transmissions were disrupted by the many floors between them and their commanders. Communications with the chiefs in the lobby became weaker and more sporadic.

Furthermore, the main radio channel for FDNY communications was not designed to handle the number of firefighters at the towers.

So many people were trying to speak at once, the transmissions overlapped and often became indecipherable.

Because that channel was so overwhelmed, it was impossible for the chiefs to track the location of the many FDNY units in the towers.

At 9:59 that morning, the South Tower collapsed. A general evacuation order was issued for firefighters in the North Tower.

Some did not receive the evacuation order over their radios, but were alerted in person by other units.

Some did not receive the order at all.

Some received the order, but did not evacuate with great urgency:

Many disregarded the order to stay and search for civilians.

Some waited for members of their teams to regroup before they headed down the stairs

Some were tired, so they rested in stairwells before continuing down.

Many firefighters in the North Tower didn't even know that the South Tower had collapsed. Even chiefs in the North Tower lobby didn't learn of the collapse of the South Tower for 30 minutes.

Several firefighters who survived told us that they, and others who did not survive, would have evacuated more urgently if they had known of the South Tower's collapse.

NYPD communications were generally better, because most NYPD officers were not climbing the Towers, but were outside evacuating civilians and controlling crowds.

Meanwhile, most Port Authority Police had no way to hear any commands issued over the World Trade Center command frequency.

POOR COMMUNICATIONS BETWEEN AGENCIES

As we learned in our investigation, the quality of communications varied from agency to agency. But radio communications and operational coordination *between* agencies was uniformly a problem, at the World Trade Center and the Pentagon.

For example:

Fire chiefs in the lobbies of the towers got no information from the police helicopters circling above. Reports that called into question the condition of the North Tower, at 10:08, 10:15, and 10:221 a.m., would have been extremely valuable information for the FDNY chiefs in the North Lobby.

Many redundant searches were conducted that morning. For example, firefighters wasted valuable time searching the PATH transit station under the Trade Center, not knowing that the area had already been cleared by Port Authority officers.

Even at the Pentagon, where the emergency response effort was a comparative success, the Arlington Country After-Action Report concluded that "almost all aspects of communications [were] problematic." The report also notes that "radio channels were initially oversaturated."

WHAT WE RECOMMENDED

The courage and determination of the first responders saved thousands of lives that morning.

They risked their lives, and many gave their lives, to rescue people they had never met.

They performed far beyond what we would ever have any right to expect. Had they received timely information that morning, many of those brave firefighters and police officers could have saved more lives, and their own lives.

As we said in our report, "The first responders of today live in a world transformed by the attacks on 9/11. Because no one believes that every conceivable form of attack can be prevented, civilians and first responders will again find themselves on the front lines."

To help those on the front lines, the 9/11 Commission made a common-sense recommendation: Congress should reallocate broadcast spectrum for public safety purposes.

CONCLUSION

Hurricane Katrina reminds us that this problem has not been solved. Poor communications delayed emergency response. Poor communications again cost lives.

New Orleans and three neighboring parishes were using different equipment and different frequencies—they couldn't talk to each another.

Helicopter crews couldn't talk to rescuers in boats.

National Guard commanders in Mississippi had to use human couriers to carry messages.

After Katrina, communications for first responders must become an urgent priority for this Congress. We should not have to learn these lessons a third time.

The transition to Digital TV offers us the perfect opportunity to fulfill this recommendation. The analog TV spectrum is ideal for public safety use. Emergency communications on these frequencies can easily penetrate walls, and travel great distances.

Broadcasters have dropped their opposition to a hard deadline for returning the analog TV spectrum. This is a step forward.Now the ball is in your court. Congress should set the earliest possible date for the transfer of 700 MHz spectrum to America's first responders. We cannot afford another four year delay—we will surely be hit again, and if we have not fixed communications problems lives will be lost.

We need a date certain for the turnover of the spectrum, so that all involved can prepare:

Manufacturers can produce new public safety communications technologies to take advantage of the new spectrum, and

Public safety agencies can acquire these capabilities.

We know that there are other contentious issues involved with the Digital TV transition. They should not stop a bill to reallocate the spectrum for public safety purposes. Our first responders must come first.

Chairman Upton and Ranking Member Markey, Chairman Barton and Ranking Member Dingell of the full Committee, Representative Pickering, Representative Wynn, and numerous other members of the Committee on Energy and Commerce should be commended for their leadership on this important national security issue.

Other members of the House and Senate have also been strongly supportive of this reform. We thank them for their efforts.

We look forward to working with you, and with your counterparts in the Senate, to enact this common-sense 9/11 Commission recommendation into law this year—for the safety of our first responders, and the communities they protect. Thank you, and I would be pleased to respond to your questions.

Mr. UPTON. Thank you.

Lieutenant Colonel Miller, welcome.

STATEMENT OF LT. COL. THOMAS J. MILLER

Mr. MILLER. Thank you, Mr. Chairman and Members of the Committee.

I am Lieutenant Colonel Tom Miller, Deputy Director of the Michigan State Police. Thank you for the opportunity to testify regarding the urgent need to promote interoperable communications between public safety first responders.

Our first responder capabilities have been tested recently in this country from 9/11 to the most recent hurricanes in the Gulf Coast. In Michigan, our tests have included a flooding disaster in the upper peninsula, civil unrest in Benton Harbor, the blackout of 2003, and most recently mobilization of our forces to assist the communities along the Gulf coast with the recent hurricanes. We have fortunately in our State experienced the unexpected and responded well. Still in Michigan, like every other State, we still face challenges. My testimony will describe the interoperability and communication challenges facing the Michigan State Police, as well as all of our State's 75,000 first responders.

In my 24 years of law enforcement experience, I have come to learn firsthand that effective, coordinated, and accessible communications between first responders is critical to the public safety mission. Michigan has the largest geographically based public safety communications system in North America. Since 1995, Michigan taxpayers have invested $211 million in the statewide communications system. The State is currently investing another $19 million in 2006 to upgrade this operating system to provide enhanced data capability, as well as additional microwave backbone capability in Southeast Michigan. Governor Granholm has also set an ambitious goal that by 2008, our first responders in Michigan will have fully interoperable communications. The State of Michigan has been recognized by industry and user groups as visionary as its approach to interoperability. But even with this success, Michigan still faces critical funding and other challenges in its quest to achieve the required level of public safety communications interoperability.

There are four interrelated challenges facing public safety agencies in Michigan, as well as public safety agencies across the country. I would like to highlight some of those four areas for you. First, limited and fragmented funding. Sufficient funding is not available to replace and update equipment. Different communities at different levels of Government have various funding schemes and budget priorities. Further, Federal guidance on local and regional collaboration, as well as, funding assistance would surely help.

Two, limited and fragmented radio spectrum. Public safety agencies compete with each other and with commercial wireless carriers for scarce radio spectrum creating problems among jurisdictions as they scramble to acquire as many frequencies as they can to meet their own needs. In Michigan today, with the state-of-the-art system that we have, we have significant commercial wireless interference that impacts the safety of the first responders utilizing that system.

Three, limited fragmented planning coupled with lack of coordination. Mr. Chairman, you mentioned that in your opening remarks. The foundation of any effort to achieve interoperability is to create a coherent and cooperatively developed and shared plan. Currently, public safety agencies in Michigan are working out a plan for interoperability, a comprehensive plan for interoperability in our State. That is definitely a foundation and requirement to have success in this area.

Four, incompatible and aging communications equipment. Aging communications equipment is a key challenge because they are either obsolete, will become obsolete, or aging at different stages and different jurisdictions which makes coordination and collaboration difficult. Federal assistance is needed as many local Governments do not have the resources to modernize their systems.

Public safety access to the 700 megahertz spectrum is critical to the safety of our citizens and to public safety first responders as a whole. In 1997, Congress and the Federal Communications Commission allocated 2400 megahertz of spectrum to public safety in the 700 megahertz band for additional voice and data capacity but there is still a small number of TV stations that use this dedicated spectrum, preventing public safety access in most major metropolitan areas. Congress must address the loophole in the 1997 legislation that failed to set a firm date when TV stations must vacate the spectrum. There must also be an equitable solution to assure that no citizens are left without access to public information during a crisis.

In Michigan, we are taking short-term initiatives or initiating short-term strategies to develop and address our interoperability issues. I would like to provide this Committee with a couple brief examples. First off, Michigan is pursuing implementation of TACNET, a mobile digital cross band repeater system for integrated directly into patrol car electronics. This system is integrated into the car, patching together as many as five disparate frequencies with the touch of a screen. The State has also deployed and interfaced different radio systems in 20 counties in the State allowing interoperability. Michigan and Ohio are piloting a project involving dual programming of State Michigan radios and Ohio radios. Michigan has developed a microwave link between the State of Michigan's system and the State of Wisconsin for the installation of a telephone hotline between our Upper Peninsula dispatch center and the Wisconsin State Police. Talks are currently underway with the State of Indiana for an interoperability solution between Indiana's system and the State of Michigan's system.

Communications interoperability for first responders is an important life safety challenge. The Michigan State Police commends this Committee's leadership in addressing this urgent issue. Michigan

has been committed to enhancing public safety interoperability prior to the heightened awareness placed on this issue as a result of the terrorist attacks on September 11. Additional funding and spectrum are key to Michigan and other States reaching our goal of public safety interoperability. We do urge Congress to assign a date as soon as possible for the spectrum transition of the 700 megahertz band which can be made available for public safety use.

I thank you for the opportunity to testify and will be pleased to answer any questions you may have.

[The prepared statement of Lt. Col. Thomas J. Miller follows:]

PREPARED STATEMENT OF LT. COL. THOMAS J. MILLER, DEPUTY DIRECTOR, MICHIGAN STATE POLICE

Mr. Chairman and Members of the Committee, I am Lieutenant Colonel Thomas J. Miller, Deputy Director of the Michigan State Police. Thank you for the opportunity to testify about the urgent need to promote interoperable communications among and between public safety first responders. On behalf of the Michigan State Police and my colleagues in law enforcement and other first responder agencies across the state, we appreciate the Committee's leadership in addressing this vital issue.

Our first responder capabilities have been tested in recent years as a country—from 9/11 terrorist attacks to the most recent hurricanes. In Michigan our "tests" have included a flood in the Upper Peninsula, civil unrest in Benton Harbor, the blackout of 2003, and most recently mobilizing our Emergency Operations Center in response to Katrina. We have, fortunately, experienced the unexpected and responded well. Still, Michigan, like every other state, faces challenges.

My testimony will describe the interoperability and communications challenges facing the Michigan State Police (MSP) and all of our state's 75,000 first responders. In my 24 years of law enforcement experience, I have come to learn first hand that effective, coordinated, and accessible communications between first responders is critical to the public safety mission.

Michigan has the largest geographically-based public safety communication system in North America. Our Michigan Public Safety Communications System (MPSCS) is a Motorola 800 MHz trunked radio system and is Association of Public Safety Communications Officials (APCO) 25 compliant, providing statewide coverage for public safety users. We have studied, conceived, and built a state of the art digital standards-based interoperable radio system with significant audio capacity and potentially enormous public safety transmission capacity. Since 1995, Michigan taxpayers have invested $221,000,000 in the construction of this statewide system. The state is currently investing another $19,000,000 in 2006 to upgrade our operating system statewide and to enhance our microwave backbone capacity in Southeast Michigan to accommodate the growth in local users. Governor Granholm has also set an ambitious goal—that by 2008 all first responders will have fully interoperable communications. She has also created an advisory board charged with developing and implementing a plan to achieve this goal.

Michigan has been recognized by the Public Safety Wireless Network (PSWN) and other knowledgeable industry and user groups as visionary in its approach to interoperability. No other state in the union boasts such a system, but even with this success, Michigan still faces critical funding and other challenges in its quest to achieve the required level of public safety communications interoperability.

THE INTEROPERABILITY CHALLENGE IN MICHIGAN

On August 17, 1987, Northwest Airlines Flight 255 crashed a mile from Detroit Metropolitan Airport killing 154 of the 155 people on board. Public Safety personnel responding to this disaster site could not communicate effectively with each other, which hampered rescue efforts. Today, 18 years after this incident, our communications capabilities have improved dramatically, however, public safety agencies in our state still lack the necessary equipment to ensure the required level of interoperability and thus a coordinated response.

There are four interrelated challenges facing public safety agencies in Michigan pursuing communications interoperability:

1. **Limited and fragmented funding**—Funding is not available to replace and update equipment; different communities at different levels of government have various funding schemes and budget priorities. Basically, there are many inter-

ests competing for scarce dollars. Stove pipe solutions have tended to be the norm, which has contributed significantly to the interoperability challenges public safety faces in this country today. We do believe that the movement toward the requirement for regionally based solutions to qualify for federal homeland security funds will have a positive impact on communications interoperability. Further federal guidance on jurisdictions working together as well as funding assistance would definitely help move along the goal of interoperability in our country.

2. **Limited and fragmented radio spectrum**—Public safety radio spectrum is a scarce and valuable resource. Exacerbating the situation is that public safety radio spectrum is not contiguous and is scattered throughout the length of the frequency spectrum. Public safety frequencies in Michigan also face geographic limitations due to our shared border with Canada and other states. Additionally, public safety frequencies are under assault from commercial wireless interference. Public safety agencies also compete with each other for scarce radio spectrum, creating significant problems among jurisdictions as they scramble to acquire as many frequencies as they can to meet their own needs. In Michigan, this has created challenges in our efforts to add larger jurisdictions such as the City of Detroit to the state's communication system. The lack of available frequencies in the 800 MHz band in Southeast Michigan has made it difficult to ensure that this region would have the adequate spectrum resources available for the number of users in that geographic area of the state. The bottom line is this impacts public safety.
3. **Limited and fragmented planning coupled with lack of coordination**—Achieving interoperability only works when there is coordination and cooperation. Indeed, the foundation of any effort to achieve interoperability is to create a coherent and cooperatively developed and shared plan. Currently, public safety agencies are racing to different solutions that exacerbate Michigan's ability, both regionally and on a statewide basis, to meet the interoperability challenge. This is not unique to Michigan, but rather typical across the nation. Effectively partnering with local responders and jurisdictions and breaking down barriers to interoperability is a priority for our state, and must be a priority for our country. Governor Granholm has called for interoperable communications among first responders by 2008 and created the MPSCS Advisory Board this year to develop and implement Michigan's interoperable communications plan and to advise on best practices for implementing interoperability; future trends; and coordination with local, regional, and statewide mutual aid agreements, 9-1-1 dispatch operations, and incident command systems. Again, further focus from the federal government on coordination and shared plans in states and among regions is crucial.
4. **Incompatible and aging communications equipment**—One key challenge with achieving interoperability in Michigan is the age of communications equipment. Many jurisdictions have equipment that is at least 20 years old. Clearly, these instruments are either obsolete or will become obsolete in the near term because manufacturers will no longer support these systems. Additionally, equipment used by various jurisdictions is aging at different stages in their lifecycle, making it difficult to coordinate and collaborate among jurisdictions to acquire common radio infrastructure and equipment. The result is agencies are communicating across different frequencies with different types of radios, analog and digital, using proprietary based systems that tend to inhibit communications interoperability. We need more federal assistance to address this problem, as many local governments just do not have the resources to modernize their systems.

THE NEED FOR FIRST RESPONDER ACCESS TO 700 MHZ SPECTRUM

Although coordination and planning for interoperability is essential, public safety access to the 700 MHz spectrum, both in Michigan and across the county, is critical for the safety of our citizens and first responders. This issue has become apparent in public safety responses to major incidents that have occurred since the terrorist attacks on September 11, 2001. The 700 MHz band is the only dedicated spectrum allocation where public safety can further develop interoperable voice communications and implement advanced mobile wide area systems that bring high speed access to databases, the internet, imaging and video to first responders out in the field. Congress and the Federal Communications Commission (FCC) allocated 24 MHz of spectrum to public safety in the 700 MHz band in 1997 for additional voice/data capacity, but there are still a small number of TV stations in that spectrum that currently prevent public safety access in most of the major metro areas. Con-

gress must address the loophole in the 1997 legislation that failed to set a firm date when TV stations must vacate this spectrum. Congress needs to enact legislation that mandates such a date without exception. Public safety desperately needs the 700 MHz spectrum today.

While addressing this most critical public safety responder issue, we must not lose sight of the potential impact on citizens who may be dependent on these 700 MHz analog broadcasts for their public information during time of emergency. We urge Congress to fashion an equitable solution to assure that no citizens are left without access to public information during a crisis.

NEAR-TERM INTEROPERABILITY INITIATIVES

In addition to our statewide planning for interoperability, Michigan is pursuing several initiatives to address our short term interoperability needs to enhance public safety first response.

1. TACNET—The Michigan State Police is pursuing implementation of a mobile digital-cross band radio repeater system integrated directly into our patrol car electronics. While there are a number of similar technologies, this particular application, offers several unique aspects which have appealed to our officers in pilot tests. Because TACNET is fully integrated into a patrol car's electronic system, patching together as many as five disparate frequency bands is accomplished easily on a touch-screen mounted on the dash. Any patrol officer can do this. While preplanning the frequencies to be coordinated is important, a major advantage of this approach is that we—and other first responders—*do not need to acquire new radios or equipment.* TACNET simply "controls" existing radio equipment, mounted in the trunk, in a seamless and effective way.

2. The Michigan State Police has been involved in interoperability solutions between the MPSCS and local public safety communication systems since 2000 when the department deployed the first interoperability "patch" with Clinton County, Michigan. Since then, Michigan has deployed patch radios interfacing local radio systems with the MPSCS in 20 counties across Michigan.

3. The Michigan MPSCS and the Ohio MARCS system are involved in a pilot project involving dual programming of MPSCS radios and Ohio MARCS radios for interoperability with the Ohio Highway Patrol, Ohio National Guard, and the Ohio Department of National Resources. In addition, Ohio is installing an MPSCS radio connected to a Raytheon ACU1000 pointed at the Michigan system and interfaced with the Ohio system which will allow communications between Michigan dispatch centers and Michigan units operating in Ohio. Ohio will have the same communications capability with units operating in Michigan. Joint exercises will be conducted with appropriate agencies when this solution is operational.

4. DOJ Cities Project/High Risk Metropolitan Areas—Michigan is finalizing a communications interoperability plan between federal, state, and local authorities in the Detroit Metropolitan area utilizing the MPSCS as the backbone for communications interoperability between law enforcement agencies.This plan also involves the installation of repeaters in Detroit to facilitate communications with other 800 MHZ radio systems (such as Oakland County) who may need to work in Detroit during a major incident.

5. Michigan has developed a microwave link between the MPSCS and the State of Wisconsin for the installation of a telephone "hot line" between the Michigan State Police Negaunee Regional Dispatch Center and Wisconsin State Police Dispatch.

6. Talks are underway with the State of Indiana for an interoperability solution between Indiana's 800 MHZ Motorola trunked system, which is under construction, and the MPSCS.

CONCLUSION

Communications interoperability for first responders is an important life safety challenge. The Michigan State Police commends the Committee's leadership in addressing this urgent issue. Michigan has been committed to enhancing public safety interoperability prior to the heightened awareness placed on this issue as a result of the terrorist attacks on September 11, 2001. Additional funding and spectrum are key to Michigan and other states reaching our goal of public safety interoperability. And we do urge Congress to assign a date—as soon as possible—for the spectrum transition so that the 700 MHz bandwidth can be available for public safety use.

Thank you for the opportunity to testify. I would be pleased to answer any questions you may have.

Mr. UPTON. Thank you.

Mr. Botterell?

STATEMENT OF ART BOTTERELL

Mr. BOTTERELL. Good afternoon, Mr. Chairman and distinguished Members of the Committee.

My name is Art Botterell and I am an independent consultant on public warning and emergency information systems. In my career, I have served at the municipal, county, State, and Federal levels of public safety and emergency management, and as a consultant to agencies in the U.S. and abroad. I have had the opportunity to experience first hand a broad array of emergency communications technologies and practices and it is a privilege to share a few observations with you here today.

Having been through these review exercises after just about every major disaster of the past two decades, I will suggest that there are some things that we as a Nation cannot and need not afford anymore. First off, we can no longer afford to build separate infrastructure for different modes of communication. The question is not voice versus data or wired versus wireless or satellite versus terrestrial. The question is how to leverage digital convergence to get the most capability, reliability, and reach for all our modes of emergency communication.

Second, we can no longer afford to treat the radio spectrum as though it were real estate. We have much more efficient ways of organizing, identifying and prioritizing our communications than by the fixed long-term allocation of blocks of spectrum. The sooner we begin the transition to dynamic spectrum management, the sooner we will realize its benefits.

Third, we can no longer afford to rely on vendor driven design of our emergency communications infrastructure. Businesses are responsible for maximizing shareholder value not for protecting the public welfare. We need independent sources of information and planning for our future emergency infrastructure lest we continue to get updated versions of the same old thing.

And finally, we can no longer afford an intermittent series of post disaster quick fix programs for emergency communications. The development of telecommunications is a continual process of incremental improvement. It requires a consistent program of implementation as well.

So how might such a program be established? First, we have to acknowledge that the problem is not just technical facilities, it is also procedures, human resources, and organizational constructs. Then we need to draw three lessons from the Internet. The first is the end-to-end principle which holds that networks should be as simple and transparent as possible so that functions and features can be negotiated and improved in an unfettered market of innovative products and services. The second is the power of judicious standards. The Internet has no architecture, instead it provides a foundation of simple, elegant, enabling standards upon which or which an agile ecology of innovation has grown continually, incrementally, and exponentially. And third, improved standards processes. The process used to create the Internet standards has had a profound influence on other standards organizations and the re-

sults have been better, more robust standards developed and deployed faster than by the more traditional standards process.

And then we need to learn how to harness the energies of the academic, non-profit, and open source communities. It has been said that free is the one price Government does not know how to pay. I have watched several generations of volunteers, amateur radio operators and many others develop and deploy innovative useful communication technologies only to be turned away by the agencies that might benefit from them because they only knew how to adopt new technologies by means of cumbersome, commercial procurement processes.

The highly successful common alerting protocol standard is one of the few such non-commercial initiatives that have succeeded in breaking through this bureaucratic glass ceiling. CAP as it is called, offers an example for harnessing the creative energy of the non-profit and open source communities for the public benefit.

The Federal Government can play a vital role in this process. By encouraging procurements based on open, non-proprietary standards through grant guidance to State and local agencies and to its own acquisitions, by expanding independent research and education of operating and procurement officers by academics and non-profit organizations so that those officials are no longer solely dependent on vendors for their information about communications and information technology. By providing micro grants, counseling, recognition, and other support for innovators from the volunteer academic, non-commercial, and open source sectors to help them bring their good ideas into public service.

Most importantly, the Federal Government can commit to increasing the robustness, reliability, and adaptability of our national communications infrastructure as a continual process of improvement with clear year-by-year goals and measurable usable deliverables in order to apply these lessons that disasters teach us time and again.

I will be pleased to respond to your questions.

[The prepared statement of Art Botterell follows:]

PREPARED STATEMENT OF ART BOTTERELL, EMERGENCY INFORMATION SYSTEMS CONSULTANT

Good afternoon, Mr. Chairman and distinguished members of the Committee. My name is Art Botterell and I am an independent consultant on public warning and emergency information systems.

In my career in emergency communications I've served in public safety and government at the municipal, county, state and federal levels, and as a consultant and advisor in Asia and Europe. I've also been involved in international standards development for emergency data exchange, and in advocacy for improvements in public warning and emergency public information.

It's been my good fortune to accumulate first-hand experience with a wide array of emergency communications technologies and practices, and it's a privilege to share a few of the patterns I've detected with you here today.

INTRODUCTION: THE FOUR LAYERS OF COMMUNICATION

Obviously the number one problem identified after 9/11 and again after the Katrina response was "communications." But what does that really mean?

For many years I've used a four-tiered "layer cake" model to help tease apart the various issues that get lumped under the broad rubric of "communication problems" or, more recently, "interoperability":

Organization—Structures, goals, objectives and metricsHuman
Factors—Capabilities, training, stresses, personal attitudes

Procedures—Patterns of interaction and problem solving
Technologies—All the hardware, software and networks

(There's actually a fifth layer on top—Culture—which in most tactical contexts is a constant, but which definitely comes into play in cross-cultural and international applications.)

Over time I noticed two things about this formulation: The first was that problems, or at least the perceptions of problems, tend to propagate downward through the stack . . . so that a lot of non-technical issues wind up being framed as technology failures. The political or bureaucratic benefits of this depersonalized reframing are fairly clear, as is its attractiveness to vendors and other technology proponents, but it leads to a lot of what might be called "Groundhog Day" experiences, as succeeding generations of technology are blamed for the same breakdowns.

In two decades of emergency response field operations, I can truthfully say that I cannot recall any occasion when I felt the available technology was being fully utilized. In almost every case, I found it possible to substantially enhance the performance of communications by interventions at the procedural, human-factors or organizational levels.

The other interesting thing, which I came to appreciate more slowly, was that change tends to propagate upward through the stack. New technologies require and enable new behaviors, requiring new skills and triggering new stresses, and creating new forces to which organizations ultimately adapt themselves. This is a continual evolutionary process, and that has important implications to which I'll return in just a moment.

