

RESILIENT COMMUNICATIONS: CURRENT CHALLENGES AND FUTURE ADVANCEMENTS

HEARING BEFORE THE SUBCOMMITTEE ON EMERGENCY PREPAREDNESS, RESPONSE, AND COMMUNICATIONS OF THE COMMITTEE ON HOMELAND SECURITY HOUSE OF REPRESENTATIVES ONE HUNDRED TWELFTH CONGRESS

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CONTENTS

	Page
STATEMENTS	
The Honorable Gus M. Bilirakis, a Representative in Congress From the State of Florida, and Chairman, Subcommittee on Emergency Preparedness, Response, and Communications	1
The Honorable Laura Richardson, a Representative in Congress From the State of California, and Ranking Member, Subcommittee on Emergency Preparedness, Response, and Communications	2
The Honorable Bennie G. Thompson, a Representative in Congress From the State of Mississippi, and Ranking Member, Committee on Homeland Security: Prepared Statement	4
WITNESSES	
PANEL I	
Ms. Roberta “Bobbie” Stempfley, Deputy Assistant Secretary, Office of Cybersecurity and Communications, Department of Homeland Security: Oral Statement	5
Prepared Statement	7
Mr. David S. Turetsky, Chief, Public Safety and Homeland Security Bureau, Federal Communications Commission: Oral Statement	14
Prepared Statement	16
PANEL II	
Mr. Kyle Malady, Senior Vice President, Global Network Engineering and Operations, Verizon: Oral Statement	27
Prepared Statement	28
Mr. Terry Hall, President, APCO International: Oral Statement	33
Prepared Statement	35
Mr. Telford E. “Trey” Forgety, Director of Government Relations, National Emergency Number Association: Oral Statement	36
Prepared Statement	38
Christopher I. McIntosh, Interoperability Coordinator, Office of Veterans Affairs and Homeland Security, Commonwealth of Virginia: Oral Statement	41
Prepared Statement	43
APPENDIX	
Question From Chairman Gus M. Bilirakis for David S. Turetsky	51
Question From Ranking Member Bennie G. Thompson for David S. Turetsky .	51
Question From Chairman Gus M. Bilirakis for Telford E. “Trey” Forgety	52
Question From Chairman Gus M. Bilirakis for Kyle Malady	53

RESILIENT COMMUNICATIONS: CURRENT CHALLENGES AND FUTURE ADVANCEMENTS

Wednesday, September 12, 2012

U.S. HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON EMERGENCY PREPAREDNESS,
RESPONSE, AND COMMUNICATIONS,
COMMITTEE ON HOMELAND SECURITY,
Washington, DC.

The subcommittee met, pursuant to call, at 3:26 p.m., in Room 311, Cannon House Office Building, Hon. Gus M. Bilirakis [Chairman of the subcommittee] presiding.

Present: Representatives Bilirakis, Marino, Turner, Richardson, Clarke, and Hochul.

Mr. BILIRAKIS. Good afternoon. Thank you for your patience.

The Subcommittee on Emergency Preparedness, Response, and Communications will come to an order. The subcommittee is meeting today to receive testimony on efforts to ensure the resiliency of our communication capability.

Now I will give my opening statement.

Yesterday marked the 11th anniversary of the September 11 terrorist attacks. Among the many important recommendations made by the 9/11 Commission was the need for operable and interoperable communications. Much progress has been made in the realm of communications since September 11 and Hurricane Katrina.

Federal, State, and local entities have worked to enhance their communications capabilities. The Office of Emergency Communications has been working with States and localities to accomplish the goals in the National Emergency Communications Plan.

At long last, the D-Block has been allocated to public safety. Members were recently appointed to the First Responder Network Authority, or FirstNet. FirstNet works with Federal, State, local, and Tribal partners. They will work to develop, build, and operate the Nation-wide interoperable wireless broadband network.

I am interested in hearing from all our witnesses about their thoughts on the development and operation of the network. To ensure and enhance the continuity of communications at the Federal level, earlier this summer, President Obama signed Executive Order 13618, "Assignment of National Security and Emergency Communications Functions."

This Executive Order requires the Secretary of Homeland Security to serve as co-chair of the executive committee established by the Executive Order. The Secretary must also establish a joint program office in support of the executive committee.

This committee has been aware of plans within the Department to reorganize the communications functions within the National Protection and Programs Directorate, although requests for details on the structure of such a reorganization have gone—they have gone unanswered.

Mr. Stempfley, I am particularly interested in hearing about the Executive Order's impact on the communications offices in NPPD. We must ensure that any reorganization or consolidation of offices does not impair the ability of OEC and NCS to achieve their vital missions, or erode any of the advancements in our communications capabilities made to date.

While we acknowledge the progress we have made in these areas, we must also acknowledge that more work remains. We need only look at the impact of the derecho earlier this summer, the storm, of course, that hit Virginia, and the impact of the 9-1-1 call centers, of course, in the State of Virginia.

I am aware that there have been a number of reviews of what happened as a result of the storm. I hope our witnesses will discuss their findings and we can work together to use these lessons learned to enhance the system in the future.

I am also interested in hearing about future capabilities that next generation 9-1-1 will be to offer our emergency response providers and the public they so ably serve.

With that, I welcome our witnesses. I look forward to your testimony.

Now I will recognize the Ranking Member, Ms. Richardson from California, for her opening statement. You are recognized.

Ms. RICHARDSON. Thank you, Mr. Chairman.

First of all, on behalf of the committee and the Chairman and all the Members here, I would like to acknowledge the unfortunate loss that we had last night of Ambassador Stevens and the other Foreign Service personnel. As those of you who are here testifying, you serve the American public as we do.

In times like these, there is no aisle. We are all serving the public. We want to thank you for your service and also be very grateful for those families who experienced this loss.

With that, I would like to thank the witnesses who are here today, and Mr. Bilirakis for holding this timely hearing. Yesterday, as we observed the 11th anniversary of the September 11 attacks, as the Chairman mentioned, we were reminded of the chaos that ensued as courageous first responders struggled to use inadequate communications equipment to coordinate and affect their mission.

Although the Nation has come a long way in gaining operable and interoperable communications capabilities, 11 years and \$13 billion later, we still have not achieved the goal of providing Nation-wide interoperable communications capabilities for our first responders.

Moreover, the derecho that hit, the disaster that hit the Midwest and the Northeast in June demonstrated that even 9-1-1 technology that we had taken for granted is still vulnerable. No matter how established a communications technology is, or how much we invest to improve it, it is only as reliable as the policies we have in place to ensure that it works.

I am pleased that earlier this year, President Obama signed into law legislation creating a Nation-wide public safety broadband network. I am hopeful that this network will ultimately achieve the goal of providing our first responders with a robust, state-of-the-art, interoperable communications network.

At the same time, though, I am mindful that the building of this network will be expensive and that it will require strong collaboration with the private sector and the support of the States if it is to achieve its maximum potential.

Unfortunately, given the severe fiscal crisis that we are all experiencing on the local, State, and Federal level, implementation, to be frank, is questionable. Towards that end, I am troubled that the FirstNet board has not seen the need to be able to include the local State partners, which I think will be critical to all of our success.

Through that appointment last month and not including an individual representing the State governments, some States may consider not participating, which would be an expense to us all.

I will be interested in learning today how FirstNet's Federal partners can help create incentives to States to participate in the Public Safety Broadband Network.

Otherwise, I am encouraged that the FCC is working with FirstNet to undertake efforts to create strict technical and interoperable requirements to ensure that networks developed by States that opt out of the FirstNet are interoperable with Federal networks.

Strong Federal leadership is required to ensure that the public gets the Nation-wide interoperable that it is paying for. Although Federal leadership and support is needed to ensure that existing emergency communications technologies are resilient and improve at the pace that the public expects, we all have to accept a responsibility in that role as well.

As many people in this room have experienced, power outages and backup power failures and private phone and cell networks disrupted the 9-1-1 system across Northern Virginia, leaving over 1 million people unable to call 9-1-1 for help if they needed it.

I understand that the private provider and the FCC have each conducted investigations into that 9-1-1 failure. We look forward to the results.

I look forward to hearing about the proactive measures that have been agreed upon to undertake and prevent future 9-1-1 failures going forward, and about the efforts that the FCC will undertake to improve the resilience of the 9-1-1 system.

Additionally, while it is important to ensure the resilience of the existing 9-1-1 technology, we must support the transition to the next generation 9-1-1 technology as well. Current 9-1-1 technology is outdated and does not have the capabilities to receive the full complement of data and text information that the public is capable of communicating.

Imagine that people incorrectly believe that 9-1-1 centers can receive text messages. A next generation 9-1-1 system that can support innovative technology will better serve us all.

Ultimately the Federal Government must provide the guidance and the resources to help State and local governments implement

the next generation of 9–1–1 technology—excuse me, the next generation of 9–1–1 technology.

Finally, I would like to return and acknowledge the fiscal burdens that are faced by the States and for us here Federally as well, and the struggle that we all will have before us to maintain and to implement emergency communications capabilities through the years of investment that has been done thus far.

Federal guidance for State emergency communications investments must establish clear guidelines to ensure cash-strapped States do not waste their limited resources.

Again, I look forward to the witnesses' testimonies here today. I thank the Chairman for holding this important hearing.

With that, I yield back.

Mr. BILIRAKIS. Thank you, Ranking Member Richardson.

Also, my thoughts and prayers go out to the families of the ambassador, the Americans that were killed in Libya yesterday.

Other Members of the subcommittee are reminded that opening statements may be submitted for the record.

[The statement of Ranking Member Thompson follows:]

STATEMENT OF RANKING MEMBER BENNIE G. THOMPSON

SEPTEMBER 12, 2012

Mr. Chairman, thank you for holding today's hearing. I look forward to hearing from our panel of witnesses.

The September 11 tragedy and Hurricane Katrina taught us that interoperable communications are essential during a disaster.

Those catastrophic events taught us that lives can be saved if first responders are able to communicate with each other.

Few questioned the need to provide Federal grant funding to enable State and local governments to achieve interoperability.

Over the last decade, the Nation has invested \$13 billion toward the goal of creating a resilient, interoperable communications infrastructure.

Our efforts to create that infrastructure have met with some success in improving the ability of first responders and public safety personnel to communicate with each other.

However, as every parent knows, ability does not always lead to achievement.

While funding has assured the availability of the tools, we must now move forward by making sure that the policies, procedures, and formal linkages are in place to achieve success.

Our next steps must involve the effective coordination among Federal, State, and local stakeholders in reviewing emergency communications failures and developing requirements and standards for advanced public safety communications systems.

Without coordination, our first responders will not be able to keep pace as the technology changes the means of communication.

As a practical example, we know that most people under 30 do not talk on the phone—they text. Text messages and video voicemail are now standard communication methods. Yet few emergency response systems are able to receive those kinds of communications.

We cannot allow disaster response efforts to be hampered because Federal, State, and local governments are unable to reach the necessary agreements to advance public safety communications systems.

In closing, Mr. Chairman, building a fully interoperable public safety communications network can be achieved. It will require collaboration and coordination. I hope that all the parties—public and private sector—are ready for the challenge.

I yield back.

Mr. BILIRAKIS. Before we turn to our first panel, the subcommittee has received multiple written statements from amateur radio operators. I ask unanimous consent to insert them for the record.

Without objection, so ordered.* Thank you.

I would like to recognize Mr. Clarke.

Mr. CLARKE. Thank you, Mr. Chairman. I also ask unanimous consent to insert a written statement from the National Association of Broadcasters into the record.

Mr. BILIRAKIS. Very good. So ordered. Without objection, so ordered.*

Mr. CLARKE. Thank you.

Mr. BILIRAKIS. I am pleased to welcome our first panel of witnesses.

Our first witness is Ms. Bobbie Stempfley. Ms. Stempfley is deputy assistant secretary of the Office of Cybersecurity and Communications. She previously served as the acting assistant secretary for CS&C, as well as the director of the National Cybersecurity Division.

Prior to joining DHS, Ms. Stempfley served as the chief information officer for the Defense Information System Agency. Ms. Stempfley received a bachelors of science in engineering mathematics from the University of Arizona, and a masters of science in the computer science from James Madison University.

Following Ms. Stempfley, we will receive testimony from Mr. David Turetsky. Mr. Turetsky is the bureau chief of the Federal Communications Public Safety and Homeland Security Bureau.

Prior to joining the FCC, Mr. Turetsky served as deputy assistant attorney general for civil and regulatory matters in the Anti-Trust Division, and as senior counsel to the assistant attorney general.

Mr. Turetsky has also held positions in the private sector and private legal practice. Welcome.

Again, welcome. Your entire written statements will appear in the record. I ask that you each summarize your testimony for 5 minutes.

We will begin with Ms. Stempfley. Again, I want to thank you for your patience. You are recognized.

STATEMENT OF ROBERTA "BOBBIE" STEMPFLEY, DEPUTY ASSISTANT SECRETARY, OFFICE OF CYBERSECURITY AND COMMUNICATIONS, DEPARTMENT OF HOMELAND SECURITY

Ms. STEMPFLEY. Thank you very much, Chairman Bilirakis, Ranking Member Richardson, distinguished Members of the committee. It is a pleasure to come and speak with you today about the Department of Homeland Security's efforts to improve communications for emergency response providers and Government officials.

As you know, DHS remains focused on improving and providing reliable communication capabilities for those important folks, those first to arrive at a disaster site, the Nation's emergency responders and our Federal, State, and local partners.

At DHS, we recognize that critical communications tools are more than just technology. It is not the right equipment or the right solution. It is a spectrum of things that range from governance to standards to operating procedures, training and exercises,

*The information has been retained in committee files.

integration of those systems into daily operations, as well as that technology.

We have a complete set of work at the Department that focuses on all of these efforts. Providing effective communications solutions requires fostering and nurturing relationships, relationships with those who own and operate the communications infrastructure, with international standards bodies, members of the emergency response community, and especially our Federal, State, local, Tribal, and territorial partners, as they are crucial as technology advances.

The Nation-wide Public Safety Broadband Network will affect all aspects of emergency communications for our first responders. As the network is planned and deployed, it is essential that DHS is prepared to adapt to these changes and support advancements in technology.

To this end, the Department is conducting a full review of the functions and programs within the Office of Cybersecurity and Communications to identify improvements that can be made in the communications programs.

As you pointed out, this review was initiated in response to Executive Order 13618, "Assignment of National Security and Emergency Preparedness Communications," signed by the President on July 6, 2012.

The Executive Order benefits the overall DHS communications mission by updating National security and emergency preparedness communications responsibilities of the Federal Government. The implementation of this will ensure the Department is able to address the challenges of a dynamic technological environment.

Through this review process, we are focused on increasing the quality and breadth of support offered to our stakeholders, which will be particularly helpful as we prepare for the implementation of this Nation-wide public safety broadband network and we continue the other important initiatives underway.

DHS will continue in its responsibility of shaping National policy and working with DHS components, Federal departments and agencies, State and local governments, the private sector and international partners to improve communication capabilities and achieve the mission requirements and build on the progress made to date.

As a part of the Department's progress in improving interoperability, we have developed and implemented the National Emergency Communications Plan. This plan contained the first set of National performance goals for evaluating emergency communications during local emergencies and complex events, and a process for measuring these goals in every State and territory.

Through the Office of Emergency Communications, a part of the Office of Cybersecurity and Communications, DHS has achieved the first two goals outlined in this National plan and is working with stakeholders to update the plan, taking into consideration all events that have transpired since its publication in 2008.

A few examples of these improvements we have seen include creation at the State level of State-wide plans, State-wide coordinators and governance, improving coordination of increasing regional investments. Through the OEC Technical Assistance Program, we

have provided more than 700 targeted on-site visits to State and urban areas to help with specific issues.

We have also trained more than 4,000 police, firefighters, and emergency management officials throughout the Nation to set up communications in a standardized way. Additionally at the Federal level, OEC has been working with other DHS components through the One DHS Committee, as well as Federal agencies through the Emergency Communications Preparedness Center Committee, to improve emergency communications.

Both of these committees will continue to be actively involved in the planning for the Nation-wide Public Safety Broadband Network.

As mentioned, with the support and leadership of several Members of this committee, the President signed the Middle Class Tax Relief and Job Creation Act of 2012 in February 22, 2012. Prior to the enactment of this law, the Office of Cybersecurity and Communications was already working with our Federal partners in the Departments of Commerce and Justice to represent DHS in the administration's efforts to set broad policy framework for the network and ensure the voices of State and local stakeholder partners were heard.

DHS will continue working with those partners at all levels of government by providing technical assistance, educating public safety and Government officials, and ensuring the network meets the needs of our stakeholders through the—Program.

With the continued progress of the Nation-wide public safety broadband network, this really is an exciting time for the public safety community. While we have made significant progress to ensure that public safety can communicate when needed, there is still much work to be done.

We appreciate the committee's continued support for our emergency communications initiatives. Thank you, again, for the opportunity to testify. I look forward to your questions.

[The prepared statement of Ms. Stempfley follows:]

PREPARED STATEMENT OF ROBERTA "BOBBIE" STEMPFLEY

SEPTEMBER 12, 2012

INTRODUCTION

Thank you Chairman Bilirakis, Ranking Member Richardson, and distinguished Members of the committee. It is a pleasure to discuss the Department of Homeland Security's (DHS) efforts to improve communications for emergency response providers and Government officials.

DHS remains focused on improving and providing the communications capabilities for those who are the first to arrive at the scene of a disaster site—the Nation's emergency responders and our Federal, State, and local partners. Our National leaders and public safety personnel must have access to reliable and instantaneous communications to effectively coordinate response and recovery operations. DHS recognizes critical communications tools as more than a technology problem that can be solved with the "right" equipment or the "right" communications system. All of the critical factors for a successful communications solution—governance, standards, standard operating procedures, training and exercises, and integration of systems into daily operations, as well as technology—are being addressed through the collective work of our programs.

Further, DHS believes that providing effective communications solutions requires fostering and nurturing relationships with those who own and operate the communications infrastructure, international standards bodies, members of the emergency responder community, and Federal, State, local, Tribal, and territorial partners.

These cooperative relationships are crucial to providing interoperable communications capabilities, planning for and developing priority services for voice, data, and video communications as networks evolve, and developing and implementing the Nation-wide Public Safety Broadband Network.

FULFILLING THE DHS COMMUNICATIONS MISSION

The Nation-wide Public Safety Broadband Network will affect all aspects of emergency communications for our first responders. As the network is planned and deployed, it is essential that DHS is prepared to adapt to these changes and support advancements in technology. To this end, DHS is conducting a full review of the functions and programs within CS&C to identify any improvements that could be made to its communications programs. This review was initiated in response to Executive Order (EO) 13618, the “Assignment of National Security and Emergency Preparedness (NS/EP) Communications,” signed by the President on July 6, 2012. EO 13618 replaces EO 12472 and eliminates the National Communications System (NCS). The EO updates and clarifies the NS/EP communications responsibilities of the Federal Government to address the challenges of a dynamic technological environment.

EO 13618 requires DHS to develop a management and organizational plan to implement its NS/EP communications functions. CS&C is conducting a comprehensive review to develop the plan, which included an analysis of the functions and services of the OEC, the NCS, the National Cyber Security Division, and the National Cybersecurity and Communications Integration Center (NCCIC).

The EO further establishes the following two entities:

- *National Security and Emergency Preparedness (NS/EP) Communications Executive Committee.*—The EO created a NS/EP Communications Executive Committee, an eight-department and agency interagency committee, co-chaired by DHS and the Department of Defense (DOD) to make recommendations to the President of the United States on NS/EP communications-related matters.
- *Executive Committee Joint Program Office (JPO).*—The EO directed the Secretary of DHS to establish a Joint Program Office to support the Executive Committee. DHS is establishing the JPO within CS&C, which complements DHS’s existing interagency fora and partnerships led by CS&C.

Through these new entities, as well as existing partnerships, DHS will continue its responsibility of shaping National policy and working with other DHS components, Federal departments and agencies, State and local governments, the private sector and international partners to improve communications capabilities and achieve mission requirements.

