

Hello and welcome to the State of 911 webinar series, hosted by the National 911 Program. My name is Sherri and I will be the moderator for today's session. This webinar is designed to provide useful information for the 911 stakeholder community about Federal and State participation in the planning, design and implementation of Next Generation 911, or NG911 systems. It includes real experiences from leaders utilizing these processes throughout the country. Today's session will feature speakers from the NG911 Interoperability and Oversight Commission, or NIOC, providing updates on their work, and the Pennsylvania Emergency Management Agency will discuss their unique approach to statewide NG911.

For closed captioning, please copy and paste the URL link in the chat window to an additional web browser. For more information on the National 911 Program webinars, or to access archived recordings, or learn more about the National 911 Program, please visit 911.gov. Feedback or questions about the webinars can be sent to the National911Team@mcp911.com. Please note that all participants' phone lines have been put in a "listen only mode" and this webinar is being recorded. To ask questions of our presenters, feel free to take one of two actions. Using the GoToWebinar's "Question" feature located on the right-hand side of your screen, you can enter a question at any time during the presentation and it will be entered into a queue. This feature may not be visible to you while your screen is in the expanded page view. Or, if you would like to ask your question live, use the "Raise Hand" feature to request that your phone line be unmuted, and you will be called upon to ask your question. Everyone registered for this webinar will receive access to today's PowerPoint presentation and the webinar recording. So with that, I would like to turn it over to Laurie Flaherty to introduce our first speaker.

Thanks Sherri. I am really happy to have three people with us today who are all members of the NG911 Interoperability Oversight Commission. Rick Blackwell is the chair of the NIOC. His day job is as the E911 Director in Greenville County, South Carolina. Mr. Jeff Wittek is also a member of the NIOC who is Chief of Staff with Motorola Solutions, and Steve McMurrer is also a NIOC member who is the 911 Systems Administrator for Fairfax County, Virginia. Gentlemen, the floor is yours.

Hey, thank you Laurie. It's an honor to be with you all. This is Rick talking. We have a whole lot of fun - Laurie Flaherty serves on the NIOC with us and we're honored to get to serve with her. So we're going to use a secret word to advance the slides, but in honor of the Pennsylvania folks that are coming up, I'm going to say groundhog. So burn through this thing - groundhog. You can see the Commissioners that are presented and you may have to hit -- there you go -- you just heard our names. You can say groundhog and groundhog and get us to the meat of the matter.

I want to talk about who or what is the NIOC. There you go - The NG911 Interoperability Oversight Commission, that's a mouth full for me man, but I want to focus on this where it says independent, transparent and revenue neutral organization. Those are all basic tenants of what the commission is about.

We are established to oversee the security and interoperability in the NG911 communications. We handle the PCA and the Forest Guide. We believe strongly that we need 911 specific security for Next Generation 911. And even though NENA contributed heavily to getting the Commission up and running, we also believe it's prudent that the Commission operates autonomously. We're all volunteers. We're not making any money off of doing this. We don't have any interest in making money. And we try to at least have some fun while we're doing it. So groundhog.

So why was the NIOC created? What we do is, we take care of the PCA and the Forest Guide. We have to oversee these operational elements that are required based on the NENA i3 standard. We believe strongly it is operationally and cost-efficient to have only one entity that is overseeing and maintaining the security and maintaining the Forest Guide. And you're going to hear more about the PCA and

Forest Guide from Steve and Jeff. The Forest Guide is needed in order to ensure that NG911 to NG911 system interoperability, and the PKI is needed for the security. So we'll say groundhog.

I want you to know who all is on the NIOC. It is a very diverse set of commissioners. And we've got folks that were nominated by -- from representative stakeholder groups as you can see. And the NENA Board initially reviewed and approved the nominations to NIOC. I'll tell you that we've got ten voting seats on the Commission, and we got four nonvoting advisory seats. Brian Fontes is on the Commission as a non-advisory member. And the NENA board has a list of representatives from everywhere, and I want to introduce you to these members. So groundhog.

You got David Furth, he is on there with the SEC, and you heard Laurie is on here with the National 911 Program Office. Michel Murray from Canada. Canada is a little bit ahead of us for Next Generation and we're learning a lot based on what Canada is doing. Groundhog.

We've got Darlene Pankonie is on from Washington County representing the PSAPs and ECC. And Maria Jacques, many of you know her from the state of Maine. She is a fabulous resource for us for the State and 911 authorities. Steve McMurrer, he's a good man from Fairfax County representing the local regional 911 authorities. Irene Fernando, that position is a very interesting position, because she does not know anything official about 911. But she has a great interest in public safety and is able to present things from her perspective from an elected person's perspective has been a valuable resource to us. Groundhog.

