S. HRG. 112–166

SAFEGUARDING OUR FUTURE: BUILDING A NATIONWIDE NETWORK FOR FIRST RESPONDERS

HEARING

BEFORE THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION UNITED STATES SENATE

ONE HUNDRED TWELFTH CONGRESS

FIRST SESSION

FEBRUARY 16, 2011

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

U.S. GOVERNMENT PRINTING OFFICE

71–532 PDF WASHINGTON : 2011

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

SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ONE HUNDRED TWELFTH CONGRESS

FIRST SESSION

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SAFEGUARDING OUR FUTURE: BUILDING A NATIONWIDE NETWORK FOR FIRST RESPONDERS

WEDNESDAY, FEBRUARY 16, 2011

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

The Committee met, pursuant to notice, at 10:02 a.m. in room SR–253, Russell Senate Office Building, Hon. John D. Rockefeller IV, Chairman of the Committee, presiding.

OPENING STATEMENT OF HON. JOHN D. ROCKEFELLER IV, U.S. SENATOR FROM WEST VIRGINIA

The CHAIRMAN. Good morning, everyone.

This hearing comes to order.

My Vice Chair, Senator Kay Bailey Hutchison from Texas, is here, and there are some others who are not would be my general impression. But you know what? I do not care.

[Laughter.]

The CHAIRMAN. You are here. We are here and we have a great subject to discuss.

The 10th anniversary of 9/11 is very quickly coming up in the fall. Despite the passage of time and of the horror, the pain, and the deep sadness that marks that day, nothing really has faded from our national consciousness. That is part of our eternal time clock, what went on during that day and what people did during that day and what the nation lost and what the nation gained that day. And I think that is all appropriate because these are wounds that, even if they heal, they always will cause us pain. That is as it should be. We grow as a nation. We deepen as a nation, and we come to understand more what people do and can do and will do.

Although strides have been made across the country in interoperability, mostly in big cities, we are still far from where we need to be. Although strides have been made, we have so much more to do. More importantly, tragedy does not know boundaries. Besides New York or Washington, emergencies occur every day in urban and rural communities all across the country. We do not hear about them. We do not read about them unless it is a Virginia Tech type of event, but they happen all the time. We live with them, and we should not have to live with them. Whether it is terrorism or a tornado or a hurricane or a brush fire, one thing is universally true, when an emergency happens, who do we rely on? We rely on first

responders like police, fire fighters, and public safety officials of all kinds to keep us from harm.

Far too often, we talk about the important role that these brave first responders play, but then we turn around and we fail to give them the tools they need to do their job. So we are full of praise, but we are not full of help. We are trying to redress that situation.

I think it is long past time that we really do something strong about this, and it turns out that we can do it with a whole lot of funding left over for deficit reduction because of the voluntary nature of the auction.

So that is what today's hearing is about, and it is what led me to introduce and to fight hard for the Public Safety Spectrum and Wireless Innovation Act. The legislation does two things.

First, it sets aside 10 megahertz of spectrum known as the D Block to public safety to support a nationwide interoperable wireless broadband network that will help keep us safe.

Second, it gives the Federal Communications Commission the authority to hold incentive auctions based on a voluntary return of spectrum. And that word "voluntary" turns out to be a very, very important word. These auctions, in turn, will provide funding to support the construction and maintenance of public safety networks, and they will free up additional spectrum for innovative commercial uses.

In short, the bill marries resources for first responders with good commercial spectrum policy. It can keep us safe and help our economy grow.

That is why this legislative union has the support of every major public safety organization across the country. I am proud that virtually every public safety officer in my great state of West Virginia has stood up and recognized how essential this bill really is for strengthening their ability to do their jobs. They may not be dealing with twin towers, but they are dealing with their equivalent of twin towers every day and they never know when it will come upon them. In fact, I am especially proud of the good work that we have done on the legislation across our State, and I have had very useful conversations with first responders in two counties that you have never heard of, Jackson County and Wood County, about how this bill would make their work safer.

Across the country, I have also gotten strong statements of support from governors and mayors. And now we have the full and unambiguous support of the Administration. It was a tad slow in coming, but it is here. It is full-force.

There are some people who argue that we simply want to sell the valuable resource to the highest bidder. I forcefully reject that, though I have said repeatedly that I will work with anyone who seeks to make sure that our public safety officials have the resources they need to communicate so they can do their jobs and protect our people.

But let me also clarify one thing. This effort is about saving lives. And to those who say we cannot afford this now, I say we can afford in no way not to do it. We have to do it and we have to do it now. The moment is right and everybody is here and this has great momentum.

But if this is not compelling enough, it is important for you to know this and important for the world to know this. This legislation pays for itself many times over. According to the Administration and industry, incentive auctions will bring in revenue well above what funding public safety requires, leaving billions—and I mean $20-plus billions—over for deficit reduction or for whatever people want to have happen. So this is a win-win-win from my point of view.

In closing, let me say that we have an opportunity right now to provide our public safety officials with spectrum they need to communicate when tragedy strikes. And with incentive auctions, we can pair this with funding. Some people are not wild about this idea, and we respect their points of view but their points of view do not measure up to the facts of what we are dealing with here. They do not realize that if we have a voluntary spectrum auction for those who feel they can do that, we pick up a ton of money, far more than you would need for not just deploying your interoperability but maintaining the system, building it out, deploying it, and maintaining it.

To my colleagues, I say let us seize this moment. This is the right thing to do. This is not a left thing to do. It is just the right thing to do. So let us do something historical. Let us do it together, and let us do it starting with this hearing today.

I will have to say this is my highest legislative priority for this committee. I say that happily, unabashedly, and proudly. We will work to get this done before our nation reaches the 10th anniversary of September 11th, which is coming upon us quickly. It comes upon us much more quickly than we do legislation in the U.S. Congress. So the earlier we start, the better it is.

I thank our witnesses for joining us today, and I will introduce them, but first Kay Bailey Hutchison.

STATEMENT OF HON. KAY BAILEY HUTCHISON,
U.S. SENATOR FROM TEXAS

Senator HUTCHISON. Thank you, Mr. Chairman.

I think you have pointed out a lot of the reasons for addressing this issue. We have all heard too many stories of our police, fire, and medical personnel who cannot communicate during emergencies, sometimes even resorting to handwritten notes passed across piles of rubble. When school children are walking to school with cutting-edge smart phones capable of video conferencing and high speed Internet connections, our first responders should have more than walkie-talkies and notes across rubble. Oftentimes we see that even the equipment they have is not interoperable.

So this is the time to act. And you have been a leader, Mr. Chairman, on this issue and I think you have shown that commitment this morning.

I said last September that I can support your proposal to allocate the spectrum known as the D Block to public safety. However, I do have some concerns about how your legislation would fund the deployment of the public safety network and whether we could work together to combine the public safety allocation with some of my priorities in the wireless area to drive innovation, investment, and job growth.

I have drafted a comprehensive spectrum bill, the Wireless Innovation Spectrum Enhancement Act, WISE Act, to be called, that I hope you will consider. My bill would allocate the D Block to public safety, as well as provide a stable funding stream through a combination of grants and zero interest loans financed by auction revenue to build a public safety network. Funds would also be specifically targeted to rural and high-cost areas where so many communities do not have access to wireless networks. This is important in every state that has rural communities and smaller communities to get the public safety broadband network in place and deployed.

In addition to ensuring our first responders will have access to communications systems they need, my bill will generate billions in new revenue to help pay down the federal deficit. It will also spur more efficient and transparent use of government spectrum, encouraging the Government to use less of its spectrum allotment so that some airwaves that today are unused or underutilized can be repurposed for higher use.

Last, my proposal will drive investment, innovation, and job creation by significantly increasing the spectrum available for commercial broadband use. This is necessary to maintain the United States' position at the forefront of the wireless world.

So, Mr. Chairman, I hope that we can combine your priority and your approach with mine and do something that I think would be a win all the way around, from public safety spectrum to paying for it and adding to the commercial capabilities to use broadband. Thank you.

The CHAIRMAN. We always do.

Senator HUTCHISON. Thank you very much.

The CHAIRMAN. I want to apologize to the other witnesses, but Senator Hutchison and I have to be on the floor to manage an aviation bill at 11 o'clock. I think we can be late, but I do not think it is a good idea.

So I want to introduce Congressman Peter King from New York. He has been a longtime advocate for handing the D Block to public safety. He is Chairman of the House Homeland Security Committee. By having him kick off the dialogue, I just think it sets the tone. He is going to make an introduction. But I must say that I am very honored that you are here, sir. The floor is yours.

STATEMENT OF HON. PETER T. KING, CHAIRMAN, COMMITTEE ON HOMELAND SECURITY, U.S. HOUSE OF REPRESENTATIVES

Mr. KING. Thank you, Chairman Rockefeller, Ranking Member Hutchison, Senators.

First of all, it is a great opportunity to be here. I want to thank you for extending the invitation to me. As a fellow New Yorker, Senator Rockefeller, I know you took a wrong turn once and ended up in West Virginia, but we still miss you in New York and we wish we had you back. But in any event, it is great to be here and it is good to see my good friend, Senator Toomey. I knew him when he worked across the street. It is good to see you, Pat. Thank you.

Mr. Chairman, ten years after the September 11 attacks, our first responders still suffer from a lack of interoperable communications.

By the way, I identify myself completely with everything said by you and Senator Hutchison. Whatever differences there are I hope can be resolved as we go forward. Some of the underlying motivation I agree with completely.

The current situation is simply unacceptable. We have spent billions of dollars to upgrade communication systems, but we still lack interoperability. For instance, at Penn Station in New York, police officers are unable to consistently use their communications equipment even when they are only 100 yards away from one another due to interference.

Now, back in 2004, six and a half years ago, the 9/11 Commission report with Congressman Hamilton and Governor Kean, recommended that the Congress should support legislation to provide for the expedited and increased assignment of radio spectrum for public safety purposes. Six and a half years later it still has not been done. And for far too long the spectrum has been allocated to public safety in a piecemeal approach.

We need to implement a new plan for solving our nation's public safety interoperable communications problem, one that ensures first responders have the latest technology to get the job done and to save lives. We need to support a plan that will provide public safety agencies enough contiguous spectrum to enable the conversions of voice, video, and data communications on one network, and this network must have enough capacity and speed to allow public safety the ability use the latest equipment and applications to do their job in a secure environment.

That is why, along with Ranking Member Thompson of the Homeland Security Committee in the House, I have introduced the bipartisan Broadband for First Responders Act, H.R. 607. This is the companion to the bill of Senator Lieberman and Senator McCain, very close to yours as well, and I look forward to working with you, Senator McCain, Senator Lieberman, and Senator Hutchison and as many people as we can on a bipartisan basis.

By allocating D Block to public safety and providing sufficient funding, we can finally give the brave men and women of our law enforcement community, fire service, EMTs the communications resources that they require and need and which we as the public require and need as we live in very, very dangerous times, whether we are talking about natural disasters or the constant peril of terrorist attack. Just last week, Secretary Napolitano said that the terror threat is as high now as it has been since September 11, 2001. So this is a real, real and present challenge, danger, and threat to our nation, and I believe legislation of this type is absolutely essential.

Now, my main purpose, Chairman Rockefeller, in being here today is to introduce New York Police Commissioner Ray Kelly who has truly been a leader. He is here today. There are men from law enforcement, men from the fire service, men who literally put their lives on the line every day to protect us and need the very, very best. Commissioner Kelly has been—probably no one has been more of a leader, not just a local leader but a national leader, since September 11. The New York City Police Department has 1,000 police officers dedicated to fighting terrorism. That is 1,000 police officers. They have an intelligence division, a counter-terrorism divi-

sion. They have people focused on interoperability. At every stage and every level of the fight against terrorism, the NYPD has been there before September 11 but especially since Commissioner Kelly came back as Commissioner in January of 2002. We in New York live every day with the constant specter of another attack. We have been attacked twice, and since Commissioner Kelly has been commissioner, we have stopped 11 other attacks against the City of New York. So we realize firsthand the danger.

But we have no monopoly on threats. We have no monopoly on death. And that is why I am supporting this legislation in a bipartisan way, why I look forward to working with you, and why it is really my privilege to introduce Commissioner Kelly to you today. He and Chief Dobbs from the NYPD have just been constant and consistent in urging passage of legislation such as this. So I am proud that Commissioner Kelly is here today. He will, as always, do a tremendous job in laying out what the reality on the ground is and what has to be done.

So as Congressman Toomey used to say and I still say, I thank you for allowing me to testify and yield back the balance of my time. Thank you, Senator Rockefeller.

The CHAIRMAN. Thank you very much.

We will have the panel come forward, and as they are doing that, I want to point out that our three members here today are all new members to the Committee. So I think that reflects very well on them and less well on the rest of our colleagues.

[Laughter.]

Mr. KING. I am not going to get involved in that, Senator.

[Laughter.]

The CHAIRMAN. Well, it is busy.

I also ask unanimous consent to enter Senator Schumer's statement in the record. He wanted to be here to support the bill and to support Commissioner Kelly but had, as they say, a prior engagement. He is a very busy man.

Mr. KING. I know.

[The prepared statement of Senator Schumer follows:]

PREPARED STATEMENT OF HON. CHARLES E. SCHUMER,
U.S. SENATOR FROM NEW YORK

I am sorry I could not be with everyone before the Committee today, but I would like to thank the distinguished Chairman, Senator Rockefeller, for holding this hearing, and his leadership in authoring this important legislation, the Public Safety Spectrum and Wireless Innovation Act.

I would like to recognize New York City's Police Commissioner Ray Kelly who is testifying today for his tireless work in keeping New York City safe and secure. We are all in his debt. He is one of our nation's preeminent experts on national security, and his endorsement of this legislation speaks volumes about its wisdom.

As we all know this year will mark the tenth anniversary of the attacks of September 11. As we continue to endeavor to understand the reality of a post-9/11 world, it is imperative that we learn from that tragedy. The 9/11 Commission's report, which highlighted our gaps in preparedness for any future attack, has been a principal roadmap for moving forward. A key recommendation of the 9/11 Commission was to increase the assignment of radio spectrum for public safety purposes.

The Chairman's bill responds directly to that Commission's recommendations and advances the cause of safety. For that reason, I am proud to join him and my colleagues, Senators Cardin, Harkin, Lautenberg, Klobuchar, Gillibrand, and Nelson, as a co-sponsor of the Public Safety Spectrum and Wireless Innovation Act.

This bill is an essential step in propelling our first responders into the twenty-first century. The bill establishes a framework for the development of a nationwide

wireless broadband network for public safety. By allocating this 10 megahertz of spectrum, or the D Block, to public safety we are in fact facilitating applications ranging from location-aware real-time services to multimedia command control capability. This technology could help a firefighter map out the most effective entry points of a burning building or ensure that police are able to effectively communicate in a perilous situation.

We owe it to the American people to do everything we can, not only to prevent any other attack, but also to equip our first responders with the tools they need to do their important work. And that means passing the Public Safety Spectrum and Wireless Innovation Act.

I encourage the Commerce Committee to swiftly mark-up this important bill in order to ensure that it is passed into law before the tenth anniversary of 9/11.

The CHAIRMAN. Could the panel come forward, please?

Congressman, we thank you very much.

Mr. KING. Thank you, Senator. Thank you very much.

The CHAIRMAN. So our panel is New York City Police Commissioner Ray Kelly, who has been introduced; Delaware Governor Jack Markell. He is on the Executive Committee of the National Governors Association, NGA. He has a long history. And I believe one of your first jobs, sir, was working for Nextel, whose former founder failed to show up this morning.

Governor MARKELL. I am looking for him.

[Laughter.]

The CHAIRMAN. Yes. But he would be sitting in about that third seat there from the end. So you can imagine him.

Also, Al Gillespie, Chief of the North Las Vegas Fire Department and First Vice President of the International Association of Fire Chiefs. That group has been a longtime supporter of this legislation. And obviously his testimony will be important.

Also, Mr. Joe Hanna, President of Directions. He is the former President of the Association of Public Safety Communications Officials, and he is also a former Richardson, Texas police captain.

So we welcome all of you, and I would ask Commissioner Kelly to begin.

STATEMENT OF HON. RAYMOND W. KELLY, POLICE COMMISSIONER, CITY OF NEW YORK

Mr. KELLY. Thank you very much, Mr. Chairman, Senator Hutchison, members of the Committee.

I also want to thank Congressman King for that very generous introduction and for his rock-solid support of law enforcement and fire safety issues in New York City. And in the interest of full disclosure, I must say that Congressman King's father was a lieutenant in the New York City Police Department.

Let me begin by expressing my gratitude for this bipartisan effort on behalf of public safety. Thanks to the leadership of Senator Rockefeller, Congressman King, Senator Hutchison, and so many other Members of Congress on both sides of the aisle, we are closer than ever to providing our nation's first responders with the tool that they desperately need: a nationwide broadband network dedicated to public safety. It was extremely encouraging to see President Obama expressing his firm support for this initiative last week.

I come to Washington today as the head of a police department that will benefit enormously from this technology. I consider it essential to the future of our mission. I know this view is shared by

law enforcement agencies and fire departments, large and small, urban and rural, across the country.

That is because our existing communications systems are fast becoming obsolete. Like virtually all other public safety organizations, the New York City Police Department relies principally on the use of two-way voice radios to communicate with responding officers and direct them to the scene. However, this technology is extremely limited. We cannot use it to exchange electronic data. And although we have made progress on local radio interoperability, the lack of a common radio spectrum prevents us from establishing a truly seamless nationwide system for all first responders.

Today a 16-year-old with a smart phone has a more advanced communications capability than a police officer or deputy carrying a radio. Given the technology that is available and the complexity of the threat that we face, this is unacceptable. It will only change if we succeed in building a nationwide broadband network to a mission-critical grade of service.

In New York City, this would enable the NYPD to fully leverage the powerful technology that we use in our Real Time Crime Center. This is a state-of-the-art computer facility we opened at our headquarters in 2005. It is supported by a massive database containing billions of public and private records. We have made this database searchable with the latest software. Around the clock, crime center detectives take calls from investigators in the field looking to follow up on various leads they obtained: a partial license plate, a seemingly untraceable cell phone number, a nickname, or even a tattoo. They conduct instant, on-the-spot searches, something that previously took days of calling, faxing between agencies, and combing through paper files.

We are also about to launch a facial recognition unit within the Real Time Crime Center. It will use digital technology to match video images of people at crime scenes to mug shots that are on file.

With a dedicated broadband network, we would be able to push this information out to tens of thousands of officers on patrol. For example, an officer using a handheld device operating on this network could receive detailed information before he or she arrives at the location. This would include who lives there, whether or not the police have been there before and why, and if any of the occupants has an outstanding warrant, an order of protection, or a firearms license.

Such a network could also provide officers with an immediate, digital snapshot of anyone they detain. It would give them the suspect's address, prior arrest history, and other critical details. The officer would be able to take electronic fingerprints at the scene and compare them instantaneously with those in local, state, and federal databases. This kind of situational awareness is vital to the safety of officers and members of the public. And it represents the next generation of law enforcement communications.

But we cannot get there without a safe, secure, and effective broadband network over which to deliver this information, one that is built and run to public safety specifications and one that we can control. We know from past experience that we cannot totally depend on systems run by the private sector. They are too susceptible

to failure in a crisis. On September 11th and after the 2009 crash of a commercial jetliner in the Hudson River, cell phone networks were deluged and police and fire communications over them became virtually impossible.

That is a grave concern in light of the threat that we face from terrorism. The New York City Police Department trains every day to prepare for large-scale disasters. But we need a network that will support a multi-agency response and all of the technology we use to keep our city safe.

To give you one example, as part of our response to the attempted car bombing in Times Square last May, we deployed a robot to inspect the vehicle. As is the case with all of our robots, it was controlled by its operator through a thin, fiber optic cable. Our need to maneuver around fire hoses and other obstacles on the street increased the risk that the cable would be run over and severed. If that had happened, we would have lost control of the robot. With an adequate broadband network in place, we would not have to worry about that. We could control robots wirelessly, thereby removing these risks.

It would also make it easier and safer to conduct complex operations involving more than one robot, say, if we found a secondary device at a bomb scene. With wireless, broadband technology, we would not have to be concerned about managing multiple cables. We could also share the video feeds from our robots with the federal government and other law enforcement agencies in real time.

Right now, these capacities do not exist. But they will if we build this network.

Every public safety agency in the nation supports this effort. That is why I urge Congress in the strongest possible terms to allocate the D Block directly to public safety and to ensure funding for this vital resource. We need adequate bandwidth, network control, and a higher standard of reliability and survivability that only a public safety network can provide. Together with our partners from across the country, the New York City Police Department looks forward to the day when we can share a broadband capability that delivers voice, video, and data on a dedicated wireless network. For the sake of the security of cities and towns throughout our Nation, I sincerely hope we see that day soon.

Thank you very much for inviting me, Mr. Chairman.

[The prepared statement of Mr. Kelly follows:]

PREPARED STATEMENT OF HON. RAYMOND W. KELLY,
POLICE COMMISSIONER, CITY OF NEW YORK

Good morning, Chairman Rockefeller, Senator Hutchison, members of the Committee. Thank you for this opportunity to testify.

Let me begin by expressing my gratitude for this bipartisan effort on behalf of public safety. Thanks to the leadership of Senator Rockefeller, Congressman King, and Members of Congress on both sides of the aisle, we are closer than ever to providing our Nation's first responders with a tool they desperately need: a nationwide broadband network dedicated to public safety. It was extremely encouraging to see President Obama expressing his firm support for this initiative last week.

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Such a network could also provide officers with an immediate, digital snapshot of anyone they detain. It would give them the suspect's address, prior arrest history, and other critical details. The officer would be able to take electronic fingerprints at the scene and compare them instantaneously with those in local, state, and federal databases. This kind of situational awareness is vital to the safety of the officers and members of the public. And it represents the next generation of law enforcement communications.

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can share a broadband capability that delivers voice, video, and data on a dedicated wireless network. For the sake of the security of cities and towns throughout our nation, I sincerely hope we see that day soon.

Thank you again for this chance to testify. I would be pleased to answer any of your questions.

The CHAIRMAN. Thank you very much, Commissioner. We are honored that you are here. You have a very excellent national reputation.

Mr. KELLY. Thank you, sir.

The CHAIRMAN. The Governor of Delaware, Jack Markell, is our next witness. We welcome you, sir.

STATEMENT OF HON. JACK MARKELL, GOVERNOR, STATE OF DELAWARE AND MEMBER, EXECUTIVE COMMITTEE, NATIONAL GOVERNORS ASSOCIATION

Governor MARKELL. Thank you, Chairman Rockefeller and Senator Hutchison, members of the Committee. My name is Jack Markell. I am the Governor of the State of Delaware.

And before I start, I would like to thank the men and women behind me from public safety and law enforcement, first responders, and certainly especially those who are behind me from Delaware. I am grateful to them.

It is a privilege to testify today on behalf of my fellow governors and also on behalf of the National Governors Association in favor of reallocating the 700 megahertz D Block spectrum to public safety. Governors are committed to working with you and with our federal partners to develop a nationwide broadband network for first responders.

And I especially appreciate the opportunity to testify on this particular issue. As you noted, before my political career, I actually spent years acquiring the spectrum that led to the nationwide network that became Nextel.

Senator Rockefeller, as you know, it is not always easy to reach consensus among governors, but when the FCC proposed auctioning the D Block for commercial use and then giving priority access to public safety for a fee, governors, legislators, county officials, and mayors joined with police and fire chiefs to say no. In our opinion, if we are to build the system that our first responders need and our citizens expect, we have got to begin by making the reallocation of the D Block the cornerstone of our efforts to develop and to deploy a nationwide interoperable broadband network.

Now, as Governor, I am fortunate to lead a state that has prioritized interoperable communications. Since the attacks of September 11th, we have worked diligently in Delaware to address interoperability by installing a statewide 800 megahertz narrowband radio system that is used by all of the public safety agencies within our state. And when we did so, we became one of the first states to operate a truly interoperable public safety communications system. But unfortunately, due to the narrow bandwidth, this system does not have the capability to provide the robust exchange of broadband data.

And this is where the opportunity to reallocate the D Block becomes so critical. Instead of a limited, piecemeal system, we have the chance to build a system to allow all first responders to share

mission-critical video, to download building plans, to track personnel and equipment in real time. And in fact, if done correctly, the build-out of a nationwide interoperable system could save states like ours millions of dollars. This is because instead of spending taxpayer money to upgrade an old system, we could invest and leverage our dollars to join a 21st century system that will reliably provide our first responders with the critical information that they need to save lives.

Now, as you know, the development of such a system is dependent upon three things. First is access to sufficient and dedicated spectrum for public safety. Second is a funding mechanism to construct, manage, and maintain the network, and third, clear governance guidelines to ensure nationwide coverage and interoperability. Efforts to address one issue without solving the others will only lead to us meeting again 10 years from now to ask why we still do not have interoperable communications.

Fortunately, Mr. Chairman, your bill, S. 28, the Public Safety Spectrum and Broadband Innovation Act, takes advantage of this unique opportunity to move us forward, and by reallocating the D Block to public safety, first responders will, for the first time, have sufficient, contiguous broadband spectrum to support a nationwide system.

S. 28 also addresses the funding question by establishing a funding source for construction and operation of the network. And as states continue to face budget gaps after several years of unprecedented revenue declines, federal funding to support network construction and maintenance will help ensure its timely development and nationwide deployment.