CURRENT INITIATIVES AND ON-GOING CHALLENGES

Nation-wide Public Safety Broadband Network

On February 22, 2012, with the help and leadership of the United States Congress, the President signed the *Middle Class Tax Relief and Job Creation Act of 2012*, which establishes the Nation-wide Public Safety Broadband Network (NPSBN) for emergency responders at all levels of government. The signing of the Act was the culmination of over a decade of effort to see the reallocation of the “D Block” of spectrum to public safety and to fulfill one of the 9/11 Commission recommendations: The development of a Nation-wide interoperable communications network. The Act establishes a new entity within the National Telecommunications and Information Administration of the Department of Commerce to oversee planning, construction, and operation of the network, known as the First Responder Network Authority, or FirstNet. The Secretary of Homeland Security is one of the three Federal representatives to the FirstNet Board, in addition to the Director of the Office of Management and Budget and the Attorney General. On August 20, 2012, the Secretary of Commerce also appointed 12 additional Board members from the fields of public safety, technology, network operations, and finance. Prior to the enactment of the law, DHS, through the Office of Emergency Communications (OEC) within the Office of Cybersecurity and Communications (CS&C) was already working with our Federal partners in the Departments of Commerce and Justice to represent DHS in the administration’s efforts to help set the broad policy framework for the NPSBN and to ensure that the voices of our State and local stakeholder partners were heard. Over the past few months, DHS has increased its efforts to support the implementation of the Network and to carry out our statutory requirement to support the Secretary through her role as a member of the FirstNet Board. More specific examples include the following broadband-focused programs and activities:

- *Planning and Assessments.*—DHS is preparing an update to the National Emergency Communications Plan (NECP), which is the first Nation-wide strategy de-

signed to advance emergency communications across all levels of government. The updated NECP will identify key broadband challenges and recommend near-term actions to foster the integration of broadband technologies and data capabilities, as well as propose measures to maintain existing Land Mobile Radio communications capabilities until broadband technologies can support mission-critical communications. Simultaneously, CS&C is working with individual States to update the State-wide Communication Interoperability Plan (State-wide Plan) criteria to ensure that State-wide Plans are reflective of broadband technologies and data capabilities.

DHS is also conducting a cyber risk assessment of the NPSBN to help the Department and our partners gain a better understanding of risks related to its deployment. Relying on the Department's expertise in cybersecurity, DHS will provide FirstNet with this assessment and recommended implementation steps. We have held several stakeholder meetings with public safety and industry representatives to discuss cyber risk issues, with a focus on network security and interoperability.

- *Outreach and Coordination.*—DHS is working with all of its stakeholder groups to ensure the views and requirements of the public safety community are fully represented in broadband planning and implementation efforts.
- To increase coordination of Federal efforts for broadband implementation, the Emergency Communications Preparedness Center (ECPC) is working to identify Federal broadband requirements by preparing a consolidated view of emergency communications assets, addressing associated legal and regulatory barriers, reviewing and analyzing Departmental positions on pending broadband regulatory matters and rulemakings, and establishing standardized grant guidance and processes. The ECPC has identified the development of broadband standards and research and development as one of its strategic priorities.
- Concurrently, the OneDHS Emergency Communications Committee is providing consolidated Departmental input into Federal interagency efforts, as well as developing strategies for broadband technology migration from current land mobile radio technology to next generation wireless network technology.
- DHS supports outreach efforts related to the development and deployment of a Nation-wide public safety broadband network by working with representatives from the SAFECOM Executive Committee and Emergency Response Council to develop educational materials on public safety broadband. Educational materials include information on funding and governance, and are targeted to multiple audiences.
- DHS continues to coordinate with the emergency response community, preparing wireless broadband guidance documents for State-wide Interoperability Coordinators, urban area and regional interoperability coordinators, public officials and executives, and emergency responders to support current NECP and State-wide Plan initiatives on interoperability planning. The Department also continues to provide emergency response stakeholders up-to-date and comprehensive information about wireless broadband in the emergency response environment. In addition, DHS is working with States and jurisdictions to incorporate broadband initiatives into the State-wide Plans.
- Under the strategy and policy direction of the OneDHS Emergency Communications Committee, DHS has initiated a joint program management office to capture and implement Department-wide broadband requirements to develop a next generation tactical communications mobile platform for voice, data, and video.
- *Grants.*—DHS has been coordinating with Federal agencies to ensure consistency in grant policies and requirements affecting broadband investments. DHS has worked with its Federal agency partners to limit investment in high-risk projects that may not comply with FirstNet requirements or support the development of a Nation-wide network for public safety users. Further, DHS has aligned key grant guidance with Federal broadband goals. The 2013 SAFECOM grant guidance, which provides guidance to State and local stakeholders applying for grants, will emphasize the need to plan before purchasing—a strategy in full alignment with the National Telecommunications and Information Administration (NTIA) State and Local Implementation Grant Program. The *ECPC Recommendations for Federal Agencies: Financial Assistance for Emergency Communication* provides guidance to Federal program managers administering emergency communication grants, and stresses the need for technical compliance to ensure Federally-funded investments are compatible and interoperable. The *ECPC Recommendations Document* will be updated to reflect new

programs, policies, and requirements related to the deployment of the Nation-wide Public Safety Broadband Network.

- *Technical Assistance.*—DHS has developed a wireless broadband technical assistance offering to assist State, local, territorial, Tribal, and regional users to develop and improve their use of broadband technology in line with the vision of a Nationally-interoperable network. The offering is tailored for each jurisdiction and provides informational briefings, governance models, standard operating procedures, project planning, and engineering support.
- *Research and Development.*—The Science and Technology Directorate's (S&T) Office for Interoperability and Compatibility (OIC) is supporting the deployment of the Nation-wide public safety broadband network through requirements-gathering and standards acceleration activities. This includes supporting the Department of Commerce's 700 MHz demonstration network, which provides public safety with a unique testing environment for broadband systems and devices before operational use. Additionally, OIC is working with the Department of Commerce on a modeling and simulation project to provide public safety with the ability to evaluate broadband network deployment scenarios and investigate how well new technologies support public safety requirements. Further, OIC is evaluating how to define a transition path for current Land Mobile Radio technology to the future broadband network.

NATIONAL AND STATE-WIDE PLANNING

Over the last 5 years, OEC has worked to fill many gaps in public safety communications and DHS is seeing progress in several key areas that enable emergency responders to interoperate in an all-hazards environment. As part of its mission, the office led a comprehensive Nation-wide planning effort with more than 150 stakeholders from the emergency response community to develop the NECP. This included significant feedback and coordination with the SAFECOM Executive Committee, the SAFECOM Emergency Response Council, and the National Public Safety Telecommunications Council. These stakeholder groups represent the interests of millions of emergency responders, as well as the State and local governments that public safety communications serve. Involving these groups in the early phases ensured that the plan took stakeholders' input into account and would be widely accepted in the public safety community.

The NECP has been instrumental in defining communication priorities for public safety personnel at all levels of government. CS&C has been driving implementation of the NECP in coordination with its Federal, State, and local partners, and we are seeing measurable improvements in building capabilities and closing gaps identified in the plan for governance, training, operating procedures, and others, including:

- *Enhanced State-wide Coordination.*—The creation of State-wide Communication Interoperability Plans, State-wide Interoperability Coordinators, and State-wide Interoperability Governing Bodies has improved coordination of emergency communications activities and investments throughout all 56 States and territories. Through the State-wide Plan development and updating process, the State-wide Interoperability Coordinators, in collaboration with their governing bodies, have been effective in helping States define their communications needs and future investments and ensuring that Federal funding is directed where it is most needed. In addition, CS&C has conducted over 160 workshops during the past 4 years to assist States as they implement and update their State-wide Plans.
- *Common Plans, Protocols, and Procedures.*—The use of standardized plans and procedures is driving improved command, control, and communications among emergency responder agencies in the field. CS&C and the Federal Emergency Management Agency (FEMA) have worked with more than 140 jurisdictions, including Urban Areas Security Initiative (UASI) regions, to develop Tactical Interoperable Communications Plans that document formalized interoperability governance groups, standardized policies and procedures, and emergency communications equipment inventories. States continue to develop these communications plans to cover additional regions.

NECP Goal Assessments

Implementation of the NECP has been a key driver behind much of our progress in improving interoperability. More than 85 percent of the NECP milestones were achieved, and progress is evident in all of the NECP priority areas, including governance, training, and coordination.

Through the NECP, OEC also established the first set of National performance goals for evaluating emergency communications during local emergencies and complex events, as well as a process for measuring these goals in every State and territory. These goals include:

- *Goal 1.*—By 2010, 90 percent of all high-risk urban areas designated within the Urban Areas Security Initiative (UASI) can demonstrate response-level emergency communications within 1 hour for routine events involving multiple jurisdictions and agencies.
- *Goal 2.*—By 2011, 75 percent of non-UASI jurisdictions can demonstrate response-level emergency communications within 1 hour for routine events involving multiple jurisdictions and agencies.
- *Goal 3.*—By 2013, 75 percent of all jurisdictions can demonstrate response-level emergency communications within 3 hours, in the event of a significant event, as outlined in National planning scenarios.

To implement Goal 1, OEC assessed UASI regions' abilities to establish and demonstrate response-level emergency communications during large-scale, planned events. Every urban area was able to achieve the Goal, and the results showed progress in key emergency communications capabilities beyond the development of Tactical Interoperable Communications Plans (TICP) in 2007. For Goal 2, OEC worked with all States and territories to assess emergency communications at the county level, including county equivalents such as parishes, municipalities, and townships. The process has generated unparalleled data on interoperability emergency communications capabilities and gaps and is helping DHS and States focus future resources and improvement activities.

As of today, more than 2,800 counties and county equivalents have participated in the Goal 2 process, including about 30,000 individual public safety agencies. Among the participating jurisdictions, about 90 percent were able to achieve response-level communications and demonstrate NECP Goal 2. The assessment also showed progress in key areas of emergency communications, including the establishment of more inclusive governance structures and formal standard operating procedures, as well as the frequency and ease in which jurisdictions use interoperable communications solutions.

CS&C is encouraged with the outcome of the NECP Goals. Both the high level of participation and the demonstration of NECP Goal 1 and 2 are major accomplishments in the Department's on-going efforts to assess progress Nation-wide and better target its emergency communications resources, such as grants, technical assistance, training, and other planning efforts. OEC is currently updating the NECP and will be revising Goal 3 accordingly to take into consideration events that have transpired since the NECP was first released in 2008. This includes key findings from Goals 1 and 2, as well as lessons learned/best practices from real-world disasters and events, such as floods, hurricanes, earthquake, and tornadoes of 2011.

Collaboration with Federal Partners

In addition to the extensive progress made to improve emergency communications at the State, local, and Tribal level noted above through the work of the NECP, the Department, through OEC, is coordinating efforts to improve emergency communications among DHS Components and other Federal agencies.

As mentioned above, CS&C operates the Emergency Communications Preparedness Center to coordinate policy, planning, and administration of emergency communications across 14 Federal departments and agencies. The ECPC provides an interdepartmental mechanism to coordinate common solutions, streamline development of policy and plans and jointly engage State, local, territorial, and Tribal partners. The ECPC has achieved early successes through defining a strategic agenda that reflects shared member priorities and establishes issue-specific focus groups to drive immediate action.

CS&C also administers the OneDHS Emergency Communications Committee, which aims to improve internal coordination of policy and planning across DHS Components with emergency communications missions. This committee provides a vital mechanism for maximizing the efficiency and effectiveness of the Department's emergency communications investments and activities. The OneDHS Committee reached a significant milestone in June 2011 with the creation of the unified OneDHS Emergency Communications Strategy. The Strategy establishes a common vision "to ensure access to and exchange of mission-critical information across the Homeland Security Enterprise anywhere, anytime, through unified capabilities." It also sets goals for coordinating and improving emergency communications architecture, investment, governance, and operations.

Improved Governance and Coordination.—DHS is working with Federal, regional, State, and local agencies to increase coordination, information sharing, and oversight of interoperability through formal governance structures and partnerships. CS&C instituted a Regional Coordination Program to strengthen collaboration and knowledge sharing with our stakeholders. CS&C has established a Regional Coordinator in each of the 10 FEMA Regions, and they regularly participate in the State-

wide Interoperability Governing Bodies, urban area interoperability meetings and their respective FEMA Regional Emergency Communications Coordination Working Groups.

The CS&C Regional Coordination program has worked closely with FEMA through the Disaster Emergency Communications Division to ensure State and local agencies have the capability to communicate during disaster response. Because the Regional Coordinators interact with stakeholders every day, they have an in-depth understanding of the needs of different communities across their Regions.

Targeted Technical Assistance.—CS&C has implemented a technical assistance strategy to ensure that all States and territories can request and receive its targeted, on-site emergency communications assistance, while also focusing support on the States and urban areas with the highest risk and lowest capability. These 40-plus offerings are tailored to support the priorities in each State or territory State-wide Plan and the objectives of the NECP, including the implementation of the Nation-wide public safety broadband network discussed above. Since 2008, the 56 States and territories have combined to request more than 750 individual technical assistance services from CS&C for support with the development of governance structures, tactical and strategic planning, and a variety of engineering services. To better address the interoperability needs at the National and local level, CS&C has developed several on-line offerings and tools that can be accessed via the internet.

Increased Training Opportunities.—As mentioned above, CS&C has developed Communications Unit Leader (COML) and Communications Technician (COMT) courses to improve emergency responders' proficiency with communications equipment and to assist them with coordinating roles and responsibilities during an incident or event. The COML program has been embraced by emergency responders Nation-wide, and CS&C has trained more than 3,500 responders, technicians, and planners to lead communications at incidents across the Nation, including local floods, blizzards, and wildfires. Trained COMLs have also contributed to recovery efforts throughout the United States, including the recent outbreak of tornados and massive flooding in the Midwest and Southeast. To assist States in leveraging these trained responders, CS&C has developed a portal for State-wide Coordinators to locate contact information for every trained COML, COMT, and Auxiliary Communicator.

Future Enhancements

Future advancements in technology will provide emergency responders and Government officials with new means to communicate during routine events as well as disasters. However, these advancements will also create new challenges that will require enhancements to current DHS programs. In order to ensure DHS is prepared to support stakeholder efforts to address these new challenges, the Department is reviewing existing communications programs to identify where future enhancements are necessary.

Critical Infrastructure Protection.—As we guide the transition of emergency and NS/EP communications, CS&C will continue building and nurturing those relationships that are critical to protecting the Communications and Information Technology Infrastructures. Since 2003, the Department has led the identification, prioritization, and protection of the Nation's 18 critical infrastructure sectors under Homeland Security President Directive 7 (HSPD-7). Since its inception, CS&C led these critical efforts for the Communications and IT system of systems, which is interdependent with other critical infrastructure. CS&C will continue planning and reporting on the progress of these sectors as outlined in the National Infrastructure Protection Plan. We will continue our partnership with all stakeholders to jointly publish Sector-Specific Plans and National Risk Assessments, which help to mitigate vulnerabilities to infrastructure.

Priority Services Program Management.—CS&C develops and maintains NS/EP communications priority services programs, which has supported the communication needs of over 1 million users across all levels of government and the private sector. The GETS program is a White House-directed emergency telecommunications service. GETS supports over 274,000 Federal, State, local, and Tribal government, industry, and non-governmental organization personnel in performing their NS/EP communications missions by providing a robust mechanism to complete calls during network congestion from anywhere in the United States. Specifically, GETS provides 90 percent or more call completion rates when network call volume is up to 8 times greater than normal capacity.

WPS is the wireless complement to GETS, created due to the overwhelming success of GETS during 9/11. The program enhances the ability of 108,000 NS/EP subscribers to complete cellular phone calls through a degraded public switched telephone network during a crisis or emergency situation. WPS calls receive the next

available radio channel during times of wireless congestion, which helps to ensure that key NS/EP personnel can complete critical calls by providing priority access for key leaders and supporting first responders. WPS service provides authorized cellular phone users with the ability to have priority within the public switched telephone network as well as priority access to cellular radio channels.

The Telecommunications Service Priority (TSP) Program is a Federal Communications Commission (FCC)-sponsored program that authorizes and provides priority restoration, provisioning, and reconstitution of NS/EP communications. The TSP Program provides service providers with an FCC mandate for prioritizing service requests by identifying those services critical to NS/EP. TSP can save days to weeks on the time required to return wireline voice/data services to normal, and there are more than 200,000 active TSP circuit assignments in support of NS/EP communications.

As the Nation's communications infrastructure migrates to an Internet Protocol (IP) operating platform, expediting the convergence between communications and cybersecurity activities remains a top priority for the Department. CS&C continues its plans for ensuring priority voice, data, and voice communications over these IP networks through its Next Generation Networks Priority Service Program (NGN-PS).

Public-Private Partnerships.—Our partnership with the private sector has been instrumental in developing critical NS/EP and emergency communications policies within the Department. One of the Department's most critical relationships exists with the President's National Security Telecommunications Advisory Committee (NSTAC). The NSTAC is a Federal Advisory Board comprising up to 30 Chief Executive Officers from the Nation's leading communications, banking, and information technology companies. Most notably, the NSTAC has been instrumental in several Government-led initiatives, such as the creation of the National Cybersecurity and Communications Integration Center (NCCIC), Government Emergency Telecommunications Service (GETS), Wireless Priority Service (WPS) and the National Coordinating Center for Telecommunications (NCC). Beyond its Federal Advisory role, CS&C actively nurtures critical relationships with NSTAC member companies to protect the overall Communications and IT infrastructures. CS&C will continue its support to and partnership with the NSTAC to create communications solutions for our stakeholders. Most recently, the NSTAC examined four scenarios designed to stress future 2015-level networks, and provided the President with recommendations for technology enhancements and Government investments that would provide the best network resilience and recovery.

Modeling, Analysis, and Technology Assessments.—The CS&C Modeling, Analysis, and Technology Assessments team provides expertise in modeling and analyzing current and future protocols, algorithms, network designs, and capabilities that will impact priority service communications in legacy and Next Generation Networks (NGNs). The modeling team also maintains a suite of specialized infrastructure analysis tools to provide critical infrastructure risk assessments for the communications sector in the event of a man-made or natural disaster. These services will play a large role in analyzing future technology.

Standards Activities.—The CS&C Standards Team is currently an active leader and contributor to various National and international standards development organizations, ensuring industry-wide adoption of non-proprietary solutions for NS/EP preparedness telecommunications requirements. The team provides leadership and representation in standards bodies to recommend standards that, when implemented in Internet Protocol-based networks, will provide capabilities to ensure National, State, and local leadership are able to communicate during times of crisis. These activities will continue as the Department works with partners to develop standards for both NS/EP communications and public safety broadband requirements.

NATIONAL RESPONSE PLANNING

CS&C is working with Federal, regional, State, and local agencies to increase communications coordination, information sharing, and oversight of emergency preparedness activities to improve response to man-made and natural disasters. CS&C works with these entities to ensure a coordinated response through formal governance structures and partnerships.

Continuity of Operations and Government (COOP/COG).—CS&C will continue leading the Department's responsibilities to ensure the U.S. Government has the means to perform Enduring Constitutional Government, National Essential Functions and Primary Mission Essential Functions as directed in National Security Presidential Directive—51 (NSPD—51)/Homeland Security Presidential Directive—

20 (HSPD-20). Furthermore, the CS&C in its role as Co-chair of the EO 13618 Executive Committee will continue to assist the Federal Executive Branch in meeting its NS/EP communications needs.

Emergency Response and Operations.—CS&C will also continue leading response, recovery, and reconstitution efforts leveraging its Emergency Support Function (ESF) No. 2 responsibilities. Partnerships with our Federal, State, local, Tribal, and private-sector partners will continue to be a critical enabler of the Department's broader homeland security mission.

We will also continue operating a joint Government-industry capability through the NCC. The NCC will continue providing critical response, recovery, and provisioning and reconstitution efforts for communications, leveraging the many DHS communications tools and capabilities. As it has since 2000, the NCC will be serving as the Communications Information Sharing and Analysis Center (ISAC), which brings together over 50 private-sector partners.

In addition to the overlapping missions and initiatives noted above, this new organization will focus on supporting the responder community at the Federal, State, local, Tribal, and territorial levels and will enhance DHS's incident handling and response for cyber and communications-related incidents.

