# REALIZING NATIONWIDE NEXT-GENERATION 911

## HEARING

BEFORE THE

SUBCOMMITTEE ON COMMUNICATIONS AND TECHNOLOGY

OF THE

COMMITTEE ON ENERGY AND COMMERCE

HOUSE OF REPRESENTATIVES

ONE HUNDRED FIFTEENTH CONGRESS

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# CONTENTS

# REALIZING NATIONWIDE NEXT–GENERATION 911

**WEDNESDAY, MARCH 29, 2017**

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON COMMUNICATIONS AND TECHNOLOGY,
COMMITTEE ON ENERGY AND COMMERCE,
*Washington, DC.*

The subcommittee met, pursuant to call, at 10:00 a.m., in room 2123 Rayburn House Office Building, Hon. Marsha Blackburn (chairman of the subcommittee) presiding.

Members present: Representatives Blackburn, Lance, Shimkus, Latta, Guthrie, Olson, Kinzinger, Bilirakis, Johnson, Long, Flores, Brooks, Collins, Walters, Costello, Walden (ex officio), Doyle, Welch, Clarke, Loebsack, Ruiz, Eshoo, Engel, and Matsui.

Staff present: Ray Baum, Staff Director; Chuck Flint, Policy Coordinator, Communications and Technology; Gene Fullano, Detailee, Communications and Technology; Theresa Gambo, Human Resources/Office Administrator; Giulia Giannangeli, Legislative Clerk, Digital Commerce and Consumer Protection/Communications and Technology; Kelsey Guyselman, Counsel, Communications and Technology; Brandon Mooney, Deputy Chief Energy Advisor; Mark Ratner, Policy Coordinator; David Redl, Chief Counsel, Communications and Technology; Dan Schneider, Press Secretary; Hamlin Wade, Special Advisor, External Affairs; Jeff Carroll, Minority Staff Director; Alex Debianchi, Minority Telecom Fellow; David Goldman, Minority Chief Counsel, Communications and Technology; Jerry Leverich, Minority Counsel; Lori Maarbjerg, Minority FCC Detailee; and Dan Miller, Minority Staff Assistant.

## OPENING STATEMENT OF HON. MARSHA BLACKBURN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TENNESSEE

Mrs. BLACKBURN. Good morning. The Subcommittee on Telecommunications and Technology will now come to order and the chair now recognizes herself for 5 minutes for an opening statement.

The evolution in communications technology continues to change the lives of Americans and for the better. The transition to the internet protocol technology underlying next generation 911 service from the circuit-based networks of yesterday is a compelling example of this.

Traditional 911 services permitted a voice call through the local phone company switch to be transferred directly to a public safety answering point, or PSAP.

Next-Gen 911 takes advantage of the robust capabilities of today's and tomorrow's digital networks and will allow the lifesaving call to take the form of voice, text or video from any wired, wireless, or IP-based device routed over a broadband network.

Realizing Next Generation 911 services throughout the nation is critical, but as with any large-scale transition there are challenges to overcome. Issues regarding such matters is funding, governance, ensuring the security of the network are a few and the cost will be significant.

Yet, while funding is a challenge, studies reveal a troubling pattern whereby some states divert money collected from consumers intended for 911 services that could assist with the transition. The FCC reports that approximately $220 million, or 8.4 percent, of the total amount of fees collected by the states to fund 911 were diverted for non-911 purposes. This was in 2015 alone.

Every member of this committee should agree to work aggressively on this issue.

Our witness from the state of Indiana, Mr. Ritter, tells us in his testimony that a state's approach to governance is an important component of a successful transition.

The majority memorandum notes that approximately have of the states have established 911 boards or similar entities. I look forward to a better understanding of how this coordinated command may facilitate transition.

And we are all aware the IP-based networks will be vulnerable to cyberattack. The FCC has said that additional work must be done to protect these networks including encrypting data to ensure the integrity of traffic.

What more can be done and what is the best approach? With that said, we should recognize that this transition is underway and these challenges are not insurmountable.

According to an FCC report, 12 states report that NG911 is operational in 100 percent of the state. My home state of Tennessee is among those 12. A solid start for our nation but well short of where we ought to be.

We have taken steps to facilitate the transition. Most recently in 2012 this committee under Chairman Walden's leadership was instrumental in passage of the Middle Class Tax Relief and Job Creation Act, which not only created First Net to bring state of the art communication capabilities to our nation's first responders but also sought to further the NG911 transition.

Republicans and Democrats must agree that having a modern 911 emergency repose system is a national necessity. I look forward to our conversation today and I yield the remaining time to Ms. Brooks for an introduction.

[The prepared statement of Mrs. Blackburn follows:]

## PREPARED STATEMENT OF HON. MARSHA BLACKBURN

Welcome to the Communications and Technology Subcommittee's hearing titled: "Realizing Nationwide Next-Generation 911." Also, thank you to our witnesses for appearing here today to offer your expertise.

The evolution in communications technology continues to change the lives of Americans, and for the better. The transition to the Internet Protocol technology underlying Next Generation 911 service from the circuit-based networks of yesterday is a compelling example of this. Traditional 911 services permitted a voice call

through the local phone company's switch to be transferred directly to a Public Safety Answering Point or "PSAP." Next Gen 911 takes advantage of the robust capabilities of today's and tomorrow's digital networks and will allow that lifesaving call to take the form of voice, text, or video from any wired, wireless, or IP based device routed over a broadband network.

Realizing NG911 services throughout the Nation is critical, but as with any large-scale transition there are challenges that must be overcome. Issues regarding such matters as funding, governance, ensuring the security of the network are but a few. The cost will be significant. Yet while funding is a challenge, studies reveal a troubling pattern whereby some states divert money collected from consumers intended for 911 services that could assist with the NG911 transition. The FCC reports that approximately $220 million—or 8.4 percent of the total amount of fees collected by the states to fund 911 was diverted for non-911 purposes in 2015. Every member of this Committee should agree to work together to tackle this issue aggressively.

Our witness from the state of Indiana, Mr. Bitter tells us in his testimony that a state's approach to governance is an important component of a successful transition. The majority memorandum notes that approximately half of the states have established 911 boards or similar entities. I look forward to a better understanding of how a "centralized command" may facilitate the transition.

And we are all aware that these IP-based networks will be vulnerable to cyberattack. The FCC has said that additional work must be done to protect these networks, including encrypting data to ensure the "integrity" of traffic. What more can be done? What is the best approach as we move forward?

With that said, we should recognize that this transition is underway and these challenges are not insurmountable. According to an FCC report, twelve states report that NG911 is operational in 100 percent of the state—my home State of Tennessee among them. A solid start for our Nation but well short of where I think we need to be.

We have taken steps to facilitate the transition. Most recently, in 2012, this Committee, under the leadership of Chairman Walden, was instrumental in passage of the Middle Class Tax Relief and Job Creation Act which not only created FirstNet to bring state-of-the-art communications capabilities to our Nation's first responders, but also sought to further the NG 911 transition. In addition, to more in grant funding, we called for a study of the costs to move to NG911 and annual reports to keep us informed of progress. Unfortunately, we are still waiting. Republicans and Democrats can both agree that having a modern 911 emergency response system in place is a national necessity. As our witnesses today share their stories and expertise, we have an opportunity to learn what works best, what is most efficient, and what will get us there quickly. I look forward to working with my colleagues on the other side of the aisle. Thank you.

Ms. BROOKS. Thank you, Madam Chair, and I would like to welcome a Hoosier to Washington, Barry Ritter, the executive director of Indiana 911.

Along with Mr. Ritter, Kelly Mitchell, the Indiana state treasurer also in attendance, and Treasurer Mitchell chairs the state 911 board and is actually the only treasurer in the country in this role. And so welcome, Ms. Mitchell.

Mr. Ritter originally joined the state as the director of the Wireless 911 Advisory Board in 2010. He was an active participant in the 2012 session of the legislature which brought about fundamental changes in the funding model in Indiana and operational responsibilities for 911 in Indiana, most notably the creation of the statewide 911 board.

Prior to joining the board he served for 4 years as the director of the Wayne County Consolidated Communications Center in Richmond, Indiana.

He came into the world of 911 after serving more than 20 years as a police officer for the city of Richmond, and during his career he held several assignments in the agency, eventually serving as deputy chief of police.

Mr. Ritter earned his degree from Vincennes University and received his emergency number professional designation through the NENA Institute in 2009.

We welcome your testimony today, Mr. Ritter, and appreciate you being here to provide this panel and to provide the other members here with your background and expertise.

I yield back. Thank you.

Mrs. BLACKBURN. Gentlelady yields back.

Mr. Doyle, you are recognized for 5 minutes for an opening.

**OPENING STATEMENT OF HON. MICHAEL F. DOYLE, A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF PENNSYLVANIA**

Mr. DOYLE. Well, thank you to the witnesses for being here today and thank you, Madam Chair, for calling this hearing.

The state and future of 911 systems in this country is a critical issue. As we move forward with the deployment of the national public safety broadband network for first responders we need to recognize the importance of 911 service and then need for modernization for both the people that take 911 calls and those that are sent to respond to them.

While Congress has allocated billions in funding in spectrum to leverage the construction and deployment of FirstNet, we have only allocated $115 million for Next-Gen 911.

And while states and localities have an important role to play, we need to ensure that they have a strong partner in the federal government that is able to direct funding, expertise, and scale at this challenge.

I am disappointed that we are sitting here today without a clear idea of how much upgrading our nation's 911 infrastructure will cost or what the ongoing cost will be of sustaining world class 911 infrastructure throughout the country.

I think what's clear is that the current funding mechanisms are not sufficient to meet current needs or to fund the next generation of upgrades.

I would call on the majority to work with us to advance legislation to address these issues. And while I commend the work being done by the witnesses here to attack the problem, we need national solutions because citizens will not adopt these new technologies if they are not uniformly deployed and uniformly functional on a national basis.

We are far past the time when localities should have a patchwork of solutions where some accept text messages, pictures, and videos and others are still working with technology from the '70s.

Smart phones and smart devices are the present and the future of emergency communications. As the testimony shows, the future of Next Gen 911 are vehicle collision notifications being sent to 911 call centers, and companies like Nest and other smart home safety and security products which are already warning consumers about incidents in their homes.

We need to be sure that both consumer, commercial and municipal IOT infrastructure can communicate effectively with first responders.

Recently, there have been a number of 911 outages in our country. This month roughly 46 million AT&T customers lost access to 911 service for five hours. Approximately 12,600 people tried to dial 911 and weren't able to get through.

More than AT&T's outage, a Dallas call center was overwhelmed by abandoned 911 calls and we have reports of similar cases throughout the country.

Some of these instances seem due to understaffing while others the root causes are still not clear. What is clear is that we are still facing challenges in places meeting basic service standards.

I would just add that compromised smart phones have already been used to attack the nation's 911 system. As the witnesses point out, moving the 911 system to an IP-based system opens up call centers to great cybersecurity challenges also.

Deploying Next-Gen 911 services isn't just about expanding the ways people access emergency services. It's also about making sure these services are more redundant, more reliable and more useful.

I hope this hearing is educational to our members. I look forward to hearing the testimony of the witnesses and I would be happy to yield the remainder of my time to any member of the subcommittee that wants to use it.

Seeing none, Madam Chair, I'll yield back.

Mrs. BLACKBURN. The gentleman yields back and the chairman of the full committee, Mr. Walden, you are recognized for 5 minutes.

**OPENING STATEMENT OF HON. GREG WALDEN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF OREGON**

Mr. WALDEN. I thank you very much and I thank you for holding this very important hearing as we move forward in our work in this area.

This morning we convene to examine the progress in the deployment of Next Generation 911. As a matter of coincidence, the timing could not have been better.

Yesterday, FirstNet announced that it took the next step in its competitive bidding process. It's expected FirstNet will soon execute a contract to form a public-private partnership in order to deploy a single nationwide wireless broadband network for our first responders.

Nearly 13 years after the 9/11 commission reported highlighted grave deficiencies in the first responder communications, the most up to date communications capabilities will finally be at the fingertips of our brave men and women who protect us daily.

Today, we all carry devices in our pockets. They allow us to communicate by voice, by text, by email, by video and now that we are at the threshold of deployment of FirstNet our nation's first responders will have a dedicated network to do the same. This is really important work.

But our 911 networks, which are based on the technologies of the past, do not provide the seamless connection between the two.

Only by bringing IP-based technology to the nation's public safety answering points, the professionals that are the first voice you hear when you call for help, can we bring the full promise of modern technology to serve us in times of emergency.

In 2012 when we passed the Middle Class Tax Relief and Job Creation Act, which created FirstNet, we also took steps to facilitate the deployment of Next Generation 911.

We engaged the 911 implementation coordination office to work with the state and local authorities, asked for a report on the cost of NG911 and established a matching grant program. We did all that as the work of this committee.

Unfortunately, for reasons that were never made clear, in response to our bipartisan inquiries the prior administration did not get that funding out the door nor did they produce the report. They failed on both counts.

Today, I hope we can get a measure of how far the transition to NG911 has come and some ideas about how to accelerate it. We understand there will be costs involved in the efforts of this magnitude.

This is big stuff. I realize that. We have done a lot of oversight hearings over FirstNet and all of this along the way.

But FirstNet and its participating states have shown there are smart ways to approach such complex public safety undertakings. Some states report they are already Next Generation 911 capable and many others are pursuing the transition.

So these states should be applauded for their efforts. However, while nearly every state collects money from their citizens for 911, some states have taken moneys collected for 911 and then used it for other unrelated purposes. This cannot continue, period.

Aside from the fact that this erodes the public trust, it ultimately impairs the transition to NG911 for the nation as a whole.

I look forward to the hearing, your testimony today. My thanks to all of you for sharing your experiences and wisdom with us and I hope we will leave with a better understanding of what works and how we can use these lessons to move forward in a manner that best delivers Next Generation 911 services to our nations and our communities.

And I apologize in advance. I have got two subcommittees meeting simultaneously and will be bouncing between the two. Your testimony was terrific. We look forward to working with you.

And I don't see Mr. Flores. I know he may be on his way but he wanted to introduce one of our witnesses, Madam Chair. But in absence of that if anybody wants the remainder of my time I am happy to yield it.

[The prepared statement of Mr. Walden follows:]

## PREPARED STATEMENT OF HON. GREG WALDEN

This morning we convene to examine the progress in the deployment on NextGeneration 911. As a matter of coincidence, the timing could not be better. Yesterday, FirstNet, announced that it took the next step in its competitive bidding process. It is expected FirstNet will soon execute a contract to form a public-private partnership in order to deploy a single, nationwide wireless broadband network for our first responders. Nearly 13 years after the 9/11 Commission Report highlighted grave deficiencies in first responder communications, the most up-to-date communications capabilities will finally be at the fingertips of the brave men and women who protect us daily.

Today we all carry devices in our pockets that allow us to communicate by voice, by text, by email, and by video. And now that we are at the threshold of deployment of FirstNet, our nation's first responders will have a dedicated network to do the same. But our 911 networks, which are based on the technologies of the past, do

not provide a seamless connection between the two. Only by bringing IPbased technology to the Nation's Public Safety Answering Points—the professionals that are the first voice you hear when you call for help—can we bring the full promise of modern technology to serve us in times of emergency.

In 2012, when we passed the Middle Class Tax Relief and Job Creation Act, which created FirstNet, we also took steps to facilitate the deployment of next-generation 911. We engaged the 911 Implementation Coordination Office to work with state and local authorities, asked for a report on the cost of NG911, and established a matching grant program. Unfortunately, for reasons that were never made clear in response to our bipartisan inquiries, the prior administration didn't get that funding out of the door nor did they produce the report.

Today, I hope we can get a measure of how far the transition to NG911 has come and some ideas about how to accelerate it. We understand that there will be costs involved in an effort of this magnitude. But FirstNet and its participating states have shown there are smart ways to approach such complex public safety undertakings.

Some states report that they are already NG911 capable and many others are pursuing the transition. These states should be applauded for their efforts. However, while nearly every state collects money from their citizens for 911, some states have taken monies collected for 911 and used it for other purposes. This cannot continue. Aside from the fact that this erodes the public trust, it ultimately impairs the transition to NG911 for the nation as a whole.

I look forward to hearing today's testimony. My thanks to all of you for sharing your experiences and wisdom with us today. I hope that we will leave with a better understanding of what works and how we can use these lessons to move forward in a manner that best delivers NG911 services to our nation's communities.

Mrs. BLACKBURN. Does anyone seek the time?

Mr. WALDEN. Seeing none, I yield back to the chair.

Mrs. BLACKBURN. And we know that Mr. Flores wanted to introduce this good Texas Aggie we have before us. But we are going to welcome him anyway.

Ms. Matsui, you are recognized on Mr. Pallone's 5 minutes.

## OPENING STATEMENT OF HON. DORIS O. MATSUI, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Ms. MATSUI. Thank you very much, Madam Chair, and thank you very much for holding this hearing today, and I want to thank the witnesses for being here today and I look forward to your testimonies.

This morning's hearing highlights the challenges facing our 911 system. Not only are we under funding our current 911 infrastructure, we are also failing to make investments to make Next Generation 911 a reality.

As consumers, all of us have seen the incredible advances in technology. In just the last decade we used our smart phone to do so much more than make phone calls. These devices can take pictures, send text messages and record video.

These tools could give first responders critical information. But today, very few 911 call centers can receive them.

It is critical that we accelerate deployment of the Next Generation 911, 9-1-1, because it could improve access to emergency services for so many Americans, like people with disabilities and victims of domestic violence.

We need to work together because this technology could truly save lives. At this time I'd like to yield time to my colleague from New York, Mr. Engel.

Mr. ENGEL. Thank you. I thank my friend from California for yielding to me. Earlier this month, millions of wireless customers had to deal with the cascading nationwide failure of 911 service in my district in New York all the way to Washington and California.

I look forward to the results of the FCC's investigation into this incident. But it speaks to a much larger problem. Our 911 infrastructure is outdated, bordering on obsolete.

For some time now we have had the technology to do a much better job of pinpointing the location of callers even within buildings. 911 call centers could take texts and other media and secure ESInets, could share information and even calls across 911 systems.

But we haven't made these leaps in part because there has been no commitment and in part because there has been no funding. So this gets into an even broader story about aging infrastructure across the board.

From roads and bridges to the energy grid to our national cyberdefense, we need to make major investments in any number of different areas.