I should also note that the reallocation of spectrum will provide state and local governments greater flexibility to innovate in the development and administration of the network, to achieve economies of scale, to utilize public/private partnerships to reduce the costs of construction and to reduce the costs of maintaining the network.

And finally, your bill addresses key governance issues necessary to maintain nationwide interoperability. For example, while the bill maintains flexibility for local areas to begin network construction ahead of the state, the legislation also would ensure that any advance network deployments are coordinated throughout the state and region. And this coordination will be critical to facilitating interoperability and coordination between existing voice communication systems and the new public safety broadband network. It will also help ensure that rural areas are included in the nationwide network in a timely manner.

So the development of an interoperable broadband network for public safety is essential for enhancing the ability of first responders to protect our citizens and to respond to emergencies, and the cornerstone of such a network is dedicated spectrum and specifically the reallocation of the D Block to public safety.

Governors greatly appreciate the support and work of this committee and the fact that S. 28 takes advantage of this one-time opportunity to avoid the mistakes of the past by allocating appropriate contiguous spectrum to support the safety and security of our country.

So on behalf of the National Governors Association, I want to thank you for the opportunity to testify on this critical issue. We governors are committed to working with you and our federal partners to develop, to build, and to deploy a nationwide interoperable broadband system for first responders. Thank you.

[The prepared statement of Governor Markell follows:]

PREPARED STATEMENT OF HON. JACK MARKELL, GOVERNOR, STATE OF DELAWARE AND MEMBER, EXECUTIVE COMMITTEE, NATIONAL GOVERNORS ASSOCIATION

Chairman Rockefeller, Ranking Member Hutchison and distinguished members of the Committee, my name is Jack Markell, Governor of the state of Delaware and a member of the National Governors Association's (NGA) Executive Committee. I appreciate the opportunity to appear before you today to discuss the importance of a nationwide broadband network for our first responders.

For more than a year Governors have called for the reallocation of D Block spectrum to public safety to serve as the cornerstone of efforts to develop and deploy a nationwide, interoperable broadband system. It is with great pleasure that I testify today to lend Governors' support for the solutions presented by S. 28, the "*Public Safety Spectrum and Wireless Innovation Act*," introduced by Senator Rockefeller.

Overview

As Governor, I am responsible for the safety and security of our citizens and must ensure that our public safety agencies can respond to any and all emergencies that may arise. Whether the event is a terrorist attack, a hurricane, chemical spill or bridge collapse, Delaware's first responders must be able to communicate seamlessly with each other and with the public at a moment's notice.

To do so requires a communications network with sufficient capacity to allow firefighters, police officers and emergency medical personnel to share video, building plans, and the location of personnel and equipment in real time. In short, they must have access to the technology that today's teenagers have at their fingertips.

Almost 10 years after the terrorist attacks of September 11 and despite a great deal of national attention to first responders' communications needs, we continue to lack a nationwide network that can provide these capabilities to first responders.

S. 28, The Public Safety Spectrum and Wireless Innovation Act

The nation's Governors believe the development of an interoperable broadband network for public safety is essential to enhancing the ability of first responders to save lives and protect property.

Development of such a system is dependent upon three things: first, access to sufficient and dedicated spectrum; second, a funding mechanism to construct, manage and maintain the network; and third, clear governance guidelines to ensure nationwide coverage and interoperability. Efforts to address one issue without solving or supporting a solution for the others will only hinder progress toward reliable and interoperable communications.

Since the attacks of September 11, 2001, Delaware has worked diligently to address interoperability by installing a statewide 800 MHz narrowband radio system that is used by all public safety agencies within the state. In doing so, Delaware became one of the first states to operate a truly interoperable public safety communications system. Unfortunately, due to narrow bandwidth, this system does not have the capability to provide for the exchange of robust broadband data.

S. 28, the "*Public Safety Spectrum and Wireless Innovation Act*", would take advantage of the unique opportunity to dedicate sufficient contiguous broadband spectrum to first responder communications by reallocating the 700 MHz D Block spectrum to public safety, establishing a funding source for construction and operation of the network and addressing key governance issues necessary to ensure nationwide interoperability.

Spectrum Allocation

The chance to allocate the 700 MHz D Block spectrum to public safety represents an unparalleled opportunity to develop a robust, modern and reliable nationwide interoperable broadband network.

Past efforts to develop and maintain interoperable communications across the country have been hindered by the Federal Communications Commission's (FCC) allocation of small sections of spectrum across different frequency bands for public safety use—none of which are large enough to consolidate communications into a single segment of spectrum. Since devices operating on different frequencies cannot

talk to each other, public safety agencies have sometimes been forced to install two or more radios in each response vehicle to ensure neighboring agencies can communicate.

This solution is not only cumbersome but costly. With state and local budgets that support public safety under continuing strain for the foreseeable future, it is time to improve the efficiency and cost effectiveness of critical public services, including first responder communications.

Without access to the D Block, however, state and local governments will again be forced to maintain multiple communications networks to ensure the brave men and women who protect the public and respond to emergencies can talk to each other.

On the other hand, by combining the D Block with the existing 10 MHz of adjacent public safety spectrum, public safety communications could eventually be migrated from other spectrum bands to allow for more streamlined, efficient and cost-effective communications systems.

While the migration of voice systems to broadband should be explored for potential future consolidation, please note that this cannot happen overnight. The narrowband spectrum is currently used by state and local governments for existing or developing interoperable voice communications systems that cannot be migrated to broadband until the technology has been further developed.

As you know, current law requires the FCC to auction the 700 MHz D Block. The FCC plans to auction the D Block for commercial purposes and provide public safety with roaming and priority access on other 700 MHz broadband networks for a fee. This will simply not work.

As demonstrated repeatedly during recent disasters, excessive demand can clog commercial systems and prevent users from accessing the network. First responders require more reliable access, especially during times of emergency. It is simply unacceptable for first responders to be forced to wait for access when lives are at stake.

In contrast, S. 28 is based on the core principle that public safety communications are simply too important to be placed in other hands. By adding the D Block to the existing Block of 10 MHz, and by providing funding mechanisms, Congress will ensure that public safety controls the design and construction of network facilities sufficient to meet their exacting standards of performance. No commercial operator builds to meet those same standards. This is not to say that commercial providers should not be involved. Public safety should explore the real potential of working constructively with the private sector to meet its needs.

Funding

Just as sufficient spectrum is critical to the success of the nationwide network, so too is a sufficient funding source to ensure that the network is constructed in a timely manner throughout the country and that these systems can then be managed, upgraded and maintained as necessary.

Regardless of whether it is built on 10 or 20 MHz of spectrum, construction of a nationwide network will be a costly endeavor. As states continue to face budget gaps after several years of unprecedented declines, Federal funding to support network construction and maintenance will help ensure its timely development and nationwide deployment.

S. 28 would address these funding challenges through the establishment of grant programs for construction and maintenance. These grants would be fully funded through future auctions of spectrum and could provide billions of dollars in financial support for a critical national public safety asset.

In addition, much like real estate, the D Block is a valuable asset. If reallocated to public safety, this additional spectrum could allow state and local government greater flexibility to innovate in the development and administration of the network. For example, commercial wireless operators will continue to spend billions of dollars deploying broadband facilities that mirror those that public safety will construct and operate. Constructive and innovative partnerships with commercial operators might achieve economies of scale and allow sharing of construction and operating costs to the benefit of both parties. By putting public safety in control of the spectrum, the playing field is leveled to enable such beneficial arrangements.

Governance

Finally, in addition to the spectrum and funding issues I mentioned, establishing clear governance guidelines for the network will be critical to ensuring nationwide coverage and interoperability.

S. 28 recognizes the importance of the coordinated development of the public safety network by requiring the FCC to establish technical and operational require-

ments and by authorizing states to oversee the issuance of requests for proposals related to the network.

While maintaining flexibility for local areas to begin network construction ahead of the state, the legislation would ensure that any advanced network deployments are coordinated throughout the state or region. This will facilitate interoperability and coordination between existing voice communications systems, such as land mobile radio, and the public safety broadband network. It will also help ensure that rural areas are included in the nationwide network in a timely manner.

Conclusion

The development of an interoperable broadband network for public safety is essential for enhancing the ability of first responders to protect our citizens from harm and respond to requests for emergency assistance. The cornerstone of such a network is dedicated spectrum; specifically, the reallocation of the 700 MHz D Block to public safety.

Governors greatly appreciate the support of this committee and the introduction of S. 28. We also appreciate the President's support and his commitment to reallocating the D Block to public safety.

By reallocating the D Block to public safety, S. 28, the "*Public Safety Spectrum and Wireless Innovation Act*," would ensure that the nation takes advantage of this one time opportunity to avoid the mistakes of the past and allocate appropriate contiguous spectrum to support the safety and security of our country.

On behalf of the National Governors Association, thank you for the opportunity to testify. I encourage this committee to work closely with Governors as you consider the legislation and to report it favorably to the Senate as soon as possible.

The CHAIRMAN. I thank you, sir.

Chief Gillespie?

STATEMENT OF AL H. GILLESPIE, CHIEF, NORTH LAS VEGAS FIRE DEPARTMENT AND FIRST VICE PRESIDENT, INTERNATIONAL ASSOCIATION OF FIRE CHIEFS

Mr. GILLESPIE. Good morning, Chairman Rockefeller and Ranking Minority Member Hutchison, and the honorable members of the Committee. I am Al Gillespie, the Fire Chief for the City of North Las Vegas, Nevada, and the First Vice President of the International Association of Fire Chiefs, the IAFC, on whose behalf I appear.

My testimony today is in support of S. 28. A top priority for all public safety, police, fire, and EMS, is to build a nationwide public safety wireless interoperable broadband network. This urgent need is recognized in many studies such as the 9/11 Commission and Hurricane Katrina reports. Mr. Chairman, S. 28, the legislation you introduced, will allow public safety to realize its nationwide communications goal by providing both the spectrum and the funding which is required.

This bill also has the support of the Public Safety Alliance, an organization of nine national public safety organizations, including the IAFC, and with the support of a diverse range of entities from both the public and private sectors. Our goal is supported by the seven national organizations representing state, county, and local governments, as well as many of the leading technology integrators, telecommunication carriers, and equipment manufacturers.

We are very appreciative of the recently announced support from the Obama administration. The President's budget announced earlier this week contains provisions for allocation of the D Block to public safety and methods for funding. We look forward to working with the administration, as well as Congress, to make possible a nationwide public safety broadband network, bringing public safety

communications into the 21st century to better serve America's citizens.

Over the past 50 years, America's domestic defenders have been allocated thin slices of spectrum in each new band as it became available. That is why today we have over 55,000 public safety agencies each operating their own mission-critical radio system over six or more different bands. This makes our goal of interoperability both difficult and expensive.

After numerous major events and other significant disasters, it is clear that a new model is necessary: a national architecture for public safety wireless communications. To achieve a nationwide public safety wireless, interoperable, broadband network, key elements need to be in place.

The network must have sufficient capacity to achieve a national public safety broadband network, connectivity coast to coast, border to border, 10 megahertz of D Block spectrum, currently slated for FCC auction, must be added to the current 10 megahertz of spectrum licensed to public safety in order to build out a 20 megahertz network. The currently licensed public safety spectrum abuts the D Block and is perfect for public safety. Only with this particular spectrum configuration and none other can public safety be assured that it will have the ability to build the network it needs now and into the future. S. 28 will accomplish this one-time opportunity to get it right.

Public safety must control the network. Local control of the network by public safety agencies is critical. Utilizing a single technology with sufficient spectrum will ensure nationwide interoperability and allow us to effectively manage day-to-day operations, as well as any major incident.

The network must be mission-critical at the onset. Key elements of mission-critical are: the network must be hardened to public safety requirements; the public safety mission-critical voice network must have the ability to broadcast and receive one-to-one and one-to-many and the ability to broadcast and receive without the network infrastructure being operative; and the network must have backup capabilities in the event of network loss and at public safety requirements.

There are numerous examples and applications for possible fire and emergency medical services. For example, live video feed to provide instantaneous situational awareness for mass casualty incidents like the Tucson shooting, major hazardous materials spills, and real-time situational awareness to incident commanders, as well as elected officials and other decisionmakers.

In the area of emergency medical services, we envision digital imaging, portable EKG's, portable ultrasounds, and field blood work with direct links to the hospital's emergency department. This would put a virtual physician in the back of an ambulance with an emergency medical technician to expedite the proper life-saving treatment. This will be especially critical in rural areas where transit time to the hospital is longer. These types of applications for fire and EMS are only possible with broadband capability.

And funding is important for the build-out of a public safety broadband network. State and local government budgets are challenged. The broadband network needed by public safety cannot be

built without federal funding support. S. 28 recognizes this fact and offers a solution.

Mr. Chairman, the IAFC and the public safety support S. 28. The bill provides public safety with what it needs to begin the task of building out a nationwide public safety broadband network. The 10th anniversary of the tragic events of September 11, 2001 will be marked in about seven months. Thus, we urgently need to move forward on a plan to develop the envisioned public safety broadband network communications. We thank you for your personal attention and leadership on this issue and will continue to work with you and the Committee to assure prompt passage.

I will be available for questions.

[The prepared statement of Mr. Gillespie follows:]

PREPARED STATEMENT OF AL H. GILLESPIE, CHIEF, NORTH LAS VEGAS FIRE DEPARTMENT AND FIRST VICE PRESIDENT, INTERNATIONAL ASSOCIATION OF FIRE CHIEFS

Good morning Chairman Rockefeller and Ranking Minority Member Hutchison. I am Al Gillespie, Chief of the North Las Vegas Fire Department and First Vice President of the International Association of Fire Chiefs (IAFC) on whose behalf I appear. The International Association of Fire Chiefs represents the leadership of over 1.2 million firefighters and emergency responders. IAFC members are the world's leading experts in firefighting, emergency medical services, terrorism response, hazardous materials spills, natural disasters, search and rescue, and public safety policy. Since 1873, the IAFC has provided a forum for its members to exchange ideas and uncover the latest products and services available to first responders.

My testimony today is in support of S. 28 (the Public Safety Spectrum and Wireless Innovation Act). A top priority for all public safety—law enforcement, fire and emergency medical services—is to build a nationwide, public safety, wireless, interoperable, broadband network. This urgent need is recognized in many studies such as the 9/11 Commission and Hurricane Katrina reports. Mr. Chairman, S. 28, the legislation you introduced, will allow public safety to realize its nationwide communications goal by providing both the spectrum and funding which is required. This bill also has the support of the Public Safety Alliance, an organization of nine national public safety organizations, including the IAFC, and with the support of a diverse range of entities from both the public and private sector. Indeed, our goal is supported by the seven national organizations representing state, county and local government, as well as many of the leading technology integrators, telecommunications carriers and equipment manufacturers.

We are very appreciative of the recently announced support from the Obama administration. The President's Budget, announced earlier this week, contains provisions for allocation of the D Block to public safety and methods for funding. We look forward to working with the administration as well as Congress to make possible a nationwide public safety broadband network bringing public safety communications into the 21st century to better serve America's citizens.

Over the past fifty years, America's domestic defenders have been allocated thin slices of spectrum in each new band as it became available. That is why, today, we have over 55,000 public safety agencies each operating their own mission critical radio system over six or more different bands. This makes our goal of interoperability both difficult and expensive. After numerous major events and other significant disasters, it is clear that a new model is necessary: *a national architecture for public safety wireless communications.* To achieve a nationwide, public safety, wireless, interoperable, broadband network, key elements need to be in place.

The network must have sufficient capacity. To achieve a nationwide public safety broadband network—connectivity coast to coast, border to border—10 MHz of D Block spectrum, currently slated for FCC auction, must be added to the current 10 MHz of spectrum licensed to Public Safety in order to build out a 20 MHz network. The currently licensed public safety spectrum abuts the D Block and is perfect for public safety. Only with this particular spectrum configuration, and none other, can public safety be assured that it will have the ability to build the network it needs now and into the future. S. 28 will accomplish this onetime opportunity to get it right.

Public safety must control the network. Local control of the network by public safety agencies is critical. Utilizing a single technology with sufficient spectrum will ensure nationwide interoperability and allow us to effectively manage day to day operations, as well as any major incident. We cannot have commercial providers deciding what is or is not an emergency and what is the priority. Public safety transmissions have to go through without delay. A "no service" signal is not an acceptable element of emergency operations. The lives of firefighters, the lives of medics, the lives of law enforcement officers depend on this. It is our responsibility.

Public safety expects to work with others and enter into public-private partnerships. We will work with state, county and local governmental agencies, Federal partners, utilities and others who respond to emergency incidents. But, public safety must have control over the operation of the network in real time. It cannot rely on commercial operators to provide its critical governance needs. Network control will give public safety assurance that it will have full, preemptive priority over its spectrum on a when-needed basis.

The network must be mission critical at the outset. In the beginning, this system will handle only data and video. At some future time—years away—we believe there will be a transition to mission critical voice. We all need to take a long term view—to start out with sufficient spectrum so that we will have the ability to migrate to mission critical voice. This will happen when the technology is developed, public safety has confidence in it, and its cost is affordable. Here are the key elements of "mission-critical:"

- The network must be hardened to public safety requirements. This means towers must be able to withstand the elements that might disable them. Towers in hurricane-prone areas and tornado alleys must be designed accordingly. Back up electrical power must be available 24/7. Redundancy is necessary.
- The public safety mission critical voice network must have the ability to broadcast and receive "one-to-one" and "one-to-many" and the ability to broadcast and receive without the network infrastructure being operative. This is called "talk around" mode—also known as simplex. This is a command and control imperative. You know well that we operate under extremely hazardous conditions. If the network, for any reason, cannot provide connectivity, then we need the capability to communicate without the network. This means communicating in the simplex mode. This is the essence of public safety communications.
- The network must have back up capabilities in the event of network loss and at a public safety standard. We envision satellite capability for the network to be available when a tower is disabled or other crippling malfunction. Satellites also can cover remote areas that do not have towers. Our mission is geography-oriented whereas commercial carriers are concerned with population.

Funding is important for the build-out of a public safety broadband network. State and local government budgets are challenged. The broadband network needed by public safety cannot be built without Federal funding support. S. 28 recognizes this fact and offers a solution. And, this network, much like current 700 and 800 MHz Land Mobile Radio (LMR) systems, must also be accessible to Federal public safety users nationwide as well as "second responders," such as utilities and highway agencies. Both a Construction Fund and a Maintenance and Operation Fund will be created and authorized to a maximum of $11 billion for both funds. These funds will provide matching grant programs at the U.S. Department of Commerce to build the network and at the FCC to operate and maintain the network. The bill will fund the Construction Fund by auctioning, at a minimum, 25 megahertz of contiguous spectrum at frequencies located between 1675 MHz and 1710 MHz.

It is important to recognize how this public safety broadband network will revolutionize the fire and emergency medical services. Examples of applications include: live video to provide instantaneous situational awareness for mass casualty incidents (*e.g.,* Tucson shootings), major hazardous materials spills, and real time situational awareness to incident command as well as elected officials and other decision-makers. In the area of emergency medical services we envision digital imaging, portable EKGs, portable ultrasounds, field blood work with a direct link to the hospital's emergency department. This would put a virtual physician in the back of the ambulance with the Emergency Medical Technician to expedite the proper life saving treatment. This will be especially critical in rural areas where transit time to the hospital is longer. These types of applications for fire and EMS are only possible with broadband capability.

Mr. Chairman, the IAFC and public safety support S. 28. This bill provides public safety with what it needs to begin the task of building out a nationwide public safety broadband network. S. 28 is the vehicle for finally securing this critical asset, and

we look forward to continuing to work with you and your colleagues in the Senate to further refine this legislation in order to enact the best possible bill into law. The 10th anniversary of the tragic events of September 11, 2001 will be marked in about 7 months. Thus, we urgently need to move forward on a plan to develop the envisioned public safety broadband communications network. We thank you for your personal attention and leadership on this issue and will continue to work with you and the Committee to assure prompt passage. I am available to respond to any questions you may have.

The CHAIRMAN. Thank you, Chief, very much.

And we turn now to Mr. Hanna.

STATEMENT OF JOSEPH L. HANNA, PRESIDENT, DIRECTIONS

Mr. HANNA. Chairman Rockefeller and Vice Chairman Hutchison, and members of the Committee, I appreciate the opportunity to be here today to testify on this significant piece of legislation. But I am sorry about my voice. This is the day my cold has to settle in here.

As Senator Rockefeller mentioned, I currently serve as President of Directions, which is a public safety-focused wireless communications practice. For the last six years, I have focused almost full time to the issue of this very topic today about a national broadband network.

The comments I am making today are solely my views and should not be construed to represent any of my clients or any past affiliations I have had. So I am just speaking from my experience in the field here.

Again, Senator, I would like to thank you for your leadership on this critical issue. It is, as folks have noted, well time that we move down the road to get this thing done.

I think everybody in this room agrees that our first responders should have all the tools they need to serve the public, including access to state-of-the-art wireless broadband communications. We fail to agree, however, on the fact that there are two paths that can provide public safety with the wireless broadband services that they need and that they deserve. Congress has provided public safety with 24 megahertz of spectrum in the 700 megahertz band. If prudently used, this allocation can provide public safety entities with the capacity they require for their day-to-day needs. Using that capacity in connection with commercial spectrum in the 700 megahertz band, as proposed in the FCC's National Broadband Plan, will give public safety the bandwidth necessary in situations in which the public safety allocation may become overloaded.

The difference between S. 28's recommendation to reallocate the D Block to public safety and that of the paradigm envisioned in the National Broadband Plan is that the LTE platform, which is now standardized as the interoperable vehicle for a public safety network, already provides for a seamless, priority-accessible mechanism that can be triggered in the event of an overload of the baseline public safety network.

Equally as important, partnering with commercial entities, a cornerstone of the National Broadband Plan, will allow first responders to take advantage of both reductions in the cost of building the core network while taking advantage of the benefits of commercial networks and the economies of scale that we have already heard

mentioned that will allow for terminal products that are needed by first responders.

Core communication capabilities for the public safety broadband network should be centered around a dedicated public safety grade broadband network, and it should recognize no distinction between urban, rural, and suburban boundaries. I believe my fellow panelists and I also agree that the widespread financial crises that are facing America's cities, counties, and states throughout the nation will not allow America to realize implementation of this dedicated public safety network without a massive infusion of federal funds. Unlike my fellow panelists, however, I do not believe that first responders need to be the licensee for all the spectrum that they need to use.

I commend Senator Rockefeller for your inclusion of the language in S. 28 that will help public safety use the spectrum they do have presently allocated through flexible use in the 700 megahertz band. We currently have 12 megahertz of narrow band spectrum in that band, and there are jurisdictions that have indicated that they have no desire to implement narrow band technologies. As they have indicated, it is a somewhat archaic technology. So to not be able to use that spectrum in an aggregated form has a massive potential to leave a large volume of this critical spectrum lying fallow in some parts of the country.

I think the greatest flaw in the reallocation of the D Block to public safety, in lieu of the current law and the proposal in the broadband plan, would be the unintended consequences of creating an island technology, a band class 14 subset that only first responders will use. With no commercial economies of scale, public safety will again find itself held hostage by a limited number of providers resulting in the same low-demand, high-cost marketplace faced every day in the public safety land mobile environment.

Additionally, budget estimates for a public safety network as calculated in the National Broadband Plan were based on a model in which the dedicated public safety network would be built in conjunction with a commercial rollout of their LTE networks. The broadband cost estimates for a stand-alone public safety network more than triples the cost of a shared deployment.

Budget provisions in S. 28 are already somewhat below the cost projections made in the broadband plan's concept of a shared buildout. We have a shortfall in federal funds provided through this bill. Public safety will be faced with the difficult choice of determining either having to come back to Congress and ask for billions of additional dollars in funding or to choose where the network will be built and where it will not be built. Instead of building a bridge to nowhere, we will be building half a bridge, then forcing the unnecessary expenditures of additional billions of dollars to complete the bridge or leaving a substantial portion of America's first responders without the broadband service that they need and they deserve.

While S. 28 has addressed many of the key elements needed to make a nationwide public safety network a reality, the proposed legislation misses one key element, and that is that of governance and the administrative structure required for the deploying of this initiative. If we fail to address the underlying issue of governance and administration at the beginning, we guarantee extended delays

in implementation, massive, needless cost, and the failure to have services implemented nationwide in an acceptable timeframe.

Again, Senator, I would like to thank you for the opportunity to speak today, and I would also be glad to answer any questions you may have. Thank you.

[The prepared statement of Mr. Hanna follows:]

PREPARED STATEMENT OF JOSEPH L. HANNA, PRESIDENT, DIRECTIONS

Introduction

Good morning, Chairman Rockefeller, Vice Chairman Hutchison, and members of the Committee. My name is Joe Hanna and I currently serve as the President of Directions, a public safety focused wireless telecommunications consulting practice. Prior to starting this practice, I retired from the public safety communications and public policy arena after 30 years of service. Additionally, I had the privilege to serve on the Association of Public Safety Communications Officials—International, or APCO, International Board of Directors from 1996–2000 and served as President during the 1999–2000 period. Since starting my consulting practice, I have remained an active member of APCO, the National Emergency Numbering Association (NENA), and have actively participated in meetings of the National Public Safety Telecommunications Council (NPSTC), Federal Communications Commission (FCC) events related to public safety, and have had the privilege to speak at numerous national conferences on topics related to public safety wireless communications. I have served as a public safety advisor to the 800 MHZ Transition Administrator and currently serve as a Senior Fellow for the Center for Digital Government. Thank you for inviting me to join this distinguished panel to address the need for a nationwide interoperable network for first responders.

