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Transcript

Public Safety Advisory Committee Meeting, San Diego, CA, June 1, 2015

Part 1 – Public Safety Advisory Committee Public Meeting

HARLIN MCEWEN: Welcome to all those people that are here in person and to those people that are viewing out in the outer limits of the world. And we appreciate your all coming here or being interested in the activities of the Public Safety Advisory Committee. This is somewhat of a historic event because, for the first time, we have opened a portion of the Public Safety Advisory Committee.

As you know, our chairman, Sue Swenson, has really brought transparency to the FirstNet process. She's opened the FirstNet Board meetings and the committee meetings to participation by the public and by viewing on the Web. And in the furtherance of that, we've tried to figure out a way to allow for the Public Safety Advisory Committee to have the kind of confidential interaction with the staff and the members of the team that we need to have that may be somewhat sensitive, and yet allow for a certain amount of topics to be shared with the public. And so for those of you that have just joined the meeting, in the back, that aren't a part of the staff, we welcome you and we appreciate the fact that you're showing your interest.

We're going to have four prepared presentations this afternoon, two of which are totally new to the PSAC. These are presentations by the chairman of the Tribal Working Group of the PSAC, and the chairman of the Early Builder Working Group of the PSAC. Both of those presentations will give you an update of what they're doing. I think that's important for both the public and the members of the PSAC to see that, and rather than duplicate that, we're doing that in the open part of the meeting.

In addition to that, we're going to be presenting to the public and to the PSAC a summary of what are the current tasks that the PSAC is engaged in with the FirstNet staff, and so you'll get three additional presentations this afternoon that will give you a sense of the breadth of the engagement of the PSAC. I have to say that it's taken, you know, a while for TJ and the team to get staff up to speed and hire enough people so that they can become really fully engaged with the PSAC, but it's really working very well now, very well organized TJ, and I appreciate that. I appreciate Jeff Bratcher and his team out in Boulder, the Chief Technology Officer's office, and we're fully engaged now with ongoing discussions with both the people in Boulder and the people in Reston. And it's really working out in a wonderful way. You'll see some of that work and some of what we're talking about here this afternoon.

So first, I'd like to call upon Richard Broncheau, who is our PSAC member representing the tribal community. He represents the [loud noise] -- yes, yes, he does. He represents the tribal interests in this, and he's going to report on the activities of the Tribal Working Group. Richard?

RICHARD BRANCHEAU: Good afternoon.

HARLIN MCEWEN: [laughter] Touchy.

RICHARD BRONCHEAU: I wasn't sure if that was me or my phone or what that might be. I'm Richard Broncheau, and I -- what is this for? Oh, yeah, thank you. Can I hand it over there? I represent the National Congress of American Indians, and I am currently, like Harlin said, I'm the Chair of the Tribal Workgroup, and, we can call that the TWG; that's what we call it, TWG.

On November 4th, 2013, 18 tribal representatives and Indian Country professionals had a meeting on the issue of states and tribes in relation to the nationwide public safety broadband network. The group came up with some advice to FirstNet on tribal engagement strategies including the establishment of a tribal workgroup, and that's the group that I'm chairing now. I don't know what that is? I'll let him do it. I have bifocals and they don't seem to work right here, so I had to take those off.

The initial task of the Tribal Workgroup was to provide advice to FirstNet on the topics of tribal outreach and education and inclusive strategies to include the fullest participation by tribal nations, Alaska Native Villages, and Oklahoma tribes in the nationwide public safety broadband network. The Tribal Workgroup had four meetings so far this year. On January 23, we had our first teleconference kick-off meeting. On February 22, we had an in-person meeting in Washington, D.C. for those who could make the trip. D.C. was iced over at the time, so some of us couldn't make it. But at that meeting, the group developed some initial recommendations for FirstNet.

On March 3, we had another teleconference where we shored up the recommendations and prepared a few items for this meeting. On May 5, we had a teleconference, and we focused on mostly the public comment period for different documents that are out and about, and on tribal engagement guidance for the FirstNet.

The Tribal Workgroup joined the Single Point of Contact group at a meeting in Reston, Virginia on April 15, and we hosted two sessions where the SPOCs -- the single point of contacts -- in the audience could ask the panel questions. Generally, our takeaway from the two sessions is from the different states, and their comments was that the states would appreciate it if FirstNet would provide some guidance on how to involve tribes in the nationwide public safety broadband network build out.

As it is right now, the Tribal Working Group is fully established as a working group of the PSAC. We have a commitment from our members and they're working hard to ensure full and active tribal engagement in the state consultations nationwide. Our main focus right now is to provide advice to the FirstNet in finalizing guidance, providing or promoting tribal and state engagement.

The Tribal Workgroup recognizes the challenges faced by both the tribal nations and states in observing the state consultation process established by the Middle Class Tax Relief and Job Creation Act of 2012. These challenges were heard during the April SPOC meeting, where the need to provide greater clarity for states and tribes to engage each other was underscored.

Based on the feedback heard during the SPOC meeting, the Tribal Workgroup will support FirstNet with guidance promoting tribal and state engagement to identify the needs of tribal public safety for the nationwide network through the state consultation process. In addition, we are working closely with FirstNet to design and develop a tribal outreach package to enhance tribal outreach efforts, targeted and culturally aligned outreach engagement campaign that may include videos, broadcasts, print, and social media, conference and reservation visits, and e-mail updates, developing tribal-specific orientation and training for SPOCs to support and enhance tribal engagement and participation in the consultation process as well. And that's all I have.

HARLIN MCEWEN: Oh.

RICHARD BRONCHEAU: That's all I had to do was move closer, huh?