For now, the first insight is that a lot of the interoperability and data-sharing challenges we face aren't technical problems, and just painting over them with a fresh layer of technology won't necessarily solve them.

PRICES WE DON'T NEED TO PAY

A couple of truisms here: Nothing is so permanent as a temporary solution, and nothing takes longer than a quick fix. Having been through these review exercises after just about every major disaster of the past two decades, I'll suggest that there are some things that we as a nation cannot—and need not—afford anymore. I'll suggest answers in a moment, but allow me a moment to review the problems first.

First, we can no longer afford to build separate infrastructure for different modes of communications. The question isn't radio versus computers, or voice versus data, or wired versus wireless. The question is how we can complete the process of digital convergence to get the most capability and reliability for all modes of emergency communication.

Second, we can no longer afford to treat the radio spectrum as, effectively, private property. We have much more efficient ways of separating, securing and identifying communications channels than by the fixed allocation of blocks of spectrum to either public or private licensees or services. Certainly this transition from the traditional approach will take time, and it will have financial implications, but the sooner we start the sooner we'll realize the benefits of dynamic spectrum management.

Third, we can no longer afford to rely on vendor-driven design of our emergency communications infrastructure. I make no criticism here of business doing business. The problem arises when government fails in its complementary role as steward of public resources and champion for the public interest, thus leaving the competitive forces of the marketplace unchallenged and unconstrained by any higher values. The phenomenon of government program managers whose mastery of technologies is limited to what their contactors tell them is, alas, a commonplace of federal and, increasingly, of state and local government. Businesses are responsible for maximizing shareholder value, not for maximizing the general public welfare. We need independent sources of information and planning for our future emergency infrastructure, else we'll continue to get updated versions of the same old thing.

And finally, we can no longer afford an intermittent series of post-disaster quick-fix programs for emergency communications. Emergency managers are sadly aware of the "window of opportunity" for funding and legislative interest that opens, all too briefly, after every major disaster. It forces them to undertake impulsive, piecemeal procurements of whatever can be delivered quickly, because they know if they don't move quickly they'll soon be back near the bottom of the spending priorities list. The development of telecommunications is, as I've mentioned, a continual process of incremental improvement. It requires a consistent program of implementation as well.

So how might such a program be established?

HOW TO FIX IT

The first task is to frame the problem properly. The problem isn't just technical facilities; it's also procedures, human resources and organizational structures. We need to involve social scientists, economists and human factors engineers as well as electrical engineers and computer scientists. The goal isn't increased communication or enhanced information sharing; those are means, not ends. The goal is to increase the resilience and robustness of our society and our economy, even as increasing efficiencies squeeze out the slack resources we used to count on to buffer us against unexpected events.

The second task is to learn three lessons from the Internet:

- **The "end-to-end principle"**—Simply put, this holds that the network should be as simple and transparent as possible, so applications and features can be negotiated and improved over time by the end users. (One implication of this is a distinction between the "user interface," e.g., a handheld radio, and the underlying network, which might be of various types without the user noticing any difference.)
- **The power of judicious standards**—The Internet has no architecture. Instead, the Internet is the spontaneous expression of a fairly simple set of enabling technical interface standards, upon which a rich and agile ecology of commercial and non-commercial innovation have been built, continually and incrementally. Likewise, the challenge for designing emergency communications capabilities is not to develop a global top-down architecture, but rather to identify and promote the key enabling standards that will allow technologies to interact, cooperate, compete and improve for the benefit of investors and the general public alike.
- The revolution in standards development—One quiet impact of the Internet has been on the processes by which technical standards are developed. The process used by the Internet Engineering Task Force stresses open participation, open non-proprietary interfaces, and a requirement that standards must actually have been implemented and tested by multiple users prior to formalization. This open, iterative approach to standards development has spread to other standards organizations, and the result has been better, more robust standards being brought to use faster than by more traditional industry standards processes.

The third task is to learn how to harness the energies of the academic, volunteer and Open Source communities. It's been said that "Free is the one price government doesn't know how to pay." I've watched several generations of communications volunteers develop and demonstrate innovative and useful communications technologies, only to be frustrated by government bureaucracies that only knew how to adopt technologies by means of lengthy and complicated commercial procurement processes.

The highly successful open standard called the Common Alerting Protocol is one of the few such non-commercial initiatives that have broken through this bureaucratic glass ceiling. "CAP," as it's called, offers a pattern for harnessing the creative energy of the academic and open-source communities for the public good. Of course, success has a thousand fathers, and so I hope the process that led to the creation of CAP will be studied carefully before its product is fully absorbed into common process.

THE FEDERAL GOVERNMENT'S ROLE

The federal government can play a key role in this process. The federal government can stimulate the development and adoption of open, non-proprietary technical standards by encouraging procurements requiring such standards through its grants to state and local agencies and its own procurements.

The federal government can also support independent research and educational outreach though academic and non-profit organizations, so that officials at all levels of government are no longer so dependent on vendors for information about communications and information technology options and trends.

And the federal government can provide micro-grants, counseling, recognition and other support for volunteer, academic, non-commercial and open-source innovators—through the Small Business Administration, perhaps—to help them push their good ideas across the gap into broader use.

Most importantly, the federal government can expand its leadership role in approaching the robustness, reliability and adaptability of our national communications infrastructure as a continual process of improvement, with discrete year-by-year goals and objectives, and in tearing down some of the traditional barriers—between disciplines and agencies, between voice and data, between emergencies and

day-to-day—that have kept us from applying the lessons that disasters teach us time and again.

I would be pleased to respond to your questions.

Mr. UPTON. Thank you.

Mr. Trujillo?

STATEMENT OF TONY TRUJILLO

Mr. TRUJILLO. Mr. Chairman, members of the committee, on behalf of the Satellite Industry Association, I would like to thank you for holding this hearing today. I would also like to express my thanks to Chairman Martin, Commissioner Abernathy, Adelstein, and Copps, and the staff of the FCC. Their efforts greatly assisted America's satellite companies in restoring telecommunication services to the Gulf Coast Region.

Satellite communications played a critical role. When the land based telephone and broadcast networks went down, satellites remained on the job. Satellites provided redundancy, ubiquity, and resiliency that were unavailable from land-based networks. Satellites first warned of the impending danger. Afterwards, satellites connected emergency personnel and other first responders. Satellites reunited families. Satellites reconnected communities. And satellites enabled the world to witness the devastation of these disasters and also the many acts of heroism.

Although the performance of satellite systems was impressive, their use was often limited by lack of preparation. Had satellite systems been more effectively integrated into our emergency communications network, many of the communications problems that occurred in Alabama, Louisiana, Mississippi, and Texas recently and New York City after 9/11 would have been substantially mitigated. As Chairman Martin recently stated, if we learned anything from Hurricane Katrina, it is that we cannot rely solely on terrestrial communications. And if I leave you with only one thought today, that satellites can guarantee redundancy. And as we learned in New Orleans, the importance of redundancy cannot be overemphasized.

The satellite industry was not as affected as land based networks were by the hurricanes. While the outages on land based networks surged in the days following the hurricanes, satellite networks were also experiencing a corresponding surge in demand for capacity. Even during Hurricane Katrina, those with mobile satellite phones along the Gulf Coast found that their phones had a dial tone when other networks were silent. FEMA, The National Guard, and Red Cross, utility workers, people in search of loved ones and even local phone companies were among those using over 20,000 mobile satellite phones and terminals provided by Globalstar, Iridium, Mobile Satellite Ventures, and Inmarsat.

Likewise, the fixed satellite service providers also stepped in quickly to provide emergency voice, video, and data communications. For example, Hughes Network Systems immediately reestablished Wal-Mart's satellite communications network creating one of the life support systems for local communities starting to rebuild. Intelsat reconfigured capacity and donated service to help cellular providers reestablish their networks and to provide capacity for the Department of Homeland Security and FEMA. PanAmSat donated

capacity to the Red Cross to provide communications to about 40 of their sites and especially equipped Red Cross mobile units. SES AMERICOM and AMERICOM Government Services donated capacity to enable high speed ship to shore communications for the USS Iwo Jima. The ship carried disaster relief teams within amphibious construction equipment and medical personnel and supplies to the New Orleans area following the flooding.

The satellite broadcast community also played a role with both XM Satellite Radio and Direct TV providing FEMA and the Red Cross with a 24/7 dedicated broadcast station for disseminating hurricane related information. XM's emergency alert channel tracked the storm, reported on evacuation routes, and now provides updates about storm clean up, road closures, school closings, and other vital information.

America's satellite industry can do more to aid disaster relief and recovery. We offer the following four recommendations. No. 1, satellites should be regarded as an essential component in all future critical telecom network planning. No. 2, satellite systems must be pre-deployed to a cadre of trained professionals. No. 3, satellite personnel must be credentialed as first responders. And No. 4, satellite spectrum must be preserved and protected.

With these initiatives, our satellite industry will be even better prepared to meet America's disaster relief and recovery needs in the future.

Thank you.

[The prepared statement of Tony Trujillo follows:]

PREPARED STATEMENT OF TONY TRUJILLO, CHAIRMAN, SATELLITE INDUSTRY ASSOCIATION

OPENING

Mr. Chairman, members of the Committee, on behalf of the Satellite Industry Association, I would like to thank you for holding this hearing today on public safety communications and the lessons learned from 9/11 and Hurricanes Katrina and Rita. I would also like to express my thanks to Chairman Martin, Commissioners Copps, Abernathy, and Adelstein and the staff of the Federal Communications Commission. Their tireless efforts have greatly assisted us in supplying critical telecommunication resources to the Gulf Coast Region.

Satellite communications played a critical role during the response to these manmade and natural disasters. When the telephone and broadcast networks went down, satellites remained on the job. Satellites connected emergency personnel and other first responders. Satellites reunited families. Satellites reconnected communities. And, satellites enabled the world to witness the devastation of these disasters and also the many acts of heroism.

Although the performance of satellite systems was impressive, their use has often been limited by a lack of preparation. Had satellite systems been more effectively integrated into our emergency communications network, many of the communications problems that occurred in Alabama, Louisiana, and Mississippi recently, and New York City after 9/11 would have been substantially mitigated. As FCC Chairman Martin recently stated, "if we learned anything from Hurricane Katrina, it is that we cannot rely solely on terrestrial communications".

Today, I will highlight;

(1) The diversity and versatility of the commercial satellite systems operating today;
(2) The role that these satellite systems played in recent manmade and natural disasters; and
(3) The importance of better integrating satellite systems into future national security and emergency preparedness communications.

As we discuss how Katrina affected Alabama, Louisiana, and Mississippi, it's important we apply the lessons we learned to improve disaster relief and recovery telecommunications in the future.

As of September 21st, nearly three weeks after Hurricane Katrina inflicted its damage on the terrestrial communications network in the New Orleans area, only 60 percent of the cell phone networks were working properly, 70 percent of the broadcast stations were functioning, and roughly two million calls were still failing. On the other hand, and in stark contrast to the failures in the terrestrial networks, fixed and mobile satellite services were nearly 100 percent operational on September 21st, just as they were on Aug. 28th, Aug. 29th, Aug. 30th, Aug. 31st, and the hours and days immediately following Katrina.

There have been calls for a new communications network for first responders and funding for new technologies and networks that can withstand such disasters. Satellites can and should be an integral part of these new networks. The required capacity is available today from commercial satellite operators and is widely available to corporations, government users and consumers across the globe. The intelligent integration of satellite and terrestrial technologies can create the communication system that our first responders deserve.

TERRESTRIAL VS. SATELLITE

Hurricane Katrina's destruction of terrestrial communications facilities in the Gulf region, and therefore the services upon which citizens rely, was extraordinary. As we know, almost three million customer telephone lines were knocked down in Louisiana, Mississippi, and Alabama. In addition to these wire-line failures, local wireless networks also sustained considerable damage, with more than 1,000 cell sites out of service. Approximately 100 broadcast stations were knocked off the air, and finally, hundreds of thousands of cable customers also lost service.

The resulting lack of communications infrastructure severely impeded the ability of first responders and others in their disaster relief and recovery efforts.

The satellite industry and our satellite network infrastructure were not as affected by Hurricane Katrina. This is partially because satellites orbit high above the problems on the ground. In the hours, days, and weeks following these disasters, satellite networks provide critical communications capabilities to emergency personnel and a vital information link for all citizens—whether via satellite radio, satellite television, or via fixed satellite broadband networks or mobile satellite telephony.

While the outages on terrestrial networks surged in the days following Katrina, satellite networks were seamlessly handling a corresponding surge—in demand for capacity.

And I am happy to report to you today that our satellite voice, video, and data networks performed exactly as they were designed to perform—providing reliable and redundant communications solutions in times of crisis.

I would like to take you through some of the examples of how satellites performed in the wake of Hurricane Katrina.

SATELLITE QUICKLY STEPPED IN TO PROVIDE INSTANT INFRASTRUCTURE

Mobile Satellite Services

Within minutes of the disaster, those with satellite phones along the Gulf Coast turned to us for immediate telecom access. As those minutes turned to hours and then to days, more and more first responders found that satellite telephones provided a dial tone that other networks simply could not.

FEMA, The National Guard, the Red Cross, state and local first responders, utility workers, reporters, people in search of relatives, and even local phone companies were among those using satellite phones to communicate in the aftermath of Hurricane Katrina. The Red Cross quickly deployed nine specially-designed Emergency Communications Response Vehicles (ECRV's). Each vehicle was equipped with 10 satellite phones and portable, tripod-mounted VSAT satellite dishes.

Over 20,000 Globalstar, Iridium and Mobile Satellite Ventures (MSV) satellite phones and terminals were deployed to the region in the days immediately following Hurricane Katrina. In just the first 72 hours of the disaster, Iridium satellite telephone traffic alone in the region increased more than 3000 percent, while the number of subscribers increased more than 500 percent. Globalstar service centers activated satellite phones at an average rate of 1,400 per day (versus an average of 80 on a typical day). MSV saw approximately a 400 percent increase in traffic in the region and provided satellite terminals to numerous emergency responders, including FEMA's Urban Search and Rescue teams.

CNN and Fox News used an Inmarsat mobile satellite terminal as the hurricane came ashore to provide live video reporting. One CNN van (Hurricane 1) was crushed by a falling roof after filming the arrival of the hurricane's eye-wall—fortunately, the crew was not injured, and the Inmarsat terminal survived intact.

Stratos Global, a reseller of Iridium, Globalstar and Inmarsat capacity and equipment, also deployed a team to provide free phone calls home for victims at shelters set up throughout the affected area.

Whether providing critical telecommunications in the aftermath of Katrina or September 11th, the Mobile Satellite Services or MSS industry has positioned itself to uniquely provide ubiquitous, reliable, interoperable, secure, and redundant communications during times of crisis.

First responders, relief workers, political leaders, news professionals and others quickly clamored for additional phones, and despite the impressive statistics that I just cited, for each phone and terminal provided, countless other requests were unmet. Supplies were rationed and all of our companies had to beg, borrow and steal every handset and terminal they could find—both within the United States and abroad. In fact, many requests, including one from the House Sergeant-at-Arms office, had to be severely limited.

And while these mobile satellite service providers performed nearly flawlessly, the one portion of the satellite industry that has gone virtually unnoticed in these past few weeks, but has proven equally critical, is the FSS or fixed satellite services sector.

Fixed Satellite Services (FSS)

After Hurricane Katrina, the fixed satellite service providers and their resellers also stepped in immediately to provide instant infrastructure and emergency voice, video, and data communications in the hard-hit areas. From transportable ATM machines to high-speed Internet access for families to stay connected, the organizations using these satellite communications ranged from federal, state and local government agencies to schools, churches and local relief organizations. Small businesses such as retail gas stations and convenience stores, and larger businesses such as insurance companies, financial institutions, and news organizations also used satellite capacity.

For example, Hughes Networks Systems immediately re-established Wal-Mart's satellite communications network, helping Wal-Mart become one of the 'life-support systems' for the local communities during their recovery.

Intelsat, Ltd. reconfigured capacity and donated service to help cellular providers such as Cingular, and Nextel/Sprint, and long distance carriers MCI, and AT&T re-establish their networks as well as provide capacity for emergency services via mobile vans for relief agencies, and mobile offices and command centers for the Department of Homeland Security and the Federal Emergency Management Agency.

PanAmSat donated satellite capacity to the Red Cross to provide communications to about 40 of their sites and deployed an experimental inflatable antenna at a Red Cross center in Biloxi used by evacuees to send email messages to family.

SES AMERICOM and AMERICOM Government Services donated satellite capacity to enable high-speed ship-to-shore communications for the USS Iwo Jima—which carried disaster relief teams to New Orleans with amphibious construction equipment and medical personnel and supplies.

In addition, Intelsat, Loral Skynet, New Skies Satellites, PanAmSat, SES AMERICOM, and other FSS operators provided free satellite communications and satellite bandwidth to enable Internet connectivity as well as voice, video, and data channels to field hospitals and relief and rescue workers on the ground, in the air, and on the water. Also, without the help of the Department of Homeland Security's National Coordinating Center and their Telecom Industry Sector Advisory Committee (ISAC), the satellite industry-government coordination that was accomplished, especially in those first 48 hours, would have been substantially more difficult.

Direct Broadcast Satellite (DBS) and Satellite Radio

In addition to the FSS and MSS sectors, the satellite broadcast community also played a key role, by helping to ensure there was an efficient method of communicating critical information to first responders and the general population within the areas affected by Hurricanes Katrina and Rita.

Both XM Satellite Radio and DirecTV provided FEMA and the Red Cross with a 24/7 dedicated broadcast station for disseminating hurricane-related information. XM's 24-hour channel called XM Emergency Alert (Channel 247) tracked the storm and reported on evacuation routes, and now provides updates about storm clean-up, road closures, school closings, and other vital information including information from the National Oceanic and Atmospheric Administration, the Department of Health and Human Services, the Department of Homeland Security and the Federal Emergency Management Agency.

Following the storm, XM launched a new channel called Red Cross Radio (Channel 248) which provides information directly to Red Cross workers located in the Gulf Coast, as well as Red Cross aid stations. XM has donated more than 200 radios for Red Cross workers to listen to the Red Cross Radio channel.

DirecTV also coordinated with FEMA and the Red Cross to offer live feeds—free of charge—to shelters and command centers throughout the area.

SATELLITE = REDUNDANCY + UBIQUITY + RESILIENCY

Something that we have been hearing repeatedly in the wake of Hurricane Katrina is the word "interoperability" and the need for first responders to communicate seamlessly with each other during times of crisis. We in the satellite industry agree that first responders at the federal, state and local level need an interoperable communications system that can be rapidly deployed anywhere in the country. We also know that such communications networks exist in the form of the applications we have just discussed that are being offered today by the mobile and fixed satellite industry.

Moreover, satellite operators are investing billions of dollars in next-generation systems that will offer new and even better services for the public safety community.

I believe one of the themes you have seen throughout my remarks here today is that satellites equal redundancy and ubiquity and resiliency. The real world examples that have presented themselves in recent years; 9/11, Operation Enduring Freedom, Operation Iraqi Freedom, the London Train bombings, and the hurricanes of 2004 and 2005, are a testament to the fact that without satellites there is no redundancy. And, without the redundancy, ubiquity and resiliency that satellite networks provide, terrestrial-only networks become useless following disasters.

RECOMMENDATIONS

Despite the tremendous contributions of the satellite industry to the rescue and recovery efforts in the Gulf region, barriers existed which prevented the full use of satellite resources.

Satellites should be regarded as an essential component in all future critical telecom network planning

To enable rapid deployment and/or restoration and truly mobile communications, the Federal Government should incorporate satellite services and networks as a redundancy requirement in any communications network or architecture. **The Department of Homeland Security is currently examining a range of emergency communication proposals, including proposals to ensure interoperability. Satellite systems should be emphasized and included in the early planning of these initiatives.**

Satellite systems must be pre-deployed to a cadre of trained professionals

The US military has long known that, to be effective, you must "train as you fight." In other words, you must prepare for a crisis with the same intensity and dedication that you will need during the crisis. Past disasters have shown us that first responders must have the satellite tools and training they need *before* an emergency happens. Today, availability of satellite capacity and satellite ground equipment for emergency preparedness requirements has been handled largely by relying on whatever excess capacity exists at the time. Hurricanes Katrina and Rita have demonstrated that this type of reliance is flawed and ultimately dangerous.

In the aftermath of the recent hurricanes in the Gulf Coast, when many terrestrial communications networks in the region were either totally or partially disabled, emergency responders were relying on satellite solutions. These solutions included satellite telephones, satellite bandwidth, as well as VSAT networks. The problem at that point was the availability of equipment and bandwidth to satisfy demands. Satellite phones became very difficult to find. VSAT equipment, in the quantities requested, was also nearly impossible to obtain, let alone ensure either timely importation or delivery to isolated locations.

Satellite handsets and small, modern, pop-up antennas and satellite phones could have been pre-positioned on-site prior to Katrina and available for immediate deployment in the aftermath. In the hands of first-responders this technology could have provided the communications necessary to deploy safety of life services to those who needed it without delay.

These products work *today.* They provide redundancy *today.* They work with other communications *today.* As such, **the Government needs to facilitate a wider pre-positioned deployment of these assets today by ensuring that satellite capacity and equipment become part of the comprehensive redundant com-**

munications solutions used by first responders during the planning stages, rather than at the last minute.

Credentialing Satellite Personnel as First Responders

The day after Katrina hit, satellite repair crews were ready to begin restoring service. Unfortunately, too many of these professionals couldn't get permission from officials to enter the area.

Given the increasingly critical role the satellite industry is playing in disaster relief and recovery, *satellite service providers and their engineers should be designated as first responders in the event of a major disaster and should be included in preparations for such events.* By credentialing such individuals and companies as first responders we can enable critical satellite infrastructure providers and others to get into the affected areas to restore vital capabilities without delay or interference.

• **Preserve and Protect Satellite Spectrum at Home and Abroad**

As discussed throughout this testimony, satellite networks are uniquely able to deliver redundant, reliable, and resilient communications services users and meet the unique demands of the public safety community for ubiquitous and interoperable communications.

The availability and widespread deployment of satellite networks, however, depends upon the satellite industry's access to sufficient spectrum. **Therefore, the satellite industry believes that 1) U.S. government policy must ensure that existing satellite spectrum be preserved and protected from harmful interference both at home and abroad; 2) the FCC's rules and policies should afford satellite operators sufficient technical flexibility to continue to meet the needs of the public safety community; and 3) the US Government should refrain from taking actions that undercut international allocations of spectrum for satellite use.**

CLOSING—WE ARE AN ESSENTIAL PART OF THE SOLUTION

Again, to recap our recommendations;

1) Satellites must be an essential component of future critical communications networks;
2) Satellite capacity and equipment must be pre-purchased and pre-positioned;
3) Satellite operators and personnel must be credentialed as first responders; and,
4) Satellite spectrum must be preserved, and protected from interference.

We in the satellite industry are justifiably proud of the crucial part we have played in disaster recovery efforts by providing vital communications to relief workers, government agencies, churches, families and journalists. However, we have also been frustrated by the knowledge that we could have done much more. On behalf of the Satellite Industry Association, I urge this Committee to take steps to ensure that satellite systems are completely integrated into emergency planning and preparations so that the unique benefits our services offer can be fully exploited the next time disaster strikes.

Mr. UPTON. Mr. Kramer?

STATEMENT OF HAROLD KRAMER

Mr. KRAMER. Thank you, Chairman Upton and Members of the Subcommittee for this opportunity to testify this afternoon on the efforts of amateur radio operators providing communications in connection with Hurricane Katrina.

My name is Harold Kramer. My amateur radio call sign is WJ1B. And I am the Chief Operating Officer for the American Radio Relay League, the ARRL which is the National Association for Amateur Radio. Amateur Radio is a voluntary communication service famous for providing reliable emergency and disaster relief communication at no cost to States, municipalities, disaster relief agencies, and the Federal Government. Radio Amateurs respond immediately following any type of emergency with communications facilities and systems manned by volunteered trained communicators.

Amateur radio operators are probably best known for their immediate responses to the tragic events on September 11, 2001, along with hurricanes, tornadoes, earthquakes, fires, snow, floods

and other natural disasters. They are immediately available during and in the aftermath of such events and commence their first response communications in support of public safety and disaster relief agencies along with State emergency response agencies without any advanced requests. When communication systems fail due to the wide area or localized disaster, Amateur Radio has consistently and repeatedly proven that it works.

Immediately at the onset of Hurricane Katrina an all volunteer army of about 1,000 FCC licensed amateur radio operators provided continuous high frequency, VHF and UHF communications for State, local, and Federal emergency workers in and around the affected areas in Louisiana, Mississippi, and Alabama. These communications were provided for several agencies such as the Red Cross and the Salvation Army and to facilitate interoperability between and among first responders such as FEMA, National Volunteers Active in Disasters and other agencies. Trained, volunteer amateur radio operators also provided health and welfare communications from within the affected areas to the rest of the United States and the world.