Tax cuts and credits alone aren't going to cut it. We need to make serious investments. I know that a lot of our witnesses here today will be or less unanimous on the question of whether we should be taking these steps on Next-Gen 911 and I hope the subcommittee can come to some agreement about a smart way to move forward with some of those much needed advances.

But it's important to remember through all this that e-911, the main federal grant program that supports 911 services across the country, is a joint program of the Department of Commerce, specifically NTIA, and the Department of Transportation, specifically NHTSA, and the White House's budget proposal would slash these two departments by 16 percent and 13 percent respectively.

Massive cuts at a time when we need to be making smart investments, to me those two things aren't smart and don't go together.

So I want to thank the witnesses for their testimony and their commitment to helping keep Americans safe. I hope that this hearing today can continue the conversation that we need to have about investing in our infrastructure and I hope that this subcommittee can take the lead on moving our infrastructure into the 21st century.

I believe that support of our infrastructure should be, can be, and will be a bipartisan move and I hope we can do that.

I thank you. I yield back, unless Ms. Matsui wants her time back or anybody else.

Ms. MATSUI. Anyone else want to have time?

I yield back, Madam Chair.

Mrs. BLACKBURN. The gentlelady yields back and that concludes our opening statements.

I remind all members that pursuant to committee rules all members' statements will be made a part of the opening statements record.

With that, we want to thank all of our witnesses for being here today and for taking your time to testify before the committee.

I also want to thank you for submitting your testimony well prepared. Today's hearing will consist of two panels. Each panel of

witnesses will have the opportunity to deliver statements and to answer questions.

So we will begin why welcoming Mr. Trey Forgety who, by the way, has Tennessee ties. We like that. And Mr. Magnussen, I would suggest that, being a Texan, you get to know the young man. Wouldn't be a Texas without Tennessee.

So glad you all are seated next to each other and—well, or Kentucky either. That's exactly right. We volunteer to do—somebody's giving me the hook 'em horns back there. So put your hand down. I saw it.

Mr. Forgety is the director of governmental affairs and regulatory counsel at National Emergency Number Association. Mr. Walt Magnussen serves as the director of the Internet to Technology Evaluation Center at Texas A&M University.

Ms. Mary Boyd, who is the VP of regulatory policy and external affairs at West Safety Services, Ms. Boyd is testifying on behalf of the Industry Council for Emergency Technologies.

Mr. Barry Ritter, who was so ably introduced by Congresswoman Brooks, and she is leading our effort, Mr. Ritter, as we look at NG911, she is leading that effort on behalf of your subcommittee and the committee at large and we thank her for that and we thank you for doing such a great job helping to—her to understand and to grow and to know all about this issue.

Mr. Steve Souder, who is representing the Maryland Emergency Number 911 Systems Board—he was previously the former director at Fairfax County 911.

We appreciate all of you being here. We will begin the panel with you, Mr. Forgety. You are now recognized for 5 minutes for an opening statement.

**STATEMENTS OF TREY FORGETY, III, DIRECTOR OF GOVERNMENTAL AFFAIRS, NATIONAL EMERGENCY NUMBER ASSOCIATION; WALT MAGNUSSEN, DIRECTOR, INTERNET2 TECHNOLOGY EVALUATION CENTER, TEXAS A&M UNIVERSITY; MARY BOYD, VICE-PRESIDENT, REGULATORY, POLICY AND EXTERNAL AFFAIRS, WEST SAFETY SERVICES, ON BEHALF OF INDUSTRY COUNCIL FOR EMERGENCY RESPONSE TECHNOLOGIES; BARRY RITTER, EXECUTIVE DIRECTOR, STATEWIDE 911 BOARD, STATE OF INDIANA; STEVE SOUDER, FORMER DIRECTOR, FAIRFAX COUNTY 9-1-1, MARYLAND EMERGENCY NUMBER (9-1-1) SYSTEMS BOARD**

**STATEMENT OF TREY FORGETY**

Mr. FORGETY. Thank you, Madam Chairwoman, and Ranking Member Doyle for hosting this hearing. It's a great pleasure for me to appear before you and an honor to appear beside such an August panel here. I mean, you really have all of the heavy hitters from the 911 industry sitting next to me here. So it's great to appear with them.

The reason we are here, ultimately, is the way that we communicate in the United States has changed radically over the last 30 years.

We are now a nation that has more wireless connections, more devices, more gadgets, more things that can connect to a network

than we have people. And all of those devices are being used by consumers in ways that we could not have imagined only a few short decades ago.

Already text and video communications, things like FaceTime and WhatsApp and Facebook are overtaking voice. People don't communicate with a telephone call anymore. For people in my generation and younger, that is not our first instinct. When we want to reach out and touch somebody we are more likely to make a video call or send a text.

But 911 has not changed at the same time. Today's 911 systems are still using technology that was invented in the '60s and '70s and deployed in the '80s and '90s.

These systems make it very difficult to move calls around to ensure the availability and to defend networks against new kinds of attacks.

The unfortunate thing about this, when you get right down to it, in today's modern networks we don't move things around my moving wires anymore. But for most 911 systems, if you want to make a change that is literally what it takes.

Someone's got to physically go down to a telephone company office and move some wires around on a panel. That's terribly disappointing. It ought to be a lot simpler than that.

Well, NG911 changes all of that. It makes it a lot simpler. NG911 has native support for voice, video, text, pictures, and data and built-in resiliency and reliability features that allow us to do things like reroute calls, efficiently visualize and map where they are coming from in three-dimensions, which is a big deal in bigger cities. And it also gives us new tools to defend these networks, modern tools, that as long as we live in the telephone network we simply won't have access to.

Another great point about NG911, this is homegrown high-tech innovation-focused technology. It uses the same technology, the same internet era technologies, that Apple and Google and Facebook and Snap use underlying all of their services like iMessage and Snapchat and Facebook Messenger.

That's a really powerful thing because if you want the citizenry to have access to 911 in the way that they communicate you've got to make it easy for the technology developers and cheap to implement. It's got to be inexpensive.

If you can't do those two things you won't have widespread adoption and you won't get the full advantage of these new technologies that we have. When our folks went and looked at how do we design Next Generation 911 for the future that was a key design element.

It was let's make it easy, let's make it the commercial off-the-shelf technologies that these folks use every day and let's make it as inexpensive as possible.

This also represents a new export for the United States. Already Next Generation 911 has been adopted as the target goal, as the standard in Canada to our north and it's being modified a little bit for use in the NG 112 systems that'll be deployed throughout Europe.

So this is something that—our homegrown technology is now being exported around the world in a way that will benefit our industry and our global public safety community.

We need this technology now. We need NG911 now. The transition costs for local governments if this transition is delayed are going to explode.

Maintaining legacy infrastructure that you can't get parts for anymore, that you can't get technicians who even remember ever being trained on how to operate it, doing those things long term is going to be devastating for the more than 2,000 counties and cities that operate the 6,800-plus public safety answering points, or PSAPs, in the country.

Not only that, but delaying the transition will also darken the outlook for our nation's field responders. A number of members of the committee mentioned in their opening statements FirstNet.

FirstNet is built on the same sorts of technologies as NG911 and as consumer networks that are transitioning very rapidly to all-IP basis whether it is wireline or wireless.

So we need to make sure that we have got the system in the middle that sits between the IP networks for consumers and the ones for FirstNet. Those need to be NG911.

They need to be all IP and they need to be that now. Congress can accelerate this transition with a one-time injection of federal capital to ensure a coordinated efficient rollout of shared databases, networks, and systems and avoid wasteful duplication and proprietary noninteroperable technology deployment.

Madam Chairwoman, I thank you for holding the hearing and I welcome your questions.

[The prepared statement of Mr. Forgety follows:]

**Before the United States House of Representatives**
**Committee on Energy and Commerce**
**Subcommittee on Communications and Technology**

*Realizing Nationwide Next-Generation 911*
March 29th, 2017

Testimony of Telford E. Forgety, III; "Trey"
Director of Government Affairs & Regulatory Counsel
NENA: The 9-1-1 Association

## Summary

1. Local 9-1-1 centers must transition to Next Generation 9-1-1 at the same time that consumer wireline and wireless networks transition to IP-based service, and at the same time as FirstNet enables IP-based service for field responders.

2. Existing funding at the state and local levels covers maintenance and operations of legacy systems, and legacy voice-centric 9-1-1 service, with little room to enable the technical transition.

3. Delaying the NG9-1-1 transition will cause state and local costs to explode as legacy infrastructure maintenance overtakes the cost of providing basic services to the public.

4. Congress should accelerate NG9-1-1 deployment by making a one-time investment in the capital infrastructure and transition costs of NG9-1-1 systems at the state and local levels.

## Testimony

Chairwoman Blackburn, Ranking Member Doyle, and may it please the Committee: My name is Trey Forgety, and on behalf of the 9-1-1 Associa-

tion's more than 12,000 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 crucial first link between the public and emergency responders.

The way consumers communicate has changed radically over the last 20 years. Telephones have evolved from single-purpose electrical appliances that hang on our walls to multi-purpose electronic computers we carry in our pockets. New media types that were once the realm of comic-book fiction are now common-place. But as consumers have adopted text, pictures, video calling, and richly integrated communications apps, the 9-1-1 world largely has not. For a large majority of our nation's more than 6,800 PSAPs, legacy analog voice remains the only effective means of handling a request for emergency service. This must change.

Sometime in the early years of the next decade, consumer wireline and wireless networks will complete their already-in-progress transition to all-IP operation. At the same time, our field responder colleagues in the law enforcement, fire, and emergency medical service disciplines will begin their transition to the all-IP services of FirstNet. If we do not transition our 9-1-1 systems to a new, all-IP architecture, and soon, we will lose out on the tremendous improvements to public safety and national security that are achievable with a modern, integrated emergency response architecture. Moreover, we will consign our state and local governments to a future of endlessly-rising costs, as more and more legacy network infrastructure must be maintained solely to keep legacy 9-1-1 service alive. To bridge the gap between consumer networks and FirstNet, and to relieve

the extreme burdens of legacy infrastructure maintenance, we must accelerate the transition to IP-based emergency services, and soon. In short, we must deploy a Next Generation of 9-1-1 service.

Next Generation 9-1-1 is a system comprised of hardware, software, data, and operational policies and procedures that provides a secure environment for emergency communications. It provides standardized interfaces from call and message services, processes all types of emergency calls, and acquires and integrates data useful to call routing and handling. NG9-1-1 delivers calls and messages and data to the appropriate 9-1-1 center, known in the industry as a Public Safety Answering Point or "PSAP." Along with the field responder communications services that will be provided by FirstNet, NG9-1-1 will allow the public safety community to better coordinate incident response and management for everything from a minor traffic accident to a major terrorist attack.

The overall architecture for NG9-1-1 is defined by the so-called "i3 Standard." i3 was developed at NENA by hundreds of public safety professionals from both the public and private sectors, starting in 2003. Now undergoing its second major expansion and revision, the i3 standard leverages common technologies and global standards from the internet era. This opens-up the 9-1-1 space to significant innovation by device manufacturers, application developers, communications platform providers, and public safety systems vendors. In deliberately building an open platform, NENA's forward-thinking developers consciously chose to make emergency communications easy and low-cost for *any* communications platform to implement. Moreover, our developers anticipated the ongoing

drive to consolidate, virtualize, and share services and systems among and between PSAPs and 9-1-1 authorities. This will allow states and localities to reduce the cost burden associated with a transition of this magnitude. Using this consensus-based, standardized, innovation-forward approach, we can achieve enormous benefits to consumers and public safety alike. Realizing those benefits, however, is not a foregone conclusion.

Today, many states and localities are *not* ready to begin the transition to NG9-1-1. A number of states have no personnel or governance structures in place to manage this complex transition, risking wasteful or redundant expenditures. There are lingering misconceptions about how NG9-1-1 systems should be deployed, leading even some individual PSAPs to believe that they should, or must, deploy an entire NG9-1-1 system on their own. Worst of all, however, two significant financial barriers exist that substantially jeopardize the timely deployment of NG9-1-1 systems.

First, according to the FCC's latest report, at least 8 states continue to callously divert fees, paid in good faith by consumers for 9-1-1 service, to non-9-1-1 purposes. In some instances, these diversions have alternative, though no less illegitimate, uses for other public services. In the overwhelming majority, however, diversions are simply directed to states' general funds. This is fundamentally wrong. Consumers value 9-1-1 service, and routinely vote to fund it via fees. I wish to acknowledge here the Federal Communications Commission's ongoing monitoring and reporting on this trend, and on Commissioner O'Rielly's recent blog post on the topic. If we as a 9-1-1 community are to seek the assistance of our national government in completing the NG9-1-1 transition, it is absolutely right

and proper that we should acknowledge this failing, and work collaboratively to find ways to incentivize the expenditure of 9-1-1 funds for 9-1-1 purposes. NENA welcomes that debate, and pledges to work with members of this Committee to find solutions that reward states for spending their 9-1-1 fees appropriately, while not penalizing local 9-1-1 systems for decisions that are beyond their control.

Second, significant capital expenditure constraints at the state level make it incredibly difficult to simultaneously operate and maintain existing E9-1-1 systems while building, testing, and training for the NG9-1-1 systems of the future. Make no mistake: This transition *will* be expensive. However, NENA is convinced that a one-time infusion of federal capital, coupled with an appropriate matching component at the state level, can significantly accelerate the transition, lowering the long-term costs of the transition for every level of government. The laboratory of the states bears this out: In Indiana, the rapid, state-wide deployment of Text-to-9-1-1 technology saved millions of dollars in emergency response costs for accidental and abandoned 9-1-1 calls. In Washington state, a move to centralize and share expensive capital equipment using newly-deployed redundant broadband systems likewise reduced costs. And, in my own home state of Tennessee, the deployment of a state-wide Emergency Services IP network has laid the foundation for a thoughtful and efficient transition to NG9-1-1 service. With a boost from the federal government, these early successes can be replicated in other states.

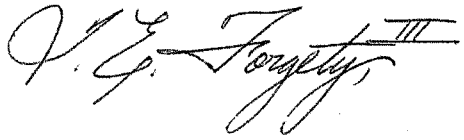
Here, I wish to mention the ongoing efforts of the National 9-1-1 Program Office, and its director, Laurie Flaherty. Much of the data that we

have about where the NG9-1-1 transition stands within the states has been made available as a result of her office's efforts. Moreover, the Office has notched major successes like convening the first-ever work on a nation-wide guideline for minimum 9-1-1 telecommunicator training, publishing a discipline-specific NG9-1-1 primer for the law enforcement community, and assembling an authoritative bibliography of standards and standards developing organizations in the 9-1-1 space. These efforts will significantly advance the NG9-1-1 transition by helping to make training portable and quash myths and misconceptions about what NG9-1-1 is and how it works. All of this has been done with exceptional support from both NTIA, which has consistently acted as a political champion for the office within Republican and Democratic administrations, and from DoT, which has maintained the office with discretionary funds, even when no program-specific funding was appropriated. Whatever the path to nation-wide NG9-1-1 deployment, there should be no doubt that the national 9-1-1 program office will play a critical role.

Notwithstanding the significant challenges facing states and PSAPs as they navigate the NG9-1-1 transition, NENA is confident that we can achieve a successful roll-out of NG9-1-1 service, *if* the federal government steps in to accelerate the transition *now*. The consequences of waiting, or of doing nothing, are simply too high: lives lost, property destroyed, and costs increased. NENA's members are dedicated to serving people in their times of greatest need. I am honored, Madam Chairwoman, that you and your Committee have called this hearing and allowed me to testify about the future of the 9-1-1 systems on which NENA's members rely to carry

out that mission. NENA believes that significant improvements in 9-1-1 service can be achieved on an aggressive timeframe and for a reasonable price. I look forward to working with you and the Committee to achieve those improvements.

Respectfully submitted,



Telford E. Forgety, III; "Trey"
*Director of Government Affairs*
*& Cybersecurity Programming*
*NENA: The 9-1-1 Association*

Mrs. BLACKBURN. Thank you, sir.

Mr. Magnussen, you're recognized for 5 minutes.

**STATEMENT OF WALT MAGNUSSEN**

Mr. MAGNUSSEN. Good morning, Chairwoman Blackburn, Ranking Member Doyle and esteemed committee members.

It is a real honor for me to be here today and as was mentioned earlier I've been the director at Texas A&M University of the center since 2004.

And while it's seen a lot of progress over those years we still have a long ways to go. However your support can and will make a big difference in accelerating the nationwide NG911 transition.

I would also like to begin my testimony here this morning by noting that my center does have a contract with the United States Department of Justice for the NIJ, the National Institute of Justice, and while I am testifying today on behalf of my work at Texas A&M University, none of the statements that I make today represent the policies of the United States Department of Justice.

Other witnesses have either or will likely talk about what is NG911 and why is it important. I would like to take my time to discuss areas where the efforts of this committee and of Congress can really have the most impact.

This information is based on a study that we did in 2004 that was funded by the ICERT, the same organization mentioned a few seconds ago, and in essence there were four findings that I have in my recommendations that were based on that study and really two recommendations that come as subsequent issues.

So those six issues are number one again is to incentivize states to establish an oversight coordinating authority. Most states have already done this. Most states have coordination within the states.

However, in some states the function of NG911 is simply a matter of collecting the fees from the telephone companies and passing it on down.

While it's possible for a state to implement NG911 within the state without central coordination, it's actually very, very difficult. So, again, anything you could do to resolve that we would greatly appreciate it.

As Mr. Forgety, who, by the way, we have worked together for 10 years now—it's been a fantastic relationship so a very good person—the second one is really to require federal or require federally assisted-provided funding to link to the NENA I3 standard.

The I3 standard we began work on it in 2004. It's been adopted by the majority of the 911 industry associations. It is standards-based.

It is based on other standardized technology such as standards that are adopted by the internet community and by other standards organizations and in that sense it will ultimately reduce costs and ensure interoperability and that is very important for public safety.

Number three, provide interim funding. As Mr. Forgety also just mentioned, while many of the states have been able to go ahead and then get through the process of supporting e-911 on their own, there is little doubt that in essence the transition to NG911 is going to incur additional costs during the transition process.

We probably can survive on our own once we get through that transition but in essence getting through that transition could require a little bit of additional support.

Number four is to establish a national authority and fund a national NG911 network to provide interconnectivity between the states.

The states are doing a fantastic job of managing resources within the states. However, voice over IP is a national issue. It's a national service, and there is a requirement in essence for these state networks to be interconnected.