HARLIN MCEWEN: Thank you, Richard. So let me just make a couple of comments. First of all, one of the things that would be important maybe for the group here to understand is that when we formed the Tribal Working Group we consulted with Richard and other tribal experts and made the decision that the Tribal Working Group would be made up of people who represent various regions and groups of tribes. For instance, technical working groups and things within the tribal community. The reason is it would be difficult to have -- there are over 500 tribes in the United States -- and so we decided to, you know, make up the working group of people who represent various constituents within the, to try to get the broadest possible participation as we could without having, you know, 500 people in the room. So that's kind of what Richard is doing. So I think that's very important to the success of this working group. Any comments or questions from Richard? PSAC members? Very good. Thank you, Richard.

RICHARD BRONCHEAU: Thank you.

HARLIN MCEWEN: Next is the Chairman of our Early Builder Working Group. Again, you're going to get a good historical perspective and bringing us right up to date. The Chairman is Darryl Ackley from the State of New Mexico, and the Vice Chairman is Todd Early from the State of Texas. Darryl?

DARRYL ACKLEY: Thank you very much, Chief. And before I get going, I'd very much like to thank Todd Early as the Vice Chair of the Committee, who I think has done some amazing work and is instrumental to some of the presentation we'll be making today. So appreciate that and also thanks very much to Vicki Lee from FirstNet for all her support in helping us get this presentation put together.

So much as you mention, Chief, I thought I would give a little bit of historical background. Hopefully that will be helpful, both for the committee here, as well as for the folks watching online as to some of the governance and what went into this working group's formation and the work that we're doing. We did have a previous tasking that we were operating under that we completed, and then a new tasking that was delivered to us by Mr. Kennedy of FirstNet, and then want to talk a little bit about the work plan. But the meat, I think, of the presentation at the end, will be updates from each of the pilot projects that have been authorized under FirstNet. So with that, we'll jump right in.

In terms of background, the work, I think, that survives on in the Early Builder Working Group today predates the passage of the Spectrum Act and the formation of FirstNet. So, in terms of some of the folks that are involved in these efforts, this is a continuation of work that started in 2010 under the, then, Public Safety Spectrum Trust Operator Advisory Committee, which was chaired by yourself, Chief, and co-chaired by Bill Schrier from Washington State. Originally that group represented 21 waiver recipients in the public safety spectrum who were working, some under BTOP funding, to the tune of \$372 million, and some of out their own funding, to begin deployments of these networks in response to the anticipated need of public safety broadband communications and their various jurisdictions.

And there was significant work, I think, that was accomplished by that group, prior to the passage of the Spectrum Act, and for many, I think for a lot of the folks, even on this committee and some of you watching on the web, I'm sure who were solved in that, you'll remember some of the work that went into the organization and, ultimately, the assignment of the PLMNID, the 313-100 for that network, the standard numbering scheme for Public Safety Network identifiers, and generally, I think, serve to incubate some of the best practices for public safety broadband among many of the stakeholders and practitioners.

With the passage of the Spectrum Act of 2012, that changed the dynamic considerably and the formation of FirstNet and the assignment of the full 20 megahertz and 700 megahertz spectrum. In August of 2012, subsequent to that, the PSSTOAC transitioned into the Early Builders Advisory Committee under the Chairmanship of Mr. Early from Texas so that the work essentially, in terms of the best practices, the lesson learned, and basically the momentum and inertia of all the work that had gone into Public Safety Broadband's communications could be maintained through the transition to FirstNet. That work was graciously supported by the folks at the Office of Emergency Communications at DHS, and eventually, you know, the license itself for that spectrum was transferred from the PSSTOAC to FirstNet so that they could begin their operations.

The Early Builder Projects, of course, some of those were negotiated with FirstNet, with the Board, and with the General Manager and the staff there so that those spectrum manager lease agreements were transferred back into the central license with FirstNet and then subsequent for those projects that have been enabled to continue under the leadership of FirstNet, the Early Builders Working Group was convened as a working group of the PSAC, with, and we've already introduced ourselves.

So until recently, I mentioned both the Early Builder Advisory Committee and the Early Builders Working Group, that until recently, operated concurrently, and I'll talk a little bit more about the current state of that governance as we get into the presentation. As far as the members of the working group represented here, there are five. There's Adams County, Colorado; Los Angeles; the State of New Jersey; the State of New Mexico; and then Harris County and the State of Texas represented. So these are the five projects that are authorized essentially to continue as these early builder pilot projects under FirstNet.

And I think that it's important to understand, and you will see this in the slides later, that there are, you know, the license, the SMLAs that have been granted for these projects to continue. But, I think, the key factor in these projects having been authorized, and then in what they're doing, is, really, with respect to the key learning conditions. So the idea in the negotiations, I think, among these entities and with First Net with the Board and then with the folks there, was really identifying for each project that was going to be allowed to continue the set of conditions that would provide value to FirstNet in terms of their efforts to build out the nationwide public safety broadband network.

Oh, and I didn't advance the -- thank you. Yes. I apparently will not get my license to operate the clicker. Yeah, okay. My apologies, and to the folks watching at home, my apologies as well. So this makes a lot more sense now.

The key learning conditions -- really meant to be -- not to overlap necessarily but really be complementary, and we'll go through some of those things. And I think the other key point there was really allowing the judicious application of the residual BTOP funds that were left associated with those projects by FirstNet, you know, in terms of their mandate and, really, responsibility in terms of the RFP and the some of the statewide planning process. So now that you can actually see the map there, the blue stars represent those five members of the Early Builders Working Group.

So some historical background in terms of dates. The Working Group's first tasking came out on 11 April of 2014, which essentially gave the working groups the mandate to meet and discuss the projects and deliver back to FirstNet a final report on the Early Builder Working Group's findings. During that time, the group developed a mission statement, operating procedures and, you know, got the membership engaged. Several conference call meetings, as well as, I think, a lot of us meet at any number of occasions, things like SAFECOM, APCO, NICSWIC, other such junctures. So the team is actually a fairly tight knit community in terms of the early builders.