CONCLUSION

The Department appreciates the committee's support for our communications activities. Thank you again for this opportunity to testify.

Mr. BILIRAKIS. Thank you very much.

Mr. Turetsky, you are recognized for 5 minutes, sir.

Yes, if you can turn the mic on, please. Thank you.

STATEMENT OF DAVID S. TURETSKY, CHIEF, PUBLIC SAFETY AND HOMELAND SECURITY BUREAU, FEDERAL COMMUNICATIONS COMMISSION

Mr. TURETSKY. Is that better?

Good afternoon, Chairman Bilirakis, Ranking Member Richardson, and Members of the subcommittee. Thank you for the opportunity to appear before you.

When Congress created the Federal Communications Commission in 1934, it made one of the commission's foundational obligations, "the promotion of safety of life and property through the use of wire and radio communications."

In the years since, consistent with this mandate, the FCC has applied Congress' public safety charge to changing communications technologies, including, most recently, Voice over Internet Protocol. Nowhere is our responsibility to promote public safety more important than with regard to 9-1-1 services and availability.

Today I will focus my discussion on part of the FCC's response to the June 29 derecho storm that hit parts of the central, Mid-Atlantic, and Northeastern United States, and dramatically affected emergency communications over wide swathes of the country.

The vast majority of those in the path of the derecho were able to continue to use wireline and mobile communications networks effectively and reliably to make calls and reach 9-1-1. But there was also another side which showed clearly that telecommunications networks lacked needed and vital resiliency.

The FCC is very concerned that carrier network failures deprived millions of the ability to reach 9-1-1 operators who could dispatch needed help. There were brief and isolated network breakdowns in Ohio and Indiana that knocked out 9-1-1 service, and longer, systemic failures elsewhere.

Most notably in northern Virginia and in West Virginia, carrier network failures resulted in a significant number of 9-1-1 call cen-

ters not receiving 9-1-1 calls at all, or the location information necessary to enable proper dispatch.

The FCC promptly began an inquiry to learn all the facts, circumstances, and causes of the outages and disruptions in service. The goal of this inquiry is simple: To use this information to make people safer.

Although local, State, and regional governmental entities are primarily responsible for supporting and operating 9-1-1 services and providing radio communications for first responders, our inquiry is particularly important. Only the FCC can follow the full path of the storm across these jurisdictions and bring communications expertise, statutory responsibilities, excellent industry contacts, and public visibility to the entire range of communications issues it raised.

In our inquiry, we have met with more than half a dozen carriers, more than 25 public safety answering points, called PSAPS, at least once. We also sought input from the public and interested parties by issuing a public notice asking for information not only about the derecho, but also about other similar disasters where 9-1-1 or other emergency services were affected.

We received reply comments just last week.

We also continue to evaluate important information submitted to the commission on a confidential basis through two key FCC systems: The Network Outage Reporting System, we call NORIS, and the Disaster Information Reporting System, we call DIRS, both of which provide vital outage and critical infrastructure status information during times of crisis.

While we are still reviewing the record, we have learned that not all carriers have exactly the same problems in providing reliable 9-1-1 networks.

Just two examples: First, not all carriers adequately monitor and implement important best practices and technical announcements that could reduce 9-1-1 outages from standards organizations. So while best practices are helpful, they are not the complete answer.

Second, there are important differences as to how carriers ensure that necessary redundancy is preserved in the routing of emergency circuits, including circuits that carry location information.

We expect to produce a public report on what we learned from the derecho before the end of the year. As I mentioned we just received reply comments last week.

The FCC continually assesses how to enhance the reliability and resiliency of communications networks. One developing way is to foster the development of next generation 9-1-1 services, which will enable people to make voice, text, or video emergency contacts from any communications device, via Internet Protocol-based networks.

At the end of the day, our communications networks need to be just as reliable and resilient when there is an enhanced need for emergency assistance as when there is not. We should never forget that lives depend on it.

[The prepared statement of Mr. Turetsky follows:]

PREPARED STATEMENT OF DAVID S. TURETSKY

SEPTEMBER 12, 2012

Good afternoon, Chairman Bilirakis, Ranking Member Richardson, and other Members of the House Subcommittee on Emergency Preparedness, Response, and Communications. Thank you for the opportunity to appear before you to discuss the Federal Communications Commission's (FCC's) efforts to enhance public safety by making critical communications infrastructure more reliable and resilient, including America's 9-1-1 system.

INTRODUCTION

The Commission is committed to working with its public safety partners, communications providers, and others, to ensure the integrity and reliability of our communications networks and services. It is essential particularly in times of major emergencies, such as during and after a natural disaster, that communications networks keep us connected to each other and to the help we may need.

When Congress created the FCC in 1934, it made one of the Commission's foundational obligations, "the promotion of safety of life and property through the use of wire and radio communications." In the years since, consistent with this mandate, the FCC has applied Congress's public safety charge to changing communication technologies, including, most recently, phone calls made over a broadband internet connection instead of typical analog telephone lines (i.e., interconnected Voice over Internet Protocol, or "VoIP.") In fact, Congress recently reaffirmed the FCC's core mission and its approach by codifying the requirement that interconnected VoIP providers provide 9-1-1 services.

To fulfill its mandate under the 1934 Communications Act, the FCC, primarily through its Public Safety and Homeland Security Bureau, works hand-in-hand with our Federal, State, local, and Tribal public safety partners, to enhance the reliability of our Nation's communications infrastructure. Nowhere is our responsibility to promote public safety more important than with regard to 9-1-1 services and availability. While we are always very concerned whenever there is a substantial communications outage, we are exceptionally concerned when an outage affects the public's ability to obtain help through 9-1-1.

Today I will focus my discussion on the impact of—and the FCC's response to—the recent derecho storm that hit parts of the Central, Mid-Atlantic, and Northeastern United States in late June. I will also touch on the Commission's response to Hurricane Isaac just 2 weeks ago, as well as efforts the FCC has taken to make our Nation's critical communications infrastructure more resilient, and the challenges that lie ahead.

THE JUNE DERECHO STORM

The Derecho's Impact on Communications

On June 29, a fast-moving and extremely severe derecho weather system dramatically affected emergency communications over wide swaths of the United States. Starting in the Midwest and increasing in ferocity through the mid-Atlantic and Northeastern regions of the country, the derecho left death and destruction in its wake. Ohio, Kentucky, West Virginia, Virginia, Maryland, and New Jersey reported deaths; and these and other States reported billions of dollars in physical damage and severe adverse economic effects. Millions of people lost electrical power during and after the storms for periods ranging from a few hours to over a week, all during a historic, record-breaking heat wave. Many needed help urgently, as live electrical wires came down, trees crushed occupied homes and vehicles, and other emergencies unfolded.

In many areas, communications services held up very well. The vast majority of those in the path of the derecho were able to continue to use wireline and mobile communications networks effectively and reliably: To make calls, reach 9-1-1, and get help. The great majority of Public Safety Answering Points (PSAPs, which are 9-1-1 call centers) were able to receive calls and location information, and to dispatch help accordingly. Dedicated radio services for the public safety community and first responders also seem to have been mostly unaffected by the storm.

The broadcast industry performed well. As FCC Commissioner Pai noted, broadcasters played a "critical role" for those impacted by the storm—when "electrical power, cell sites, and broadband networks went offline, battery-power radios served as a lifeline connecting many of us to the outside world." For me, in addition to numerous other sources of information on conditions and developments, I listened to WTOG, the Washington, DC area news station.

While this was the “bright side,” there also was another side, which showed clearly that telecommunications networks lacked needed and vital resiliency. For various lengths of time, millions lost the ability to reach 9–1–1 operators who could dispatch needed help. Some of those who attempted to make emergency calls found their wireless service unavailable or their calls blocked. Call volume increases during and after natural disasters, and this fact combined with cell site and other outages complicated efforts to originate calls to secure emergency help.

The FCC is particularly concerned that carrier network failures hit some 9–1–1 facilities especially hard. There were isolated, short-lasting network breakdowns in Ohio and Indiana that knocked out 9–1–1 service, but longer-lasting systemic failures elsewhere. Most notably, in northern Virginia and in West Virginia, as a result of carrier network failures, a significant number of 9–1–1 call centers couldn’t receive 9–1–1 calls at all, or didn’t receive E9–1–1 location information to enable proper dispatch. Even when some connectivity was restored, 9–1–1 service was partially down for several days in many call centers due to carrier failures.

The seriousness of the situation was illustrated most clearly throughout northern Virginia, particularly in Fairfax County, parts of Prince William County, Manassas Park, and Manassas, where well over 1 million people faced the possibility of not being able to call 9–1–1 successfully. In Fairfax County, for example, these carrier network failures affected both primary and backup 9–1–1 systems. The result was that the 9–1–1 call center serving most of the 1.1 million people of Fairfax County couldn’t receive any 9–1–1 calls at all for several hours. Emergency officials have told us that about 8 hours after the storm hit, from 7:30 in the morning on Saturday, June 30, until 3:00 PM later that day, the carrier failures left Fairfax County wholly without 9–1–1 service—just as people were beginning to wake up and assess the damage, report downed wires and trees to authorities, and begin the clean-up process. Even after arrangements for rerouting 9–1–1 calls finally were made, 9–1–1 service was significantly degraded for days—in fact, 9–1–1 features that we all now take for granted and which public safety officials rely on, like automated number and location identification, were not fully restored everywhere for days.

Similarly, West Virginia experienced serious problems, with even more, but generally smaller 9–1–1 call centers knocked out of service by carrier network failures. Many of the 50 9–1–1 call centers in West Virginia were adversely affected.

Public safety officials from all of the affected areas tell us they relied in part on broadcasters and social media, (particularly Twitter, Facebook, and e-mail sign-ups) to get the word out on how to contact emergency services. These officials, in light of the utter loss of connectivity to 9–1–1 services, were sometimes reduced to telling people needing help to walk to their nearest police station or fire house—a completely unacceptable position for these first responders and the affected communities.

The public’s inability to reach 9–1–1 and obtain emergency assistance during the derecho was not just a theoretical or abstract concern, nor is it such in connection with other natural disasters. This is well understood by those who serve our country by answering 9–1–1 calls, first responders who risk all to save others, hospital workers who try to save lives, and even by those who work to make communications networks more resilient. Whether and how fast help can be called and a first responder arrives might make the difference between a life lost or the possibility of a healthy future. As the *Washington Post* reported, in Falls Church, Virginia, Dylan Cooper perished after he was struck by electrical wires brought down during the derecho. Bystanders who came to his aid and called 9–1–1 reportedly were not able to get through, even after calling for over 30 minutes. In another instance, just a few hundred feet from her Washington, DC apartment, a woman was knocked off her motorcycle and pinned under a tree, leaving her partially paralyzed—she was saved when passers-by, unable to get through to 9–1–1, flagged down an ambulance which was able to provide additional help.

The FCC’s Response

In responding to the derecho, the Commission worked very closely with the Federal Emergency Management Agency (FEMA) and others, to monitor and respond to the communications outages caused by the storm, including those severely impacting E 9–1–1 services.

In doing so, we utilized the FCC’s Operations Center, which is staffed 24 hours a day 7 days a week. We engaged in direct outreach to carriers and other affected by the storms. We collected key data, supported by pre-established information reporting protocols. We issued Situation Reports, providing our Government partners with details of the damage and the pace of recovery.

We also took immediate action to help lessen the impact of the storm. For example, we granted an emergency Special Temporary Authority the day after the dere-

cho struck, so that a utility company from out-of-State could go to Ohio to help restore power there, and communicate using the frequencies that their communications equipment supported. We also used the FCC's website and social media to issue a set of consumer tips for communicating during an emergency.

Immediately after the impacts of the derecho on communications and 9-1-1 services dissipated, the FCC began an inquiry through its Public Safety and Homeland Security Bureau to learn all of the facts and circumstances of the outages and disruptions in service, including the causes. The inquiry covers both disruptions that affected the 9-1-1 call centers and those that affected cell sites, network interconnection, switches, and other facilities. The latter impedes the effective use by consumers of wireline, wireless, and broadband communications to reach emergency providers in and after a natural disaster, when more consumers than usual need to do so.

The goal of this inquiry is simple—to use this information to make people safer. We want to enhance public safety by applying the lessons learned to help make communications more reliable and resilient, and reduce the chances that these failures will be repeated. As FCC Commissioner Rosenworcel aptly put it: “the agency has a duty to search out the facts—wherever they may lead. Then we can apply the lessons we learn and make our networks more resilient, more secure, and more safe.”

Although local, State, and regional governmental entities are primarily responsible for supporting and operating 9-1-1 services and providing radio communications for first responders, our inquiry is particularly important: Only the FCC can follow the full path of the storm and bring communications expertise, statutory responsibilities, excellent industry contacts, and public visibility to the entire range of communications issues it raised. Moreover, as noted earlier, Congress has given the FCC authority to ensure that communications networks, including those that offer interconnected VoIP service, promote the “safety of life and property.”

To aid our core mission, the Commission has been seeking helpful information and views from a broad range of stakeholders. On July 18, we sought input from the public and interested parties by issuing a Public Notice, asking for information not only about the derecho, but also about other similar disasters where 9-1-1 or other emergency services were affected. We received reply comments just last week, which we are currently reviewing. This effort is distinct from, but complementary to, a pre-existing inquiry into the overall resiliency, reliability, and continuity of American communications infrastructure and services, when exposed to catastrophic events.

We began our derecho-related inquiry by conducting a series of meetings that is still on-going. We have spoken directly with a wide range of stakeholders, some several times, including 6 different communications service providers, 25 different 9-1-1 call centers in the most severely-impacted areas of Virginia and West Virginia, and numerous public safety officials, including those working for Federal, State, local, and Tribal governments.

We also continue to assess and evaluate important information submitted to the Commission on a confidential basis through two key FCC systems, the Network Outage Reporting System (NORS) and the Disaster Information Reporting System (DIRS), both of which provide vital outage and critical infrastructure status information during times of crisis.

Although we are still conducting our inquiry and reviewing the record, we have already learned, for example, that not all carriers have exactly the same problems in providing reliable 9-1-1 networks. To provide just a couple illustrations:

- not all carriers adequately monitored and implemented important best practices and technical announcements from standards organizations that specifically target reducing 9-1-1 carrier network outages. Thus, the development of standards voluntarily may well be a good idea, but it is not a panacea.
- there are some important differences on how carriers ensure that necessary redundancy is preserved in the routing of emergency circuits, including the circuits that carry location information; on a going-forward basis, we are particularly interested in how carriers conduct audits to enhance that redundancy.

After we have completed a full review of the record, and before the end of this year, we expect to produce a public report on what we learned from the derecho.

We are also mindful that we need to consider not only highly specific fixes that will result in improvement to the systems affected by the derecho, but also whether more systemic improvements are needed in our 9-1-1 system generally. The public safety community is rightly concerned that 9-1-1 has been adversely impacted repeatedly by carrier network problems. Even though the root causes may not be precisely the same in each instance, we need to explore whether there are solutions that can lower the risk of 9-1-1 failure generally.

IMPACT OF HURRICANE ISAAC AND FCC RESPONSE

I would also like to mention the communications impact of and the FCC's response to Hurricane Isaac, which hit the Gulf Coast region just 2 weeks ago. Unlike the powerful, unanticipated, and fast-moving derecho, Hurricane Isaac followed the pattern of a typical hurricane and provided carriers with more lead time to mobilize their response and reroute call traffic to avoid major outages.

Isaac severely affected the northern Gulf Coast region and caused deaths in Louisiana, Mississippi, and Florida. Though almost a million people in the affected States were without electrical power at the height of the storm, and preliminary estimates are that it caused \$1.5 billion in damage, we are thankful that, in contrast to the derecho, we have received no reports of any 9-1-1 systems being completely knocked out in the region where Isaac hit.

Beginning even before the hurricane hit, the FCC, in consultation with its Federal partners, most notably FEMA, activated DIRS to gather and monitor information for select, targeted counties and parishes in Florida, Alabama, Mississippi, and Louisiana.

The FCC staff worked tirelessly before, during, and after the storm, including through the entire Labor Day weekend, compiling and analyzing this information and preparing daily Situation Reports to inform our Governmental partners in detail of the state of communications services in the selected areas, which is vital knowledge in setting public safety and restoration priorities. This information identified, among other things, the extent of outages and the pace of recovery experienced by wireless and wireline carriers, broadcasters, cable providers, PSAPs, and others. The FCC's 24x7 Operations Center assisted in these efforts.

The FCC also:

- identified 9-1-1 call centers and broadcasters in Puerto Rico, the U.S. Virgin Islands, Florida, Alabama, Louisiana, and Mississippi to determine their operational status and to assist with provisioning any needs to help maintain or restore their operations;
- conducted outreach to Federal partners, emergency operation centers, the National Association of Broadcasters, Association of Public Safety Communications Officials (APCO), and National Emergency Number Association (NENA), the 9-1-1 association;
- deployed, at the request of FEMA Region IV, two Roll Call Teams to conduct spectrum scans along Florida's Gulf Coast, and in the States of Alabama and Mississippi. (In a hurricane situation, Roll Call teams use spectrum analyzing equipment to develop a baseline of public safety communications users before the storm and then again after landfall, to identify which systems are operating and which are not, and which areas their signals reach, which assists in identifying and prioritizing recovery needs);
- conducted outreach to the Florida, Louisiana, Mississippi, and Alabama broadcaster associations to determine status of their emergency preparations;
- conducted outreach to FEMA Region VI to determine support required from the FCC in Louisiana; and
- conducted outreach to local Spanish language radio and television broadcasters in the New Orleans area; and monitored and coordinated with our Federal partners to ensure that the non-English speaking community continued to have access to vital local news and emergency information during and after Isaac through KGLA 1540 AM/105.7 FM, and Telemundo Channel 42. These efforts led to the refueling of the back-up generators that serve these stations' transmitter and studio.

Notably, these types of coordination and action also reflect the dramatic improvement that has occurred in the last few years in preparation and coordination across the Government to respond to National disasters. Much of the information supplied by the FCC came through systems that did not exist at the time of Hurricane Katrina.

OTHER FCC INITIATIVES

The FCC is continually assessing and evaluating what initiatives it should take to enhance the reliability and resiliency of our Nation's critical communications facilities. In August of last year, for example, the Chairman announced a five-step action plan to further the development and deployment of Next Generation (NG) 9-1-1 services. The plan includes actions by the FCC, and a roadmap for FCC partnerships with State, local, and Tribal 9-1-1 authorities, other Federal agencies, and the private sector.

Though NG 9-1-1 deployment will take time to accomplish, NG 9-1-1 systems will improve the reliability of 9-1-1 service because Internet Protocol-based archi-

ture provides more flexibility and resiliency than the legacy circuit-switched 9-1-1 system. In an NG 9-1-1 world, people will be able to make voice, text, or video emergency “calls” from any communications device via Internet Protocol-based networks.

When NG 9-1-1 ultimately becomes widely available, consumers will benefit by having more ways to send information and more types of information that they can transmit. For example, someone who is able to text but not to speak aloud because of the danger they face, or someone who is hearing impaired, will be able to seek and obtain help more easily than now. In appropriate cases, the availability of more types of information—pictures, videos, etc.—may enable first responders to assess emergencies faster and more accurately, and launch a more effective response.

There is much work to do to advance to a full NG 9-1-1 environment. It will not be easy or fast. Consumers will need to be educated about the transition, and must understand that even as NG 9-1-1 introduces new capabilities, voice 9-1-1 calling will continue to have many important advantages and will remain fully supported. We need to make sure that as NG 9-1-1 is deployed, we address the many important and valid concerns that PSAPs have about introducing new technology—so that new technology serves our 9-1-1 professionals rather than the other way around.

One crucial point: Even though the FCC and others are engaged in the hard and important work of helping to make an NG 9-1-1 world a reality in the not-too-distant future, we stress that it is essential to public safety that the FCC, telecommunications carriers, and the public safety community—take steps to improve the E 9-1-1 world as it is today. The public demands this, and rightfully so. As FCC Commissioner McDowell noted, having “[h]ardened and reliable 9-1-1 systems is crucial to the public interest.” The Chairman and other Commissioners, and public safety, demand that we improve the reliability of 9-1-1 in the world as it is today.