Summary

Everyone in this room agrees that our first responders should have the tools they need to serve the public, including access to state-of-the-art communications systems. We differ on the most effective path to get to that result. Congress provided public safety with 24 megahertz of spectrum in the 700 MHZ band. If prudently utilized, this allocation can provide public safety entities with the capacity they require for day-to-day needs. Using that capacity in connection with commercial spectrum in the 700 MHZ band, as proposed in the FCC's National Broadband Plan, will give public safety the bandwidth necessary for disaster situations. Equally as important, partnering with commercial entities will allow first responders to take advantage of the benefits of commercial networks and handsets that consumers have come to enjoy.

Public Safety Must Have a Nationwide Interoperable Network

As I am sure that you will hear from all of the panelists, it is inexcusable that almost 10 years following the tragic events of September 11 and the carnage inflicted upon the residents of the Gulf Coast following Hurricane Katrina, America's first responders still find themselves ill equipped to communicate to the degree they need and deserve.

My real estate agent can take a client to a home, take out her laptop computer and pull up photos of the interior of the house, tax records, surveys and plats, and a list of comparable values in the neighborhood. But a firefighter at a burning building cannot pull up a floor plan to aid in a search and rescue or identify known hazardous conditions inside the building. A pedophile in a park can sit on a bench with a smart phone, take photographs of vulnerable children, and then instantly send his pictures to other pedophiles around the world. But a police officer who has responded to that park to investigate this suspicious person cannot upload or download a photograph or scanned fingerprint of that person to a local, state or national database to help determine if this subject is indeed a known threat to the community.

I believe that every member of this panel can agree on a common set of principles for a public safety broadband network that will best serve our nation. First, America's first responders deserve and require the same communications capabilities used every day by our real estate agents and junior high school students. Second, these core communications capabilities should be centered around a dedicated, public safety grade broadband network. Third, America's first responders need for these communication capabilities to recognize no distinction between urban, suburban, and rural boundaries. In fact, rural America may have the greatest need for high-

speed data. An accident victim in Brewster County, Texas or Webster County, West Virginia bleeds just as fast as an accident victim in New York City or Houston, Texas. The only difference is that the time it takes to respond to that victim and to transport him or her to the nearest medical facility may be measured in hours rather than minutes. The deputy stopping a suspicious van on a dark highway in Hillsville, Virginia recognizes that his closest backup may be 20 to 30 minutes away. The volunteer fire fighter understands that fire burns as quickly in Mountain View, Arkansas as a house fire in Dallas, but the nearest resources will take considerably longer to respond.

Public Safety Users Need Funding and a Plan for the Efficient Use of the Existing Spectrum Allocation

I believe that every member of this distinguished panel will also agree that, at a minimum, there are two fundamental elements for providing America's first responders with the wireless broadband tools that we need—dedicated spectrum and funding. I assume that my fellow panelists will agree that the widespread financial crisis facing cities, counties, and states throughout the nation will not allow America to realize the nationwide implementation of a dedicated, public safety broadband network without a massive, unprecedented infusion of Federal funds. At a time when we are seeing major cities laying off substantial numbers of police officers and as fire departments are not able to upgrade critical equipment with more reliable or efficient models, communications systems far too often fall victim to these fiscal realities. One need look no further than the 21 jurisdictions that have been granted waivers by the Federal Communications Commission for early deployment of public safety broadband networks. Only 7 of these 21 jurisdictions have initiated steps to actually deploy their network. The remaining 14 jurisdictions have not. The difference between the 7 who are actively attempting to deploy and the 14 who are not? Funding from the Federal Government in the form of a grant from the Broadband Technology Opportunity Program, or BTOP.

While I agree with the views of my fellow panelists on most issues, unlike them, I don't believe that first responders need be the licensees of all the spectrum they may need to use. Working through one of the most ambitious schedules imposed by the Obama administration, the FCC was charged with development of a National Broadband Plan. One key element of the National Broadband Plan was the proposal for the deployment of a nationwide, interoperable dedicated public safety wireless broadband network. The proposal was made possible through tens of thousands of person-hours of intensive research, interviews, and a thorough understanding of technical requirements needed to implement this network. While proposal is not perfect, I believe that the National Broadband Plan fundamentally "got it right." In addition to the proposal's recognition of the need for funding, the cornerstone of the proposal is a dedicated public safety network utilizing the 10 megahertz of spectrum allocated to public safety by Congress in 1997. Recognizing that a September 11 or Hurricane Katrina situation could tax the 10 megahertz allocation, the National Broadband Plan proposed to allow public safety to utilize the capacity of commercial wireless carriers on a priority basis. The fundamental assumption of the National Broadband Plan was that the 10 megahertz of public safety spectrum would be more than adequate for the day-to-day, routine needs of the national network. This basic assumption remains true today. The question is how to address spectrum needs when faced with infrequent, but critical events that require additional capacity.

This question is faced every day by every public safety entity in the Nation. While designing and managing my communication center in Richardson, Texas, I had to evaluate our daily, annual, and average call volumes to determine the number of call takers, dispatchers, and support personnel. This is no different than my counterparts here at the table. While we all try to provide resources based on our heaviest need, no public safety entity can provide enough telephone trunks, radio channels, or personnel to handle the extreme cases such as September 11 and Hurricane Katrina. I could have equipped my suburban call center with 500 trunk lines instead of 7, but I would not have 500 people to answer the overload of calls if faced with an event the magnitude of a September 11 or Hurricane Katrina. Even if I could produce 500 people to answer the phones, there would not be 500 first responders on the street to respond to the 500 calls being answered.

While I don't believe that the reallocation of the D Block as proposed by S. 28 is the key to an effective first responder broadband network, I do strongly support another provision of the bill that will help public safety use the spectrum they are allocated more effectively. S. 28 would provide for the flexible use of the 700 MHZ public safety spectrum allocated for narrowband communications. While the overwhelming majority of public safety entities have voiced opposition to this concept, failure to provide this flexibility will result in critically needed spectrum to remain

fallow in many parts of this Nation. New York City representatives, for example, have made multiple public statements that they have no desire to deploy any new voice systems that utilize narrowband land mobile radio, or LMR, technology. If New York City's position remains unchanged, the 12 MHZ of beachfront 700 MHZ spectrum currently assigned to them for narrowband technology will lie fallow in one of the most spectrum-pressed jurisdictions in the Nation. While coordination of narrowband and broadband spectrum is challenging, it can be accomplished and this flexible use can provide additional broadband capabilities within the current public safety allocation.

Public safety has multiple other spectrum resources; in particular, 50 megahertz of spectrum in the 4.9 GHz band is well suited for many emerging broadband applications. Public safety cannot allow this, or any spectrum to lie fallow or under-used in an era in which a "spectrum crisis" has been identified by the administration. While no one would argue that the 4.9 GHz spectrum suited for the backbone of a national public safety broadband network, it can certainly be used to put flesh on the skeleton.

LTE Technology Allows Public Safety Sharing of Commercial Networks

The difference between current spectrum use and the paradigm envisioned in the National Broadband Plan is that there is a viable alternative for accessing spectrum needs in an overloaded broadband network. As you may be aware, the public safety community has embraced a technology known as Long Term Evolution, or LTE, as the technology of choice for the proposed national public safety broadband network. The FCC has, for justifiable cause, broken a longstanding tradition of technical neutrality and proposed codifying LTE as the communications protocol for the future public safety broadband network. While this choice will not only provide for the critical requirement of interoperability within the network, this same technology provides for the ability of the proposed public safety broadband to seamlessly and automatically tap the networks operated by commercial carriers on a priority basis. Those commercial networks will also be using LTE technology.

Public safety has correctly specified and demanded preemptive capabilities that will give it priority over all users in an emergency. An analysis of the current LTE standards shows that this capability exists today. Through a mutually agreeable partnership between the public safety broadband network and a commercial wireless operator, public safety can be guaranteed automatic, seamless, access to additional capacity on a priority basis—with priority including the functional equivalent to "ruthless preemption" in today's circuit switched networks. From an operational, functional perspective, this process also gives public safety control of this shared spectrum, a requirement that public safety has identified as critical. This element provides the cornerstone for the National Broadband Plan's notion that a commercial carrier operating in the 700 MHZ D Block can bear the burden of building that portion of a network and reducing the building requirements of the public safety portion the network.

The fly in the ointment for the shared spectrum concept is the willingness of current or future wireless carriers to agree to such an arrangement. Some national carriers have made public statements that they have no desire or intent to enter into a spectrum sharing arrangement with public safety, as they do not wish to potentially degrade services to their subscriber base. Their position is unreasonable and contrary to the public interest. Commercial users in an LTE world will not be totally preempted, but just put at the rear of the network access line. Thus, the policy question is whether commercial carriers—who hold their FCC licenses to serve the public interest—should be permitted to decline participation in a shared network. In an environment in which spectrum is a national resource, slower access to commercial applications is a relative small price for the needs of public safety.

A Public—Private Partnership with the D Block Licensee will Provide First Responders with Significant Benefits

The greatest flaw with Congressional reallocation of the D Block to public safety in lieu of the current law and the proposal in the National Broadband Plan, however, are the unintended consequence of creating an island technology—a technology that only first responders will use. With expenditures of billions of dollars over the past 20 years, the shortcomings of public safety reaching interoperability through traditional land mobile communications is beyond debate. Quite simply, public safety land mobile communications has been balkanized into a number of technologies scattered over thousands of jurisdictions. With the limited market in which public safety operates, the technology has changed relatively little (in terms of basic functionality), but costs have soared. It is the norm for a single, portable LMR radio to cost $5,000, with some models costing considerably more. Contrast that with the

commercial wireless market over its twenty-year life span, where prices for terminal products have decreased significantly, while the capabilities of these devices have developed exponentially. The difference? The scope of the marketplace.

Current estimates for the total number of first responders range from two to three million users, a fragmented market divided among thousands of independent purchasing units. Press reports released last week estimates that Verizon will sell one million iPhones during their first week of sales. Another report noted that Samsung delivered over ten million units of *one* phone model in the last 6 months of 2010, plus one million tablet computers during the month of December.

Under the National Broadband Plan, the public safety broadband network would have access to the 700 MHZ D Block, plus possible access to other 700 MHZ band commercial networks at such time that technology allows. On the other hand, if the D Block is reallocated to public safety, it is less likely that public safety entities will have access to commercial networks. AT 700 MHZ, equipment is expected to operate within designated spectrum bands, known as band classes, but not necessary across band classes. The current public safety and D Block comprise the entire band class 14. Therefore, if public safety were reallocated the D Block, there would be no incentive for any commercial operators using other band classes to include band class 14 into the handsets they order from manufacturers. With no commercial orders for use of band class 14, there is no incentive for baseband chip vendors to design band class 14 into their baseband chipsets. With no commercial economies of scale, public safety will again find itself held hostage by a limited number of providers, thus resulting in the current low demand, high cost marketplace.

Additionally, the network budget estimates calculated by the National Broadband Plan were based on a model in which the dedicated public safety network would be built in conjunction with commercial deployments of their LTE networks. Co-located sites, sharing of some key components, and simultaneous deployment will result in reduced costs. These simultaneous or shared build outs would also permit public safety to access commercial sites where they might have elected to forego infrastructure deployments. As noted in the current round of early deployment by the City of Los Angeles, the initial public safety network will be built with approximately 350 sites. In that same geographic area, one of the Nation's four largest carriers currently has over 5,500 sites already in operation. Based on the reduced number of sites being built in the public safety network, those sites must work at higher power levels and will have greatly diminished cell-edge coverage and performance. The only viable path in this design to enhance coverage and performance is to add significantly more spectrum to the network. Commercial carriers address these same issues without additional spectrum by adding cell sites. Under the National Broadband Plan, public safety entities could take advantage of this more responsible strategy as well.

Budget figures in S. 28 are already below the cost projections made in the National Broadband Plan's concept of a shared build out. If the paradigm shifts to one in which public safety builds a stand-alone network in the D Block, there will be additional costs of building a national broadband network. With a shortfall in Federal funds, public safety will be faced with the difficult choice of determining either how to ask Congress for billions of additional dollars In funding or to choose where the network will be built and where it will not. Instead of building a bridge to nowhere, we are now faced with building half a bridge, then forcing the unnecessary expenditure of additional billions of dollars to complete the bridge or leaving a substantial portion of America's first responders without the broadband services they deserve.

The Critical Element of Governance Must Be Addressed

While S. 28 has addressed most of the key elements needed to make a nationwide, dedicated public network a reality, the proposed legislation misses one key element—that of the governance and administrative structure required for the deployment of this complex undertaking. The decades-long absence of a national strategy to manage land mobile communications within public safety has fostered the unacceptable lack of interoperability. While billions of local, state, and Federal funds have been poured into legacy land mobile voice communication systems, those funds have generally been allocated and spent with no national strategy to ensure interoperability. As complex as interoperability within land mobile voice systems may be, it pales in comparison to the complexity of broadband networks. If we fail to address the issue of governance and administration of this proposed network at the outset of this effort, we are guaranteed extended delays in implementation, massive needless costs, and failure to have services implemented nationwide in an acceptable timeframe.

Public safety is well suited to define its operational needs, but has relatively little sophistication in network architecture. It is also unreasonable to expect any project for which billions of dollars are allocated can be managed by a small group of well meaning associations. Given the fact that we have already watched 12 years pass from the time that the 700 MHZ band was first allocated until it was made available to public safety, and, given the fact that we have been actively trying to take concrete steps to get broadband services in the hands of first responders for almost 6 years, any legislation proposed by this Congress should ensure the creation of a multi-disciplinary governance/management structure that can deliver this network to those that critically need it without having to wait another 6 or 12 years. If we fail to find an appropriate alternative to the practices of the past, we are doomed to repeat the failures of the past.

To emphasize the critical nature of the role of an effective governance and management structure, there are 21 waivers granted by the FCC, 7 of which are actively in the process of deploying LTE systems. While there has been discussion about creating a "network of networks" within these 7 jurisdictions, each of these waiver jurisdictions is effectively proceeding on its own—initiating procurements, negotiating and implementing interoperability plans, and certification and compliance testing protocols Each jurisdiction will build and staff a network operating center to manage these complex centers. Without a governance structure that understands and controls issues such as these from the outset, the road to a nationwide interoperable broadband system is guaranteed to be bumpy and paved with expensive, redundant capabilities.

Conclusion

I again commend Senator Rockefeller for his leadership in bringing awareness of this critical issue to the forefront. At the end of the day, my greatest fear is that this debate will linger far too long. In the 6-years since I helped introduce the concept of broadband to the public safety community, we have seen the commercial sector move through three generations of broadband technology. In the midst of high-minded policy debates and national policy discussions, it is easy to overlook the simple fact that broadband is not a political issue; it is not an "I win, you lose" contest, but instead, is a matter of life and death for our first responders on the street. We should ask ourselves why it took 12 years for public safety to gain access to the 700 MHZ spectrum that it desperately needed and why it has been another 6 years since the debate over a dedicated broadband network has lingered with no results. The bottom line is that there are two fundamental approaches that can provide the same functional product to the police officer, fire fighter, or EMT on the street. In one model, public safety can control its own destiny as it has in the narrowband world—a world that does not take advantage of new technology or a widely built network paradigm. The other option is to take advantage of the fundamental constructs of the National Broadband Plan that will allow the most prudent stewardship of both our limited spectrum resources and precious Federal funds.

I appreciate your time and look forward to working with you on this critical issue.

The CHAIRMAN. I thank you very much.

As I indicated, Senator Hutchison and myself have to be on the floor to do the aviation bill, and you kind of care about aviation. But we have got them to push it back just a little bit. So I am going to have somebody here for me because you may want to go downstairs. So we will be covered. But I want to apologize upfront for that. We had no idea that aviation was going to be brought up as the first bill. I mean, I am glad it is, but I am not happy right now because I want to spend two hours with all of you.

Let me just ask a question to the public safety witnesses and the Governor. Much of the debate has been about how much spectrum public safety needs for broadband. You have discussed that, each of you. Some interests maintain that public safety needs no more than 10 megahertz of spectrum for broadband and can at times of emergency be given priority access to commercial networks.

I would start with you, Commissioner Kelly. In your opinion does this reliance exclusively on commercial networks work for public safety? Number two, are there fundamental differences between

commercial and public safety networks that you could describe for us? Are commercial networks built to withstand disaster conditions? You gave one example in your testimony. Are there special protections needed in public safety networks not present in commercial networks?

Mr. KELLY. Mr. Chairman, as I said in my prepared remarks, I do not think the private sector can totally guarantee availability when we need it. I have experienced other examples besides the one in my prepared statement when the system became overloaded. And I am told by the experts that 10 megahertz is simply not enough, particularly as we look down the road as technology becomes more complex, as the threat—certainly the threat in New York City as far as terrorism is not going to abate anytime soon. Everything that I am told by our experts is that we simply are not in a position to rely on the private sector.

We know that they also have obligations, when there is an emergency, to keep citizens informed. Citizens have to be able to notify their loved ones in the event of a major catastrophe.

So my sense is that your legislation or similar pieces of legislation in this day and age simply make common sense, and I would not want to have to totally rely on a private carrier or carriers to conduct our business.

The CHAIRMAN. Governor?

Governor MARKELL. Mr. Chairman, first of all, I would like to say, with Senator Warner coming in, it is a pleasure to see you again. Senator Warner, when the history books are written about the creation of the cellular and wireless industry in this country, you should be featured prominently. And it is great to see you here.

I agree with Commissioner Kelly that the issue with relying on commercial systems is really one of reliability and that public safety has got to be able to rely on communications in all corners of the country when all else has failed. And that may not be a standard that commercial operators would build to. And so I agree with Commissioner Kelly.

At the same time, I do believe that there are plenty of opportunities within your proposed legislation for there to be creative partnerships between the public and private sectors. And so I think as a general matter we should not be in a position where public safety has to rely on a private sector network, but I do believe that there should be and would be opportunities for the private sector to participate.

The CHAIRMAN. Thank you, sir.

Chief Gillespie?

Mr. GILLESPIE. Thank you, Senator.

I also agree that we do not believe 10 megahertz is enough. We respectfully disagree with our folks on the other side of the table of this thing. The demonstration of that has happened over and over throughout our country. A good example is a GETS phone line. You have to ask for permission and you have to be able to get through to get your GETS phone line to work. In many cases that just does not work either. So going to somebody and asking permission to get on their system at the time of an emergency is just not feasible for us.

We certainly support a model where we have control of the spectrums and we work closely with public/private partnerships to develop and use those systems. We do not need them like every day like perhaps they do in New York City, but Las Vegas is a pretty urban area also. We have a lot of issues there, but there are a lot of rural areas across our country that only need them intermittently. So we have great opportunity to share with our friends in the private sector, not only to use the spectrum but also to build out the system.

The CHAIRMAN. Thank you.

Mr. Hanna?

Mr. HANNA. Senator, I have not heard anyone yet suggest that we rely solely on a commercial network for the service. My testimony, I think, clearly stated I fully support building the core platform, the base platform of the 5 by 5 in a dedicated network.

The notion of using commercial spectrum—I think we have to realize that the existing LTE standard that this network will be built to, as proposed by public safety, allows a different paradigm than we have had in the past, unlike GETS where you have to ask permission and flip switches to make this work. The existing LTE standard allows for an automatic, seamless migration into that shared spectrum that will give public safety access to that spectrum if they have reached an agreement with a carrier to do that.

So I think we agree fundamentally that we need a dedicated core for this system to work. No question about that. I think there is some misunderstanding about the technology as to how you work in that shared environment, and the folks that did the National Broadband Plan understood that process and thus developed the share model.

The CHAIRMAN. I thank you, sir.

And I turn to Senator Hutchison.

Senator HUTCHISON. I just have one question and it is a follow up really because I was going to ask the question that I think Mr. Gillespie just answered for himself. But it is that regardless of the need for the D spectrum to be allocated, which I think we all agree with in principle, are there not still places where we can have public/private partnerships where public safety spectrum could share with commercial users on an as-needed basis in exchange for the upkeep and repair of the system that would not have to be at public expense. I think you, Mr. Gillespie, said you think there are ways, particularly in areas where the public safety spectrum will not be needed on a constant basis, and that would allow for, obviously, more build-out and also taking some of the costs off the public sector for the maintaining of the equipment and technology.

I would like to ask if there are others who would have a view on that as we are working through trying to write a bill that would meet all the needs.

Mr. KELLY. Obviously, New York is——

Senator HUTCHISON. It is different.

Mr. KELLY.—different. We do have a great need, we believe, for a public sector or public safety controlled system. But, obviously, in other parts of the country, it is not going to be so. And I think the legislation, as I read it, lays out the very strong possibility of the excess capacity being made available to the private sector. So

it seems only logical to me that there will be opportunities there and the opportunity, of course, also to fund part of the cost of the bill.

Senator HUTCHISON. Thank you.

Anyone else care to comment? If not, if it is basically the same view, then I will pass it to my colleagues.

[No response.]

Senator HUTCHISON. All right. Thank you very much.

Thank you, Mr. Chairman.

The CHAIRMAN. All right.

Senator Boozman?

STATEMENT OF HON. JOHN BOOZMAN,
U.S. SENATOR FROM ARKANSAS

Senator BOOZMAN. Thank you, Mr. Chairman.

I guess one of my frustrations is that we all agree that this needs to get done and probably should have already gotten done in the sense of having interoperability. We live in a country where it is very difficult to protect ourselves against all the challenges that we face from a number of different areas, but we need to have the ability to respond once something happens. Again, we just are not able to do that.

So I really do not have any questions right now. I am enjoying the discussion. So I will go ahead and defer to somebody else at this time and yield back.

The CHAIRMAN. Thank you, sir.

Senator Warner?

STATEMENT OF HON. MARK WARNER,
U.S. SENATOR FROM VIRGINIA

Senator WARNER. Well, thank you, Mr. Chairman. I want to thank you and the ranking member for your leadership on this issue. I look forward to working with you to try to get this done.

I do have some comments. I will submit my full comments for the record.

[The prepared statement of Senator Warner follows:]

PREPARED STATEMENT OF HON. MARK WARNER, U.S. SENATOR FROM VIRGINIA

Thank you, Chairman Rockefeller for your work to make the issue of communications infrastructure for first responders a priority. This issue has languished for years and I am hopeful that on the eve of the 10th anniversary of September 11, Congress may reach a bipartisan compromise that delivers a nationwide interoperable broadband network for primary use by public safety that responsibly contains costs, leverages commercial technology, and ends the practice of building communications systems that fail to deliver on promises of interoperability between local, state, and Federal first responders.

I do have some serious concerns about the true cost of building a new network, particularly given that some are advocating for a stand-alone network, which dramatically increases the costs. I also believe that Congress must do the hard work of insisting on multiple cost saving measures, including a complete transition of narrowband systems to the new broadband network within 10 years. Finally, I think Congress does its best work under pressure. I strongly encourage the Federal Communications Commission (FCC) to move forward with the Notice of Proposed Rulemaking regarding the auction of the D Block of 700 MHz so that if Congress has not reached consensus within a year, the FCC should auction the spectrum as is required under current law.

Costs

I remain deeply concerned about the estimated costs of constructing a new network for several reasons-to say nothing of the ongoing costs of operating and maintaining such a network over time.

Some of you may know that I have spent the last year working with our Republican colleague, Sen. Saxby Chambliss of Georgia, on long-term deficit reduction efforts. There are many tough choices ahead for our country, given the fiscal realities we face today. I have a hard time saying we have to make tough choices everywhere in the budget, except for building a new communications network.

All the cost estimates show that if the D-block is not auctioned, then it becomes more expensive to build this new network and much harder to introduce commercial technology that meets public safety needs. This is because public safety only has two to three million users, at most. That goes up to approximately six million users if you include Federal users and others. That's a far cry from the 90 million users of the two largest commercial networks—90 million users each. Public safety is never going to be big enough to direct the commercial market in terms of technology or the network, so we need to make sure we insist on cost-effective devices and equipment that meet the legitimate needs of first responders.

It's a disgrace that we don't have a nationwide network already. But let's not waste the opportunity to actually deliver a network. It can't happen if we rely on a system based on high-cost, proprietary technology that has failed every promise to reach interoperability over the past 30 years.

The National Broadband Plan estimated $6.5 billion in capital expenditures under the best-case scenario if the D Block is auctioned and network deployment occurred during the 4G rollout. Unfortunately, we have missed that boat. Verizon rolled out its 4G deployment in 40 cities in December 2010. It is my understanding that Verizon did not map its network for public safety network needs, as was originally discussed. AT&T has yet to deploy, but without other commercial service providers in 700 MHz, you just don't get the same cost savings when you try to deploy a network like this.

So, the cost estimate is now $15.7 billion in cap-ex to build a *shared* network. That's expensive, but it's a much better deal than the upper estimates-ranging from $41 billion to at least $47 billion for a stand-alone network. Frankly, we're probably underestimating those costs if we provide funding for a network, but do little to ensure the money is well-spent.