We did develop a standard template for our information sharing, and ultimately delivered a final recommendation in January of this year to the Chairman of the PSAC, to Chief Harlin McEwen. And in that recommendation, we basically said that the Early Builders Working Group had a tremendous value, not only terms of the formal key learning conditions that FirstNet had asked us to report on, but also in terms of the informal, we called them the "informal" key learning conditions, the things that we traded with each other on the conference calls, and so forth. So we did request that the Chief make the recommendation to FirstNet that this group be allowed to continue, which we were given that authorization.

So moving right along then, in that regard -- there we go. So our current -- the Early Builders Working group is currently tasked through 31 March of 2016, with the following task: holding a monthly working group call; providing written deliverables on each of our project's key learning conditions, formal and informal, and coordinating those reports through the CTO office of FirstNet, providing advice on any topics as requested by the PSAC or by FirstNet on the virtue of the work that we're doing on those projects; and to provide quarterly updates to the PSAC, which then will go to FirstNet for consideration. So today, we're entering the first such presentation to this group, in that regard.

Most recently, we met in May with several important outcomes. We determined, for one, there was a lot of reporting requirements, especially for those groups that have BTOP funding through NTIA on the reporting that they have to do as far as the expenditures of those money, and rather than duplicate any of that reporting, I think we agreed with the OCTO that we could utilize that reporting as much as possible. FirstNet's also developing the evaluation plan per the GAO recommendation for the formal key learning conditions that will be reported by these groups, and, you know, with the continued support of the FirstNet staff, who have really been great, we'll be able to take those informal key learning conditions and document those as well.

On a side note, the Early Builder Advisory Committee was also discontinued on the 21st of May 2015. And, really, the intent there, I think, is to have the work that was being done by that committee subsumed by the Early Builders Working Group in terms of moving forward. And so, you know, just take a minute, I think, to thank, again, Todd and numerous folks who participated in that activity over the years, because I think their voices, prior to FirstNet on the PSST and the OAC, a lot of these folks have really carried the torch on this to get us to the point where now we're in a room with everybody engaged on this, and then the momentum that FirstNet has, and the backing by the stakeholder communities. So I think, you know, that's a little bit of sentimentalism there, but, really, there was a tremendous amount of work accomplished, and hopefully the working group here can continue on in that spirit as we move forward.

So, that's some background in history. We'll jump right into the member updates, if that's okay. So, I think one thing that you'll notice -- I mentioned this earlier -- each of these projects is very different in certain ways. Of course, the unifying theme is public safety broadband in that 700 megahertz block. But you'll get a sense for just how, I think, compatible the key learning conditions are for each of these, as well as some of the use cases, I think, that each are intended to provide.

So Adams County, Colorado, the Adams County Communications Center is providing 700 megahertz LT public safety agencies in their jurisdiction, as well as to the DIA service area. Another intention of the program there is to have greater interconnectivity between the PSAPs in the greater Denver area, also to include local school districts and governments. The Adams County project is primarily funded through BTOP, with matching funds from local agencies.

In terms of their -- you can see at the bottom of these slides you'll see a profile for each of the locations. So, we talk about sites. These are, you know, the radio access network, essentially. Sites across their project, 16. Intention there is to use vehicular modems, dongles, handsets for tablets and cameras. About 2000 first responders intended to be served. You can see the partner agencies there, as well as the applications that they're looking to deploy.

The key learning conditions for them is really, given their proximity to PSCR in Boulder, is to serve as a real-world test bed to complement the efforts that are ongoing at the PSCR in terms of laboratory testing and then translate to how that actually works in the field. Similarly, for device beta testing, so as these various devices are deployed within their environment, how they'll work, and then demonstrations with both FirstNet and public safety stakeholders.

Update from, I think, the last time we provided a report to the PSAC in the FirstNet, the 16 sites are on air. They're looking at potential expansion sites, DIA, with one additional site. The other development there is that backhaul is now in place between the State of New Mexico and Adams County for interoperability of the core, with routing details being worked out currently. All the covered police and fire agencies -- I didn't advance the slide, did I? Somebody's going to have to throw something at me here. So, there you go.

So all the currently covered agencies are starting to install the requisite modems and then formal drive testing of their network is underway for the sites that are on the air. There have been some successful demonstrations of end-user technology that's listed there. And Adams County reports that there's been a very favorable reception by the users of that system. So there are currently 46 devices deployed to partner agencies, and the plan, again, is to roll out to around 2000. That's the original SIM allocations. So that's the work going on in Adams County.

The State of Texas, and in particular Harris County – so, and I'll trust that Mr. Early will jump in if I get anything wrong here. The Broadband Interoperable Gateway Network or Big Net-- Texas, as you can see here, was born of necessity in 2010. So Texas, really, I think the first operational site in terms of public safety broadband in this spectrum, you know, with the need obviated, really, after the loss of cellular services during some the recent hurricane disasters there.

And, really, I think these lessons learned about the need and the dependence on data communications by first responder community led to a, really, a passion there in that community to deploying these mobile data systems and getting Harris County on a path of the earliest public safety broadband deployment. And with their approval of their interoperability showing, back in August of 2012, they stood up the first band class 14 public safety licensed network in the United States. Texas is the stand up from the others and it does not have BTOP funding for this. This has been funded through DHS grant funding and, really, I think, through strong partnerships with the other governments there, the locals, municipals, etc.

So you can see the number of sites currently 15, with two more phases to go. So, ultimately, the goal to get up to 91 sites, particular devices or vehicular modems, dongles, handsets, cameras, a list of partners there that you can see, you know, if you've seen the video, the work that they're also doing with the university there, the A&M, to ensure public safety broadband coverage for first responders during stadium events and some of the other large population incidents -- I think it's pretty great -- as well as a number of applications that they're work on there.