You got Dave Sehnert, He is with RapidSOS, he represents the NENA Board. And, you see me on there. Steve O'Connor is on there representing NENA Core Services committee, that is part of the i3 scenario.

And you beat me to groundhog. You got Doug Cunningham representing core service providers. And Jeff is commercial, Jeff Wittek, you're going to hear from him in just a little bit, NG users, NG911. And then Kris Zuniga, who represents Public Safety Associations. Groundhog.

So, we put this slide in here just so you can sort of see the dotted line relationship that's going on. The NIOC is over the PSAP Credentialing Agency, Forest Guide, and any others that are going to come about. And there's a dotted line relationship with the NENA Board, any of the PCA Forest Guide administration support, and NENA standards development also contribute to that. And, you can see we are developing policies for the PCA and the Forest Guide with input from everybody - from SMEs and administrators and tons of folks.

So groundhog. And I think I'm going to turn this over to Steve to talk about the PCA and PKI.

No, actually are going to turn it over to Jeff.

Ok, thank you.

Good morning everybody. I am going to, the first thing we're going to discuss a little bit is PKI. And you know, the term public key infrastructure, or PKI, may not be familiar to everyone. But in fact I would venture to guess that many of you use it almost on a daily basis. Because when you interact with the public Internet, and you do secure transactions. Like for instance when you do banking, or when you pay bills, or when you purchase items off of the Internet, you are actually interacting with the Internet public key infrastructure.

That PKI is what helps ensure secure communications and secure transactions. So what is a PKI? It's a set of rules, policies, hardware and software, and procedures that are required to ensure communications security.

In an NG911 environment, it's really the same thing, except the security is relative to secure inter-jurisdiction interoperability. What the PKI does is set up what is called a chain of trust. And it uses secure electronic certificates that are exchanged to provide that security.

The certificates are created and managed by a Credentialing Authority. We're going to talk about that Credentialing Authority next. Next please.

In the NG911 world, the PSAP Credentialing Authority, or PCA, is the root of trust. It's where all trust starts for NG911. And the PCA is the root of trust in the total chain. It starts with the PCA, the PSAP Credentialing Authority, and then go - you might go -- to an intermediate Credentialing Authority and then those certificates are passed along to the PSAPs. And, the unbroken chain of certificates is that chain of trust. The PSAP Credentialing Authority, or PCA, is actually required as a NENA i3 functional element. And, it's an integral component of the public key infrastructure that we're going to be using in NG911 .

Next please.

So where are we with the establishment of the PSAP Credentialing Authority?

In June of 2019, an RFP was released by NENA to solicit competitive proposals for the PSAP Credentialing Authority. The responses that were received were formally reviewed by a team of subject matter experts, and those experts made a recommendation for an award. The entire procurement and review process was then re-reviewed by the NIOC. And during that review, the NIOC found that the entire process was of the highest integrity. Based on that review, the NIOC then awarded the PCA to DigiCert and Eonti. DigiCert is right now putting in place the necessary hardware for implementation and is scheduling a signing ceremony. A signing ceremony is an official, formal ceremony to sign the root certificate that will then be used in the chain of trust. Along with that, in parallel, the NIOC created, reviewed, and approved something called the Certificate Policy. And, what the certificate policy is effectively the Constitution, the set of laws that will be used to govern how the certificates are handled in the NG911 PKI. Next please.

And with that I am going to turn it over to Steve to talk about the Forest Guide.

Okay, thanks Jeff. So the Forest Guide is a part of the total architecture for Next Generation 911. If you look at the way NextGen 911 is being deployed across United States, there are multiple implementations by various states, sometimes regions, where they're establishing a NextGen core services system and they've established an ESInet that's going to handle the network routing of calls. So given that there is going to be this proliferation of the ESInets across the United States, there are going to be opportunities where a call can't be routed to where it needs to go. So the Forest Guide, you think of the idea of being lost in the forest guide - in the forest - the Forest Guide is the place of resolution for a 911 call that cannot find its way to its original point in the beginning. So the Forest Guide is supposed to tie these ESInets together so that a 911 call gets where it needs to go. And it is going to provide the ability for calls that fall between the gaps, between ESInets, to be routed to the correct place. It is a standards-based system, not just by NENA, but also by IETF. So it's well established in terms of its functionality and it will present its ability to various systems across United States' implementations of Next Generation 911 through a process that is undergoing selection process which I'll talk about in just a minute. So when a 911 call can't be routed, the Forest Guide is to be the place where you go for resolution. And, in

the U.S. there will be likely just one Forest Guide. There will likely just be one in Canada. There will likely be others outside of the United States, across the world, but that is yet to be determined. But the idea would be generally there will be one within the United States. Next slide please.