The President's budget request for FY 2012 included only $10.7 billion for the network, and $3 billion of that was to cover the cost of giving away the D-block. We know that's not going to be enough at this point. This is also on top of the $1.5 billion we've already spent over the last few years for interoperable communications that never materialized. Some of the highlights, according to the Government Accountability Office (GAO) are as follows:

- Public Safety Interoperable Communications Grant Program ($968 million in FY 2007)
- COPS Interoperable Communications Technology Grant Program ($269 million from FY 2003–2006)
- Interoperable Emergency Communications Grant Program ($200 million from FY 2007–2010)
- Interoperable Communications System, after Hurricane Katrina ($20 million in FY 2009)

These numbers don't count billions in taxpayer money spent over the past three decades for related purposes, including state and local funds for the purchase of devices, because the GAO and others are struggling to even track where we've spent our money. For instance, when Virginia built the first statewide public safety network several years ago, we spent $5000 per device for first responders.

All of us have already spent billions of taxpayer dollars at the Federal, state and local level for interoperable communications. What do we have to show for it?

We Need Serious Savings

If we're going to move forward-and I think we should try-there are a number of cost saving measures Congress should consider. Some of the things we should prioritize include:

- A new governance structure for licenses that gives the states a leading role in developing regional interoperability plans, mapping buildout to cover 98 percent of the population, and most importantly, creating a competitive process for building out the network in different parts of the country, instead of relying on a limited pool of companies for buildout.

- Only building new infrastructure where we lack it, which means we should focus on rural areas. Network upgrades, collocation, infrastructure sharing with the commercial sector are some of the lower cost options we need to prioritize wherever possible. We've already spent billions on public safety communications infrastructure. We don't need to recreate the wheel.
- Permitting licensees to lease excess wireless broadband capacity to the private sector to create another funding stream for ongoing O&M for all public safety entities, not just big cities. I'm not all that worried about the best first responder technology getting to northern Virginia. I'm worried about rural southwest Virginia.
- Migrating public safety narrowband networks, including Federal law enforcement, to the new broadband network within 10 years. I would also like to credit Rep. Peter King and Sen. John McCain for including limited narrowband migration language in their legislation. I think we can do better in the Senate Commerce Committee. We should set up separate incentive auctions for narrowband spectrum within the next 5 to 8 years, as I discussed during last September's hearing. Whatever we're not able to clear would be auctioned after a few years, so we can create an incentive for early adopters of cost-saving technology. We can use the revenues for ongoing O&M costs and we'll save money by not funding two networks. We do not need both a broadband network and a narrowband network in perpetuity. If taxpayers aren't paying for narrowband indefinitely, I have a feeling new technologies will emerge much more rapidly than previously expected.
- Supporting these efforts by requiring interoperability standards for devices and network components, including funding for R&D for new technologies like mission-critical voice capabilities. Senator Roger Wicker and I are working on bipartisan legislation—the Next-Generation Public Safety Devices Act-that we believe starts this process, but there's no pride here. There may be even better ways to generate innovation and lower costs—I'd welcome that discussion.

Finally, Congress has tried and failed to address this issue before. The politics of making tough choices on this issue are not easy. But I think there are Republicans and Democrats on this Committee who are ready to make good decisions about using limited resources. Congress operates best with a deadline. Let's move the NPRM on the auction so that if we can't reach consensus in a year, we're not stuck in the same place we are today.

There are no easy choices in the current fiscal environment. I appreciate the amount of work the Chairman and Ranking Member have contributed already. I stand ready to work with the Committee on possible solutions as we move forward. Thank you.

Senator WARNER. First of all, I want to also welcome my good friend, the Governor from Delaware, and correct his one comment. We worked on the creation of wireless networks together. I made a lot of the money. He did a lot of the work.

[Laughter.]

Senator WARNER. It was a great working relationship.

[Laughter.]

Senator WARNER. And it is a real tribute to know Jack Markell to see the great progress he has made in his both private sector career and public sector career.

And let me also state that I have a number of colleagues here from the Commonwealth of Virginia, and we have had robust conversations, Mr. Chairman, about this issue.

Let me put at the front end of my comments that I share, as every member on this committee does and like the Senator from Arkansas has mentioned, we need a dedicated, fully interoperable public safety network that takes advantage of advanced technology. Now, how we get there ought to be a robust debate.

And let me just add one other comment. In my previous tenure as Governor, we in the Commonwealth of Virginia, I think at that point leading in the country, put our money where our mouth was,

north of a $400 million investment, in creating that interoperable network for our state law enforcement.

And I look forward to working with the Chairman to get to where we need to be on S. 28, but I do want to make a couple comments.

I am very concerned on the cost issue. The National Broadband Plan outlined that this dedicated network would cost about $6.5 billion if it had been done in conjunction with the build-out of the 4G network. That is not going to happen. The costs, by the time this would get rolled out even with this dedicated source, an estimate at about $15 billion just on capital expenditure. And that is based on a shared network. If we are not to do some level of shared network, we are probably talking in most estimates in a $40 billion area. And the President's proposal puts about $10 billion out on this.

My concern is how do we make sure that, if we are going to do a D Block allocation, even if we are going to do a straight public safety D Block allocation, in the days when you will see us constantly cutting back, find the capital, particularly if it is coming from other spectrum reallocations or other spectrum auctions, to make sure that we build out a system. I have a concern—and I have shared this with the chairman—that we may build out the New Yorks, the Las Vegases, the northern Virginias, maybe the Charlestons and the Wheelings. But how do we make sure that rural communities where the cost level of getting that kind of full system built out is going to be put in place? And I really think we need to drill down on this and work with our partners in public safety so that we are all going into this with open eyes if we do a straight allocation of the D Block. Point number one.

Point number two.

And again, it is great to see the Governor here.

We have talked about interoperability forever, and I have made the comment before this committee before. It is much easier to get Republicans and Democrats to agree than it is to get radio engineers to agree on actually sharing spectrum in an interoperable way. I am concerned. And if we look back on Congress's history, since 9/11, there have been five or six efforts already where we have tried to promote interoperability. And frankly, we have not gotten there. So if we are going to move forward with the plan, the Chairman's proposal, we need to, I think, even strengthen further the interoperability requirements.

And when we think about governance, we need to make sure that our local partners and our state partners, in terms of collocation and in terms of build-out, all have skin in the game. Again, shared tower space, shared other things, terribly, terribly important. I know my time is about up.

And let me just add two quick comments. I am not going to get to a question. I apologize. I have got other members. But I feel a little passionate on these issues.

Just to stir the pot a little bit more, I believe in the narrow band, the notion of trying to migrate existing law enforcement narrow band spectrum into broadband over a defined period of time and if we migrate, giving some of those dollars back to law enforcement in terms of an operating and maintenance budget so that even if

we get the capex done, no network is ever finished. There are always going to be upgrades, and we are going to need to make sure that there is some dedicated source other than coming back to Congress on a regular basis. I know you do not want to give up your narrow band, and I know you do not want to migrate. I know you want to look at some of your other spectrum. But if you can get a piece of that in terms of long-term operation and maintenance, it is terribly important.

So I look forward to working with my colleagues from Virginia and the Chairman on getting this right. I do also think we ought to go ahead and start the clock ticking. This stuff always takes longer.

And I do believe on basic cost structure—final comment—that there are different needs in public safety, but technology is changing and the market in public safety will never approach a commercial market. And the cost differential is so great. We have got to find some ways to level that. And I think the chairman has got some ideas there. I think some of us have got some other ideas, and we have got to get this done in a timely way as we approach 9/11 so we can show real, tangible progress and not continue to avoid the hard choices that we need to make.

I really thank you, Mr. Chairman, for your leadership on this issue.

The CHAIRMAN. Thank you, Senator Warner.

I simply want to apologize to you. This aviation safety, the whole question of how do you deal with fatigue, and all kinds of things, and a modern air traffic control system which we do not have in this country, digitalized, the only one in the industrialized world that does not have it. That is what we are debating now, and Senator Hutchison and I have to do that on the floor. I desperately apologize to you. We did not know this bill was coming up when we set this hearing. So I want to apologize to you.

Senator Udall is going to stand in for me, and Senator Blunt are you as going to stand in?

Senator BLUNT. Yes.

The CHAIRMAN. OK.

Please accept my apologies and thanks.

STATEMENT OF HON. TOM UDALL,
U.S. SENATOR FROM NEW MEXICO

Senator UDALL [presiding]. Thank you.

I think the next in line is Senator Thune.

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

Senator THUNE. Thank you, Mr. Chairman.

Thank you all very much for your testimony today. It has, I think, been very enlightening.

I would like to direct a question, if I might, to you, Chief Gillespie. In your testimony, you mentioned that public safety must have control over the network. I wonder if maybe you could talk a little bit more how you would see the administration of that sort of a network.

Mr. GILLESPIE. Thank you, Senator. Well, at this particular juncture, I am going to leave the governance issues to the folks that have more letters behind their name than I do. I think it is important that we do have control of that. There are a number of different models out there, and I think we will find the right one as we wind this up. The less different licensures we have out there I think the better, but the general governance at this point—it is more important to me as a fire chief out on the streets to make sure that we have this available to us than how it is governed.

Senator THUNE. Under any circumstance, could you envision a public/private partnership that could manage such a network in a manner that meets the needs of first responders?

Mr. GILLESPIE. I think we have to look at all the options certainly. But I have got to tell you from the public safety side of this thing, if we do not have the control, whether it be by the number of votes or by just control in general, I think we are always going to be at odds with when and how we have access to a system.

Senator THUNE. You mentioned also in your testimony and also in follow-up on some of the things the Senator from Virginia asked about—I represent a very rural State. South Dakota is a state that is made up of rural areas. Could you expand a little bit about some of the remarks that you made in your testimony about how this public safety broadband network could have positive results in rural America?

Mr. GILLESPIE. Certainly. Well, first of all, I think that is a great opportunity for our public and private partnerships using facilities that are already in place and adding facilities as the network is built out.

I am from the West also. I spent most of my career in Washington State, and I have been mobilized on a number of wildland type fires. So I have worked in very urban settings and worked in very rural and wilderness settings.

The ability to have the information at your fingertips, as people talked about, that folks in the teenage years have right at their fingertips right now—to have that available to our first responders working out in remote areas like that is just extremely important. We know that one of our largest loss of lives in the fire service has been in the wilderness areas responding to wildland fires. If they had the technology at their fingertips that had the weather information, had the fire movement, all of that in the commander's viewpoint right now in real time, they might be able to better respond to those things.

If we have a medical incident in a very remote area, in a farming community in your state or in mine, then we could have the ability of the responders that are responding to this incident to have linked in with the terminus where they are going to be taking these patients to the hospital, have them linked in all the way into the hospital because sometimes we are talking about not minutes but hours transporting these people into medical care facilities that can deal with their issues. And they can work with the doctors that are there, making sure that the doctor sees the EKG that they see, the condition of the patient. They could actually have a video of the patient as they are coming in, seeing that information going back

and forth. The responders could have the doctor right there working with the team inside the hospital.

So I think those are just a couple of quick examples where that would be a great opportunity for us to work that.

Senator THUNE. Mr. Hanna, I appreciate the ongoing debate about auctioning versus allocating the D Block to first responders. If the D Block is ultimately auctioned, what restrictions should be placed on this auction to ensure that first responders would have priority access in times of an emergency?

Mr. HANNA. Well, I will make clear that this answer is definitely my opinion and certainly not representing anybody else.

I think envisioned in the broadband plan—and even going back to the last attempt to have an auction on this spectrum, it was always envisioned, I believe, that there would be a hook in the D Block portion of this that would have a fundamental requirement that the D Block winner have a relationship with a public safety partner. To the extent that that hook goes outside the D Block, I mean, I think that is something that certainly is open for debate as well if other carriers choose to provide this access. But I think having that hook in the D Block, it certainly will impact the auction value of that spectrum, but that has been envisioned from day one. And it goes back, I say, to the last attempt we had to make this thing work.

Senator THUNE. My time has expired. Thank you, Mr. Chairman. Thank you all very much.

Senator UDALL. Thank you very much.

Just to remind all the Committee members, the rule we are functioning in, in terms of order—this committee functions in early bird, time of arrival, regardless of party. So we are following that rule. So, Senator Blunt, I am going to recognize myself now since I am on that list and move along here.

Thank you all very much for your testimony. I want to say to the Chairman—I know he is not here, but I really look forward to working with him on S. 28. I think it is a good, solid piece of legislation. It has many, many good things in it.

The thing that concerns me is what was mentioned by Senator Warner, Senator Thune, and some of the other Senators here: rural areas and how we deal with rural areas. And in New Mexico, we are a border state, and four states are along the border with Mexico. You obviously have border states along the northern border with Canada. And what is going down on the border right now are things like drug smuggling, human trafficking, many other illegal activities that are growing concerns for ranchers and other residents. And so we get ourselves into a situation on the border, and there are drug cartels operating on the other side of the border. And some of that is flowing in. A rancher was killed recently in Arizona as a result of violence, I think, flowing across the border.

So I guess what I am wondering is how we work the border into this situation. And my question is how should a new public safety network be optimized to meet the needs of those living along the nation's border with Mexico in light of the problems I mentioned? Any one of you can jump in.

Mr. KELLY. About ten years ago, I was the U.S. Customs Commissioner before there was a customs and border protection. So I

am very aware of some of the issues and concerns of the border communities. As a matter of fact, the problems have only exacerbated in ten years' time.

I think it is sort of a classic situation, spoken about by the Chief before, where you have events that can happen in an area where multiple jurisdiction personnel could respond because there is no one jurisdiction that has enough personnel for major events. And that is where I think the benefit of this system comes in. It allows for sharing of information. Some of the examples the chief gave I think are appropriate. You can use aviation assets to send video back to a central command or share with other agencies, I think sharing of information between local entities and the Federal Government. We need more of that. I believe this is the vehicle that will enable us to do precisely that.

I can think of many examples of sending forensic evidence, for instance, to a lab from a remote area. Chemical, biological, radiation detection equipment findings can be sent instantaneously to many partners. Any database that needs to be accessed can be accessed by multiple agencies. I think sharing is the operative word when we talk about this system, as far as law enforcement is concerned, and I think along the border sharing of information and the sharing of resources is as much an issue now if not more so than ever before.

Governor MARKELL. Several of you have raised the issue of the rural states, and I think it comes up in connection with the border issue as well.

One thing that I think is important for you to understand is, at least in the President's proposal, he suggests investing $5 billion for rural networks separate from public safety. But the reason I think that is important is because many of you have talked about the potential public/private partnership. That is a very clear place where much of the expense in building out a network has to do with construction of towers and some of that kind of infrastructure. And there is certainly an opportunity there for the public and private sectors to participate and share.

The broader issue that has been raised a couple times—Senator Thune brought it up again with respect to the kind of opportunity for public/private collaboration. The challenge is that the incentives are so different on the public and private sides. And so on the public side, we all want to make sure that there is build-out in all parts of the country so that your rural constituents can be served as well. And not surprisingly, the private sector folks will be more likely to build where the density is greatest and where the demand is going to be greatest, which is why I think there are tremendous opportunities for a public/private collaboration and partnership, but I also think it is very important that it is the public side that be overall responsible.

Senator UDALL. Thank you for those answers.

Senator Blunt, why do we not come to you now for questioning?

STATEMENT OF HON. ROY BLUNT,
U.S. SENATOR FROM MISSOURI

Senator BLUNT. All right. Well, thank you all for being here. I was in an Intel meeting. I wanted to be here for this and I do not want to recreate a lot of the discussion that has already happened.

But in this whole area of the spectrum, we continue to think, among other things, that people who have spectrum can use less and less of it. And I am really wondering how much we need to reserve and how much we can afford to build out. I mean, one of the ways we would finance this, Mr. Hanna, I am told is that we would ask people who have been allocated spectrum to give up some of the spectrum they have. And what I am wondering is why have we allocated more spectrum to the private sector than we now think they may need, but we still think that the allocation to the public sector needs to be as big as we thought it needed to be a few years ago. What we do not want to wind up with here is a lot of allocated spectrum that we cannot develop. Whatever we need to do to serve the rural areas—I think we all understand the need to do that.

But, Mr. Hanna, what is your sense of how we could have this paid for by other people giving up part of the spectrum that we have decided they do not need and we still think we need all we have allocated to the D Block for the public effort?

Mr. HANNA. Senator, there has been a lot of discussion about incentive auctions, reclaiming spectrum, and for the most part, I think that the focus has been on broadcast spectrum, so returning spectrum from the broadcast community, not necessarily from—I have not seen any carriers offering up spectrum for public safety. So I think most of this will either be federally owned spectrum or the broadcast spectrum.

Certainly through this last year, there was major discussion about the country has a spectrum crisis, and obviously people pay billions of dollars. So they see value in that.

There is certainly opportunity to raise a significant amount of money through spectrum auctions. I think the unknown at this stage is exactly how much that is going to be. If we did it three years or four years ago, it would be one value. If we did it a year and a half ago, there would be a very different value based on what is happening in the economy. So to a degree, we are venturing out, committing money based on speculation of what we think auctions will bring in. And I think they will bring in a great deal of money. No question about that.

Senator BLUNT. Governor, in your State, have you got all of the public safety people now where they can communicate with each other from whatever the highway patrol would be, which is what we call it in Missouri, and I think what that is called in Delaware, to other areas?

Governor MARKELL. We do. Right. We built one of the first interoperable systems. But what it does not have is the robust communications potential that a broadband and contiguous spectrum offer together. So that means everything from if a paramedic arrives at a scene and can literally download video to the doctor at the emergency room or to have a fire fighter walk into a building and have the plans sort of right there in front of him on the screen.

So there are really two huge benefits. One has to do with interoperability. We are a small state. We border on Maryland, Pennsylvania, and New Jersey. And so right now the interoperability between our agencies and those states—it is really a patchwork.

And Senator Warner said, I think very appropriately, that one of the great difficulties that this industry has had over time is getting radio frequency engineers to agree with each other in terms of a whole range of issues. And one of the opportunities that you have with this piece of legislation, if you are talking about a nationwide block, you can deal with some of those types of governance issues. Like the chief, I am going to stay away from any specific suggestions in terms of governance, but I think what you have is the potential to really ameliorate many of those potential issues by authorizing this in one block.

Senator BLUNT. And currently are we able to share any of these examples that really the three of you have given on what is already developed privately on the spectrum? The information to the emergency room. Is there some reason that cannot be sent now? Commissioner? Anybody that wants to answer that would be fine.

I mean, we have got all these things that we would like to be able to do. What I am asking is is there some reason we cannot do those on the developed spectrum already. Are you blocked out of that? Is this too sensitive to send across that? Is there anything keeping you from doing that now as opposed on the D Block that is not funded and developed? Commissioner?

Mr. KELLY. We have what we call an ICE 1 system in New York City that can do some of this. However, it does not penetrate buildings, for example. This is, obviously, a significant restriction for us. We want to be able to have responding police officers get, for instance, a bank robbery suspect. We want to get that picture out immediately. We cannot do that as yet. We are limited in terms of broadband capacity, I am told. And there is a whole series of initiatives that we would like to put in place that experts tell me we just cannot do because of the narrowness of the band that we have now.

Senator BLUNT. Well, I am interested in being able to do all those things. I am also interested in figuring out the way that we are most likely to be able to get that network in place, whether we get it in place with public money quicker or we get in place with private development with assured access. Senator Warner and I have been talking about that and others. It is a critically important issue. And to have all of you here today and to have the people backing you up in this hearing room is meaningful to us. But we want to have a system that we can use and as quick as we use it.

Chairman I have used up my time.

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

Senator KLOBUCHAR [presiding]. Thank you very much, Senator Blunt.

It is good to be here with all these great and renowned witnesses.

I have to tell you I am taking over the chair here from Senator Rockefeller who is significantly taller than me, and so my feet do not touch the ground, but I am trying to look mature.

[Laughter.]

Senator KLOBUCHAR. I first wanted to just talk about why I am so interested in this. I head up the 9–1–1 Caucus along with Senator Burr. Also, my own experience with this came from my years as a prosecutor and two tragedies in our state.

The first was when a police officer was killed in St. Paul, Minnesota, and he was killed by someone who got away. And there was a huge chase. And literally we had six or seven different radios, multiple walkie-talkies, and telephones that were connecting different departments and helicopters and other people as they chased him down. And it was simply unacceptable.

Then you fast-forward to the tragedy of our 35W bridge collapse where since then we have made many upgrades especially in Hennepin County where I worked under the leadership of Sheriff McAllen. And as you know, that eight-lane bridge right in the middle of the Mississippi River, 55 cars in the water, and sadly while 13 people died, many more would have died if we did not have the kind of system we had in place to bring in emergency personnel and get people there to rescue people in the water. So that was a tale of things working well from an emergency coordination perspective.

And that is why I am so interested in moving this along, and I am supportive of the work that Senator Rockefeller has done. I understand that the Fraternal Order of Police is now supporting this effort as well, and I think you will see a real interest in this in the Senate.

Now, from the 911 perspective, Commissioner Kelly, I want to ask you about New York's Real Time Crime Center and the support that is offered to your investigators and how you think we might incorporate into a national model using some of the work that you have done there.

Mr. KELLY. Well, thank you. We are very proud of our Real Time Crime Center. It really is the first in the country.

We were probably the biggest user of whiteout and carbon paper in 2002. So we created a data warehouse and we put a lot of information into it. And we put on top of that data warehouse this Real Time Crime Center which is staffed by detectives 24 hours a day. And it gets information out into the hands of investigators when a crime happens, a murder, a robbery. We deal with a recidivist criminal population. So the quicker we can make an arrest, the more likely we are preventing further crimes. So we put out victimology. We put out 911 call information, up to 10 years of that. We have the history in a particular location. And it gives us the ability to very quickly check things such as tattoo files and information, both publicly available information and proprietary information.

But this system that we are talking about now will enable us to share that, to share it on a regional basis with other law enforcement entities.

Senator KLOBUCHAR. It is the tie-in——

Mr. KELLY. That is the tie-in with the D Block.

Senator KLOBUCHAR. Senator Burr and I are reintroducing the Next Generation 9–1–1 Preservation Act which also fits into this and looks at how we can have better access to all. People are not

just calling in with their emergency calls anymore. They are texting. For instance, Mr. Gillespie, you can send blueprints to fire fighters at a building ready to go in. You could actually get them the blueprints to that building. And looking at how we can update the 911 system, and that is what this bill does, complements the work that is being done on the spectrum bill, to make sure that we are updating the 911 system.

Do you think that would be helpful to update some of that technology as well?

Mr. KELLY. Absolutely.

Senator KLOBUCHAR. All right. Very good.

Governor Markell, I have a question about Delaware's experience with developing a statewide public safety network and what insights you have to offer here in terms of how we can develop a national public safety network that would work better.

Governor MARKELL. Well, I mean, it has been extraordinarily helpful in Delaware to have one network organized at the state level. As you know, neither crime nor emergencies stop at either the city boundary or the county boundary, and the idea of having everybody on one network has been tremendous.

That being said, the idea of also being on the same network as neighboring states, as having the more robust communications capability that I mentioned earlier, we see nothing but up-side in the proposed legislation.

Senator KLOBUCHAR. Very good.

I think Senator Warner has a second round of questions here.

Senator WARNER. Thank you, Madame Chairman, and I will try to actually get to a question this time.

Senator KLOBUCHAR. Maybe I should say your first round.

[Laughter.]

Senator WARNER. Just one other quick little point, though. Maximum public safety devices—my estimates—would anybody disagree with the maximum universe of public safety devices out there, even with full build-out, $2 million to $3 million? Anybody going to disagree with that? I did not see anybody in the back nodding.

We do have to recognize that we build out on the commercial side right now robust, interoperable, pretty darned good handsets on a worldwide market that have consumer prices of a couple hundred dollars, many, unfortunately, still in our public safety market. Now, there are clearly durability requirements that are higher. We have bought radios that cost $5,000 for a handset.

I agree with Governor Markell. The D Block allocation will give the ability to build out a network in a truly more interoperable way. But that delta, unless we can find a way to better public/private partner, is not going to diminish greatly. And I do get concerned that the construction costs of this network are much higher than what has been built in and baked into the plan, and that an ongoing operating and maintenance piece of that is going to be continuing to upgrade your units.

Let me do get to a question, though, and this is for the Governor and for everyone on the panel. If we were to do some allocation like this that did not include an auction, how do we make sure, for your own long-term interests, that everybody has got some skin in the

game? And Governor, I know you cannot commit the Governors Association or commit your localities. But the notion, again as you well know better than I, of collocation—and every local community in Delaware and every local community in Virginia and in Missouri and in Minnesota all see their water towers and their tower sites as revenue sources right now. But could we work together on something where they will all have skin in the game? Would the public safety community be willing to say we will do collocation? We will do build-outs together. Will you do narrow band migration and then take some of that spectrum, and if you got a piece of the pie, in terms of ongoing operating, would you take—I think Senator Blunt has asked some of the right questions.

But we do have spectrum in public safety that, under any kind of modern utilization, is not fully utilized to the maximum value. We have voice spectrum that could still have voice communications, but that could be done more efficiently. There are ways.

What I guess I would ask the Governor and then the public safety community is will you be willing, if the Federal Government were to take on this enormous commitment of this huge construction cost build-out and give up the revenue source that would be generated by kind of a shared spectrum auction? Will you put skin in the game as well?

Governor MARKELL. Well, first of all, Senator, I appreciate the context of the question which is, of course, states across the country have very difficult financial situations.