While simply peering between states is possible, it's not the best solution. It's not practical.

The fifth one is one that basically comes out of a recent FCC recommendation in the TFOPA document and it basically calls for the establishment of a centralized or some centralized cybersecurity centers.

The unfortunate reality today is that there's a significant shortage of cybersecurity experts in the United States. There's also 6,500 PSAPs and managing cybersecurity at the PSAP level probably is not possible.

And then lastly is to coordinate international 911 efforts between Canada and Mexico. Today, with the e-911 system we actually have calls being routed to the wrong country as a citizen that is close to the border is having lunch on the other side of the border, makes a call and actually the call gets routed to the wrong country. That's costing time and, obviously, in emergency response time is money—or time is lives.

Yesterday, as was noted earlier, was a big day for FirstNet. FirstNet, in essence, now that they're going forward, in essence they appreciate the fact—in fact, we were talking about it on a panel yesterday—they appreciate the fact that services that will come to them that will be delivered to first responders, a lot of that information is going to come from the citizens.

It will come through NG911. FirstNet is designed to be voice, video, text. NG911 would be the mechanism to deliver that.

So it is important that this effort happen.

Thank you very much. I appreciate the opportunity to talk today and look forward to question.

[The prepared statement of Mr. Magnussen follows:]

**Written Testimony of Dr. Walt Magnussen**
**Texas A&M University Internet2 Technology Evaluation Center**
**29 March, 2017**

In 2001 the National Emergency Number Association, or "NENA", began a revolutionary process of transitioning the 911 emergency system developed in the 1960s from legacy technology to an Internet Protocol, or "IP-based" system. Two of the most noteworthy reasons necessitating this transition are:

- The entire private sector telecommunications industry was in the midst of a similar transition to IP technologies. The motivation for this transition was the elimination of dependence upon switching systems and infrastructure that was past end-of-product life--outdated technologies were significantly more expensive than the newer IP-based solutions, and service providers began to experience reliability issues with older equipment. The 911 community knew their dependence upon legacy infrastructure was at risk of causing service issues and ultimately being abandoned by service providers as they retired their legacy infrastructure.
- The 911 system effectively supported only voice calls and the association wanted to acknowledge changes in consumer technologies and communications practices. According to the FCC's Task Force on Public Safety Answering Point (PSAP) Optimization, or "TFOPA",[1] more than 240 million 911 calls are answered annually across the United States. While voice calling is still the most common practice, the reality is that we live in a world where support for video, images, text and data is becoming just as important as for voice. The IP-

based Next Generation 911 (or NG 911 ) architecture was designed from the beginning to support multimedia.

Since the early meetings in 2000 significant milestones have been achieved in the transition to NG 911. The Internet2 Technology Evaluation Center (ITEC) at Texas A&M University is a center that I direct, and we are honored to have been a part of these technologic milestones.

- 2001 – NENA released the "Path Forward" vision document. This document described an architectural framework and desired capabilities of the proposed network.
- 2006 – NENA released the first NG 911 architecture specification. This document, later referred to as "the NENA i3 specification", established the first architecture specification and standards for NG 911. The i3 specification, like any good standard, is a living document that undergoes continuing enhancements and modifications. The latest release of this document is dated September 10, 2016.
- 2008 – The U.S. Department of Transportation completed NG 911 Proof of Concept Project. This project built, deployed and tested the NG 911 architecture at five 911 centers across the United States[ii].
- 2009 – First NENA Industry Collaboration Event (ICE)[iii] - This is an ongoing industry interoperability event that allows equipment manufacturers to test their systems. Eight of these events have been held with each event involving about 30 industry participants.

- 2016 – The NG 911 NOW Coalition is formed. Members of this coalition include several emergency communications associations who have an expressed goal of pushing for a nationwide NG 911 transition by the year 2020.

In 2014 the ITEC[iv] released a study entitled, "The Status of NG 911 Deployment in the United States"[v]. This study examined the NG 911 transition status across representative states and discussed the transition process, status of the transition, and recommendations that could accelerate the transition. It described four steps required for any state to transition to NG 911. These four steps are:

- **State Coordination:** Creation of a state-level organizational agency to oversee and/or coordinate NG 911 efforts. In today's 911 environment, the telephone company networks provide interconnection between jurisdictions within the same state over their legacy networks. Interconnection in an IP environment requires significant coordination, not only within the states, but also between the states.
- **Geospatial Data:** Establishment of a geospatial or GIS dataset. Current 911 architecture relies upon local management of all location information. This information, also referred to as Automatic Location Information, or "ALI", worked well in legacy networks for fixed locations. For today's nomadic communications environment, with everyone having one (or more) wireless devices, we need a new method of routing 911 calls. NENA's i3 architecture resolved this issue through what is called the "Emergency Communications Routing Function" (ECRF). This new process is hierarchical in nature, providing local control of data while supporting the sharing of this data across other jurisdictions, regional, state, and even

nationwide. ALI data within each state must be converted to the i3 format to be consistent with ECRF requirements.

- **Broadband 9-1-1 Center Connectivity:** Establishment of standards-based, state-level Emergency Services IP Network, or ESInet, to connect to wireline, wireless and Voice Over IP (VoIP) service providers to rout emergency callers to the most appropriate 911 call center. Depending upon funding and jurisdictional boundaries, there may be one ESInet in a state, or there may be several regional networks. This broadband connectivity provides resource sharing between 911 centers and first responders, providing great backup flexibility for our 911 centers.
- **Call Handling Equipment:** Equipment acquisition for 911 call centers, including 911 "call handling equipment", provides the systems and technologies to gather caller information and get it to the right first responder. A study that the ITEC is currently working on estimates that there are approximately 40,000 call taker workstations located at nearly 6,500 911 centers across the United States.

Some states have already made significant progress toward the goal of transitioning to NG 911 using these four steps. While the order in which states complete each step is not rigid, if there are sufficient resources, these tasks may be implemented in parallel.

Although the technology is changing rapidly, we find that most of the findings of our 2014 study still hold true today. Some of the issues uncovered by the study may be improved through proposed legislation:

- *Incentivize states to establish a state oversight / coordinating authority*. The first step in transitioning towards a state NG 911 implementation is that of establishing a state oversight agency within each state. While many states have this type of organization already in place, our experience tells us that those states without 911 oversight face an uphill and inefficient journey, making the NG 911 transition take much longer and cost much more.
- *Require any federally-provided assistance to be linked to a NENA i3 NG 911 solution*. Since 2003, NG 911 equipment development, interoperability testing, and standards development have all been focused on the community-developed and adopted NENA i3 solution. The TFOPA recommendation does recognizes interim solutions based upon IP-based legacy technology as a viable solution, but the fact remains that these are interim solutions and are not recognized as NG 911. They do not support full industry standard, interoperable multimedia--a shortcoming which should not be overlooked. It is imperative that NG 911 standards and technology are adopted by the industry to ensure a successful transition to an open, non-proprietary NG 911 system. Introducing additional interim solutions will cause unnecessary costly delays and confusion and our 911 centers and first responders will be hampered in their ability to effectively share information.
- *Interim funding*. According to the FCC, 2015 collections of 911 fees reported nationwide was approximately $2.6 billion dollars[vi]. A small portion of these funds are being used for NG 911 transitions today. The report notes 13 states are working on the broadband connectivity portion of the transition. While this level of funding should be sufficient to maintain the infrastructure once it is in place, our study indicates that additional federal

and/or state funding will be required to get the industry through the transition. The funding will be needed to support legacy systems, NG systems and the transition elements connecting the two networks during the transition. Our ITEC center is finalizing an interim cost study, but the final funding amount, and the ways and means of funding distribution should be based upon the cost study currently underway by the U.S. Department of Transportation[vii], due out later in 2017.

- *Interstate network connectivity*. As was mentioned earlier, NG 911 is a hierarchal architecture. While most of the transitioning tasks will be accomplished within the state networks, there needs to be a national layer to interconnect the state networks before we can successfully complete the nationwide transition. Since this is a national issue, the issues of organizational ownership and funding of such a network must be determined. Some of this work has already begun through the efforts of the National 911 Program. Working with a handful of Midwestern states, an "Interstate Playbook" has been developed[viii] to help states identify and mitigate interstate 911 technology, operational, and policy issues. From a networking perspective, the ITEC staff priced out the national-level network, with interconnection points in every state, carried over an existing private backbone network. This interstate layer could have several benefits, in addition to the call routing that it must provide. It could provide interconnection points to national-level service providers, such as VoIP service providers. For example, one VoIP service provider that we are working with has six major switching centers across the United States. This national backbone could be used to connect this service provider to their six locations providing the redundancy required to ensure reliability while eliminating the need to connect at every state. It is

anticipated that many of the NG 911 services will be cloud-based services. If these services are directly connected to the national backbone, these services become a "private cloud" service which is more appropriate for public safety applications. This national backbone needs to be established as soon as possible.

- *Establish 911 Cyber Security Centers.* FCC's 2016 TFOPA report recommends the establishment of the Emergency Communications Cyber Security Centers (EC3) that would place monitoring "probes" within the state-level ESInets. The EC3 deployment is one area where cross state collaboration will provide significant operational and cost efficiencies. With the fundamental lack of cybersecurity professionals in today's society, centralizing cybersecurity operations may help protect our 911 centers. One recent study reported 209,000 unfilled cybersecurity positions in 2015, and that number is expected to rise to between one and two million by 2019[ix]. Proposed legislation could provide leadership in this area. Cybersecurity is an area of great concern for me and my colleagues across the industry and state-level 911 ESInets need to do more in this area. The FCC's 2016 State Collection and Distribution of 911 Fees report shows that 38 states reported ZERO expenditures for 911 cybersecurity.
- *Coordinate International NG 911 efforts.* Recent efforts involving the 911 International Border Coalition have been focused on calls being routed to a PSAP in the wrong country for international visitors in close proximity to the border. An estimated 100,000 calls per year are routed to the wrong country initially on the U.S. Mexican border alone. This is an issue specific to the way that e911 wireless calls are routed that could possibly be improved or

eliminated through NG 911. This issue should be studied for both the Mexican and Canadian border.

- In February 2016, the NG 911 NOW Coalition[x] called for "NG 911 by 2020". This date was not just arbitrarily selected, but based on timelines that many of our largest service providers, like AT&T and Verizon, have set as their goal for marking legacy wireline and wireless technologies as they transition to their own all-IP networks. As a 911 technologist, the time has come to make this transition to NG 911 and retire the decades-old technology that people like me worry about every day. Implementing NG 911 now provides our 911 call takers and first responders with the technology they so desperately need to help serve millions of 911 callers daily in their worst time of need. I look forward to working with you in making this goal a reality.

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[i] https://apps.fcc.gov/edocs_public/attachmatch/DA-16-179A2.pdf

[ii] https://www.its.dot.gov/research_archives/ng911/

[iiiii] http://www.nena.org/?page=NG911_ICE

[iviv] https://itec.tamu.edu/

[v]https://www.theindustrycouncil.org/publications/iCERTReportontheStatusofNG911DeploymentintheUnitedStates.pdf

[vi] https://apps.fcc.gov/edocs_public/attachmatch/DA-17-61A2.pdf

[vii] https://www.911.gov/911connects/911-study-on-next-generation-911-costs.html

[viii] https://www.911.gov/docs/NG911-Interstate-Playbook-FINAL-111516.pdf

[ix] http://www.informationweek.com/strategic-cio/security-and-risk-strategy/cyber-security-skills-shortage-leaves-companies-vulnerable/d/d-id/1326463

[x] http://www.ng911now.org

Mrs. BLACKBURN. The gentleman yields back.
Ms. Boyd, you are recognized for 5 minutes.

**STATEMENT OF MARY BOYD**

Ms. BOYD. Good morning, Madam Chairman.
Mrs. BLACKBURN. Microphone, please.
Ms. BOYD. Oh, thank you. My apologies.
Good morning, Madam Chairman, Ranking Member Doyle, members of the committee. I am Mary Boyd, vice president of regulatory policy for West Safety Service.

But I am honored to be here this morning really on behalf of the Industry Council for Emergency Response Technologies, often we call ICERT.

ICERT is appreciative of your interest in NG911 and assisting in the advancing of this technology. I'd also speak to you this morning from my heart.

I have been in this business 35 years at local state government levels as well as the private sector but, more importantly, my household is public safety.

My husband spent his career in law enforcement and our youngest son, Derry, climbs in an Aerovac helicopter to respond to rural Texas emergencies. So if we can give them the technologies that keep them alive as well as the people they're trying to save, let's partner to get this done.

We have talked this morning about the benefits of Next-Gen 911 but I'd like to just focus on a few of the elements that could really help public safety do their job a little bit easier.

The simple fact we talked about text, we take it for granted that we can text to one another, text to our kids, our grandchildren's photos. But, unfortunately, very few of our 911 centers in the country have the ability to receive a text to 911 call.

But yet our speech and hearing impaired community rely on that communication to talk to their families but they also need to talk to public safety.

We have very few, probably a thousand in the country, of PSAPs that have deployed that. A Next-Gen infrastructure would make that much easier to deploy throughout the community.

The technology companies are ready to do that. We just need the partnership of government. Also, in an era of increased sensitivity to security, national safety, first lines of defense, information is critical.

So imagine the ability for a PSAP to receive the photo of a suspect. I suspect any law enforcement entity in this country would value that piece of information instead of getting the verbal description of perhaps they were wearing a t-shirt with blue jeans and a ball cap.

We have that technology available today to send the photos in as well as video. Another benefit of Next-Gen on an IP network is information about the scene.

A helicopter if flying into a rural area in your state in the middle of the night. It would be wonderful for them to know whether they were going to hit utility lines.

Are they going to have a fuel storage tank that they're unaware of? Are your volunteer firefighters responding to the same?

Next-Gen 911 affords our first responders wonderful information when it is partnered with FirstNet. Another most valuable benefit of an IP network is the redundancy, resiliency, and basically the ability to move networks' voice and data around.

Today, our 911 centers are tethered with outdated technology from the '70s. We cannot move voice and data easily.

So if you have an overburdened 911 center with a spike of call volume or you have a natural disaster—Vermont is a perfect example with their Next-Gen system. When the hurricane hit Vermont, they did not lose one 911 call but yet they did have a PSAP impacted. So they easily changed the traffic to a backup facility.

But as I said, unfortunately most of our technologies today are outdated throughout our public safety agencies and they do pose a risk when we are trying to advance technologies and aid public safety.

ICERT believes that Congress can take a leadership role in a consensus legislation that makes NG911 funding and implementation a national priority and we applaud your efforts to take this subject on.

We would also encourage you that if you have a much larger discussion about broadband and funding that you place NG911 at the core of those discussions.

It is important, as you indicated, that we do recall Congress played a critical role in our country for the initial deployment of 911. In fact, some of my systems we updated in Texas were from the LEAA funds.

So we think it is very appropriate that you look at Next-Gen 911 funding as indicated by Walt and Trey just for the capital upfront cost for local—state and local government.

We are not asking Congress to endure the entire cost but we do know that we have an impediment today because funds are lacking at the state level to cover the upfront implementation.

So members, we want to thank you for your time this morning. I know I am running very short and feel like I've just given you a drink out of a fire hose.

But 911 cannot fall behind. FirstNet and NG911 should be partnered. We thank this committee for this opportunity. We look forward to working with you.

[The prepared statement of Ms. Boyd follows:]


Prepared Testimony and

Statement for the Record of

Mary A. Boyd

Vice President for Regulatory, Policy and External Affairs

West Safety Services

On Behalf of the

Industry Council for Emergency Response Technologies (iCERT)

Before the

Energy and Commerce Committee

Subcommittee on Communications and Technology

U.S. House of Representatives

Hearing on

Realizing Nationwide Next-Generation 9-1-1

March 29, 2017

2123 Rayburn Building

Madame Chair, Ranking Member Doyle, and Members of the Subcommittee, my name is Mary Boyd, Vice President for Regulatory, Policy and External Affairs for West Safety Services. I thank you for convening this hearing on "Realizing Nationwide Next-Generation 911" and for the opportunity to offer input as you consider federal support and guidance for modernizing 9-1-1 services, and accelerating the implementation of Next Generation 9-1-1 (NG911) throughout the United States.

In my testimony today, I am speaking on behalf of the Industry Council for Emergency Response Technologies (iCERT), in my role as a Board member for the organization that looks to add the voice of industry to issues affecting the emergency calling and response technology ecosystem. While in my current professional role I serve as a commercial sector executive, my more than 35 years of public safety experience also includes service in the state and local government sector, working to deliver crucial 9-1-1 services to the public.

iCERT represents the commercial sector of the emergency response technologies field, and along with its member companies, works with the public safety community and other stakeholders to advance the development and deployment of technologies, systems and services that will improve emergency response. Given the current threats and challenges faced by our nation, iCERT believes that first responders and the public should have access to the most advanced 9-1-1 systems possible. We do not believe this goal will be satisfied without the collaborative leadership of and transition funding from Congress leveraging

the collective efforts of stakeholders at the national, state, and local levels, and the commercial community.

**An accelerated deployment of NG911 would yield significant benefits**. The manner in which consumers communicate has changed rapidly in recent years, and a principal objective of NG911 is to ensure the compatibility of the nation's 9-1-1 systems as these changes occur. New NG911 systems will allow Americans in need to access 9-1-1 in new, exciting, and more useful ways (e.g., text, data, devices, and video). ). This will benefit all consumers, but is especially critical for consumers with disabilities, such as the deaf and hard of hearing, that would otherwise not be able to make a 9-1-1 voice call. As texting to 9-1-1 continues to roll out nationwide, the Limited English Proficiency (LEP) community will benefit as text translation comes into service. Video services aid those who speak American Sign Language (ASL). In short, NG911 significantly upgrades the emergency communications capabilities of these underserved populations.