In the days after Hurricane Katrina, the Coastguard, the Red Cross, and FEMA all put out calls for volunteer amateur radio operators to provide communications because phone lines and cell sites were inoperative and public safety communications were overwhelmed due to the loss of repeater towers and the large number of first responders in the area. Amateur radio operators responded en masse. Approximately 200 Amateur Radio emergency service communicators responded immediately. The number of amateur radio operators providing communications in the three States who were either deployed or awaiting relief duty onsite or at the reserve facility in Montgomery, Alabama swelled to over 1,000 within a week.

The principal reason why Amateur Radio works when over communication systems fail during natural disasters is that Amateur Radio is not infrastructure dependent, it is decentralized. Amateurs are well-trained in emergency communications. We practice a lot. They are disciplined operators and their stations are in general both portable and reliable. High frequency Amateur Radio communications use substantially in this communications effort requires no fixed repeaters, cable, or wire lines. Portable repeaters for VHF and UHF communications were provided very quickly via mobile facilities in the affected areas.

Specifically, in Mississippi, FEMA dispatched amateur radio operators to hospitals and evacuation shelters to relay emergency calls 24 hours a day. At airports in Texas and Alabama, radio amateurs tracked evacuees and notified the Baton Rouge Operating Center of their whereabouts so their families would be able to find them. Amateur radio operators in New Orleans participated directly in locating stranded persons because local cell phone calls could not be made by stranded victims due to the inoperative water line systems in the area. The Red Cross deployed qualified Amateur Radio volunteers to 250 shelters and food kitchens in Mississippi, Alabama, and Northern Florida.

Amateur Radio provided a critical link between Coast Guard helicopters and emergency centers because the ambulance crews could

not contact the helicopters directly. In Texas, Amateur radio operators worked 24 hours a day in the Astrodome in Houston, in the Reliance Center next door, and in the Harris County Emergency Operations Center. In San Antonio at the Kelly Air Force Base, radio amateurs from Montana provided local and national health and welfare communications for evacuees. These examples were repeated throughout the Gulf Coast and in the southern cities that received a large number of evacuees.

In closing, Mr. Chairman, the Committee should be aware that this vast volunteer resource in support of public safety is always at the disposal of the Federal Government and of State and local Governments. The United States can absolutely rely on the Amateur Radio service. Amateur Radio provides immediate high quality communications that work every time when all else fails.

Thank you again, Mr. Chairman and members of the subcommittee for the opportunity to testify today on the views of the ARRL and its membership and I would welcome any questions.

[The prepared statement of Harold Kramer follows:]

PREPARED STATEMENT OF HAROLD KRAMER, CHIEF OPERATING OFFICER, THE NATIONAL ASSOCIATION FOR AMATEUR RADIO

Thank you, Mr. Chairman and members of the subcommittee, for the opportunity to testify today on issues related to Public Safety Communications. As Chief Operating Officer of ARRL, the National Association for Amateur Radio, it gives me great pleasure to provide this statement for the record to the Committee on the successful efforts of Amateur Radio operators providing communications for First Responders, Disaster Relief agencies, and countless individuals in connection with the Hurricane Katrina relief effort. As has been proven consistently and repeatedly in the past, long before the 9/11 terrorist attacks, when communications systems fail due to a wide-area or localized disaster, whatever the cause, Amateur Radio works, right away, all the time. This is not a statement of concern about what must be changed or improved. It is, rather, a report on what is going right, and what works in emergency communications, and what can be depended on to work the next time there is a natural disaster, and the times after that.

Immediately at the onset of Hurricane Katrina, an all-volunteer "army" of approximately 1,000 FCC-licensed Amateur Radio operators provided continuous high-frequency (HF), VHF and UHF communications for State, local and Federal emergency workers in and around the affected area in Louisiana, Mississippi, and Alabama. These communications were provided for several agencies such as the American National Red Cross and the Salvation Army, and to facilitate interoperability between and among these agencies; First Responders; FEMA, VOAD (National Volunteers Active in Disasters) and other agencies. Trained volunteer Amateur Radio operators also provided health and welfare communications from within the affected area to the rest of the United States and the world. Amateur Radio was uniquely suited to this task by virtue of the availability of HF communications covering long distances without fixed infrastructure. During the week of September 7, 2005, the Coast Guard, the Red Cross, and the Federal Emergency Management Agency all put out calls for volunteer Amateur Radio operators to provide communications, because phone lines, cell sites and public safety repeaters were inoperative, and those public safety communications facilities which were operational were overwhelmed due to loss of repeater towers and the large number of First Responders in the area. Amateur Radio operators responded en masse: Approximately 200 Amateur Radio Emergency Service (ARES) trained communicators responded to the Gulf Coast within a week after the call. The Red Cross, a week after they issued the call, notified ARRL that they had enough radio operators and Amateur Radio communications facilities. The number of Amateur Radio operators providing communications in the three States, either deployed or awaiting relief duty on-site or at a reserve facility in Montgomery, Alabama, swelled from 800 to 1,000 in a week. Many more thousands of radio amateurs outside the affected area regularly monitored radio traffic and relayed thousands of messages concerning the welfare and location of victims.

The principal reason why Amateur Radio works when other communications systems fail during natural disasters is that Amateur Radio is not infrastructure-de-

pendent, and is decentralized. Amateurs are trained in emergency communications. They are disciplined operators, and their stations are, in general, portable and reliable. High-frequency Amateur Radio communications, used substantially in this emergency communications effort, require no fixed repeaters, cable or wirelines. Portable repeaters for VHF and UHF communications can be provided via mobile facilities (many Amateur Radio groups deployed communications vans in the Gulf Coast for precisely this purpose) in affected areas instantly. There are now approximately 670,000 licensees of the FCC in the Amateur Service, which assures the presence of Amateur stations in most areas of the country. Emergency communications are conducted not only by voice, but also by high-speed data transmissions using state-of-the-art digital communications software known as WinLink. As Motorola's Director of Communications and Public Affairs stated earlier this month: "Amateur Radio communications benefit us all by having a distributed architecture and frequency agility that enables you to set up faster in the early phases of disaster recovery and can provide flexible and diverse communications—Motorola believes that the Amateur Radio spectrum provides valuable space for these important communications."

In Mississippi, FEMA dispatched Amateur Radio operators to hospitals and evacuation shelters to send emergency calls 24 hours per day. At airports in Texas and Alabama, radio amateurs tracked evacuees and notified the Baton Rouge operations center of their whereabouts so their families would be able to find them. Amateur Radio operators in New Orleans participated directly in locating stranded persons, because local cellphone calls could not be made by stranded victims due to the inoperative wireline systems in the area. The Red Cross deployed qualified amateur radio volunteers at its 250 shelter and feeding station locations, principally in Mississippi, Alabama and northern Florida.

The local 911 operators could not handle calls from relatives calling in from outside the affected area, so they passed those "health and welfare" inquiries to amateur radio operators stationed at the 911 call centers, for relay of information back to New Orleans to facilitate rescue missions for stranded persons.

Amateur Radio provided a communications link between Coast Guard helicopters and emergency centers because the ambulance crews couldn't contact the helicopters directly. In Texas, Amateur Radio operators worked 24 hours per day in the Astrodome in Houston and the Reliant Center next door, and as well in the Harris County Emergency Operations Center. In San Antonio, at the Kelly Air Force Base, radio amateurs from Montana provided local and national health and welfare communications for evacuees. These examples were repeated throughout the Gulf Coast and in the cities in the southern states receiving large numbers of evacuees.

The Salvation Army operates its own Amateur Radio communications system using Amateur Radio volunteers, known as SATERN. In the Hurricane Katrina effort, SATERN has joined forces with the federal SHARES program (SHAred RESources), which is a network of government, military and Military Affiliate Radio Service (MARS) radio stations. MARS is an organized network of Amateur Radio stations affiliated with the different branches of the armed forces to provide volunteer communications. SATERN, in the Katrina relief effort, received over 48,000 requests for emergency communications assistance, and the affiliation with the SHARES program allows the Salvation Army to utilize Federal frequencies to communicate with agencies directly. This is but one example of the innovative and reliable means by which Amateur Radio right now provides organized interoperability on a scope far beyond that now being planned for local and State public safety systems.

Much discussion has been given in recent years to the issue of Public Safety interoperability. The Amateur Radio Service provides a good deal of interoperability communications for First Responders in disaster relief incidents. This critical role for our Service exists because, though there are interoperability channels right now in most Public Safety frequency allocations, those channels, and all others, become useless where the communications infrastructure of public safety facilities becomes inoperative. Interoperability, in short, presumes operability of Public Safety facilities. While some "hardening" of public safety facilities is called for, there is in our view an increasing role for decentralized, portable Amateur Radio stations which are not infrastructure-dependent in providing interoperability communications onsite.

Mr. Chairman, Amateur Radio is largely invisible to both the FCC and to Congress on a daily basis, because it is virtually self-regulating and self-administered. It is only during emergencies that the Amateur Radio Service is in the spotlight. At other times, emergency communications and technical self-training and advancement of telecommunications technology occupy licensees' time. For the first time ever, in recognition of the work of Amateur Radio Operators in this Hurricane Relief

effort, the Corporation for National And Community Service (CNCS), which provides strategic critical support to volunteer organizations which in turn provide services to communities, has made a $177,000 grant supplement to ARRL to support the Katrina emergency communications efforts in the Gulf Coast. This enables ARRL to reimburse to a small degree, on a per diem basis, some of the expenses that radio amateurs incur personally in traveling to the Gulf Coast to volunteer their time and effort. The CNCS grant is an extension of ARRL's three-year, Homeland Security training grant, which has to date provided certification in emergency communication training protocols to approximately 5,500 Amateur Radio volunteers over the past three years.

ARRL wishes to commend the FCC's Enforcement Bureau (specifically the Special Counsel for Amateur Radio Enforcement), for the efficient and successful effort during the Hurricane Katrina relief in monitoring the Amateur Radio High Frequency bands to prevent or quickly remedy incidents of interference.

In closing, Mr. Chairman, the Committee should be aware that this vast volunteer resource in support of Public Safety is always at the disposal of the Federal government and to State and local government. The United States absolutely can rely on the Amateur Radio Service. Amateur Radio provides immediate, high-quality communications that work every time, when all else fails.

I thank you again, Mr. Chairman and members of the subcommittee, for the opportunity to testify today on the views of the ARRL and its membership. I would welcome any questions.

Mr. UPTON. Well thank you.

Thank you all for your very good testimony. We look forward to you answering some of our questions and again note that some of members are on other subcommittees that are meeting and we are expecting votes on the floor soon so we may be sending you questions like we did with the first panel.

Mr. Roemer, we again appreciated your testimony. Something I said earlier, you were not here because I know you were not here for the entire first panel that was here, but it does look like we have an agreement and not only with the House and the Senate, but with Republicans and Democrats on actually setting a date as part of the transition for the DTV Bill that we are anticipating a move to the House floor as early as next month. And with that, of course, comes in, once that happens will free up some more spectrum, which is so important for our first responders and it really seems to be quite a theme that we have heard for some time.

As it relates to that, Lieutenant Colonel Miller, I have seen the TACNET devices in some of our police vehicles back home. I think it was both in sheriff, county sheriff, as well as, State Police vehicles. Are those and for those in the audience, these are little mini computers that are in the squad car where the officer is able to identify with a license number, get a history of not only the driver but the vehicle, all those different things. They are, in fact, do provide what we need, does it not, in terms of interoperability between the different departments? Does the TACNET, do those devices have interoperability with—as it relates to the other first responders? It provides a shell to communicate with that device to the State Police to fire and rescue?

Mr. MILLER. It does provide that capability, Mr. Chairman, it is multifaceted technology in the sense that one of the primary benefits of the technology is it improves the interior ergonomics and safety of the patrol car. But in addition to that, they have fashioned the technology to provide the capability to link up to five disparate systems or frequencies so that they can communicate within a specific geographical area.

Mr. UPTON. Now does that utilize the 800 megahertz spectrum, do you know?

Mr. MILLER. It can operate at any spectrum level based on whatever system the agencies within that geographical area are operating on.

Mr. UPTON. Now how is that again? I am making it sort of a Michigan related question. Our delegation, Mr. Stupak, myself, others, the Senate, as well, work very hard to get a weapons of mass destruction team, civil support team which is now based, as it turns out, in Battle Creek at Fort Custer. I watched some of their operations as they integrate their personnel with different first responders in my district but I know they have been to the Upper Peninsula and other places around. I also know that they work with other States as part of the Defense Authorization Bill a couple of years ago. Every State is now going to have one of these teams and they have a pretty sophisticated communication device and I think they have five vehicles, 22 staff, but obviously communications where they can downlink right into the Pentagon and work, integrate again with our first responders. Have you worked with that particular team out of Battle Creek?

Mr. MILLER. Our personnel have. Congressman we have a comprehensive strategy in the State where our military affairs, Department of Military Affairs, our military have the State public safety communication system equipment and have access to that equipment. They are in the State EOC in the case of any event or any disaster. So they absolutely have the ability to communicate with public safety and coordinate a response to any type of incident within our State.

Mr. UPTON. And the equipment they have obviously is mobile. I mean one of the reasons why they are in Battle Creek is that there is an Air Force installation there so they are able to use the runways, but it is also on an interstate and they are actually able to deploy, you know, with relative ease throughout the State.

Mr. Trujillo, one of the things we heard quite a bit and I had some private conversations with Chairman Martin earlier this week and the last couple weeks actually was the great success of the satellite industry in terms of coming to the needs of those with Katrina in the ability finally to bring in literally thousands of devices begin to set up the links terrestrial with the satellite. Some of that was mobile that they brought in, but I think some of the firms had literally one drop. How important is it to have a stockpile of this equipment to be able to pre-deploy it in a variety of different places around the country and how active is—what do you see the needs of the satellite industry in terms of providing that type of benefit and who should manage it? Should it be directly our first responders, should it be through the DHS, maybe through regional offices, should the FCC? What are some of your suggestions as it relates to that?

Mr. TRUJILLO. Well assuming the question, Mr. Chairman that mainly following the disaster that it became clear there was a paucity of mobile satellite phones in the State of Mississippi and certainly one of the things we are advocating is the idea that we ought to pre-deploy some of this equipment to areas that it can be quickly funneled into the affected areas before a disaster strikes. So we

certainly think that pre-deployment and credentialing satellite personnel to help with the infrastructure there is very important.

In terms of at the Federal, State, and local levels who should be responsible, I think in some of these disasters such as a Katrina, it clearly would benefit from a Federal coordination effort in whether it is this new bureau that Chairman Martin discussed or, you know, an internal agency sort of set of some kind. The important thing is to secure satellite capacity ahead of time, secure the satellite equipment ahead of time and have it pre-deployed so that it is immediately available when disaster strikes. That would be very helpful.

Mr. UPTON. Let me ask one more question before I yield to my colleague and that is we saw Katrina coming. I mean all of us that watch The Weather Channel, CNN, a couple days saw this, you know, giant storm moving its way through the Keys and then up. At what point did the satellite industry realize that they needed to come up—that they could really be of true assistance by providing these devices? Was it after the storm hit? Were there any preparations made before the storm hit in terms of assembling caches of these, of this material and be willing to respond to FEMA and others that—when it was ready? At what point did you really start hitting the panic button and getting things ready?

Mr. TRUJILLO. Well generally speaking, I would say that it was certainly a case that our commercial customers were much more sensitized to the impending disaster that was looming on the television screen and heading toward the Gulf Coast. And we were already working with our commercial customers and to a degree also with the Government customers. But the problem was is that there was not the equipment, the satellite phones, and that kind of equipment on the ground already or in preset staging areas that you could truck it in very quickly or fly it in very quickly. The wonderful thing about the satellites are that they are 22,000 miles above the earth's equator. They are impervious to what is going on on the surface of the earth. It is just a matter of getting the equipment to the right people, first responders and others.

Mr. UPTON. Last question very briefly, how hard was it to get that XM station literally into a local station that folks on the ground could listen to? Did they have to get a special waiver from the FCC?

Mr. TRUJILLO. No, sir. The issue there really was that if you were not an XM radio customer, you would not have gotten access to it.

Mr. UPTON. You would not get it.

Mr. TRUJILLO. Right, that was the issue there.

Mr. UPTON. So they had the capacity to add the station?

Mr. TRUJILLO. Yes, sir.

Mr. UPTON. Mr. Stupak?

Mr. STUPAK. Thank you, Mr. Chairman.

Congressman Roemer, good to see you again.

Mr. ROEMER. Good to see you, Congressman.

Mr. STUPAK. You were co-chair on the 911 Commission when Governor King said after Katrina hit he said "It is the same thing all over again. It is a lack of communication, first responders not being able to talk to each other. It is no command and control. No-

body is in charge. It is delayed responses. It is basically many of the things that frankly if some of our recommendation had been passed by the U.S. Congress, that could have been avoided." And your statement today seemed to echo those same comments. In fact, the 9/11 Commission said Federal funding of such interagency communication units should be given a high priority. And do you think Congress has heeded that advice?

Mr. ROEMER. Well Congressman, in my testimony, what I am very clear about is that we need to do this now not next week, not 2 years from now, not 4 years from now, as quickly as possible. Look, we know that we are going to have another natural disaster. We know Al Qaeda or jihadists are going to attack us again. We know looking back at 9/11 that lives were lost because we did not have interoperability and we did not have access to public radio spectrum. We know in New Orleans that lives were lost because we did not have this capability. We need it now. These folks need it now. And we are very clear about that.

We are also very clear, Congressman as you well know as a fiscal conservative that we outline in the 9/11 Commission report, Lieutenant Colonel Miller talked at length about this. He needs funding for aging equipment. Congress needs not to spend money, you know, on how pork barrel weighs on Homeland Security but to respond to a national strategic plan developed by Homeland Security and Congress that will invest wisely in things like public radio spectrum, incident command and control, evacuation plans that are worked, practiced, and simulated so that we can get people out of the fourth largest city in the country like Houston. We are not doing that. We have not done any of those three things yet, incident command and control, evacuation plans that are tested and simulated for Federal Funds to be allocated and this public radio spectrum. So we hope Congress will act right away on these kinds of initiatives.

Mr. STUPAK. Well even if it costs, and I do not believe it does, but even if it costs $18 billion to make us fully interoperable, when you pass a budget that has $106 billion in tax breaks for a limited number of people in this country, I would think we would cut that back at least $18 billion and get us interoperable so all Americans can be protected during natural disaster and a terrorist attack, wherever it might be.

The part that baffles me a little bit is it almost seems like we use this 700 megahertz spectrum sale which is supposed to be in 2008 as an excuse not to do anything like nothing can happen. We cannot do anything because we got to sell the spectrum and then we will be able to do it. But Lieutenant Colonel Miller in your testimony, you talk about TACNET and in fact a question by Mr.—Chairman Upton you talked about patch and that technology has been around for awhile. And we have Mr. Trujillo, I am sorry, satellite phones. Why can't we—we knew that Hurricane Katrina was going to hit. We all watched it. We knew it was going to—they could tell you the exact time it was going to hit and we knew that for days. Why could not we put some TACNET, some patch, code spear, satellite phones down there? Why couldn't we pre-deploy it? Why couldn't we interface communication systems with patch or

TACNET or some of the other technologies you are using right now in Michigan?

Mr. MILLER. Michigan State Police responded with other Michigan law enforcement agencies to assist down there. We took our communications equipment there and we operated out of Louisiana State Police communication system. We reprogrammed, the technology is there. It is not something that——

Mr. STUPAK. How long did it take you to reprogram it?

Mr. MILLER. We reprogrammed those radios probably in hours——

Mr. STUPAK. We knew days before that Katrina was going to hit. We knew that it was going to be a Category 4 or 5 but no one thought of it.

Mr. MILLER. Right.

Mr. STUPAK. You know, I called the guys from Cold Spear and said could you have done something, could you have interfaced the communication system in greater New Orleans? They sure, I said, how much time do you need, just a couple hours. That is interfacing it through their computer system and I know you are using it for your emergency services. I know Wayne Gulley is using it. But aren't you using the same system with Ohio right now as pilot program?

Mr. MILLER. There is some alerting and notification pilots that we are doing there.

Mr. STUPAK. Right.

Mr. MILLER. The big issue in my mind as a law enforcement administrator is you cannot legislate leadership. And a lot of discussion has gone on today about proper planning, proper training, proper coordination, proper exercise and Congressman Roemer mentioned that. The Department of Homeland Security funds those types of initiatives today. The real issue is getting people to the table to develop a strategy in ensuring that the Federal Government requires the State and local Government to adhere to a standard and to adhere and to develop a strategy before you fund anything. If you are funding initiatives that are not cooperative efforts that are not enhancing interoperability and you are not tying those funding requirements to that, you are going to continue to have agencies out there purchasing equipment that is not going to communicate with each other. And that is really the issue here is developing those requirements at the Federal level and then ensuring at a State and local level that there is leadership that places a proper sense of urgency on this issue.

Mr. STUPAK. Sure, I do not dispute that and I agree having been in law enforcement that there is jurisdictional turf wars many times when you are doing this thing but I would think when you have a Hurricane 5, Level 5 bearing down on you, a little common sense would prevail and you could bring the satellite phones and get them properly deployed. I think I read somewhere there was only 200 in all of the Gulf Region when Katrina hit. Well, why don't we pre-deploy that stuff. Why don't we have your patch system and others there? Why do we have to wait until after the fact and then why does the helicopters from the Coast Guard cannot talk to the people in the boats as we are all talking about when it could be done if we just pre-deploy, plan ahead. Someone has

got—I mean, the President declared the Gulf Region a national disaster area before, a day or two before the storm ever hit, I think 48 hours before. So I guess maybe it is leadership but I get frustrated sitting here. I have heard this for so many years.

And someone mentioned the plane going down the Potomac that was in 1982. I was still in the State Police then. I remember that well. And then that was the start of the—Congress should have been alerted then in 1982 since it happened in their back yard about interoperability and I have heard about this for 20, 30 years since I have been in police work. But it is just sort of frustrating to sit here and it seems like we always have excuses below practical common knowledge and we could get some of this stuff done before it hits. We know that there are certain cities that are subject for a terrorist attack. Why can't we pre-deploy right now? We do not have to wait for 700 megahertz spectrum sale.

And I am not going to go to you, Chairman, on that but I am just—the frustration just continues on and on here.

So I thank all of you for providing good insight to us and we appreciate everything you have done.

Mr. UPTON. Well I share those sentiments and I was looking forward to supporting the gentleman from Michigan's amendment yesterday on the Department of Justice Bill that would have added, I think a half a billion dollars for interoperability and sadly it was denied as an amendment on the House floor but I was looking forward to voting for that and was surprised when it was not allowed.

But I just want to again underscore our thanks to all of you. It is helpful for all of us. I cannot think of a higher priority within the Department of Homeland Security as we look to defend not only our first responders, the men and women that put their lives on the line every day but in order to do their job to help all of us non-first responders, they have got to have that equipment and for the life of me, sometimes I do not understand some of the priorities within the funding stream of what their providing when, in fact, here we are 4 years later and it is the same thing happened again. Who knows that it would not be the same result that we have been commiserating about over the last 4 years. So again, I appreciate your testimony, your work. We look forward to hearing from you in the days and months ahead and we wish you the very best.

Thank you. We will adjourn the hearing.

[Whereupon, at 3:35 p.m., the subcommittee was adjourned.]

[Additional material submitted for the record follows:]

See the possibilities®

Before the

Committee on Energy and Commerce

Subcommittee on Telecommunications and the Internet

United States House of Representatives

Statement of

Gregory W. Gyllstrom

Vice President/General Manager, Aftermarket

Visteon Corporation

Thursday, September 29, 2005

Mr. Chairman, Members of the Committee, I am Gregory W. Gyllstrom, Vice President/General Manager, Aftermarket, with Visteon Corporation. Visteon commends the Committee for its leadership in addressing the critical need to enable interoperable communications between first responders. We appreciate the opportunity to submit this statement and describe our TACNET technology for first responder vehicles which provides a cost-effective, readily available interim solution to the interoperable communications challenge.

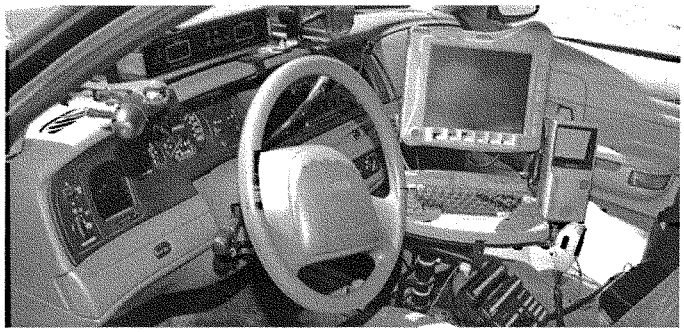
Visteon is a leading full-service supplier delivering consumer-driven technology solutions to automotive manufacturers worldwide and through multiple channels including the global automotive aftermarket. Visteon has about 50,000 employees and a global delivery system of more than 1800 technical, manufacturing, sales and service facilities located in 24 countries. Our new global headquarters, Visteon Village, is located in Michigan just ten minutes from Detroit Metro Airport.

TACNET

Visteon manufactures many of the components found in police cruisers and other first responder vehicles. Our involvement with the law enforcement community and expertise in the full range of automotive systems, including climate control, engine management, electronics, interiors and safety equipment, led us to develop the integrated TACNET command-and-control system for first responder vehicles.