That being said, we understand—certainly when it comes to public safety, I think many people would argue that protecting the public is at the very top of what we as governments are expected to do. We have demonstrated for a very long time now that we had skin in the game, whether it is, in the case of Delaware, the construction of the interoperable network over the last 12 or 13 years. And of course, in this business, that is going to require upgrades over some period of time.

We believe that actually this program and this initiative could end up saving us money. I mean, first of all, the President's plan does allocate a significant portion, billions of dollars, specifically toward the build- out of this network. There is additional funding that goes to the rural piece. And again, as I mentioned earlier, we think that whether it is the sharing of towers or other infrastructure, that that is one great place for public/private partnership. But I do think that in the spirit of all of us trying to figure out how to pay for this, that the idea of some kind of public/private collaboration and partnership is certainly something that should be on the table.

Where I have an issue is when the conversation gets flipped and the question is what about a private network that gives priority access to public users. And I think the real challenge there again—it is not just a matter of priority access. It is about where is the network going to be built out because the private sector has much less of an incentive to build out in places where there is going to be less private sector demand.

Senator WARNER. Unless the guaranty of the grant of the spectrum had build-out requirements in it—coverage requirements.

Governor MARKELL. But I think again whether it is the money from the incentive auctions specifically focused on this network, whether it is funding specifically for the rural piece, whether it is the necessity of some kind of state investment—and states are going to have to, over any period of time, continue to have to invest in their own public safety networks, along potentially with some kind of private/public partnership—it seems to me that there are several potential sources.

Senator WARNER. Again, I apologize, Madame Chair, but my time has expired. But I would like to include the notion of working with local governments to make sure that siting locations and other things are done at the least possible price and cost.

And if we could just get a quick comment from the public safety colleagues whether they would be willing to say that you would look at migration of narrow band, other kind of spectrum that may not be fully utilized to make sure that if some of that was then better deployed, if resources that came from that could then go back to operating or building out this D Block.

Mr. KELLY. It simply makes sense, Senator. Sure, we would be willing to do that.

In New York—a rough analogy—we have a Lower Manhattan coordination center where we have cameras and license plate readers that protect the lower part of Manhattan. In that facility, we have private sector stakeholders with New York City police officers and other government folks working together, working collaboratively. We are open to working with the private sector. They are very important to help us protect the city.

We have another organization called NYPD Shield where we have 7,500 private sector entities that work with us.

So we need the private sector. We know we have to work in partnership.

Senator WARNER. Chief, would you agree that potentially even reallocating, moving around some other spectrum that may not be used, if you are going to get some great——

Mr. KELLY. I think if it is available, it makes sense. Yes, sir.

Mr. GILLESPIE. Senator, obviously, we are very interested in the government's model and that we have full access and that we decide when we have access and when we need it. That certainly is important. As the technology becomes available to make some sort of migration, it would be foolish for us not to look at those things, obviously.

We have a specific need not only in the fire departments but certainly in the police agencies around the country also for simplex or talk-around or one-to-many and one-to-one, those sorts of conversations that take place in the area you are talking about. We have that need and as the technology becomes available, certainly I think those are things we could look at.

Senator WARNER. Other existing spectrum could be looked at.

Mr. GILLESPIE. I think we could look at it, certainly.

Senator WARNER. I will not put the migration of all the existing narrowband into broadband under a ten-year frame. You are not saying you are endorsing that, are you?

Mr. GILLESPIE. No. No, please do not put me there.

Senator WARNER. Sorry, Madame Chair.

Senator KLOBUCHAR. Do you have any more questions really, Senator Warner?

[Laughter.]

Senator KLOBUCHAR. All right.

Senator Blunt, any closing comments? Anything?

Senator BLUNT. Well, I do think our goal here should be getting this system working, getting it working across the country, the ability to communicate within a state. As the governor said, these things do not know county lines or city lines. They also do not know state lines. But I am particularly concerned that we do not allocate a lot of spectrum that nobody can afford to develop particularly prior to exhausting every other avenue we might take so that we have full access to develop spectrum, that we understand the public safety aspect of that. And what I would hate to see is that five years from now we are still saying, OK, we have got this big block of allocated spectrum to public safety, but it is really undeveloped still because our needs are now. And as Senator Warner mentioned, be sure that we are maximizing the publicly available technology at increasingly lower cost so that we are seeing how much of that is transferrable to the true public safety that each of you and so many people in this audience represent.

So I think this is a decision. We need to figure out how to move forward in the way that produces the best possible result in the short term. The medium term in this area is so hard to plan for because everything changes so quickly, and saying, well, we may need this 10 years from now or 15 years from now—in any discussions I have had on any of these issues, none of the challenges have ever been anywhere near what anybody thought they were going to be, and the opportunities have been significantly greater than anybody thought they were going to be.

So we want to work together and continue to talk with everybody that is represented here today to be sure that we get these tools available—at least my goal would be to get these tools available to you in the quickest possible way and the best possible way rather than continuing to reserve things that do not get developed. I think this hearing was an important part of that and, Madame Chairman, I am glad to be part of it.

Senator KLOBUCHAR. Well, thank you very much.

I want to thank you, Commissioner, for your good work and, Governor, Chief, and Mr. Hanna, for being here. I think you see from the high rate of attendance, the number of Senators that showed up here today, there is a lot of interest in this issue. But I do remember us having a hearing on this—I have only been here 4 years—the first year I was here. And I think there is some impatience, which I feel, a sense of urgency on the public safety side that we move forward in this area.

And I just wanted to note before I got here, I was at a Judiciary hearing. The issue of rural service as well was mentioned. It is more than just New York City, as you know. As you look at the region that you want to share your information with, Commissioner, especially some of the rural areas in our state have had some real issues with interoperability and getting the information that they need. So I am really hopeful by the number of people in-

terested in this, in Senator Rockefeller's work. People are pledging here to work on a solution that we can move ahead.

And I want to thank you all for being here and let you know that we will keep the record open for the next two weeks for submissions and questions and other things.

With that, the hearing is adjourned. Thank you.

[Whereupon, at 11:43 a.m., the hearing was adjourned.]

A P P E N D I X

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

Thank you, Mr. Chairman, for holding this hearing on public safety communication. As we all know, in less than a year we will observe the tenth anniversary of 9–11 and I am concerned that we haven't yet realized the goal of establishing a nationwide interoperable public safety wireless broadband communications network. Such a network is vital to effectively responding in times of regional or national emergencies because of the enhanced mission-critical services it will provide to first responders. This network, if properly designed and built, will provide greater safety and protection to all citizens and, because of that, is long overdue.

The need for this network cannot be overstated but my concern is compounded by the ongoing debate regarding the fate of 10 megahertz (MHz) of 700 MHz wireless spectrum known as the "D-Block." This issue has unfortunately overshadowed deliberation over the future of this critical infrastructure.

Last fall, this committee held a hearing similar to the one today and it made clear the importance of public safety having enough network capacity to respond to emergency events. But no matter how much spectrum is utilized for this nationwide network, it will not be effective unless we also address several key areas such as adequate funding for the network, proper planning and governance to build and administer the network, and seamless coverage and interoperability to ensure undisrupted communications.

I raise the last two points because the lack of interoperability and coverage are not necessarily remedied by additional spectrum but more directly associated with equipment and infrastructure deployment as well as planning and governance. The inability of public safety officials to effectively communicate with each other has been a constant problem it was even cited as a major problem in the 9/11 Commission report. And the lack of nationwide service coverage, which precludes responders from communicating at all—is a difficulty that continues to plague rural areas across the country. So I hope we do not focus solely on one aspect such as spectrum when what is required is a multi-faceted approach to comprehensively address the challenges we face.

We also must closely examine how we will fund the construction and maintenance of the wireless broadband network because the funding challenges that exist are compounded by the fiscal constraints our nation and most states face. Current law requires the Commission to auction the D Block but if it is directly allocated, then approximately $3 billion in auction revenue would be lost—these funds could be used to assist in the construction of this critical asset.

Furthermore, the Commission concluded a public safety network would require "a substantial investment"—with initial estimates between $12 and $16 billion for construction and operating costs over ten years, which dwarfs previous federal funding for public safety communications. If public safety were to rely on a stand-alone network, construction and operating costs would most likely exceed $30 billion over the same period.

Also, no amount of spectrum and funding will be effective without sufficient planning. A clear example is with interoperability more than $7 billion of taxpayer money has been spent over the past 7 years without proper planning and coordination. And as a result, only incremental improvements have been made—many experts state it may be several more years before it is completely resolved. In addressing this issue, we must balance providing the public safety community with the tools and resources it needs to effectively respond to emergencies with our fiscal responsibilities to taxpayers to ensure their hard-earned money is used wisely and responsibly. And without proper planning, we could expend more money without improving the safety and security of citizens in times of emergency or putting them at risk due to incomplete and disparate systems.

I would like to commend you, Mr. Chairman, for your attention to this critical issue but I do have some outstanding concerns about the current draft of the legislation, which I would like to work with you and your staff to address. I believe making

these corrections will improve the legislation to ensure public safety has sufficient resources to build and operate this critical asset effectively.

I have been calling for comprehensive spectrum reform for almost two years. Last Congress, Senator Kerry and I introduced comprehensive spectrum legislation to modernize our nation's spectrum planning, management, and coordination activities and fix fundamental deficiencies that exist. It is my intent to reintroduce this legislation or some variation of it this Congress to continue to advance the legislative discourse on spectrum reform.

The problem we are facing is growing demand for spectrum by both non-federal and federal users in order to enhance the services provided to consumers and citizens. To meet the ever-increasing demand, users have to utilize existing spectrum more efficiently and we also have to develop more robust spectrum management models that involve sharing and reuse of this finite resource. Because it is not just public safety that is calling for more spectrum, it is the wireless industry, utilities, and numerous government agencies. So I hope we will have an additional hearing on spectrum reform to discuss this issue important to meeting the future needs of all spectrum users.

But in regard to this hearing's topic, this nation has for too long lacked a nationwide interoperable public safety network, so the quickest and most feasible path to achieve that goal must be found. Let's not allow the tenth anniversary of 9/11 to pass while we are no closer to protecting our nation than we are now.

Given the importance of this issue, I look forward to working with my colleagues in Congress to ensure public safety officials have the resources and necessary communications network to effectively respond to any future emergency events this nation faces.

Thank you.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. CLAIRE MCCASKILL TO HON. RAYMOND W. KELLY

Question 1. The Wireless initiative that the President has put forward is a plan that is worth strong consideration. As I stated in a forum that I held in Missouri last year with FCC Chairman, it is paramount that rural and underserved areas have access to broadband. The President has stated that his plan would reduce the deficit by $9.6 billion and that about $28 billion would be raised through incentive auctions. However, I want to get a better handle on these calculations. How are we determining that $28 billion would be raised?

Answer. As you state, the President has stated that these saving would occur and that $28 billion would be raised in incentive auctions. These are his figures and I respectfully suggest that the President's budget experts are the most appropriate people to explain the process by which they arrived at these budgetary numbers.

Question 2. There is a lot of uncertainty about how much spectrum would be voluntarily given up for auction—do we have assurances that we can actually reach this figure?

Answer. Since LTE is a new technology and public safety communications are mission critical, public safety agencies including the NYPD are understandably reluctant to specify an exact amount of spectrum that they would be willing to give up at this time. However, I hasten to add that if public safety's needs are met by the 700 MHz public safety broadband network, there would be no reason, technically or economically, to retain large blocks of spectrum in other bands. In particular, public safety data networks now operating on 25 Khz channels would be the first to be replaced by a public safety broadband wireless network.

Question 3. Conversely, I have concerns about how we would pay for a public safety network under the FCC's plan. The estimate is that we can raise $3 billion by auctioning off the D Block. I realize that this would be a different type of auction than what was attempted a few years ago but, given that that effort failed, how (do) we know we're going to get $3 billion?

Answer. As you know, I am not in favor of auctioning the D Block. I am in favor of assigning the D Block to public safety and auctioning off alternative spectrum.

The D Block auction failed for many reasons, but one of the primary reasons was a requirement that the D Block auction winner partner with public safety and build a network to public safety standards which are much more stringent than commercial standards, and provide service nationwide including in areas where there were insufficient customers to support the network and still provide the network owners with a positive return on their investment.

Our opposition to the D Block auction and desire to have it allocated to public safety are driven by two basic concerns. The NYPD has consistently maintained

that the D Block will be required to support the broadband needs of public safety, particularly if these requirements include the eventual migration of mission critical voice to the public safety broadband wireless network. The City of New York submitted a white paper to the FCC supporting this contention.[1] The requirement for contiguous spectrum is important since LTE increases in spectrum efficiency as the channel bandwidth increases. Doubling the channel bandwidth more than doubles the channel capacity. This is the essence of broadband and is one of the reasons that it is more spectrally efficient than narrowband. The wider the channel bandwidth the more spectrally efficient LTE becomes. The D Block is the only available spectrum that is adjacent to the public safety broadband 700 MHz spectrum. Furthermore, we maintain that if the D Block were to be auctioned to a commercial entity, the resulting network deployed would cause interference to the adjacent public safety 700 MHz broadband network, decreasing its capacity.

By auctioning alternative spectrum without the restrictions imposed by the previous D Block auction, we believe that the market would react more positively. Spectrum is a limited resource. All commercial wireless network providers realize this and they also realize that demand for broadband wireless service will increase over time. Since the D Block auction, Long Term Evolution (LTE) has become the technology of choice among commercial wireless providers worldwide, thus reducing technology risk.

Long Term Evolution (LTE) is a very spectrally efficient technology. It approaches the theoretical limit. As more spectrum is auctioned, less remains; particularly in the frequency bands preferred by commercial wireless network operators. The scarcity of appropriate spectrum coupled with the reduced technology risk, the removal of previous auction restrictions and the anticipated accelerated demand for wireless broadband services are all factors that will combine to increase the commercial value of the remaining spectrum on the open market.

Question 4. If we donate more spectrum to public safety agencies, can you give me any assurances that interoperability between different jurisdictions would work? And that you would have economies of scale to get good technology at good cost?

Answer. Interoperability has been elusive since the early days of public safety radio. In the early years, the primary impediment to interoperability was that public safety agencies operated on different frequency bands. Later, digital systems were introduced. Although these systems provided many features and benefits, they also introduced an additional obstacle to interoperability; the digital systems were incompatible since they were developed by companies in competition with each other. Although APCO has strived to resolves some of these issues, the fact remains that many public safety agencies lack the ability to communicate with each other directly.

One of the primary benefits of the public safety broadband wireless network will be native interoperability, that is, the ability to communicate directly without the aid of intermediary devices such as gateways or cross band repeaters. The 700 MHz public safety broadband wireless network will go a long way to solving the interoperability dilemma, by adapting a common air interface (LTE) and a common frequency band (700 MHz).

Since commercial wireless networks will also use LTE technology, device costs will decrease. Public safety will benefit from research and development funded by commercial interests. Ultimately, when the vision of a public safety wireless broadband network supporting video, voice and data is realized, public safety will be able to satisfy its wireless requirements using a single network. One of the major cost factors in the current pubic safety radio environment is the high cost of proprietary subscriber units manufactured specifically for public safety. The FCC's Public Safety and Homeland Security Bureau has found that, "while a-state-of-the-art consumer cellular device typically costs a few hundred dollars, a typical land mobile radio for pubic safety communications may cost as much as $5,000 . . . Commission staff expect that leveraging the commercial mass market could reduce costs for public safety devices substantially . . ." as noted by FCC Chairman Genachowski in his letter to the Honorable Henry A. Waxman, dated July 20, 2010.

Question 5. If the spectrum is auctioned off, the non-profitable public safety share of this deal could slip as commercial demand grows. How do we ensure that private entities will ensure that the needs of public safety are met?

Answer. To be clear, I am not in favor of auctioning the D Block. As previously discussed, The D Block is the only available spectrum that is adjacent to the public

[1] See NYC Filing under FCC Docket 06–229 posted 02/23/2010 entitled "700 MHz Broadband Public Safety Applications And Spectrum Requirements" available on the FCC website (*FCC.gov*).

safety broadband 700 MHz spectrum allocation. Public safety requires a dedicated broadband wireless network of sufficient capacity to meet its current and future communications needs. Nevertheless, we are not opposed to partnering with commercial networks to add capacity for non mission critical connectivity, provided that these networks meet public safety requirements. We would also advocate partnering with commercial wireless networks to share radio sites and backhaul facilities as a means of reducing costs and expediting network deployment.

Question 6. There is a lot of discussion about up-front costs of maintaining a public safety network but not a lot about ongoing operating costs. How much is this going to cost in 10 years? Or in 20 years? How will that be paid for?

Answer. The FCC estimates expenses that constructing a public safety network through partnerships with commercial providers will cost approximately $6.3 billion over 10 years. Adding in operating costs bring the total to $12–16 billion over 10 years. The FCC also estimates that constructing a stand-alone public safety network would cost approximately $16 billion over 10 years and that adding in operating expenses would bring the total to approximately $34.4 billion over 10 years. It is impossible for me at this time to project costs twenty years into the future.

We hope that the federal government will assist state and local government in paying for the construction of the network and for ongoing network costs. The federal government should consider auctioning alternative spectrum, reducing network costs by leveraging existing public safety infrastructure and entering into partnership agreements with critical infrastructure entities such as electric and natural gas utilities. To some extent however, the users of the network may be required to help to pay for network operating costs. To that end, our goal should be to maximize the number of users on the proposed 700 MHz public safety wireless broadband network without overloading the network, thereby reducing the cost per user while ensuring network access for first responders. Costs can be further reduced by sharing sites and backhaul with commercial entities. In areas where the number of public safety users is small, we should consider allowing critical infrastructure users onto the network to help mitigate the cost to public safety. This, however, would likely require Congressional legislative action. In the longer term, migrating legacy public safety mission critical voice and data to the 700 MHz nationwide broadband public safety wireless network can further reduce costs by eliminating duplicative services and utilizing lower cost non proprietary user devices.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. OLYMPIA J. SNOWE TO HON. RAYMOND W. KELLY

Question 1. Beginning with the Radio Act of 1927 and continuing with the Communications Act of 1934, the federal government began defining the public airwaves, or radio spectrum, as a resource that must be used in the public interest and, more specifically, "for the purpose of national defense" and "for the purpose of promoting safety of life and property through the use wire and radio communications." Since 1927, local, county, state and regional public safety organizations across the nation have built, maintained and updated their individual communications facilities. To meet those communications needs, it is my understanding that public safety entities utilize approximately 104 MHz of spectrum—including 24 MHz of public safety spectrum in the 700 MHz band for both broadband and narrowband services. Can you elaborate on the existing spectrum utilized by public safety, such as what frequency bands are used, how much spectrum in each band is used and what communications services are supported in those bands?

Answer. Public safety uses frequencies in the following bands: Very High Frequency (VHF), Ultra High Frequency (UHF) and Super High Frequency (SHF). The VHF land mobile frequency bands are 30 MHz–50 MHz and 150 MHz–174 MHz. Within these allocations, public safety channels are interspersed with commercial channels throughout the band on a non-exclusive basis.

In the UHF band, public safety operates in the following sub-bands: 450 MHz–470MHz; 470 MHz–512 MHz; 700 MHz and 800 MHz. Within both the 450 MHz–470 MHz and 470 MHz–512 MHz sub-bands, public safety channels are interspersed with commercial channels. Within the 470 MHz–512 MHz sub-band land mobile radio users, including both public safety and commercial licensees, share the band with television broadcasters based upon area of operation. Specifically, in the largest urban areas, a maximum of three television channels, a total of 18 MHz, may be allocated to land mobile radio. This includes both public safety and commercial licensees.

Within the 700 MHz UHF sub-band, public safety is allocated 24 MHz of spectrum divided into narrowband and broadband channel assignments. Within the 800

MHz UHF sub-band, public safety has exclusive use of 6 MHz of spectrum and shares the 806 MHz–860 MHz sub-band with commercial licensees. In the SHF band, public safety is assigned 50 MHz of spectrum for broadband applications (4940 MHz–4990 MHz).

All of the public safety frequency assignments are narrowband with the exception of the 700 MHz broadband channels and the 4.9 GHz channels, which are also broadband. The narrowband frequency allocations primarily support mission critical voice operations, although some of these channels are now used for data. However, data rates on these channels are typically limited to 19.2 kbps.

As you point out, public safety is currently assigned over 100 MHz of spectrum. However, much of this spectrum is not available nationwide. Furthermore, public safety frequency allocations are scattered throughout the RF spectrum on many disparate frequency bands, which impedes interoperability. 50 MHz of the public safety spectrum you reference is in the 4.9 GHz band. This frequency has very poor propagation characteristics. It is used primarily for incident scene broadband data applications and limited local surveillance video. The poor propagation characteristics of this band make any wide area network deployment cost prohibitive.

Question 2. What services, if any, will migrate to the new wireless broadband network? How many first responders in the field are expected to be supported by this wireless network?

Answer. The first services likely to migrate to the new wireless broadband network are data services. Currently, many public safety agencies use narrowband (25 kHz) channels for mission critical voice as well as low speed (19.2 kbps) data. With the deployment of the new public safety wireless broadband network, data-only services currently using 25 kHz channels, such as digital dispatch, could be migrated to the new public safety wireless broadband network relatively easily and quickly. In fact, it would be prudent to make this transition sooner rather than later since Long Term Evolution (LTE) will support much greater data rates and is spectrally more efficient than utilizing 25 kHz bandwidth channels for data, as these channels were intended primarily for voice communications and were used for data because they were the only channels available at the time. In the longer term, the NYPD believes that public safety mission critical voice can also be migrated to the new public safety wireless broadband network.

The limitation on how many first responders in the field can be supported simultaneously at a given location (per cell, or per cell sector) is a question of user density. Doubling the channel bandwidth more than doubles the channel capacity. This is the essence of broadband and is one of the reasons it is more spectrally efficient. In fact, the wider the channel the more spectrally efficient LTE becomes.

Question 3. If there are radio-based services that will migrate to the wireless broadband network or aren't required anymore due to the new enhanced services that will be available on the wireless broadband network, would public safety work with the Commission to develop a transition plan to relinquish underutilized spectrum over a certain period of time?

Answer. The NYPD would be willing to work with the Commission on this issue provided that sufficient broadband spectrum is allocated to public safety, and a comprehensive migration plan was developed.

Question 4. The FCC estimates expenses for its plan of constructing a public safety network through partnerships with commercial providers and infrastructure will total approximately $6.3 billion over 10 years. Adding in operating expenses would bring the approximate total to $12–16 billion over 10 years. The FCC also estimated that constructing a stand-alone public safety network would require approximately $16 billion over 10 years and that adding in operating expenses would bring the total to approximately $34.4 billion over 10 years. A Verizon study for the Southern Governor's Association back in 2007, suggested that a network would cost $61 billion over 10 years for construction and maintenance.

If the D Block were directly allocated to public safety, would public safety look to build its own network, utilize existing commercial infrastructure, or a hybrid, or both? Would it be one nationwide network or a compilation of regional/state networks, or virtual networks over existing carrier's networks?

Answer. These issues are the subject of ongoing discussions among the various stakeholders. No final decision has been made at this time. The NYPD is not opposed to partnering with commercial wireless networks to share radio sites and backhaul facilities as a means of reducing costs and expediting network deployment, nor would we be opposed to partnering with commercial networks to extend coverage into areas not yet covered by the public safety broadband wireless network.

Question 5. Who would maintain the network—would it be centralized, regional or state operated? How would new users be authenticated and granted access to use

the network? Also how many additional personnel would be needed to maintain it on a day to day basis?

Answer. These issues are the subject of ongoing discussions among the various stakeholders. No final decision has been made at this time.

Question 6. When will there be a greater and more detailed discussion on planning and governance issues related to the broadband wireless network? Are these issues critical to addressing interoperability as well as overall design of the network and subsequent costs?

Answer. Planning and governance are critical issues. Some of this work is already underway; discussions are ongoing within the public safety community, the Obama administration, federal government agencies and industry experts regarding these very issues. Preliminary public safety requirements are defined by the NPSTC Statement of Requirements document issued July 2009. The National Institute of Standards and Technology (NIST) is engaged with the waiver recipients, the Public Safety Spectrum Trust (PSST) numerous LTE vendors and other stakeholders to further define public safety's requirements. The optimal public safety network design is a topic being actively discussed by public safety stakeholders, industry experts and the FCC.

Question 7. The 9/11 Commission report found that "the inability to communicate was a critical element" at each of the "crash sites where multiple agencies and multiple jurisdictions responded." Even with the lack of interoperability clearly highlighted, efforts to improve this significant problem have fallen short and at best have only been incremental.

To remedy this problem, the FCC established the Emergency Response Interoperability Center (ERIC) to ensure that the applications, devices, and networks that public safety groups utilize all work together, so that first responders nationwide can communicate with each other seamlessly. ERIC is supposed to hold its first meeting very soon.

The National Broadband Plan noted that past efforts to create a public safety narrowband network failed and that many public safety radio systems lack basic interoperability. It also found that most jurisdictions that have improved their systems still only have an "intermediate" level of interoperability at best—not the advanced level of interoperability that is required for truly seamless communications in the event of a major emergency. Should those with industry expertise in designing and building nationwide networks have a greater voice in the development of interoperable systems?

Answer. The failures in communications that you describe above are the result of disparate frequency assignments and the lack of a common air interface. The migration of public safety communications to a single frequency band and a common wireless platform over time are key elements in providing native interoperability between public safety agencies nationwide. The selection of LTE technology by the FCC and public safety is a first step in achieving this goal.