So the Forest Guide has been specified in the standards and it has not been implemented. So what the NIOC has done is that some subject matter experts were involved in preparing the requirements based on what the NENA standards say. Those requirements were reviewed by the NIOC board and there was an RFP that was put out in November. There's been some pre - there's been parts of the procurement process that are underway. A pre-bid conference was held in the middle of January, next week the proposals are due in from the vendors who provide capabilities in this Next Generation 911 space, and then there will be some interviews towards the end of the month. So the process for this will be open and transparent. There is a report on the NIOC webpage that describes the procurement process that was undertaken for the PCA that Jeff was just speaking about. We will be using a very similar process, and so the opportunity to understand the specifics of what happened will be available to the public. In terms of who is evaluating the RFP, we solicited across the industry, subject matter experts and people that had an interest in evaluating that. So there is a team of volunteers that will begin their work next week to make their way through these proposals with the hope to make an award soon thereafter. And, I will turn it over to Rick.

Yes and groundhog, there you go. In summary, you've seen who the NIOC is and why we have a governance role. We try to be diverse and independent and we definitely want to be revenue neutral. We want to be transparent and you've heard the purposes of the PCA and the PKI, and you've learned about where and how the Forest Guide is going support NG911. It is an honor for all of us to serve, and we appreciate greatly you all letting us participate in the State of 911 webinar. I think now is the time that we would entertain any questions, anything that we've said that feels of interest to any of you folks. Just sing out.

I'll go ahead and say muskrat. So you see right there is our webpage if you want to go out and read that. [Laughter].

Oh, I guess I should say groundhog instead of muskrat, don't I? [Laughter].

Alright, yes, thank you gentlemen, to all three of you. So, yes, as Rick just mentioned, we now open up our Q&A session. And just as a reminder, you have two options. You can either click on the raise hand button to have your phone line unmuted, or you can type your question into the question window. So with that, Sheila do you want to go ahead with our first question?

Yes, thank you Sherri.

Our first question asks, does APCO have any representation or voice on your board?

Well I'll take that. This is Rick. My understanding is that APCO was initially offered a position and decided not to participate in it. We've actually met with APCO and explained to them what NIOC is all about. We would love for APCO to be part of what we are doing. And I would also mentioned that many of us, me included, I serve on APCO's Executive Council, I am a card-carrying APCO member and card-carrying NENA member, so we don't have any ax to grind with anybody. Anybody that is helping 911, we want to support that. Jeff, Steve, or Laurie, if I misspoke, about where we are with NIOC and APCO, you all sing out.

Not at all, Rick. I think I would simply amplify that APCO was invited to participate and respectfully declined.

Thank you, gentlemen. How many calls per year are expected to need the Forest Guide to get routed?

This is Steve. I'll try, I can't answer that specifically because I don't have a photographic memory, but I am pretty sure that we had what the expectation was but I don't have it on the top of my head. But it is - it is specked out to be sufficient to handle what we would expect to be the maximum based on today's calls and growth over time. But we can look that up and provide that back to the coordinators of this to give you a very specific answer. I just don't have the answer off the top of my head.

Thank you. And yes, if you want to provide that answer we can share that with everybody who joined. Thanks.

Next question. Are you stating that there will be a standard that any vendor must comply with, or that they will only be approved vendors via the RFP process that all NG911 agencies must purchase?

So I'll try to take that. So the RFPs that we talked about today were RFPs that were released that helped identify the vendors for - that will run the PCA and the Forest Guide for the NIOC. There are, with the PCA there are standards or policies that will be followed by all NG911 vendors in the marketplace. Again the policy is the certificate policy that's published and will be utilized to provide that level of security. So no, each vendor will be able to follow the certificate policy to interact with the PCA. As far as the Forest Guide is concerned, as long as a vendor is adhering to the i3 standard, the vendor will be able to interact for the customers, for everyone, they'll be able to interact with the Forest Guide.

Thank you. Our next two questions are related to funding and the money side of all of this. How is NIOC funded and does it have an annual operating budget?