Typical police cars are crowded with equipment purchased and installed on an aftermarket basis. These systems include radar, video, multiple radios, lights and siren controls, usually installed separately, and without any mutual system interface. Additionally, laptop computer equipment is often installed in the front seat, taking up significant space and presenting ergonomic challenges for patrol officers.

This equipment is often installed within airbag deployment zones which presents a potential safety hazard to officers. Figure 1 presents a typical interior configuration.



[Figure 1]

TACNET System Overview

To address these challenges, Visteon developed TACNET. TACNET makes operating in-vehicle electronic equipment simple. TACNET reduces clutter and improves officer safety by eliminating the need for traditional electronic equipment in the passenger compartment. Through various Human Machine Interfaces, an officer can control virtually every system in the vehicle:

- *In-Dash Computer Display* - One easy to reach command and control touch screen.
- *Control Pod* - Ergonomic tactile control pod providing redundant control of mission critical functions.
- *Voice Activated Controls* - Allows officers to operate key equipment without taking their eyes off the road.
- *Heads-Up-Display* - Enables officers to quickly view critical information while keeping hands on the wheel.

[Figure 2]

TACNET Radio Interoperability

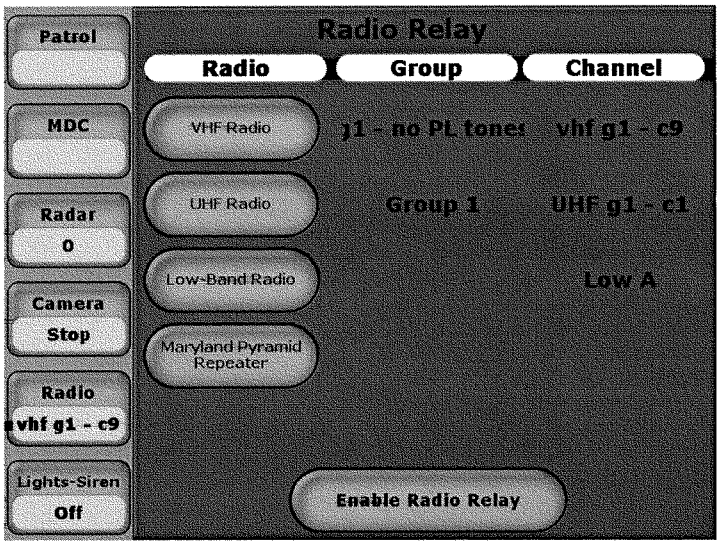
A TACNET-equipped vehicle is an effective communications center in the field which allows first responders with incompatible radios to communicate seamlessly:

- When equipped with multiple radios, a TACNET mobile command vehicle receives transmissions from five or more source bands at the same time – then digitally simulcasts the signal across each of these bands. This versatile cross-band repeater permits fire, police, EMS and other public safety agencies with disparate radio equipment to talk to each other easily through a TACNET relay vehicle.

- The TACNET display provides streamlined access to and management of the relay function, with visual indication of the current channel and group for each radio activated. TACNET can use dynamic signal mixing to permit monitoring different radios on different speakers in the vehicle. Priority can be given to transmissions on the primary channel automatically by muting the sound on the other vehicle speakers.

Communications interoperability through TACNET requires that agencies pre-plan designated coordination frequencies. When activated, TACNET enables all of the radios at an incident scene to appear to be tuned to the same channel, even though some may be analog, or digital, trunked, or not trunked, and/or operating on different frequencies. When any participant transmits, all other participants hear the message.

Figure 3 shows the standard touch-screen display, indicating how different radio transmissions can be made interoperable. The officer pushes the buttons on the screen and the broadcasts are linked automatically.



[Figure 3]

Benefits of TACNET

TACNET offers an immediate, readily available, and cost-effective solution to the first responder communications interoperability dilemma prevailing in today's critical security environment. Importantly, TACNET provides mobile redundancy – by its very nature, it is a

movable asset integral to the vehicle. TACNET also migrates interoperability down to the first responder in the field, not just at the command level.

The average base TACNET system costs $10,000, comparable to the cost of mobile data computers being purchased today. Installation and configuration costs are consistent with costs of equipment installed separately. Since TACNET makes use of existing police radio systems, including Motorola, MA/COM, Kenwood, and similar systems by other manufacturers, there is no need to purchase new mobile radio equipment.

TACNET offers the potential to be a cost-effective bridge to voice radio interoperability. If, for example, first responder agencies in each state had 100 units in operation at any given time, the nation's interoperability concerns would be dramatically reduced.

Conclusion

Visteon supports the Committee's initiative in making available the necessary spectrum so all first responders can communicate seamlessly on the same bandwidth. As a supplier to the law enforcement community, we will work with our customer agencies to ensure that the vehicle systems we supply meet their evolving communications requirements as migration to the 700 MHz spectrum occurs.

Visteon believes that TACNET is a good example of a low-cost, effective technology answer to the communications interoperability challenge that can help save lives now. TACNET is a solution that is available today and compatible with future police technologies. We look forward to working with the Members of the Committee, the Congress, and first responder agencies across the nation to help solve the critical challenge of first responder communications interoperability.

Thank you for the opportunity to submit this statement.

Before the

Subcommittee on Telecommunications and the Internet

United States House of Representatives

Hearing on "Public Safety Communications from 9/11 to Katrina: Critical Public Policy Lessons"

Statement of Edwin A Kelley
Principal Engineer
Interoperable Wireless

September 29, 2005

I. Introduction and Summary

"How do we make sense of the current state of public safety wireless communications and how should we proceed to fix it?"

The unfortunate incidents of 9-11, Katrina, and Rita highlight the critical nature of a modern public safety communications infrastructure and the need for all the efficiency, operability, interoperability, survivability, and connectivity possible. The problems in public safety wireless go far beyond lack of enough suitable spectrum, or basically beyond the domain and purview of the FCC. The problems in public safety wireless go to the heart of what we call the four "Insolvable" problems in public safety:

(1) Spectrum. Public Safety requires more spectrum resources, and they require it soon.
(2) Interoperability. Our first responders can't talk to each other.
(3) Equipment. Nearly all deployed public safety wireless equipment is obsolete, and the modern equipment that everybody should have costs too much.
(4) Funding. The cities are broke, the counties are broke, the states have no money, and the federal deficit is already too large.

We submit that the answers to those "Insolvable" problems only appear when one addresses all four problems together. We believe that this Subcommittee's desire is to understand the entire public safety wireless problem and it must understand that simply focusing on one problem, such as spectrum or interoperability or failure, does everyone an injustice. As we show in the following submission, optimizing and solving only the spectrum issue will have substantial negative implications to the other three "Insolvable" problems, making them worse and thereby actually increasing public safety's communication problems. This process of determining the spectrum needs of public safety, near-term and long-term, can only be accomplished in the context of the larger problem – improving or solving all four "Insolvable" problems together.

The Subcommittee must understand that without a process of implementing and deploying spectrum efficiency techniques in public safety wireless systems, that it will be endorsing the current processes that enable public safety to waste large amounts of spectrum, and it must then

be prepared to allocate substantial new spectrum in VHF/UHF to provide public safety with the wireless resources it needs to do its job. When we address these issues one or two or even three at a time (as Congress has done in its spectrum and interoperability legislative proposals), we formulate incomplete mechanisms and thus we will get partial results. While it seems easier to conceive and address some of public safety problems (e.g., spectrum or interoperability) separately, a single issue approach only promulgates the status quo and won't result in the much improvement at all – maybe not even in that one issue.

Unfortunately, Congress is organized in a way that exacerbates this partitioned system because it itself also separates spectrum (in the House Energy and Commerce and the Senate Commerce Committees) from homeland defense (in the House Homeland Security and the Senate Homeland Security and Governmental Affairs Committees). Bills such as the HERO Act (HR 1646) and the SAVES LIVES Act (S. 1268) (and perhaps other legislation as a result of the December 17, 2005 report to Congress) primarily address spectrum issues (with a little funding and interoperability). These spectrum focused bills are separated from homeland security bills such as (S. 21, S. 1274, HR 1323, and HR 1251) that primarily address interoperability (and a little equipment and funding) but and ignore spectrum. The real insight is that all these bills are actually highly related and unified by spectrum in one important way: they identify the *presumed* upcoming FCC spectrum auctions as their primary source of funding public safety and/or DTV conversion. Thus it is important that these FCC spectrum auctions proceed in some manner so that public safety may be funded in meaningful ways from their proceeds.

The true irony in the current scenario is evident from the filings contained in FCC WT Docket 05-157. Because of genuine and documented requirements described in these filings, public safety makes a very good case for obtaining most (if not all) VHF and UHF spectrum eventually released from DTV conversion. If (as is likely) the FCC recommends and then Congress passes legislation to transfer many tens or hundreds of MHz of valuable VHF and UHF to critical homeland security and public safety use, the probable result is that there will be very few future FCC spectrum auctions, and thus very little funding for public safety equipment and interoperability projects. If public safety is allocated most of their requested spectrum, then they simultaneously lose their most viable source for future funding for equipment and

interoperability. Further, the WT Docket 05-157 filings by the commercial wireless telecommunication industry make evident that this VHF and UHF spectrum is desperately needed for new wireless commercial products and services that are extremely important for growth in our highly mobile national economy.

Thus, by focusing only the "insolvable" spectrum problem yields alone this circular dilemma:

(1) If public safety doesn't get more spectrum, they will not be able to improve first responder communications and interoperability.

(2) If public safety is successful in getting most of the additional spectrum they need, there will be no more FCC auctions, or at least they will be very much curtailed. Thus, there will be very little funding from the FCC auctions for public safety interoperability or DTV conversion.

(3) But the national economy also desperately needs most of this VHF/UHF spectrum from DTV conversion to grow connectivity and mobility, so we can't afford to allocate very much more of it to public safety.

(4) Go back to (1) and repeat.

Interoperable Wireless in this contribution will show that there is an answer to this circular spectrum dilemma as well as the other four "insolvable" problems in public safety wireless. **These 4 "insolvable" problems in public safety are actually solvable if and only if they are addressed all four together at one time.** They are apparently "insolvable" when addressed separately, such focusing only on a single issue individually like spectrum or interoperability.

In order to do this, we will examine and refute six common myths in public safety wireless communications, all involving spectrum:

Myth #1: Public safety users are good spectrum stewards and conserve spectrum with new technology.

Reality #1: Public safety users are spectrum hogs, and routinely deploy new systems with modern technology that use 2X, 4X, 8X or more spectrum than needed in order to save small amounts of money.

Myth #2: If public safety just had enough spectrum and enough funding, then we could buy modern equipment and finally have interoperability.

Reality #2: Public safety uses an awful lot of equipment, an enormous amount of spectrum, and huge amounts of money NOT to be interoperable.

Myth #3: Public safety requires spectrum to improve interoperability.

Reality #3: True interoperability requires *less* spectrum not more. "Band aid" interoperability approaches are extremely spectrally inefficient. Public safety commonly uses spectrum to perpetuate non-interoperability.

Myth #4: Public safety must have greater than 90 MHz of VHF/UHF to support interoperable voice services.

Reality #4: More than 60,000 busy users and 60,000 non-busy users (note: a dense area like Los Angeles County has only 100,000 total public safety users) can be supported in less than 8 MHz using well known (but infrequently deployed) spectrum efficiency techniques. This will free-up 40 – 50 MHz of currently allocated VHF/UHF spectrum for high-speed data.

Myth #5: Commercial wireless systems can meet public safety Quality of Service requirements.

Reality #5: Because of public safety's unusual requirements, commercial systems require many hundred's of MHz of spectrum to duplicate public safety wireless QoS. Besides, commercial systems are probably useless in terrorist emergencies because they are routinely de-activated to prevent cellular activated explosive devices.

Myth #6: Public safety can achieve critical interoperability near term using autonomous approaches.

Reality #6: The eight autonomous interoperability techniques currently advocated by DHS/SAFECOM actually act as "band-aids", waste spectrum in order to operate, are not robust enough to be used on a daily basis and thus have questionable utility in a crisis.

Integrated interoperability techniques (not currently used by DHS/SAFECOM) are robust enough for daily as well as crisis use and save enormous amounts of spectrum.

The result of examining these myths and describing their associated realities is that we will show that public safety can use ANSI series 102, 902, and 905 equipment (AKA the APCO Project-25 standard) in **spectrally efficient** ways to actually **reduce public safety spectrum voice requirements by at least 10X and make all first responders interoperable. This will free-up about 40-50 MHz of current (non 700 MHz) spectrum for high-speed wireless data.**

Finally, we make an critical suggestion to the Subcommittee. Because of programs such as CAP-WIN, the Washington DC area has a modern public safety wireless system. Because of 9-11 and the $20B rebuilding fund, New York City has a modern public safety wireless system. However, the 88 Los Angeles area cities and Los Angeles County are arguably the 3rd most likely terrorist target and they have perhaps the worst communications and least interoperable public safety wireless systems in the country. **We encourage that the Congress consider designating and funding Los Angeles County and cities to be the site of a national Spectrum Efficiency Demonstration System (SEDS).** SEDS would be the key mechanism where we can demonstrate how well known (but seldom deployed) spectrum efficiency techniques can be combined to compress 80 MHz or more of public safety voice services into only 8 MHz. This in turn will open up 40 to 50 MHz of **current** spectrum in VHF/UHF now used for public safety voice for desperately needed high speed data services – far more than the 12 MHz currently allocated by FCC/NCC in the 700 MHz band. Ultimately, the goal of SEDS would be four-fold: (1) to create a successful spectral efficiency template in Los Angeles that can be **economically** replicated elsewhere (perhaps everywhere) in the USA; and (2) to demonstrate how spectral efficiency can eliminate all need for additional public safety spectrum allocations; (3) demonstrate interoperability takes *less* spectrum not more, and (4) show an approach for simultaneously solving all 4 "insolvable" public safety wireless problems (spectrum, interoperability, equipment/cost, and funding).

We suggest that Congress require the FCC to temporarily set aside tens of MHz of VHF/UHF spectrum for potential public safety use pending the results and success of the SEDS

demonstration. After the appropriate SEDS demonstration, test, and evaluation, a national dialog could begin in the public safety wireless community under the jurisdiction of the FCC and NTIA/OSM. **The likely result is that valuable VHF/UHF spectrum initially set aside for public safety could at that time be auctioned off to commercial wireless businesses to enable continued growth in the national economy as well as providing the necessary funding for replicating the Los Angeles SEDS template across the nation to all 2.5 million first responders. This is a win-win-win scenario for everyone – public safety, the commercial wireless businesses, and the national economy.**

II. MYTH #1: PUBLIC SAFETY USERS ARE GOOD SPECTRUM STEWARDS AND CONSERVE SPECTRUM WITH MODERN TECHNOLOGY

Reality #1: Public safety users are spectrum hogs, and routinely deploy new systems with modern technology that use 2X, 4X, 8X or more spectrum than needed in order to save small amounts of money.

The "dirty little secret" in public safety is that public safety users are "frequency hogs," that they use a lot of spectrum, and that they use a lot of spectrum by design. The "really dirty little secret" is that public safety users routinely design and deploy systems using 2X, 4X, and even 8X or more spectrum than absolutely necessary in order to save $1M or $2M or $4M (really measly small amounts of money).

Why do they do this??

Because public safety is extremely concerned about quality of service (QoS) in its wireless system. Figure 1 shows how total ownership cost (acquisition plus operation plus maintenance) increases as a function of QoS. Public safety always desires more coverage, and this means more sites, N. Public Safety also desires more users, and this means more channels, C. Public safety

also desires more service in its channel, and this means a high cost system, E. So, as these QoS variables are increased, the total ownership cost increases as a 3rd order cost exponential.

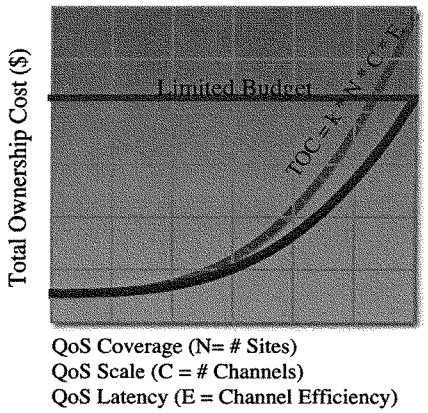


Figure 1. Economic Trade-offs Cause Public Safety to be Massively Spectrum Inefficient. Massive spectrum waste permits deploying a slightly higher QoS system on a limited budget. The trade-off comes down to: Either spend funds to reduce spectrum requirements by 4X, 8X, or 12X or more, or use those funds to increase QoS slightly and, perhaps, save first responder lives. Nearly all public safety deployments choose the choose QoS (saving lives) over spectrum efficiency. Because of lack of any cost on the spectrum, the resulting economic trade-offs cause public safety to be massively spectrum inefficient.

When a new public safety system is deployed it is always on a limited budget. That means that the system cannot have as many sites N, or as many channels C, as are desired. However, if a spectrally *inefficient* architecture is implemented, then the cost can be reduced by 10-15%. It takes money to buy simulcast controllers, voters, trunking controllers, and narrowband technology. By not spending money on these spectral efficiency items (or only as little money as absolutely necessary) then the critical QoS elements such as number of sites and number of channels can be increased again. Massive spectrum waste permits deploying a slightly higher QoS system on a limited budget. The trade-off comes down: They may either spend funds to reduce spectrum by 4X, 8X, or 12X or more, or use those funds to increase QoS slightly and, perhaps, save first responder lives. Nearly all public safety deployments choose the choose QoS

(saving lives) over spectrum efficiency. Because of lack of any cost on the spectrum, the resulting economic trade-offs cause public safety to be massively spectrum inefficient.

There are substantial spectral efficiency benefits from combining three Project-25 spectrum efficiency techniques (see Table 1, top) into one system: (1) Narrowbanding; (2) Simulcast; and (3) Trunking. Since all these techniques can be combined together, and are multiplicative in their benefits, then the result can be an extraordinary large increase in spectral efficiency. A reasonable goal is 10X spectral efficiency improvement, but larger spectral efficiencies are certainly possible or even likely.

Table 1. Spectral Efficiency Techniques and Spectral Inefficiency Practices. These efficiency techniques are combinable and the results are multiplicative. Further, a modern trunked talk group system eliminates such as allocating whole frequency channels to small jurisdictions and patching two channels together to create larger talk groups. This would mean that it is possible to do all Los Angeles County and Cities voice communication using only < 10% of current spectrum. Then the remaining 90% could be reallocated to critical high speed data and video uses

Spectral Efficiency Technique	Improvement
Narrowbanding	2X-4X
Simulcast	2X-10X
Trunking	2X
Total	8X-80X

Spectral Inefficiency Practices	Improvement
Independent Systems	1X-3X
Patching	1X-3X
Grand Total	8X-100X

A further improvement is possible (see Table 1, bottom) if one reduces or eliminates common public safety spectrum inefficiency practices. In a community such as Los Angeles County there are many independent systems, often administered by small jurisdictions. Normally, the Regional Planning Committees (RPCs) will allocate channels at the rate of one frequency pair per 100

users. But what if there are fewer than 100 users in a jurisdiction? Since the RPC can't allocate a partial channel, then it rounds up the allocation to a whole channel pair. In fact, often a second channel pair is allocated as an active back-up channel. In a multicast, simulcast, trunked, narrowband system, then those sub-100 user jurisdictions would receive the equivalent of a "fractional channel" and there will be a resultant spectral efficiency. Similarly, it is common to "patch" two talk groups or independent systems together to make a larger talk group. These legacy approaches take excess spectrum and are obsolete in a modern trunked talk group system. The result of the efficiency and inefficiency approaches is not purely multiplicative, and so we have estimated a potential grand total of somewhere between 8X and 100X. Thus, we believe that a 10X improvement is a realistic goal, and a greater improvement such as 25X is a reasonable "stretch" goal for spectrum efficiency improvement. The result is to take about 80 MHz of wireless voice services (well more than the 47.55 – 58 .15 MHz currently available) and compress it into less than 8 MHz. This will free up 40 – 50 MHz of spectrum for new services, such as high speed data (see Section V).

There is no real magic here; all these spectral efficiency techniques are well known by the NTIA, the FCC, and public safety engineers. But far too often these spectrum efficiency techniques just cost too much money and are simply "designed out" of the system, and thus are infrequently deployed, or were not deployed in obsolete legacy systems.

The other feature of spectrum efficiency by consolidation is that the approach creates an underlying Interoperability fabric. Interoperability is just built in and continuously available on demand. The best way to think about it is to use the Verizon cellular system as an example. When somebody talks on a Verizon phone, it doesn't mean that they are immediately connected to all 2.5 million users in LA. It just means that if they have to talk to any of them, then it is just an ordinary process to make that happen. Thus:

- Interoperability is integral and intrinsic to the system, not patched-in or wired-up
- Users have as much or as little interoperability as they require or are comfortable with
- Saves, reuses, consolidates spectrum across all users

However, just implementing a public safety system using Project-25 waveforms and protocols is not a panacea and does not automatically result in hardware and spectrum efficiency. Very often public safety systems are implemented using non-spectral efficiency techniques because of two phenomena: (1) Commercial manufacturers charge more for hardware systems to spectrum efficiency; (2) The spectrum was committed many years ago and is just reused (in an inefficient manner) because it costs more money to be efficient. The dirty little secret is that most recent systems have been deployed using 2X or 4X more spectrum than really necessary in order to reduce the system cost by 10-20%. Manufacturers charge slightly more for narrowband (12.5KHz) channels than last generation channels (25 KHz) so through 2006 many systems will be deployed in 25 KHz. Manufacturers charge more for trunking hardware (like in cellular systems) so Project-25 systems are often deployed in non-trunked (conventional) mode to save money and use 2X the spectrum. Manufacturers charge more for simulcast controllers and voters, so Project-25 systems are often deployed in non-simulcast forms, and thus use much more spectrum.

III. Myth #2: If public safety just had enough spectrum and enough funding, then we could buy modern equipment and finally have interoperability

Reality #2: Public safety uses an awful lot of equipment, an enormous amount of spectrum, and huge amounts of money NOT to be interoperable.

When one wastes spectrum, not just by 10-15%, but by 2X, 4X, 8X or even more (as detailed in Section II), there is simply not enough total spectrum to ever satiate this spectrum gobbling monster. Further, since the cost function shown in Figure 1 is a 3rd order exponential, the cost may become enormous and there may never be enough money in all branches of government to fund expanding QoS demands.

Finally, we would like to make this point from a different perspective; let us compare public safety wireless to a commercial wireless -- Verizon. Suppose we told Verizon that they had to cover nearly 100% of Los Angeles County (not the just the 50% where there are appreciable

customers), but they had to do it with 27 separate wireless systems on 8 different bands. There is no doubt that they would have the same spectrum problems, interoperability problems, equipment/cost problems, and funding problems (who would invest in that monstrosity?) that public safety now has.

The fact is that 25 years ago commercial wireless was in nearly the same situation that public safety is in today. There were once nearly 20,000 separate wireless operators, more than public safety has currently. However, over these last 25 years we have consolidated, merged, replaced, taken over, and bankrupted into today's situation where we have only a handful of wireless companies (e.g., Sprint, Verizon, Cingular). The result has been enormous wireless efficiencies: spectrum, cost, equipment, technology, upgrades, interoperability, shareholder value, capabilities, and price. Unfortunately, public safety has never consolidated its thousands of independent operations and thus there have been no efficiencies from consolidation.

The taxpayers can no longer fund, maintain, support, and upgrade all these independent non-interoperable systems. The nation can no longer afford to allocate excessive spectrum to support non-interoperable inefficiencies. Our national security depends on efficient allocation of spectrum, funding, equipment, and personnel resources to both public safety and commercial endeavors. We can no longer afford the excessive public safety deployments that use an awful lot of equipment, an enormous amount of spectrum, and huge amounts of money NOT to be interoperable. It simply cannot continue.

The result is our current situation: Public safety uses an awful lot of equipment, an enormous amount of spectrum, and huge amounts of money NOT to be interoperable.

IV. Myth #3: Public safety requires spectrum to improve interoperability

Reality #3: True interoperability requires *less* spectrum not more. "Band aid" interoperability approaches are extremely spectrally inefficient. Public safety commonly uses spectrum to perpetuate non-interoperability.

This myth/reality is a corollary of sections II and III. Public safety requires additional spectrum to continue to build and replace independent non-interoperable system, e.g., the status quo. Interoperability, like spectrum efficiency, costs money, and thus will diminish QoS. The simple fact is this: truly interoperable communications actually require *less* spectrum, not more. We will show in Section V that the total voice traffic for 100,000 (actually 120,000) users in Los Angeles County require less than 8 MHz using *integrated interoperability* systems with spectrum efficiency deployments. The main reason that public safety voice takes 50+ MHz currently, and public safety is requesting so much more in Docket 05-157, is that it takes that enormous spectrum to continue on the current path of maintaining and expanding *separate spectrally inefficient* non-interoperable systems.

To be sure, "interoperability band-aids" that are currently being funded and deployed in COPS, ICTAP, and Project SAFECOM programs. However, these do not even begin to put us on the path of spectrum efficiency. We are talking about integrated interoperability (described in section VII) that intrinsically comes from consolidating dozens or hundreds of independent "smoke stack" public safety systems and user groups into one.