The benefits of NG911, however, are not limited to improved accessibility for consumers. NG911 will dramatically improve emergency response by providing first responders, who are the first line of defense in local emergencies, with access to more and more useful data in a timely manner. In an era of increased security and situational awareness, NG911's multi-media capabilities offer realtime tangible information that can make the difference in time-sensitive law enforcement situations. What law enforcement agency wouldn't want immediate access to a suspect's picture, for example? NG911 includes

more accurate information about a caller's location, as well as actionable information about the caller and the scene. Imagine, the following scenario:

> *A multi-vehicle crash occurs on a major highway in a dense urban area. A driver involved in the crash is hurt and unconscious. The crash notification system installed in her car automatically alerts the 9-1-1 Center. Information about the crash is automatically provided to the center, including the condition of the driver, the condition of the car, and photographs of the scene. Similar information is provided from the other nine vehicles involved in the crash, including a truck carrying a toxic substance. Highway sensors determine that the substance poses a significant health risk. All of this information is collected and provided to public safety officials and others. As a result, police, fire, and EMS officials arrive on the scene more prepared and with greater assurance of their own safety and their ability to provide assistance to those in need. Local hospitals are notified to prepare for a large influx of severely injured patients. Hazmat officials quickly arrive on the scene to address the toxic spill. And, transportation officials act promptly to divert traffic away from the scene.*

NG911 will provide the enhanced capabilities to make this scenario a reality, and enable the 9-1-1 center of the future to make use of more and better information for a faster and more effective response. NG911 will also allow these centers to operate more

flexibly, while increasing reliability and resiliency so that access to emergency services can be assured even in the face of natural disasters and other crises. It will be an invaluable resource for our increasing security needs.

NG911 technology enables more flexible call routing, so that 9-1-1 calls directed to one Public Safety Answering Point (PSAP) can be redirected to another, if necessary. While this feature of NG911 allows PSAPs to manage workloads more effectively by sharing calls with other PSAPs, it is a critical capability during regional emergencies or severe weather, as demonstrated in one of the few states that have implemented NG911.

> *On August 28, 2011, Hurricane Irene caused extensive damage to Rutland, Vermont and other parts of the state. The Rutland PSAP (second largest in the state) was at risk of flooding and needed to be evacuated. Fortunately for the citizens of Rutland, the state had implemented a statewide NG911 system just months before. As a result, all 9-1-1 calls to Rutland were redirected to other PSAPs in the state. While Vermont experienced the highest 9-1-1 call volume on record during the storm, not a single 9-1-1 call went unanswered due to the resiliency, redundancy, and diverse call routing of the state NG911 system.*

**Technological obsolescence creates dangerous risks for public safety**. Despite the numerous benefits of NG911, unfortunately,most of today's 9-1-1 systems still use technologies prevalent in the 1970's that are rapidly becoming obsolete. Continued reliance on outdated technologies poses significant risks to public safety due to higher

maintenance costs, system malfunctions, service outages, and increased cybersecurity vulnerability.

Fortunately, these risks can be minimized by implementing NG911 and supportive technologies that are widely available today. iCERT and its member companies have spent considerable time and resources to develop innovative solutions and the systems and services that use them. For more than a decade, iCERT's members have worked with the National Emergency Number Association (NENA) and other interested stakeholders to develop the architectural framework and standards blueprint for NG911 (referred to as "NENA i3"). NENA i3, while still evolving, is both detailed and roubust enough that systems, products, and services using the i3 standard are widely available in the U.S. today, as well as in Canada and Europe where i3 has been welcomed.

**Next Generation 9-1-1 should be a national priority and a national imperative much as 9-1-1 once was.** Everyday, our nation faces a variety of challenges that threaten the safety and security of our communities. While most are localized events that impact a relative few, many increasingly impact a large segment of the population. However, regardless of their size, each emergency requires – indeed demands – the most effective emergency response possible. State and local 9-1-1 authorities are doing their best with the limited budgets they have, but more must be done to ensure that the nation has an emergency response system that can effectively meet the challenges of the future. Whether or not NG911 is implemented should not be a question. It should be a national imperative, and it should occur as quickly as feasible. As I'll discuss in a moment,

Congressional action and financial support are major reasons we have 9-1-1 today. Federal, state, and local officials should work together again to ensure that NG911 is implemented promptly and effectively. Put simply, NG911 should be made a national priority that has the full support of policymakers across the nation.

**Federal legislation is needed to accelerate the implementation of NG911.** iCERT believes that Congress should take a cooperate leadership role through bipartisan concensus legislation that makes NG911 funding and implementation a national priority, and we applaud the current initial efforts underway. Any discussion of a larger infrastructure effort would be incomplete if it did not include an NG911 initiave at its core.

It's important to recall that incentive leadership for 911 and public safety is not a new role for Congress, but a return to one of its core values – protecting the American people. It was Congress that initiated the first study and recommendations for 9-1-1 in the United States, and it was Congress that provided the initial grants, through the Law Enforcement Assistance Administration (LEAA), to fund the first 9-1-1 systems in our country. In demonstrating the strong commitment of Congress to the important goal of NG9-1-1, Federal legislation could help to achieve several key objectives.

First and foremost, it could provide additional Federal funding support to assist states and localities in upgrading to and implementing NG911 systems and services. This Federal funding assistance is critical, as iCERT believes that the lack of available "seed" or "gap" grants is the single greatest impediment to NG911 implementation. Importantly, we do

not believe that the Federal Government should bear the full responsibility of funding future 9-1-1 system operations. However, the existing funding mechanisms used by state and local 9-1-1 authorities are severely strained, as public safety professionals look to operate and maintain existing 9-1-1 systems. Increased Federal funding would provide the on-time capital necessary to upgrade those systems to NG911.

Federal legislation could also promote more effective implementation of NG911 by requiring that Federal funds be made available in accordance with grant guidelines that are designed to support important national objectives. For example, iCERT believes that the effectiveness of NG911 implementations will be maximized when there are clear governance structures and effective coordination at the regional or state level. iCERT is a strong supporter of local government control, but effective planning and funding of Next Generation 9-1-1 requires regional and statewide planning. Federal guidance tied to funding can also ensure that there is both effective and efficient integration of NG911 systems with the nationwide public safety broadband network being implemented by the First Responders Network Authority (FirstNet). To be clear, NG911 is not the "same" as FirstNet, and the accomplishment of FirstNet's goals is not a substitute for NG911. Neither is NG911 a substitute for FirstNet. However, if both are not accomplished in a coordinated fashion, then each is diminished, and the dream of a seamless collaborative public-to-first responder end-to-end network will go unrealized.

As NG911 is deployed throughout the nation, with IP-based secure networks taking the place of legacy 9-1-1 analog systems, the risks posed by increased exposure to cyber attacks will need to be considered and addressed in a comprehensive fashion. A national collaborative standardized blueprint for NG911 can provide the necessary assurances that NG911 systems are implemented with appropriate and effective measures to protect against cyber attacks, including compliance with the Cybersecurity Framework developed by the National Institute of Standards and Technology (NIST).

Conclusion: The Time Is Now To Act. As a nation, we cannot continue to let 9-1-1 fall behind – we must act. The good news is that much of the work has been done to enable the transition to NG911. The roadmap is there. Standards bodies are hard at work. iCERT members are applying their marketplace creativity in developing innovative solutions Now is the time to accelerate our progress down the transition path. Funding for accelerated implementation of NG911 service across the U.S. will provide significant benefits and improved security and emergency services for; the public, vulnerable and undersereved populations,9-1-1 professionals, andour first responders. Yet, we cannot expect our 9-1-1 system to continue to be successful without support from all of us – from Congress, from the commercial sector, state and local government, and from key stakeholders as we look to support the public agencies that deliver life saving services to our citizens, residents, and visitors every hour of every day.

iCERT looks forward to working with all the members of this Committee, Congress, and the Administration to support the advancement of NG911 for our country.

I thank the Committee for the opportunity to discuss these important issues with you today and I am happy to answer any questions.

Mrs. BLACKBURN. Thank you so much.

And Mr. Ritter, you are recognized. Five minutes.

**STATEMENT OF BARRY RITTER**

Mr. RITTER. Chairman Blackburn, Ranking Member Doyle, members of the subcommittee, thank you for the opportunity to be here today. I am honored to share the story of success in the great state of Indiana. Thank you, Ms. Brooks, for that kind introduction.

In 1996, the General Assembly created the Wireless Advisory Board, predecessor to the now statewide 911 board. Established as a body corporate and politic, it is separate from state government.

However, the board's powers constitute an essential government function. This board is chaired by the state treasurer, a single elected official which we credit for the success that we have shared in Indiana.

As the state's 911 authority, the board has two primary responsibilities. The first is to oversee the statewide 911 system that has been and will be deployed across the state.

The second is to administer the funding that supports that uniform statewide 911 program. Established as a state trust fund, the funds have a targeted use authorized by statute.

Our funds have never been diverted or raided in the state. This governance model permitted the board to deploy wireless 911 service and now Next-Gen 911 service on a very aggressive schedule.

Generation One of the original wireless network began in 2004 and was completed in 2006. This work brought the cost of wireless 911 under control and began the goal of uniform service.

Completed in 2010, Generation Two included the build out of our ESInet and established connectivity to all bordering counties in Michigan, Ohio and Kentucky.

Those bordering PSAPs now have the ability to transfer calls and handset location information across state lines. In 2013, as part of the board's strategic plan for Next-Gen services, the board commissioned a statewide study of the PSAP's legacy networks and call processing equipment.

The estimated cost to replace the networks and the PSAP equipment county by county was enormous. The decision was made to manage the transition to Next-Gen 911 networks as a statewide project under the authority of the board.

In 2014, the board published their first request seeking proposals for Next-Gen service compliant with NENA's I3 standard.

In 2015, the board awarded contracts for dual networks. The new IN911 network will operate as a public-private partnership with two private vendors.

The dual network design was a cost effective solution and leveraged efficiencies from two providers. ESInets operate independently and are responsible for specific service areas.

However, they connect at the core to provide redundant services. The board also required the primary vendor to deploy a third tier disaster recovery service. This further ensures that calls can be delivered statewide anytime.

And finally, the board contracted with a third party network for monitoring and data analytics. Scheduled for completion in the

fourth quarter of '17 all PSAPs will be served by the new Next-Gen networks.

Purchased as a service, the board's annual cost will only be approximately $15 million to serve all 92 counties. Indiana's statewide 911 program benefits from the efficiencies provided by modern technologies such as hosted solutions. We believe that our design and implementation can serve as a model for other state and/or regional programs.

Our next priority will be to assist local government in replacing their legacy call processing equipment, some of which is not capable of processing the many types of emergency calls that can be generated by the public today.

It is important to understand that funding alone is not enough to achieve Next-Gen in the U.S. Leadership, collaboration and cooperation between local, state, and federal government and between industry partners and industry associations is a must.

That leadership needs to start here at the federal level. 911 will continue to be a local service but it needs strong leadership and a spotlight on the methods that are proven to get results.

Sustainable funding, strategic planning, and advocacy for nonproprietary standards support Next-Gen initiatives. We recognize that Next-Gen networks, while separate from FirstNet, will serve a critical role in the larger public safety initiative.

Citizens reporting an emergency could improve public safety using video, pictures, or other data which can be processed and delivered to the PSAP.

A FirstNet-connected PSAP could then relay the same information to and receive from first responders' data to improve public safety.

Thank you for the opportunity to be here and I look forward to answering any questions that you may have.

[The prepared statement of Mr. Ritter follows:]

**Testimony of**

**Barry Ritter, ENP**
**Executive Director**
**Indiana Statewide 911 Board**

**on**
**"Realizing Nationwide Next Generation 911"**

**Before the House Energy & Commerce Subcommittee of Communication and Technology**

**March 29, 2017**

Chairman Blackburn, Ranking Member Doyle, other members of the Subcommittee, thank you for the opportunity to be here today. I am honored to share the story of success in Indiana. Thank you, Ms. Brooks, for the kind introduction.

I am joined here today by the Chairwoman of our Statewide 911 Board - Treasurer of State Kelly Mitchell. As the only state treasurer in the country to chair a 911 Board, I am especially grateful for her continued leadership and support of the work we do and the progress we have made to improve public safety.

As Ms. Brooks said, I am Barry Ritter, Executive Director of the Indiana Statewide 911 Board.

In 1996 the General Assembly created the Wireless Advisory Board, the predecessor to the now Statewide 911 Board. Established as a "body, corporate and politic" - it is separate from the State, and the Board's powers constitute an essential government function. As the state's 911 authority, the Board has two primary responsibilities:

The first is to oversee the statewide 911 system, known as the IN911 network. The second, is to administer the funding that supports a uniform statewide 911 program.

Established as a state "Trust Fund", the funds have a targeted use – authorized by statute. Our 911 funds have never been diverted or raided.

This governance model permitted the Board to deploy wireless 911 service on a very aggressive schedule.

Generation 1 of the original Wireless Direct Network began in 2004, and was completed in 2006. This work brought the cost of wireless 911 under control, and began the goal of uniform service.

Completed in 2010, Generation 2 included the buildout of an Emergency Service Internet Protocol network, now known as an E-S-i-net and established connectivity to all bordering counties in Michigan, Ohio and Kentucky. PSAPs now transfer calls and handset location information across state lines. (Exhibit A)

In 2013 as part of the Board's strategic plan for NG services, the board commissioned a statewide study of PSAP's legacy networks and call processing equipment (CPE). The estimated cost to replace the remaining legacy networks and PSAP equipment was enormous. A decision was made to manage the transition to NG911 networks as a statewide project, under the authority of the Board.

In 2014, the board published a Request for Service Notice, seeking proposals for a NG911 service compliant the NENA i3 standard. In 2015, the board awarded contracts for "dual networks". The new !N911 network will operate as a "Public – Private Partnership".

The dual network design was a cost-effective solution, and leveraged efficiencies from two providers. The ESinets operate independently and are responsible for specific service

areas. However, they connect at core level to provide redundant service. This design provides statewide redundancy.

The Board also required the primary vendor to build and deploy a 3rd tier disaster recovery service. This further ensures that calls can be delivered statewide. And finally, the board contracted with a 3rd party for network monitoring and data analytics.

Scheduled for completion in the fourth quarter of 2017, all PSAPs will be served by the NG911 network. Purchased as a service, the board's annual cost will be approximately $15M, serving all 92 counties. (Exhibit B1, B2)

Indiana's statewide 911 program benefits from the efficiency provided by modern technologies – such as hosted solutions. We believe that our design and implementation can serve as a model for other state programs.

Our next priority will be to assist local government in replacing their legacy call processing equipment, some of which is not capable of processing the many type of emergency calls that can be generated by the public today.

It is important to understand that funding alone is not enough to achieve NG911 in the US. Leadership, collaboration and cooperation between local, state and federal government – and between industry partners and industry associations is also a must. That leadership needs to start here at the federal level. 911 will continue to be a local service, but it needs strong leadership and a spotlight on the methods that are proven to get results.

Sustainable funding, strategic planning and advocacy for non-proprietary standards support NG911 initiatives.

**National broadband (FirstNet)**

We recognize that the NG911 network, while separate from FirstNet will serve a critical role in the larger public safety broadband initiative. Citizens reporting an emergency could improve public safety using video, pictures or other data which can be processed and delivered to the PSAP using NG911 standards.

A FirstNet connected PSAP could then relay this same information to, and receive from first responders, data to improve service. Indiana is engaged in the FirstNet Public Safety Broadband project, led by the Integrated Public Safety Commission and the Office of Technology. Representing the 911 community, I serve on the Commission's key players subcommittee as an advisor. It is the committee's responsibility to ensure the Commission and the Governor have sufficient data to make an informed decision.

**Non-voice Communication – Text for 911**

As mentioned above, Indiana's governance structure has allowed an aggressive deployment of services, both voice and non-voice.

In 2013, the board authorized deploying the first non-voice communication tool, Text FROM 911. This communication service is text messaging initiated by the PSAP to a wireless device. Most often a text message initiated by a PSAP is in response to a dropped "voice" call or the caller simply hangs up

Indiana PSAPs are using the Text FROM 911 several thousand times each month as a tool to communicate with citizens. Utilizing this tool saves time and resources of first responders which is an indirect cost savings.

In May 2014 Indiana began deploying Text to 911 service. As of June 2016, Indiana provides Text TO 911 in all 92 counties. The Board has conducted several media campaigns to publicize the new feature and has worked with the hearing impaired community to promote its' use. The largest use of non-voice communications is in Text FROM 911. (Exhibit C)

Thank you for allowing me to share Indiana's story with you today and I would be happy to answer any questions you may have.

Mrs. BLACKBURN. Thank you, Mr. Ritter.Mr. Souder, you are now recognized for 5 minutes.

**STATEMENT OF STEVE SOUDER**

Mr. SOUDER. Madam Chairman, good morning. Members of the committee, good morning. Thank you again for having me here. It is my pleasure to be here.

I am pleased to say, I am proud to say that I have been in 911 since the first 911 call was made on February 16th of 1968. I could replicate by reading my testimony many of the remarks that my colleagues have made before me. But I am instead, with your permission, going to speak from my heart.

In the 20 minutes that we have been testifying here, there have been 5,000 911 calls made in the United States of America. By the end of this day, there will be 240,000 calls made and by the end of this year, 87 million calls made.

911 is the most recognized number in the United States. It is a go-to number every time there is an emergency. It is predicated upon technology that was developed in the 1960s. If any of us had an antique car that was built in the 1960s we would be proud to have a license plate that had adorned to it antique.

That's exactly what our system is today. It is old, it is still reliable but it no way is as good as it needs to be. In my hand and in your pocket we probably have a smart phone. Residing in that smart phone is computing power greater than was used to launch Apollo 11 to the moon in 1969, one year after 911 was deployed.

And yet for all of us here if we had to call 911 from this room we would simply put 9-1-1 and all we would get would be a voice connection. We could not in any way utilize this technology which each of us and each of our citizens across this nation have to identify where we are, to send photographs or videos or medical data that is relative to where we are or a patient's condition.

Yesterday morning at the Commerce Department auditorium I had the privilege with other public safety professionals to attend the FirstNet authority's board of directors meeting when they approved the awarding of an award that will allow the FirstNet network to be built out.

After that was announced, a number of public safety law enforcement, fire rescue, EMS chiefs and so forth got up to speak and each of them said that with this technology they will be able to in the future provide a higher level of information and technology to field forces that are responding to an emergency and that is absolutely true.

But 911 has to stay paced with that and Next Generation 911 gives the 911 community and your citizens the ability to access and to provide that information in the future.

How much it will cost I do not know. I do know this, that in 1972 the United States government as a means of promoting and advocating and encouraging the deployment of basic 911 back then established, as Mary Boyd said, through the Law Enforcement Assistance Administration a grant program that would allow for communities to be funded so that they could kickstart their initial 911 system.

That was then and this is now, and I would suggest to you that America's 911 systems need another kickstart, the kickstart that can start right here in the Congress of the United States.