I will start on that. The NIOC right now doesn't have any funding. We are stood up by NENA, originally, and we are borrowing NENA's resources initially, but the intention is for us to spec out the cost of everything involved with what we're doing and recover that by fees associated with certificate policy to the point that we're not making money. I want to be very clear about that. We don't want to make money off this thing. We want to be revenue neutral. So we don't - we're going to learn more about what the cost associated are with setting anything up with RFPs are finalized and we get the vendor responses. I don't know if that totally answers your question. Jeff, Steve if you all want to chime in?

Yes, Rick I would. As Rick said, at this point in time the NIOC was originally funded through NENA. The NIOC, however, is an independent organization. As the RFPs come back, and we better understand exactly what the costs will be, a budget will be produced. As Rick has said, that budget will be revenue neutral. It will only cover the cost associated with the operation of the PCA and the Forest Guide. It will not generate profit for the NIOC or, frankly, for anyone else. It's revenue neutral.

So this next question we may not be able to answer at this point, but we'll ask it to have it on record. How sufficient will these costs be to public safety?

So you are correct. At this point in time, I can't specifically answer that question. Until we have the RFP and costs back for the Forest Guide, so that we can incorporate them.

Okay.

May I also add, there is another factor that will impact specific costs to the PSAPs. And that is additionally how each state wants to implement the public key infrastructure. Some states may implement an intermediate PCA, other states may not. So the exact architecture from state to state, will also impact the specific costs to PSAPs in a state.

Thank you. Is there a benefit of PKI over block chain?

So the benefit of PKI over block chain is that PKI is a universally understood and utilized method of security. Again, we use it every day on the Internet. And the PKI that we're establishing for NG911 - it's not exactly the same, it has some differences. The NG911 has some differences to the public Internet. But the similarity is close enough that it is well understood, it is well exercised, vendors understand it, and we're not reinventing the wheel.

Next question is asking, what is the difference between the PSAP registry tool that NENA recently launched and the Forest Guide?

This is Steve, I can try to answer that. The PSAP registry tool is a more general purpose way to see information about PSAP information that's available in the United States in terms of vary of coverage. It is not a part or plan to be a part of a production Next Generation 911 system. So I would put it more as it's an administrative informational tool. But the Forest Guide is going to be integral in operations between ESInets and it won't be a casual thing that would be just sort of used by any particular person. You would access that and it would be used to route decisions between ESInets to get calls routed. So one is much more going to be a production-oriented system and, in general, the other one is more an administrative and information tool that can be used by PSAPs.

Okay. I want to again thank all three of the gentlemen for presenting on NIOOC. And, we did have a few more questions that came in that we didn't have time to get to. And if we don't have time to circle back and answer those questions at the end of today's presentation, we will provide them to the presenters and post their answers when we post the recording of today's webinar.

So with that, I am now going to turn it back over to Laurie and ask her to introduce our next speakers, Mr. Jeff Boyle and Mr. Bill Shertzer.

Thanks Sherri. As Sherri just mentioned, our next two speakers are Jeff Boyle and Bill Shertzer. They are both with Pennsylvania Emergency Management Office. Jeff is the Deputy Director of the 911 Office and Bill is the 911 Program Manager. So gentlemen, please proceed.

Alright, next slide please. Thank you Laurie.

So good afternoon, everybody. I am Jeff Boyle, Deputy Director for 911 at the Pennsylvania Emergency Management Agency, and with me today I do have Bill Shertzer, our program manager. In Pennsylvania the county does have responsibility for providing 911 service within its jurisdiction. PEMA, we serve in a support role at the state level with responsibilities related to statewide planning, coordination, oversight, and funding. With counties having the responsibility for providing 911, we do have a fairly consolidated 911 system today. We have 67 counties and 60 primary PSAPs. Our largest PSAP in terms of call volume is Philadelphia in the southeastern part of the state. And on the other side, our smallest standalone PSAP is Juniata County which located in central Pennsylvania. In between Pennsylvania does have a diverse geography and our PSAPs serve a variety of areas, urban and rural areas, across the Commonwealth.

Prior to 2015 our efforts in Pennsylvania were primarily county-based, county-

focused. Since that time, we have progressed from a county focus to more of a regional focus. And now we're at the very beginning of a statewide Next Generation 911 solution. So today we're going to talk about how we made this transition from a county-focus to a regional-focus, and how those regional efforts will be leveraged as part of our statewide NextGen 911 solution.

Before we talk about our approach to NG911, I do just want to touch briefly on our legislation and how we're going to go about funding NextGen 911 here. Next slide please.

(pause) Next slide.

I apologize, Jeff. There it goes.

No problem.

I was having technical difficulties.