We have important examples of this process in cellular: Verizon, Sprint, Cingular. Interoperability comes from wireless consolidation pure and simple; look at Verizon, Sprint, and Cingular. Wireless consolidation produces spectrum efficiencies; again look at Verizon, Sprint, and Cingular. As long as we continue to feed these independent *spectrally inefficient* public safety wireless voice systems with *additional* spectrum and funding, we will require even more spectrum and funding.

True interoperability requires *less* spectrum not more. "Band aid" interoperability approaches are extremely spectrally inefficient. Public safety commonly uses spectrum to perpetuate non-interoperability.

V. Myth #4: Public safety must have greater than 90 MHz of VHF/UHF to support interoperable voice services.

Reality #4: More than 60,000 busy users and 60,000 non-busy users (note: a dense area like Los Angeles County has only 100,000 total public safety users) can be supported in less than 8 MHz using well known (but infrequently deployed) spectrum efficiency techniques. This will free-up 40 – 50 MHz of currently allocated VHF/UHF spectrum for high speed data.

Many submissions to Docket 05-157 cite the PSWAC[1] report to support their demands for more spectrum, more than even the 24 MHz allocated when the 700 MHz when it becomes available. We will show that the PSWAC report uses an Erlang model based on cellular deployment model, rather than a model that is possible with the APCO Project-25 standard.

In Table 2 and Table 3 we summarize the current spectrum allocation for federal, state, and local public safety for Los Angeles. Los Angeles is one of the 11 metropolitan areas that currently use 120 channels in TV Channel 19, so the total spectrum allocation in Los Angeles is 53.65 MHz instead of 47.65 MHz as in most communities (and will increase to 58.15 MHz (53.65 MHz) after 800 MHz rebanding is complete). Notice that these allocations are for currently deployed systems and the tables do not include any spectrum allocations in 700 MHz or 4.9 GHz.

The portion of the PSWAC traffic model for present requirements is shown in Table 4. From this table, present traffic for a "busy user" requires 0. 0554832 Erlangs of capacity. From this one could reasonably conclude that the voice portion of the capacity is really only (0.0073484 + 0.0462886) = 0.053637 Erlangs, which is actually the case for a conventionally deployed trunked system.

[1] *See* Final Report of the Public Safety Wireless Committee to the Federal Communications Commission and the National Telecommunications and Information Administration, Public Safety Wireless Committee, September 11, 1996 (PSWAC Final Report).

Table 2. Existing Federal Public Safety Spectrum Allocations in Los Angeles.

Band (MHz)	Total Allocation	Public Safety	Comments*
25-50	6.36	3.8	VHF Low Band. Used extensively by the Military and other Fed Agencies for fixed, land/maritime/aeronautical mobile services.
138-150.8	6.75	4.0	VHF Military Band. Used extensively for Military non-tactical mobile systems. Heavy use by fixed, aero mobile and maritime mobile.
220-222	0.1	0.1	SMR Band. Very narrowband. May be used for some ITS requirements.
406.1-420	13.9	8.3	UHF Low Band. Federal growth band. Used for wide variety of land, maritime, aero mobile. Heavily used for fixed service. Most Fed government trunked systems.
	38.89	24.45	TOTAL

*** From PSWAC report, page 27, September 11, 1996.**

Table 3. Existing State and Local Public Safety Spectrum Allocations in Los Angeles

Band (MHz)	Channels	MHz (est.)	Comments*
25-50	315	6.3	VHF Low Band. Generally used for conventional, non-trunked dispatch voice communications. The band is in use by state highway patrols for wide-area coverage. Future use of the band is questionable as equipment availability is limited.
150-174	242	3.6	VHF High Band. Generally used for conventional, non-trunked dispatch voice communications
220-222	10	0.1	SMR Band. This allocation is fairly recent, and requires very narrow (5 kHz) channelization. New equipment is limited for this band.
450-470	74	3.7	UHF Low Band. Generally used for conventional, non-trunked dispatch voice communications.
470-512	120	6.0	UHF TV Sharing. Various bandwidth have been made available in 11 metropolitan areas for private land mobile radio use, including Public Safety use. AKA T-Band
806-821 851-866	70	3.5 (8.0)	800 MHz Band. Used for conventional and trunked 851-866 systems. Subject to 800 MHz rebanding, and an additional 4.5 MHz from NEXTEL when completed.
821-824 866-869	230	6.0	800 MHz Band. Used for both conventional and trunked systems.
	1061	29.2 (33.7)	TOTAL

*** Table 3 is from PSWAC report, page 25-26, September 11, 1996.**

Table 4. PSWAC Traffic Model for Present Requirements. For simulcast, multicast, trunked deployments, Erlang traffic is generated ONLY by user generated PTT traffic (all other users in the talkgroup simply listen to the associated channel of the channel pair), and thus the outbound Erlang requirement can be ignored.

Present Requirements Summary (Average Busy Hour):		
Transaction Type	Inbound Erlangs	Outbound Erlangs
Voice (Digital)	0.0073484	0.0462886
Data	0.0004856	0.0013018
Status/Message	0.0000357	0.0000232
Present Busy Hour Traffic Load Per Officer: 0.0554832		

However in a simulcast, multicast public safety system, most terminals are simply listening to the trunked traffic channels and thus require exactly zero Erlangs capacity. In other words, all traffic in a simulcast, multicast system is initiated from a PTT user, and thus all other members of the talk group simply listen to the associated trunked frequency pair. This means that the total capacity requirement for a busy user is a mere 0.0073484 Erlangs, not 0. 0554832 Erlangs. Thus, 60,000 busy users plus another 60,000 non-busy users will require 550 Erlangs of capacity.

This capacity, as calculated using Erlang-C, requires 570 channel pairs. These Erlang-C calculations are summarized in Table 5 where the system has been segmented into 10 subsystems, each with 55 Erlangs of traffic. In Project-25 phase II technology, these 570 channel pairs require only 7.125 MHz. Additionally, about 30 - 40 control channels will be needed for an additional 750 KHz – 1 MHz.

By comparison when we use the full PSWAC traffic model for conventional mode, the same 60,000 busy users and 60,000 non-busy users require 3218 Erlangs and 804 Erlangs, respectively, totaling 4022 Erlangs. This requires approximately 4100 channels, which translates into 102.6 MHz (for 12.5 KHz frequency pairs) or 205.2 MHz (for 25 KHz frequency pairs).

Thus, LA County could provide 102.6 MHz of voice services in only 7.125 MHz of spectrum, which is sufficient for 60,000 busy users and 60,000 non-busy users. Since over 50 MHz of spectrum is already allocated to public safety, then between 40 and 50 MHz would be available for non-voice or high speed wireless data services.

Table 5. Excel Spreadsheet Erlang-C Calculation for Projected Traffic. We have calculated channel requirements based on projecting the probability of queue times of > 10 seconds is less than 1%.

			Erlang C Calculation		
			# of voice channels	Probability of a call being queued, Pd	Probability of a call being queued for greater than Maximum Queue Delay P(T>t)
Offered traffic (erlangs)		55	1		
Maximum Queue Delay (sec)	t	10	2	53.07018	###################################
Average transmission length (sec)	h	5	3	51.17656	###################################
	6.29914		24	19.74301	16659852030906100000000000000.00000
			25	18.64027	2128733077366470000000000000.00000
			26	17.57296	271596874947643000000000000.00000
			27	16.54096	34598055956777000000000000.00000
			28	15.54419	4400175592822520000000000.00000
			29	14.58252	558657616506969000000000.00000
			30	13.65585	70801545574151000000000.00000
			31	12.76402	8956176949012510000000.00000
			32	11.90689	1130692960062230000000.00000
			33	11.08430	142450963940245000000.00000
			34	10.29604	17907649880286500000.00000
			35	9.54192	2246027979734080000.00000
			36	8.82170	281023620197936000.00000
			37	8.13513	35072439825099100.00000
			38	7.48192	4365414572790570.00000
			39	6.86175	541824333647894.00000
			40	6.27428	67049912565382.90000
			41	5.71911	8271298487865.79000
			42	5.19581	1016973605202.09000
			43	4.70391	124602401784.98400
			44	4.24288	15210358587.32430
			45	3.81215	1849522189.28773
			46	3.41108	223971374.83097
			47	3.03898	27004689.47612
			48	2.69509	3241121.91313
			49	2.37858	387125.58531
			50	2.08857	46003.90019
			51	1.82410	5437.57108
			52	1.58414	639.08640
			53	1.36758	74.66745
			54	1.17328	8.66941
			55	1.00000	1.00000
			56	0.84648	0.11456
			57	0.71140	0.01303
			58	0.59340	0.00147
			59	0.49112	0.00016
			60	0.40318	0.00002
			61	0.32820	0.00000
			62	0.26484	0.00000
			63	0.21179	0.00000
			64	0.16781	0.00000
			65	0.13169	0.00000
			66	0.10235	0.00000

VI. Myth #5: Commercial wireless systems can meet public safety QoS requirements.

Reality #5: Because of public safety's unusual requirements, commercial systems require many hundred's of MHz of spectrum to duplicate public safety wireless QoS. Besides, commercial systems are probably useless in terrorist emergencies because they are routinely de-activated to prevent cellular activated explosive devices.

Figure 2 shows a plot of hardware (cost) efficiency versus spectrum efficiency for voice, data, and video services for 6 different standards when engineered for maximum effectiveness and deployed in a typical public safety deployment. For public safety type systems[2] non-multicast non-simulcast technologies such as GSM/GPRS/EDGE (T-Mobile, Cingular), CDMA (Verizon, Sprint), and iDEN (Nextel) will require many channels (base stations and spectrum) to implement PTT over Cellular (PoC). This translates into large hardware (cost) inefficiencies and requires a lot of spectrum.

How can it be that commercial technologies are 10X, 100X, or even 1,000X less spectrally efficient than APCO Project-25 waveforms? The answer is that Project-25 is designed to support our first responders in a way that reflects their standard operating procedures (SOP). The SOP is simply that our first responders train to *work together, and that means they communicate together.* The standard call for commercial wireless is one person communicating to one person. The standard call for public safety is a group call. A group call is similar to a conference call where many users listen to the same voice communication. The FCC and RPCs require that one frequency be allocated to every 100 first responders (e.g., Los Angeles police department uses 109 frequencies to support 9,200 uniformed and many additional civilian users, about 100:1), and thus group calls may *average* 100 users.

[2] Public safety system operates with large talk groups, which are implemented with multi-cast technology. GSM/GPRS/EDGE, CDMA, and iDEN implement talk groups (sometimes called PTT over Cellular) using packet replicators, and thus each user in a talk group requires a separate channel and additional frequency. For large talk groups, that translates into enormous numbers of channels (cost) and many MHz of spectrum.

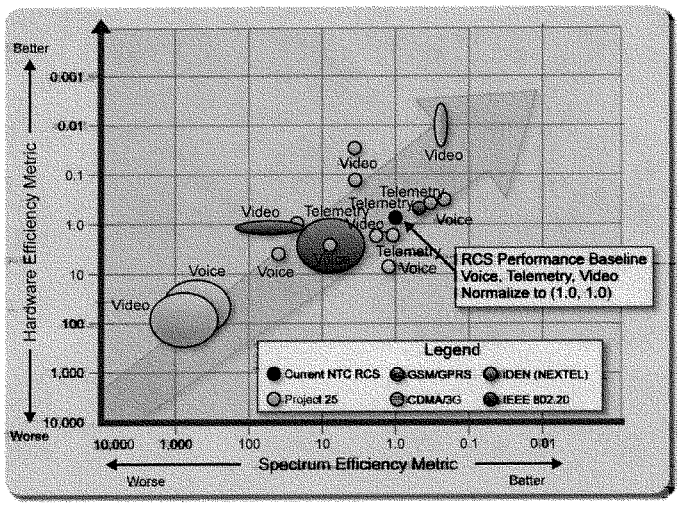


Figure 2. Plot of Hardware Efficiency as a Function of Spectrum Efficiency for Various Wireless Standards. Hardware (cost) efficiency and spectrum efficiency correlate across technologies.

In public safety, this can be accomplished in as little as a *single* frequency pair because APCO Project-25 is designed to support group calls using technologies such as multicast and simulcast. For commercial cellular technologies, the same 100 user group call will take an amazing 100 channels, or at least 2MHz of spectrum. If we assume that all 109 channels in LAPD are active simultaneously (and they will be, because they have 100 users each), then this can take an amazing 10,900 channel pairs, which is very nearly the entire channel capacity of the commercial carriers in LA City. The fact is, commercial cellular carriers are very spectrally inefficient way to build public safety capacity, and this is shown graphically in Figure 2. Because of the technologies used and the way it is implemented, commercial cellular cannot provide anywhere near the capacity for daily or emergency communications for public safety.

Further, given then experiences in Iraq and Israel, terrorists have the capability to use commercial cellular to detonate explosive devises. It is currently standard procedure as a precaution to de-activate cellular systems during times of emergencies (such as the London

bombings) even if they have nothing to do with cellular systems. We cannot plan to commit mission critical communications to systems that may not even be operational.

The possible exception to this is satellite communications. Satellite is an effective replacement for cellular systems in emergency situations for person to person communication. However, they also do not support multicast communications, and thus cannot be expected to be an effective replacement or backup for the group call in emergency public safety communications.

VII. MYTH #6: PUBLIC SAFETY CAN ACHIEVE CRITICAL INTEROPERABILITY NEAR TERM USING AUTONOMOUS APPROACHES.

Reality #6: The eight autonomous interoperability techniques currently advocated by DHS/SAFECOM actually act as "band-aids", waste spectrum in order to operate, are not robust enough to be used on a daily basis and thus have questionable utility in a crisis. Integrated interoperability techniques (not currently used by DHS/SAFECOM) and similar to those implemented by commercial carriers such as Verizon, are robust enough for daily as well as crisis use and save enormous amounts of spectrum.

All public safety radio communications interoperability strategies that have been proposed and deployed to date have been autonomous. As such, they begin with two overall objectives: (1) create a system of interoperability "on top of" the currently deployed systems; and (2) NOT to disturb or impact in any way ANY of the underlying wireless public safety systems. We believe that this is a mistake and results, as a direct consequence in minimal interoperability.

We believe the better approach is to begin with two other objectives: (1) create a system of interoperability that is "integrated" and can be exploited to impact and replace all underlying wireless public safety system; and (2) deploy it in a way that the disruption is managed and minimal and that the user community can decide when/if there will be an impact. We believe that

this is the only means in which public safety can begin to meet the goals and objectives of SAFECOM Interoperability.

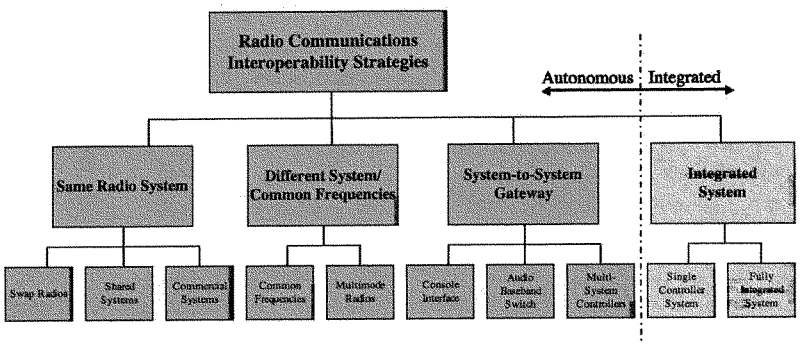


Figure 3. Autonomous versus Integrated Interoperability Strategies. We show two completely new types of public safety interoperability strategies to the complement of known approaches, both of which belong to a new class of interoperability: integrated interoperability. The Single Controller System strategy is exemplified in the Mutual Aid System is all digital, much simpler, and more reliable than all other known strategies/approaches. The Fully Integrated System approach is where everyone is on the same system with the same standards and protocols. Interoperability is total because all "daily users" are on the same system.

Figure 3 is a modified version of a diagram taken from an April 1, 2003 AGILE report[3] showing the various categories and strategies for interoperability. In this report, each of the 8 common interoperability strategies are categorized into three major themes: (1) Same Radio System; (2) Different System/Common Frequencies; and (3) System-to-System Gateway. However, all 8 strategies have the same two objectives described earlier: (1) create a system of interoperability "on top of" the currently deployed systems; and (2) NOT to disturb or impact in any way ANY of the underlying wireless public safety systems. As such we believe that they ultimately perform as interoperability "band-aids": autonomous systems with no impact on the currently deployed systems and thus very limited potential impact in benefits from either daily or major incident interoperability.

[3] #TE-02-02, *Guide to Radio Communications Interoperability Strategies and Products*, April 1, 2003

Further, the most "popular" interoperability strategies implement crossband repeaters across the many divergent public safety bands (shown in Table 3 and Table 2). The result is that a communication that take one frequency pair in a multicast system, may be rebroadcast on 4, 5 or more other frequency pairs to implement interoperability. The result is that these interoperability strategies quickly become extremely spectrum inefficient as the gobble up additionally channels on multiple bands in order to function.

In contrast, there are interoperability approaches that form an entirely new category of interoperability: Integrated Systems. . This is the category of integrated interoperability most people are used to when they think of large commercial wireless carriers such as Verizon, Sprint, or Cingular. The Single Controller System is fully integrated as a single (redundant) system. But more importantly, it is designed and deployed to be extendable into a Fully Integrated System. Thus it is designed not to be autonomous (although it can easily operate that way), but as a bridge to help transition the legacy systems into a modern fully integrated system. Thus, the interoperability systems have the goal/objective of impacting the systems and implementations of users. As individual jurisdictions become "comfortable" with the operation and performance, they can manage the impact of the conversion and modernization.

Thus on one extreme, they could choose to completely upgrade to new equipment (for very low cost), and limit their user coverage areas and ability to communicate to other jurisdictions. At the other extreme, they could fully extend the coverage areas, and definite interoperability talk groups to other public safety users and jurisdictions. Likewise, there are many operational points in between.

We believe that ultimately almost all users will extend and migrate to the largest suitable coverage and the largest user community as their frequency of use, training, policies and procedures require and/or permit. This forms the basis of a viable and minimal risk transition plan. Under the umbrella of a fully integrated system, these extensions and migrations functions are entirely operational and will simply require the definition or modification of talk groups.

The eight autonomous interoperability techniques currently advocated by DHS/SAFECOM actually act as "band-aids", waste spectrum in order to operate, are not robust enough to be used on a daily basis and thus have questionable utility in a crisis. Integrated interoperability techniques (not currently used by DHS/SAFECOM) and similar to those implemented by commercial carriers such as Verizon, are robust enough for daily as well as crisis use and save enormous amounts of spectrum.

VIII. CONGRESS MUST FUND A NATIONAL SPECTRUM EFFICIENCY DEMONSTRATION SYSTEM (SEDS) IN LOS ANGELES COUNTY

Finally, we make a critical suggestion to the Subcommittee to consider a Spectrum Efficiency Demonstration System (SEDS). Los Angeles city and Los Angeles County are arguably the 3rd most critical terrorist target in the country, but they perhaps the worst communications system with the least interoperability. The other two major terrorist target areas have good public safety wireless communications. CAP-WIN and other programs have made the Washington DC area the most modern public safety wireless system in the Country. Because of 9-11 and the $20B rebuilding fund, New York City also has a modern public safety wireless system.

SEDS would be the key mechanism where we can demonstrate how well-known (but seldom deployed) spectrum efficiency techniques can be combined to compress 80 MHz or more of public safety voice services into only 8 MHz. This in turn will open up 40 to 50 MHz of **current** spectrum in VHF/UHF now used for public safety voice for desperately needed high speed data services – far more than the 12 MHz currently allocated by FCC/NCC in the elusive 700 MHz band. Ultimately, the goal of SEDS would be three-fold: (1) to create a successful spectral efficiency template in Los Angeles that can be **economically** replicated elsewhere (perhaps everywhere) in the USA; and (2) to demonstrate how spectral efficiency can eliminate all need for additional public safety spectrum allocations; and (3) show an approach for simultaneously

solving all 4 "insolvable" public safety wireless problems: spectrum, interoperability, equipment/cost, and funding.

We believe that it may take as little as $8-12B to bring all 2.5 million first responders in the USA into the 21st century with modern Project-25 technology, equipment that they truly require to do the job we need them to do. We believe that this can be done in a 10X more spectrally efficient and 10X lower cost manner, and that the result will be integrated interoperability –the underlying intrinsic ability to communicate with each other everywhere, not a patch or a interoperability "band-aid." We ask the Congress the following questions:

(1) Is it worth $12B to the country to equip first responders with the tools and the modern wireless equipment to do the job we ask and need them to do?
(2) Is it worth $12B to the country so that public safety won't require nearly all the freed-up DTV analog spectrum that is estimated to yield up to $30B at FCC auction and has value of $200B - $432B[4] to the national economy?
(3) Is it worth $12B to the country so that public safety has fully interoperable communications, not as a "band-aid" or kludge, but genuine fully and intrinsically interoperable communications functioning on a daily use as well as an emergency use basis?
(4) Is it worth $12B to the country to provide a permanent fix the four "insolvable" problems in public safety so that our first responders can on and do an excellent job and not have to continuously fight for spectrum and interoperability funding and resources?
(5) Is it worth $350M to demonstrate the first step toward (1) – (4) above and fund a national demonstration SEDS in Los Angeles County that will validate the spectrum efficiency, cost reduction, and full interoperability functionality claims – essentially creating a template that can be extended across the nation to all 2.5 million first responders?

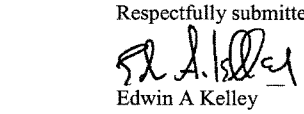
Finally, we suggest it prudent that the FCC recommend to Congress to **temporarily** set aside tens of MHz of VHF/UHF spectrum for potential public safety use pending the results/success of

[4] House Energy and Commerce Subcommittee on Telecommunications testimony by Peter Pisch of Intel on May 26, 2005, describing a report from the Analysis Group by Coleman Bazelon: http://energycommerce.house.gov/108/Hearings/05262005hearing1533/Pitsch.pdf

the Los Angeles SEDS project. After the appropriate SEDS demonstration, test, and evaluation, a national dialog could begin in the public safety wireless community under the jurisdiction of the FCC and NTIA/OSM. The likely result is that valuable VHF/UHF spectrum initially set aside for public safety could then be auctioned off to commercial wireless businesses as envisioned by Intel[3] to enable continued growth in the national economy as well as providing more than the necessary $8-12B funding for replicating the Los Angeles SEDS template across the nation to all 2.5 million first responders.

The unfortunate incidents of 9-11, Katrina, and Rita highlight the critical nature of a modern public safety communications infrastructure and the need for all the efficiency, operability, interoperability, survivability, and connectivity possible. We propose to Congress a win-win-win scenario for everyone – public safety, the commercial wireless businesses, and the national economy – and deserves serious consideration.

Respectfully submitted,



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Testimony of John Vaughan,
Vice President and General Manager, Wireless Systems, M/A-COM, Inc.

Committee on Energy & Commerce
Subcommittee on Telecommunications and the Internet
Public Safety Communications from 9/11 to Katrina: Critical Public Policy Lessons
September 29, 2005

1. Introduction

M/A-COM is one of the largest suppliers of two-way radios to the public safety community in the United States. Headquartered in Lowell, Massachusetts, we are a subsidiary of Tyco Electronics, which is an operating segment of Tyco International. M/A-COM is a market leader in the supply of critical communications systems and equipment for public safety, utility, federal, and select commercial markets. Agencies that provide critical support services to our nation's communities rely on M/A-COM products to enable consistently reliable and secure communications.

M/A-COM is also a pioneer in the development and manufacture of radio frequency (RF), microwave and millimeter wave components and technologies for the wireless telecom, automotive, aerospace and military applications. M/A-COM is a leading manufacturer of Internal Protocol (IP)-based public safety communications systems. Because our systems are IP-based, they allow first responders to share data as well as speak to each other in real-time. Moreover, they provide extensive, in-building portable coverage, as well as mobile coverage out of doors.

We just signed a contract with the State of New York for what is arguably the most sophisticated, most spectrally efficient two-way system in the world, and that includes our most advanced IP interoperability system. That system grew out of New York's experience during September 11th. New York learned and responded to the most critical lesson for enhancing the public's safety in a widespread incident – the need for communications interoperability for all first responders.

More than a dozen years ago, we also supplied the public safety communications network to New Orleans, one that enabled city police and fire departments and emergency personnel to interoperate during Hurricane Katrina, once damage to the main generator was repaired. A lesson learned from that disaster was the importance of physical security for technicians of critical infrastructure. Providing widely-recognized credentialing and physical security for technicians would be an excellent best practice to follow in disasters in the future. The delay caused by that inability to access the generator was the only "down time" in any of M/A-COM's twenty radio systems deployed in the region, including the systems for Mobile, Biloxi, Gulfport, and St. Tammany Parish. The New Orleans generator continued to operate after New Orleans was flooded a second time by Rita.

Our trunking system in the New Orleans Airport allowed the Louis Armstrong International Airport to become a major triage area following the hurricanes, due to its robust support of a number of different first responders and emergency medical personnel. Because of the flexibility of the system, emergency personnel from different disciplines were able to turn the airport into a makeshift hospital, caring for thousands of patients and then coordinating their evacuation to other hospitals in the South.