The key learning conditions for the State of Texas is core transition to FirstNet. So as FirstNet does get the RFP out and begins to deploy the nationwide network, one of the key learning conditions for Texas is how the transition will go between the Big Net core into the FirstNet core; data analytics; defining the public safety user; and understanding the impact of public safety broadband network, both in terms of the use case applications, but also the impact of the network and the data there. Extended mode, exploring the LTE capabilities beyond a nominal 15-mile range, especially, I think, with the geography there.

I mentioned the special events, such as the stadium events, and then really training, which is a key component of the work that they're doing, that you will see in a moment is training users on how these devices, how the use of public safety broadband becomes part of the SOPs associated with their first response community.

So update for the State of Texas. The one thing that I think is awesome; the state has launched two online learning courses that are free for anybody to take there in May of 2015. One isn't just an overview. I thought I clicked it. My apologies. Okay. As the representative of the National Association of State Chief Information Officers on the PSAC --yeah, okay. One of these days, right? So the update there, so these online learning courses, I think, represent a fantastic opportunity for anyone in the public safety community to learn about what this means, and they're also providing credit for qualified students, and so the public safety, as well as the mobile data survey, which I think is a great tool. So, those are deployed and available online.

There is work on five additional sites to provide better coverage along the Interstate 45 corridor. They are working on the environmental studies for those additional sites for Phase Two; and working to obtain additional local funding for that build out. But, really, you know, as an operational entity, I think they're just working to make improvements to the way that they operate it on this network. So great work there in Texas.

Moving on to Los Angeles, California, the, I'll trust Mr. [inaudible] to keep me honest if I get anything wrong for them. So, the Los Angeles Regional Interoperable Communications System, the intent of that is to provide improved radio and broadband communication for the public safety providers of the Los Angeles regions. The project there was really split into two phases. The infrastructure for improving their LMR communications and backhaul from a data perspective and then the LTE, the public safety broadband deployment and the 700 megahertz spectrum. So their project includes, you know, in addition to the microwave and fiber optic backhaul, with the first part of that, is the actual deployment of the

eNodeBs and the physically hardened and secured EPC and cell on wheels for their LPE deployment there.

The other aspect of it, I think, is a procurement vehicle for their end users to be able to procure the devices. The funding for that project was BTOP. You can see, we talked a little bit about this this morning. Some of the negotiation back and forth that's gone on there. They're now at 84 sites, very similar to the other ones, vehicular modems, dongles, handsets, and cameras. Their first responder base there is up to 34,000 initially. I think they're looking at 19,000 that will be covered by that; 72-member agencies, which is substantial; over 4,000 square miles of highly diverse urbanized areas in some of the terrain that they have. And you can see the applications.

As far as their update, you know, the sites that I just mentioned, the breakdown there is really 67 permanent, 15 cell on wheel, and then the two backhaul sites. The authority there is continuing to work with utility providers, Department of Water and Power and Southern California Edison -- and I did it again -- to leverage the existing fiber for public safety broadband design. They're working with -- their contract has a mechanism basically, to allow for them to alert for congestion capability. However, the authority is not specifically defined how they'll be alerted under what conditions. So that's scheduled for their completion in Quarter Two of 2015.

They have negotiated compliance with the NPSTC SOR, with a few outliers, but, really, in terms of that compliance there from a public safety perspective is in place. The quality of service requirements for their system has been addressed during these discussions as well. So a lot of work there. Essentially on the way the network is going to operate in terms of things like priority and the quality of service from a public safety perspective. And then they're working to ensure that those requirements are tested during acceptance testing progress.

I'll go right back because I did skip over their key learning conditions. The interaction with the utility and secondary responder agencies, so understanding how that works, both from a technical perspective and, I think, also from a governance perspective, the congestion impacts and the quality of service that I was just updating on and the preemption requirements to drive technical standards development, and after this morning's presentations, where I know we spoke quite a bit about some of the work that's going into that from the PSAC writ large, you can see how very easily how these will tie directly in from a formal perspective. But also the validation of those priority and QOS requirements. So I think a point there to make is that when we talk about the governance and the technical requirements that go into how FirstNet will operate and move forward, the value just in having, you know, having projects like this that will have tested those things out and borne them out, hopefully, will be valuable.

Moving on to, all the way across the country, to our friends in New Jersey. New is Jersey Net. So Jersey is implementing a deployable network almost entirely cell on wheel system, and throughout the state, so there's currently a proof of concept implementation in three locations there -- the Route 21 corridor in north central New Jersey, Camden in southern New Jersey, and then Atlantic City on the Jersey Shore. The New Jersey project was funded by BTOP funds. Their key learning conditions: demonstration and documentation of the use and capabilities of rapidly deployable assets, the understanding of how to conduct emergency management exercises that showcase the virtue of a deployable system like that, and the deployment of a network operations center, notifications approached so that they can understand how to best manage and operate that network and in that regard.

So you can see the approximate number of deployables there: 14, 9, and 7 in the three regions that I mention, respectively. Their current device profile, vehicular routers, and handhelds. You can see a number of partners there. I know Mr. Scalera from New Jersey is quite dynamic in terms of reaching out across the different jurisdictions in the state to get buy-in and to get folks excited about this. And you can see the apps that they've looked there -- video mutual link, license plate readers, etc.

An update on the State of New Jersey. The team continues to execute well. They're targeting operations of the network in September of 2015. They've got custom-developed cell on wheels, and I can't remember-- System on Wheels -- thank you Mr. Kennedy -- that have arrived in state, so their working

groups are established to support all of the aspects of their key learning conditions. They have had some challenges in terms of their microwave design, you know, for backhaul for these deployable systems. But they've been able to be nimble with their modifications to that system to keep it moving, and then seven of those incremental deployable assets are going to be reserved for training, and then the emergency response activities that I mentioned as part of their key learning conditions. So that's the State of New Jersey.