No worries. So our legislation had been foundational to our progress over the past few years. And it provides not only a good framework to implement a NextGen system but also to sustain it. So to talk about some of the key provisions in our law, first a new Advisory Board was established. The board has been foundational to statewide planning and coordination efforts. It really gives our PSAPs a voice in statewide decisions and it's really helped develop a very good working relationship between PEMA and our PSAPs. And this has led to many system improvements over the past few years.

PEMA's also required to maintain a statewide 911 plan, and by law this plan must focus on NG911. Our current plan was developed working with our board and our county partners, and it was decided that a statewide approach works best for Pennsylvania. So our plan does call for PEMA to procure a statewide NextGen 911 solution. In preparation for NG911, we are also required to adopt new minimum standards for our PSAPs in areas such as technology, operations, training, QA/QI and administration. Also by law we're required to review and update these standards on annual basis. So this does give Pennsylvania the opportunity to keep our standards current as Next Generation 911 standards and capabilities continue to evolve.

PEMA's also required to maintain a full physical inventory of every PSAP. For a couple purposes. One, to determine each PSAPs NextGen 911 readiness, and then also for statewide planning and coordination. From a funding perspective, our legislation does give us a dedicated funding stream to support regional efforts as well as NextGen 911. And, this also gives PEMA the opportunity to go back and revamp all of our business processes to make sure that we have effective statewide planning, budgeting, and oversight in place, to make sure that we have the funding available to support NextGen efforts. Next slide please.

So, just to touch on how we're going to fund Next Generation 911 here. Before 2015, a primary concern in Pennsylvania was that we had no ability to invest in system improvements and future technologies. So our legislation was completely rewritten in 2015 that brought about a number of funding reforms.

Before 2015, revenue collection and distribution procedures varied by service plate. Wireline and VoIP revenue was remitted directly to the counties and wireless revenue came to the state for distribution. In Pennsylvania that made it very tough for statewide planning, coordination and oversight when you're talking about system improvements and investing in Next Generation 911. Now, all revenue comes to the State on a quarterly basis and every quarter at least 83% of our collections are paid out to the counties through a formula-based distribution.

These formula payments, they are essentially block grants to our counties. The PSAPs can spend these funds as they see fit as long as the costs meet our eligibility criteria. But it is the PSAPs responsibility to manage those funds to meet their needs.

Now a very unique feature of our legislation is that up to 15% has been carved out that PEMA can use to support regional initiatives, as well as Next Generation 911. Since 2016, we have used these funds to prepare for NG911 here. We've done things such as establish and support regional ESInets. We did a full inventory in 2016 that said over half of our PSAPs needed to upgrade their CHE and CAD. So we've been working to address those issues while incentivizing our PSAPs to come together and share those systems.

From a GIS perspective we've taken more of a statewide approach. We just completed a statewide GIS gap analysis; we've done things such as we managed a statewide imagery project; and we've been providing counties grants since 2017 focused on data development. But very importantly, with this carveout, this 15% carveout, we do plan to cover the majority of the costs for our Next Generation 911 service.

It's important to note that Pennsylvania counties did contribute over 46 million from their general funds, or other local revenue sources, in support of 911 last year. So it was a lot of sacrifice and also forward thinking from the Pennsylvania 911 community to agree to carve out some of this revenue. So we do have the ability to invest in system improvements and future technologies.

Next slide please.

So these efforts over the past few years have led counties to come together and essentially form seven regions in Pennsylvania. And to talk about some of our regions today, I'll first focus on the WestCORE region in the southwestern part of the state. This is a 14-county region. They are connected by very robust regional ESInet. And within this region, we have groups of counties that have come together to share systems and applications such as CHE, CAD, LMR, dispatch protocols. There is a lot of excellent work going on within that region. Right above them in the northwestern part of the state is the Northern Tier region. And this is a 10-county region connected by our regional ESInet. All ten counties are sharing a single CHE system, nine counties are sharing a CAD system. They standardize dispatch protocols, fire and police and EMS among all counties, and they're sharing many other applications. So a lot of credit goes to our PSAPs in regions. And a lot of good work is going on in Pennsylvania, and I wish I could touch on all of them. Those are just two examples.