As we have seen from these last two disasters, as well as the terrorist attack on our nation five years ago, an effective response from the entire first responder community requires interoperability among public safety communications networks.

2. The Needs of First Responders

Much has been said about the need for interoperability, both by Members of Congress and by the public safety community and industry. There is an expectation that there should be an easy fix for the current lack of interoperability. To solve the problem, we need to understand the problem. Radio operability refers to different radios produced by different manufacturers built to transmit over the same frequency using a standard protocol. That has been achieved. Much more difficult is the goal of interoperability between radios operating in different frequency bands, such as users in the 800 MHz or 150 MHz band communicating with users in the 380 MHz or 700 MHz band. This problem is solved by using a network -- not a radio.

It is often assumed that by providing 24 MHz of spectrum in the 700 MHz band (currently occupied by broadcasters prior to their transition to digital television (DTV)) would solve the interoperability problem between users in different bands. While additional spectrum in the 700 MHz band would alleviate overcrowding in other public safety frequency bands, it could magnify, rather than alleviate, interoperability problems, given that existing public safety systems operate in several other bands.

M/A-COM supports legislative proposals for a finite date for the DTV transition and a refarming of that 24 MHz to the public safety community. But that 24 MHz of spectrum cannot accommodate all of the law enforcement, emergency services personnel, and other public safety units, let alone the many federal and state emergency agencies with whom local first responders should interoperate. So Congress should not look to the 700 MHz refarming to solve interoperability problems but rather, should look to it to solve critically needed capacity.

Another expectation is that we could simply buy all the first responders in this country the same radio built for the same band and thereby achieve interoperability in the near term. There is simply not enough room in any frequency band to host the approximately 2,500,000 public safety first responders, and the cost would be tens of billions of dollars. This seems an unreasonable investment when there are better, more cost and time effective solutions.

How can we most expeditiously provide interoperability, in a cost-effective way that takes into account the realities of a challenging budget environment? M/A-COM's solution is to use technology that is available to us today and convert voice calls to IP packets so that all first responders, regardless of the frequency used, can talk to each other. One network, not one radio.

An IP network, managed by an IP server running a Public Safety grade application would enable the translation. M/A-COM is not proposing a national *radio* system. This is not a call to buy every first responder in the country a new radio. We are proposing a unified, secure, reliable IP-based public safety network with the capability and capacity to handle multiple widespread disasters through the interoperation of existing radio systems. Because the network would be IP-based, it would provide greater flexibility, resiliency, and redundancy. The interoperability network would deploy open, non-proprietary IP technology, but would not use the public Internet, and hence would provide security and reliability to the public safety community.

The idea is a simple one. Put all the radio systems on one advanced digital IP network. A radio from one system cannot talk *directly* to a radio from another radio system. But, if both systems are on the same network, one radio can talk through the Network to a radio on another system. First responders from state and local emergency agencies will benefit from enhanced emergency radio communication and greater interoperability during crisis situations. An IP software application would convert analog voice signals to digital IP packets, thus becoming interoperable with other analog systems and digital systems. The vast majority of public safety communications equipment in the field today is still analog. An IP-based interoperability network would not strand that existing infrastructure, nor require communities to immediately undertake expensive, wholesale replacement of their communications equipment or costly, time-consuming training for new radio use.

An interoperability network could use widely available servers and other components provided by a large number of equipment manufacturers. M/A-COM's interoperability solution, called NetworkFirst, has already been deployed in multiple markets. The system deployed in Pennsylvania, the statewide integrated system, was developed by M/A-COM in response to Pennsylvania's request to permit a disparate range of public safety units to interoperate with each other, from volunteer game wardens to state police. M/A-COM's NetworkFirst is being deployed by local governments that wished to leverage their existing infrastructure to achieve greater capacity and efficiency, such as the cities of Denver, CO and Milwaukee, WI. Federal agencies have used M/A-COM's system to permit numerous facilities in various locations to interoperate. M/A-COM supplied a system to the U.S. Army in the Nation's Capitol Region ("NCR"), which permits ten military installations to interoperate. The NCR system M/A-COM supplied gave the annual Boy Scout Jamboree host, Fort A.P. Hill, much needed interoperability with local police and rescue teams during the 2005 Jamboree when hundreds of boys became ill from heat stroke. That interoperability allowed rapid rescue and treatment of the boys.

The recently announced statewide system in New York was designed with interoperability as a primary goal. Learning from the lessons of September 11th, New York sought a system through which any city and state public safety unit could communicate with another during a widespread incident. Oakland County, Michigan chose a M/A-COM network because of its efficiency gains, allowing four times as many calls as the previous modulation technology, but also because M/A-COM's system permitted the cities in the county to interoperate with each other and with Oakland County first responders. The Oakland County system will also allow a number of different technologies to operate with the system, including 802.11 "WiFi". Multiple Maryland counties have jointly chosen the M/A-COM system, in order to interoperate, in the Eastern Shore Interoperability Network.

NetworkFirst can even be used with radios that are not M/A-COM radios. First responders using systems provided by other vendors can use NetworkFirst to communicate with other first responders in a disaster. In fact, M/A-COM's system is the only DHS-qualified Anti-Terrorist Technology in the two-way radio industry, qualified under DHS' SAFETY Act. By regulation, federal and local first responders are in different frequency bands and today, cannot talk to each other. If federal and state and local first responders were on an IP interoperability network, they could effectively communicate during widespread incidents such as the preparation, the duration and recovery from Katrina and Rita. They could communicate during homeland security emergency preparedness exercises.

An IP interoperability network costs a fraction of what a wholesale change of radio systems would cost. An IP interoperability network would facilitate the migration from legacy radio systems to new systems by also allowing them to interoperate, regardless of the pace or scale of that migration. An IP interoperability network would allow local governments to minimize costs by maximizing use of current assets including radios. Because an interoperability network would permit public safety to use existing radios, public safety users can continue to use their current frequencies. An IP interoperability network works spectrally and financially. Since it would be IP-based, such an interoperability network would not take away capacity from existing radio systems that must serve their local users. Unlike "patching" today's radio systems, no precious spectrum need be allocated to permit voice communications to be converted into IP packets for interoperability. And unlike patching, IP networks scale to rapidly add new users or to achieve interoperability during widespread disasters or other threats to public safety.

As Federal Communications Commission Chairman Martin recently testified on the subject of communications during a disaster, public safety systems should incorporate IP-based technologies to provide resiliency and flexibility to first responders.[1]

Until today, we have always attempted to solve radio problems with radios. And, because radios are all different, the more radios we throw at the problem, the worse the problem gets. Congress and DHS have spent enormous sums funding interoperability at the local level. Last year, Congress appropriated close to one billion dollars. Since 2001, Congress has appropriated over $8 billion for new communications equipment, training and disaster preparedness. Where the government directs its efforts impacts success. We cannot fund exclusively at the lowest level and expect interoperability at all levels. We cannot expect local governments to fix a national problem. Perhaps we should not have expected it to work anymore than we should expect that an interstate highway system would be created by connecting all the Main Streets in America. Instead, we should leverage the existing investments

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[1] See WRITTEN STATEMENT OF FCC CHAIRMAN KEVIN MARTIN, HEARING ON COMMUNICATIONS IN A DISASTER. Before the Committee on Commerce, Science and Transportation, United States Senate, September 22, 2005 by Testimony. OCM <http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-261219A1.pdf> <http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-261219A1.txt>

we have made and ensure all those upgraded local systems can interoperate on a national IP network.

3. The Role of Interoperability

Now that we have identified a practical, near-term and affordable path to interoperability, we can step back and examine the critical importance of interoperability. Its role is fundamental to each phase of disaster communications—before, during and after a disaster—where M/A-COM's focus is on readiness, repair and recovery.

The role of a vendor of a public safety radio system is linked to the stages of a disaster. If there is disaster warning, as was the case with Hurricane Katrina, M/A-COM pre-positions resources to be ready to repair any damage. Applying lessons from earlier disasters, M/A-COM positioned its command and control center in advance of Katrina in Lynchburg, Virginia, well out of the hurricane's path, to monitor reliably the performance of the 20 systems in the Gulf region before, during and after Katrina made landfall. If there is no warning of a disaster, speed of response is critical. In all cases survival of the communications assets is paramount. The design of those assets reflects our first priority—minimizing disruption of service. We also incorporate into our system designs lessons learned from earlier incidents. In New Orleans, for example, we built our radio site on the 34th story to avoid flooding and to maximize the distance of the signal coverage. Once repaired from hurricane damage, the site functioned continuously to support New Orleans police and firefighting forces, while towers at ground level elsewhere in Louisiana were flooded. For example, our statewide system in Florida operated continuously to support public safety, in the face of near-constant barrage from four successive hurricanes during the 2004 season.

During and immediately after a disaster, we must be able to make any repairs quickly. One unanticipated factor in New Orleans was the difficulty for our radio technicians—some of the first persons returning to New Orleans—in reaching the equipment in order to repair it in a timely manner. The situation delayed critical repairs. We therefore join earlier witnesses before you in a recommendation that in the future, technicians to critical infrastructure be credentialed as first responders, and that the credentialing system be recognized throughout the many layers of city, county, state and federal public safety agencies.

Once the radio system is repaired, the communications assets can support public safety as it spearheads recovery from the disaster. During the recovery phase, the need for interoperability among units of first responders is at its most critical. In those precious hours after a disaster strikes, life-saving is maximized by the efficiency of first responders, which is facilitated by interoperability of multidisciplinary responders.

4. M/A-COM's Position on Pending Legislation

M/A-COM supports the various pending bills to expedite the refarming of the 24 MHz of 700 MHz spectrum for public safety use, as proposed in the HERO and SAVE LIVES bills. Additional spectrum will help to relieve capacity restraints for public safety users in those bands.

As noted above, such additional spectrum, while needed, will not bring interoperability to America's first responders. M/A-COM also supports additional funding to the public safety community. But such grants must be done in a way that expedites the goal of a competitive, robust and innovative environment. M/A-COM believes that the only approach that will provide widespread interoperability, in a cost-effective manner, is to rely on a national IP-based network.

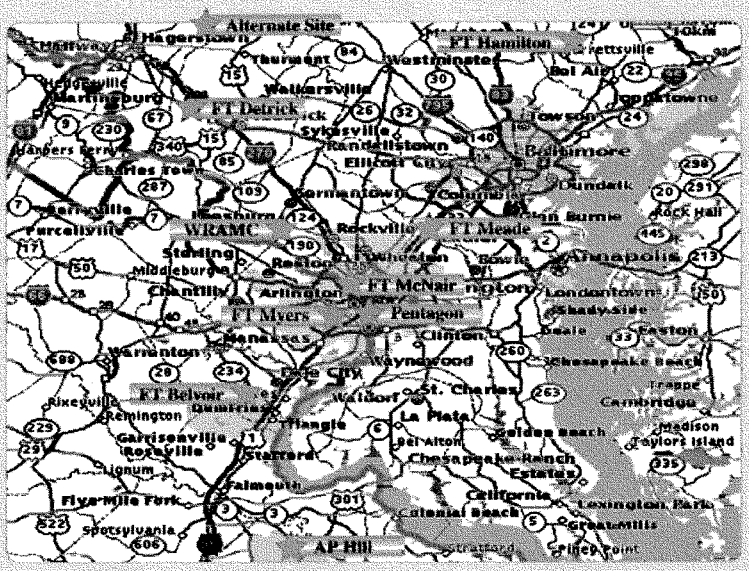
Only an IP network can provide the high level of reliability, coverage, flexibility and cost-effectiveness that State and local governments require. Only an IP interoperability network can allow federal, state and local first responders to communicate with each other during a widespread disaster.

5. Conclusion

The critical lesson to learn from the disasters of the last five years is that first responders need interoperability to effectively respond to a widespread incident. We should also take a lesson from the commercial sector and note the deployment of IP infrastructure and information technologies in all industrial sectors. IP deployment has led to innovation, competition and productivity gains. Likewise, in the public safety sector, IP is the solution for connecting public safety systems. Using existing, cost-effective IP equipment, a National Interoperability Network would be well within our reach. A national network used by Federal, State, Tribal and Local Public Safety entities would deliver in the near-term interoperability for voice, video and data, at affordable cost. Radios don't save lives—people do. But people must be able to communicate before they can help. When the need is great and requires great help, the communications capability must be great also. Only IP can deliver that capability. To improve disaster-related communications in the future, we urge you to embrace secure, IP-based solutions to maximize interoperability of public safety.

NetworkFIRST

Selected Interoperability Solution for National Capital Region



NCR Phase 1:
11 TX/RX Sites: DC, Maryland, Virginia, and New York.
10 Army Installations:

FT Belvoir	**FT Detrick**
FT Myer	**Raven Rock**
FT McNair	**FT A.P. Hill**
FT Meade	**Pentagon**
FT Hamilton	**Walter Reed Army Medical Center**

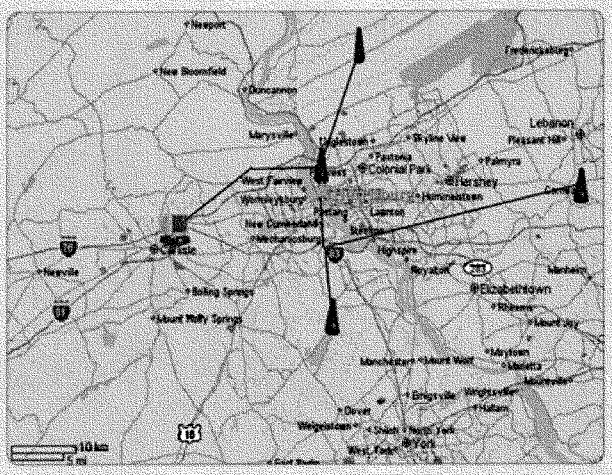
NetworkFirst Scalability Adds Value for NCR Phase 2 :
Navy and Air Force will join with 25 additional locations

MASCOM

NetworkFIRST

At Work in the Pennsylvania Capitol Region

- **Enhanced Security: providing interoperability between state agencies and county responders for 4 counties surrounding Three Mile Island nuclear power plant.**
- **Daily Operations: providing interoperability across all frequency bands without impact to current operations.**



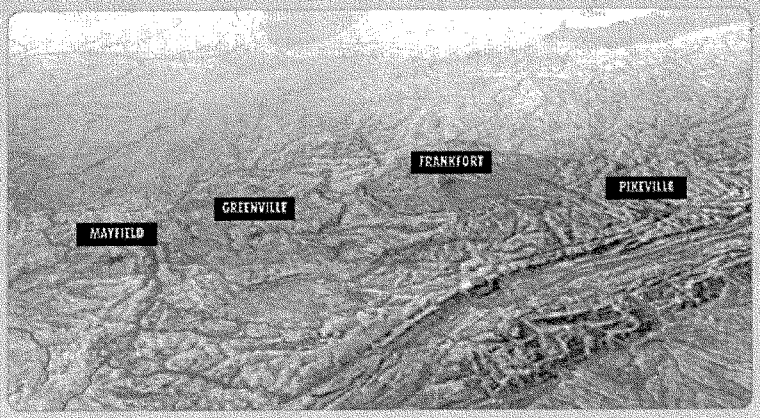
The Interoperating Agencies Are:

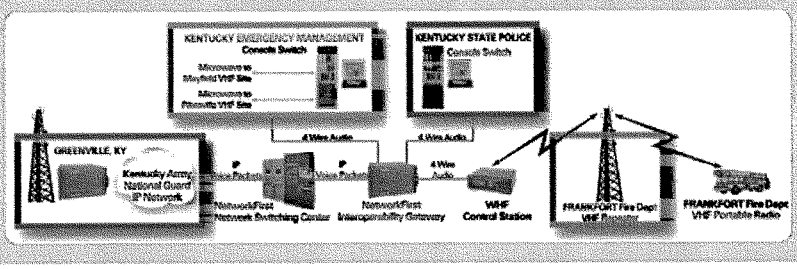
Capitol Police Department
Cumberland County Fire Dispatch
Cumberland County Police Dispatch
Dauphin County Fire Department
Dauphin County Police Department
Harrisburg City Fire Department
Harrisburg City Police Department
Hershey Medical Center
Lancaster City Police Department
Lancaster City Fire Department
National Emergency Police Frequency
York City Police Department
York City Fire Department

M/A-COM

NetworkFIRST

Federal, State, and Local LMR Interoperability experienced for the first time across the Commonwealth of Kentucky



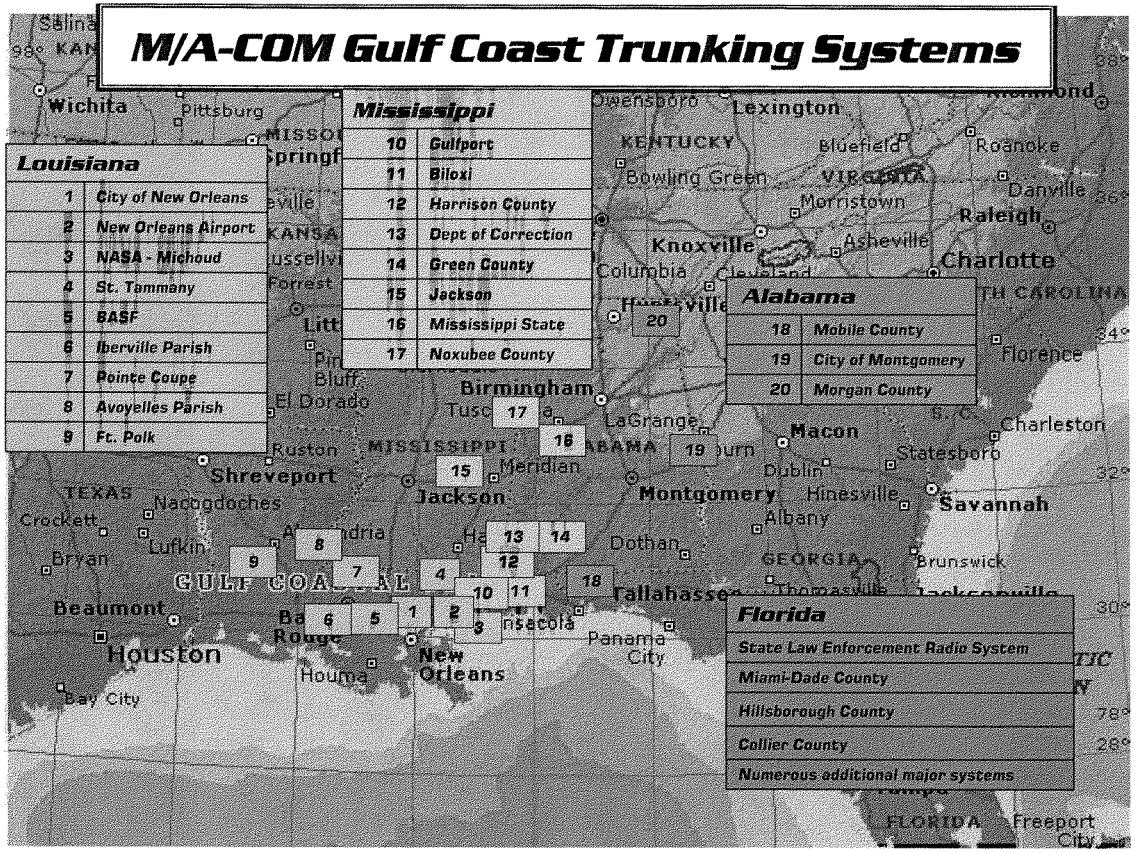


The Commonwealth of Kentucky witnessed many of the benefits of NetworkFirst:

- **Connectivity: NetworkFirst provided voice interoperability among historically independent Federal, State, and Local systems.**
- Investment Protection: **The participants enjoyed interoperability using their existing radio systems, consoles, and radios connected by NetworkFirst. NetworkFirst provides interoperability without a forklift, protecting customer investment in their LMR systems.**
- Interoperability **NOW: NetworkFirst provides interoperability quickly. With excellent support from the agencies, the NetworkFirst equipment was fully deployed and the demonstration was conducted within one week.**
- **Interoperability "On-Demand": Dispatchers and field personnel enjoy interoperability on-demand with their own equipment with NetworkFirst.**
- Scalability: **This NetworkFirst demonstration utilized assets hundreds of miles apart across the Commonwealth of Kentucky. NetworkFirst's packet-switching architecture makes a system that can be scaled to connect literally millions of users.**
- **Availability: All the NetworkFirst capability shown in the demonstration and more is available TODAY.**

M/A-COM

M/A-COM Gulf Coast Trunking Systems



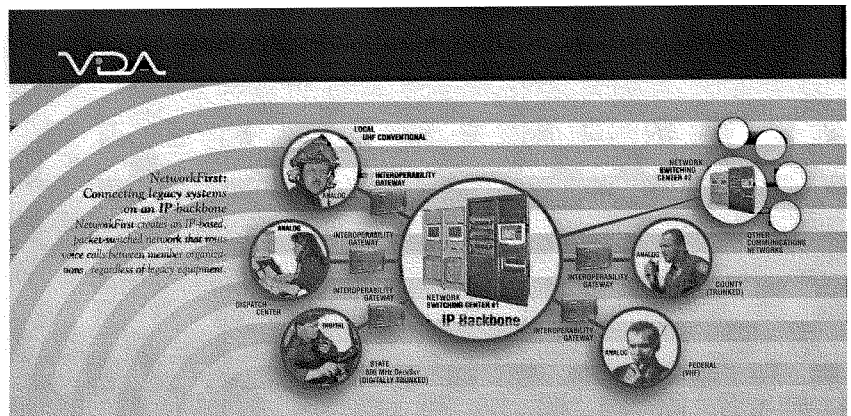
INTEROPERABILITY SOLVED

NetworkFirst *provides easily expandable and cost-effective interoperability among multiple Federal, State, County and Local public safety and homeland security agencies, regardless of frequency, manufacturer, bandwidth or air-link protocol.*

NetworkFIRST
A VIDA Network Application

tyco Electronics

M/A-COM



NetworkFirst: Connecting legacy systems on an IP backbone

NetworkFirst creates an IP-based, packet-switched network that routes voice calls between member organizations, regardless of legacy equipment.

The Cost-effective, IP-based Solution for Interoperability

Since its introduction in early 2002, NetworkFirst has emerged as the single most significant advancement in the cause of interoperability among our Nation's first responders. The reason is clear: It works.

Until NetworkFirst, the most frequently discussed solution to the problem of interoperability was to scrap and replace the millions of radios and radio systems used by first responders. But these new radios and systems would have to operate on a common frequency, bandwidth, and protocol – a scenario that is extremely unlikely both for technical and political reasons. Even if such a task could be accomplished, the projected costs put it beyond reach.

According to the Public Safety interoperability planning group PSWN, it would require more than $18 billion for hardware alone. And it could require as many as ten years to execute such a plan on a national scale.

Proven Concepts Used in New Ways

NetworkFirst provides rapid, multi-agency connectivity without the need for all-new radios and infrastructure. It accomplishes this by converting the radio's audio into digital packet data. This data is easily transported over a private and secure wide-area network (WAN) using the Internet Protocol (IP).

NetworkFirst is structured in a way similar to local area networks (LAN) that characterize modern digital communications used in Enterprise networks. The same industry-standard routers and servers that connect organizations around the globe are configured for the critical, reliable, secure communications required by public safety first responders – all on a secure, private IP network.

NetworkFirst Components

The primary components of NetworkFirst include Interoperability Gateways (analogous to Ethernet cards) which convert

analog audio into IP packets, and a Network Switching Center (NSC). Industry-standard routers are used to transport the IP packets to and from the NSC, helping to keep costs down and reliability up.

The NSC contains an industry-standard software switch to control the routing of calls among the different agencies in the network. Since each audio node in the packet-switched network has an IP address known by the switch, it's easy to segregate or combine callers into interoperability talk groups.

The Interoperability Gateways are installed at analog audio access points, which are typically located in base stations or dispatch centers. The NSC is typically located at an existing agency operation center, or at interoperability command centers. Multiple NSCs can be connected through redundant IP paths.

Field Proven

NetworkFirst has undergone stringent and demanding field tests by numerous public safety and other organizations. In an interoperability pilot program conducted in Oakland County, Michigan, NetworkFirst successfully linked seven agencies across six technologies from different manufactures operating on:

- Both conventional and trunked systems
- Analog and digital voice radios
- UHF and 800 MHz frequencies

Additionally, NetworkFirst has been selected by the U.S. Department of Defense for deployment throughout the National Capital Region, where it will provide interoperability between numerous military installations and approximately 60 civilian public safety agencies in the region.

And Ready For the Future

NetworkFirst is ready for tomorrow's technology, today. NetworkFirst provides more than just immediate interoperability; it can form the framework for the migration of any system toward advanced technology capabilities of M/A-COM's VIDA Network because it is:

- Data-capable to support future mobile data applications.
- Ready for the addition of spectrally efficient, high capacity air links such as the emerging P25 Phase II standard.
- Designed for growth and scalability. All agencies, including county and municipal, can seamlessly connect with statewide or nationwide networks.