Moving on to the other new state, and in full disclosure, I am a citizen of the State of New Mexico. I need to move forward, and there we go. That's unrelated to my citizenship. That's the slides. The Statewide Interoperable Radio Communication Internet Transport System and Circuits, very similar to LA RICs is a two-part project, BTOP-funded, that was intended to upgrade digital microwave infrastructure across the state and have backhaul upgraded. And then the second phase of that, to do a public safety deployment in LTE.

So, the idea behind that is to evaluate the public safety broadband in the complex multijurisdictional landscape on the national border. The State of New Mexico has BTOP funding for that project, and the key learning conditions, as you can see listed there, evaluate the use of an evolved packet core located remotely. Originally this was going to be the Harris County deployment, but based on some technical issues, that's now in Adams County. The spectrum management and issues associated with the operation of a network on an international border, you know, so the United States/Mexico boarder and understanding how that might impact operations for any of those southwest border states, as well as the understanding of the use of a shared network with local, state, tribal, and federal users. So New Mexico with their seven sites. Our seven sites. Same basic device profile.

You can see some of the federal partner agencies there. The Interior, Customs and Border Protection, Defense Department, and then a number of state and local entities that we're collaborating with there. Applications, I think, very similar to the other four that we've talked about. So, in the great State of Nuevo Mexico, we've selected our vendor for the equipment. We're in the final stages of the design for that, which are due soon this month. We have the site surveys completed for our radio access network and digital microwave backhaul for the deployment. We have the initial delivery of equipment underway, with many of the components of those systems arriving by mid-June. And if all goes well, on the 23rd of June, we'll begin the first radio access network installation.

So, another aspect of our project has been the many MOUs among the state -- I didn't -- did I advance it? Yeah, ok -- between New Mexico and Adams County for one, on the backhaul, but also with many of our partner agencies.

So, with that, I think that I'm done with an update. And I'll just -- I don't know if Mr. Early wants to say any words as the Vice Chair, but we certainly appreciate the opportunity to continue on with these pilot projects from FirstNet and hope that we will be able to provide a lot of very valuable information about how we can move this forward. So, thank you.

HARLIN MCEWEN: PSAC members, any comments or questions? Very good, Darryl. Thank you very much. We appreciate that. So, again, these are the reports to the PSAC. There are two working groups. And for those from the public, this is the first time we've had those reports to date.

Next, we're going to talk about the three tasks that we're currently engaged in. The first task is the user device task. So what we've done is we've created two task teams, and we assigned the third task, which is the first presentation on user devices, to the Executive Committee, mainly because the, so many people on the PSAC were engaged in the other two tasks concurrently. We just felt it was too much to expect of them in a short term. So, but we had a full discussion of that earlier today, and you're going to get an overview of that from Dave Marutiak. Dave?

AV TECH: [Inaudible].

HARLIN MCEWEN: Go over there and use the mic over there.

DAVE MARUTIAK: Does that clicker work?

AV TECH: [Inaudible].

DAVE MARUTIAK: Thank you very much.

AV TECH: Do you have better luck with that?

UNIDENTIFIED: [Inaudible/laughter].

DAVE MARUTIAK: Thank you, Harlin. As Harlin mentions, our task group from the device organization within the CTO organization has been working directly with the EC to answer a lot of questions and do some inquiries and some technical investigations regarding key elements of the device ecosystem. Now, one of the biggest changes that first responders are going to see with the network is the device that they hold in the hands and the way they use it and the feature and applications it supports. So the device team is very curious about some of the use cases, some the capability sets, and some of the evolution of the technology that first responders are going to expect from the device in the marketplace. And that's really the focus for the inquiry that we're about to show you.

So, the goals are basically to go through some of the design decisions, some field information, some background from actual usage characteristics, and verify some the design assumptions that the team has been making over the last couple of years. As many of you are aware, we released the original RFI for the device ecosystem back in 2013, and, of course, devices evolve very rapidly, so the industry has continued to move along. Public safety users have continued to move along, and we want to do some of these investigations to make sure that we track that information as we prepare the relevant areas in the RFP. And as you've seen in some of these cases, also in the draft RFP.

The approach is fairly simple. The device team basically briefs the EC. The Executive Committee then responds to ten questions, and we'll show you an example of what that approach looks like. Essentially, on each subsequent visit then, they respond to the questions from the last visit, and we brief them on a new technical issue.

So, the initial one we chose was the mobile communications unit. Now the MCU is outlined in three different parts of the draft RFP, and it's been with us since Day One. The original board meeting actually featured a concept, wasn't using the terminology MCU at the time. It was called a sky bridge at the time. But it was also in the initial notice of inquiry that went out. And we got comments back from the industry on it. It was then replicated in the device RFI. And it also showed up in the deployables RFI that was issued later, in 2013.

Terminology has changed to be the MCU, but the concept is still very much the same. The concept is simply, a mobile unit that's built into the vehicle, and the first responder shows up with that vehicle and mobile connectivity at the same time. So, when we brief the PSAC EC here, we go through what we call the "Users Needs Statement", and I'll show you a little briefing on what some of that looks like. We follow that with technology elements and I'll give you a sample for the kinds of technology elements that we anticipate being in an MCU, and the various options and features associated with them. And then also, alternative solutions. The MCU, as you will see, is kind of also a coverage element, a range extension, if you would. It's part device and it's part network.

We work very closely with our network and our RAN engineering people to make sure that this concept of an MCU can be used both for planning the network, but also as an individual element for the person in the vehicle. And then, we go through some of the timing and cost estimates, our best guess kinds of things, just to inform the EC. And finally we present them with top-ten-questions list. Since David Letterman is no longer using it, we thought we'd usurp it. So here is a high-level need statement.