To Mr. Walden's comments earlier, I noted with interest his comment about fee diversion. There is a list of those states that divert fees.

I know when I get my phone bill and probably when you get yours there is listed a 911 fee, a charge or a tax. It's called different things in different communities. But the expectation is by you, me, and us that that 911 fee or tax is going to go to funding and improving the 911 systems.

If that money is being diverted for whatever the reason that is not good and I, like my colleagues, welcome your remarks in the future and thank you again for the opportunity.

[The prepared statement of Mr. Souder follows:]

**Testimony of**

**Stephen H. (Steve) Souder**

**Representing**

**Maryland Emergency Number *(9-1-1)* Systems Board**

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**Former Director, Fairfax County 9-1-1**

**Chair, FCC Task Force on Optimal PSAP (Public Safety Answering Point, aka 9-1-1 Center) Architecture (TFOPA)**

**Before**

**U. S. House of Representatives**

**Subcommittee on Communications and Technology**

**Wednesday, March 29, 2017, 10:00 a.m., Rayburn House Office Building, Room 2123**

Members of the Sub-Committee, good morning and thank you for the privilege to appear before the sub-committee again to discuss the most recognized number in America.....9-1-1, and in particular the Next Generation of 9-1-1 (NG9-1-1).

My comments will focus on ten items.

1. The role of the federal government in establishing and fostering the 9-1-1 system, as it is known today.

   1967.....FCC adopted 9-1-1 as the nation's universal emergency number

   1968 ....First 9-1-1 call made

   1972.....Selective call routing implemented, i.e. Enhanced 9-1-1

   1973.....DOJ Law Enforcement Assistance Administration (LEAA) established a Grant

program to promote and assist in funding implementation of 9-1-1 throughout the nation. This resulted in today there being approximately 6,100 9-1-1 centers in the U.S.

2016….. FCC issued Federal Advisory Committee Task Force on Optimal PSAP/Public Safety Answering Point, (i.e. 9-1-1 center) Architecture…a way forward to implementing NG9-1-1

2. The impact of the 9-1-1 system over the past 49 years.

   Millions of lives and trillions of dollars of property saved

3. The three most significant technological advancements on 9-1-1 during that period.

   1972…..Selective Call Routing to direct 9-1-1 calls to the closest 9-1-1 center and include the calling # (ANI) and the location of the calling # (ALI) when made from a "wireline" phone

   1987…..Cellular Telephones introduced leading to 75-80 % of 9-1-1 calls currently received made from mobile phones

   1995…..Voice over Internet Protocol (VoIP) introduced

4. The public's expectation of NG9-1-1.

   To Voice or Text 9-1-1

   Call/Text received at the closest appropriate 9-1-1 center

   Accurately identify the location of the caller/text-er

   Allow the caller/text-er to send photos, video, data, selective important medical information, etc.

5. The need for a Next Generation of 9-1-1.

   State-of-the-art 9-1-1 center call handling equipment

   9-1-1 call routing based on GIS/GPS location technology

   Robust and secure Emergency Services Internet Protocol Network (ESInet) which can be shared by other public safety agencies

   Provide the ability to transfer a 9-1-1 call and the information associated with it from one 9-1-1 center to another 9-1-1 center

   Accurate location of the caller and, if in a building, where in a building they are located

6. How to transition from Legacy 9-1-1 to NG 9-1-1.

   There are various ways and each requires a commitment to advocate, act, cooperate and fund

7. Challenges, impediments and opportunities impacting the transition to NG9-1-1.

   Cost

   Funding

   Collaborative strategy

   Economy of scale

   Governance

   Elimination any 9-1-1 fee diversion

8. How much will NG9-1-1 cost and options for funding?

   Depends on each NG9-1-1 deployment

Willingness to consider and embrace a NG operational paradigm model

Willingness to consider and embrace a NG funding paradigm model

9. Who are the beneficiaries of NG9-1-1?

   Every man, woman, and child; in every State, the District of Columbia, Territory and Tribal Nation in the United States

10. Not deploying NG9-1-1 is not an option.

    9-1-1 is America's "go to" number in time of an emergency and the most recognized number in U.S.

Thank you again and I welcome any questions you may have.

Mrs. BLACKBURN. Thank you, sir.

At this time I will recognize myself for 5 minutes for questions as we begin that part of our hearing.

Mr. Souder, I want to stay with you, if I may. You talk a little bit about the antique model that we have existed under and needing to kickstart something to boost the NG911 and in your testimony you talked a little bit about economy of scale and the deployment of NG911.

I want you to talk just a moment about that economy of scale and why you think that is important to the discussion.

Mr. SOUDER. Thank you very much.

Yes, economy of scale—we all know what is behind that term. But as it applies to 911 it means this. Currently, there are 6,800 911 centers in the United States. By and large, each of them have within their facility equipment that drives the 911 system within that 911 center, if you will.

When we move to Next Generation 911 through various technologies there is the ability to have those same centers now simply provide the service but have it hosted by a computer, a router or whatever the equipment would be that would be centrally located and really providing the connectivity and the network to those 911 centers that ultimately use it.

So if we think smart and go about this in a way that capitalizes upon the power that we have today with technology, we can deploy Next Generation 911 in a more cost effective way and that we won't have to replicate every single piece of equipment in every PSAP that exists today.

Mrs. BLACKBURN. Thank you, sir.

Mr. Magnussen, you mentioned cost studies in your testimony and the FCC did one in 2011. It wasn't comprehensive but I noted that there was a substantial difference in outcomes between the estimate based on the current 911 system at the time and one where there was a consolidation of the PSAPs and the PSAPs opted for hosted solutions. And I think the dollar difference was $2.68 billion versus $1.44 billion.

I would love for you to talk for a moment about hosted solutions, what that means in context and how that will help to drive the cost lower.

Mr. MAGNUSSEN. Consolidation has been a controversial term in the 911 community for a long time because there's always been a desire to have the call takers be locally hosted, locally available.

However, as was just mentioned a second ago by my esteemed colleague, in essence by putting the technology in a cloud architecture in that sense you can still do the local call receiving, local call taking but you're really doing resource sharing and that is really what it's all about.

The technology is all about—it's the bigger part of the cost. Keep in mind that most of the costs borne in the PSAPs actually from the staffing level and the building level is really done locally anyway. It's not typically out of the funds that we are talking about that really end up funding 911 here.

So, realistically, being able to provide the local control of the people and another big difference needs to be understood in this too

and what we are talking about doing cloud services for the most part these are done in what we call a private cloud.

It really scares the public safety community when you start talking about doing it on the internet because of the security issues and everything else there.

The emergency services' IP networks that we are talking about are based on the same technology and infrastructure as the internet but they're not the internet.

It's a private internet connection. So, in essence, we can still manage the security and reliability but have the benefits of the resource sharing. That's the whole premise of NG911

Mrs. BLACKBURN. So you're tying back to what Mr. Souder said on economies of scale?

Mr. MAGNUSSEN. Exactly. Yes.

Mrs. BLACKBURN. OK. Mr. Forgety, I saw you shaking your head as if you wanted to add something to the discussion.

Mr. FORGETY. So I want to completely agree with and associate myself with the remarks made both by Mr. Souder and by Mr. Magnussen. We have evidence already that economies of scale can tremendously benefit the 911 community.

In the state of Washington they have deployed an existing sort of e-911 solution but they've moved it into a hosted kind of fashion where instead of buying 80 or 90 widgets they buy three of them, put them in secure high-reliability data centers, connect folks to them with redundant connectivity and their connectivity costs, even engineering that for redundancy and so forth, fell by half.

That is a tremendous, tremendous, tremendous savings and a tremendous benefit to public safety by moving to hosted systems, shared services, shared databases. These things don't have to be unique around the country.

Mrs. BLACKBURN. Thank you for that.

And in Tennessee we would say that falls in the category if it ain't broke don't fix it.

Mr. FORGETY. Yes, ma'am.

Mrs. BLACKBURN. All right. My time has expired.

Mr. Doyle for 5 minutes.

Mr. DOYLE. Thank you. My first question is to Ms. Boyd specifically or also to anyone else on the panel that feels qualified to answer.

What are the major challenges to integrating emerging internet of thing technologies into our 911 systems? Do you think that the current and emerging standards will support the types of technologies and volumes of data that are being anticipated?

I know that, for example, technologies like Nest Home Protect, while the device will notify the consumer of an accident it's still up to the consumer to call 911.

How do you see this dynamic evolving and do you anticipate Next-Gen 911 systems being able to accommodate these technologies?

Ms. BOYD. Yes, sir. Mr. Doyle, the IP infrastructure in a Next-Gen environment allows the technologies that you've just mentioned to be able to come into the 911 network or into the public safety communications center.

Today in that analog world it's very limited just to a telephone number and an address, basically. When you have a collision, the crash notification data that can all come in through the network in secure and also manageable ways so that the communication centers are not overwhelmed with the amount of data.

That is the concern you might hear from public safety is how do I manage all this additional information. It will be basically parsed and perhaps the street doesn't need that information right now as first responders but yet it's available to perhaps investigators that need it later.

So an IP infrastructure really allows in a secure protected private network environment the transmission of alarm system information, crash notification data, personal medical information. Did I answer your question, sir?

Mr. DOYLE. Yes. Does anyone else want to add to that? Mr. Forgety?

Mr. FORGETY. I will jump in here just to say that——

Mr. DOYLE. Forgety. Sorry.

Mr. FORGETY. That's all right. I will jump in just to say that the internet of things is something that for a long time has generated a lot of angst in public safety.

We are worried about, do we really want every smoke detector out there able to call 911, and I think historically the answer would have been no simply because the only thing it could do was detect whether two wired had crossed or a beam of light had been broken or something like that.

Today, though, we are getting to the point where sensors don't work on a one-off basis. We are getting to the point where you can have a collection of sensors in a house or an apartment that notice with high confidence that there's a fire.

If the sprinkler water is flowing, if you see a heat flare, if there's smoke detectors and so on, you put all those things together and you can come to the conclusion that yes, there might really be a fire there.

There is still a lot of work that needs to be done on that but we absolutely believe that in the future we'll have that ability to take in IOT alerts like that and process them intelligently. We have to make sure that we do that so that the PSAPs are not overwhelmed, as Mary said. We've got to bring in those new automation tools into public safety as well. NG911 allows us to do that.

Mr. DOYLE. Thank you.

Mr. Ritter—oh, I am sorry. Mr. Souder, did you want to add to that?

Mr. SOUDER. Mr. Doyle, thank you.

Two years ago the Federal Communications Commission established the task force on optimal PSAP—public safety answering point—architecture. It had nothing to do with brick and mortar but it had everything to do with the technology infrastructure that would allow for the very items that you talk to be accommodated in a Next Generation world.

That task force is comprised of 40 people from the 911 profession and industry representing 800 years of 911 experience, and they produced in December of last year a road map for all practical purposes—a road map for any elected, appointed or local official to fol-

low to help in deploying Next Generation 911 and to consider and accommodate all of the various points that you made, and thank you for making it.

Mr. DOYLE. Thank you, Mr. Souder.

Mr. Ritter, in your testimony you noted that while Next-Gen 911 is separate from FirstNet, the two are somewhat connected in the larger public safety broadband initiative. I believe Next-Gen 911 is an essential link in this chain. You have people who, more often than not, are contacting 911 through a smart phone and you will have first responders using FirstNet smart technology on the other end.

The 911 call center is what connects these two pieces together. Could you elaborate a little bit more on what Indiana is doing with its FirstNet project and how that fits into your state's Next-Gen 911 plans?

Mr. RITTER. Yes. Thank you.

The state of Indiana, through their single point of contact, is led through the Integrated Public Safety Commission that is responsible for the LMR system across the state and through that agency I serve on the executive committee as we have began to do our analysis and the draft of the state plan that has been submitted for review.

We anticipate that in the future should the Indiana governor make the decision to opt in or opt out of this initiative. Our Next Generation system will be in place and operable for citizens to be able to communicate the technologies that has been spoken of here today to the PSAP.

We envision then the FirstNet network, or broadband initiative, to be the tool that delivers the data from the PSAP to the first responders and in turn what a first responder may encounter back to the PSAP.

Mrs. BLACKBURN. All right. Mr. Latta, you're recognized for 5 minutes.

Mr. LATTA. Well, thank you, Madam Chair, and thank you very to our witnesses for being here today. It's a very important topic and I would like to start, if I could, Mr. Ritter.

I have five counties that run parallel or I should say are down the Ohio-Indiana line. I was kind of interested when you were talking about the counties across the state line with Indiana, how you're working with them.

Now, how does that work so—for calls coming in and out? Because, again, just about halfway down the state of Indiana that I have a border with you all.

Mr. RITTER. Yes. The current vendor who operates the original wireless network in the state at the request of the counties not only in Indiana but those in Ohio we are encountering a large number of transfers from the motoring public when the call comes from a wireless device and we had no way to transfer other than voice. And between the PSAP managers and elected officials in those jurisdictions we agreed to build our existing network to those individual PSAPs in Ohio that would provide the telecommunicator the opportunity to not only transfer the voice in a 911 call but the associated call data today, the ANI and the ALI, to that adjoining PSAP in the event that the motorist was to travel into Ohio. And

we are limited to the ability to transfer that specific data today on our existing network.

Mr. LATTA. OK. Now, does the existing or does the county have to have—years ago I was the county commissioner in Ohio and we were also responsible for 911 systems and working with them.

Do they have to have the equipment or how—what else does an Ohio county have to have?

Mr. RITTER. So they were able to use their existing equipment through their 911 system service provider and the connection occurs between our vendor and Indiana and the service provider in Ohio.

Mr. LATTA. OK. Thank you.

If I could ask Mr. Souder a follow-up, when you were talking in regards to our more antiquated system that we have out there you said if you have a vehicle back from 1968 being antique—actually, in Ohio after you hit 25 years you get an antique plate.

But how do we go forward? Because you were mentioning especially, again, with if you're out someplace and let's say there's an accident, can't you triangulate from a cell phone through an enhanced 911 to that spot today under the existing system that we have?

Mr. SOUDER. The existing system that we have today relative to mobile phones, who, by the way, are the source of about 80 percent of 911 calls received in the United States, in a way it was one of the greatest things that ever happened to 911—wireless phones.

But it also had its own drawbacks because now instead of getting one call reporting a traffic accident on an interstate now you get a hundred phone calls reporting a traffic accident on an interstate. But in this case, more is better than less.

But to your point, the cellular tone today integrates very well into the legacy network. However, and this is a big however, it does not bring with it the absolute location of that particular call.

If you were to call 911 from your home wireline phone, if you had one, there's no doubt about it that the 911 call will be received with the exact address from which that wireline went.

But in a wireless world that's not the case at all. At a previous hearing in this building in this room I tried a 911 call from within this chamber and it identified me as being on Independence Avenue Southeast.

Not a very good thing if you're having a heart attack, and that is one of the big drawbacks that goes with wireless 911 calls in a legacy network. Wireless 911 calls in a Next Generation network will bring to you the absolute location of that phone.

Today, you might not or maybe would be surprised to hear that if you were to call a pizza in to Papa John they would know where you are. But if you were to call 911 they may not know where you are.

Mr. LATTA. OK. Well, it's a very, very important topic and when I was a commissioner we worked very closely with our sheriffs because our sheriffs were the ones that run the 911 system in the State of Ohio and, again, as you say, we have an interstate highway system that runs through our county and my district and so in order to get those calls it's so important for our law enforcement and especially our sheriffs because they are the ones that are run-

ning it. But I really appreciate you all being here and your testimony today. Thank you very much.

Mrs. BLACKBURN. The gentleman yields back.

Ms. Eshoo, you are recognized for 5 minutes.

Ms. ESHOO. Thank you, Madam Chairwoman. Thank you to each one of the witnesses for the work and the experience of your life that you bring to us. It's very rich and it is enriching to us in your testimony.

There are a couple of things that I want to mention that I am really very, very proud of. John Shimkus was here earlier but has left. At that time it was called the E-9-1-1 Caucus in the House and it was also established in the Senate with Senator Conrad and Conrad Burns and Senator Clinton at that time.

So we are still the originals around here for that caucus and proud of it, and we have been able to bring many of the issues that we are talking about today forward.

I also am proud of the fact that while Congress had dealt with the recommendations of the 9/11 commission there was one that Congress had not made good on and that was to establish a nationwide interoperable public safety network, and I carried the legislation successfully and it became law.

So now here we are. We have got different parts of different systems and different technologies and there is something unsettling to me about it because it's 2017.

And I don't think that we have made the headway that we should. This is not fault or blame. I would recommend, Madam Chair, that at some point we have a hearing where we bring in the NTIA and NHTSA and FirstNet because they are the implementers of this.

And I think it needs a revving up. I really do.

So having said that, we have 6,800 PSAPs in the country, I think. I think it is someone's testimony or maybe the committee memo.

Let me ask, Mr. Souder, how would you characterize the progress being made over that landscape—the 6,800?

Mr. SOUDER. Each state and each community within it has the option as to how they will utilize 911, as we have noted in the past, and I would suggest to you, looking to the future, that control of 911 should still be a local effort, whether it be at the county at the local level.

Ms. ESHOO. Where I come from—I come from county government so I am very familiar with the operations locally.

Mr. SOUDER. Right, and it is for them to decide whether or not they need whatever they have currently, if you will. To several of our witnesses that commented that you can continue to have your local 911 center staffed by local people. However, it can be hosted by technology that is far removed from that.

So you have the dual benefit, if you will, of local engagement but at the same time an economy of scale by nature of the way you deploy the hardware.

Ms. ESHOO. I was going to repeat the story of your making the telephone call from the Rayburn Building. And your call was answered but you were told by the public safety operator that your location could not be determined.

Now, this is from a traditional landline multi-line telephone system. This is not uncommon in our country, and I think Congress really needs to push hard on location technology because we comfort ourselves that we have an emergency system in the country but if the first responders can't find the person that's experiencing the emergency, really, what kind of a system is that? What kind of a system is that?

So I think we need to ride hard on that. Mr. Souder, what would you recommend to us to do about fee diversion?

Mr. SOUDER. The issue of fee diversion is monitored closely by the Federal Communications Commission, again, because 911 is funded locally. It is the decision of local policy makers as to what to do with that money.

I would only imagine that various statutes that give rise to the figure of the tax or the surcharge can be interpreted one way or another at a local level as to whether or not they really have to divert all of that money into 911 or maybe they can redivert it into something else.