And I bring up these two examples for a couple of reasons. Each of these regions is going to take a different approach for connecting to Pennsylvania's Next Generation 911 system. When we wrote our requirements for our RFP, we knew that we would need flexibility. We anticipated some regions, such as WestCORE, would want to maintain a separate regional ESInet as part of the overall statewide NextGen solution. And on the other hand, regions such as Northern Tier, it was anticipated they would want each of their PSAPs directly connected to the statewide ESInet. In addition, our NextGen solution had to be designed to support ancillary services in place today such as CAD. So overall Pennsylvania's solution needed flexibility and we wanted to leverage our previous investments as much as we possibly could. So in November 2020, we did execute a contract with Comtech to provide a statewide NextGen service here. So to talk more about Pennsylvania's approach to NG911 and the different approaches that regions are going to take, I will now turn it over to Bill Shertzer.

Thanks Jeff. Good afternoon everybody.

Our approach to NextGen 911 has been a long time coming. As Jeff said we signed a contract in November of 2020. That RFP had been released in February of 2019. Many months of work and years of work went into it prior to that. Now we have a contract signed and are moving forward. We have an architecture that we're putting in place that will hopefully allow the originating service providers to connect to TDM POIs that will be located within each LATA. They'll be diversely - diverse - redundant connections to and every LATA at a minimum. Those POIs will then be connected to aggregation sites in Cleveland and Philadelphia. With that, with those aggregation sites, if a carrier has gone to an IP, as carrier G is depicted in here, if they've gone to some type of IP call deliverability, they'll be able to directly connected via IP to those aggregation sites. We also are going to have the legacy selected router connectivity at those sites through the TDM POIs.

The aggregation sites will be connected to our two data centers. Those two data centers are dedicated, redundant connections that can serve the entire Commonwealth in and of itself in a single capacity but they will be fully redundant. One in Boyers, Pennsylvania, and one in the city of Philadelphia. We will then connect those data centers via the ESInet, the statewide ESInet, to our PSAPs whether it be a regional deployment or directly connected to every PSAP. And we're going to get into that in a little bit more detail. But this is going to be a ring architecture. If you think of it, we're doing it regionally, as the previous slide had depicted. Many different regions across the state, a lot of them have some type of ESInet in place today. If they so choose and want to keep that network, as WestCORE in the southwestern corner of the state is choosing to do, they're going to keep their regional network and will have connections to the portions into their region, and then their regional network will connect all of the remaining PSAPs and final call delivery. But we'll get into that on the next slide please.

So here is WestCORE. The PEMA ESInet coming from the two data centers, will connect to three POIs in this region. They, one, in this case, is Westmoreland, Mercer and Cambria. That's our targeted point of interconnect for the region at this point. Those were decided on a couple different factors. Mainly with Comtech being the chosen vendor, and Zeto Media being the fiber ESInet provider, the presence that was already available for connecting to Mercer and Cambria were a key factor in choosing those two sites because we already had facilities to allow the regional, or the PEMA ESInet, to connect to the region at those two locations. Westmoreland was the other site chosen, they housed, they do a lot of CHE sharing here, there are two systems, actually three independent systems, but Westmoreland has two nodes of two of the shared systems sitting at their location. So, it seemed like a logical choice. The regional network, after the interface from the PEMA ESInet for the call delivery will hand the call off to the appropriate CHE and then the CHE will route that call over the regional network to the destination PSAP for the call.

One key thing to remember, Comtech will handle everything up to the regional network and have voice connectivity to the CHE. Once it hits the CHE the voice connection and the regional ESInet will be the responsibility of the region and that provider . Next slide please.

Northern Tier as Jeff mentioned was another one, this is a different deployment strategy. They currently have a shared CHE solution and in the shared CHE solution, Elk and Clearfield are the two node locations with multiple remotes hanging off of that via a regional ESInet. This regional ESInet is provided by Zito Media and it will become part of the statewide network. So the ownership of the call and the network will go entirely to every PSAP, whether it's a host site or the node site. The CHE will still handle the voice path after every remote, but it will ride the ESInet that is put in place and managed by Comtech.

So, in this deployment strategy, the PEMA ESInet will connect and direct all calls for these counties in this region to the two node locations. Those node locations in the CHE will determine which PSAP that call needs to go to. That call, once routed to that destination, the voice path will be set up over the PEMA ESInet and total ownership of the network will be under the State and under Comtech's control.

Next slide.

Here's just the deployment strategies and different phases that we are looking at in deploying this strategy across the Commonwealth. We're currently in the design and build phase. We've designed a statewide network that is fiber-based. It is fully fiber-based. We're building about 400 miles worth of fiber in the construction of this network. And that's just the initial builds knowing where we need to place connectivity. Once we get into, and we're doing currently - surveys - site surveys and network assessments of the different regional networks that are out there, it's likely we will see additional builds required. And depending on the strategy that some of these regions want to take as far as coming onto the statewide network, those changes are expected.