Industry experts are currently engaged in preliminary discussions related to the design of the public safety wireless broadband network. The NIST Public Safety Communications Research Program (PSCR) is overseeing the deployment of two test LTE networks, one in a radio quiet zone at Table Mountain, Colorado just north of the NIST facility in Boulder and one in Washington, D.C. The results of these test networks coupled with ongoing dialog between public safety, industry experts and federal officials will further define the network architecture.

Question 8. Wouldn't we more properly address this if public safety outlined the operational requirements and services that needed to be provided by the network and then private sector experts develop the standards and network design to meet those needs?

Answer. Much of this work is already underway. The National Institute of Standards and Technology (NIST) is engaged with the waiver recipients, numerous LTE vendors and other stakeholders to further define public safety's requirements. The optimal public safety network design is a topic being actively discussed by public safety stakeholders, industry experts and federal agency officials. The choice of LTE as the wireless transport technology by the FCC in consultation with public safety was an encouraging first step in this process.

Question 9. Last year, the FCC granted more than 20 waivers to public safety entities to begin building out wireless broadband networks using the existing 10 MHz that is already assigned to public safety in the 700 MHz band.

Public safety officials have noted that these waiver build-outs will provide data important in the deployment of the proposed national network. A New York public safety official was quoted as saying "We have always made the argument that granting these waivers will further the ability to understand what it is that we

want to build and how to build it." How can public safety say it definitely needs the additional 10 MHz of spectrum from the D Block if these waivers are being used for determining what to build and how to build it?

Answer. Granting the waivers set a process in motion that engaged industry experts and federal government agencies to more clearly articulate the minimum network requirements. The waivers provided an incentive for equipment manufactures to become involved in two test networks sponsored by NIST. The NYPD has never doubted that the D Block will be required to support the broadband needs of public safety, particularly if these requirements include the eventual migration of mission critical voice to the public safety broadband wireless network. The City of New York submitted a white paper to the FCC supporting this contention.[2]

The same forces driving commercial network operators to seek additional spectrum will drive public safety. As wireless broadband capabilities become available commercially, the demand for these features will increase. Public safety officials will seek ways to tailor these capabilities to meet their mission requirements. The waivers are designed to allow early builders to deploy public safety broadband wireless networks in advance of the planned nationwide network. Long Term Evolution (LTE) provides a suite of standards to which the network will be built. Public Safety national organizations, such NPSTC in consultation with federal agencies such as the FCC and NIST will establish minimum network requirements, not the waiver recipients.

Question 10. The FCC and others have suggested giving public safety the option to use 700 MHz narrowband spectrum for broadband in order to provide additional broadband capacity. Is this feasible? If not, why?

Answer. The 700 MHz public safety narrowband spectrum will continue to be required for off network tactical (unit-to-unit) voice communications. In addition, many public safety entities have just recently deployed, or are in the process of deploying, P25 radio systems on the 700 MHz narrowband channels and expect an appropriate return on their investment. Narrowband voice networks will continue be needed until mission critical voice over LTE becomes a reality that is accepted by the public safety community as a viable alternative to existing public safety land mobile radio networks.

Wireless networks traditionally are built from urban cores and extended outward over time to less populated areas. Public safety agencies generally, and those in rural and sparsely populated areas in particular, must be given sufficient time to transition from existing legacy narrowband radio networks to the proposed nationwide public safety wireless broadband network. The transition will not be quick nor will it be easy. One of the goals of the National Broadband Plan is that at the end of this transition period public safety will have a reliable wireless broadband nationwide network that supports video, voice and data with native interoperability.

Question 11. It is my understanding that there are several federal departments and agencies involved with public safety communications—including the FCC, Department of Commerce, Department of Homeland Security, and the Department of Justice. I'm concerned there isn't one agency responsible and with all the agencies involved it presents challenges to making progress and proper planning.

In addition to this bureaucracy, I am concerned about the funding challenges that have existed and will likely continue to exist with public safety interoperability. It is my understanding that more than $7 billion of taxpayer money has been spent over the past seven years in federal grants without proper planning and coordination. As a result, only incremental improvements have been made—many experts state it may be several more years before it is completely resolved. This includes Public Safety Interoperability Communications (PSIC) grant program and about $4.3 billion DHS has spent to improve interoperability.

My concern is that we are hastily providing resources to public safety without proper planning to ensure those assets, whether it is funding or spectrum, are properly utilized. What can we do differently this time to ensure we achieve the goals necessary for public safety to sufficiently respond and communicate in emergencies and ultimately protect our Nation's citizens but upholding our fiscal responsibilities to taxpayers to ensure their hard earned money is widely used and responsibly?

Answer. The lack of radio interoperability among public safety agencies today is largely a result of past mistakes. The two salient obstacles to seamless interoperability are: short-sighted public safety land mobile radio frequency allocations across multiple frequency bands, and a failure to agree on a single air interface. Prior to

[2] See NYC Filing under FCC Docket 06–229 posted 02/23/2010 entitled "700 MHz Broadband Public Safety Applications And Spectrum Requirements" available on the FCC website (*FCC.gov*).

the advent of digital land mobile radio communications, the air interface was simply analog. However, beginning in the 1970s, when trunked radio systems were introduced, the air interface quickly became an issue. Although the voice channels in these early trunked radio systems were analog, the control channels were not and competing vendors developed their own proprietary systems. The result was that there were now two barriers to interoperability, disparate frequency assignments and non-compatible air interfaces. APCO Project 25 is an attempt to solve one of these problems, the non-compatible air interface. However, it does not solve the problem of disparate frequency assignments. The NYPD is aware that there are numerous external devices available that patch channels from different frequency bands together to enable basic voice interoperability during an emergency; we have several of them. However, these devices sacrifice spectrum efficiency in order to achieve their goal. Furthermore, they are expensive and often cumbersome to set up during an emergency. Public safety would be served best by migrating over time to a broadband network on a single frequency band using a common air interface that provides native interoperability without relying on external devices. Consolidating public safety communications onto a contiguous spectrum of sufficient bandwidth and adapting a global standard air interface are key elements to controlling future costs and ensuring native interoperability.

Question 12. If the D Block were directly allocated to public safety then it would utilize 34 MHz of spectrum as its primary spectrum for both narrowband and broadband communications. While this wouldn't necessarily present a problem in the event of a natural disaster, there is a concern about over reliance on this band during a disaster or terrorist attack.

If public safety principally relies on a relative narrow band of spectrum, then a coordinated attack could disrupt, or worse cripple, public safety communications through the use of high-power wireless jammers. For example, a recent University of Pennsylvania report highlighted the susceptibility of the P25 System to active traffic analysis and selective jamming attacks.

Is this a serious concern that needs to be addressed? Wouldn't the public safety network be more resilient by utilizing the existing public safety spectrum in 400 MHz, 800 MHz and 4.9 GHz by using technologies such as dynamic spectrum access, cognitive radio and spectrum aggregation as well as just greater interoperability with commercial systems, which operate in various bands?

Answer. Broadband networks are inherently more resistant to frequency jamming than narrowband networks. LTE is much more technically advanced than Project 25. LTE utilizes thousands of sub-carriers. The LTE network constantly monitors the RF channel for interference and schedules transmissions accordingly, choosing sub-carriers that are free from interference while avoiding those where interference exists, adjusting power levels accordingly to ensure the transmission will be successfully received.

The University of Pennsylvania study points out the ability for an adversary to monitor Project 25 conversations and determine the approximate location of the users. In addition, it illustrates the ability for an adversary to use this information to selectively jam such conversations. The vast majority of public safety radio networks in use today are subject to vulnerabilities similar to those described in the University of Pennsylvania report. Most public safety radio networks are unencrypted narrowband networks that are easy to monitor and are vulnerable to jamming. Broadband networks are far more difficult to jam than narrowband networks. The vulnerability of narrowband networks to monitoring and jamming is one of the reasons that the NYPD advocates the eventual migration of public safety radio communications (including mission critical voice) to 700 MHz LTE.

Spectrum aggregation generally refers to aggregating channels within the same frequency band, since aggregating channels from disparate bands results in different propagation patterns. Dual or triple band user devices are either extremely expensive or they compromise performance specifications to meet size constraints, or both. The most cost effective high performance user devices are single band devices.

Question 13. What impact would greater interoperability with commercial systems across the entire 700 MHz band have upon the costs and time to market of providing mobile broadband capabilities and end user devices for first responders?

Answer. One of the preliminary requirements of the public safety broadband wireless network is interoperability with commercial systems. Mobile broadband capability is available to first responders today in many jurisdictions if they choose to use the commercial networks; however, mission critical communications require networks built to public safety standards. Public safety requires its own network to ensure adequate network capacity for first responders and to ensure that the network

infrastructure meets public safety standards for reliability and availability. Nevertheless, we are not opposed to partnering with commercial networks provided that they meet public safety requirements, particularly during the early stages of network deployment as a means to extend coverage into areas not yet covered by the public safety broadband wireless network.

We would also advocate partnering with commercial wireless networks to share radio sites and backhaul facilities as a means of reducing costs and expediting network deployment.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. CLAIRE MCCASKILL TO HON. JACK MARKELL

Question 1. The Wireless Initiative that the President has put forward is a plan that is worth strong consideration. As I stated in a forum that I held in Missouri last year with the FCC Chairman, it is paramount that rural and unserved areas have access to broadband. The President has stated that his plan would reduce the deficit by $9.6 billion and that about $28 billion would be raised through incentive auctions. However, I want to get a better handle on these calculations. How are we determining that $28 billion would be raised?

Answer. The $28 billion revenue estimate was prepared by the White House. Questions regarding the analysis used to reach this number would best be directed to White House staff.

Question 2. There is a lot of uncertainty about how much spectrum would be voluntarily given up for auction—do we have assurances that we can actually reach this figure?

Answer. The President's Wireless Initiative and the Federal Communications Commission's (FCC) National Broadband Plan highlight the possibility of not only improving the efficient use of spectrum but also raising revenue to fund important communications initiatives through the use of incentive auctions. By sharing a portion of auction proceeds with existing spectrum license holders, the FCC believes significant portions of spectrum may be voluntarily freed up for new purposes. The FCC may be able to provide greater detail regarding how much spectrum is suitable for auction.

Question 3. Conversely, I have concerns about how we would pay for a public safety network under the FCC's plan. The estimate is that we can raise $3 billion by auctioning off the D Block. I realize that this would be a different type of auction than what was attempted a few years ago, but how do we know we're going to get $3 billion?

Answer. The $3 billion estimate was prepared by the FCC. Questions regarding this analysis would best be directed to them.

Question 4. If we donate more spectrum to public safety agencies, can you give me any assurance that interoperability between different jurisdictions would work? And that you would have economies of scale to get good technology at a good cost?

Answer. One of the reasons public safety agencies from different jurisdictions lack interoperability is because they operate on different bands of spectrum that have been assigned over the years by the FCC. Without a sufficient section of spectrum in the same bandwidth that can accommodate public safety users, true interoperability will be very costly and complex. This is why reallocation of the D Block is so important. An additional 10 MHz of spectrum in the 700 MHz range will provide the opportunity to consolidate public safety communications on a single network as it is developed and deployed, as opposed to our current communications capabilities that have been patched together over the years to achieve cross-jurisdictional connectivity.

When combined with the existing 10 MHz of public safety spectrum, the D Block would allow greater flexibility for state and local governments to develop innovative means to fund the deployment and maintenance of the network. With 20 MHz instead of only 10, it may be possible in many areas to allow other government services such as transportation officials to utilize the network or to engage in public-private partnerships to reduce costs. Furthermore, the additional spectrum would allow more users on the network, which would increase demand for devices and further reduce costs through economies of scale.

Question 5. If the spectrum is auctioned off, the non-profitable public safety partnership of this deal could slip as commercial demand grows. How do we ensure that private entities will ensure that the needs of public safety are met?

Answer. In order to ensure that public safety's needs are met, the network must be dedicated for public safety and cannot be a shared network with commercial

users. Public safety control of the network will ensure it is designed and built to mission-critical standards. It will also remove uncertainty regarding when and how first responders will be granted priority access to the network, which is a significant cause for concern in the FCC's proposal to have public safety users share the network with commercial customers.

Question 6. There is a lot of discussion about upfront costs of maintaining a public safety network but not a lot about ongoing operating costs. How much is this going to cost in 10 years? Or in 20 years? How will that be paid for?

Answer. For detailed information regarding the costs to build the network, please refer to the analyses conducted by the White House and the FCC. These analyses propose several different mechanisms to fund network construction and maintenance, including through the proceeds from incentive auctions.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. OLYMPIA J. SNOWE TO HON. JACK MARKELL

Question 1. The 9/11 Commission report found that "the inability to communicate was a critical element" at each of the "crash sites, where multiple agencies and multiple jurisdictions responded." Even with the lack of interoperability clearly highlighted, efforts to improve this significant problem have fallen short and at best have only been incremental.

To remedy this problem, the FCC established the Emergency Response Interoperability Center (ERIC) to ensure that the applications, devices, and networks that public safety groups utilize all work together, so that first responders nationwide can communicate with one another seamlessly. ERIC is supposed to hold its first meeting very soon.

The National Broadband Plan noted that past efforts to create a public safety narrowband interoperable voice network have failed and that many public safety radio systems lack basic interoperability. It also found most jurisdictions that have improved their systems still only have an "intermediate" level of interoperability at best—not the advanced level of interoperability that is required for truly seamless communications in the event of a major emergency. Should those with industry expertise in designing and building nationwide networks have a greater voice in the development of interoperable systems?

Answer. To be successful, those with industry expertise must work closely with public safety officials to ensure the network is interoperable. While industry expertise is important, industry experts may lack a full understanding of public safety requirements and how communications capabilities may be used in the field. This public safety field expertise is critical to ensure the network is designed and built to meet the needs of public safety.

Question 2. Wouldn't we more properly address this if public safety outlined the operational requirements and services that needed to be provided by the network and then private sector experts developed the standards and network design to meet those needs?

Answer. To ensure the network is successful, public safety officials and industry experts should work together to design and implement the network. These discussions are important to ensure that all parties share the same understanding of what is feasible with the technology as well as what will be the required and desired capabilities of the network.

Question 3. Last year, the FCC granted more than 20 waivers to public safety entities to begin building out wireless broadband networks using the existing 10 megahertz of spectrum that is already assigned to public safety in the 700 MHz band.

Public safety officials have noted that these waiver build-outs will provide data important in the deployment of the proposed national network. A New York public safety official was quoted as saying "We have always made the argument that granting these waivers will further the ability to understand what it is that we want to build and how we want to build it."

How can public safety say it definitely needs the additional 10 megahertz of spectrum from the D Block if these waivers are being used for determining what to build and how to build it?

Answer. Current research shows that with over 55,000 public safety jurisdictions in existence nationwide, reallocation of the D Block to form a contiguous band of 20 MHz of spectrum will be necessary to ensure that all jurisdictions will be able to utilize the network and gain access to the kinds of video and data services that many Americans currently enjoy. The waivers to begin construction on the existing

10 MHz of spectrum are important to test the new technology and ensure that it will meet public safety's needs as the network is further developed.

Question 4. The FCC and others have suggested giving public safety the option to use 700 MHz narrowband spectrum for broadband in order to provide additional broadband capacity. Is this feasible? If not, why?

Answer. The FCC's suggestion to use narrowband spectrum for broadband communications is not technologically feasible at this time. The 700 MHz narrowband spectrum is being used for interoperable voice communications that are critically important to our Nation's first responders. The flexible use of narrowband spectrum for broadband services could produce interference with current radio communications and poses too great a risk to the safety and well-being of citizens and first responders. While there may be potential for migration of existing narrowband systems to broadband technologies in the future, there is currently no guarantee that both can be supported at the same time on the same network.

Question 5. It is my understanding that there are several federal departments and agencies involved with public safety communications—including the FCC, Department of Commerce, Department of Homeland Security, and the Department of Justice. I am concerned there isn't one agency responsible and that with all the agencies involved it presents challenges to making progress and proper planning.

In addition to this bureaucracy, I am concerned about the funding challenges that have existed and will likely continue to exist with public safety interoperability. It is my understanding that more than $7 billion of taxpayer money has been spent over the past 7 years in federal grants without proper planning and coordination. And as a result, only incremental improvements have been made—many experts state it may be several more years before it is completely resolved. This includes the Public Safety Interoperability Communications (PSIC) grant program and about $4.3 billion DHS has spent to improve interoperability.

My concern is that we are hastily providing resources to public safety without proper planning to ensure those assets, whether it is funding or spectrum, are properly utilized. What can we do differently this time to ensure we achieve the goals necessary for public safety to sufficiently respond and communicate in emergencies and ultimately protect our nation's citizens but upholding our fiscal responsibilities to taxpayers to ensure their hard-earned money is used wisely and responsibly?

Answer. It is important to note that the reallocation of the D Block is time-sensitive and must be a top priority. The FCC is under legal obligation to auction the D Block to commercial providers unless Congress removes this requirement. Once an auction takes place, the spectrum will be gone and the nation will have missed perhaps its greatest opportunity in decades to improve the efficiency and cost effectiveness of public safety communications.

Once sufficient spectrum is allocated for the network, establishing a governance structure for the development and maintenance of the system will be necessary. Beginning with the Public Safety Interoperable Communications (PSIC) grant program, Congress required that state and local officials work together to create and implement communications plans to guide investments and measure progress in achieving interoperability. These plans, as well as the National Emergency Communications Plan, have improved governance and helped ensure coordination necessary for the effective use of taxpayer funds.

These plans should be leveraged in the development of the nationwide broadband network for public safety. Doing so will ensure that various Federal, state and local agencies work together and avoid duplication of effort. By including all appropriate agencies, it will also ensure that the network ultimately meets various agencies' mission requirements and will help reduce spending on multiple communications systems.

Question 6. If the D Block were directly allocated to public safety then it would utilize 34 MHz of spectrum as its primary spectrum for both narrowband and broadband communications. While this wouldn't necessarily present a problem in the event of a natural disaster, there is concern about possible overreliance on this band during a disaster or terrorist attack.

If public safety principally relies on a relatively narrow range of spectrum then a coordinated attack could disrupt, or worse cripple, public safety communications through the use of high-power wireless jammers. For example, a recent University of Pennsylvania report highlighted the susceptibility of the P25 System to active traffic analysis and selective jamming attacks.[1]

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[1] Sandy Clark and others, *Security Weaknesses in the APCO Project 25 Two-Way Radio System,* CIS Technical Report MS–CIS–10–34, University of Pennsylvania, November 18, 2010.

Is this a serious concern that needs to be addressed? Wouldn't the public safety network be more resilient by utilizing the existing 700 MHz assignment with existing public safety spectrum in 400 MHz, 800 MHz, and 4.9 GHz by using technologies such as dynamic spectrum access, cognitive radio, and spectrum aggregation? As well as just greater interoperability with commercial systems, which operate in various bands?

Answer. Governors and our public safety officials share your concerns regarding network security and reliability. As the network is developed, it must be "hardened" against attack and include redundancies to ensure the ability to communicate during an emergency. Technologies such as dynamic spectrum access and spectrum aggregation are still considered developing technologies and are therefore unreliable in the event of disaster. In addition, some of these technologies, like dynamic spectrum access, require additional software for interoperability, which would increase costs.

It should be noted that the reason the 700 MHz band is so valuable is because of its ability to reach users through buildings, concrete and even underground. This is a characteristic of the 700 MHz band that would prove invaluable to the public safety network. Additionally, spectrum in other bands will still be required for some time for voice communications until the LTE technology has been proven capable of reliably supporting first responder voice communications.

Question 7. What impact would greater interoperability with commercial systems across the entire 700 MHz band have on the costs and time to market of providing mobile broadband capabilities and end users devices for first responders?

Answer. While greater interoperability with commercial systems might ultimately be beneficial, it cannot be a substitute for reallocation of the D Block to public safety. Public safety must have a dedicated 20 MHz of spectrum for a nationwide network in order to ensure public safety's critical requirements are met. By their nature, commercial systems must serve their customers and would have little incentive to prioritize first responder communications over those of their customers during an emergency.

Furthermore, sharing commercial systems could be dangerous. In the event of a bomb scare, for instance, law enforcement may need to shut down wireless communications within a specified area. If public safety uses those same networks to communicate, this would mean disabling critical first responder communications, which is unacceptable.

Question 8. In your opening testimony you stated "almost 10 years after the terrorist attacks of September 11th and despite a great deal of national attention to first responders' communications needs, we continue to lack a nationwide network that can provide these capabilities to first responders." However, a set of standards known as Project 25 (P25) was initiated back in 1989 by public safety agencies and manufacturers to ensure radio interoperability with emergency communication systems but to date only a portion of the standard set has been developed. It is also my understanding that there has been only one single demonstration of interoperability and that was between Motorola and Harris land mobile radio handsets.

In your opinion, what have been the key reasons 21 years later we still don't have nationwide radio interoperability? How will public safety approach this issue with broadband so as not to repeat the same mistakes? My concern about this is that the European standard (TETRA) was successfully completed in only a few years and its handsets are significantly cheaper than P25 devices.

Answer. A key reason the nation lacks true interoperability is the manner in which public safety radio communications have developed over the decades. Over time, public safety users have been allocated small segments of spectrum in different frequency bands, none of which can communicate directly with each other and none of which were coordinated as they were developed across multiple jurisdictions. Without a single contiguous section of spectrum to accommodate all public safety users, achieving interoperable voice communications has often required first responders to carry multiple radios or use gateway systems to patch together different radio networks. The reallocation of the D Block to public safety can help avoid repeating these mistakes as we move to broadband. In addition, there has been significant progress in establishing effective governance structures to coordinate the development of communications systems that will greatly improve the efficiency and effectiveness of the broadband network's deployment.

Question 9. Is the P25 standard based on open standards? How many companies are involved in the development of P25 equipment and devices? How does this affect the cost of P25 equipment?

Answer. For questions regarding P25 standards, please refer to the Office of Emergency Communications at the Department of Homeland Security.

Question 10. In your testimony you mention Congress can ensure that public safety controls the design and construction of network facilities sufficient to meet their exacting standards of performance by directly allocating the D Block and providing funding mechanisms. You also mention that no commercial operator builds to meet those same standards. Can you elaborate on what standards you are referring to? Are they codified somewhere and how were these standards developed?

Answer. The standards I was referring to are the "mission critical" requirements of first responders and are the standards to which public safety radio communications systems are built. These requirements include more rigorous features for safety and redundancy and do not tolerate dropped calls as occur on systems built for commercial purposes.

Question 11. How much experience does public safety have in general in designing and building wireless broadband networks? If that experience is limited, then is public safety actually capable of managing a new, complex technology such as LTE (Long Term Evolution)? If not, who should? Should there be a greater group of industry parties involved in the standards and technology development—wouldn't that help reduce costs?

Answer. Public safety officials have been designing and building communications systems for years. LTE is a new technology that is just now being tested in both the commercial and public sectors. To ensure this technology is developed to include public safety requirements, public safety must have a seat at the table and must be a key player in efforts to design and build a nationwide broadband network. Without public safety leading efforts to design the network, it would likely fail to meet the somewhat unique and rigorous requirements of our Nation's law enforcement officers, firefighters and emergency medical service providers.

Question 12. You also mention state and local budget strains and the importance of improving the efficiency and cost effectiveness of critical public services. Isn't the lack of uniform standards contributing to the excessive cost in public safety communications?

Answer. Public safety communications are costly today in part because they lack interoperability. As discussed above, the disparate segments of spectrum that have been allocated to public safety over the years has led to the development of multiple communications systems that cannot talk to each other. Achieving interoperability has required first responders to often carry two, three or even four different radios to communicate across jurisdictions. This increases equipment costs and also requires additional personnel costs to maintain these systems. By devoting resources to one network, we can greatly reduce the costs incurred at the local, state and federal level.

Question 13. Wouldn't it be more cost effective if public safety utilized one network for both voice and data communications?

Answer. While it might be more cost-effective in the future, unfortunately the technology doesn't allow flexible use without risk at this time. While Governors and their public safety officials support the eventual migration of both voice and data to one system, we must ensure that the network will be able to support both before we fully devote ourselves to that premise.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. CLAIRE MCCASKILL TO CHIEF AL H. GILLESPIE

Question 1. The Wireless Initiative that the President has put forward is a plan that is worth strong consideration. As I stated in a forum that I held in Missouri last year with the FCC Chairman, it is paramount that rural and unserved areas have access to broadband. The President has stated that his plan would reduce the deficit by $9.6 billion and that about $28 billion would be raised through incentive auctions. However, I want to get a better handle on these calculations. How are we determining that $28 billion would be raised?

Answer. First it's important to understand that S. 28 does not rely solely on incentive based auctions. Like its predecessor, S. 3756, as well as Senator Lieberman and McCain's legislation, S. 3625, it includes spectrum proceeds from other auctions as well. This language was also part of the House Bipartisan Commerce Committee Discussion Draft that was circulated last year. It is our understanding that commercial carriers and industry experts provided the estimate on the amount of money the incentive auctions will raise. Public safety is not in a position to agree or disagree with the projections. We believe that as Congress and the administration work together to clear additional spectrum, there is sufficient spectrum to auction in order to pay for the build out and maintenance of the public safety broadband

network while allocating the D Block to public safety. Furthermore, a recent study by the Phoenix Center clearly establishes that the allocation of D Block to public safety will realize greater deficit reduction and $3.4 billion more in value than its commercial auction.