Clearly, for those states that have that interpreted flexibility I would ask that they go back and they look at that with a close eye. We all know the economy that we work in. We all know how tight funds are. But it's very, very important that as a taxpayer if you are paying tax for a particular service that that's in fact where that tax goes.

Ms. ESHOO. Well, what would you do, though? You explained how it's working.

Mr. SOUDER. Well——

Mrs. BLACKBURN. Gentlelady's time has expired.

Mr. SOUDER. I don't know what I would do but I could make a couple of suggestions, that to the degree that the Congress in its wisdom sees fit to establish perhaps a Next Generation grant program that there could be embedded in that grant program criteria that would say that if you are eligible for the grant there are certain things that you have to comply with or cease to do and if there was current fee diversion going on you're not eligible for a grant until that is addressed.

Ms. ESHOO. Thank you very much.

Mrs. BLACKBURN. Mr. Guthrie, 5 minutes.

Mr. GUTHRIE. Thank you. Thank you, Madam Chairman.

Dr. Magnussen, are you familiar with the FCC's 2013 report to Congress regarding Next-Gen 911? I am sure it was a best seller—widely read.

Mr. MAGNUSSEN. Yes, sir. I am.

Mr. GUTHRIE. OK. And so according to that report, some of the participants called for the federal government to establish certain databases to support Next-Gen 911. Could you briefly describe those databases and the function they provide?

Mr. MAGNUSSEN. OK. Thank you. I appreciate it.

One of them actually is what we refer to in the industry as a forest guide. The forest guide gets to the point that I was talking about having a national level database that understands the interconnection points between the states.

Again, it is really important that within the states they manage their call routing and everything else. But what is often the case

today is if, for example, you have a visitor here in Washington, D.C. but their home service is back in Texas and when that happens actually that call is routed back to Texas and the Texas service has to understand where that person is.

So, again, we use the system called the forest guide where at the local level they try to determine the PSAP to route it to. If it can't determine at the local level, it goes to a higher level.

And that higher level then would take it to Washington, D.C. and say, where is Walt right now, and the call would be routed appropriately.

The database that understands the relationships between the states and is able to handle the call processing between the states is what we call the forest guide and that is something that currently doesn't exist and, unfortunately, one of the larger issues is it really doesn't have a home today.

In other words, is it a responsibility of the U.S. Department of Transportation through NHTSA? Is it OEC? That hasn't been determined.

Mr. GUTHRIE. Good. I know that a lot of these reports do get produced and it's good to have people read them, understand them and can give expert testimony. So we appreciate the value of that.

Mr. Ritter, you mentioned FirstNet. FirstNet is an IP network and we were talking about IP networks when we talk about Next-Gen 911.

Do you have any thoughts on how these networks should be integrated and do they have to be integrated?

Mr. RITTER. From Indiana's perspective, I would envision the integration being at the PSAP level—that our current Next-Gen network would operate independent from a FirstNet broadband and the integration is through the workflow in the PSAP to the first responder.

Mr. GUTHRIE. To the PSAP? So what is that? Could you explain that a little bit?

Mr. RITTER. The 911 center.

Mr. GUTHRIE. OK. The 911 center. OK. Thank you very much.

And Ms. Boyd, and when you get a question prepared—Mr. Souder almost talked about this but I'd like for you to talk about it as well—you said you agree with Mr. Ritter. You seem to agree with Mr. Ritter that a greater federal role is needed.

It seems to me your focus is on the funding side of it and Mr. Ritter has testified that funding alone is not the answer. And my question is you agree with that and you state that you're a strong supporter of local government control but call for more federal involvement.

And just is funding alone is not the answer and do you agree? And the second one is how do you reconcile a greater federal role but keep it local? And then Mr. Souder kind of talked about that a minute ago but just to reemphasize.

Ms. BOYD. Mr. Guthrie, our company and the members of ICERT are very large supporters of local control. But what we are void of right now is a policy authority that would set a date and a time to actually put our country in the Next-Gen 911 technology.

If you look historically for any deployment of technology, whether it was the TTY deployments with the Americans with Disabilities

Act, whether it was wireless, whether it was void—even our state planning, I think Barry would agree.

We had dates that we had to meet. So Congress could be the policy authority that helps with the initial grant funding and also sets the expectation as a policy body that we have to achieve these deployments. So it's multi-faceted and do that also on a regional and statewide coordinated basis so we can get the economies of scale and that also works parallel with FirstNet.

Mr. GUTHRIE. I understand the local and the coordinating because as Dr. Magnussen said, if I called 911 now it would go through and—I don't know.

Somehow it would think I am in Kentucky. That's my local exchange, and you have to have all these systems work together. We appreciate this. It's been very informative to me, someone who's certainly not a expert in this at all.

But it's very informative and I appreciate your testimony. I yield back 5 seconds.

Ms. BOYD. Thank you, sir.

Mrs. BLACKBURN. Mr. Pallone, you're recognized for 5 minutes.

Mr. PALLONE. Thank you, Madam Chairman.

I understand that FirstNet is on the verge of an historic announcement of a private partner, and despite a lot of doubters along the way this announcement is the culmination of years of work and will begin the next phase of deployment.

Getting us this far toward a nationwide interoperable public safety network was a signature accomplishment of the Obama administration.

So, Ms. Boyd, I wanted to ask you how important is the successful implementation of FirstNet to the transition to NG911?

Ms. BOYD. Mr. Pallone, in my opinion, coming both from government and 911 background as well as from the industry perspective, they are very important and they should be partnered.

When our citizens call 911, that's coming in from a voice or could be a text connection. But without integrating into FirstNet, which is the radio network, our first responders will not have all that wonderful data that we are able to transmit through smart devices.

So they need to be planned and integrated together. One without the other will basically be somewhat ineffective in terms of maximizing the efficiencies of those technologies. Does that make sense?

So as Barry had indicated, at the 911 center when you have voice and data coming in it's the radio network that's actually getting the information out to the first responders. So through 911 that data would be handed off and integrated into the radio communications network.

Mr. PALLONE. Thank you.

Ms. BOYD. Thank you, sir.

Mr. PALLONE. We have also noted how states put a fee on their citizens' phone bill that says it is for 911 but too many states, including my own, then use that money for different purposes and I think that's deceptive and dangerous.

So, Mr. Souder, can you please tell us why diverting 911 fees is so harmful to the lifesaving transition to Next Generation systems?

Mr. SOUDER. Anytime a 911 system is dependent upon tax dollars they are dependent upon all of the tax dollars that were intended to be received.

When you divert funds from that revenue stream, you obviously are going to have an impact in one way or another in the operation of that 911 center whether it's technology, whether it's administration, whether it's personnel or what it may be.

So to pinch that revenue stream and reduce it by varying degrees has a definite correlation to the efficiency of the 911 center and the level of service that they can provide to the very citizen that paid that tax, expecting that all of it would go to the center.

Mr. PALLONE. All right. Thanks.

I wanted to ask you another question. In your testimony you indicate that ignoring Next Generation 911 is "Not an option" and I agree. I also understand that money alone will not solve the problem.

But I think adequate funding is the foundation for any serious conversation about upgrading our systems and that's why I think passing a national infrastructure bill presents us with a unique opportunity get this done the right way.

So, Mr. Souder, you mentioned in your testimony ways to fund the transition by using an NG operational paradigm model. Can you explain to us what that means?

Mr. SOUDER. Yes, I would be happy to.

Generally speaking, Next Generation 911 is viewed as a technology initiative. But the reality is that it is, in my opinion, a three-pronged initiative.

One, technology for sure, and that has consumed most of what we've talked about today. But the other two parts of that are the governance of that and the funding of that. We've talked a little bit about the funding but very little about the governance.

So I think it's very important because Next-Gen 911 is administered locally and should be—you have heard that said many times—that we use this opportunity to take a fresh look at the way in which we both fund, the way in which we govern and the way in which we deploy technology so that the three are working in harmony with each other for the collective benefit that they will bring.

Mr. PALLONE. All right. Thank you. I want to get one more question in to Mr. Forgety. Senate Democrats recently unveiled a bill that could help finally deliver on the promise of Next Generation 911.

Well, tell me what you think about that bill, if you could.

Mr. FORGETY. Congressman, I think there's a lot to like in the discussion draft that was circulated in the Senate. You know, we certainly came out strongly supporting that language. I think there are other things, certainly, that we'd like to see, you know, in a bill like that as well and we are certainly willing to work with the committee on that.

One of the things that Chairwoman Blackburn mentioned earlier was the success of states that have 911 boards, and I think coming from a Tennessean that speaks particularly powerfully to me because in my home State in Tennessee our former 911 director, Lynn Questel, wherever she went she would tell people, if you want

911 to be successful get people from the legislature, from the regulators, from the industry, from public safety professionals, get them together and work on it collectively and you'll be much more successful. So those are the kinds of things we think can make the bill even stronger.

Mr. PALLONE. Thank you, and thank you, Madam Chairwoman.

Mrs. BLACKBURN. The gentleman yields back and Mr. Shimkus, you are recognized.

Mr. SHIMKUS. Thank you, Madam Chairman. It's great to have you all here.

Mr. Forgety, I want to just follow up on Ranking Member Pallone's question because I don't know the answer on this.

But the question is premised on that some states' regulations are based upon legacy technologies. Does the Senate bill address this issue or how do you think that challenge can be addressed?

Mr. FORGETY. The FCC report required by the Middle Class Rax Relief and Job Creation Act of 2012, something that report addressed based on our comments, actually.

In your home state, the counties of southern Illinois—I think it is a 17-county region—they got together and said we want to put together a Next Generation 911 networking system. We want to go out and be first on this issue.

They ran into a regulatory morass. They spent years trying to figure out how can we do this as counties—how can we go out and build this thing collectively, because they didn't fit neatly into the right boxes.

They weren't a telecom. They weren't a phone company and historically the rules were written so that you had to be a phone company to do some of these things.

So I think one of the things that we talked about in our comments to the FCC was that we may need some kind of backstop in federal regulations that say look, this is new technology and the old regulations, if they are not done away with at some point, we've just got to say look, you can petition the FCC or you can just go and build. But you've got to be able to deploy these new technologies without these legacy barriers.

Mr. SHIMKUS. Thank you very much, and I don't want to beat up on my own state but this does give me the platform to do that every now and then and I don't think that's bad policy sometimes.

We are one of the diverting states now. We didn't used to be. We held firm. But we are such a dysfunctional state, budgetary wise.

So I think the report says about 5.2 percent transferred to the general fund. So I am just calling my state out on that.

Mr. Ritter, though, in your testimony, because you're my neighbor, you mentioned Michigan, Ohio and Kentucky. But, obviously, you left out interoperability across the state lines in Illinois.

In fact, I pulled out your Exhibit A and drew this big circle and that's my district—it abuts all of southwestern Indiana. Do you want to comment on that? Why are you not helping Illinois out, I guess, is——

Mr. RITTER. It's not personal, sir. Much to Trey's comment, when we began to look at Illinois to partner with—as we had the other states, we hit regulatory issues and there were limitations that in-

hibited our ability to build our network on our dime into your state to provide those critical services.

Mr. SHIMKUS. I guess that's it. Thank you.

And let me finish up with Dr. Magnussen. If the federal government were going to be involved even—there is that debate, right? We've done FirstNet. There is a pot of money. I think their question is, is there going to be another pot of money?

Do you have any idea, a ballpark soup to nuts, of how much to get us to where a lot of people in this sector would like us to be, what that would be?

Mr. MAGNUSSEN. The center that I direct has been working for several recent months on an interim study.

The interim study basically is what I am going to call a back of the napkin type study because of the fact that the challenge we are running into is when you start to look at what it's going to cost you really need solid data and, again, so few states have really done this and there is so much variance in what it would cost from state to state. Coming up with an accurate number is very difficult.

I would anticipate that probably within about the next three or four weeks our interim study will be ready. Now, the interim study is only that.

In essence, right now there is a study being done by the NG911 office that will be out later on this fall and that will be the authoritative study.

That one actually has been funded and will in essence really give a much, much better determination of what those total costs are.

I have worked with the people that are doing it. They've got some really, really very good people working on it. They do have the same challenge we did, though, and that's when you do a study and you don't have a whole lot of solid data to base it on it's hard.

Mr. SHIMKUS. I appreciate it.

Madam Chair, I yield back my time.

Mrs. BLACKBURN. Ms. Clarke, you're recognized for 5 minutes.

Ms. CLARKE. Thank you, Madam Chair and Ranking Member. I thank our expert witnesses for lending your expertise to this very important issue for our nation.

This question is for Mr. Magnussen. The 911 call centers by design are an interconnect point for the public to first responders. As such, they could be an attractive target for possible cyberattacks that can have serious repercussions to the public.

We have already seen current analog systems compromised by simple cyberattacks such as telephoning denial of service and radio frequency jamming. Next-Gen 911 will not be immune to attacks. We must plan for a strong cyberdefense sooner than later.

And clearly assuring that Next-Gen 911 systems is secure will save lives. During your testimony this morning, you made a number of references in this regard.

Have these issues been taken into account when planning Next Generation 911 systems and is there a need for additional funding necessary to ensure security is baked into the Next Generation 911 systems?

Mr. MAGNUSSEN. Thank you for the question.

If you look at the architecture that NG911 is based upon, one of the devices you have at the edge of the network is called a BCF.

It stands for border control function, and in lay person's terms that's basically a firewall on steroids.

So yes, it is designed into the architecture. Yes, it will be built in and a BCF is pretty much a required function of every one of ESInets.

The centralized monitoring facility though that I talked about a little bit earlier is really kind of a key function behind that. It's in essence a second layer up, because there will be a large number of ESInets. Each one of those ESInets will have one of these border functions.

Unfortunately, hackers are very smart and they seem to have a lot of time on their hands. So what in essence the problem is is an attack on one hardened area could easily be moved to another area.

So the function of the central monitoring facilities would have a global view and as an attack occurs in essence that attack would be understood what's going on to help shut things down but, more importantly, also to make sure that that same attack is not invoked on the neighboring PSAP.

Ms. CLARKE. And so the concern then becomes information sharing, right? So we witnessed an attack in one part of the system that there is a mechanism in place so that that information is shared in real time. Is that also part of what you envision or part of what is being discussed and planned?

Mr. MAGNUSSEN. Exactly, because, again, attacks typically are almost like a virus. They keep changing themselves to do what they were intended to do, which is damage, and in essence you have to stay—it has to be a real time active process.

Ms. CLARKE. Did anyone else want to add any comments to that? Mr. Forgety.

Mr. FORGETY. So I appreciate your asking about cybersecurity because this is something our organization has been focused on for about the last 2 years very intensely.

Even before that, our standards developers created something called the NG–SEC, or Next Generation 911 security standard.

It goes far beyond just firewalls and border control functions, establishes defense in depth. This is a key point. Today's telephone network systems are vulnerable to attack. For a long time we thought they weren't and we acted like they weren't in the PSAP community and we didn't defend them.

The challenge is we don't have tools to defend them in the telephone network. People have said well, won't the move to IP introduce new vulnerabilities, new attack surfaces, and so forth and the answer to that is yes, of course it will.

But the other thing that it does, the most important thing, is it gives us tools to fight back. It gives us tools to defend our networks that in the telephone world we simply don't have and that's another reason it's so important that we move to Next Generation 911 soon.

Ms. CLARKE. Very well. This question is for Ms. Boyd. In your testimony you discussed the need for Congress to take a bipartisan approach to develop legislation to make Next Generation 911 a national priority.

Can you please elaborate on what this legislation should look like and how Congress can take the appropriate steps?

Ms. BOYD. Yes, ma'am. Thank you for the question.

If I were going to frame the policy I would establish, one, the grant system that allows for the upfront non-recurring capital investment for the areas.

I would also consider that in that you establish planning time frames and deployment time frames working with the states. It's always partnered with the states and local government.

But I would also encourage Congress not to just focus funding the initial up front for areas that haven't deployed. I think it's only fair that you also look to perhaps Mr. Ritter in Indiana.

He may have elements that are still needed within his Next Generation 911 infrastructure that he could use funding and grant assistance for.

So the policy framework really would be enabling grant distribution, setting a time frame for deployment and the expectation that our country is going to be NG911.

Ms. CLARKE. Thank you very much. I yield back.

Thank you, Madam Chair.

Mrs. BLACKBURN. The gentlelady yields back.

Mr. Bilirakis, you are recognized for 5 minutes.

Mr. BILIRAKIS. Thank you, Madam Chair. I appreciate it. I want to thank the panel for being here as well today.

I am the former chairman, as is Ms. Brooks as well, of the Subcommittee on Emergency Preparedness Response and Communications under the Homeland Security Committee. So we really are interested in this subject.

Mr. Forgety, can you briefly explain the particular benefits of the Next Generation 911 for the blind, deaf, visually impaired, hearing impaired that are not currently available through the analog 911 services?

Mr. FORGETY. That's an incredibly important question, Mr. Bilirakis, and I really appreciate your bringing it up.

In the United States today there are more than 38 million, I believe, deaf, hard of hearing or speech-impaired individuals.

Historically, their access to emergency communications was greatly restricted by limitations of networks and systems. It was only after the federal government mandated that TTY technology, the ability to type characters over the telephone line using analog tones—only after that was required that that service became available over 911.

The great thing is if you look at the work that our standards developers did with NG911, they baked those functionalities in deeply into NG911, support not only for message-based texts but for real time texts character by character that has the same conversational flow as a TTY, the ability to do multi-party video calling so you can have a sign language interpreter available so that you can do things like interact with someone who is blind and sort of be their eyes for them if need be.

All of those things are natively supported in NG911 and from the standpoint of the PSAP community it makes it far easier for our members to provide service to these more vulnerable aspects of our population in the ways that they communicate already and that's the key thing is we want to make 911 service available to people in the way that they're used to communicating.

It shouldn't be some rare oddball thing. It should just happen the way you do it every day and that's very important to us.

Mr. BILIRAKIS. Very good. My district represents a significantly large population—in the Tampa Bay area—of seniors, as compared to most congressional districts.

What benefits do the Next Generation 911 provide for our nation's seniors who are most likely to request emergency call centers and need emergency services?

Mr. FORGETY. So I will point to two things in particular. Contrary to some media characterizations, senior Americans are some of the fastest technology adopters.

They actually end up using video calling and text messaging just as quickly as the average teenagers do and love the technology.