If you look at the deployable space -- and some of these have already been introduced from the BTOP discussion earlier -- COWs, and SOWs, and COLTs. They're very slow to roll out but they have a high capacity. They're great for high-coverage areas as well too, but, again you have to call for them. They have to be driven to a site. They have to be turned on, set up, and all those kinds of things, which means it takes hours, and sometimes even longer, to prepare one of them, get them out there, and give coverage. So when it comes to the 95 percent of the incidents that are very small incidents and only need a few people to respond to them, they're inappropriate deployables.

Simultaneously, at the very low end, if you're totally off the network, most people in this room are familiar with land mobile radio's capability for direct mode -- for two handsets to talk without a network being capable. In between those two is the space that we call the MCU space, and essentially the MCU allows you to grow your communication capability as the incident itself grows. So, it's not just a matter of direct mode between a few handsets, but you can actually put a local kind of feel to a cell site communication there based on the MCU, and so that if more people show up or if they show up from different jurisdictions or you have to cover more territory, the vehicle power system and the capabilities of the MCU can extend to be much larger than a direct mode capability is anticipated. Two key elements of that is fast response, meaning it's there as soon as the first responder drives there. They don't have to call for it. They don't have to unpack it. It's built into the vehicle.

And secondly, it's there immediately. And that means when they come across an incident, if they've driven off of the terrestrial network, and they need some kind of coverage, that MCU is already in their vehicle, and to the extent that industry can fulfill the concept, that MCU kind of turns on automatically and configures automatically, so that the first responder can concentrate on the incident and not the technology.

Now, here are six different elements that may or may not be in a given MCU, depending on what the technology provider wants to build into that MCU. One of the baselines is our old standard in-vehicle router. When the MCU is on net, the IVR is going to act like it would with every other IVR in a vehicle. It's a set of modems with some software to hunt between the modems and maybe do some VPN and some security kind of things. It obviously has satellite backhaul from the beginning of the concept, it's actually had the ability to do some kind of satellite connectivity so you can get further out than the terrestrial network can take you and essentially still guarantee that you can talk back to the FirstNet core.

Now there's a lot of new technologies that enable that, and there's a lot of new satellite pricing that enables that, and we're interested to see what the proposers and offerors come up with as part of the RFP process in those two spaces. But the key things about satellite technology, are satellite antenna technology nowadays, is physical installation is improving. They're getting smaller. They're getting easier to use, and they're being made from different types of material, so they're a lot more facile when it comes to finding satellites and tracking satellites.

At the heart of it is also, of course, this concept of being able to talk to the regular handset. So that means an implication that there's a version of a local eNodeB in the device as well, too. And at the bottom bullet here, you see that the idea from the concept is that everybody around this vehicle uses their standard FirstNet handset. They don't switch to Wi-Fi. They don't have to switch to another frequency.

This vehicle kind of extends the network in a range basis, and ostensibly could cover the 30 percent of America that commercial carriers don't cover today. And allow this first responder to have connectivity not only for their own phone, but for other people that show up with a phone and need to talk to each other in the incident site. That may also require some kind of local EPC elements, some kind of intelligence in the vehicle, that also allows these handsets to act like that local network and to exchange information, but also to be able to have higher level of capabilities, whether that be multi-tasking video or the ability to take care of provisioning and local control equivalency, or priority and preemption functionality around the MCU unit. One more. There we go.

If you put that on a block diagram, we've shown here that some of these obviously are optional. And, in fact, what you see in blue is essentially the standard IVR configuration--rooftop antennas, some modems,

and the ability to talk to different elements within the vehicle, either over Wi-Fi or over Ethernet inside the vehicle. The optional ones that we described earlier are the satellite modem, the satellite rooftop antenna, the local EPC functionality, and the potential for the LTE femto cell. We're just using that term loosely here. We don't need to necessarily dictate a particular design element. But put into this kind of architecture there, we think the MCU, whether it's one element that does everything or a family full of elements from small, medium, to large, that fulfills these kinds of needs, really is a critical missing piece, if you would, of the public safety mobile environment today.

Now, I mentioned that there are alternatives out there, and these are also the kinds of things that we do in this dialogue with PSAC EC. And three of them are listed here. This is not meant to be a complete or exhaustive set. Obviously, if you have a high-power user equipment, it also extends the range of the network. If you have range extension relay nodes, or if you have direct nodes and you're running without this extra element, all of these can meet some of these needs, and we're looking for creativity that says some of these are appropriate in case A, others in case B, others perhaps in case C. Or pricing and feature tradeoffs are important when you go from one of these alternatives to the other. And that's also part of the dialogue we're having with the PSAC EC.

FEMALE SPEAKER (off-camera): Inaudible

DAVE MARUTIAK: Okay. Oh, no. This is a description for background. When we use the term ecosystem, this is just a definition of all the other things besides a handheld device that might be considered in the user equipment ecosystem. These are familiar to everybody I imagine that's in the area here, from whether that's mobile device management or programs around device options and recycling options and installation issues and things like that. That might be future discussions that we have under the same task with the EC. There we go.

UNIDENTIFIED: [Inaudible].

DAVE MARUTIAK: Oh, yeah, yeah, it's good point, too. MCUs are frequently used to fill rural areas, but they're also used in areas that are wilderness. And they're also not necessarily just a driven vehicle; they can be something that somebody uses in an airplane or a boat to coverage areas where the terrestrial network doesn't reach. Go ahead, Tom.

TOM SORLEY: So, from being in a large metropolitan area, do you envision MCUs as the ability to maybe provide in-building coverage or not? I mean that's one of the things we all worry about, from my area, is how do I get inside all these big buildings and how big a network do I have to build, and can I afford it? So I'm just curious if part of this would be envisioning an MCU that might help in an urban area.