Question 2. There is a lot of uncertainty about how much spectrum would be voluntarily given up for auction—do we have assurances that we can actually reach this figure?

Answer. We agree there is a lot of uncertainty, but again there are also a lot of other spectrum bands that can be repurposed for commercial services. We understand that in order to free up additional spectrum, Congress must start somewhere, and the FCC and the Obama Administration join with Chairman Rockefeller and others to include incentive based auctions as part of that equation. When Congress passed legislation that established the hard date for the DTV transition, there was no certainty that the auction would raise the $12 billion that was required by law, however, the auction raised nearly $20 billion, $8 billion more than estimated. And that was without the D Block, which was originally calculated within the $12 billion estimate. Therefore, it is not unreasonable to believe that the current projections will meet or even exceed current estimations as projected in the President's plan.

Question 3. Conversely, I have concerns about how we would pay for a public safety network under the FCC's plan. The estimate is that we can raise $3 billion by auctioning off the D Block. I realize that this would be a different type of auction than what was attempted a few years ago but, given that that effort failed, how we know we're going to get $3 billion?

Answer. The President's budget plan provides an offset of $3.2 billion for reallocating the D Block to public safety and moving it away from a commercial auction. We believe that is more than what any auction would receive, particularly if potential bidders were restricted from participating and/or even limited public safety requirements/provisions were included in the auction rules. A good analysis of the questions related to D Block auction vs. allocation are provided in the new paper by the Phoenix Center (*http://www.phoenix-center.org/PolicyBulletin/PCPB26Final.pdf*). The Phoenix Center report makes it clear that the cost of not allocating D Block to public safety, and then having public safety have to build out two separate infrastructures in two different spectrum bands for their current and future broadband needs would well exceed any revenue derived from a potential commercial auction of D Block now.

Question 4. If we donate more spectrum to public safety agencies, can you give me any assurance that interoperability between different jurisdictions would work? And that you would have economies of scale to get good technology at a good cost?

Answer. Yes, public safety is united on ensuring that the network is interoperable and provides seamless roaming across the country to first responders. While the number of public safety users on the network might be around 2 million, the number of devices and other users will exceed all predictions, which will exponentially increase the need for spectrum resources. Device-to-device communications will eventually outpace the actual number of users on the network. In addition, adoption of LTE technologies by the U.S. and global public safety communities will create a market demand that lowers cost of equipment, networks and applications by creating greater market demand, competition and innovation. Indeed, the U.S. public safety community adopted LTE as its standard for public safety broadband in order to leverage commercial technology and build out, to ride the commercial market, and create efficiencies, drive down costs and spur competition and innovation within the marketplace.

Question 5. If the spectrum is auctioned off, the non-profitable public safety partnership of this deal could slip as commercial demand grows. How do we ensure that private entities will ensure that the needs of public safety are met?

Answer. If the spectrum is auctioned, public safety will not be able to rely on commercial systems for mission-critical services. To ensure private entities meet the needs of public safety, Congress and the FCC will need to place considerable requirements (as they did for the last auction) on commercial providers to ensure systems are reliable, redundant, secure, and provide a higher level of priority access, specifically ruthless preemption, to public safety at times of emergency. Commercial carriers will need to give up control of their networks to public safety during emergencies. These conditions would make it impossible for commercial carriers to create a profitable business model to bid for the spectrum and provide mission-critical services to public safety. They have told us as much.

Question 6. There is a lot of discussion about upfront costs of maintaining a public safety network but not a lot about ongoing operating costs. How much is this going to cost in 10 years? Or in 20 years? How will that be paid for?

Answer. FCC's National Broadband Plan states that the build-out of a 10-MHz broadband network will cost approximately $6 to $10 billion over the next 5 years. The cost of building a 20-MHz network is practically the same, if not less, as there are some efficiencies that would be gained in building out 20 MHz versus 10 MHz. The difference is who will pay for it. The FCC's plan requires the Federal Government to pay for the build-out. However, if public safety were able to leverage the excess network capacity, utilize existing public safety infrastructure when building out the network, and secure partnerships with other public and private industry partners, the actual cost to local, state, tribal and Federal Governments would be less.

A combination of leasing excess capacity, prioritized Federal grant programs and revenue from other auctioned spectrum would help build and sustain the nationwide interoperable public safety broadband network, while creating a budget neutral funding model.

There are a number of funding models to support the build-out of the network. While no single solution will pay for the entire network, a flexible program will make it possible to offset many of the costs associated with its construction. Some of the funding mechanisms include:

1. Excess network capacity not utilized by public safety can be leased out to commercial providers or other users on a secondary basis. This will ensure efficient use of the spectrum, while still giving local public safety agencies control over who is able to use the spectrum and when they are able to use it. The lease revenue of the network would offset a portion of the build-out and maintenance of the network.

2. Proceeds from other spectrum auctions are proposed to finance the establishment of a grant program that will fund the build-out and maintenance of the network.

3. Current Homeland Security, Justice, Transportation and other Federal grants could be authorized and prioritized by Congress to assist state and local governments in building a broadband network.

4. Universal Service Funds (USF) can also be prioritized to help local and state government deploy broadband networks in underserved and unserved areas.

5. A nominal monthly fee can be imposed on consumers of commercial broadband services to aid local and state governments in building the network.

6. Public safety agencies can partner with private industry such as utilities to share the cost of building the network.

7. Funding will also come from state and local public safety operational expenses.

If the D Block spectrum is auctioned, then the cost of building out the 10-MHz of public safety broadband network will need to rely solely on Federal grant dollars. Given that scenario, public safety will not be able to leverage the excess capacity of the network in order to create flexible partnership and funding programs.

The long-term strategy and vision is for public safety to migrate to converged IP systems that are capable of mission-critical voice, as well as data and video. Therefore, the long-term costs of maintaining traditional Land Mobile Radio networks, as well as future public safety broadband networks, will evolve into converged mission-critical voice capable broadband networks. The only unanswered question is not if, but when? The interim cost is the real challenge.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. OLYMPIA J. SNOWE TO CHIEF AL H. GILLESPIE

Question 1. Beginning with the Radio Act of 1927 and continuing with the Communications Act of 1934, the Federal Government began defining the public airwaves, or radio spectrum, as a resource that must be used in the public interest and, more specifically, "for the purpose of the national defense" and "for the purpose of promoting safety of life and property through the use of wire and radio communication." Since 1927, local, county, state and regional public safety organizations across the nation have built, maintained and updated their individual communications facilities. To meet those communications needs, it is my understanding that public safety entities utilize approximately 100 Megahertz of spectrum—including 24 megahertz of public safety spectrum in the 700 MHz band for both broadband and narrowband services. Can you elaborate on the existing spectrum utilized by public safety such as what frequency bands are used, how much spectrum in each band is used, and what communications services are supported in those bands?

Answer. Today, more than ever, our nation's public safety agencies must have the tools they need to perform their critical tasks. Appropriate radio spectrum is at or near the top of the list of those essential tools. The lack of sufficient radio spectrum for public safety has several significant consequences including channel congestion, overloading of systems, and lack of capacity. The lack of spectrum during incidents.

Current allocation of public safety spectrum is compartmentalized across various spectrum bands.

Public Safety Narrowband Land Mobile Radio (LMR) Spectrum

29–50 MHz

The spectrum is non-contiguous and it is interleaved with other uses. Total spectrum allocation in the block is 7.2 MHz.

Frequencies	Amount of Spectrum (MHz)
30.98–31.98	1
33.02–33.98	0.96
35.02, 35.64, 35.68	0.06
37.02–37.42	0.4
37.90–37.98	0.08
39.02–39.98	0.96
42.02–42.94	0.92
43.64, 43.68	0.04
44.62–46.58	1.96
47.02–47.66	0.64
Total	7.2

150–174 MHz

The spectrum allocation is non-contiguous and it is interleaved with other uses. Total spectrum allocation in the block is 3.8 MHz.

Frequencies	Amount of Spectrum (MHz)
150.7750–150.8050	0.03
150.9950–151.4975	0.5025
152.0075	0.02
153.7400–154.47875	0.73875
154.6500–156.2400	1.59
157.45	0.02
158.7225–159.4725	0.75
163.25	0.01125
166.25	0.01125
170.15	0.01125
170.425	0.006
170.475	0.006
170.575	0.006
171.425	0.006
171.475	0.006
171.575	0.006
172.225	0.006
172.275	0.006
172.375	0.006
173.075	0.006
173.20375	0.006
173.21	0.006
173.2375	0.006
173.2625	0.006
173.2875	0.006
173.3125	0.006
173.3375	0.006
173.3625	0.006
173.39	0.006
173.39625	0.006
Total	3.805

450–470 MHz

The spectrum allocation is non-contiguous and it is interleaved with other uses. Total spectrum allocation is 3.7 MHz.

Frequencies	Amount of Spectrum (MHz)
453.0125–453.99375	0.98125
458.0125–458.99375	0.98125
460.0125–460.64375	0.63125
465.0125–460.64375	0.63125

Frequencies	Amount of Spectrum (MHz)
462.9375–463.19375	0.25625
467.9375–463.19375	0.25625
Total	3.7375

470–512 MHz

The spectrum allocation is made up of 6 MHz contiguous and is interleaved with other uses. Total spectrum allocation varies by geographic area from 6 MHz to 18 MHz.

16 MHz Spectrum Block	Number of Licenses Issued	Major Metro Areas
470 to 476	1,133 public safety licenses	Boston, Chicago, Miami, Los Angeles, New York City, Cleveland, Pittsburgh
476 to 482	376 public safety licenses	Chicago, Detroit, New York City, Cleveland
482 to 488	1,133 public safety licenses	San Francisco, Los Angeles, Detroit, Boston, Dallas/Fort Worth, New York City
488 to 494	140 public safety licenses	San Francisco, Houston, Washington, D.C.
494 to 500	41 public safety licenses	Washington, D.C., Pittsburgh
500 to 506	278 public safety licenses	Philadelphia, Southern NJ, Northeastern NJ, Nassau County, NY
506 to 512	171 public safety licenses	Los Angeles, Philadelphia, Southern NJ

768–775/798–805

The spectrum allocation is contiguous. Total spectrum allocation is 14 MHz.

806–809/851–854 MHz

The spectrum allocation is contiguous. Total spectrum allocation is 6 MHz.

809–815/854–860 MHz

The spectrum allocation is non-contiguous and it is interleaved with other uses. The total spectrum allocation is 3.5 MHz.

Wide Area Broadband

763–768/793–798

The spectrum allocation is contiguous. Total spectrum allocation is 10 MHz.

Hot Spot and Microwave Broadband

4940–4990 GHz

The spectrum allocation is contiguous. Total spectrum allocation is 50 MHz.

Question 2. Progress has clearly been made in the assignment of or availability of spectrum for public safety addressed directly to the issue of interoperability. However, within each spectrum there are a multitude of issues that affect licensing, coverage, operability, and interoperability. What services, if any, will migrate to the new wireless broadband network? How many first responders in the field are expected to be supported by this wireless broadband network?

Answer. The initial services that will migrate to broadband networks are data and video. Eventually, when voice over LTE equipment is available, which can provide the same level of mission-critical voice services as existing LMR systems, then we expect public safety systems to begin migrating their LMR systems to the wireless broadband network. The goal will be to support every first responder and those who provide support and logistical services to first responders.

The number of first responder users might be over two million, the number of equipment that might access the network could easily be over ten million. Industry experts believe that device-to-device or machine-to-machine equipment and applications will quickly outpace the actual number of users on the network. This is especially true when you consider monitoring services and situational awareness applications.

Question 3. If there are radio-based services that will migrate to the wireless broadband network or aren't required anymore due to the new enhanced services that will be possible on the wireless broadband network would public safety work with the Commission to develop a transition plan to relinquish underutilized spectrum over a certain period of time?

Answer. Yes, if the migration of LMR systems to broadband networks would increase efficiency, improve interoperability and reduce cost for the agencies. Agencies that migrate their systems to broadband networks should release their licenses in the lower bands as currently required of the existing RPC process.

Question 4. The FCC estimates expenses for its plan of constructing a public safety network through partnerships with commercial providers and infrastructure will total approximately $6.3 billion over 10 years. Adding in operating expenses would bring the approximate total to $12–16 billion over 10 years. The FCC also estimated that constructing a stand-alone public safety network would require approximately $16 billion over 10 years and that adding in operating expenses would bring the total to approximately $34.4 billion over 10 years. A Verizon study for the Southern Governors Association back in 2007, suggested that a network would cost $61 billion over 10 years for both construction and maintenance.

If the D Block were directly allocated to public safety, would public safety look to build its own network, utilize existing commercial infrastructure, or a hybrid of both? Would it be one nationwide network or a compilation of regional/state networks, or virtual networks over existing carriers' networks?

Answer. Public safety strongly believes that it needs to work together with multiple public and private partners to build the nationwide broadband network. We will utilize existing public safety, commercial, and private infrastructure to build out the network. Commercial carriers will play a big role in helping to build out the nationwide network, and they will be critical partners to public safety.

This will reduce cost and create efficiencies. The nationwide network architecture will allow local, regional and statewide systems to be built to a national standard that ensures nationwide roaming and interoperability.

Question 5. Who would maintain the network—would it be centralized, regional, or state operated? How would new users be authenticated and granted access to use the network? Also, how many additional personnel would be needed to maintain it on a day-to-day basis?

Answer. Like any other network, there will be multiple levels for network maintenance. This function could vary from a localized (single tower maintenance) to a regional core that is maintained by a commercial or industry partner.

At this time, we do not have information on the number of personnel that would be needed to maintain the network, but we are confident that building out and maintaining such a network will create thousands of new and sustainable high paying professional jobs.

Question 6. When will there be a greater and more detailed discussion on planning and governance issues related to the broadband wireless network? Are these issues critical to addressing interoperability as well as overall design of the network and subsequent costs?

Answer. Yes, this discussion is underway within the Administration and within public safety. The current governance will most likely need to change, however, the change should not undo the great work that has already been done by public safety.

Question 7. The 9/11 Commission report found that "the inability to communicate was a critical element" at each of the "crash sites, where multiple agencies and multiple jurisdictions responded." Even with the lack of interoperability clearly highlighted, efforts to improve this significant problem have fallen short and at best have only been incremental.

To remedy this problem, the FCC established the Emergency Response Interoperability Center (ERIC) to ensure that the applications, devices, and networks that public safety groups utilize all work together, so that first responders nationwide can communicate with one another seamlessly. ERIC is supposed to hold its first meeting very soon.

The National Broadband Plan noted that past efforts to create a public safety narrowband interoperable voice network have failed and that many public safety radio systems lack basic interoperability. It also found most jurisdictions that have improved their systems still only have an "intermediate" level of interoperability at best—not the advanced level of interoperability that is required for truly seamless communications in the event of a major emergency. Should those with industry expertise in designing and building nationwide networks have a greater voice in the development of interoperable systems?

Answer. We strongly rely on industry experts to inform us on how to build out the nationwide network; however, we must ensure that the network is designed and built to meet the needs of first responders and public safety. In other words, while we will strive to ensure industry experts have a greater voice in the development of the interoperable systems, we must recognize that the voice of public safety users must be primary.

Question 8. Wouldn't we more properly address this if public safety outlined the operational requirements and services that needed to be provided by the network and then private sector experts develop the standards and network design to meet those needs?

Answer. That is what we tried to do with the Project 25 standards, but after 25 years, we are still struggling to develop standards and network design to meet public safety needs. That is why public safety endorsed LTE standards, and now we are working with the Public Safety Communications Research program (PSCR), to ensure public safety requirements are considered in the IEEE standards setting process.

Question 9. Last year, the FCC granted more than 20 waivers to public safety entities to begin building out wireless broadband networks using the existing 10 megahertz of spectrum that is already assigned to public safety in the 700 MHz band.

Public safety officials have noted that these waiver build-outs will provide data important in the deployment of the proposed national network. A New York public safety official was quoted as saying "We have always made the argument that granting these waivers will further the ability to understand what it is that we want to build and how we want to build it." How can public safety say it definitely needs the additional 10 megahertz of spectrum from the D Block if these waivers are being used for determining what to build and how to build it?

Answer. It is public safety's industry partners that are saying we definitely need an additional 10 MHz of spectrum. These industry partners are the ones that are building out the systems for the waiver entities, and they are the ones that are determining that 10 MHz systems built today will not meet the future needs of public safety.

Question 10. The FCC and others have suggested giving public safety the option to use 700 MHz narrowband spectrum for broadband in order to provide additional broadband capacity. Is this feasible? If not, why?

Answer. No. FCC's recent NOI clearly shows that network flexibility is not going to be possible because of the potential interference it will cause to existing narrowband systems and future broadband systems. Industry experts have refuted this notion and have provided a clear argument as to why this will not work.

Question 11. It is my understanding that there are several federal departments and agencies involved with public safety communications—including the FCC, Department of Commerce, Department of Homeland Security, and the Department of Justice. I am concerned there isn't one agency responsible and that with all the agencies involved it presents challenges to making progress and proper planning.

In addition to this bureaucracy, I am concerned about the funding challenges that have existed and will likely continue to exist with public safety interoperability. It is my understanding that more than $7 billion of taxpayer money has been spent over the past 7 years in Federal grants without proper planning and coordination. And as a result, only incremental improvements have been made—many experts state it may be several more years before it is completely resolved. This includes the Public Safety Interoperability Communications (PSIC) grant program and about $4.3 billion DHS has spent to improve interoperability.

My concern is that we are hastily providing resources to public safety without proper planning to ensure those assets, whether it is funding or spectrum, are properly utilized. What can we do differently this time to ensure we achieve the goals necessary for public safety to sufficiently respond and communicate in emergencies and ultimately protect our Nation's citizens but upholding our fiscal responsibilities to taxpayers to ensure their hard-earned money is used wisely and responsibly?

Answer. More and better planning and learning lessons from prior failures.

Public safety shares these concerns and we would like to work with you to find the solution to that will provide proper oversight and accountability to ensure efficiency and maximum utilization of all the resources.

Question 12. If the D Block were directly allocated to public safety then it would utilize 34 MHz of spectrum as its primary spectrum for both narrowband and broadband communications. While this wouldn't necessarily present a problem in the event of a natural disaster, there is concern about possible over reliance on this band during a disaster or terrorist attack.

If public safety principally relies on a relatively narrow range of spectrum then a coordinated attack could disrupt, or worse cripple, public safety communications through the use of high-power wireless jammers. For example, a recent University of Pennsylvania report highlighted the susceptibility of the P25 System to active

traffic analysis and selective jamming attacks.[1] Is this a serious concern that needs to be addressed? Wouldn't the public safety network be more resilient by utilizing the existing 700 MHz assignment with existing public safety spectrum in 400 MHz, 800 MHz, and 4.9 GHz by using technologies such as dynamic spectrum access, cognitive radio, and spectrum aggregation? As well as just greater interoperability with commercial systems, which operate in various bands?

Answer. Jamming, regardless of what spectrum band public safety operates on, is a serious concern. However, a jammer can be used to cripple networks on multiple bands and brute force jamming does not distinguish between public safety spectrum and commercial spectrum. If a jammer is being used to block a public safety network, then most likely it will also cripple a commercial network, as well. In order to utilize multiple spectrum bands, in any given area, you will need to build out a network on all the spectrum bands, which will increase the cost of the network astronomically. It is not economically feasible or efficient utilization of spectrum resources to build a 700 MHz, 400 MHz, 800 MHz, and 4.9 GHz network.

Question 13. What impact would greater interoperability with commercial systems across the entire 700 MHz band have on the costs and time to market of providing mobile broadband capabilities and end users devices for first responders?

Answer. Commercial services providers can answer this question better than public safety, but it is our understanding the technology is currently not available. We are very interested in having the ability to roam across the entire 700 MHz band and would like to see this technology come to fruition as soon as possible.

Question 14. In your testimony you stress that the wireless broadband network must be mission critical at the outset. You also state, in the beginning, the system will only be able to handle data and video, and that mission critical voice is years away—some have even indicated that it is decades away.

This is somewhat confusing because innovation and technological advancement in wireless and broadband are measured in months. Also, the Long-Term-Evolution standard includes "voice over LTE" capabilities, which will promote scale, reduce complexity, and implement roaming—all issues critical to public safety. Also, Verizon Wireless announced that it had successfully made the world's first voice over LTE call over its commercial network yesterday morning. So there is rapid advancement in this space. How did you come to this assessment that mission critical voice is "years away?" How soon would you prefer to have mission critical voice supported by the LTE-based broadband wireless network?

Answer. Our preference is to have a mission-critical voice system supported by the LTE broadband network today; however, it is not there yet. The technology must be proven, reliable and available to public safety at a reasonable cost. It is our understanding that the IEEE standards process has not even begun considering such standards, and if and when they are ready to do so, it could take years to finalize the mission critical voice standard. The technology also needs to allow for peer to peer and one to many communications without the need to go through the network (*e.g.,* the talk around or simplex mode).

We are encouraged that the administration budget provides considerable funding for research and development (R&D) for LTE mission critical voice equipment. We hope this will considerably shorten the length of time it will take to have the mission-critical voice system on the LTE network.

Question 15. You also mention that it has to be affordable. Are the current narrowband land mobile radios affordable? If not—why not?

Answer. No, current LMR systems are expensive, but there is no alternative. There are a number of reasons why LMR systems cost as much as they do. First and foremost, the radios need to be reliable and sturdy. They need to be able to work under extreme conditions, and they need to be durable enough to operate after being severely damaged. Second, most radios operate only one band. This makes LMR systems unique to each agency and jurisdiction and limits competitions and variety. Third, many LMR systems are proprietary. In order to operate a radio on the network, you have to buy the radio from the network manufacturer. This limits completion and interoperability. Fourth, the public safety market is a specialty market. Only very few other public or private entities have the same needs as those of public safety. This limits the number of companies that are willing to invest in developing products that will meet public safety's needs.

Question 16. Wouldn't the long-term operation of two separate networks—one for voice and one for data—be more expensive than operating one converged network that carries voice, video, and data and also compound interoperability issues due to

[1] Sandy Clark and others, *Security Weaknesses in the APCO Project 25 Two-Way Radio System,* CIS Technical Report MS–CIS–10–34, University of Pennsylvania, November 18, 2010.

the required interconnectivity necessary between narrowband and broadband systems?

Answer. Yes, absolutely, and that is why we do not intend to operate two separate systems unless there is no other choice. Having a single system that does everything you need at a lower cost is preferable and desirable. However, until we have a system that can do that, we need to operate two systems on a parallel track. When public safety is ready to switch tracks, we will.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. CLAIRE MCCASKILL TO JOSEPH L. HANNA

Question 1. The Wireless Initiative that the President has put forward is a plan that is worth strong consideration. As I stated in a forum that I held in Missouri last year with the FCC Chairman, it is paramount that rural and unserved areas have access to broadband.

The President has stated that his plan would reduce the deficit by $9.6 billion and that about $28 billion would be raised through incentive auctions. However, I want to get a better handle on these calculations. How are we determining that $28 billion would be raised?

Answer. Not being an expert in the auction arena, I have no personal knowledge as to the amount of funds that may result from a potential auction. The professional literature and information discussed in public forums indicates that spectrum is indeed a premium commodity and commercial carriers are willing to pay considerable sums for spectrum. The last round of auctions certainly paved the way for future auctions to generate considerable amounts of funds for the Treasury. Dependent on the conditions, or lack thereof, on the D Block specifically, valuations are hard to predict. As all spectrum in the 700 MHz band is considered beachfront property, an unencumbered D Block will bring a premium price. Based on information in the trade press, AT&T is currently negotiating with Qualcomm to acquire an unpaired 6 MHz block of spectrum in the 700 MHz band for a reported $2 billion.

When looking at a projected $28 billion auction proceed, however, one must also consider that the bulk of proposed spectrum to be auctioned would come from an incentive-based broadcast pool. Based on the theory behind incentive auctions, a considerable portion of the proceeds of the auction would be returned to the carriers (thus "incentive"). Additionally, funds from the auction would also be required to relocate broadcasters who elected to not auction their spectrum in the same band to provide for a clear band. Thus $28 billion does not equal $28 billion to the U.S. Treasury.

Question 2. There is a lot of uncertainty about how much spectrum would be voluntarily given up for auction. Do we have assurances that we can actually reach this figure?

Answer. I have no expertise regarding the probability of the amount of spectrum that might be put up for auction.

Question 3. I have concerns about how we would pay for a public safety network under the FCC's plan. The estimate is that we can raise $3 billion by auctioning off the D Block. I realize that this would be a different type of auction than what was attempted a few years ago but, given that that effort failed, how we know we're going to get $3 billion?

Answer. The amount of funds that would result from the D Block will clearly be insufficient to pay for the proposed public safety broadband network. It is my understanding that the funding from for this network would come from the large auction pool. The larger question is whether the Congress is willing and able to forego the funds that have already been scored by the Congress for the D Block. If the D Block is not auctioned, that will require the expenditure of future auctions to make up for this loss.

Question 4. If we donate more spectrum to public safety agencies, can you give me any assurance that interoperability between different jurisdictions would work? And that you would have economies of scale to get good technology at a good cost?