The FCC is also looking at what we can do better, including what actions, if any, we can take to improve the process of obtaining information through NORS and DIRS, how we use the information internally, and whether we can communicate better in emergencies with the public and with our partners, Federal and otherwise. As part of those improvement efforts, I note that this past February, the FCC, working with its public safety partners and telecommunication carriers, adopted rules requiring interconnected VoIP service providers to report significant network outages that meet specific criteria and thresholds. The action was a common-sense recognition that interconnected VoIP services have become increasingly popular in recent years. The number of consumers using these services in lieu of traditional telephone service is growing steadily, with more than 87 million residential telephone subscriptions now provided as interconnected VoIP service. This means VoIP platforms are carrying a substantial volume of 9-1-1 calls.

At the end of the day, the bottom line is: All Americans should expect 9-1-1 service to be available not only in “normal,” everyday circumstances where a range of emergencies take place, but especially when it is perhaps most needed most of all—when a major disaster occurs. Our communications networks need to be just as reliable and resilient when there is an enhanced need for emergency assistance, as when there is not. We should never forget that lives depend on it.

Thank you for inviting me to appear before you today. I would be happy to answer any questions you may have.

Mr. BILIRAKIS. Appreciate it very much. I will recognize myself for 5 minutes for questions.

The first question is for Ms. Stempfley. Ms. Stempfley, as you know, I sent a letter to the under secretary, Beers, back in June requesting information on the rumored merger of OEC and NCS. I received a reply a month later, but did really didn’t get a response to my questions.

President Obama, in the mean time, issued Executive Order 13618. It is my understanding this merger will be completed under that authority. Is that correct?

Ms. STEMPFLEY. Thank you very much, sir, for the question, because it really gives me the opportunity to talk about the Office of Cybersecurity and Communications as a whole, and the important focus areas that we have under the Executive Order 13618.

There are several areas in the implementation plan that we have going through staffing process inside the administration right now,

that we are focused on. It includes ensuring that we have broad operational reviews—so the National Cybersecurity and Communications Integration Center, which will be the organization that integrates the operations capabilities of all of the component parts of the Office of Cybersecurity and Communications, including those that are currently in the National Communications System.

It also includes information about the pieces of the Office Emergency Communication and of the National Communication System that are best aligned and integrated with each other.

Finally, it recognizes some of the important points where industry is coming together in strong ways. We want to have consistent stakeholder engagement with our industry partners across the communications and cybersecurity spectrum.

As I said in my opening statement, it is very important for us to focus on ensuring that what this does is improve our service to the public safety community.

Mr. BILIRAKIS. Okay, what does it mean to the merger of OEC and NCS? How will this work to ensure—how will we work to ensure that OEC will not be adversely impacted by this merger? I mean, a lot of people are concerned about this, as you can see and you can understand.

Ms. STEMPFLEY. I certainly can understand. It has always been a priority for the Department to—the public safety community has been a priority for the Department.

What I would say is the statement that merger is too limiting in what we are talking about. As I attempted to point out, we are looking at ensuring that we can bring the best parts of the National Communication System efforts that actually expand on what OEC can do into that, look at what the existing National Communication System does in operations and align that with the broader operations capabilities across the board.

I welcome further dialogue on this with your staff.

Mr. BILIRAKIS. Okay. Well, we will follow up with that.

Ms. STEMPFLEY. Absolutely, sir.

Mr. BILIRAKIS. Discuss now the new Executive Order. How will it impact or change the continuity of communications operations at FCC?

Mr. TURETSKY. The new Executive Order, we think, is a very positive development. The FCC is one of the eight entities on the executive committee. The updating of the order I think, in part, recognizes, at least from an FCC perspective, the tremendous changes that have occurred over time.

I mentioned earlier the development of the DIRS reporting system and the NORS reporting system. These didn't exist a decade or 20 years ago when the prior structure was set up.

We produce in emergencies daily situation reports to help provide information to FEMA and to our other Federal partners about the status of networks, the pace of repair, to help target what the immediate needs are. We do things like respond to requests to send what we call roll call teams out to sites where hurricanes are going to come, to scan the frequencies and determine what is up and operating in terms of broadcast and the like. Then we come back and do it afterward to see what is not operating.

All of these kind of measures have given us a very active role that has changed in the last few years from what was true a long time ago. So from our point of view, a streamlined executive committee that enables us to deal effectively with our partners is a very positive development that will facilitate emergency response.

Mr. BILIRAKIS. Okay. Mr. Turetsky, can you discuss briefly the next generation 9-1-1 and the potential it has to enhance resiliency on the 9-1-1 capabilities? How far, in your estimation—how far out are we in implementing this Nation-wide?

Mr. TURETSKY. We have got a ways to go. This is not going to, in all of its glory, be an answer in the short term. I think it is going to proceed in phases. I think one of the phases that is achievable in the shorter term is texts to 9-1-1.

Texts to 9-1-1 is a very important development for a number of reasons. One, for hearing impaired citizens, it may be the only realistic way in an emergency to reach out and communicate effectively to obtain 9-1-1 help.

Second, in emergencies it may be the only available way for other people. If you think about the kind of situation at Virginia Tech, where you had a shooter going through halls, trying to go into classrooms, you couldn't make 9-1-1 calls very easily in certain of those areas because nobody wanted to be heard. Silence was important.

Well, texting allows for that. It is another way to get help. There are trials going on around the country. Verizon has been a pioneer in these trials. AT&T has just been a pioneer as well, announcing a trial of Tennessee.

Last week, I believe, we received a filing from Vermont that said in a text to 9-1-1 trial, they saved one human life. Someone who was going to commit suicide texted, did not make a call. They were able to get there and prevent that.

So it is very, very promising. We can't wait for it all to be available and operational, the parts of it that will take longer. But there are parts of it we can do sooner rather than later.

Mr. BILIRAKIS. All right, well, thank you very much. Appreciate that.

Now I will recognize my Ranking Member. You are recognized for 5 minutes, Ms. Richardson.

Ms. RICHARDSON. Thank you, Mr. Chairman.

First, Ms. Stempfley, what assurances are that the FirstNet will design and implement the Nation-wide public safety broadband network in a way that would avoid some of the carrier network vulnerabilities that were exposed recently by the storm?

Further, given that carrier networks are not hardened in the same way as public-safety-grade networks to withstand these kinds of storms, was it wise for the NTIA to suspend the early public safety LTE deployment, made possible by the Recovery Act, such as the one that was near completion in the State of Mississippi?

Ms. STEMPFLEY. Ma'am, one of the advantages of the relationship that the Department has with industry is the communications sector, which represents the carriers plus the wired line broadcast and other members, presents an annual National Sector Risk Assessment.

That National Sector Risk Assessment talks about key vulnerabilities that exist across the environment and articulate the actions that the sector is taking as a part of that. This is a plan that is required under the National Infrastructure Protection Plan.

We are using that information to inform the work that is being done by the FirstNet group. So that plan is a part of the work that the Office of Emergency Communications is using as it is helping through the Emergency Communications Preparedness Center and through the FirstNet Advisory Board and others to inform FirstNet and that board as they go forward.

Ms. RICHARDSON. Had they, though, previously considered the impacts of these types of storms that would have been on the system?

Ms. STEMPFLEY. So in the plan, there is certainly the concept of physical issues, whether they be through natural or unnatural causes. It doesn't go into a level of specificity that this storm dictated, but it covers a broad set of efforts.

There is continual work for this sector to do to build more detail into the plan. That work is underway with industry.

Ms. RICHARDSON. Do you anticipate, going forward, that this will, in fact, be considered?

Ms. STEMPFLEY. I do.

Ms. RICHARDSON [continuing]. Suggesting that?

Ms. STEMPFLEY. Yes. Yes, ma'am. I believe it is actually in the physical component of it. Certainly as communications ISAC, which those members are represented on the floor of the National Cybersecurity and Communications Integration Center. We have partners on the floor there, both from the carriers and others.

As that ISAC meets and reviews that process and as that sector coordinating council meets and reviews those activities, a part of the Government contribution to that is articulating what is of interest to the Government. This certainly is—

Ms. RICHARDSON. Okay.

Ms. STEMPFLEY [continuing]. One item of interest.

Ms. RICHARDSON. So if you could communicate that information as it progresses back to the committee—

Ms. STEMPFLEY. Yes, ma'am.

Ms. RICHARDSON [continuing]. It would be helpful.

Mr. Turetsky, can you please tell me why you think the FCC is uniquely qualified to monitor the status of and provide information about the operations of our Nation's communications infrastructure? Couldn't other agencies do the same thing?

Mr. TURETSKY. Thank you for the question. I think the derecho investigation was perhaps one of the illustrations of what is unique about the FCC and what we bring to the table that is hard to duplicate.

As the expert regulator in the communications sector, we have deep relationships across the board with carriers who are wireless or wire lined, with broadcasters, with cable companies, and with all of the other participants in the infrastructure.

We have a Nation-wide jurisdiction in the area that we are talking about today. It includes, as I said, the promotion of safety of life and property through the use of wire and radio communications, which is a very broad jurisdiction.

It enables us to cross all of the lines and dig in with the expertise we have, the jurisdiction we have, to address public safety issues in a way that nobody else can.

Ms. RICHARDSON. Thank you, sir.

Ms. Stempfley, again, I understand that many critics have described the Executive Order 13618 as a potential power grab by the administration. But it is my understanding that the Executive Order is merely an exercise of the authority already granted by the statutes dated back to 1934.

Could you discuss the statutory authorities that support this Executive Order? I only have 28 seconds left.

Ms. STEMPFLEY. Ma'am, Executive Order 13618 is an update of 24-year-old Executive Order 12472. The statutory authority is the same.

Ms. RICHARDSON. Okay. Thank you.

With that, I think I will yield. Thank you, Mr. Chairman.

Mr. BILIRAKIS. Thank you very much.

Now I will recognize Mr. Marino from the great State of Pennsylvania. You are recognized for 5 minutes, sir.

Mr. MARINO. I have no questions at this time.

Mr. BILIRAKIS. Okay.

I now will recognize Mr. Clarke from the great State of Michigan. You are recognized for 5 minutes, sir.

Mr. CLARKE. Thank you, Mr. Chairman. The State of Michigan, parts of it borders Canada. Because of that, I am very concerned that the new broadcast spectrum auction that has been authorized by Congress earlier this year could really pose a problem to many of the people that I represent who are senior citizens or disabled, who are struggling financially, all of whom exclusively rely on local, over-the-air free television for their information, and also to receive their emergency information and news.

The broadcast incentive auction could result, I believe, in the reduction in the number of channels available to local television stations in the metro Detroit area as a result of the likely repacking or reallocation of that spectrum that would occur as a result of the incentive auction.

If that happens, many of the people that are the most vulnerable, less likely to get information from any other source, may not be able to get an emergency alert in the event of an emergency.

Mr. Turetsky, would you commit to work with the Congress to make sure that all Americans, especially the folks that I represent in metro Detroit and those residents that live along the Northern Border, that they would still have access to free local, over-the-air television during an emergency, be able to receive emergency communications?

Mr. TURETSKY. Certainly, Congressman, the kinds of communications you are talking about are very important. The FCC will be working to preserve them.

I am not involved in the incentive auction item that is coming up. But I would be happy to supply a further response in writing on behalf of the commission.

But certainly we very much care about that issue and would want to ensure that there is a continued source of information, as you describe it.

Mr. CLARKE. Thank you very much.

Then on the same note—and I am also concerned. You know, we have had previous disasters where cell phone service has failed. I am from Detroit and that happened many years ago.

If there is a way that we could make sure that these cell phones either, you know, radio receivers in them, or those that already have radio chips, so that they could be activated, so that people would be able to have access, via radio, being able to receive the emergency alerts, that would be helpful as well.

So if that is something that the FCC could also help safeguard, that the emergency communications available through cell phones would have that radio chip in them or have them activated, we would appreciate that.

If you have any comments on that, I would also welcome.

Mr. TURETSKY. I do. We provide a variety of ways that are voluntary for emergency alerts to be received. To the extent you are talking about the FM chip issue, in 2008 the commission considered that issue and decided neither to require it nor to prohibit it.

Since that time, the FM chip has been included in numerous cell phones and is available today from the major carriers. There is certainly a very important value to having access to broadcast. I supplemented during the derecho when I had no power the information I received through other sources with information from WTOP radio and others.

But I did it with a crank radio and I did it when I went into my car. I did it a lot of other ways.

Consumers have a number of options. If they want it from their cell phone, that is an option that is available to them. Right now, I think I would be inclined to leave it to the marketplace.

Mr. CLARKE. Well, thank you. I will follow up with you on that too.

My final comment, Mr. Chairman, is that I would hope that this subcommittee would exercise its oversight jurisdiction to make sure that the broadcast spectrum auction preserves free, over-the-air local television service, especially to those residents that live along the Northern Border.

Thank you very much.

Mr. BILIRAKIS. Thank you. Thank you.

I have one additional question. I will ask the Ranking Member if she has any.

But this is for the two of you: How, if at all, will the Executive Order signed by President Obama apply to FirstNet?

Ms. STEMPFLEY. FirstNet is an independent entity. What the Executive Order provides for is the opportunity for the Federal users to present the resilience requirements of the Federal user to the board, for the board's consideration.

So that would be the means by which the Executive Order applies.

Mr. BILIRAKIS. Would you like to respond, sir, as well?

Mr. TURETSKY. I don't have anything to—

Mr. BILIRAKIS. Okay.

Mr. TURETSKY [continuing]. To add.

Mr. BILIRAKIS. All right.

Representative, do you have any questions? Any questions for them? Any additional questions?

Mr. Clarke.

Okay. Thank you very much for your testimony. Appreciate it. Thanks for your patience as well.

Now I will dismiss the first panel. We will get right into the second panel.

We are expecting votes around 4:45. So we are going to try to finish up. We will finish up before the next votes.

I welcome our second panel. Our first witness is Mr. Kyle Malady. Mr. Malady is a senior vice president for the Global Network Engineering and Operations at Verizon, where he is responsible for the planning, design and operation of Verizon's global voice, data, and I.P. network.

He previously served as the vice president of network and technology at Verizon Wireless, and began his career with NYNEX Mobile Communications. Mr. Malady has earned his degree in mechanical engineering from the University of Bridgeport in Connecticut, and his MBA in finance from NYU.

Following Mr. Malady, we will receive testimony from Mr. Terry Hall. Mr. Hall is a communications manager with the York County Virginia Regional Emergency Communications Center, and has been appointed by the governor of Virginia to the State E 9-1-1 Service Board.

Mr. Hall currently serves as the president of the Association of Public Safety Communications Officials.

Next, we will receive testimony from Mr. Trey Forgety. Mr. Forgety is the director of government affairs and regulatory counsel for the National Emergency Number Association, a position he has held since 2010. Prior to joining NENA, Mr. Forgety served for 2 years a presidential management fellow in the Department of Homeland Security's Office of Emergency Communications.

He has also worked with the FCC's Public Safety and Homeland Security Bureau, and at NTIA. Mr. Forgety attended the University of Tennessee, where he got both his bachelors of science and applied physics and his J.D.

Finally, we will receive testimony from Mr. Chris McIntosh. Excuse me. Mr. McIntosh is the Commonwealth of Virginia State-wide interoperable communications coordinator. He also served as the operations section chief at the Virginia Department of Emergency Management and has worked in the private sector in support of the Department of Homeland Security's Virtual USA Program.

Mr. McIntosh served in the United States Navy—thank you for your service—as a surface warfare officer. Mr. McIntosh earned his B.A. in history from Penn State University.

Welcome. We look forward to your testimony. Your written statements will appear in the record. I ask that you summarize for 5 minutes.

We will start with Mr. Malady. You are recognized, sir, for 5 minutes.

**STATEMENT OF KYLE MALADY, SENIOR VICE PRESIDENT,
GLOBAL NETWORK ENGINEERING AND OPERATIONS,
VERIZON**

Mr. MALADY. Thank you, Mr. Chairman. Good afternoon to you and to the Ranking Member Richardson and Members of the subcommittee.

I am pleased to appear today to discuss Verizon's provision of 9-1-1 services. I will specifically focus on the impact that a severe storm had on the 9-1-1 network in northern Virginia in late June. I will discuss the lessons we learned from that event, and the steps we have taken to solidify our resilience to natural disasters and commercial power outages.

Verizon provides service to over 1,500 9-1-1 call centers across the country. These centers are referred to as Public Safety Answering Points, or PSAPs. Our network connects people who need assistance to each PSAP, where they can speak with personnel trained to handle such emergency calls.

During a typical month, we deliver, on average, over 14.5 million calls to the PSAPs. Verizon is proud to be a part of the 9-1-1 ecosystem. We take very seriously the important role our networks play in ensuring 9-1-1 services are always available, particularly in times of crisis.

Verizon designs its network to be fault tolerant. In fact, our 9-1-1 networks' designs include multiple levels of diversity and redundancy. If a particular call route is not working, we send the call over another route to the PSAP automatically.

We also equip our critical facilities with back-up power sources. If we lose commercial power, the facility is designed to continue operating via a combination of built-in batteries and generators.

We try to prepare for all reasonable contingencies in emergency planning, to ensure that the 9-1-1 network is available 24/7. But emergency preparedness is an ever-changing and on-going process.

So if our systems do not work as planned or if a storm or other event reveals opportunities for further improvements, we will be proactive in implementing appropriate changes.

The June storm provided valuable lessons that allow us to improve our ability to handle 9-1-1 calls and better serve the public and our PSAP partners. So here is what happened in northern Virginia as a result of the recent storm.

On Friday, June 29, a severe storm hit the Mid-Atlantic region with unusually intense straight line winds. This derecho caused widespread commercial power outages in the D.C. Metro area, and widespread damage to Verizon's network.

It downed more poles than Hurricane Irene did in 2011. We lost commercial power in more than 100 locations. Almost everywhere, our back-up power systems kicked in. The batteries and generators worked as designed, allowing us to continue service. We were able to maintain 9-1-1 service to the vast majority of the more than 200 PSAPs we serve across the storm's path.

However, generator failures at our Fairfax and Arlington facilities disabled hundreds of network systems, and causing us to lose our ability to monitor the network in the impacted area.

These generator failures also caused a loss of 9-1-1 service to four PSAPs. Our backup power systems should have withstood the

derecho without the resulting 9-1-1 outage, but they did not. That is why we are making three key improvements, above and beyond repairs to the generators that failed, that will minimize the risk of 9-1-1 service disruptions in the event of future power outages.

First, we are currently performing rigorous power system audits in all mission-critical facilities supporting 9-1-1 in the D.C. Metro area. We will complete these audits by the end of October. We will also perform the same audits Nation-wide and complete them by March, 2013.

We will take corrective measures, identify these power audits right away.

Second, we are instituting new emergency procedures for testing, power restoration, and personnel mobilization. We could have restored service sooner if we recognized more quickly the partial power outage in Fairfax. We have developed procedures to accurately assess and effectively communicate the status of our power systems.

This activity has been completed for the sites in northern Virginia, and is underway for the rest of our service area.

Third, we are redesigning our systems to enhance the survivability of our monitoring systems. This new design will include new equipment and more diverse network connections. Much of this redesign will be in place Nation-wide in 2013.

We are also working with the PSAPs to improve communications during an emergency or system failure. Over the past few years, Verizon has established robust processes to communicate with the PSAPs during such events.

However, as a result of this storm, the northern Virginia PSAPs have made recommendations on how to improve communications, which we are supportive of and are working to implement.

We must also improve our overall communications to the public during events such as this. We will share additional information about the future storm impacts and our restoration efforts more quickly, in a more easily understood manner.

So in summary, Mr. Chairman, Verizon understands the critical role of 9-1-1 services to the community. We are applying improvements and lessons learned from the derecho in the D.C. Metro area and in other areas to other areas in our service territory as well, so that 9-1-1 services are always available whenever needed.

Thank you. I look forward to answering any questions you have.