DAVE MARUTIAK: Well it's not a primary use of the MCU, because the urban area causes a lot of interference issues with the terrestrial network around it. And it's also an area for investigation, by the way, when we do the feature tradeoffs, as well as the functionality, whether the interference with the rest of the network is a problem and whether the MCU can operate in all those environments that we'd like it to be in. Certainly, in an area where it's free of the terrestrial network, yeah, your proximity to the building and the ability to park close to the building will definitely improve in-building coverage, and the mere fact that you have connectivity back to the terrestrial network enhances all the things you could do compared to something like a direct mode [inaudible].

HARLIN MCEWEN: So, Dave, let's just extend that discussion one minute. So, clearly, if we, we probably should have further discussion about how to, you know, create one version of that, that is more susceptible to use in an urban area, where you could give improved in-building coverage, because I think that is a big, big concern, and certainly I'm sure you would agree that could be done as one of the options, as opposed to out in a rural area, where that isn't necessary, right?

DAVE MARUTIAK: I agree, there are other technologies as well that address that whole issue.

HARLIN MCEWEN: Sure. You could put into that.

DAVE MARUTIAK: Then the tradeoff with the other technologies is a bit different.

HARLIN MCEWEN: Yeah, definitely. Good point, Tom. Good. Any questions from the PSAC? Any concerns? Very good. Thanks, Dave.

DAVE MARUTIAK: You're welcome.

HARLIN MCEWEN: So, that's the first task that the PSAC has been engaged in. The second task is quality of service, priority and preemption, and we've set up a task team of PSAC members who have been engaged now since April with the FirstNet staff, including a number of phone calls and an in-person meeting in Boulder, with the technical team in April. And to report on that, we have the chairman of the task team, Barry Fraser, and FirstNet staff, Brian Kassa, and PSCR representative Tracey McElvaney. So we'll start with Barry.

BARRY FRASER: Okay, thanks, Chief. I'm Barry Fraser. I represent NATOA on the PSAC, and I'm happy to have the opportunity today to talk a little bit about quality of service, priority and preemption, and the framework we've been working on.

First, I've got to say, the task team has had the real opportunity to talk or to work with some really smart and really experienced folks from PSCR and from FirstNet, and we have learned a lot about the technical details and the operations of the quality of service, priority and preemption technology behind this. I keep hoping some of this smarts will rub off on me by associating myself with these really brilliant engineers we're working with. But I want to acknowledge them and that they really kind of made all this work.

I'm going to spend just a couple minutes talking about our process and methodology that we've gone through with the task team, and then I will turn it over to Brian to talk about more of the substance of the framework. And I don't have a clicker.

OFF-CAMERA: Brian's got it.

BARRY FRASIER: Okay, could you -- thanks.

So let me just start by saying that the 3GPP release that we're working with for LTE offers a large number of technical tools to manage quality of service, and there are many ways to utilize these tools. So there are many different combinations of framework that we could look at to make all of this work. And that's a good thing, because public safety has a diverse number of practices, a lot of different disciplines. A lot of different agencies will be using this network and we have to share this network, so there will be some complexity from both sides of this. And so, the point, I guess, that we have here is that this is going to be a complex task. And there's no one-size-fits-all solution, where there are a number of different ways of looking at this. So part of what we've been doing is looking at the many different ways we can utilize the technology. Next slide.

So, with this complexity, the task force was asked to develop a framework for QPP to help these engineers that are making this happen, apply to the various tools to our public safety day-to-day operations, and during major incidents that we have to respond to. This framework won't answer all the potential questions. It won't work in every situation. But we want to design something that's going to cover most of the identifiable situations that we can make it work. And for those very small times when the QOS solution doesn't work, we know that we will have to have some type of manual override or local control to intervene. But we want to minimize the number of times that that happens.

And, you know, basically, we have to develop something that's pretty much seamless and invisible to the law enforcement, the firefighters, the EMS folks that are going to be using this network. But at the same time, it's got to have the full functionality that's available within LTE QOS, and it's got to work. It's got to be flexible enough to work from the smallest volunteer fire department to the most sophisticated law enforcement agencies. So, next slide, please.

I just want to quickly identify the task force, the members of the task force that worked on this. I'm going to mention their names, so if you give me just a little bit of time, I think it's important because everybody has really contributed to this effort. Captain Chris Lombard, Brent Lee, Chief Gary McCarraher, Chief Harlin McEwen, Captain Mike Worrell, Phil Mann, Tom Sorley, Michael Varney, Trey Forgety, Mel Maier, and Mark Ryckman. And, again, I want to thank you all for the contributions that you've made to this, and the time and effort that you've put into it. Next slide, please.

So, very briefly, this is sort of the methodology we employed so far with this task. We first began by developing a fairly large number of what we call "usage scenarios", and this is basically a long list of ways that we came up with that public safety would use the network. And a lot of different applications, a lot of different uses, everything from video to data to messaging to 911 applications. We tried to come up with as many different uses of the network as we could, because that's how we're going to figure out the capacity and how much bandwidth, essentially, all of these uses are going to take when we're in the operations. Then we took those and we next tried to develop a list of incident scenarios.

In other words, from day-to-day scenarios, to medium-sized, to planned large-scale events to unplanned large-scale events, and we developed a list of these types of scenarios that would allow us to plug the usage into the scenario. Then we developed what we called a "QPP worksheet", and we actually had some help from NPSTC from this. NPSTC gave us a very good presentation to help us work with this task and to actually identify several different attributes that we should collect in order to develop the prioritization that we would need to make this work.

And Brian will talk a little bit more about this in just a minute. We then developed in a meeting, a day-long meeting in Boulder, Colorado, we did a tabletop exercise where we tried to plug in the usages into the incident scenarios to develop some ideas of how the network would perform based on a various, variety of different incidents and a variety of different usages by the first responders in those incidents. And that's where we are pretty much here today. We have developed an initial framework. We have, I think, more work to do. We need to add, run additional scenarios, and continue to test it, and continue to flesh it out and development it.