It's the VIDA Network that Makes the Difference

NetworkFirst is a fully-supported VIDA Network application that can also serve as your gateway to other standard IP-based networks. Either way, it delivers:

- Digital and tone control of base stations and desk sets
- PSTN connectivity
- Network diagnostics
- Easy fleet mapping
- Easy connectivity to Telco, fiber or microwave backhaul
- Conventional interface to console switches
- Redundancy
- Data transport capability

NetworkFirst Benefits Are Clear:

- ***Connectivity***– NetworkFirst links historically independent radio systems over a private IP network, maximizing the use of existing radios, stations, and sites.
- ***Scalability***– NetworkFirst's packet-switching architecture makes a system that can be scaled to connect literally millions of users.
- ***Affordability***– The ability to keep existing radios and systems as well as the use of standard hardware within the network minimizes overall costs. NetworkFirst is a network solution to a radio problem.
- ***Availability***– Because NetworkFirst links its software solutions with standard hardware, it can meet your scheduling requirements today.

M/A-COM RADIO SYSTEM IN HARRISON COUNTY, MISSISSIPPI WITHSTANDS KATRINA; BECOMES VITAL COMMUNICATION LINK DURING RESCUE AND RECOVERY OPERATIONS

M/A-COM EDAMS System Covering Storm-Ravaged Gulfport and Biloxi, MS Maintains Coverage throughout Hurricane and Provides Base Communications for Search & Rescue Teams During Aftermath

LOWELL, Mass., September 14, 2005 – M/A-COM, Inc., a business unit of Tyco Electronics and a leading manufacturer of critical radio systems deployed around the world, today announced that the M/A-COM EDACS (Enhanced Digital Access Communications System) simulcast trunked radio system installed in Harrison County, Mississippi remained operational at nearly 100% capacity throughout Hurricane Katrina and is now serving as the base of communications for more than 1,000 additional users now stationed in the area to provide emergency support.

The simulcast system, which consists of three 20 channel sites and two 10 channel sites, was installed in 2003 to serve law enforcement, fire, emergency medical, emergency management, and public utility services in Harrison County, which includes two of the Mississippi cities most heavily-affected by Hurricane Katrina, Gulfport and Biloxi. Four of the five separate sites withstood the hurricane; the fifth was damaged when a microwave dish shifted in the heavy winds. That site was repaired less than 48 hours after the storm's passing. Working at complete capacity since mid-day on Wednesday, August 31, the Harrison County EDACS system enabled area first responders to maintain critical communications before, during and after the storm. The system currently provides the interoperability to link the many agencies that have arrived from surrounding areas, such as the Florida State Police and Florida Fish & Wildlife Agency, who are assisting with rescue and recovery operations. Because the State of Florida also utilizes a M/A-COM EDACS system for its statewide radio network, Florida state officials who arrived in Harrison County to lend assistance were able to quickly reprogram their EDACS radios to communicate over the County's network.

"While this emergency has been truly catastrophic for our community, we believe that the situation would have been even more dangerous had our first responders and other public safety officials not had access to consistent, uninterrupted radio communications capabilities throughout the initial ordeal and continuing on to today," said Gil Bailey, Telecommunications Manager, Harrison County. "Not only has our M/A-COM EDACS system held up to the extreme conditions brought about

able to easily reprogram other EDACS radios to expand the reach of our network and communicate with the various agencies that have come to our aid. We are grateful to M/A-COM and its dealers in the local area for helping us with a vital aspect of our emergency response."

In addition to assisting with the repair of the one damaged site in Harrison County, M/A-COM technicians from Communications International and Patterson Communications are currently working to expand the two 10 channel sites by an additional 10 channels. The expansion should be completed in the very near future, a significant achievement given the short timeframe. A typical expansion of this size would take approximately 10-13 weeks to complete. M/A-COM is fulfilling this request in approximately one week. The channel expansion will provide continued reliable communications for the thousands of first responders in the field. The expansion will also allow additional outside public safety agencies and the adjoining counties of Jackson and Hancock to utilize the system to in insure a comprehensive public safety response throughout the Mississippi Gulf Coast during the aftermath of Katrina.

"We are obviously pleased with the performance of the Harrison County EDACS system, which held up to the extreme conditions for which it was designed," said John Vaughan, vice president and general manager, M/A-COM's Wireless Systems Business. "But beyond the technology, we are pleased that we have been able to assist the first responders and public safety officials across Harrison County and its neighboring areas to effectively respond to this horrifying emergency. From our technical team to our local dealer in Harrison County, Patterson Communications Electronics, we send our appreciation for the truly remarkable work they are continuing to do."

George E. Pataki
Governor

James T. Dillon
Chief Information Officer

NEWS

FOR IMMEDIATE RELEASE

Contact: Rob Roddy
(518) 474-3421
www.cio.state.ny.us

STATEWIDE EMERGENCY RADIO NETWORK PROJECT SET TO BEGIN
Contract Approved; Network Will Improve Emergency Communication for First Responders

Albany, NY (September 22, 2005) -- New York State Chief Information Officer James T. Dillon today announced that design and construction of the state's new public safety radio network is set to begin. The Statewide Wireless Network will improve emergency response and homeland security efforts by replacing several outdated radio systems with an advanced digital network. First responders from state and local emergency agencies will benefit from enhanced emergency radio communication and greater interoperability during crisis situations.

"Reliable, timely communication is often cited as the number one factor for first responders to effectively answer the call to an emergency," said New York State Chief Information Officer, James T. Dillon. "Improved collaboration and communication across jurisdictions is the foundation of many of Governor Pataki's successful public safety initiatives and SWN will support those efforts. Across the state, I encourage all local governments to explore the benefits that partnership in this essential project can bring."

The Statewide Wireless Network (SWN) will be the first comprehensive upgrade to many of the state's emergency radio systems in more than 30 years. SWN will be used as a day-to-day public safety radio system, as well as during emergencies. It will provide essential connectivity to enable on-demand and real-time coordination of police, fire, emergency medical and other necessary response services.

While SWN was initiated to replace aging state agency systems alone, fostering voluntary partnerships with local governments to address their communications needs has become a cornerstone of the SWN Project. Many local agencies have expressed interest in participating in SWN. Partnership will facilitate network development by sharing frequencies and infrastructure as well as providing access to end user equipment procurement contracts.

Director James W. McMahon of the New York State Office of Homeland Security said, "SWN will provide the vital interoperable communications backbone first responders at the local, State and federal level need to effectively respond to and mitigate any type of hazard including acts of terrorism."

- more -

New York State Police Superintendent Wayne E. Bennett said, "In the aftermath of numerous natural disasters, emergencies and September 11th, as well as the need to plan for future emergencies, the need for a modern emergency radio communications system has become even more acute. From the standpoint of the State Police, it cannot happen soon enough."

M/A-COM Inc. was selected as the prime contractor to lead the design and construction of the statewide digital land mobile radio network. After extensive review and analysis of the competitive request for proposal, M/A-COM was judged to have the most technically and financially superior plan.

M/A-COM Inc. is a worldwide developer and manufacturer of critical communications systems, land mobile radio equipment and interoperable communications for homeland security. M/A-COM will be responsible for ongoing operation and maintenance of the new radio network as well. Construction of the complete statewide system will take five years. The New York State Office for Technology is the lead state agency for SWN and will serve as the overall project manager.

Michael McCormack, Director of the state Office for Technology said, "We have negotiated a contract with the prime contractor M/A-COM that has significant financial safeguards to protect the State's investment and that ensures New York State will have a modern and comprehensive emergency radio system for our first responders. We look forward to working with our state and local partners and M/A-COM to complete the regional build-outs of the network."

The M/A-COM technology approach is environmentally friendly and allows the state to maximize existing tower infrastructure and minimize construction of new radio towers. M/A-COM created a design philosophy for their OpenSky® technology to deal with the realities facing 800 MHz public safety radio systems today. OpenSky® uses traditional "high-profile" wide-area coverage sites to achieve approximately 90 percent radio coverage required. Coverage gaps will be filled using low-profile sites to cover small geographic areas and serve relatively small numbers of users.

Under the State Environmental Quality Review Act, the state Office for Technology (OFT) has considered the potential environmental impacts and has completed a statewide Generic Environmental Impact Statement (GEIS) review. One of the most important aspects of the review process was to address concerns regarding potential environmental impact. Thirty-two hearings were held at 16 locations statewide. More than 1,800 copies of the findings were distributed for review and comment. The SEQRA process and final GEIS is posted on the OFT web site at https://www3.oft.state.ny.us/swn/seqradocs.cfm.

Considering the scope and complexity of this statewide initiative, SWN will be phased in through a series of regional implementations. The initial region will test the performance, compatibility and interoperability among a wide variety of existing radio systems. The build-outs are scheduled to begin in Erie and Chautauqua Counties, and with the Metropolitan Transportation Authority.

The contract price of the Statewide Wireless Network is $2.005 billion, financed over a 20 year period. Included in the total not-to-exceed price is network design, materials, construction,

- more -

towers, shelters, fixed assets, network equipment and finance charges. In addition, the cost of site leases, operation and maintenance of the network over the twenty year term and future upgrades are included in the cost. The project is funded from the State Wireless Communications Service Surcharge.

The contract was constructed to provide strong controls for the state to manage and places liability squarely on M/A-COM. Some of the safeguards established in the contract include designation of M/A-COM as prime contractor with sole liability for contract performance, full risk and capital outlay by the contractor, payments made only with successful performance and acceptance, a $100 million letter of credit, and the state's ability to buy-out the system in whole or part throughout the term of the contract. Further, the state has provided for termination, without cost to the state, should M/A-COM fail to meet the state's rigid acceptance criteria.

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HAROLD KRAMER
CHIEF OPERATING OFFICER, AMERICAN RADIO RELAY LEAGUE (ARRL)

SUBCOMMITTEE ON TELECOMMUNICATIONS AND THE INTERNET
HOUSE COMMITTEE ON ENERGY AND COMMERCE

If New Orleans is rebuilt, will it provide an opportunity for all levels of government and industry to install a new communications infrastructure that will be better able to cope with a disaster, and that may provide a model for other areas to follow?

ARRL's response to this question is as follows:

The rebuilding of New Orleans provides an opportunity for the "hardening" of public safety facilities in the City and the region. However, no amount of "hardening" of terrestrial, repeater-based communications or cellular architecture will insure operability in all disaster environments. Total public safety communications failures, partial public safety communications failures, and short-term interoperability failures should be planned for. The "new communications infrastructure" opportunity should be the result of planning and training, developed on a national scale. It should incorporate improved methods of public warning; decentralized backup telecommunications infrastructure, and it should plan to incorporate Amateur Radio volunteers as an integral component of all of the foregoing. The Amateur Radio Service provides trained volunteers at no cost, and is the ultimate "failsafe" mechanism for public safety, disaster and emergency relief communications, because it is not dependent on any centralized infrastructure and because it is ubiquitous.

A rebuilt New Orleans should promote interagency and intergovernmental telecommunications planning and training, and should bring public safety officials at all levels of government in the region together with Amateur Radio groups, clubs and the Amateur Radio Emergency Service (ARES) and Radio Amateur Civil Emergency Service (RACES) groups together for facilities planning, contingency planning, interoperability planning, and training, including emergency communications drills and exercises.

"PUBLIC SAFETY COMMUNICATIONS FROM 9/11 TO KATRINA: CRITICAL PUBLIC POLICY LESSONS"
September 29, 2005

Subcommittee on Telecommunications and the Internet Follow-Up Questions

Mr. Art Botterell

From the Honorable Cliff Stearns

1. If New Orleans is rebuilt, will it provide an opportunity for all levels of government and industry to install a new communications infrastructure that will be better able to cope with a disaster, and that may provide a model for other areas to follow?

Honorable Mr. Stearns:

Perhaps a few times each century the United States has the opportunity for a fundamental review and renovation of communications infrastructure. The tragic destruction of New Orleans has left in its wake great suffering, but also just such an opportunity for innovation and national leadership.

There is, however, a risk in such situations that the very urgency of reestablishing services will tend to encourage the hasty deployment of whatever technologies and designs are most readily available.

This is an opportunity not only for new installations but also for new ideas. Some of those ideas may fly in the face of established practice, and some may even take us beyond the scope of existing regulatory strictures.

Therefore, it might be useful to designate New Orleans and perhaps some of the surrounding area as a Special Infrastructure Innovation Zone. Such designation might provide a useful context for special regulatory relief if needed, and for the creation of new institutions.

Respectfully submitted,

Art Botterell

"PUBLIC SAFETY COMMUNICATIONS FROM 9/11 TO KATRINA: CRITICAL PUBLIC POLICY LESSONS'

September 29, 2005
Subcommittee on Telecommunications and the Internet
Follow-Up Questions

The Honorable Kevin J. Martin

From the Honorable Rick Boucher

1. **Mr. Chairman, as you look back on the Katrina ordeal, I think you will see how seemingly mundane changes in telecommunications law can have unanticipated but profound effects. To 'protect' its citizens, for example, Louisiana and Florida adopted legislation in recent years intended to slow the deployment of municipal broadband communications networks. But this public policy choice has hurt and will continue to impede first responder access to communications by making it difficult or impossible for cities to deploy on-the-spot wireless broadband communications systems based on new technologies such as self-healing Wi-Fi mesh. With this in mind, do you see value in encouraging a wide range of competitors and a true balance between old line carriers and new technologies, and between licensed and unlicensed spectrum in the United States?**

RESPONSE: Yes, I see value in encouraging a wide range of competitors and a true balance between old line carriers and new technologies, and between licensed and unlicensed spectrum in the United States. I see value in having available to emergency first responders a wide range of competitors offering traditional and new communications technologies. In fact, successful communications among emergency responders may depend on technology that allows communications across multiple bands and different communications protocols. Through numerous proceedings, the Federal Communications Commission (Commission) is creating incentives for companies to make broadband services available through multiple platforms, including Wi-Fi, ultra-wideband, satellite, and broadband over power line. In particular, Wi-Fi networks, which operate on an unlicensed basis and provide a means of linking many devices in a single location, can enable first responders to rapidly deploy crisis communication systems quickly and efficiently.

This nation needs multiple providers operating multiple networks that give first responders viable and reliable communications options. Municipal broadband networks can be part of this mix of providers. While the Commission continues to work to make available the full potential of broadband and new technologies for the public safety sector and consumers, our work is part of a cooperative partnership with industry, state and local governments, and our federal counterparts. State and local governments are well-positioned to evaluate the benefits of having access to municipal broadband networks for emergency needs. The Commission remains committed to using its resources to promote efficient and effective first responder access to traditional and new communications technologies.

From the Honorable Barbara Cubin

1. **My state is building a statewide communications system in the 150 MHz band. One thing I hear about this effort is that it is difficult to coordinate the neighboring spectrum occupied by federal agencies controlled by NTIA and the spectrum under your control. What can the FCC do to help facilitate inter-agency cooperation with our local folks and the federal neighboring spectrum so we can maximize the bandwidth available on our communications system?**

RESPONSE: The Commission and the National Telecommunications and Information Administration (NTIA) authorize non-Federal and Federal radiocommunication stations, respectively. Specifically, the Commission and NTIA coordinate non-Federal and Federal frequency assignments in shared radiofrequency spectrum under the Interdepartment Radio Advisory Committee/Frequency Assignment Subcommittee to ensure there is no potential for mutual harmful interference. The Commission and NTIA are positioned to facilitate inter-agency coordination of statewide communication systems in the 150 MHz band.

Over the last decade, the Commission has taken various actions to remove regulatory barriers to encourage State and local government licensees and Federal agencies to enter into agreements for joint-use systems. On August 3, 2005, the Commission authorized the State of Wyoming to operate on 131 frequencies in the 151-160 MHz band (150 MHz band) within an 80 km radius of seven locations as part of its planned statewide trunked radio system (WyoLink). The application indicates that the State of Wyoming has entered into discussions with various Federal agencies about sharing its WyoLink system as part of a mutual interoperability/cooperative trunked radio system. The Commission stands ready to intervene, as necessary, should problems arise.

From the Honorable Paul E. Gillmor

1. **The 800 MHz portion of the spectrum is being re-banded, in large part to decrease interference to public safety and other users. How is the aftermath of these storms going to affect that process, and are any steps being taken to ensure that public safety and other users will be protected from interference?**

RESPONSE: I do not anticipate that the aftermath of Hurricanes Katrina and Rita will adversely affect the rebanding process for the 800 MHz band. The 800 MHz rebanding process will be accomplished in four "waves," in accordance with a schedule established by the Transition Administrator, an independent entity overseeing the process.

In light of the aftermath of the storms, the 800 MHz rebanding schedule was modified to shift Louisiana from "Wave 2" to "Wave 3" to enable public safety agencies in Louisiana to focus their efforts on restoring operations and relief efforts. As a result of this modification, Louisiana will undergo rebanding at the same time as the other Gulf Coast states. Commission staff expects that this modification will not affect the overall timing of the 800 MHz rebanding process, and no Commission action is required to use the frequencies that were already licensed at 800 MHz for Louisiana's new system.

The Commission's actions in the 800 MHz band rulemaking proceeding should control interference on a short-term and long-term basis. In addition to abating interference in the 800 MHz band by reconfiguring the band to spectrally separate incompatible communications technologies, the Commission adopted interference abatement rules that define what constitutes "unacceptable interference" in the band and delineate responsibility and procedures for abating such interference. In the case of a public safety entity, these rules provide for an expedited response to interference complaints, as well as the ability for a public safety entity to petition the Commission to issue an order requiring that the source of interference immediately cease operation if the interference threatens the safety of life and property. With respect to other 800 MHz band users, the interference abatement rules provide a regulatory landscape wherein they can pursue system design and operational strategies to avoid interference or utilize the interference abatement procedures and protections afforded under the Commission's rules.

2. **Will manufacturers and other commercial users be protected from interference in order to help spur economic recovery?**

RESPONSE: Commission actions in the 800 MHz band rulemaking proceeding should successfully control interference. If there is specific regulatory relief needed to assist manufacturers and commercial users in their efforts to restore their operations in the aftermath of Hurricanes Katrina and Rita, the Commission remains poised to provide whatever assistance is appropriate. The Commission has responded to all such requests for assistance on an expedited basis.

From the Honorable Bart Gordon

1. **In your testimony before the Senate last week, you stressed the importance of ensuring that our PSAPs are redundant and the need for the federal government to take the lead facilitating coordination among state and local governments to ensure the resilience and**

reliability of the 9-1-1 system. Following up on your comments, in your opinion should efforts be focused on building redundancy into the current 9-1-1 system, for example, by ensuring that all PSAPs have access to multiple Selective Routers? If so, how do you propose that such a system be funded? Or, should we be placing more emphasis on the migration from today's 9-1-1 system to a more robust IP-based emergency services network that is by its nature redundant system?

RESPONSE: I believe that there are steps we can take in the short term to improve the resiliency and reliability of the existing 911 system, while at the same time encouraging and facilitating the development of an IP-enabled E911 system that will offer better resiliency, reliability and performance. In my Senate testimony, my focus was on cases in which the PSAP itself was knocked offline – whether due to power outage, flooding, or some other overwhelming condition. The redundancy failure we observed during Hurricane Katrina was that 911 calls initially routed to an offline PSAP were not rerouted to a secondary or tertiary PSAP capable of handling the call. Instead, calls were in some cases simply dropped because the appropriate protocols were not in place to reroute this emergency traffic. In the context of the recent hurricanes, the Commission has worked closely with local emergency authorities to ensure that such instances are avoided.

I also believe it is important to support innovation and the adoption of new technologies that will improve the reliability and performance of our emergency service communications networks. As such, the Notice of Proposed Rulemaking issued with the *VoIP E911* Order asked for public comment on how the Commission can best encourage the development and adoption of more advanced solutions. I also note the important work being done through the National Emergency Number Association (NENA), which has released its transitional "I2" 911 standard, and intends to release its "I3" IP-based E911 system redesign standard for public comment before the end of 2005. I look forward to working with the Congress, public safety organizations, and emergency authorities to help the vision of an improved, advanced E911 system come to fruition.

From the Honorable Edward J. Markey

1. **When the electric grid went down in certain areas and when the hurricanes knocked out communications infrastructure, it became important to turn to technologies that were not reliant upon terrestrial infrastructures or were capable of mobility and easy installation. Satellite communications obviously played an important role in this regard. What specific steps are you taking to promote satellite-based technology as a public safety communications tool?**

RESPONSE: Satellite services played a critical role in maintaining and re-establishing communications in the wake of Hurricanes Katrina and Rita. In the immediate aftermath of the hurricanes in the affected areas, satellite services helped to bridge some of the gaps left by communications infrastructure outages by providing first responders and other personnel reliable mobile telephony, data and information services, and radio and television services. Space station and earth station licensees were generally able to provide such services pursuant to their existing authorizations. However, special temporary authorization for earth station operators played a critical role in establishing broadband connectivity for users such as emergency response centers and temporary medical facilities.

With specific regard to satellite communications for public safety users, the Commission has exercised its rulemaking and licensing authority in a number of areas:

- *Authorizing the use of Ancillary Terrestrial Components by Mobile Satellite Service (MSS) Operators.* In 2003, the Commission adopted rules under which MSS operators can integrate ancillary terrestrial components (ATCs) into their MSS networks. These rules enable the MSS operators to provide high-capacity mobile services in places where their systems have previously been unable to offer reliable service. The Commission issued the first ATC authorization to MSS provider Mobile Satellite Ventures Subsidiary LLC last year. First responders have used MSS services in a variety of situations including (1) search and rescue, (2) wild land fire suppression, and (3) port security.

- *Emergency Alert System (EAS).* Under the initial EAS rules, only analog broadcast stations, cable systems, and wireless cable systems were required to disseminate alerts. In 2004, the Commission adopted a Notice of Proposed Rulemaking to update the EAS seeking comment on whether Direct Broadcast Satellite (DBS) and Satellite Digital Audio Radio Service (SDARS) providers should also be subject to EAS requirements. On November 3, 2005, the Commission adopted a First Report and Order expanding the EAS rules to include providers of digital broadcast and cable TV, digital audio broadcasting, satellite radio, and DBS services. With the exception of DBS service, all affected entities must comply with these new requirements by December 31, 2006. DBS services must comply no later than May 31, 2007.

- *Outreach.* Commission staff frequently participate in groups that evaluate and make recommendations to ensure the integrity of the satellite communication infrastructure. This occurs both domestically (with organizations such as the Network Reliability and

Interoperability Council) and internationally. In 2004, Commission staff participated in a DoD-Commercial SATCOM Study Group which developed several recommendations related to Homeland Security for commercial satellite systems to include: (1) A new strategic approach to commercial SATCOM; and (2) Satellite System Protection Enablers. Finally, in 2004 and 2005, the Commission hosted annual public forums on satellite technology and services. In 2004, the forum included a panel dedicated to highlighting the public safety applications of satellites and the regulatory challenges faced by satellite service providers. In 2005, the Commission's forum highlighted mobile satellite services and their impact on, among others, first responders.

2. **In addition, Wi-Fi technology using unlicensed spectrum also assisted in quickly getting communications back up and running. What additional frequencies, if any, do you plan to allocate to unlicensed use? What other measures do you plan to promote greater unlicensed use of spectrum?**

RESPONSE: Wireless Internet Service Providers (WISPs), using Wi-Fi and other technologies operating under the Commission's rules for unlicensed devices, played an important role in helping to restore communications in areas that experienced service outages. WISP networks were set up and became operable in a short time, and they often provided coverage to relief shelters – including churches and community centers – that needed additional communications capabilities as the result of the hurricanes. The Commission has taken a number of actions to make more spectrum available for unlicensed operations. For example, the FCC increased the available unlicensed spectrum in the 5 GHz band by 80% to a total of 555 MHz throughout the band. This spectrum will become fully available in the near future and provides significant additional capacity for growth. In addition, the Commission recently made an additional 50 MHz available at 3650 MHz using a light licensing approach that is specifically designed to ensure WISPs have access to this spectrum.

3. **Given the massive relocation of thousands of people brought about by Hurricanes Katrina and Rita, traditional telephone service is unlikely to meet the needs of this dislocated population. As a result, reliance on wireless service appears to have grown. What is the Commission doing to minimize further service disruptions to people displaced by the hurricanes, in particular for those relying on pre-paid service, who have the fewest options available to them?**

RESPONSE: The Commission has sought to minimize disruptions to communications services and to help ensure that telecommunications networks are rebuilt as quickly as possible in areas affected by Hurricanes Katrina and Rita by increasing its industry and consumer outreach efforts and providing regulatory relief where possible. The Commission has implemented a number of measures to facilitate the resumption of communications services in the affected areas and to minimize further service disruptions to people displaced by the hurricanes:

- *Providing Universal Service Fund Support.* On October 14, 2005, the Commission adopted rules that provide targeted support from the Universal Service Fund (USF) for reconstruction and restoration of telecommunications services. Among the temporary rules adopted by the Commission are:

- Low-Income Program. Any person approved for individual FEMA housing assistance or determined by FEMA to be eligible for such assistance relating to Hurricane Katrina is eligible for federal Lifeline support for a free wireless handset and a package of at least 300 minutes for use until March 1, 2006. Carriers will be reimbursed $130 per package, and only one package will be provided per household.