[The prepared statement of Mr. Malady follows:]

PREPARED STATEMENT OF KYLE MALADY

SEPTEMBER 12, 2012

Good afternoon, Mr. Chairman and Members of the subcommittee. I am pleased to appear before you today on behalf of Verizon to discuss our company's role in the provision of 9-1-1 services, the impact that a severe storm had on the 9-1-1 network in northern Virginia in late June, the lessons we have learned from that event, and the subsequent steps we have taken to further solidify our resilience to natural disasters and commercial power outages.

VERIZON DESIGNS ITS NETWORK TO MAKE 9-1-1 SERVICE AVAILABLE EVEN IN A CRISIS

Verizon provides service to more than 1,500 9-1-1 call center locations (referred to as "Public Safety Answering Points" or "PSAPs") around the country. The role of our network is to connect callers to the personnel trained to respond to emergency

calls in each PSAP. Verizon is proud to be a part of the larger 9–1–1 ecosystem, and we take very seriously the important role our networks plays in ensuring 9–1–1 services are available around the clock—and, particularly, in times of crisis. Accordingly, Verizon designs its network to be fault tolerant so that we can continue to provide 9–1–1 services even during natural disasters and the commercial power loss and network damage that often come with them.

Our 9–1–1 network designs include multiple levels of diversity and redundancy, so that—if a particular call route is not working—we can send the call over another route to make sure it gets through to the PSAPs. Similarly, Verizon equips its critical facilities with back-up power sources, so that—in the event we lose commercial power at those facilities—the network will continue operating and callers can still place 9–1–1 calls reliably. Specifically, Verizon deploys a combination of built-in batteries and generators at critical facilities to support operations during a commercial power failure; the batteries provide an immediate source of power following the loss of commercial power until the generators go on-line (which is designed to occur automatically), and then the batteries act as the back-up power source should the generators fail.

In these and other ways, Verizon tries to prepare for all reasonable contingencies in its emergency planning to ensure that the 9–1–1 network is available whenever needed. But emergency preparedness is not static; it is an ever-changing and on-going process. So, if our systems do not work as planned or if a storm or other event reveals opportunities for further improvements, Verizon has been and will be proactive in implementing appropriate changes. Verizon recently experienced just such an event, and we have learned valuable lessons that will allow us to improve our ability to handle 9–1–1 calls and serve PSAPs on a going-forward basis, even when we lose commercial power to our own facilities.

THE JUNE 29, 2012 DERECHO AND ITS IMPACT ON THE 9–1–1 NETWORK IN THE MID-ATLANTIC STATES

Late in the evening of Friday, June 29, 2012, a severe storm hit the Mid-Atlantic region with unusually intense straight-line winds. This “derecho” caused widespread commercial power outages in the Washington, DC, Virginia, and Maryland area, and widespread damage to Verizon’s networks. Indeed, the derecho downed more poles and generated more commercial trouble tickets for Verizon than even Hurricane Irene did in August 2011. As a result of the derecho, Verizon lost commercial power in more than 100 locations.

At each of these locations, Verizon’s emergency back-up power systems kicked in, with batteries and nearly all the back-up generators working as designed, allowing us to continue service. However, one of two back-up generators failed to start at each of the Fairfax and Arlington facilities, disabling hundreds of network transport systems, and causing Verizon to lose much of its visibility into—or ability to monitor—the network in the impacted area.

While Verizon was able to maintain 9–1–1 service to the vast majority of the more than 200 PSAPs it serves across the storm’s path, these two generator failures caused a loss of 9–1–1 service to four PSAPs in northern Virginia. Three of these PSAPs (Fairfax County, Prince William County, and Manassas) did not receive 9–1–1 calls for several hours Saturday, June 30, and the other (Manassas Park) did not receive 9–1–1 calls for much of that weekend. In addition, a number of area PSAPs (including those four) faced other 9–1–1-related problems, consisting primarily of a lack of delivery of location information on 9–1–1 calls and the loss of administrative and back-up phone lines.¹

VERIZON IMMEDIATELY INVESTIGATED AND IDENTIFIED THE CAUSE OF THE TEMPORARY 9–1–1 OUTAGES

Immediately following the temporary loss of 9–1–1 service to these four PSAPs, Verizon launched an investigation to determine the cause of the outages. Our investigation determined that the 9–1–1 disruptions were caused when, following the loss of commercial power, one of two back-up generators at each of our Arlington and Fairfax central office locations failed to start. Multiple failures cascading from these

¹ Location information, referred to as Automatic Location Identifier (“ALI”) information, automatically provides the PSAP with the address of 9–1–1 callers using landlines. Callers can dial 9–1–1 and reach the PSAP even if the ALI systems are not operating, and the PSAP can dispatch the appropriate public safety response. In these cases, however, a 9–1–1 call-taker must obtain location information from the caller rather than the information appearing automatically. In addition, the Arlington County PSAP’s regular business lines (which could also be used during emergencies) were not working because of the problems at the Arlington central office, explained in more detail below.

specific generator problems and damage to Verizon's transport network combined to cause the outages for the four PSAPs. Included among those failures were systems that enable us to monitor the condition of our network facilities in northern Virginia, and that loss of visibility over our network hindered our initial efforts to assess and repair damages.

Arlington Facility.—The Arlington facility has two generators that must operate in tandem to support all of the equipment at the site. At 10:55 PM on June 29, 2012, the Arlington facility lost commercial power. One of the two generators started, but the other did not. The single running generator could not support the entire site load, became overloaded, and shut down as designed. Back-up batteries served the office's equipment into the morning of June 30. A power technician arrived at 12:28 AM on June 30, but despite best efforts throughout the night, could not get the second generator started. At approximately 5:00 AM on June 30, the batteries drained completely and network equipment failed.² Verizon deployed additional resources, working in parallel both to start the second generator and prepare a replacement mobile generator. Commercial power was restored at 12:45 PM, before those efforts were completed.

Verizon since has conducted extensive testing using third-party experts to determine why the second generator in the Arlington facility did not start. We determined that air had entered the fuel system, resulting in a lack of fuel in the lines. We have since replaced the fuel lines for both of the back-up generators at the Arlington facility (even though no leaks were found in the generator that started).

Significantly, during the period while power was out in Arlington, Verizon lost use of its telemetry systems located at that facility, which ordinarily allow Verizon to monitor its network and other facilities in northern Virginia. When Verizon lost its Arlington telemetry systems, it lost its ability to monitor and identify problems at other northern Virginia locations, including the Fairfax facility. Once power was restored in the Arlington office, we began to regain our visibility into the network at large.

Fairfax Facility.—The Fairfax facility has two generators that each support specific components of network equipment in the location when commercial power is lost. At approximately 10:35 PM on June 29, the Fairfax facility lost its commercial power. One of the generators started and supported its equipment as designed. The other generator did not start, so back-up batteries served the corresponding equipment into the morning of June 30. At approximately 6:15 AM, the batteries completely drained and the network equipment in the specific section of the facility served by the inoperable generator failed. Throughout this period, the other generator supported its network equipment in the rest of the building.

That morning, because we had lost visibility to the network in the area, the decision was made to send technicians to various facilities, including Fairfax. A central office technician arrived at the site at 7:30 AM, but did not immediately recognize that one section of the facility was not on generator power. At approximately 9:45 AM, the central office technician realized there was an issue in one section of the building and called for a power technician. The power technician arrived at the Fairfax facility at approximately 11:30 AM, investigated the power plant, determined that the second generator had failed to start, initiated the starting procedures, and brought the generator back on manually by 12:15 PM. Verizon immediately started restoring the equipment in the office and bringing services back online.

Verizon conducted extensive testing using third-party experts to determine why the second generator did not start at this location, ultimately concluding that the Fairfax generator did not start because the auto-start mechanisms failed. Those mechanisms are designed to automatically start the generator once commercial power is lost, but they did not operate correctly and since have been replaced.

AS RESULT OF THE DERECHO OUTAGES, VERIZON IS MAKING SEVERAL PROACTIVE IMPROVEMENTS TO ENSURE THAT 9-1-1 SERVICES REMAIN AVAILABLE IN THE EVENT OF COMMERCIAL POWER LOSS

In addition to implementing the specific fixes identified above, Verizon is committed to making the following additional improvements that will minimize the risk of 9-1-1 service disruptions in the event of commercial power loss in the future.

Changes to Address Generator System Failures.—As described above, we suffered key generator system failures that were different in each of the two locations. The specific failures that occurred at those two locations have been repaired, but we are

²Some network equipment is more sensitive to low voltage and failed before the batteries were completely exhausted.

extending our review to other critical locations to address any other potential issues. In particular, Verizon is conducting back-up power system audits in the mission-critical Verizon facilities supporting 9-1-1 in Virginia, Maryland, and Washington, DC, and will institute any corrective measures identified in those power audits. For example, we have already completed the Arlington audit and are instituting an automated controls process to prioritize system load shedding (e.g., to support telemetry over other, less critical functions) in case one of the two generators fails.

Instituting New Emergency Practices and Procedures.—Our investigation determined we could have improved our restoration of service had we: (i) Recognized more quickly the partial power outage in Fairfax, and (ii) been able to power some network equipment (e.g., telemetry systems) on the one generator in Arlington that was working. Accordingly, Verizon has developed and posted at each location a set of site-specific back-up power system assessment procedures that can be used by any employee to determine if there is a loss of power to an area of a building. Verizon also is developing and will post at each location a site-specific set of procedures on how to manually start a generator that does not start automatically and how to transfer certain functions from a non-working generator to be powered by a working unit, including instructions on how to serve system loads on a prioritized basis (i.e., with available power to be used for more critical functions first). And, to help ensure that back-up power will work when needed, Verizon is enhancing our “Black Out” testing at critical facilities. Under the new approach, we will continue to test our back-up power systems regularly (as we have been doing), but will enhance this existing testing by including tests for “failed automated controls” and “prioritized system load transfer” scenarios.

Improvements to Communication and Mobilization.—Verizon has maintained a standard practice of internal mobilization to address service disruptions or outages based on their actual or potential service impacts. This process is triggered by alarms in the system, but—in the case of the northern Virginia outages—the loss of visibility prevented us from receiving these alarms and, therefore, delayed our response. To avoid this issue going forward, Verizon will create two new event criteria for notification and mobilization purposes. We have enhanced our notification and mobilization procedures to trigger activity more quickly when back-up batteries are activated or when telemetry is lost. These events now will trigger a response that will lead to quicker escalation with greater resources.

Redesign the Telemetry Systems to Avoid Loss of Visibility to Multiple Sites.—As noted above, Verizon’s ability to identify and address outages was impeded by the loss of telemetry functions at the Arlington office. To avoid a similar problem in the future, Verizon will redesign its telemetry network to include more diverse connections and failover (alternative) locations, so that—if telemetry is unavailable at one location—those critical functions can be carried on at other facilities.

IN ADDITION TO INTERNAL IMPROVEMENTS TO ADDRESS THE GENERATOR-STARTING PROBLEMS, VERIZON IS WORKING WITH PSAPS TO ADDRESS PSAP-SPECIFIC ROUTING ISSUES

As noted above, Verizon’s 9-1-1 design provides multiple diversities or redundancies “inside the network.” There are multiple tandem offices providing routing so that, if one fails, the calls to the failed office are routed through the other(s). Also, Verizon’s ALI databases and links to each ALI database are redundant, as are Verizon’s signaling systems, which route calls to their destinations. However, Verizon’s analysis of the network impacts following the derecho has identified areas for improvement—especially with ALI diversity—for certain, specific PSAP configurations. Since those specific PSAP configurations are highly sensitive and confidential to those PSAPs, and present security issues, they cannot be publicly disclosed. However, Verizon is committed to working directly with the specific PSAP partners to decide on improvements for their particular configurations to minimize the risk of 9-1-1 service disruptions in the future.

VERIZON IS WORKING WITH THE PSAPS TO IMPROVE COMMUNICATIONS DURING AN EMERGENCY OR SYSTEM FAILURE

Over the past few years, Verizon has established robust processes to communicate with PSAPs during an emergency or system failure, particularly during high-volume (also known as “mass calling” or “focused overload”) situations. In fact, Verizon has a large team entirely dedicated to communicating with PSAPs. These processes generally worked well during the derecho, as Verizon stayed in frequent communication with PSAPs during the 9-1-1 outages, including sending automatic notifications to PSAPs when certain alarms were triggered. But, once Verizon lost its telemetry, we did not have the specific information needed by the PSAPs to understand the impact

of the event and plan for alternatives. Likewise, certain automatic notifications that go to PSAPs stopped when the alarms stopped.

As discussed above, Verizon is redesigning its telemetry systems so it can retain its visibility into its network even when telemetry is lost at one location, and that will improve the utility of the communications with PSAPs in the face of catastrophic failures. But there are other ways in which Verizon can improve its communications with PSAPs during a crisis.

The 9-1-1 directors of the city of Alexandria, and the counties of Arlington, Fairfax, Loudoun, Prince William, and Stafford have recommended that Verizon adopt five steps in response to the storm, primarily focused on communications. These recommendations include: (1) Adopting and utilizing the National Incident Management System (NIMS) model to address and mitigate any and all significant events/incidents impacting providing 9-1-1 service; (2) utilizing a system to notify the PSAPs, via voice and text, as soon it is known or suspected by Verizon that there is or may be an interruption of 9-1-1 service; (3) developing a method to conduct a semi-annual drill/exercise on actions to be taken in the event of a potential or actual 9-1-1 outage; (4) providing a current contact list during the first week of each month for the Verizon account manager assigned to each PSAP jurisdiction and the four immediately escalating Verizon personnel up to a vice president level; and (5) having a Verizon representative be present at the jurisdictions' Emergency Operations Center (EOC), to provide current, accurate information concerning 9-1-1 service and outages, other telephone service, etc. and liaison with other parties staffing the EOC, when the EOC is activated.

Verizon believes these recommendations are constructive, and we have already taken steps toward working with the 9-1-1 directors to most effectively implement these concepts.

VERIZON IS COMMITTED TO BETTER COMMUNICATION WITH THE PUBLIC DURING AN EMERGENCY

Verizon also is committed to improving communications with the public during outages. In the future, when we face significant network-related issues like those caused by the derecho, Verizon will share additional information about our restoration efforts more quickly to provide greater insight regarding the extent of the impact to our subscribers and the expected duration of the restoral efforts. We are mobilizing a more robust emergency response communications process to ensure that media outlets and other channels are provided relevant information on a timely basis.

VERIZON ALSO IS COMMITTED TO LOOKING AT THE NEXT GENERATION OF 9-1-1 SERVICES

In addition to looking at issues directly related to the derecho, Verizon has commented extensively on the appropriate way to develop Next Generation 9-1-1 services ("NG 9-1-1") at the Federal Communications Commission, which has a rule-making proceeding pending on the subject. NG 9-1-1 takes into consideration the evolution of network technologies, and contemplates the move to an IP-enabled 9-1-1 system. Verizon strongly supports a standards-based and efficient transition to NG 9-1-1, which must involve more than just PSAPs and their 9-1-1 networks if it is to be deployed successfully. Wireline, wireless, and VoIP service providers, device and network equipment manufacturers, app providers, State and local governments, and consumers themselves must be involved if we are to realize the public safety benefits of an end-to-end IP-enabled NG 9-1-1 system. Verizon is committed to doing its part and is engaged in the development of NG 9-1-1 standards and products across its business units.

With the right funding mechanisms, PSAPs could make the necessary investments in NG 9-1-1 architecture and provide an overall increase in 9-1-1 system reliability. The architecture contemplates that all critical components would be deployed with no single point of failure, and that services are provided in a manner to survive disaster, deliberate attack, and massive failure—which would require a redundant and geographically diverse design. And full NG 9-1-1 is dependent upon end-to-end IP communications, which has the capability to dynamically reroute traffic and improve redundancy, and to dynamically re-route 9-1-1 calls to established back-up PSAPs or even virtual PSAPs that can efficiently serve multiple jurisdictions. Still, no network can be fully immunized from natural and man-made disasters, so PSAPs will still need to incorporate recommendations for reliability and security into migration plans as appropriate. Verizon looks forward to working with the PSAPs as part of its continued participation in NG 9-1-1 development.

VERIZON HAS DEVELOPED TEXT-TO-9-1-1 CAPABILITIES

In further recognition of consumers' changing communications demands, Verizon Wireless has voluntarily developed an interim SMS-to-9-1-1 solution to supplement the existing 9-1-1 networks, and we are committed to deploying this solution to capable PSAPs beginning in late 2012 or early 2013. This would allow the public to contact 9-1-1 through text messaging, providing another means to contact PSAPs during an emergency, in addition to voice 9-1-1 calls.

As a general rule, however, Verizon expects that SMS-to-9-1-1 communications can be affected by outages in much the same way (and to largely the same degree) as voice 9-1-1 calls. That is because the interim SMS-to-9-1-1 solutions currently under development all rely on existing radio, SMS, and PSAP architecture. Thus, cell site outages would affect SMS-to-9-1-1 communications just as they would voice. And, within a PSAP's facilities, an outage of the PSAP's network would also necessarily affect SMS-to-9-1-1 traffic flowing over that network. By the same token, PSAPs also may have limited SMS-to-9-1-1 "call-taking" capabilities. Accordingly, while Verizon has been working on a text-to-9-1-1 option, there is a broad consensus that—as the first option—users can and should be instructed to make a voice call to 9-1-1, if possible. Or stated differently, I would caution that we should not rely heavily on alternate legacy technologies, such as SMS-to-9-1-1, as a substantial alternate mechanism of reaching 9-1-1 in emergencies. Instead, policy-makers at all levels should remain focused on the transition to end-to-end IP-enabled NG 9-1-1 services.

CONCLUSION

Verizon understands the critical role of 9-1-1 services to the community, and is committed to making improvements to avoid the issues that occurred during the derecho and otherwise to ensure that the next generation of 9-1-1 services are available to the public. Verizon will improve its internal processes and procedures and work directly with the PSAPs, as described above, to implement the lessons learned. And we will look to apply improvements and lessons learned from the Washington metropolitan area to other areas in our service territory as well, so that 9-1-1 services are available whenever needed.

Mr. BILIRAKIS. Thank you very much.

Mr. Hall, you are recognized for 5 minutes, sir.

**STATEMENT OF TERRY HALL, PRESIDENT, APCO
INTERNATIONAL**

Mr. HALL. Good afternoon, Chairman Bilirakis, Ranking Member Richardson, and Members of the subcommittee. My name is Terry Hall, and I am the current president of the Association of Public Safety Communications Officials, known as APCO.

I am also the chief of emergency communications for the York-Poquoson-Williamsburg Regional Emergency Communications Center in York County, Virginia.

APCO is the world's largest organization of public safety communications professionals. It includes members from police, fire, emergency medical services, as well as public safety answering points and emergency operation centers.

Thank you for the opportunity to speak with you today about the importance of resilient communications.

Certainly, the need for resiliency was engrained into the design of my own communications center in Hampton Roads. I made sure to build resilience in the communications center based on my years of experience in coping with the loss of commercial power and loss of telephone network outages.

Although highlighted by the recent derecho storm last June, outages are not all that uncommon and are also not specific to any one telephone company. The public safety community attempts to insulate themselves from telephone companies.

As an example, in York and James City Counties in Virginia, we bypassed the telephone network by directly connecting two public safety answering points together via our own microwaves systems.

The widespread 9-1-1 disruptions that followed the derecho forced APCO members to operate 9-1-1 communication centers under very severe and frustrating conditions. Power losses and back-up power failures at Verizon contributed to 9-1-1 outages.

9-1-1 call-takers and dispatchers, in their typical professional fashion, acted very appropriately to save lives and property using the best information and resources they had on hand.

Nothing unique to the derecho caused the failures at Verizon generators. As Verizon reported, one of its generators failed due to air in the fuel line, and another failed due to a defect in its auto-start mechanism. Thus, as we consider steps to make emergency communications more resilient, we must not overlook the importance of compliance with existing requirements and procedures.

APCO is a National standards-making body. One of the standards we continue to address is network monitoring. Verizon's power and back-up power failures should have resulted in an immediate alarm and an urgent response.

Carriers should test their generators and uninterrupted power supplies under load conditions regularly, and promptly report the test results to the Federal Communications Commission, and complete a successful retest if required.