I mean, you know, video calling with your grandmother is now, you know, a common everyday thing. So these technologies will benefit seniors.

The other thing that was mentioned before is the internet of things. We are seeing a phenomenal growth in new wearable technologies that principally focus on health and security. I mean, these are things that Americans care about and that our innovators are building products for.

As that happens, as more of those things come online and as we get used to them in the 911 community, I think there is going to come a point where because the standards allow for it we are going to start to see alerts coming in from those things so that we can respond and so that we can know, for example—and this is a big NG911 feature—if a consumer wants to make health data available when they call 911, something like hey, I am a diabetic, hey, I am a hemophiliac, I have a heart condition, whatever that is, they can do that securely through a trusted third party.

They don't have to share their data with the government up front and that makes it much easier for responders in the field to provide good service.

Mr. BILIRAKIS. Very good. Anyone else want to respond to this subject matter, whether it's disabled in general, senior population, what have you? Anyone else want to——

Ms. BOYD. Could I just——

Mr. BILIRAKIS. Yes. Please go ahead. Yes.

Ms. BOYD. I think another benefit as we do have an aging population and want to live at home, right, added to the medical information that they can personalize and send to 911 and the first responders is also the ability to notify a third party if they wanted to.

So you say, my parents, if they were living, they dial 911, I could know they had called and they could set that up in pre-plan.

So, once again, the Next Generation technology affords so much added benefit and data.

Mr. BILIRAKIS. Is that technology available currently?

Ms. BOYD. Yes, sir. It is.

Mr. BILIRAKIS. Oh, great. Sorry to interrupt.

Ms. BOYD. No, no, no. That's fine.

Mr. BILIRAKIS. Keep going.

Ms. BOYD. So as Trey had indicated, it's the ability if you choose to share the information with first responders we can arm them as

they're en route to know that I have medical emergencies or that I have a third party to be notified and that would help them as they are also trying to find loved ones and notify them. Thank you.

Mr. BILIRAKIS. Absolutely. Anyone else?

Yes, please.

Mr. SOUDER. I did. Thank you. Health care is changing in the United States of America, legislation aside. There are technologies presently available and on the horizon that will allow and mandate that health care of the future is as different in the future as 911 will be different in the future.

It is incredibly important that as that technology advances, for all segments of our population that they can take full advantage of that technology when they need to call 911.

Whether it's body-worn technology, whether it's pre-entered profile technology, whether it's medication technology, whatever it may be but the next generation of 911 when deployed will be able to communicate that both to the first responders that we spoke about earlier through the FirstNet network but also to the hospital staff so that when a patient arrives at the hospital there are many things about that patient that will already be known by the attending people in the ER. Very, very important.

Mr. BILIRAKIS. Very good. Thank you very much.

I yield back, Madam Chairman.

Mrs. BLACKBURN. Gentleman's time has expired.

Mr. Long for 5 minutes.

Mr. LONG. Thank you, Madam Chairwoman.

Ms. Boyd, your testimony mentions the benefits of Next Generation 911 including providing increased reliability and resilience of the network, particularly in times of emergency and high use, and I know that in my district that when we had a tornado that killed 161 people in a town of 50,000, right.

After I had been here for 5 months I know how important the 911 is and you explained how Next Generation 911 could provide such increased reliability and resilience.

Ms. BOYD. Yes, sir. In an IP advanced architecture different than what we have today with the legacy analog, today's networks are very tethered. That's the best way to explain them. They are fixed. They are not dynamic and they don't move.

So in a Next-Gen world, in an IP world, we regionally plan or statewide plan in Missouri for Next-Gen. If you have another unfortunate event, as the tornado, that impacted PSAP, one, has its neighboring communities that can help back it up both from call volume or if you had to abandon that PSAP, that 911 center.

They can already have pre-planned backup from your neighboring counties. You have redundancies in these IP networks that do make them more resilient but at the same time they also add that flexibility.

Mr. LONG. OK. Thank you.

And also another question for you.

Ms. BOYD. Yes, sir.

Mr. LONG. Your testimony mentions the dangers of technological obsolescence of the current 911 network, which often rely on 1970s technology and, yes, I remember the '70s.

You mentioned that—you mentioned that these data technologies pose significant public safety risks due to higher maintenance costs, system malfunctions and outages and increased cybersecurity vulnerability.

Focussing on the cybersecurity, can you explain how Next Generation 911 technology is less vulnerable to cybersecurity attacks than the legacy 911 network?

Ms. BOYD. Yes, sir.

In a Next Generation environment, it's also vulnerable but the difference is, once again, the intelligence. It's either putting cybersecurity detection devices at the edge of those new IP networks or it's also with the work Steve Souder and I did with the FCC TFOPA work we actually have a full report that we published this past December that speaks to cybersecurity for public safety and the risk and we make a recommendation to introduce an added element not only just for 911 purposes but also for general public safety systems where they can have the added protection, detection, aversion, and also the notification feature.

Oftentimes, I think, as Mr. Forgety mentioned, our public safety agencies don't know they're even in an attack today. Those companies that do networks for 911 we have cyber elements and we monitor and detect that they can actually infiltrate the PSAPs themselves. And so in an IP world we can actually strengthen that ability to hopefully divert those attacks on the systems.

Mr. LONG. OK. Thank you.

And Mr. Forgety, my next question is for you. The Middle Class Tax Relief and Job Creation Act required a report on the legal and regulatory framework surrounding Next Generation 911.

Do you agree with that report's recommendations?

Mr. FORGETY. And that's been some time ago so I can't recall all of the recommendations yet.

Mr. LONG. Four years, I think.

Mr. FORGETY. But I do recall that quite a few of the recommendations actually in that report followed comments that we had provided to the FCC and we certainly support everything that we said then just as much as we did then. It's all very important.

We need comprehensive liability protection for not just network providers but also originating service providers. That was something we mentioned in there.

If you want folks like Apple and Google and Facebook to get in and 911-enable their services, they've got to have the same assurances and, frankly, at a national level that telecom carriers and the wireline and wireless world get at a state level. That's very important.

As Walt mentioned earlier, you've got to have things like a national forest guide, an ability to credential PSAPs with a cryptographic certificate authority.

There are things like that that the FCC took our recommendations on, reported those to Congress. We agree with all of that.

Mr. LONG. Do you think the 911 coordination office needs to submit the cost study required by the Middle Class Tax Relief and Jobs Creation Act in order for Congress to adequately evaluate the needs to be done to complete the transition to Next Generation 911?

Mr. FORGETY. That's a hard question, Congressman.

I always think it's better to have a report in hand when you're going to do something. However, the clock is ticking.

Every day, every week, every month that we wait to get this process started the costs for local and state governments are going up and the outcomes for consumers and field responders are going down.

That is an untenable state of affairs and it's one that we need to fix. So while I always want that if I can get it, I am not willing to say we should just wait continuously.

Mr. LONG. OK. Thank you.

Before I yield back, Madam Chairwoman, I have a couple of articles I'd like to submit for the record—update to 911 issues in Dallas and mobile not at fault for ghost 911 calls.

Mrs. BLACKBURN. So ordered.

[The information appears at the conclusion of the hearing.]

Mrs. BLACKBURN. The gentleman yields back.

Ms. Brooks, the leader of our NG911 efforts, you are recognized for 5 minutes.

Ms. BROOKS. And thank you, Madam Chair, and as we have heard from my colleague from Florida, Mr. Bilirakis, we have been involved in, as chairs of subcommittees in Homeland Security on emergency preparedness response and communications.

So we have both been involved as have a number of folks on the subcommittee and these issues because it's so very critically important and I look forward to working with each of you in the future as we continue to explore these issues. I want to thank all of you for coming in.

I want to, of course, ask Mr. Ritter and I want to applaud your leadership in Indiana, and we have prioritized emergency communications in a big way in our state whether it's from not diverting funds out of our trust fund, which I realize now is a much bigger deal than maybe I fully appreciated, having a statewide 911 board that's overseeing rapid deployment.

But you also mentioned public-private partnerships and you were the only one that mentioned public-private partnerships.

You described that as our approach in Indiana do you believe that we've saved money by pursuing Next-Gen 911 in this deployment model and whether—what other advantages do you believe it brings? And then I would be curious in hearing from other experts here what their thoughts are on the public-private partnership model. Mr. Ritter.

Mr. RITTER. Yes, thank you.

You know, when I came to this job seven years ago I was a staff of one, and the—to the wisdom of the general assembly when they created the wireless board they chose to pursue a version then of the public-private partnership.

My colleagues around the country, there were varying models of state-run networks operated within state agencies. However, we chose, in Indiana, to maintain the course in this public-private partnership and that we did not have the infrastructure build in our own state for a public safety grade network to move 911 to.

We knew that that would be cost prohibitive to start a new initiative to build and therefore we chose to leverage the economy of

scale, the expertise and technology, if you will, from the private sector to provide to us a design as to what they could build and provide to meet the needs of our citizens in the state.

Ms. BROOKS. How many partners would you say you have in the system?

Mr. RITTER. The two primary vendors that will be providing networks are at the top of that list. However, their requirements to connect with other systems service providers in the state add to that count as well as the vendors who operate the equipment inside of the PSAPs.

So as we build this network the list of those partners continues to grow.

Ms. BROOKS. And have you discussed this model, and I am curious from your other colleagues across the country—is this a model? Have we saved money in part because of this? Found efficiencies and relied, I would guess, on the expertise from the private sector?

Mr. RITTER. I'd like to say that yes, we have saved money. When the general assembly asked me how much it was going to cost to build these networks in Indiana my answer was, I have no idea—trust me.

And it came out at the end of the day that we estimate that it will cost us, from the state's perspective for the networks right in the area of $15 million.

Now, this process required one of the vendors to build a network in the state and to participate. Their cost to build that network is not a number that they have shared. But I am sure that it was quite extensive from a private investment for that company to build and the state's going to reap the cost savings of that.

Ms. BROOKS. Would anyone else like to comment on whether or not states and other areas have contemplated this? Mr. Souder.

Mr. SOUDER. Thank you for that very insightful question.

As I attended the FirstNet board meeting yesterday at which they announced approval to go ahead with the contract with a private-public partnership, it really struck me as being an excellent way in which the deployment of Next Generation 911 could be looked at as well.

We are going to need a new network. In our world, we call it an ESInet—an emergency services integrated internet network.

The ESInet will not be telephone poles and wires between them nor manholes in the street. It will be in the cloud, if you will.

There is no need at all for any 911 center to build its own ESInet. There are ways in which they can avail themselves of the private sector to deploy that ESInet.

So I think that there are a lot of opportunities that exist as we look to deployment as to how we do that, and I go back again in the most cost effective way possible.

Ms. BROOKS. Thank you, and thank you all for your expertise.

Mr. MAGNUSSEN. And if I could add to that too, the State of Texas is doing the same type of thing in that we have selected vendors to work with us and partner in that.

Rarely is it ever going to be a state employee that's actually going to be running the switches and managing it. There will be a vendor or service provider backing us.

Ms. BROOKS. Thank you all. I yield back.

Mrs. BLACKBURN. The gentlelady yields back.

Mr. Kinzinger for 5 minutes.

Mr. KINZINGER. Thank you, Madam Chair, and thank you all for being here with us today. We really appreciate it.

Mr. Souder, as you said earlier, one of the most important components of a successful response to a 911 call is knowing the location of the emergency.

Responders need to know, for instance, that we are in this room if it's called. You made that clear last time. Do you agree that a quicker response times are a benefit of Next-Gen 911 and can you describe how Next-Gen 911 can help with location, accuracy and mapping for first responders?

Mr. SOUDER. Thank you, and unquestionably.

There are appropriate standards within the 911 world as to how quickly a 911 call is answered and once answered how quickly a unit that needs to be dispatched is dispatched.

In an ideal world, if the information that was provided initially through networks provided the exact location of the caller it would save a huge amount of time. The reality is that on a typical 911 call in my former position took about 40 seconds of a one-minute time frame in which to get the dispatch achieved, 40 seconds to ensure that you had the right address.

That doesn't leave a whole lot of time for triaging the call taker about the emergency being reported. So yes, in the Next Generation world there will be a very, very large decrease in the amount of time to verify and confirm the address from which the call was coming and consequently how quickly units can be dispatched to that call.

Mr. KINZINGER. And you also indicated that the cost of Next-Gen 911 depends on each deployment, and I read that statement to imply that some states might wind up with deployments that are better than others.

Given the network architecture underlying Next-Gen 911, would that undermine the deployment of Next-Gen 911 nationally?

Mr. SOUDER. I do not believe so. I think that all of us at this table have said repeatedly that 911 should be a local issue, whether local at the state, county, or local level.

But it's very important that these principal fundamental guidelines that are already established through the task force on PSAP architecture are followed because they are designed in a way to give options and alternatives to the way in which Next Generation 911 is deployed, allowing for differences that exist in different communities.

Mr. KINZINGER. Mr. Magnussen, do you have any thoughts on that?

Mr. MAGNUSSEN. Yes, I do. The location accuracy isn't necessarily a complete 911 issue. The problem is that our location information depends heavily today upon network equipment and satellite location and, unfortunately, in-building location is a real problem.

There are efforts going on right now within NIST and within the FCC and a number of organizations to try to figure out a better technological way of increasing or improving in-building location accuracy without breaking the bank because, unfortunately, a lot

of the solutions that are out there today would be exorbitantly expensive and would not be able to be—would not be implemented.

So while this is somewhat a policy and a funding issue, there are also some very significant technical hurdles and, quite frankly, if we could find a perfect in-building location solution that was somewhere between next to nothing and free, we would have done it. But I don't think that solution exists.

Mr. KINZINGER. Keep searching.

Mr. Forgety, we have heard that a central authority of some type at the state level is critical to accomplishing the transition in an efficient and timely manner.

Ms. Boyd suggested in her testimony that the local government should be in control. This dichotomy reminds me of some of the discussions around FirstNet.

What are your observations regarding this? And from what I had gathered anecdotally, the single point of contact model at FirstNet seems to be working pretty efficiently.

Mr. FORGETY. So having known Mary for a long time, I think I would say that there is no air between us on this issue. We agree that local control is very important. State coordination is equally important.

I am a member of FirstNet's PSAP and I can tell you from firsthand experience that the single point of contact model has worked extraordinarily well.

It has been a feature of FirstNet's design that allowed states to move forward with this process in a coordinated fashion.

I think you have heard everyone sitting here today say that doing things in a shared hosted coordinated environment is far better for us than trying to go out and build 6,800 unique snowflake systems. That just isn't going to work. That's not the modern way.

So we absolutely at NENA believe, and I don't think we'll get too much disagreement from anybody else here, that that model is quite effective.

Mr. KINZINGER. OK. Well, thank you.

Madam Chair, I yield back.

Mrs. BLACKBURN. Gentleman yields back.

Mr. Johnson, 5 minutes.

Mr. JOHNSON. Thank you, Madam Chair.

Dr. Magnussen, we have been talking about the transition to Next-Gen 911 and I want to dig in a little bit more into the transition and how that occurs.

I assume there isn't a flash cut. Could you explain what the transition means in terms of the legacy networks that we are now leaving and how that factors into the costs of the transition in the short and the long term?

Mr. MAGNUSSEN. Yes. Thank you for the question.

And the transition within a local entity really has got four major steps that we had identified in the study that we did in 2014, again.

First one is really setting up the organizational structure, making sure that somebody has responsibility for seeing it from beginning to end.

Second one is transitioning existing databases to NG databases because they are fundamentally different and in essence the for-

mat, and it sounds simple but there's complications in the way we currently read names and streets and things like that.

And the third one is really to go ahead and actually create the state or local ESInets, and then the fourth one is to convert the local call centers.

As you said, that's not going to be a flash cut. We are not going to suddenly wake up next Friday morning and say the state of Texas has transitioned over.

During that transition period one of the really complicating issues is the fact that we have to have these things called legacy gateways. So if a call originates in this call center and it's NG but it needs to be transferred to this call center and it's legacy, how do I do that transition?

That's where a lot of the cost complications are going to come in but it's almost like you're translating two different languages and you got to make sure that you don't really screw up the translation because that, again, is where you start running into problems. So——

Mr. JOHNSON. Yes. I am just curious. Do we have companies that are building a bridge? I am a software engineer by trade and so when we implement large software systems we sometimes have to have legacy interfaces from legacy systems to the new systems during the transition period. So do we have capabilities built in now to bridge the current 911 systems to the Next-Gen systems so that you can make that crossover transition?

Mr. MAGNUSSEN. Yes, sir. Not only do we have companies that are building them but they're also defined into the architecture.

One of them is called an LNG, a legacy network gateway. The other one is an LSRG, a legacy selective router gateway. So one is NG to legacy. The other one is legacy to NG.

So both of those architectures—both of those transitions are defined and they—there are several companies that are building them.

Mr. JOHNSON. OK. Great.

Ms. Boyd, your testimony mentions the dangers of technological obsolescence of the current 911 network, which often relies on 1970s technologies.

You mentioned that these dated technologies pose significant public safety risk due to higher maintenance costs, system malfunctions, outages and increased cybersecurity vulnerability.

Focussing in on the cybersecurity aspects, can you explain how Next-Gen 911 technology is less vulnerable to cybersecurity attack than legacy 911 networks are?

Ms. BOYD. Yes, sir. Not that IP networks aren't vulnerable—I'd like to clarify that—I think the difference is when you have an intelligent IP network you have the ability to introduce cybersecurity elements.

That exists today in companies that provide 911 network services. They do a lot of good work to detect and divert. However, the public safety agencies themselves don't have those technologies.

Recent work that Mr. Souder and I did with the FCC on the TFOPA report published we have a full section on cybersecurity and the recommendations on what we do in a Next Generation network to ensure that our PSAPs are secure.

Mr. JOHNSON. OK. All right.

Mr. Forgety, military installations—the people, their families on bases throughout the United States—rely on their smart phones in many cases just like ordinary citizens do.

Do you know if the transition to Next-Gen 911 capabilities is underway on military bases and should it be?

Mr. FORGETY. As a matter of fact, Congressman, it is. In fact, our organization is working very closely with the Pentagon to make sure that as they do roll out NG911 they are not only looking at the technological aspects of it but also the operational pieces of it.

For the longest time the telecommunicators and dispatchers in the military context—the military does operate PSAPs just like civilian jurisdictions do. They have not had standards for training and call answering and so forth. We are working with them to fix that.