So, the other thing is utilization of those redundant data centers. It was one key thing, redundancy and diversity were key points in the discussions and in the RFP requirements to ensure that we had the redundancy and diversity necessary that no single point of failure could take down the network.

One key, another key factor and one thing that we did is in our network we've had issues in the past in the regions where public services have impacted 911 because the public network is - or 911 is - riding and sharing the public network. We've had incidents where an Xbox was receiving - received the DDoS attack and it took down the network due to the bandwidth and it affected 911. We didn't want that to happen going into this statewide deployment. So what we've done is we've actually taken and, as part of our contract, negotiated a private, optically separated network. The only thing on that wavelength will be 911 with dedicated bandwidth for 911. So, it should not be impacted by anything external to emergency services.

It also has the capability, as Jeff mentioned, to be expandable. We wanted to build this network - and I could probably put 10 meg connections into a lot of these PSAPs and do call delivery all day long - but we wanted to build this forward thinking knowing that the possibility is there to share additional services, use this network to enhance the sharing of those services such as CAD, recorder, radio, as we look forward into the future. Many of these locations and their PSAPs in these regions are already sharing these other services so we wanted to build a network that would support what they're doing today.

The PSAP and network assessments I just mentioned, that goes to not only the site surveys so we know what they have, where we are going to install the equipment in their data rooms, but also understanding their network, how we integrate with them. Those types of things.

We will also have to build the carrier ingress network. Make sure that the OSPs have connectivity to the POIs, and then that ingress gets connected from the POIs to the aggregation sites. The NGCS software and building out of these data centers, building out of the network across the state, is a very, very large deployment and we anticipate all counties are going to come on board with this. But, once that occurs, we have every region, we'll focus in each region. Then we have to do the equipment insulations at every PSAP. These site surveys, gathering all of that data is going to allow us to move forward to that step of the installation process. One key thing is, we are a Commonwealth so the counties do have the control of how services get delivered. This is not the state's procuring this service on behalf of all of the counties, but the counties are very, very involved in how the services

will get deployed, how their regions will integrate with the system. Very key piece is to make sure we have their support, have their buy-in, have their cooperation, make sure that they are completely involved in support and we're supporting them in a way that's going to move them forward.

Pre-migration testing and validation and the PSAP migration, we wanted to make sure as part of this contract that we do all kinds of pretesting. I don't want to go and put a service on here that hasn't been tested thoroughly, prior to a migration. So, all kinds of pretesting, all kinds of validation testing will be done. Then the PSAP migrations, right now there's multiple ways to look at this, but we'll hopefully migrate the traffic off of the legacy selective routers connecting them to the NGCS locations and then migrate the carriers onto the NGCS POIs. Another strategy would be to move carriers and have them set up an established and cut a carrier at a time. So that's still all being worked out as part of the implementation phase, how that's going to occur. And once all the carriers are migrated, well actually, go live will actually be when the PSAPs get their traffic, but once all carriers are migrated we do have a timeline of six months to have carriers migrated off the legacy selected routers. We want to make sure we are not incurring old legacy costs versus the new NG911 costs. So, the carrier migration needs to occur within six months of a PSAP migration to the NG911 solution. Next slide please.

Here is a look at our plans from a region and planning across the state. We looked at Northern Tier, we looked at WestCORE region and we're going to work west to east from a planning perspective. These are just target completion dates at very early stages of this project. But, the one thing we wanted to do was work in tandem. We have multiple sets of legacy selective routers across the state today. We wanted to try and work in a region where we have shared CHE solutions, where we have regional networks in place to do those migrations. So, Northern Tier, because of their already existing network with Zeto Media and the integration of that into the state network, seemed like a logical place to start along with Region 13, or the south WestCORE region in the southwestern portion of the state because they already have an established regional network. Starting there, knowing that their own similar tandem pairs or some of the counties share tandems, we have two different sets of tandems in those regions, we will migrate those first and then continue to move west to the east across the state. Now as I have already talked some shifting and moving of counties, that's all built as part of this process but this is the deployment strategy. We'll focus in a region, focus in tandem pairs, and try and migrate the counties off of a tandem pairs as quickly as we possibly can to reduce the cost of legacy costs versus the NG911 costs so we're not paying duplicate charges.

With that, I will open up the floor to any questions.

All right, thank you to both of our presenters. Here on the screen they have provided some contact information. And, just like before, we have two ways for you to ask questions. And, Sheila, I believe we do have someone who has their hand raised. I will go ahead and turned it over to you to go through our questions.