Further, when systems fail, carriers must immediately provide 9-1-1 centers with meaningful and actionable information.

APCO looks forward to the deployment of next generation 9-1-1 technology, which holds great promise to assure a level of diverse and redundancy that greatly exceeds current capabilities we have in our communication centers today.

Let me next remark on yesterday's 11th anniversary of the events of September 11, and how we remain very appreciative of the work of this Congress in passing Public Safety Provisions Act of the Middle Class Tax Relief and Job Creation Act of 2012.

By sheer coincidence, the statutory deadline for the appointments to the Nation-wide governance body established under this legislation, called the First Responder Network, or FirstNet, fell during APCO's annual conference on August 20.

We were honored that the acting secretary of commerce, Dr. Rebecca Blank, announced the non-Federal board members of FirstNet at our conference. The technology that will be deployed for public safety broadband network, the public/private partnerships to come, and the various statutory requirements put forth by responsibilities of FirstNet will lead to a very highly reliable, secure, and resilient network.

In sum, APCO looks forward to working with this subcommittee and all stakeholders to ensure that public safety communications reach a new level of resiliency and sophistication.

Thank you again for the invitation to appear before you. I welcome any questions you may have.

[The prepared statement of Mr. Hall follows:]

PREPARED STATEMENT OF TERRY HALL

SEPTEMBER 12, 2012

Good afternoon, Chairman Bilirakis, Ranking Member Richardson, and Members of the subcommittee. My name is Terry Hall and I am the president of the Association of Public-Safety Communications Officials, International, known as APCO. I am also the chief of Emergency Communications for the York County Regional Emergency Communications Center in Virginia. APCO is the world's largest organization of public safety communications professionals, including members from police, fire, and emergency medical services, as well as 9-1-1 public safety answering points, referred to as PSAPs, and emergency operations centers.

Thank you for the opportunity to speak with you today about the importance of resilient communications for the public safety community. This is a timely topic and I'm pleased to see this subcommittee's interest in exploring these issues.

Certainly, the need for resiliency was engrained into the design of my Communications Center in York County. I made sure to build redundancy into this center based on my years of experience coping with the loss of commercial electrical power and telephone network outages. As the project manager for the regional public safety radio communications system in that part of Virginia, I also am aware of the need for highly reliable communications networks that survive natural and man-made disasters. My experience with the importance of network resiliency and reliability was especially enlightened during my deployments as an urban search-and-rescue and disaster medical assistance team member following Hurricanes Katrina, Rita, Isabelle, and Gustav.

Although highlighted by the recent "derecho" storm last June that wreaked havoc in the DC area, 9-1-1 outages are not all that uncommon—such outages have occurred across the country for decades, with a variety of causes, and are not specific to any one telephone company. This has led some in the public safety community to attempt to insulate themselves as much as possible, as I have done in York County, from outages occurring at telephone company facilities that could adversely impact 9-1-1 call centers. In York and James City Counties, for example, we bypassed the public telephone network by directly connecting two public safety answering points for redundancy purposes.

We applaud the recent efforts of the Federal Communications Commission to explore the causes and potential solutions of 9-1-1 outages. APCO recently filed public comments with the FCC on August 17.

As APCO pointed out in its comments, the June derecho storms cut off electricity to millions, caused substantial property damage, and, most regrettably, loss of life. The storms also led to widespread and unusually extended disruptions to 9-1-1 service in several areas, especially in the northern Virginia suburbs of Washington, DC.

During and following the Derecho storms, many of APCO's members were forced to operate 9-1-1 call centers under severe and frustrating conditions. At least a portion of the 9-1-1 outages were a result of power losses in Verizon's Central Offices and subsequent backup power failures. Despite these adversities, 9-1-1 call takers, in their typical professional fashion, acted appropriately to save life and property using the best information and resources they had available to them at the time.

It's important to note that while the June 29 derecho was unique in its ferocity, nothing unique to the derecho caused the 9-1-1 failure. As Verizon reported, one of its generators failed due to air in the fuel line; another failed due to a defect in its auto-start mechanism. This suggests that as we consider additional requirements and procedures to make emergency communications more resilient, we must not overlook the importance of compliance with and proper execution of the requirements and procedures that are already in place.

APCO is a National standards-making body in the area of public safety communications. These standards address many of the areas that governing authorities and call center managers must consider when assessing their level of preparedness and survivability against a wide range of natural and man-made events. One of the standards addresses network monitoring. A failure of power and back-up power at Verizon's central office should have resulted in an immediate alarm state at its network operations center and should have generated an urgent response by carrier maintenance crews and technicians to resolve issues and restore generator power. Instead, it seems that Verizon personnel were not fully aware of the equipment failures and the subsequent impact on 9-1-1 call delivery. Therefore, carriers should test their generators and uninterrupted power supplies (UPS) under load conditions regularly, and report the results of their tests to the FCC's Public Safety & Home-

land Security Bureau within 3 business days, and complete a successful retest if needed and report those results within 24 hours.

Compounding the impact of the 9-1-1 outages was the lack of outage reporting and other communications from Verizon to emergency call centers. In critical times of outages when systems fail, it is imperative that there be direct contact between emergency call centers and an on-call representative of the local carrier. Verizon has acknowledged that the normal means of such communication was itself disrupted by the outages. 9-1-1 centers need immediate, meaningful, and actionable information concerning outages impacting the carriers that serve them.

Carriers should establish hardened and redundant links to disseminate outage information to emergency call centers in their service areas. They should also utilize and regularly test an emergency notification system that would timely notify public safety officials of any events that impact the delivery of or ability to make 9-1-1 calls.

Today's 9-1-1 networks are based upon many decades-old technologies, which have their own inherent limitations and challenges. Thus, while as mentioned earlier, service providers could implement a number of sensible improvements right away to assure better resiliency, APCO also looks forward to working with local exchange carriers and other 9-1-1 system service providers as Next Generation 9-1-1 technology is deployed. NG 9-1-1 holds great promise to assure a level of diversity and redundancy that greatly exceeds current capabilities.

Let me next remark on yesterday's 11th anniversary of the events of September 11, and the transformation in public safety communications we are about to witness with enactment of the public safety provisions of the Middle Class Tax Relief and Job Creation Act of 2012. We at APCO remain very appreciative of the work of this Congress in passing this especially important legislation, which will enable the deployment of an advanced, public safety broadband network with a Nation-wide level of interoperability from the start.

By sheer coincidence, the statutory deadline for the appointments to the Nation-wide governance body established under this legislation, the First Responder Network Authority, or "FirstNet," fell during APCO's annual conference on August 20. We were honored to have hosted Acting Secretary of Commerce Dr. Rebecca Blank at our conference as she publicly announced the non-Federal board members. We look forward to working with the FirstNet Board to successfully implement the public safety legislation.

Similar to the promise of Next Generation 9-1-1 technology, the Long Term Evolution or "LTE" technology that will form the basis of the public safety broadband network will inherently lead to improved resiliencies and redundancies in wireless broadband communications. Furthermore, the legislation itself rightly mandates that in carrying out its duties and responsibilities, FirstNet is to ensure the resiliency of the network. This extends to FirstNet's obligation to consult with State and local jurisdictions concerning the adequacy of hardening, security, reliability, and resiliency requirements. Finally, I am hopeful that with the legislation's emphasis on establishing public/private partnerships with a variety of commercial mobile service providers, infrastructure owners, and backhaul providers, this too will lead to a highly resilient, advanced wireless broadband communications network for first responders.

APCO looks forward to working with this subcommittee and all stakeholders to ensure that public safety communications reach a new level of resiliency and sophistication.

Thank you again for the invitation to appear before you, and I welcome any questions you may have.

Mr. BILIRAKIS. Thank you, sir.

Mr. Forgety, I apologize for mispronouncing your name earlier. You are recognized for 5 minutes.

STATEMENT OF TREY FORGETY, DIRECTOR OF GOVERNMENT RELATIONS, NATIONAL EMERGENCY NUMBER ASSOCIATION

Mr. FORGETY. Thank you, Mr. Chairman and Representative Richardson. Thank you to the entire committee for holding this hearing on the reliability of emergency communication systems.

9-1-1 is the critical link between the public and emergency responders. It is imperative that 9-1-1 systems always work. Over the past 44.5 years, 9-1-1 systems and the carrier networks that

they are based on have served the public reliably and well. That is why I believe that, in some ways, 9-1-1 has fallen victim to its own success.

The public and policy makers at all levels of government know 9-1-1 as a service that just works, and often fail to consider the level of effort it takes to deploy, operate, and maintain 9-1-1 systems.

Over the last 10 years, the Department of Homeland Security has expended billions of dollars to improve planning, coordination, and equipment for aging land mobile radio systems and to transition those systems to broadband technology.

At the same time, DHS has devoted little time, attention, or money to planning for or executing the transition from legacy E 9-1-1 systems to I.P.-based next generation 9-1-1. NENA is very much looking forward to working with DHS to ensure that the next version of the now 4-year-old National Emergency Communications Plan will devote more than a single vague milestone to improvements in 9-1-1 service.

Despite the lack of attention from the broader homeland security enterprise, however, the 9-1-1 community at the local and State levels has achieved remarkable successes. Even under the extraordinary budget pressures of the last 4 years, States like Alabama, Tennessee, Vermont, and Washington have deployed NG 9-1-1 systems or precursor networks and technologies, such as broadband-based voice over I.P. transport for 9-1-1 calls and 9-1-1 text messaging pilots.

Similarly, the 9-1-1 community is providing its own support for disaster situations by self-organizing teams of telecommunicators who can relieve overwhelmed call center staff when a disaster strikes.

Just recently, one of these teams based out of Texas relieved telecommunicators at the St. John the Baptist PSAP in Louisiana when Hurricane Isaac kept them at their posts for more than 40 hours straight.

Here I would like to commend officials from the DHS National Communication System and the National Cybersecurity and Communications Integration Center, or NCCIC, for assisting that team with access to the affected area and routing support.

These examples show how States that appropriately use the more than \$3 billion that consumers are charged each year for 9-1-1 service are reaping the benefits of their responsibility. On the other hand, the lack of support for transitional costs associated with the move to more resilient Next Gen 9-1-1 system architecture, and the continuing diversion by some States of 9-1-1 service fees to purposes other than 9-1-1 system operation or improvement represent key risks to our Nation's future security.

One scenario I think illustrates this point better than any other. Everyone here will no doubt recall the failed Times Square bombing attempt. Now that terrorist plot was foiled when a member of the public saw something suspicious and said something to 9-1-1.

Having 9-1-1 service available makes it possible for the public to quickly contact the authorities and for field responders to quickly locate the origin of the call and to respond effectively.

Had an NG 9-1-1 system been in place in New York, the caller that stopped that attack might have easily supplied additional information, such a license plate photograph, that might have sped up the response or led to additional information about terrorist operatives.

That brings me to my final point: 9-1-1 represents a tremendous source of actionable information for the public safety community and the broader Government enterprise, but a source that is currently untapped.

I can't tell you precisely, for example, the number of 9-1-1 calls that are made on an average day or in an average month. The best statistic available, about 600,000 calls per day, is compiled by CTIA, the wireless association, on the basis of a variety of different sources and a tedious methodology that is riddled with extrapolations and assumptions.

But just as Verizon relies on telemetry from its network to ensure that 9-1-1 systems are operating as expected, the public safety community and Government officials should be able to rely on data from 9-1-1 systems to ensure that those systems are operating as expected, and to ensure that the public resources are allocated efficiently.

As the committee considers the future of public safety communications, I encourage you to keep in mind the need to include 9-1-1 as a core component of all public safety and homeland security planning and improvement efforts, to work toward assisting States with cost of transitioning to Next Gen 9-1-1, and finally to move swiftly to deploy advanced data collection and analytics capabilities to PSAPs and government agencies at all levels.

With that, Mr. Chairman, thank you. I welcome your questions. [The prepared statement of Mr. Forgety follows:]

PREPARED STATEMENT OF TELFORD E. "TREY" FORGETY, III

SEPTEMBER 12, 2012

Chairman Bilirakis, Ranking Member Richardson, and may it please the Committee: My name is Trey Forgety,¹ and on behalf of the 9-1-1 Association's more than 7,000 public- and private-sector members, I want to thank you for holding this hearing. Providing emergency response service is perhaps the core function of Government, and 9-1-1 is the critical link between the public and emergency responders that enables counties and towns to perform that function quickly and efficiently. Next year, we will mark the 45th anniversary of the first 9-1-1 call. As we approach that important milestone, it is entirely appropriate that we should confront pressing questions about how our Nation's 9-1-1 systems are built and maintained now, how they will be designed and operated in the future, and how we can improve and sustain the reliability and resiliency of those systems as we transition to next-generation IP-based networks.

¹I joined NENA: The 9-1-1 Association in 2010 after 2 years as a presidential management fellow in the Department of Homeland Security (DHS) Office of Emergency Communications. During my fellowship, I served temporarily with the Federal Communications Commission's (FCC) Public Safety and Homeland Security Bureau and with the Department of Commerce's National Telecommunications and Information Administration (NTIA). At the FCC, I developed recommendations for the Public Safety chapter of the National Broadband Plan. Later, at Commerce, I worked to implement the Plan's recommendations as NTIA evaluated applications to the Broadband Technology Opportunity Program (BTOP). Both at NTIA and DHS, I participated in discussions with senior administration officials from the Office of the Vice President, the Office of Management and Budget, the Office of Science and Technology Policy, and the National Economic Council to develop policies for the deployment of the Nation-wide mobile broadband network for first responders, now known as FirstNet. I hold a Bachelor of Science in Applied Physics and a Doctor of Jurisprudence, both from the University of Tennessee.

It is unfortunate, of course, that we must consider these questions in the wake of events that have shown us all too clearly the vulnerabilities of our existing systems. Damage to network and commercial power infrastructure in the wake of the derecho that struck the Midwest and the National Capital Region on June 29 of this year left tens of thousands of homes, businesses, and wireless subscribers without access to 9-1-1 service. As we consider the vulnerabilities that led to those outages, however, I believe it important that we keep in perspective the purpose of our inquiries: When the safety of the public is at stake, we must put aside the temptation to assign blame, and focus instead on learning how we can prevent future failures. NENA has already engaged with the 9-1-1 community, with the carrier community, and with officials from the Federal Communications Commission to begin that process. Already, the Commission has issued a Public Notice asking important questions about the nature and causes of the 9-1-1 outages associated with the derecho. The comments received in response to that notice have included a frank and detailed account by Verizon of the equipment and procedural failures that occasioned the outages, along with robust and well-considered recommendations from Fairfax County, Virginia. It will take some time for the affected municipalities, the serving carriers, and the broader public safety community to fully analyze the causes of these outages. As we continue to do so, however, there are a few key lessons that I believe we can learn from the derecho and the outages it caused.

First, extended commercial power outages, whether resulting from severe weather or some other cause, are predictable, and carriers and public safety agencies responsible for 9-1-1 must both prepare for such outages. On the carrier side, this is particularly important for facilities that provide 9-1-1 service to Public Safety Answering Points. Given the architecture of legacy E 9-1-1 systems, it is generally a single Central Office of a single Local Exchange Carrier that routes and terminates all 9-1-1 calls in a relatively large geographic area. This is one of the few public safety communications circumstances in which the absence of redundant facilities is tolerated, mostly because the cost of providing fully redundant 9-1-1 trunks from all End Offices in the served area to a redundant Selective Router would be prohibitively expensive. Consequently, it is all the more imperative that these non-redundant facilities have reliable, frequently-tested sources of backup power, and that those sources prioritize safety-of-life systems such as selective routing of 9-1-1 calls. Similarly, on the public safety side, it is important that Public Safety Answering Points (PSAPs) have reliable and frequently-tested sources of back-up power, and that such capabilities are consistent across jurisdictions. As things stand today, the resilience of 9-1-1 centers is largely a matter of jurisdictional accident: Some States manage all 9-1-1 systems and PSAPs within their borders, and build-in back-up power capabilities. Other States leave system and PSAP management to the discretion of local officials, but set mandatory requirements for resilience features such as back-up power. Still other States, however, set no standards for the construction and operation of PSAPs at all. In those States, the actual preparedness of PSAPs for commercial outages can vary to the extreme: Some PSAPs will have diverse grid connections, quick-reaction battery systems, and stand-by generators to power the entire facility. Others may have only short-term battery protection, or, in some cases, no protection at all. Given the centrality of 9-1-1 service to public safety and homeland security, NENA believes that both the carrier community and the PSAP community must ensure that standards are in place and followed to keep 9-1-1 service available during predictable events like severe weather that deprive their facilities of commercial power.

Second, legacy circuit-switched networks will soon outlive their usefulness as the sole platform for providing 9-1-1 service. Over the last 6 years, the public safety community, carriers, hardware manufacturers, and software developers have worked collaboratively through NENA to develop consensus standards for the architecture and operation of Next Generation 9-1-1 systems. Next Generation 9-1-1, or "NG 9-1-1," represents the first fundamental change in public communications with public safety agencies since the introduction of 9-1-1 service decades ago. Rather than relying on specialized and expensive-to-replicate facilities in a single carrier's network, NG 9-1-1 is based on open standards, commodity hardware, and fungible connectivity. For example, an NG 9-1-1 PSAP will have the ability to procure connectivity from multiple, diverse carriers to increase resilience in the face of network failures. Indeed, NG 9-1-1 systems can even be offered on a fully-redundant, cloud-hosted basis. This change in paradigm will provide the public with several benefits, including greater reliability and resilience of 9-1-1 service, an expansion of available communications media to include text and video, and lower costs of service resulting from competition for hardware, software, and connectivity. NG 9-1-1 systems are already being deployed, in stages, around the country, but deployment time lines are inconsistent from State to State, and even from county to

county. In some places, it may be a decade or more before the public has access to the advanced capabilities of NG 9-1-1. At the same time, funding for 9-1-1 service, largely a fee-for-service model premised on wireline telephone revenues, is undergoing its own radical transition. Wireline subscribership continues to fall at a dramatic pace as wireless and broadband service replace it in consumer adoption. Not all States have prepared for or reacted to this transition, however, and many public safety agencies already find themselves underfunded as the user fees that once supported their operations dwindle while call volumes remain the same or continue to rise. Agencies will also face some additional costs as they transition to NG 9-1-1 in order to continue operating legacy services and facilities in parallel with Next Generation facilities and software until a final cut-over can be effected. This is one area where NENA believes a relatively small amount of preparedness grant funding could have a major impact on the readiness of key public safety services for future natural disasters or terrorist events, and I recommend that the committee consider including NG 9-1-1 transition work as allowable costs in future rounds of Federal grants.

Third, the public safety community needs access to analytic and visualization capabilities that are now common in the private sector in order to leverage the tremendous value of aggregated 9-1-1 data. During and after the derecho, for example, there arose significant questions and perhaps even disagreements as to precisely when 9-1-1 service failed, and precisely when it was restored. Had analytic capabilities been in place, however, affected PSAPs could have detected the outage quickly as 9-1-1 call volumes deviated from the expected range for that date and time. From a preparedness perspective, robust analytic capabilities will be key to future improvements in 9-1-1 service as they allow 9-1-1 authorities to better match staffing levels to expected call volumes, to reduce the instance of over-provisioning in circuits or bandwidth used to terminate 9-1-1 calls, and to detect service failures such as abnormally-long call ring times or abandonment rates. In addition, analytic capabilities will also play an important role in prioritizing the use of scarce public resources in the improvement of public safety and homeland security response services. For example, knowing the percentage of 9-1-1 calls in a given jurisdiction that require a response by fire protection services, and the type of response at that, will allow municipal officials to make better, more informed choices about how to expend taxpayer dollars with the greatest effect on taxpayer safety. Without these capabilities, the public safety community will remain largely blind to the drivers of its costs and largely unable to effectively articulate its impact on safety of life and property in data-driven regulatory and legislative processes. At the Federal level, analytic capabilities can form a powerful tool for situational awareness and response prioritization. Near-real-time map-based visualizations, for example, could allow coordinating agencies such as FEMA and the FCC to detect incidents as they occur and monitor their progress as they expand, contract, and change in character. On a Nation-wide basis, NENA estimates that deploying analytic and visualization capabilities to 366 metropolitan statistical areas would cost less than \$20 million in capital expenditures, and less than \$10 million in annual operating expenditures; expanding such capabilities to all 6,000+ primary PSAPs would be only marginally more expensive. Given the clear benefits that such capabilities can provide in terms of on-going improvements to the preparedness and resilience of public safety communications and to the broader public safety enterprise, NENA believes that achieving a Nation-wide deployment of such capabilities should be a key homeland security goal for the next 5 years.