Mr. JOHNSON. Great. Madam Chair, I was a communication squadron and deputy commander in the Air Force and I can tell you that our military folks will be very concerned about this transition and that it's done right.

Mrs. BLACKBURN. I agree with you on that, and I recognize Mr. Flores for 5 minutes.

Mr. FLORES. Thank you, Madam Chair, and I want to thank the witnesses for joining us today, and Dr. Magnussen, I am sorry I wasn't here to formally introduce you. We had an Energy Subcommittee hearing at exactly the same time.

But that said, I do appreciate all the great work that you do at the Internet 2 Technology Center at Texas A&M and also applaud the work you've done with public safety LTE and the roll out of Next-Gen 911.

Continuing with Dr. Magnussen, one of the things you discussed in your testimony is the need for a national layer to interconnect state NG911 networks. Can you explain the national background and what it brings to the transition?

Mr. MAGNUSSEN. Yes, sir. And the question, basically, I think we have addressed already part of it was the fact that we really need a method for the state to be able to interconnect and transfer information from state to state.

But another large, large benefit of having a national backbone or a national interconnection point is things like FirstNet—are they going to really connect at every PSAP or are they going to connect in every region or are they going to connect at three or four places across the state.

Some of our large companies such as our large service providers typically have got five or six major call centers across the U.S. So if we have to basically require for them to connect in every single state which, quite frankly, in an IP world makes no sense, right, so if we can really go ahead and have a system that can aggregate some of those connections it'll be more effective for 911, actually be more effective—cost effective for the vendors as well and it also could serve basically as the—we were talking a little bit earlier about the shared services—the private cloud type concept—because, again, if I am going to have my services out in the cloud if that cloud is protected and that cloud is basically designed under the same types of premises that that Ms. Boyd was talking about,

then in essence I have a higher level of confidence in it. If it's across a commodity internet you're going to have a hard time selling that one to public safety.

Mr. FLORES. Right. Right.

One of the things I noticed in the research prior to this hearing is that there are certain state laws and tariffs and regulations that are inhibiting or actually I'd say inadvertently inhibiting the migration to an IP-enabled 911.

Do you have an example of that and more importantly than an example, what would you recommend that Congress consider doing to try to help the states alleviate those impediments?

Mr. MAGNUSSEN. And, again, some of my colleagues can speak to that as well. But one example, again, in the case of Illinois was an issue where the state regulations required that 911 services be purchased under a tariff.

Well, in an era where telephone companies are deregulating, tariffs are going away. So it's things like that that, in essence, trying to check that block just don't work.

Mr. FLORES. Right. In your testimony, you talked about the missed routing that can occur when you're calling from close to the border on either side of the border. How will NG911 help to alleviate this problem where the calls are misrouted to the wrong country?

Mr. MAGNUSSEN. The current system actually is based on a concept where for wireless calls I route on the location of the tower and that's initially how the—how the call routing is performed.

So the scenario is this. I am a U.S. citizen and I am on a cell plan with the U.S. telephone company. I cross over the border to go ahead and have lunch. Let's say I am going into Canada. When I make that call, since—if I am right on the border my call could actually still be homed to a U.S. tower.

That call actually could very easily and would in fact be routed to a 911 call center, let's say, for example, in upstate New York.

Well, if I am sitting in Canada there is nothing the call center in upstate New York can really do to resolve that issue. So what they are doing right now is what they call a blind transfer where I just dial the 10-digit number of the call center on the other side of the border, and that's the thing that Mr. Ritter was saying that we are trying to eliminate in the state crossings.

Well, that's prevalent across the Mexico and Canadian systems as well. Obviously, Canada has implemented 911 and Mexico recently had another number. Mexico recently had actually adopted 911 as their national number as well. So the dialing sequence is the same but, unfortunately, the networks are not interconnected.

Mr. FLORES. Right. Right.

And lastly, in your testimony you talked about the need for better interstate connectivity. We know, obviously, why the connectivity is needed.

Now that we have got cloud technology it makes it fairly simple. Well, I am oversimplifying simple. But that said, I have run out of time. So I would ask you to supplementally answer, if you can, what actions Congress should take to help facilitate that interstate connectivity.

Thank you, and I yield back.

Mrs. BLACKBURN. Gentleman yields back.

Mr. Costello is batting cleanup and you are recognized.

Mr. COSTELLO. Thank you.

A couple observations and then Mr. Magnussen, I have a question for you. I previously served as a county commissioner and in a very populated high-growth county in southeastern Pennsylvania where it seemed every year we got a little bit less from the state 911 fund because more counties are getting in the game of providing their own 911 call centers rather than going to a regional approach, and that's because the state essentially enables counties to do what they'd like with it.

I always felt that you should have some sort of population threshold in order to have your own 911 center or some sort of formula because to a point that was made earlier there is just so much duplication that it becomes very frustrating because in high need counties that do need to operate their own call centers there is less revenue in order to draw from.

The other observation that I had is Pennsylvania is not one of the states that does not use their 911 money for what it should be used for. I think I saw there's five or six states.

And I am just having a little bit of difficulty. I will just put this into the record. In a county you have a county controller. At least in Pennsylvania it's referred to that. I am sure in other states it's referred by another title. It's an elected position.

And you have to sign off and verify that the funds are being utilized for a lawful purpose. If it's at the state level I presume it would be a comptroller or auditor general or something to that effect.

So I am having a little bit of difficulty how 911 funds are used for something other than 911 purposes. I think that we should all scrutinize that a little bit closer because somewhere along the way I think somebody is signing a check that they are not allowed to sign.

In the Commonwealth of Pennsylvania, the PSAP inventory report from 2016 identified challenges to regionality. In some counties there are frequent interstate mutual aid considerations across borders in New York, New Jersey, where I am in south Jersey, which is part of New Jersey, but if you're from New Jersey obviously I think there's a north Jersey and south Jersey—Delaware and also northern Maryland.

The report also noted that many of the design and deployment phases for regional projects involve a sizeable time investment which burdens the available administrative staff from each PSAP.

Mr. Magnussen, I noticed your testimony also focused on collaborative interstate connectivity layers in order to alleviate 911 technology operation and policy issues such as the Midwest's interstate play book.

One, could this be a model used for other areas of the country, specifically in the crowded northeast corridor where my district is, and two, can you please further explain how this interstate layer—where interstate layers ties into national level service providers?

Mr. MAGNUSSEN. OK. The collaborative effort that the states have done in the play book makes a lot of sense for what they are

doing today because in fact there is no national interconnectivity system to really be able to manage that.

So what they are really doing is doing a peering relationship with bordering states. Two problems with that. Voice over IP is not based on bordering states.

Voice over IP, I could very well be talking to a company that has a call center in California even though I am sitting in Texas. So the bordering state concept really starts to fall apart there.

But more importantly, we run into a network and we call it the N+1 problem. So everybody that gets those routes needs to propagate the routes across everybody else.

With four states you can do that. With five states it becomes more difficult. With 50 states it becomes impossible because you're having to constantly update all of your information independently and that model is just not scalable and that is just across the United States. Keep in mind this architecture is really designed to go globally.

So while it would be next to impossible in the U.S., you are not going to do it across the entire globe.

But there is also—and as far as the global efforts—we have the honor over the last 3 years of being involved with the CAUSE experiment. CAUSE stands for U.S. Canada Resilience Experiment and it involves DHS, SNT and the Canadian DRDC.

So it involves homeland security of both countries and what we do there is actually an experiment where we build networks and then we look at cross border issues.

CAUSE 5 is scheduled for November of this year and it will have a significant NG911 component to it because, again, we need to better understand how U.S. and Canada are going to be able to work together in an NG911 environment.

Mr. COSTELLO. Thank you. Yield back.

Mrs. BLACKBURN. The gentleman yields back.

That concludes our hearing as we have no further members who want to ask questions of our witnesses. And Mr. Doyle and I were just sitting here having a conversation based on the comments that you have made for us today.

You have been excellent. We look forward to working with you as we continue to move forward and look at how we achieve those economies of scale, how we utilize the ability to build on work that has been done so that we deploy a little bit faster. And I want to thank you all for being with us today.

I would remind members you have 10 days to submit additional questions for the panel and I have no doubt there will be some. And I would ask that each of you please respond in writing within 10 days of receipt of those questions.

And there being no further business to come before the committee today, we stand adjourned.

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

[Material submitted for inclusion in the record follows:]

WSJ

# Dallas Says T-Mobile Not at Fault for 'Ghost' 911 Calls: Officials say aging technology and staffing shortages contributed to problem

*Ryan Knutson*
*March 16, 2017*

Dallas officials on Thursday walked back their claim that T-Mobile US Inc. was flooding the city's 911 system with "ghost" calls, and pointed instead to aging technology and staffing shortages.

City officials said earlier this month that repeated hang-up calls from T-Mobile numbers were overwhelming operators, who are required to call back every number to ensure there isn't an emergency. T-Mobile sent network engineers to Dallas on Wednesday to examine the issue.

In a statement, the city said meetings with T-Mobile over the past 24 hours revealed the issue was a backlog of legitimate 911 calls, not ghost calls, which aren't initiated by a person.

The city's system keeps a queue of all calls, including hang-ups. Callers were trying 911, hanging up after being put on hold and calling again, exacerbating the backlog as operators had to dial back each call, said Sana Syed, a spokeswoman for the city.

In some cases the operators weren't able to reach the caller because he or she had called again and was on hold, Ms. Syed said.

A shortage of call-takers and a need for more advanced computer systems that can better sort through calls contributed to the problem, Ms. Syed said.

T-Mobile, according to the city's statement, said it would keep staffers in Dallas for two weeks and make adjustments to "smooth the delivery of calls to 911."

The city said it is adding an additional 12 workers to help manage the volume of calls and is pursuing technology upgrades.

4

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# Update to 911 issue in Dallas

City of Dallas sent this bulletin at 03/16/2017 04:14 PM CDT

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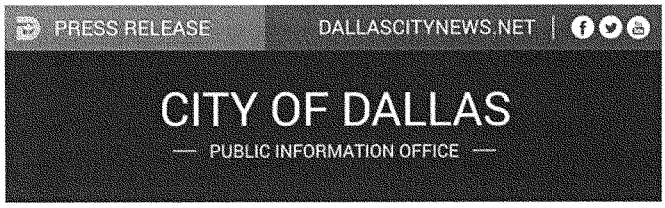


**FOR IMMEDIATE RELEASE**
March 16, 2017

**FOR MORE INFORMATION CONTACT**
Sana Syed, Public Information Office

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214.846.0519

## Update to 911 issue in Dallas

Since the press conference Wednesday, we are pleased to report that the team has been diligently working on the 911 issue for the past 24-hours and made some significant progress in identifying a combination of factors that contributed to the 911 issue.

T-Mobile has clarified that the calls that were gathering in the queue were not ghost calls, but abandoned calls. Ghost calls happen when a person's phone makes repeated calls to 911, unbeknownst to the person. Abandoned calls happen when a caller hangs up before reaching a 911 call taker.

To address this, beginning this weekend, the City is adding a dozen additional call takers per day to ensure an enhanced level of service until this issue is fully resolved. We are also pursuing technology upgrades. To further assist the call takers, T-Mobile has made adjustments in its network to smooth the delivery of calls to 911.

"T-Mobile committed resources in Dallas until we made progress, and they have kept their promise," said City Manager T.C. Broadnax. "We want our citizens to know that their safety is our number one priority and they can count on us when they call 911."

"I'm pleased that our staff and T-Mobile worked through the night and have determined some immediate technological upgrades that will better serve our citizens calling 911," said Mayor Mike Rawlings. "I'm also encouraged that City Manager T.C. Broadnax has committed to increasing staffing and recommending any other budgetary enhancements to our 911 call center."

T-Mobile has committed to having a team in the 911 call center for the next two weeks so that they can help monitor any potential issues that may surface in real time. The City's third-party vendors that support the City's public safety infrastructure will also be on hand.

**City of Dallas**

**House Committee on Energy and Commerce**
**Communications and Technology Subcommittee**
**Hearing on:**
**"Realizing Nationwide Next-Generation 911"**

March 29, 2017

Statement of the Peace Officers Research Association of California

The Peace Officers Research Association of California ("PORAC") appreciates the opportunity to provide the Subcommittee with its views on the deployment of Next Generation 911 ("NG911") in the United States.

PORAC is the largest statewide association representing public safety personnel in the nation, with over 69,000 members. Our members serve in California and Nevada and include active, retired, and reserve municipal police officers and sheriff's deputies as well as dispatchers, correctional and probation officers, airport police, and other statewide groups. PORAC is dedicated to empowering and representing the interests of rank-and-file peace officers and to protecting the rights of the men and women who keep our nation's communities safe on a daily basis.

In that spirit, PORAC fully supports improvements to the national emergency 911 system, which is growing increasingly outdated and incompatible with modern technologies. When a person makes a 911 call, it is *the* most important call s/he will likely ever make. Lives are on the line, and the 911 dispatcher must be able to quickly and accurately direct public safety personnel to the scene where assistance is being requested. There is no room for error—every second counts.

The methods dispatchers currently use to ascertain the locations of 911-callers, however, are often inconsistent, inaccurate, and antiquated. PORAC believes that it is time to make NG911 the standard and push the National Telecommunications and Information Administration ("NTIA") and the National Highway Traffic Safety Administration ("NHTSA") to catalyze improvements to the 911 grant program.

Outlined below are a number of problems that PORAC members have experienced with the existing 911 and other emergency communications systems, and an explanation as to how NG911 can help mitigate these concerns.

## I. Problems with the Existing 911 and Other Emergency Communications Systems

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Under the current 911 and emergency communications systems, there exist a number of problems that prevent dispatchers from quickly and accurately locating those in need of assistance. With respect to the 911 system, these problems include:

- Difficulty Locating Wireless Callers. When landlines are used to call 911, the caller's customer data provides the exact address from where the call is placed. When a cell phone is used to contact 911, however, such location information is not available to operators and law enforcement, who are then forced to rely on imprecise techniques (such as triangulating the cell signal) to determine the caller's location.

- Vertical Location Issues. While signal triangulation, GPS, and physical address databases are *sometimes* able to obtain horizontal coordinates and addresses, that technology is currently unable to ascertain the vertical location of 911 callers (i.e., on what floor of a building the caller is located). It is a common scenario for 911 callers to correctly give their address to 911 operators but fail to inform them that they are on a specific floor. When the emergency personnel arrive, they have to try to determine which floor the caller is on, which means critical time is lost.

- Problems with Multi-line Phone Systems. Many multi-line phone systems (such as those used in hotels and office buildings) require the caller to dial a pre-fix number in order to make an outgoing call—even if the call is to 911. This creates problems for callers who are unaware that they must dial a pre-fix number, and disproportionately impacts children because they have usually been taught to simply dial 911 in an emergency.

- Complications with VoIP Calls. Voice Over Internet Protocol ("VoIP") systems are very reliant on Internet connection and power. If either one or the other were to fail, then there would be no possible way for a caller to use VoIP to contact emergency services. This problem is faced by both callers to 911 and the 911 operators themselves.

In addition to the existing 911 system, other emergency communications systems are in desperate need of updating. For example, many of our districts have struggled with antiquated public safety radio systems. Oakland, California is a perfect example. For years the Oakland radio system failed regularly, putting the lives of Oakland's first responders and citizens in jeopardy. In fact, the problems were on display for all to see when the radio system failed during a high security presidential visit to Oakland in July 2012.[1] However, after diligent work by Oakland City leaders in cooperation with county and state officials and with the aid of federal funding, Oakland was able to transition to a regional public safety communications radio system: the East Bay Regional Communications System Authority. Since that transition finished in July 2016, Oakland Police and Fire Personnel have experienced *zero* radio failures and Oakland's

[1] *See* Jaxon Van Derbeken, *Oakland Police Radios Fail During Obama Visit* (July 25, 2012), http://www.sfgate.com/bayarea/article/Oakland-police-radios-fail-during-Obama-visit-3736022.php.

ability to access an upgradeable, sustainable, and interoperable radio network has been widely lauded as a huge success for Oakland and the region. While Oakland is a success story, there are still many areas across the country where radio systems need to be updated.

## II. NG911 Will Help Save Lives

NG911 would allow for modern day methods of communication—such as smartphones and Internet-enabled devices—to be used to contact 911 services as well as provide dispatchers with more precise and timely location information for all callers. This added integration will allow for emergency responders to arrive on location with a better knowledge and awareness of the situation, increasing both their efficiency and their safety. In meetings PORAC has had with the Federal Communications Commission, the Commission has indicated that updating the antiquated technologies is a very high priority.

In addition to agency action on this critical issue, legislation has also been introduced to address certain shortcomings of the 911 emergency communications system. One such bill that PORAC supports is the Kari's Law Act of 2017 (H.R. 582/S. 123), to require multi-line telephone systems (such as hotel and office telephone systems) to have a configuration that permits users to directly initiate a call to 911 without dialing any additional digit, code, prefix, or post-fix.[2] PORAC hopes that this important legislation will become law during this Congress.

Finally, unlike many other states, California has its own NG911 plan, signed into law by Governor Jerry Brown in September 2014.[3] The bill requires the state's Office of Emergency Services ("OES") to develop a plan and timeline of target dates for testing, implementing, and operating a NG911 system, including a text to 911 service, throughout California. The implementation process, however, has been slow and additional funding is needed in order to fully implement NG911 across the state. Nevada is similarly struggling to implement its NG911 systems. In addition to the benefits that state-level boards can provide to facilitate the NG911 transition, PORAC believes that greater federal oversight of the process is also needed.

## III. Conclusion

As law enforcement officers are often first responders, PORAC strongly supports all updates and changes to the 911 system that would allow for 911 callers to more easily access the emergency communications system, as every moment that it takes before emergency services

[2] In the House, the Kari's Law Act was introduced by Representative Louie Gohmert (R-TX) and passed 408-0 on January 23, 2017. The Senate version was introduced by Senator Amy Klobuchar (D-MN) and is awaiting further legislative action in the Senate.

[3] *See* SB 1211 (Sept. 30, 2014), *available at* http://www.leginfo.ca.gov/pub/13-14/bill/sen/sb_1201-1250/sb_1211_bill_20140930_chaptered.html.

reach victims is a moment in which dire situations can worsen. PORAC also generally supports additional funding to support the NG911 transition.

PORAC appreciates the Subcommittee holding a hearing on this matter, and stands ready to serve as a resource as Congress works with federal agencies to ensure that NG911 becomes a reality.

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