Answer. Public safety interoperability can indeed be assured if there is a governance and implementation model that is defined at the outset. Unfortunately, no such structure has yet been defined. There is currently (as of this past week) some disagreement within public safety writ large regarding the governance and nature of the proposed public safety broadband network. One element is currently calling for a single national network design, with another faction suggesting that failure to provide local control over networks will be unacceptable. If a public safety network is built with a nationwide plan that covers urban and rural areas equally and

provides for a common, centralized governance structure, interoperability can indeed be achieved, just as is done in the commercial world.

Regarding economies of scale, a dedicated public network operating solely within the current public safety broadband block and the D Block (thus, Band Class 14) will significantly restrict any realistic notion of economies of scale. At final buildout, the proposed public safety network will cover and estimated 2.5–3 million users. According to today's press reports, APPLE sold an estimated 5 million IPad2 devices in one week. Samsung reported selling 60 million units of a single device this past year. Not only will public safety be plagued with low volume, but specifications for ruggedized devices will compound design issues. Without access to commercial bands, public safety will be guaranteed low volume, high cost devices.

Question 5. If the spectrum is auctioned off, the non-profitable public safety partnership of this deal could slip as commercial demand grows. How do we ensure that private entities will ensure that the needs of public safety are met?

Answer. If the D Block remains in the auction pool as required by current law, the FCC clearly has the ability to mandate conditions or restrictions on that spectrum. Thus, a winner of the D Block could be mandated to provide public safety with access to the band on a priority basis. Less clear, although desirable from my perspective, is whether the Commission has the authority ex post facto to require similar access in carriers in the 700 MHz band who have already acquired spectrum in previous auctions.

Question 6. There is a lot of discussion about up-front costs of maintaining a public safety network but not a lot about ongoing operating costs. How much is this going to cost in 10 years? Or in 20 years? How will that be paid for?

Answer. The rule of thumb across most wireless networks runs approximately 10 percent of the cost to build a system. Most of the bills introduced in both the House and Senate appear to propose a maintenance fund that would cover some of these costs, but I would suggest that public safety should be prepared to cover these costs on an ongoing basis. Currently, a substantial number of public safety entities either build non-interoperable broadband systems or, more commonly, pay for commercial services through major carriers. I happen to subscribe to a school of thought that state and local entities have a responsibility to pay for a portion of their services, as they do today. Given the magnitude of the initial build out costs for a national broadband network, however, exclusive use of local and state funds will not provide for the initial deployment of a national infrastructure.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. OLYMPIA J. SNOWE TO JOSEPH L. HANNA

Question 1. Beginning with the Radio Act of 1927 and continuing with the Communications Act of 1934, the Federal Government began defining the public airwaves, or radio spectrum, as a resource that must be used in the public interest and, more specifically, "for the purpose of the national defense" and "for the purpose of promoting safety of life and property through the use of wire and radio communication." Since 1927, local, county, state and regional public safety organizations across the nation have built, maintained and updated their individual communications facilities. To meet those communications needs, it is my understanding that public safety entities utilize approximately 100 Megahertz of spectrum—including 24 megahertz of public safety spectrum in the 700 MHz band for both broadband and narrowband services.

Can you elaborate on the existing spectrum utilized by public safety such as what frequency bands are used, how much spectrum in each band is used, and what communications services are supported in those bands?

Answer. Public safety is currently allocated 97 MHz of spectrum. This spectrum is spread throughout the VHF (both low band and high band), UHF, 700 MHz, 800 MHz, and 4.9 GHz bands. Much of the spectrum in the VHF and UHF bands are shared with other non-public safety radio services. To date, the overwhelming use of public safety spectrum has been limited to narrowband voice communications, with limited narrowband data services utilized by some public safety entities. As a result of waivers issued this past year by the FCC, 20 jurisdictions have been given approval to implement early deployments of broadband operations in the 700 MHz band. Due to the nature of the spectrum, public safety uses of the 4.9 GHz band have generally been limited to short range broadband operations.

Question 2. What services, if any, will migrate to the new wireless broadband network? How many first responders in the field are expected to be supported by this wireless broadband network?

Answer. Few existing services used by public safety will migrate from existing bands to the public safety broadband platform in the 700 MHz band in the foreseeable future. An extensive array of high speed applications that have been outlined in numerous documents, including, but not limited to, document transfer, video, telemetry, and sensors, are not currently available on the narrowband frequencies currently licensed to public safety and will thus find a home in the broadband network. While broadband spectrum in the 4.9 GHz is allocated to public safety, this spectrum is limited to short range applications and is not suited to large area mobile applications.

Mission critical voice communications may, at some point in the future, migrate to the broadband network. At this time, however, public safety has not yet addressed the requirements for mission critical voice communications over broadband. Once public safety completes such a set of requirements, these requirements will have to be standardized in the worldwide 3GPP standards process, manufacturers will have to ramp up for these standards, and user equipment will have to be designed around these standards. While mission critical voice capabilities appear promising, several mission critical capabilities, including peer-to-peer (*i.e.,* calls that can be made from one device to another off network) create challenges in an architecture designed for network-based communications. Additional issues related to local command and control within dispatch centers will create challenges for the widespread use of mission critical voice over broadband services.

A number of jurisdictions have deployed proprietary mobile broadband networks on a jurisdiction-by-jurisdiction basis. The fragmented and proprietary nature of these deployments do not allow for interoperability outside the jurisdiction. Jurisdictions who have deployed these systems have done so at considerable costs, but out of necessity due to the lack of a nationwide public safety network.

According to most studies, first responders, if defined as police, fire, and emergency medical personnel, can load a national network with 2.5–3 million users. The number of devices may ultimately exceed that number, as sensors and fixed equipment could add to that total. That said, it will take a number of years before a nationwide network will be completed, with a resulting level of system loading considerably lower than the 2.5–3 million users in the early years of deployment. Additionally, the low number of potential users (low in comparison to the several hundred million commercial customers served by commercial carriers), will significantly impact the number of devices made available to the public safety community in the early years of the network.

Question 3. If there are radio-based services that will migrate to the wireless broadband network or aren't required anymore due to the new enhanced services that will be possible on the wireless broadband network, would public safety work with the Commission to develop a transition plan to relinquish underutilized spectrum over a certain period of time?

Answer. While several legislative proposals currently being considered in both the House and Senate have proposed spectrum give backs once a national broadband network is deployed in the 700 MHz band, I would argue that such give backs come with substantial drawbacks. First, the spectrum used for narrowband voice operations in the 150 MHz and 400–512MHz are generally scattered and interleaved with other radio services, including, but not limited to, amateur radio services and the business, industrial and transportation categories. Clearing of only the public safety channels will not provide any clear blocks of spectrum suitable for future auctions.

Additionally, all current public safety users operating in spectrum below 512 MHz have either completed or are in the process of narrow banding their land mobile radio systems to comply with a FCC mandate for narrow band operations by January 1, 2013. Hundreds of millions of dollars, all funded by the licensees, have been, or are being, spent to meet this mandate. Any forced migration from these narrow banded systems will substantially impact the return on investment for this migration.

More significantly, lower frequency bands in the 150 and 400–512 MHz have excellent propagation characteristics for suburban and rural areas, as well as excellent in building penetration in urban environments. As noted above, almost all users of these frequency pools have either just completed, or are in the process, of spending hundreds of millions of dollars to meet an FCC mandate to narrowband these frequencies. Additionally, the cost to replace these systems with 700 or 800 MHz channels will be many times higher than the spectrum currently in use, as 700 and 800 MHz systems require far more radio sites than required for lower-band systems. Rural users (*e.g.,* Western Texas, Arizona, North Dakota, Nevada and most of the western United States) would face massive costs to replace existing lower band systems with 700–800 MHz systems. No such transition from lower band systems to

700–800 MHz systems could be contemplated without massive expenditures in the billions of dollars range coming from the Federal Government, thus offsetting any potential future auction proceeds from reclaimed spectrum.

If relinquishing spectrum in the lower bands is the price for reallocation of the D Block to public safety, it is my strong opinion that this cost is both harmful to the vast majority of public safety entities, is a poor return on investment, and sacrifices the financial investments and best-use of spectrum for far too many public safety entities. During a recent meeting (February 28–March 1, 2011) of the National Public Safety Telecommunications Council, its Governing Board passed a resolution citing its opposition to the giveback of spectrum below 512 MHz in recognition of the adverse impact on public safety and other users in the band.

Question 4. The FCC estimates expenses for its plan of constructing a public safety network through partnerships with commercial providers and infrastructure will total approximately $6.3 billion over 10 years. Adding in operating expenses would bring the approximate total to $12–16 billion over 10 years. The FCC also estimated that constructing a stand-alone public safety network would require approximately $16 billion over 10 years and that adding in operating expenses would bring the total to approximately $34.4 billion over 10 years. A Verizon study for the Southern Governors Association back in 2007, suggested that a network would cost $61 billion over 10 years for both construction and maintenance. If the D Block were directly allocated to public safety, would public safety look to build its own network, utilize existing commercial infrastructure, or a hybrid of both? Would it be one nationwide network or a compilation of regional/state networks, or virtual networks over existing carriers' networks?

Answer. While many within public safety have advocated a network controlled and operated by public safety, I will argue that broadband networks should be build and operated by companies or commercial operators who do this on a daily basis. In the current public safety governance structures (Public Safety Spectrum Trust, National Public Safety Telecommunications Council, APCO, etc.), there is no indication of any expertise in the design, operation, or maintenance of highly sophisticated broadband networks. This is not to say that public safety should not have a strong voice in the design of functional requirements, procurement and governance of such a network.

Unfortunately, public safety has a relative poor record in designing, building, or managing large scale telecommunications networks beyond the local level. Project 25, for example, has been in existence for over 20 years, yet still has a significant number of standards yet to be completed. The national record is replete with documentation regarding the lack of interoperability between existing P–25 systems in spite of the billions of dollars that have been spent on these systems to date.

Ten years following FCC requirements for wireless carriers to deliver location and subscriber information to public safety answer points for persons placing 9–1–1 calls, a significant number of SAPS throughout the United States have yet to upgrade their internal systems to accommodate receipt of location/subscriber identification data.

In terms of network design, *i.e.,* a single national network or a network of networks, is currently being debated within the public safety community. During sessions at the International Wireless Conference and Exposition in Las Vegas during the week of March 7–11, 2011, there was considerable dialog that demonstrated that this issue clearly has no definitive agreement within public safety writ large. I would suggest that any hope of delivering true nationwide interoperability, as well as fundamental operability within a substantial part of the United States (particularly in rural areas) will only be accomplished through the deployment of a single nationwide network. As long as local jurisdictions demand control over their portion of a network, the silo mentality that has prevented interoperability in the land mobile radio environment to date will simply be perpetuated.

Last, it is hard to imagine any network design that does not take advantage of the commercial deployments throughout the United States. Technology in place today allows for the co-location of various users, either through site sharing or virtual division of common equipment. Failure to follow this path guarantees poor use of valuable Federal funds.

Question 5. Who would maintain the network—would it be centralized, regional, or state operated? How would new users be authenticated and granted access to use the network? Also, how many additional personnel would be needed to maintain it on a day-to-day basis?

Answer. Until such time as a governance model can be defined and made operational, this question will remain challenging. To date, the National Public Safety Telecommunications Council has advocated a centralized model of governance. With-

out a strong, centralized model, I would argue, as noted above, that the fundamental issues of interoperability, maintenance, refresh, and other essential requirements of a true, nationwide effort, will be made considerably more difficult.

There should be no mistake that additional personnel will be required to administer, operate, and manage a national broadband network. The underlying question is whether public safety is best equipped to perform administration, operation, maintenance of this network, or whether this task is best left to experienced network operators (existing or new), with public safety's role better focused on the policies related to the use of this network.

Question 6. When will there be a greater and more detailed discussion on planning and governance issues related to the broadband wireless network? Are these issues critical to addressing interoperability as well as overall design of the network and subsequent costs?

Answer. Following the Senate Commerce hearing on this topic on February 16, 2011, the topic of governance has become a central topic of conversation. It is somewhat regretful that a number of public safety leaders still argue that legislation providing spectrum reallocation and funding should precede the final determination of a governance structure. Sadly, however, there is no consensus within public safety, nor has there been any articulated plan for this ultimate governance structure, nor has there been any definitive document regarding the plans for the design, deployment, management, operation, or maintenance of the ultimate network. Again, without a governance plan in place prior to passage of legislation, we guarantee unwarranted and unnecessary delays in the implementation of a network for the Nation's first responders.

One need look no farther than the San Francisco Bay Area to confirm this argument. A consortium within the San Francisco Bay area was granted a waiver for early deployment of a public safety broadband network in the 700 MHz broadband allocation. Additionally, TOP funds were granted for this construction. Due to internal issues within this regional effort, however, considerable questions have been raised regarding governance, authority, purchasing decisions, etc. Similar regional issues were faced by the National Capitol Region when deploying a trial broadband network several years ago. While both regions are to be commended for their initiative and desire to deploy broadband networks for their first responders, an essential lesson has been presented for the need of a well-defined governance model at the front end, not the back end, of the process.

Question 7. The 9/11 Commission report found that "the inability to communicate was a critical element" at each of the "crash sites, where multiple agencies and multiple jurisdictions responded." Even with the lack of interoperability clearly highlighted, efforts to improve this significant problem have fallen short and at best have only been incremental.

To remedy this problem, the FCC established the Emergency Response Interoperability Center (ERIC) to ensure that the applications, devices, and networks that public safety groups utilize all work together, so that first responders nationwide can communicate with one another seamlessly. ERIC is supposed to hold its first meeting very soon.

The National Broadband Plan noted that past efforts to create a public safety narrowband interoperable voice network have failed and that many public safety radio systems lack basic interoperability. It also found most jurisdictions that have improved their systems still only have an "intermediate" level of interoperability at best—not the advanced level of interoperability that is required for truly seamless communications in the event of a major emergency. Should those with industry expertise in designing and building nationwide networks have a greater voice in the development of interoperable systems?

Answer. Without question, industry expertise should be an integral component in the design and implementation of the proposed network.

Question 8. Wouldn't we more properly address this if public safety outlined the operational requirements and services that needed to be provided by the network and then private sector experts develop the standards and network design to meet those needs?

Answer. Yes.

Question 9. Last year, the FCC granted more than 20 waivers to public safety entities to begin building out wireless broadband networks using the existing 10 megahertz of spectrum that is already assigned to public safety in the 700 MHz band. Public safety officials have noted that these waiver build-outs will provide data important in the deployment of the proposed national network. A New York public safety official was quoted as saying "We have always made the argument that granting these waivers will further the ability to understand what it is that we

want to build and how we want to build it." How can public safety say it definitely needs the additional 10 megahertz of spectrum from the D Block if these waivers are being used for determining what to build and how to build it?

Answer. Unfortunately, there has been no engineering analysis or documentation from the public safety community regarding the amount of spectrum that will be required.

Question 10. The FCC and others have suggested giving public safety the option to use 700 MHz narrowband spectrum for broadband in order to provide additional broadband capacity. Is this feasible? If not, why?

Answer. Per my testimony during the February 16 hearing, I believe that flexible use within the 700 MHz narrowband public safety allocation should include a flexible use capability. While flexible use is not a simple element, it can be accomplished with proper coordination. Without such flexible use, large jurisdictions such as New York City who have made public statements about their lack of intent to deploy any narrowband technologies in the future, we will see extremely valuable spectrum lie fallow for years to come. If the predictions for mission critical voice capabilities are realized, this flexible use of the narrowband channels will provide automatic access to 10 MHz of prime spectrum.

Question 11. It is my understanding that there are several Federal departments and agencies involved with public safety communications—including the FCC, Department of Commerce, Department of Homeland Security, and the Department of Justice. I am concerned there isn't one agency responsible and that with all the agencies involved it presents challenges to making progress and proper planning.

In addition to this bureaucracy, I am concerned about the funding challenges that have existed and will likely continue to exist with public safety interoperability. It is my understanding that more than $7 billion of taxpayer money has been spent over the past 7 years in Federal grants without proper planning and coordination. And as a result, only incremental improvements have been made. Many experts state it may be several more years before it is completely resolved. This includes the Public Safety Interoperability Communications (PSIC) grant program and about $4.3 billion DHS has spent to improve interoperability.

My concern is that we are hastily providing resources to public safety without proper planning to ensure those assets, whether it is funding or spectrum, are properly utilized. What can we do differently this time to ensure we achieve the goals necessary for public safety to sufficiently respond and communicate in emergencies and ultimately protect our Nation's citizens but upholding our fiscal responsibilities to taxpayers to ensure their hard-earned money is used wisely and responsibly?

Answer. This question is well advised. As noted above, there is no doubt that America's first responders require and deserve a world-class broadband network. Without a well defined governance structure and implementation model (nationwide vs. jurisdiction based, public safety vs. commercial operator, etc.), there will be no way to avoid long term delays in implementation.

Of equal concern, there appears to be an emerging tug of war within the Federal Government regarding control of the proposed public safety broadband network. While the FCC has provided initial guidance and leadership through its National Broadband Plan, the Office of the Vice President, Department of Justice, Department of Homeland Security, and the Department of Commerce/NTIA have all emerged with interests in this issue. Each of these entities has a valid interest and contribution to the effort, but the potential for fragmentation and control issues is increasing as time passes.

The key is to balance the development of a firm governance model and implementation plan within a reasonable timeframe.

Question 12. If the D Block were directly allocated to public safety then it would utilize 34 MHz of spectrum as its primary spectrum for both narrowband and broadband communications. While this wouldn't necessarily present a problem in the event of a natural disaster, there is concern about possible over reliance on this band during a disaster or terrorist attack.

If public safety principally relies on a relatively narrow range of spectrum then a coordinated attack could disrupt, or worse cripple, public safety communications through the use of high-power wireless jammers. For example, a recent University of Pennsylvania report highlighted the susceptibility of the P25 System to active traffic analysis and selective jamming attacks.[1]

Is this a serious concern that needs to be addressed? Wouldn't the public safety network be more resilient by utilizing the existing 700 MHz assignment with exist-

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ing public safety spectrum in 400 MHz, 800 MHz, and 4.9 GHz by using technologies such as dynamic spectrum access, cognitive radio, and spectrum aggregation? As well as just greater interoperability with commercial systems, which operate in various bands?

Answer. An underlying principle of the FCC's National Broadband Plan was the ability to provide a diverse path for public safety. As the question notes, systems operating in a single band may well be more prone to failure than through diverse paths. While commercial sites may not always be built to public safety grade standards, there are hundreds of thousands of commercial sites currently in play. In any given catastrophic situation such as Hurricane Katrina, or the more recent events in Japan, diverse infrastructure can only be viewed as an asset.

Question 13. What impact would greater interoperability with commercial systems across the entire 700 MHz band have on the costs and time to market of providing mobile broadband capabilities and end users devices for first responders?

Answer. This question creates a two sided sword for consideration. As noted in my initial testimony on February 16, a network dedicated only to public safety users is faced with the underlying issue of economies of scale, or the lack thereof. With a user base of less than 3 million first responders, handset providers are challenged with providing specialized terminal products at price points realized in the commercial market. According to recent press reports, Apple sold more than 5 million IPad2 devices in less than a week. With no access to other commercial bands, whether the D Block operated by a commercial entity or other spectrum within the 700 MHz band, devices will unquestionably be limited in variety and will come at a premium price.

This point, should, however, be tempered with the fact that making devices that can operate across the entire 700 MHz band will present engineering challenges. It is my understanding that there are no such devices available today. That said, if public safety is unable to build out a network with the speed that commercial operators have been able to demonstrate, failure to have access to commercial systems in the lower portions of the band may well preclude nationwide access to broadband services by first responders.

Question 14. One of the problems that has been raised about auctioning off the D Block spectrum is the uncertainty surrounding public safety preemption and prioritization over commercial rules in a public-private shared broadband network and that the FCC current recommended rules for the D Block do not require cooperation between the public and private sectors. Has this been a major sticking point attributable to the unsuccessful attempt to auction the D Block? How can the FCC resolve this issue properly?

Answer. Without question, the issue of access to, and priority access within, commercial systems has been a sticking point for public safety. Recent technical papers have demonstrated beyond any question that LTE technology allows for shared access and priority access (including the functional equivalent of preemption). The issues of public safety access to commercial systems and priority access within that access is indeed tied to FCC rules, not technical restraints. If the D Block is not allocated to public safety, I would continue to argue, as I did in my original testimony, that, as a minimum, public safety should be guaranteed access on a priority basis within the D Block. In the ideal world, commercial operators in the 700 MHz band would embrace a public service mindset and allow for this same priority access. Based on public statements of several of the Nation's largest carriers, however, this voluntary public service does not appear imminent. To the extent that the FCC's authority would allow for the mandatory access to networks across the 700 MHz band could be permitted, I would argue that this action would be in the public's interest.

Question 15. If the D Block were directly allocated to public safety, what impact would that have on public safety's ability to take advantage of lower handset prices and more feature-rich equipment?

Answer. Per my original testimony on February 16, it is my strong opinion, and one that has not seen a response to the contrary from any manufacturers, is that providing the D Block to public safety will have the unintended (but predictable) consequence of creating an island technology that will result in greatly increased pricing and limited availability of user equipment for first responders. While public safety should never expect to see "feature rich" handsets available at the pricing at levels consumers have become accustomed, devices created for a band class 14-only market will, without question, come at a premium price and in limited variety. This concept alone can substantially negate many of the benefits that were the cornerstone of the concept of a dedicated public safety broadband network. With prices considerably above those realized by commercial consumers, the logical question is

whether we perpetuate a distinction between haves and have-nots within public safety.

Question 16. Could public safety also use other 700 MHz commercial systems on the same basis? Would that provide even greater coverage and redundancy benefits?

Answer. While I believe that commercial systems offer a great deal to public safety, I will continue to argue, as I have for the past 6 years, that public safety requires a core, dedicated infrastructure. Given the loading on commercial systems, it is unlikely that public safety will ever be able to receive guarantees of access, not to mention preemptive priority access, on these commercial systems. I strongly believe that public safety requires and deserves a dedicated core network that can provide the levels of access they need on a daily basis. That said, I equally believe that the FCC's analysis and recommendations within the National Broadband Plan regarding access to commercial networks for overflow situations during major emergencies is the optimum solution when considering the economics of the day and the demands for spectrum throughout other communities.

Question 17. Public safety has built and operated its own communications systems for decades. What is public safety's track record on the implementation of those systems and the technology they use? What are the advantages of having public safety partner with commercial providers in the development of a 700 MHz broadband network?

Answer. As noted above, public safety has done a relatively good job of building and managing voice systems within their own jurisdictions. It is interesting to note, however, that a considerable number of these entities have turned over the maintenance of these systems to commercial providers. That said, the record is equally harsh regarding public safety's inability to realize interoperability beyond the jurisdictional level. Interestingly, however, many of these same entities never blink at using nationwide, shared systems from commercial providers for broadband services. For many years, public safety users have purchased CDPD, 1XRTT, EDDO, EDGE, and HSAA/HSAA+ services from commercial providers. Each of these purchases utilizes the nationwide offerings of commercial carriers. While none of these commercial offerings will provide the quality of service guarantees that public safety needs and requires, the existing model does demonstrate that commercial providers and be valuable partners in the delivery of broadband services.

Question 18. In addition to the direct allocation of the D Block to public safety, the Public Safety Spectrum and Wireless Innovation Act Chairman Rockefeller introduced also provides the FCC with incentive auction authority—allowing existing spectrum licensees to voluntarily relinquish their airwaves in exchange for a portion of the proceeds of the commercial auction of their spectrum—and primarily relies on incentive auction revenue to raise the funds for the construction and maintenance of the public safety broadband network.

In order to raise the necessary funds, there may have to be significant voluntary participation by broadcasters. However, if there is less than expected participation then the network runs the risk of being underfunded.

Is this a valid concern and how should it be addressed? Also, even though this is voluntary for broadcasters, if there were less than expected participation, could there be pressure applied to broadcasters to participate given the reliance on funds from incentive auctions to pay for the public safety network? How might we prevent this from happening?

Answer. As stated in my testimony of February 16, I am not able to speak as an auction expert. From reading extensively on the subject, however, I can offer some thoughts on this question. Clearly, no person or entity has a crystal ball that can make valid predictions about the extent to which broadcasters will participate in the proposed auctions. Nor can anyone make a valid estimate on the value of spectrum that may come up for auction. The more spectrum that might appear available for auction, the less dollars per MHz that will be offered. The less spectrum that might appear, the higher the potential value of that spectrum. Both assumptions, however, may well be tempered by the status of the national economy at the time of the auction.

Equally to be considered with any discussion on auctions is the amount of funds that will ultimately result from said auction. If, for example, an auction were to result in $30 billion of bids, the rules of an incentive auction would require the return of a portion of those funds to the entity offering up the spectrum-no (or low) incentives equals little spectrum being offered. Second, once the incentives were returned to the original licensee, additional funds would then be required nationwide to move incumbent carriers that did not provide spectrum for auction to allow for clear bands of spectrum. Needless to say, this will result in considerable expense. Thus, $30 billion is not equal to $30 billion to the treasury.

Question 19. In your opinion, how long will it take to raise the necessary funds for the construction and maintenance of the public safety network, if the primary funding mechanism were auctions? Might multiple auctions need to take place and how long does it typically take to set up and execute a spectrum auction?

Answer. Again, while I have no expertise in auctions, the record is relatively clear that the path for realization of auction proceeds is longer than it is short. That said, the time to begin meaningful construction for a public safety broadband is now, not years down the road.

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