Providing reliable and responsive emergency communications service to the public is the core mission of NENA's membership, and I am pleased, Mr. Chairman, that you and your committee have called this hearing and allowed me to testify about how we can better do so in the future. I believe that significant improvements in the reliability and resilience of 9-1-1 service can be achieved over the short term and with minimal fiscal impact if only the necessary parties can work together with a common goal and a common understanding that 9-1-1 is a unique service with unique requirements and a central position in the preparedness of our Nation. I look forward to working with you and with my counterparts from the carrier community to ensure that those improvements are made, and I am happy to take your questions.

Mr. BILIRAKIS. Thank you very much.

Mr. McIntosh, you are recognized for 5 minutes.

STATEMENT OF CHRISTOPHER I. MCINTOSH, INTEROPERABILITY COORDINATOR, OFFICE OF VETERANS AFFAIRS AND HOMELAND SECURITY, COMMONWEALTH OF VIRGINIA

Mr. MCINTOSH. Thank you, Mr. Chairman, Members of the committee.

Eleven years ago yesterday, interoperable communications was identified as one of the major areas of public safety that required improvement following the attacks of 9/11. Communications is the one constant that forms the foundation for all other public safety disciplines. It is the bedrock of every response plan, the core of every procedure.

Without reliable communications, effective command and control cannot be achieved, critical information cannot be passed, and life-threatening developments cannot be shared.

In the past 11 years, billions of dollars have been spent across the Nation, new radio systems have been fielded, interoperability has been greatly improved, and the ability of our first responders, emergency managers, and homeland security professionals to communicate is better than ever.

We stand at a crossroads, however. Many of those critical radio systems procured in the years following 9/11 are becoming antiquated. Technology, as is always the case, has continued its relentless advance, resulting in the need to perform major upgrades to existing systems, or in some cases wholesale replacement.

The increased use of the finite radio spectrum resulted in an FCC requirement to narrowband, resulting in the improved efficiency in the use of spectrum, but also creating the de facto obsolescence of an entire generation of radio equipment.

Maintenance and sustainment costs for existing systems alone cost hundreds of millions of dollars, forcing jurisdictions to make tough budgetary choices, often resulting in critical systems no longer being supported.

All of this is occurring while funding levels have fallen precipitously. Virginia has seen consecutive 50 percent cuts in homeland security grant programs, and has seen the loss of two urban area security initiatives. The loss of the Central Virginia and Hampton Roads UASIs has resulted in the loss of tens of millions of dollars in annual funding.

Systems built in those areas did not go away, however, and are now competing with the rest of the commonwealth for the dwindling SHSGP funding stream while their costs are migrated to local budgets.

The invaluable Interoperable Emergency Communications Grant Program has also not been funded. This grant provided for the planning, training, and exercises of the most important component of any communications program, the people. Technology is useless without knowledgeable people who know how to use it properly, have identified and trained to its capabilities and limitations, and have planned and exercised its application in numerous settings.

IECGP also funded many of the State-wide interoperability coordinators around the country, whose job it is to focus solely on issues surrounding interoperable communications. Through the SWICs, States now have State-wide interoperability executive committees that pull people from across jurisdictions and disciplines,

allowing them to work together to solve cross-cutting communications problems, share lessons learned and best practices.

With the loss of IECGP, these positions and associated governance structures are increasingly beginning to fall victim to the budget axe.

Simultaneously, we stand on the verge of a revolution in emergency communications. Land mobile radio is becoming integrated with voice over I.P. Virginia operates the largest voice over I.P. public safety radio network in the country. Soon in Virginia, any laptop, tablet, or smartphone in the hands of a public safety professional will become a radio capable of communicating all across the State.

All of these capabilities, indeed our entire path forward, rely on reliable connectivity. The events of the derecho storm at the end of June 2012 demonstrated how vulnerable public safety networks are to saturation, degradation, or destruction. The loss of a couple of key facilities resulted in a cascading failure that affected millions of people's potential safety and security.

In the wireless world, the rising popularity of smart devices has created a demand for bandwidth that threatens to overwhelm the entire public safety network when an incident occurs, including text message-based alerting systems.

Public safety broadband offers a solution to address many of the connectivity issues faced by public safety. Its advocates cite the need of first responders and public safety professionals to have unfettered access to wireless communications.

We agree, but don't think the dialogue to date has been broad enough. Public safety broadband also provides the opportunity for public safety to implement a terrestrial network, linking PSAPs, EOCs, and critical infrastructure facilities in a secure and reliable manner, free from the demands and limitations of the internet.

The challenge lies in making all of this a reality in the current fiscal environment. As noted above, the commonwealth and many other States' public safety communications budgets are stretched to the breaking point. After conducting an informal poll with localities within Virginia, where we asked how much they could afford, the response was almost universally, if it costs more than my cell service does now, we can't do it.

Virginia is a commonwealth made up of 135 jurisdictions. They are all sovereign and they all have their own competing budgetary requirements. It is only through getting these jurisdictions to work together that we will achieve a successful program implementation.

The existing State-wide interoperable executive committees have been the laboratories for this approach. Their success is evidenced by their existence in every State in the Nation.

Congress should recognize the assigned spectrum has value to States. States should be free to use it to generate revenue. Given the current fiscal environment, it would be irresponsible and inadvisable for the commonwealth or any other State to enter into a project as expensive, far-reaching, and mission-critical as public safety broadband without having adequate funding mechanisms in place.

Virginia is committed to this path. I stand to answer any questions.

[The prepared statement of Mr. McIntosh follows:]

PREPARED STATEMENT OF CHRISTOPHER I. MCINTOSH

SEPTEMBER 12, 2012

Eleven years ago yesterday, interoperable communications was identified as one of the major areas of public safety that required major improvement following the attacks of 9/11. Communications is the one constant that forms the foundation for all other public safety disciplines; it is the bedrock of every response plan, the core of every procedure. Without reliable communications, effective command and control cannot be achieved, critical information cannot be passed, and life-threatening developments cannot be shared. In the past 11 years, billions of dollars have been spent across the Nation, new radio systems have been fielded, interoperability has been greatly improved, and the ability of our first responders, emergency managers, and homeland security professionals to communicate is better than ever.

We stand at a crossroads, however. Many of those critical radio systems procured in the years following 9/11 are becoming antiquated. Technology, as is always the case, has continued its relentless advance resulting in the need to perform major upgrades to existing systems, or in some cases wholesale replacement. The increased use of the finite radio spectrum has resulted in the FCC requirement to "narrowband", resulting in improved efficiency in the use of radio spectrum, but also creating the de facto obsolescence of an entire generation of radio equipment. Maintenance and sustainment costs for existing systems alone cost hundreds of millions of dollars, forcing jurisdictions to make tough budgetary choices, often resulting in critical systems no longer being supported.

All of this is occurring while funding levels have fallen precipitously. Virginia has seen consecutive 50% cuts in State Homeland Security Grant Programs, dropping from \$18 million in 2010 to less than \$5 million in 2012. Historically, almost 30% of this funding has gone to support and maintain our communications programs. In 2011 alone, the Commonwealth received \$43 million in requests from localities for communications grant funding, and was only able to allocate \$2 million, resulting in many necessary projects going unfunded. Virginia has also seen the loss of two Urban Area Security Initiatives (UASIs). The loss of the Central Virginia and Hampton Roads UASIs resulted in the loss of tens of millions of dollars in annual funding. Systems implemented in those areas did not go away, however, and now must compete with the rest of the Commonwealth for the dwindling SHSGP funding stream while their costs are migrated to local budgets. The invaluable Interoperable Emergency Communications Grant Program (IECGP) has also not been funded. This grant provided for the planning, training, and exercises that improved the capabilities of the most important component of any communications program, the people. Technology is useless without knowledgeable people who know how to use it properly, have identified and trained to its capabilities and limitations, and have planned and exercised its application in numerous settings. IECGP also funded many of the State-wide Interoperability Coordinators (SWICs) around the country, whose job it is to focus solely on the issues surrounding Interoperable Communications. Through the SWICs, States now have State-wide Interoperability Executive Committees (SIECs) that pull people in from across jurisdictions and disciplines, allowing them to work together to solve cross-cutting communications problems, share lessons learned and best practices, and write strategic plans that shape a common direction forward. With the loss of IECGP, these positions, and the associated governance structures, are beginning to fall victim to the budget axe.

Simultaneously, we stand on the verge of a revolution in emergency communications capabilities. Traditional Land Mobile Radio systems are beginning to become integrated with Voice over Internet Protocol (VoIP) technologies. By fusing voice communications with internet technologies, a whole new world of possibilities is becoming a reality. Virginia operates one of the largest Public Safety VoIP networks in the Nation which, by the end of calendar year 2012, will have points of presence in 122 jurisdictions, as well as the Virginia State Police, Department of Transportation, and Department of Emergency Management. The Commonwealth's Link to Interoperable Communications (COMLINC) program allows different radio systems to be linked together, much in the way that other radio gateways do, resulting in interoperability through the creation of a "patch" by an operator in a Public Safety Answering Point (PSAP). The true potential of COMLINC, when fully implemented, lies in its VoIP functionality. Soon, any laptop, tablet, or smart phone in the hands of a public safety professional will become a radio capable of communicating with any PSAP in the State, or any responder on a radio connected to it.

Due to this advancement, interoperable communications no longer involves just voice and radio systems. We are entering an era where interoperable information is the goal. Advances in Computer Aided Dispatch (CAD), Crisis Management, VoIP, video, and Geospatial Information Systems (GIS) allow for the sharing and display of information that allows decision makers and responders to have previously unheard of levels of situational awareness. Using the common denominator of location, the ability to merge real-time information such as CAD, weather, sensor data, video, and Crisis Management reports with mapping systems and plan overlays allows personnel, from the tactical to the strategic, to have a better understanding of a given situation, presenting information in context that is critical for effective decision making. For example, a large hazmat on the highway is one thing, but a large hazmat on the highway upwind from a county fair in a neighboring jurisdiction is something else entirely. The integration of COMLINC and its VoIP functionality now allows not only the rapid understanding of the true severity of a situation, but also allows for the interaction of decision makers through the same interface. Potentially, the days of a journal full of usernames and passwords, hopping from system to system searching for tidbits of relevant information, will be a thing of the past. Virginia has recently completed a pilot project in the Charlottesville/Albermarle region that demonstrated that this is possible today. We are following that pilot up with another in Hampton Roads that kicks of this month, with the goal of realizing a State-wide information sharing capability by the end of next year.

It is important to note that we are not doing this in a vacuum. Virginia along with Oregon and California initiated a National Information Sharing Consortium (Consortium) in order to share technology and best practices which will enable State and local agencies across the country to work in tandem towards these goals which we all share. Through the Consortium, which is growing daily, we will be able to leverage one another's experiences so that we, as a community, don't repeat costly mistakes over and over again. Additionally, we are also working closely with the DHS Science and Technology First Responders Group (FRG) and its Office of Interoperability and Compatibility (OIC) who are providing us critical assistance in assessing and working through the issues with the new generation of technologies that can facilitate achieving these goals such as shared services in "the cloud" and various "bridge" technologies. Taken together all of this will enable us to create a true "Virtual USA" enabling intrastate and interstate interoperability and will serve as the roadmap towards making use of the new broadband capabilities when they reach fruition.

All of these capabilities, indeed the entire path forward, rely on reliable connectivity. The events of the derecho storm at the end of June 2012 demonstrate how vulnerable public safety networks, where they exist, are to saturation, degradation, or destruction. As the derecho showed, the loss of a couple of key facilities can result in a cascading failure that affects millions of people's potential safety and security. In many cases, public safety responders rely on the public network for mission-critical communications. This is especially true in the wireless world, where the rise in popularity of smart devices has created a demand for bandwidth that threatens to overwhelm the entire network when an incident occurs. According to the President's Council of Advisors on Science and Technology's report entitled "Realizing the Full Potential of Government-Held Spectrum to Spur Economic Growth", the amount of wireless data transmitted from smart phones and wirelessly connected tablets has doubled every year for the last 4 years. We saw this scenario realized during the recent earthquake in central Virginia. When the shaking stopped, most people picked up their phones to call a loved one, text a friend, or post on a social media site. This spike in volume resulted in the inability of the public safety community to communicate via wireless network, both with each other and with the public. Text message-based alerting systems were rendered useless, as the networks that they are dependent upon were so overwhelmed by traffic that texts didn't get through for up to 30 minutes, if at all. Phone calls were pointless, emails were spotty.

The problem isn't limited to the wireless world. We are increasingly reliant on the internet itself for communicating critical information. Everything from accessing the latest weather to requesting assistance now flows on the web, the same web that you or I use at home. Bandwidth in the terrestrial network is a finite resource, subject to the similar loading demands as the wireless network. In Virginia, we have experienced degradation in our capability to use web-based information during several large-scale events. During tropical storm Hanna, the prevalence of teleworkers in the Richmond area resulted in difficulty in obtaining critical weather information from the National Weather Service website. Ironically, my mom, at home in another part of the State, had no trouble whatsoever accessing the same information that

I was struggling to get at the State EOC. Unfortunately, there is currently no way for public safety to prioritize traffic on the public internet.

Public Safety Broadband offers a solution that addresses many of the connectivity issues faced by public safety. Its advocates cite the needs of first responders and public safety professionals to have unfettered access to wireless communications in order to improve their ability to respond to incidents safely and effectively. I couldn't agree more, but I don't think that the dialogue to date has been broad enough. Public Safety Broadband also provides the opportunity for public safety to implement a terrestrial network, linking PSAPs, EOCs, and critical infrastructure facilities in a secure and reliable manner, free from the demands and limitations of the public internet. This network is necessary to support programs such as VoIP communications, GIS-based information sharing, and Next Generation 9-1-1 routing. It would allow for the consolidation of PSAPs, the rerouting of volume around failures, the use of improved situational awareness tools, and the ability for the public safety community to depend on data-based communications unlike ever before. In short, it could change the entire landscape of the discipline.

The challenge lies in making all of this a reality in the current fiscal environment. As noted above, the Commonwealth's (and many other States') public safety communications budgets are stretched to the breaking point. After conducting an informal poll with the localities within Virginia in which we asked how much they could afford to contribute towards the operation of a Public Safety Broadband network, the almost universal response is "if it cost more than my cellular service costs now, we can't do it". Virginia is made up of 135 jurisdictions, each with its own sense of budgetary priorities and fiscal demands. Since Virginia is a Commonwealth, each one of those 135 jurisdictions is also sovereign, free to make their own financial decisions. This governance model is replicated in some form or fashion across the country, and in over 11-plus years of focusing on interoperability programs, what we've learned is that it is only through the establishment of mutually beneficial partnerships, creating a "coalition of the willing" that respects jurisdictional independence, is a successful model for implementing interoperability programs achieved. The existing State-wide Interoperability Executive Committees have been the laboratories for this approach, and their success is evidenced by their existence in every single State in the Union.

While no one can argue the need for broadband, the implementation of it has been the subject of much debate. It is only through a partnership between the States and localities, their existing governance structures, and the recently appointed "FirstNet" board that the program will be successful. In this context, the fact that there is not a single current State employee included in the recently announced FirstNet board appointments is of concern.

FirstNet, with all the best intentions in the world, cannot be expected to understand each State's unique circumstances and needs. That is why National interoperability should be the task they focus on. There is a real urgency in many States to get communications resources up and running as soon as possible. As such, States should be allowed to proceed immediately with their plans, as long as they are interoperable with the Nation-wide network and meet minimum technical standards, and build their networks ahead of FirstNet. This is also true of all major cities, but especially true of Washington, DC. This can be allowed under the "special consideration . . . to areas with unique homeland security requirements". Major cities typically represent the greatest threat from a terrorism and homeland security perspective and therefore need to have their communications networks up and running as a matter of priority.

Congress should recognize that the assigned spectrum has real value to States for their public safety communications mission and as a revenue generator. This revenue should flow straight to the States to fund their respective public safety communications missions, and an arrangement met for States to contribute from any surplus revenue to a FirstNet fund for the National interoperability mission. This should be the result of partnership between the individual States and FirstNet, where States operate within a framework developed by FirstNet, but create partnerships with its jurisdictions and surrounding States to create coalitions of the willing that are able to work together to solve the myriad of implementation issues that will inevitably arise, at the correct geo-political level. States must also be allowed, within the interoperable requirements established by FirstNet, to pursue every technical means available, including those cited in the Presidents Panel report, to ensure that the spectrum is used as efficiently and effectively as possible. They must also be allowed to follow their codified procurement procedures that are designed to ensure that competition between vendors is maximized, resulting in reduced cost. The conversation surrounding broadband governance must not be allowed to devolve into an increasingly polarized discussion surrounding the "opt-in vs. opt-out" issue,

usually driven by those without experience in managing the challenging interests of local, State, and Federal communications stakeholders.

Congress should be aware that even though the opt-out provision is in legislation, it seems that there has been an active effort to “discourage” it. This risks interfering with the will of Congress. This is manifest in a number of ways, some subtle, some more blatant, and serves only to increase the tension of the conversation. “Opting out” is an explicit State’s right, as in the end they cannot and will not be forced to participate in a costly program that obligates State funds should they choose not to. In many cases (such as in a Commonwealth), “opting out” may be a local right as well. In order to be successful in achieving our combined goal of a Nation-wide interoperable broadband capability for public safety, a successful model must be developed that falls somewhere in between the extremes “opt in vs. opt out”, focusing on a sense of cooperation and problem solving that can result in an evolutionary leap forward in communications capabilities while providing adequate fiscal protection for its participants. Any other approach threatens alienating critical partners and fails to take into consideration each jurisdiction’s unique and specific needs, potentially resulting in that jurisdiction being forced to “opt out”, the very scenario we all wish to avoid.

Given recent events, it would be both irresponsible and inadvisable for the Commonwealth, or any other State, to enter into a project as expensive, far-reaching, and mission-critical as Public Safety Broadband without having adequate funding mechanisms in place. We cannot assume that Federal funding will be available in perpetuity. We must, up-front, ensure that the business model is in place that permits the network, its operation and maintenance, and the planning, training, and exercising that are going to be necessary to efficiently use it to be adequately and reliably funded.

This is not a simple or easy path, but Virginia is committed to this course because we strongly believe this “convergence” of voice and data communications is the future. Given the current budget environment, we also believe it is important that Federal, State, and local efforts are in alignment, working together efficiently towards a common goal. We are watching carefully the direction that FirstNet and other Federally-supported efforts are taking, hoping to join them in a spirit of cooperation and openness. In this we can use your help. You can help us by putting the safeguards in place to make certain that these efforts are driven by the needs of States and localities, as well as making certain that the funding that you provide helps us to achieve those crucial goals. We look forward to working with you on these efforts.

Mr. BILIRAKIS. Thank you very much. Thank the panel for their testimony. I will recognize myself for 5 minutes. I will try not to take 5 minutes, though, because I know we are in the interests of time.

Mr. Hall, APCO’s former president was a signatory to a letter to Secretary Napolitano earlier this summer expressing concern about the potential impacts of a merger of OEC and NCS on OEC’s State and local public safety communications focus. I share those concerns, as you know.

Has APCO received a response from DHS with regard to this letter? If so, has DHS expressed a willingness to work with APCO and other first responder organizations to ensure OEC’s mission is not diminished?

Mr. HALL. Yes, sir. We have received a response. We have had several meetings as a result of that. We have great dialogue moving forward. Our concern was that we keep those projects and programs going, such as NPSTC and SafeCom and a lot of the forward momentum we have for interoperability.

We believe that they are going to work with us on that. We feel very positive. Yes, sir.

Mr. BILIRAKIS. That is good. Very good.