  The Commission also is providing Eligible Telecommunications Carriers (ETCs) $30.00 per qualifying household for commencing telecommunications service at any temporary housing arrangement through March 1, 2007. ETCs also may receive $30.00 for connecting each qualifying household returning to a primary residence in the Hurricane Katrina disaster area, including the reconnection of service disconnected as a result of Hurricane Katrina.

  High Cost Support Program. The Commission determined that carriers serving the disaster area may use high-cost support funds to assist in reconstructing facilities damaged by the hurricane.

- *Ensuring Continued Service to Consumers.* The Commission has taken steps to ensure that wireless service providers do not improperly disconnect consumers displaced by Hurricanes Katrina and Rita who are unable to pay their bills. To ensure that consumers continue to have access to wireless services, the Commission required all wireless licensees serving consumers affected by the hurricanes to verify their compliance with the standard industry practice of maintaining service to people displaced by the hurricanes despite failure to pay bills.

- *Facilitating Number Portability.* Due to the extensive damage to telecommunications systems caused by Hurricane Katrina, carriers may need to port numbers to destinations outside the affected rate centers. Therefore, the Commission waived its number portability and number assignment rules to allow carriers, as well as the numbering administrators that support them, to port customers' numbers to areas unaffected by the hurricane.

- *Granting Special Temporary Authority (STAs).* The Commission has granted dozens of requests for STAs to enable emergency workers, organizations, and companies to provide wireless and broadcast service in the affected areas and shelters. To facilitate granting of these requests, the Commission issued a temporary waiver allowing for expedited treatment of such requests. Virtually all STA requests (including those that required coordination with other federal agencies) were granted within 24 hours.

From the Honorable Charles W. "Chip" Pickering

1. **Given the massive relocation brought about by Hurricanes Katrina and Rita, it appears that traditional telephone service will not be able to meet the needs of those displaced. As a result, reliance on wireless telecommunications service appears to have grown. What is the Commission doing to minimize further disruptions, especially among those relying on pre-paid wireless phone service that have the fewest options available to them?**

RESPONSE: The Commission has sought to minimize disruptions to communications services and to help ensure that telecommunications networks are rebuilt as quickly as possible in areas affected by Hurricanes Katrina and Rita by increasing its industry and consumer outreach efforts and providing regulatory relief where possible. The Commission has implemented a number of measures to facilitate the resumption of communications services in the affected areas and to minimize further service disruptions to people displaced by the hurricanes:

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2. **In the post-Katrina recovery efforts, we saw how critical it is for first responders to have access to diverse telecommunications services, especially new technologies, such as Wi-Fi Mesh. These new technologies not only are resilient but can be installed very quickly and cheaply. I know you recognize the value that satellite communications can provide and you have noted the inherent limits of relying on traditional wireline means of communications. Clearly, a combination of all of these kinds of technologies will provide critical redundancy. Can you tell me what steps the Commission intends to take to encourage the deployment of these kinds of new technologies, such as wireless mesh, that can help our first responders better react to the inevitable next disaster?**

RESPONSE: New technologies, such as Wi-Fi mesh networks and smart radios, show significant promise in enhancing the flexibility and diversity of available communications options. The Commission has initiated numerous proceedings to facilitate the implementation of new technologies, and, in particular, the Commission has recognized the potential benefits to the public safety community of enabling access to more diverse telecommunications services (*e.g.*, Cognitive Radio/Software-Defined Technologies, IP-Enabled Technologies, Ultra-Wideband, 700 MHz Band, and 4.9 GHz band). We will continue to explore these opportunities.

License exempt technologies, such as Wi-Fi mesh networks, are relatively simple to install and inexpensive to use. In addition, the wireless mesh network architecture is inherently more resilient than the traditional hub-and-spoke architecture because each network node can act independently as a hub, allowing transmissions even if other nodes sustain damage. Because Wi-Fi mesh networks operate on an unlicensed basis, however, their operations are not protected from harmful interference.

From the Honorable Cliff Stearns

1. **If New Orleans is rebuilt, will it provide an opportunity for all levels of government and industry to install a new communications infrastructure that will be better able to cope with a disaster, and that may provide a model for other areas to follow?**

RESPONSE: The unfortunate destruction to the communications infrastructure wrought by Hurricanes Katrina and Rita provides an opportunity to significantly improve the communications infrastructure of New Orleans and to demonstrate the viability of new services

for further deployment in other areas. Old infrastructure could be replaced or enhanced by fiber, IP technology, wireless service, and advanced electronics. This next generation of service has the potential advantage of greater resiliency, reliability, and restorability. New service can also be deployed with renewed attention to back up equipment and generators. The ability to deploy next generation communications equipment will likely be balanced by the need to restore communications service promptly, the ability to salvage the existing communications infrastructure, and the proper use and deployment of new technology.

2. **What do you see as the primary obstacles to developing a nation-wide interoperable communications system for use by federal, state, and local public safety officials in performing their daily duties of serving and protecting this nation's citizens, and in instances of responding to major disasters, whether man-made or natural?**

RESPONSE: Developing a nation-wide interoperable communications system for use by federal, state, and local public safety officials requires targeted spectrum, funding for equipment and implementation, and effective organizational and personal coordination and communication.

With respect to spectrum, it is critical that emergency response providers have sufficient spectrum available. In this regard, we note that the Commission has already designated certain portions of the 700 MHz band specifically for interoperability purposes.

Further, it is imperative that the Nation's first responders have the ability to utilize emerging technologies and benefit from the same state-of-the art communications technologies and equipment developments that are experienced in the commercial sector. Given that public safety entities operate mission-critical communications systems in a variety of spectrum bands, first responders should have the capability to operate on multiple frequencies in multiple formats so that different systems can connect with each other. "Smart radios" are ideally suited to this purpose, as they can intelligently jump to available frequencies as needed to establish communications. Properly implemented, a system with adequate spectrum and smart radios would help to ensure that both data and voice are transmitted seamlessly between agencies.

Finally, emergency response providers must have adequate resources. Funding can be an impediment to public safety obtaining and upgrading communications radios and facilities

3. Can you discuss what constitute interoperability?

RESPONSE: "Interoperability" refers to radio communications between or among public safety agencies (usually of different jurisdictions) in furtherance of both day-to-day and emergency operations. For spectrum access and use designation purposes, the Commission's rules define interoperability as "[a]n essential communication link within public safety and public service wireless communications systems which permits units from two or more different entities to interact with one another and to exchange information according to a prescribed method in order to achieve predictable results."

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF STATE POLICE
EAST LANSING

COL. TADARIAL J. STURDIVANT
DIRECTOR

October 31, 2005

The Honorable Fred Upton
United States House of Representatives
2183 Rayburn House Office Building
Washington, DC 20515

Ref: Follow-Up Questions for Hearing Record
Subcommittee on Telecommunications and the Internet
Questions from the Honorable Cliff Stearns

Dear Representative Upton:

I am please to be able to respond to follow-up questions stemming from the September 29, 2005, Committee on Energy and Commerce, Subcommittee on Telecommunications and the Internet hearing titled "Public Safety Communications from 9/11 to Katrina: Critical Public Policy Lessons."

These two questions were submitted by the Honorable Cliff Stearns.

1. ***If New Orleans is rebuilt, will it provide an opportunity for all levels of government and industry to install a new communications infrastructure that will be better able to cope with a disaster, and that may provide a model for other areas to follow?***

   Government leaders in New Orleans and the state of Louisiana must come together to discuss a strategy that will ensure communications interoperability for public safety first responders in their state. There are creative options, such as shared infrastructure and frequencies, and the technology available to ensure this goal is met.

   Coordination and planning will be critical to this effort. Public and private partnerships should be examined as one alternative to ensuring that a robust communications infrastructure is built that will service the needs of the citizens of the state of Louisiana. I would recommend that a statewide executive interoperability committee be formed to develop a comprehensive interoperability plan for the state of Louisiana. This committee should have representatives from all levels of government within the state as well as each public safety discipline.

2. ***What do you see as the primary obstacles to developing a nation-wide interoperable communications system for use by federal, state, and local public safety officials in performing their daily duties of serving and protecting this nation's citizens, and in instances of responding to major disasters, whether man-made or natural?***

   The primary obstacles to developing a nation-wide interoperable communications system include funding, limited and fragmented radio spectrum, and the challenge of planning and coordinating interoperability solutions that will effectively address the needs of the nation's public safety first responders. One nationwide communications system is not feasible and is not necessary. The federal government needs a strategy that will take advantage of existing infrastructure across the country and develop interoperability solutions that are consistent

with the existing, as well as planned, systems. From that point, a gap analysis can be conducted to identify areas of the country where new infrastructure needs to be built. Once that gap analysis is completed, a national strategy can be developed that takes into account funding, spectrum, and coordination issues.

The technology exists today to support a comprehensive public safety communications interoperability strategy. The key is leadership at a national level to drive solutions that are cost effective and support the operational needs of the nation's public safety first responders.

I hope you find this information helpful. If you have any additional questions, please do not hesitate to contact me.

Sincerely,

THOMAS J. MILLER, LT. COLONEL
Deputy Director
Administrative Services Bureau

Question for the Record Submitted by the Honorable Cliff Stearns (R-FL)
Hearing on "Public Safety Communications from 9/11 to Katrina"
Subcommittee on Telecommunications and the Internet,
Committee on Energy and Commerce
U.S. House of Representatives
September 29, 2005

Questions for the Honorable Tim Roemer:

1. If New Orleans is rebuilt, will it provide an opportunity for all levels of government and industry to install a new communications infrastructure that will be better able to cope with a disaster, and that may provide a model for other areas to follow?

Answer: The rebuilding of New Orleans is an excellent opportunity to create a new model for urban communications, especially in the area of public safety. As New Orleans emergency response agencies rebuild, they should coordinate their efforts to establish a fully interoperable, state-of-the-art public safety communications network. The transfer to public safety agencies of the promised 700 Mhz spectrum would allow implementation of such a network at a much higher level of capability, capacity and reliability. When we can do this properly and effectively for the first responders in New Orleans, it can serve as a template for other communities around the United States.

11/16/2005

Answers from the Satellite Industry Association

Re: Follow-Up Questions from House Energy and Commerce Committee, Subcommittee on Telecommunications and the Internet hearing titled, "Public Safety Communications from 9/11 to Katrina: Critical Public Policy Lessons," held on September 29, 2005.

From the Honorable Charles F. Bass

1. Like a lot of members on this committee I am concerned about protecting localism on our airwaves and the viability of free over the air broadcasting. Are you telling us that because broadcast towers were knocked down and primary and even backup power was out over a wide area in the Katrina-affected Gulf region, satellite radio or television may have been the only source of local emergency information for some citizens?

Yes. As described by Chairman Martin in his testimony, local broadcasters were not broadcasting for a number of reasons, including downed towers, damaged/destroyed transmitters, loss of connectivity between studio and broadcasting site, loss of power at broadcasting site and/or studio, and evacuated studios. DIRECTV was able to continue retransmitting local stations by using neighboring station signals, or using local station signals that were originating from outside the New Orleans market (i.e., we rerouted the New Orleans FOX affiliate's feed from Orlando, and the New Orleans ABC affiliate's feed from Chicago).

Moreover, XM Satellite Radio provided coverage of the storm on its dedicated "24/7 Emergency Alert" channel which began when the storm formed in the Atlantic Ocean. As with other storms and natural disasters, XM provided critical information on this channel for evacuation, location of relief centers, road closings, school closings, etc. XM's coverage remained uninterrupted throughout the storm and aftermath. XM also provided an audio channel and several hundred radios, at no charge, to the American Red Cross for disseminating information to volunteers and the general public.

Below please find a summary of other DIRECTV Katrina-related information:

- **Channel 100 Hurricane Katrina Information. DIRECTV dedicated a full-time channel, available nationwide, to carry official messages from FEMA and the Red Cross, live press conferences from government and public safety officials, and other important relief information. Local messages regarding shelters, transportation, safety and contact information for assistance and insurance companies were categorized by locality (i.e., New Orleans, Louisiana and Mississippi).**

- **Hurricane Katrina message service. DIRECTV established a text message and e-mail message line for people trying to connect with loved ones. DIRECTV received thousands of such messages that included the sender's name, location, the person he**

wished to reach, and a substantive note. That information was then transcribed and scrolled on channel 100.

- **DIRECTV service at shelters. DIRECTV worked with the Red Cross to provide DIRECTV service and television sets to over 250 shelters across the Gulf area. This effort, in conjunction with channel 100, provided a vital communications resource to public officials wishing to communicate directly with the people who most needed information.**

2. Would you agree that the example of Hurricane Katrina that you have reported perhaps indicates that having both satellite and broadcast channels of communication available is important in much the same way as we think of redundancy for military terms?

Absolutely.

For this reason, we urge you to oppose H.R. 998 – a bill that would jeopardize satellite radio's ability to deliver critical information of a local interest during an emergency like Hurricane Katrina.

We should point out, however, that satellite television operators have a much more limited amount of capacity to provide local services than do our cable and terrestrial competitors. So there will always be a trade off between local carriage obligations and local service.

In the analog world, this means that the existing requirement to carry all stations in markets DIRECTV serves means that DIRECTV can serve fewer markets. In the digital world, if the Government requires satellite to carry more "bits" from each local broadcaster's digital signal (e.g., HD, multicasting, datacasting), DIRECTV will likewise be able to serve fewer markets. To put this in the terms of your question, HD and multicast requirements would achieve redundancy of <u>multiple programming streams per broadcaster in some markets</u> at the expense of <u>any redundancy in other markets</u>.

3. I have spent a good amount of time in the last few months looking at video retransmission consent agreements. Since you have testified that the video satellite providers brought local signals from Louisiana and Mississippi to the evacuees who were being sheltered across the country, did the providers have any problem bringing what would in effect be "distant signals" into the shelters that may have been out of the local station's DMA?

DIRECTV had to obtain waivers from each local broadcaster in order to temporarily import distant signals. They had to do so because of provisions in both the Copyright Act and Communications Acts.

11/16/2005

Although DIRECTV was able to obtain the necessary waivers, the process did take some time, and was not always painless – particularly with respect to some of the smaller station owners.

We would, however, like to point out one instance in which we saw quite extraordinary cooperation with broadcasters. WWL-TV New Orleans, owned by Belo, had a working tower and transmitter in New Orleans, but no working studio. They moved their studio to Baton Rouge, but had no fiber feed between Baton Rouge (where their temporary studio was located) and New Orleans (where WWL-TV's tower was located). DIRECTV was able to provide them with fiber capacity at their Baton Rouge receive facility, which they were able to downlink via satellite at the tower. In other words, DIRECTV essentially served as WWL-TV's temporary studio-to-transmitter link in order to ensure WWL-s continued service.

4. If there were problems, do you think the President, FEMA, or the FCC should have some waiver ability in these emergency situations?

We note that the FCC was involved on an informal basis, and, in our experience, was able to many resolve problems that did arise fairly quickly. Given the increasingly critical role the satellite industry is playing in disaster relief and recovery, satellite service providers and their technicians should be designated as first responders in the event of a major disaster and should be included in preparations for such events.

From the Honorable Marsha Blackburn

1. You probably heard me ask Chairman Martin how we can learn from this disaster and build a preeminent communications infrastructure in this area. What role would satellite communications play in this?

Had satellite systems been more effectively integrated into our emergency communications network, many of the communications problems that occurred in Alabama, Louisiana, and Mississippi recently, and New York City after 9/11 would have been substantially mitigated.

In order to ensure America has reliable communications, satellite systems must be integrated into future national security and emergency preparedness communications. There have been calls for a new communications network for first responders and funding for new technologies and networks that can withstand such disasters. To ensure redundant, resilient and reliable interoperable communications networks, satellites must be a required component of all communications networks. ***Before systems can be interoperable, they must be operable.***

11/16/2005

The Department of Homeland Security is currently examining a range of emergency communication proposals, including proposals to ensure interoperability. Satellite systems should be emphasized and included in the early planning of these initiatives. The required capacity and equipment is available today from commercial satellite operators.

Pre-positioning mobile satellite terminals, satellite phones, small satellite antennas (VSATs), and satellite radio receivers near anticipated relief areas enables more rapid deployment in the aftermath of a disaster. The Government needs to facilitate a wider pre-positioned deployment of these assets by ensuring that satellite capacity and equipment become part of the comprehensive redundant communications solutions used by first responders during the planning stages, rather than at the last minute. Given the increasingly critical role the satellite industry is playing in disaster relief and recovery, satellite service providers and their technicians should be designated as first responders in the event of a major disaster and should be included in preparations for such events.

Looking toward the future, some satellite operators are moving forward with the deployment of an ancillary terrestrial component to its satellite system which will ensure reliable and seamless communications in such emergency situations. New hybrid satellite/terrestrial networks will provide interoperable ubiquitous and affordable communications using handsets similar to those most Americans carry in their pockets today for cellular service.

2. I know your testimony calls for incorporating satellite technology into any communications proposals for interoperability - some have concerns that the technology might be cost prohibitive --can you tell us for the record if and how this technology has become more affordable?

Today's satellite voice and data networks are, or can easily be, interconnected with any switched telephone or wireless (i.e., cellular) network . To that extent, interoperability is not an issue with satellite networks.

In the aftermath of Hurricane Katrina, FEMA and other agencies that already had satellite phones in their inventories could turn them on and communicate with any other user who also had a working phone plugged into the public switched network anywhere in the U.S. or abroad.

In terms of cost, mobile satellite handsets are widely available for about $400 to $1,000, and emergency kits are available for about $500 to $1,200, plus usage. Usage can be as low as 14 cents per minute with a large bundle of minutes.

Moreover, new hybrid satellite/terrestrial networks currently being developed will enable mobile satellite handsets to be offered at comparable costs to terrestrial wireless handsets with similar usage charges.

As we know, almost three million customer telephone lines were knocked down in Louisiana, Mississippi, and Alabama. In addition to these wire-line failures, local wireless networks also sustained considerable damage, with more than 1,000 cell sites out of service. Approximately 100 broadcast stations were knocked off the air, and finally, hundreds of thousands of cable customers also lost service. The resulting lack of communications infrastructure severely impeded the ability of first responders and others in their disaster relief and recovery efforts. (i.e. it is substantially more expensive to not include satellite, than it is to include satellite).

As of September 21st, nearly three weeks after Hurricane Katrina inflicted its damage on the terrestrial communications network in the New Orleans area, only 60 percent of the cell phone networks were working properly, 70 percent of the broadcast stations were functioning, and roughly two million calls were still failing. On the other hand, and in stark contrast, fixed and mobile satellite services were nearly 100 percent operational on September 21st, just as they were on Aug. 28th, Aug. 29th, Aug. 30th, Aug. 31st, and the hours and days immediately following Katrina.

Moreover, satellite *radio* is an efficient means of one-way delivery of critical information to establish common situational awareness among large numbers of emergency personnel and decision-makers across various levels of government and across multiple jurisdictions. An emergency manager exercising command and control over a response can disseminate information over a dedicated audio channel to First Responders equipped with very small mobile receivers on land, in air, or on the sea. These same receivers are capable of receiving information from any of the various national cable news channels carried by satellite radio. Thus, existing satellite infrastructure can be leveraged to provide a secure, cost-effective and efficient means of communicating a common understanding of situational awareness to responders in a particular area.

The challenge for emergency services and national security agencies is to integrate satellite back-up systems into their primary communications systems so that they can be activated immediately in the event of a terrestrial system failure. Satellite system operators are ready, willing and able to work with them to design effective, feasible solutions. We just need to ensure that satellite is 'called out' as a required part of the solution.

11/16/2005

From the Honorable Barbara Cubin

1. I'm pleased to learn about the important role satellite companies have played in emergency communications. Besides having satellite phones more widely available, how can localities integrate satellite communications into their existing communications systems?

Satellite equipment must be integrated into future communications networks at the federal, state, and local level. There have been calls for a new communications network for first responders and funding for new technologies and networks that can withstand such disasters. To ensure redundant, resilient and reliable interoperable communications networks, satellites must be a required component of all communications networks.

Pre-positioning mobile satellite terminals, satellite phones, small satellite antennas (VSATs), and satellite radio receivers near anticipated relief areas enables more rapid deployment in the aftermath of a disaster. The Government needs to facilitate a wider pre-positioned deployment of these assets by ensuring that satellite capacity and equipment become part of the comprehensive redundant communications solutions used by first responders during the planning stages, rather than at the last minute. Given the increasingly critical role the satellite industry is playing in disaster relief and recovery, satellite service providers and their technicians should be designated as first responders in the event of a major disaster and should be included in preparations for such events.

The Department of Homeland Security is currently examining a range of emergency communication proposals, including proposals to ensure first responder interoperability. Satellite systems should be emphasized and included in the early planning of these initiatives. The required capacity and equipment is available today.

Looking toward the future, some satellite operators are moving forward with the deployment of an ancillary terrestrial component to their satellite system which will ensure reliable and seamless communications in such emergency situations. New hybrid satellite/terrestrial networks will provide interoperable ubiquitous and affordable communications using handsets similar to those most Americans carry in their pockets today for cellular service.

From the Honorable Cliff Stearns

1. What can be done today to ensure redundancy in the communications system, especially for my home state of Florida that may face a Hurricane since we have several weeks left in this hurricane season?

In the aftermath of the recent hurricanes in the Gulf Coast, when many terrestrial communications networks in the region were either totally or partially disabled,

emergency responders were relying on satellite solutions. These solutions included mobile satellite terminals, satellite phones, as well as VSAT networks. The problem at that point was the availability of equipment to satisfy demands. Satellite phones became very difficult to find and it was difficult to get pre-positioned VSAT equipment and technicians into the affected areas.

More satellite terminals and small, modern, pop-up antennas and satellite phones could have been pre-positioned on-site prior to Katrina and available for immediate deployment in the aftermath. In the hands of first-responders this technology could have provided the communications necessary to deploy safety of life services to those who needed it without delay.

These products work <u>today</u>. They provide redundancy <u>today</u>. They work with other communications <u>today</u>. As such, the Government needs to facilitate a wider pre-positioned deployment of these assets <u>today</u> by ensuring that satellite capacity and equipment become part of the comprehensive redundant communications solutions used by first responders during the planning stages, rather than at the last minute.

The required capacity and equipment is available <u>today</u>. Pre-positioning satellite terminals and handsets near anticipated relief areas enables more rapid deployment in the aftermath of a disaster. The Government needs to facilitate a wider pre-positioned deployment of these assets by ensuring that satellite capacity and equipment become part of the comprehensive redundant communications solutions used by first responders during the planning stages, rather than at the last minute.

Moreover, satellite *radio* is an efficient means of one-way delivery of critical information to establish common situational awareness among large numbers of emergency personnel and decision-makers across various levels of government and across multiple jurisdictions. An emergency manager exercising command and control over a response can disseminate information over a dedicated audio channel to First Responders equipped with very small mobile receivers on land, in air, or on the sea. These same receivers are capable of receiving information from any of the various national cable news channels carried by satellite radio. Thus, existing satellite infrastructure can be leveraged to provide a secure, cost-effective, efficient, and truly interoperable means of communicating a common understanding of situational awareness to responders in a particular area.

The Department of Homeland Security is currently examining a range of emergency communication proposals, including proposals to ensure interoperability. Satellite capabilities should be emphasized and included in the early planning of these initiatives.

2. How expensive would it be to integrate first responder communications equipment with a redundant satellite network?

11/16/2005

Many terrestrial wireless devices available today, including first responder equipment, have several terrestrial wireless frequency bands integrated into the device. Adding satellite-enabled chipsets to this equipment will be feasible shortly. Integrating satellite capability into deployed first responder equipment will enable first responders to retain their existing equipment investment while receiving the benefits of a redundant satellite network. Although estimates vary, one MSS provider has received estimates that integrating hybrid satellite/terrestrial chipsets into both existing and next generation first responder equipment would cost the public safety user between $40 and $80 per unit.

3. I understand that satellite communications were not included in the IWN proposal. Do you think satellites should be included?

Though the US Government IWN Request for Proposal (RFP) did not explicitly call for the inclusion of satellite technology, the RFP did not exclude satellite capabilities from consideration either. Moreover, the US Government IWN RFP explicitly encouraged "innovative, big picture solution sets that address IWN requirements", including a combination of technologies.

Therefore, it is industry's expectation that the IWN Source Selection Authority will strongly consider integrated technology solutions. To ensure redundant, resilient and reliable communications networks, satellite access should be a component of all future government communications networks.

4. If New Orleans is rebuilt, will it provide an opportunity for all levels of government and industry to install a new communications infrastructure that will be better able to cope with a disaster, and that may provide a model for other areas to follow?

Yes, moreover, we have a unique opportunity to design a new flexible, redundant, and interoperable communications network in New Orleans. For instance, all hospitals could be outfitted with satellite VSAT equipment to ensure they will be able to communicate the next time the terrestrial telecommunications infrastructure is damaged. In accordance with a well-coordinated emergency preparedness and response plan, an operational concept could include deployment of mobile satellite terminals to police and fire trucks to ensure connectivity, even if the power infrastructure is damaged.

Those public officials committed to ensuring communications and network survivability should not let the opportunity slip away to plan and obtain a better emergency communications system for first responders, government, and the general public; the efforts in New Orleans can and should serve as a model for other cities as they modernize their emergency communications systems.

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