Thank you, Sherri. Our first question is asking, is the fiber network being built or contracted from other existing providers?

So the, there is, primarily Zeto Media is the network provider today and we're going to leverage the majority of their network in place, but we do have to build roughly 400 miles of fiber to complete this statewide ESInet. Bill, you want to add anything on to that?

No, I mean, we are leveraging existing facilities that Zeto has in place today. Where they don't have facilities and we need to get connectivity to the PSAPs, one

thing I didn't mention that I'll speak to here is, one of the requirements is dual diverse redundant connections to every PSAP in the Commonwealth. We wanted to ensure that we had dual redundant connections. We did not want a single point of failure for any PSAP throughout this service. So if they had one connection already there and we need to build a second, that would be identified. As a get into these regional network assessments, where a regional network is already in place, we'll do an assessment there to see if that regional network is meeting the statewide requirements of the network that we're expecting there. And then we'll talk and work with the regions and the county to move forward with any plans of enhancements that may be needed for their county or their region.

Thank you.

Another thing I want to mention about those builds, Jeff and I mentioned about the 400 miles of fiber builds, we will leverage whatever Zeto has in the network as a backbone, build whatever we need to make connectivities that they don't have fiber today. With those builds, we also have IRUs available that could be used for other Commonwealth agencies. So there will be something, that if we didn't have fiber to a certain location, other state agencies may be able to utilize the fibers that have been put in place to leverage additional services from the Commonwealth's perspective.

The attendee who has raised their hand, we have unmuted your phone line. If you would like to ask your question, please go ahead. >> I show that she is self-muted. Yes, thanks Sheila.

Alright, we will try a little bit later to come back to her. In the meantime we do have several more questions. Will the state of Pennsylvania conduct any procurements for CAD RMS systems? And the second part of the question asks, Does statewide contracts that the local - are there statewide contracts that the locals could piggyback on?

So as of now for systems such as CAD, CHE etc. they're not statewide contracts but that's something that we would like to migrate in the future. This NextGen efforts definitely taken up a lot of our time but we definitely want to evolve to have to statewide contracts for CAD, CHE and other systems that our county partners can leverage.

The next question, to clarify, Pennsylvania has multiple regional ESInets as opposed to one statewide ESInet? So I will let you answer that question and then there is a second part.

Okay, so I guess the easiest way to explain it, will be that we're going to have a statewide ESInet, but as part of that we're going to be leveraging some of the regional ESInets in place today to form a comprehensive single solution. So for example, in some regions the statewide ESInet's going to go all the way to the PSAP. But in other regions, such as the WestCORE region, we're going to connect to it a couple touch points on that regional network.

So, the second part was asking, what does Pennsylvania feel is the benefit of having multiple ESInets and is there more costs involved as opposed to operating one ESInet?

Bill, do you want to try to tackle that, or do you want me to take it?

The, one of the benefits and one of the reasons we did this regionally, and to piggyback on the previous question, if you think of it as a ring of rings. So while we're going to connect every region -- if you look and think of the map and the multiple regions that were deployed there -- if we put every region into a ring

arrangement, and that would be the regional network, whether it's part of the statewide contract or an independent regional network maintained by another provider, those rings will be established and then we would use the statewide ESInet to connect all of - each region rings at multiple points of connection at diverse redundant points of connection in every region. So it's a ring architecture. So if you think of a statewide ring, everyone will be connected to that statewide ring. It may be all the way out to the PSAP, it may be regionally at multiple points of inter-connect. So from that perspective, the benefit is, you know if we have a failure in a region, it can be isolated to the region, not to - across - the state.

And just from a cost perspective. Yes, there will be additional cost to maintain a separate regional ESInet and that's something that we have to keep in mind as part of the contract. But our counties and regions have built those capabilities up and they'd like to keep those networks in place. And so it's just a cost of our statewide solution and that is how we look at it.

All right. Thank you gentlemen, and thank you to all five of our speakers today.

This concludes today's webinar, and we appreciate everyone's participation. I know we had a lot of questions both for the gentlemen from PEMA, as well as our NIOC presenters, that we did not get a chance to answer on the webinar. We will capture those questions, provide them to our speakers and post the answers when we post the recording of the webinar. An archived version of today's webinar will be available in the near future on 911.gov. And, as a reminder, our next webinar is scheduled for Tuesday, May 11th, at noon Eastern time. And we hope that you will all be able to join us. With that, I'd like to thank you all and hope you have a great rest of your Tuesday.

[Event concluded]