Okay, Mr. Malady, my last question, I want to thank you for your very candid testimony about the issues at Verizon that caused

the PSAP outages, and your willingness to work with PSAPs to avoid any similar issues in the future.

To the point, you noted in your statement that you are working with 9-1-1 directors to implement a number of recommendations they made to you. Can you elaborate on the status of your efforts?

Mr. MALADY. Thank you, Mr. Chairman. You know, it is our responsibility to find out what we can here and make all the corrections that we can to make this more resilient. I appreciate your comment.

As far as the working with the PSAPs, especially around communications, one of the first things that the PSAPs in Northern Virginia who were affected by this came to us and said, you know, we need to do a better job of communicating between each other.

They made five specific suggestions, one of which is the ability to communicate multimodal. So right now, we have spent a lot of time and effort working out a system where we send them emails when we have issues or we will pick up a telephone.

But now we are putting in systems. We have actually selected a system and are trialing it right now that will give us the ability to communicate with PSAPs via emails, text messages, automated phone calls, and other sorts of communication ways, so we can always alert them of what is happening.

Another one is getting an escalation procedure in place, so that every single month we give them a list of the escalation procedures, with the names and numbers of people, all the way to vice presidential level in our company, so they can always have someone to talk to and they can escalate as needed.

So those are a couple of the different things that we have worked on with them and we are instituting now.

Mr. BILIRAKIS. Very good. I yield back the balance of my time.

I am going to recognize the Ranking Member, Ms. Richardson from California, for 5 minutes.

Ms. RICHARDSON. Yes, thank you, Mr. Chairman.

First of all, Mr. Hall, in your testimony today and in your comments to the FCC, you provided detailed insight into how private carriers can improve resilience of the 9-1-1 network.

How would you suggest that those private carriers prioritize the improvements to the network that you have recommended?

Mr. HALL. I would say that the very first in the communications directly with the PSAP. Running a PSAP myself and listening to those comments from the folks in Northern Virginia, being able to have a two-way dialogue was very important.

When we receive emails and e-blast and so on, that is very good. But if we have questions, we need the correspondence to be two-way. I will say that in recent months, being a Verizon customer myself, we have actually seen the escalation list and the two-way communications that Verizon is speaking about now.

So they have implemented those. We are seeing some positive immediate changes as a result of that.

But two-way communications.

Ms. RICHARDSON. Okay.

Mr. McIntosh, in your testimony, you indicated that the Federal Government is not doing enough to discourage the States from opting out of the Nation-wide Public Safety Broadband Network.

Can you describe the incentives the Federal Government might implement to entice States to participate in the FirstNet, instead of building their own networks?

Mr. MCINTOSH. Yes, ma'am. The issue here is the success and failures, as far as the States are concerned, in building the broadband network lies in the fiscal burden that that bears. Partnering with States so that States can explore other means of generating revenue to offset operating and maintenance costs for the operation of the network is critical.

Just some quick math; the average price point that we have seen in other similar networks operating across the country, for the Virginia State Police alone to have enough subscribers for them to use the network, it would cost the commonwealth approximately \$4 million a year. That is for one agency.

So we are obviously very concerned about taking an unfunded financial burden, with full understanding that Federal funds may not be available in perpetuity, and the commonwealth and the localities within it may have to take over that burden.

Ms. RICHARDSON. Thank you.

Mr. Forgety, regarding 9-1-1 user fees, are you aware of how many States dedicate all their 9-1-1 user fees to advance 9-1-1 technology?

Mr. FORGETY. Representative, I don't have in front of me the specific figures. I can tell you that there are two sources for that information of varying quality.

First of all, I believe it is a semi-annual report by the FCC on States that have diverted 9-1-1 funds to other purposes. That was required, I believe, under the Net 9-1-1 Improvement Act back in 2008.

That report is very valuable, but it is limited because it relies on States to self-certify whether or not they have diverted funds to improper purposes. So in some cases, what we have seen is States will actually use 9-1-1 funds for some other purpose and yet still certify that they are using those funds as they have told the public they will.

In the recently passed Next Generation 9-1-1 Advancement Act that was part of the Middle Class Tax Relief Act, there was actually another report authorized out of the GAO that is supposed to look at primary source material to determine whether States are, in fact, using 9-1-1 fees for the purposes which they have advertised, essentially.

Ms. RICHARDSON. Thank you.

With that, I yield back.

Mr. BILIRAKIS. Thank you. Thank you.

I will recognize Mr. Marino from the State of Pennsylvania. You are recognized for 5 minutes, sir.

Yes, okay. All right.

Ms. Hochul from New York, you are recognized for 5 minutes.

Ms. HOCHUL. Thank you, Mr. Chairman.

One thing that troubles me, and I am impressed with the progress that has been made, but, you know, we don't have to go back as far as Virginia Tech. I had a situation in my own district where there was a gun that went off in a high school. Fifty stu-

dents in a lock-down situation thought they were texting 9-1-1 for help.

I find it hard to believe it is 2012 and we haven't overcome the barriers to make that happen. We have a whole generation of young people. I got to tell you how often I text. In fact, I couldn't talk to my teenagers unless I learned how to text.

So we are, in my judgement, so far behind the curve on where this country is on this. So I appreciate all the efforts that you have made with two-way communication. I am impressed with all that.

But what are the barriers? I introduced a bill called the Alert Act, after hearing this story in my district. It would have communication providers have to give an error message, at least, send something back so someone knows it didn't go through, because these kids all think help was coming as a result of their efforts.

So I am not sure if my bill is going to pass. But can't the communications community on their own take steps to make sure that that is occurring? At least I would like to make it be—I would like to have it occurring. I would like to have the 9-1-1 texting receive, people can send pictures of an accident. You get a lot more information. It would be incredibly valuable.

But in the mean time, can't people at least get an error message from their communications company, at least telling them that no one receives this; you better pick up a phone or something? So are we getting any closer to that? Because that is a huge problem, in my mind. It would be a dramatic improvement in our public safety if we could accomplish that sooner than later.

Throw that out to everybody.

Mr. MALADY. So as the gentleman from the FCC stated earlier, we are in the early days now of the ability for folks to text 9-1-1 at Verizon. I can't speak for everybody else. I am going to be honest with you. I am not the expert on this particular subject.

But we have been in trials. He alluded to a trial in Vermont, where a life was saved and also a text was sent about a domestic violence incident, and the text went through and the first responders came and broke that up.

So that is all good. We are testing it in a couple other jurisdictions. We are at the forefront of this. We are rolling this out. We do think it is a good idea.

In our particular implementation, we are sending back, in certain circumstances, the notice to a person that your text did not go through. But I can't talk about what there might be limitations at a PSAP level, or there might be other limitations in other carriers' networks that don't allow them to do that.

I am not the right person to really to comment on that. I don't have the expertise.

Mr. HALL. Terry Hall with APCO. I will respond as well. Running a PSAP, we are getting ready to undertake a program to be one of the early adopters with a very large local exchange carrier and wireless carrier to take text to 9-1-1.

The biggest challenge that we have are some of the things that you have already addressed, as well as is this at a new language? Is it going to overwhelm us? Are we going to be able to track these calls?

So it is very important that these early adopters get out there and do some best practices and some benchmarking. In my own PSAP, we had to form a workgroup to talk about what are their fears. Their biggest fear was we have 30-plus-year-old people who are going to be dealing with people that have another language than we are used to.

So we developed a dictionary, if you will, to put out at each one of the consoles, to understand what is coming in. The vendor that we are working with has assured us that if we become overwhelmed, we are going to be able to log off, and that they will receive information on their cell phone that texting is not available and that they need to contact 9-1-1 via a landline or a voice dial.

So it is a work in progress.

Mr. FORGETY. I will follow that up with a couple points. I think we have seen significant action by the carrier community over the past year. There have been major announcements from Verizon and more recently from AT&T of Nation-wide SMS or text, more generally, deployments to 9-1-1 that overcome some of the limitations we have previously seen, including latency and location determination.

We have also seen action out of the FCC, in particular asking questions about how we can get to a state where, at the very minimum, someone in an area where text to 9-1-1 is not supported will receive precisely the kind of error message that you are talking about, and such that we will have text capabilities that work both for the consumer and for public safety, using either existing equipment or reasonably available equipment.

Ms. HOCHUL. Thank you. I have one more question after the next one, but—

Mr. MCINTOSH. I have nothing to add.

Ms. HOCHUL. Okay. Thank you.

Very quick question: I come from a State where counties are diverting 9-1-1 funds. This is something I hear from my sheriffs. They are not happy about it. I don't know what authority is available to make sure that it is being put in place. In fact, I suspect if the money was being used appropriately for 9-1-1 purposes, there would be more resources available for my local PSAPs to be able to implement the technology they need to accept a 9-1-1 text.

So it is something I am also—I appreciate your questions on that. It is something I am concerned on. I want to see those reports on what consequences there are to States that are diverting it inappropriately.

Thank you, Mr. Chairman. Yield back the balance of my time.

Mr. BILIRAKIS [continuing]. Witnesses for their valuable testimony. Thank you for your patience as well. The Members for their questions. The Members of the subcommittee may have some additional questions for you. If you would respond in writing, we would appreciate it very much.

The hearing record will be open for 10 days. Without objection, the subcommittee stands adjourned. Thanks so much.

[Whereupon, at 4:43 p.m., the subcommittee was adjourned.]

APPENDIX

QUESTION FROM CHAIRMAN GUS M. BILIRAKIS FOR DAVID S. TURETSKY

Question. Could you please discuss how the Commission worked with the Federal Emergency Management Agency (FEMA) in responding to the communications outages caused by the June derecho?

Answer. Immediately following the derecho, FCC staff contacted the FEMA Region III, Regional Emergency Communications Coordinator (RECC), and FEMA Headquarters to provide information about the status of communications in the National Capital Region and West Virginia, and to determine if FEMA required the deployment of the FCC's staff and Roll Call capability. Under Roll Call FCC teams use equipment to identify which public safety systems are not working to prioritize recovery needs. FCC remained in constant contact with the FEMA Region III RECC over the next several days providing twice-daily updates on communications restoration. In addition, FEMA asked the FCC to gather information and report on the operation of telecommunications services for the affected counties in Virginia, West Virginia, Maryland, and DC. FCC contacted communications service providers and gathered this information from communications service providers and reported it to FEMA from June 30 to July 4.

QUESTION FROM RANKING MEMBER BENNIE G. THOMPSON FOR DAVID S. TURETSKY

Question. Recent emergency response events have again reinforced the need to reach as many citizens as possible with emergency alerts. The Commercial Mobile Alert System should be an effective way to reach large portions of the population.

- Currently, how many wireless carriers that have opted into the CMAS program are capable of providing CMAS alerts? [If not 100%] What is the hold-up? Are delays being experienced with the FCC, DHS, or FEMA?

Answer. Based on our records, 74 wireless carriers have opted in to provide CMAS alerts. Under our rules, carriers that have opted in were required to deploy CMAS by April 7, 2012. Our understanding is that most wireless carriers that opted in, including the four major Nation-wide carriers, have done so and are in fact currently delivering CMAS alerts to subscribers. In order to deploy CMAS, however, carriers first must be authorized by FEMA and DHS to connect to FEMA's Integrated Public Alert and Warning System (IPAWS) gateway. This requires that the carriers, FEMA and the DHS complete Memoranda of Agreement and Interconnection Security Agreements, and then test the gateway connection. According to FEMA, once a carrier has initiated the process, it takes approximately 4 weeks to complete. It is our understanding that most carriers that have opted in have obtained their connection while others are in the process of completing the FEMA authorization process.

- Understanding that all wireless consumers, especially in rural or lower-income areas, may not have the latest smartphone that is capable of receiving cell broadcast alerts, can you confirm that the use of applications to provide CMAS alerts to a larger population is compliant with the technology-neutral directives of the program?

Answer. Consistent with the WARN Act, the Commission's CMAS rules contain specific performance requirements that handsets must meet in order to be CMAS (or WEA) capable. The Commission adopted these rules in a technologically neutral manner so that individual carriers and handset manufacturers can provide CMAS-capable handsets using a wide range of handset technologies and at a wide range of price points, from high-priced smart phones to fully subsidized feature phones. Since the launch of the program in April 2012, participating wireless carriers have made available a wide range of devices, not limited to smart phones, that support CMAS alerts and which are compliant with FCC rules.

The Commission does not mandate particular telephone technologies, nor does it mandate that any individual wireless carrier provide inexpensive wireless telephones to its customers. Further, the Commission's CMAS rules do not address "applications" supplied by third parties and purporting to support CMAS alerts. Rather, CMAS technology is resident in each handset's wiring and software.

Lists of compliant handsets can be found on individual wireless carrier websites, and are compiled by CTIA here: http://www.ctia.org/consumer_info/safety/index.cfm/AID/12082.

Regarding handset availability, we are aware of at least one rural carrier that alleges that it has not been able to obtain CMAS-capable handsets for its customers, and are working with FEMA and the wireless industry to ensure that the smaller and rural wireless providers have access to CMAS-compatible handsets equal to that enjoyed by the large carriers.

QUESTION FROM CHAIRMAN GUS M. BILIRAKIS FOR TELFORD E. "TREY" FORGETY

Question. Mr. Forgety, we hear a lot about next generation 9-1-1 (NG 9-1-1) and the significant advancement that technology such as Voice over Internet Protocol (VoIP) will bring to Public Safety Answering Points (PSAPs). I understand that some 9-1-1 call centers across the country are now able to receive text messages, another exciting development. How far away are we from developing the PSAPs of the future where callers will be able to send video and images from cell phones for example?

Answer. It is my pleasure to respond to your question of October 4 concerning the time line for development and deployment of next generation public safety answering points. NENA has expended great effort over the last decade to develop open, consensus standards for NG 9-1-1 and to establish a legal and regulatory framework that fosters meaningful competition in the market for 9-1-1-related equipment, software, and services. Those efforts have begun to bear fruit, as States as diverse as Vermont, Alabama, Washington, and Tennessee have started to deploy transitional 9-1-1 systems with intermediate capabilities and foundational infrastructure. In many cases, however, these efforts have been stymied by laws and regulations drafted at a time at which there was no alternative to the physical reality of the public-switched telephone network (PSTN). This, coupled with the persistent exclusion of 9-1-1 from nearly all Federal preparedness, homeland security, and public safety grant funding streams has slowed the deployment of NG 9-1-1 service. As you are aware, IP-based communications systems offer the potential for dramatic improvements in service to the public and significant cost savings for still-struggling municipal and State governments.

In order to overcome these challenges and reap the benefits of modern communications technology, NENA believes that we must undertake a serious effort to eliminate legacy laws and regulations that inhibit the deployment of advanced technology, and include 9-1-1 improvements as eligible costs in all Federal grant programs aimed at public safety communications and preparedness.

In your letter, you correctly note that some text messaging trials have taken place in small geographic areas such as Blackhawk County, Iowa, and Durham, North Carolina. These trials, however, represent but a meager response to an imminent and pressing need: The public overwhelming prefers text for much of its daily communications needs, and, for certain segments of the public, text messaging represents the only—or the only safe—means of communicating. For example, individuals with hearing or speech disabilities and victims of domestic violence are often unable to make a voice call to 9-1-1 due to their impairment or fear of reprisal, respectively. For these individuals, text-to-9-1-1 represents the only viable option to seek timely emergency assistance. Commercial solution providers now offer an array of text-to-9-1-1 service offerings on a competitive basis, and major carriers have announced plans for broader text-to-9-1-1 trials or deployments. These developments are encouraging, but are far from sufficient: In order for text messaging to serve the public as many already believe (wrongly) that it does, text-to-9-1-1 must be made operational throughout the country. Otherwise, the public could face a bewildering patchwork of jurisdictions, carriers, and devices with which text service does and doesn't work.

To speed the deployment of ubiquitous text-to-9-1-1 service, NENA has advocated for a three-part solution that would ensure access to text-to-9-1-1 on a reasonable but certain time frame while preserving the flexibility of carriers and public safety answering points alike to engineer their own solutions for text messaging support. First, we propose carriers be required to implement a "bounce-back" message in areas where text-to-9-1-1 is not yet supported. This short-term measure would alert consumers who are unaware that this capability does not exist in most carrier net-

works or jurisdictions of the need to contact 9-1-1 via voice telephone call. Second, we propose that carriers be required to implement text—without specifying a required text messaging platform—by a reasonable date certain. This will allow carriers to choose the text-messaging platform that is best suited to their unique architectures and user bases, and avoid the imposition of unrealistic or unnecessary requirements. Finally, we propose that PSAPs be permitted to choose the method by which they wish to receive text messages. This would allow PSAPs to leverage existing investments in TTY equipment and software required under ADA regulations, or to implement transitional IP-based or full-blown NG 9-1-1 service processes, as circumstances permit. NENA believes that this approach strikes an appropriate balance between the needs of the public, the public safety community, and carriers.

Beyond these transitional steps, the PSAP of the future looms large in the sights of NENA's members. Already, PSAPs around the country are implementing transitional technologies like consumer-facing data registries, "big data" analytics, blueforce tracking, and integrated mass-notification systems. True next-generation capabilities such as photo and video interchange will not, however, be available until the transition is further along. These capabilities require significantly different infrastructure that—though cheaper to operate on a long-term basis—may not be readily deployable due to the lack of funding for transitional operations during which both legacy and next generation systems must be simultaneously maintained. Furthermore, the diverse and ever-changing world of applications, devices, and networks that modern video and still-image communications inhabit presents novel and unique problems for our existing regulatory apparatus which developed in response to a much more monolithic model of telecommunications. Sorting through jurisdictional questions alone will take some time. Too, Congressional action may be required to provide the certainty necessary to ensure that the public will continue to have access to robust emergency communications capabilities using the applications, devices, and networks they prefer without opening the door to excessive regulation of competitive markets for those products and services. These are important issues that deserve exploration, and I urge you to continue the committee's inquiry into 9-1-1 matters in the upcoming Congress.

Once again, thank you for holding this important hearing, and for providing NENA with this opportunity to inform the committee about the pressing issues facing the 9-1-1 community. If I may be of any further service, please do not hesitate to ask!

QUESTION FROM CHAIRMAN GUS M. BILIRAKIS FOR KYLE MALADY

Question. Mr. Malady, in your testimony, you discussed several tests Verizon is conducting to root out and protect against system vulnerabilities. Among others, you mentioned tests for "failed automated controls" and "prioritized system load transfer" scenarios. Can you tell us more about these tests and about other tests Verizon plans to execute?

Answer. In my testimony, I referred to enhanced testing for "failed automated controls." As background and as a matter of course prior to the June derecho, we frequently conducted tests to ensure that, in the event of a commercial power outage, our generators would start and support equipment at affected sites. We executed these tests using an automated control system (known as a "controller") in central offices that senses the loss of utility power; signals the generator(s) to start; and, once the generator(s) are working, opens and closes a series of breakers to transfer the equipment from commercial power to generator power. Thus, our previous testing routine focused on verifying that site equipment would transfer to generator power when the automated controller was functioning properly.

As a result of our investigation, we have added procedures to our maintenance routine to test the transfer to back-up generator power in the event that the automated controller is not functional. We have created procedures for turning on generators manually and for manually opening and closing the various breakers.

In my testimony, I also referred to "prioritized system load transfer" scenario testing. Prioritized system load transfer refers to the ability, in an office with multiple generators that are connected as a common system, to program the controller to close only the breakers connected to priority equipment if one of the generators in the system is not operating. This enables priority equipment to be powered by the generator(s) that is operational. Again, as a result of our investigation after the storm, we have instituted a number of improvements to test our prioritized load transfer capabilities. For example, we now test to ensure that prioritized equipment continues to be powered in the case where one of the generators fails to start. We also test to ensure that prioritized equipment continues to be powered in the case where all of the generators initially start but then one generator fails. In all of the

scenarios, we are testing to confirm that the controller closes only certain breakers to ensure that higher priority equipment continues to be powered by the generator(s) that is operational.

Finally, we are also implementing test scenarios that assume that the controller's prioritized system load capability has failed. In those scenarios, we will test to ensure that we can manually control the breakers to achieve the system loads that an operational controller would have achieved.

Verizon has added the testing protocols described above to our existing power test procedures.

Thank you for the opportunity to clarify these points.