But, I think, what I'll do there is stop and have Brian come on now and talk about some of the – well, some of the details of the scenarios. The next slide is simply a timeline of the things that we have done. Harlin, I think, talked about the conference calls and the in-person meetings that we've conducted. So, Brian, I'll turn over to you now.

BRIAN KASSA: All right, thank you, Barry. You've actually keyed it up, and I'm going to keep everybody waiting. We're going to go into depth on the actual framework that was developed from this exercise, and we're actually going to do it during Tracey McElvaney's presentation on Wednesday. So, I believe that's Wednesday afternoon. But, I just wanted to say that the task team was wonderful to work with.

It is always fun when you put public safety operational people and LTE engineers in the room together and kind of see what comes out. We each have our own disciplines, but, I think, one of the most enjoyable experiences in my time at FirstNet was that face-to-face meeting that we had there in Boulder. So I just wanted to thank you guys for your help on this. I think we're going to continue working on it and, like I said, we'll go deep into the details on Wednesday. Thank you.

HARLIN MCEWEN: Thank you, Barry and Brian, and Tracey is here, and, of course, they've done a really good job in preparing a more detailed presentation. For those of you that will be here during the PSCR Wednesday afternoon, I think you'll enjoy that. We really believe that we made great progress in the discussion of this topic, and it is probably one of the more important topics, because it is the thing that we haven't been able to accomplish through commercial networks, and that we intend to manage in this new FirstNet network. So it's very important for everybody to understand exactly what we're talking about and to provide us -- for those of you who were here in the public domain -- to provide us as much feedback as possible after that presentation. So, any comments from the PSAC?

UNIDENTIFIED MALE: Harlin, Is there going to be time during your meeting for comments from those attending, question-and-answer, or time when you can fill in a lot of their questions they might have on Wednesday afternoon?

BRIAN KASSA: Definitely. We're really looking for a very interactive discussion. As interactive as we can be with 500 people in the room.

TRACEY MCELVANEY: We'll have the last presentation of the day on Wednesday. There will be plenty of time to answer questions within the time allotted. We're going to stay after, as long as it takes... [Inaudible].

UNIDENTIFIED MALE: Great. Yeah, I think that's apparent, so I wanted to clarify that. Thanks.

TJ KENNEDY: For those who are online, just wanted to restate what Tracey said from the audience, is that he's willing to stay all night Wednesday to answer questions. One other comment, just to make, Chief, is I think it's terrific the work that Barry and all the volunteers in the PSAC have done over the past few months, working with the FirstNet technical team and the PSCR team, and this type of digging into such critical issues, this priority and preemption, is vital to FirstNet success and to making both the actual deployment model and the financial model and the actual network serve the needs of public safety. So, such an important topic, a lot of great interaction between the technical team and the task team to make this work, and I'm just really glad to see that engagement with the PSAC. It's been very, very fruitful.

HARLIN MCEWEN: Good. Thank you. Very good. Our next presentation is on the Public Safety Grade Task Team, and, again, a number of members of the PSAC have volunteered to participate. I gave the whip to Captain Chris Lombard from the Seattle Fire Department to manage this group. He's done a pretty good job, and so he'll make the presentation assisted by Pat Schwinghammer. Captain?

CHRISTOPHER LOMBARD: Thanks, Harlin. So one of the other focus areas as TJ was saying that we've really started to dig in on is public safety grade. And we can't emphasize enough that, with the help of the FirstNet staff, none of these areas are operating in a vacuum, that they're all interrelated, and we just talked about the public safety quality of service that is going part and parcel with the actual infrastructure itself and how the infrastructure will prioritize based on the people and whatnot. This effort is very daunting. It's a very big effort, but it's well underway.

We'd like to just pay some special dues to some groups, NPSTC, specifically, that kind of launched this effort on their own and brought a lot of the work to us as far as determining what public safety grade is and what ought to be included.

So, the focus on it is kind of two key areas there as far as what we mean when we're talking about the public safety grade. We're talking about the hardness of the infrastructure itself, you know, whether a building should be determined to be bombproof or how stout it should be. But we're also talking about the connectivity, that those can't operate independently of each other, that, so I have an island and it's all protected and everything like that, but until I can reach back to other data sources, to other users, both have to be treated the same way.

We've been able to do this by working through some of the experts on the Board. If you want to click to the next slide, again, kudos to all these folks for the time and the effort that they put in, and their valuable input. So with that, Pat, you want to talk a little bit about kind of what we were working on.

PATRICK SCHWINGHAMMER: Yes. What we've been doing is we've been looking at hardening as more of on a coverage basis, on a one-mile-by-one-mile square basis instead of a cell site. Although, hardening of cell site in the traditional ways, we're definitely going to be doing that. And we're also going to be hardening and making the network more resilient through a disaster response strategy through COWs and SOWs that was described a little bit earlier.

And then also, we're doing -- it's in LTE you can move coverage around by priority preemption. And the more secondary use you have, you can move things around. We'll touch on that a little bit, as well. But, first, we need to define what areas actually require hardening the most.

Right now, where we're at now, there's going to be three basic work areas that we're going down. The first is defining what critical infrastructure is, the infrastructure mapping, and critical area. We basically have that done right now, and in initial format. Then, after that is what do we do with that information, because what is hardened -- how we harden a coverage in New Orleans is going to be a little different than in Seattle or in other areas because of flooding or because of different type of weather events that can happen in each area. And so, we're going to tie all those together, and so we end up having a hardening strategy throughout the country.

CHRISTOPHER LOMBARD: The way that we started the effort was by looking at all the different databases, national, federal, the conglomeration of state, all the different databases that are available. The group, so far, has started to try to vet through some of those as far as what may be more important issues than others, you know, interstates versus state highways. Are the same? Are they equal? Are they different? You know, stadiums, would, you know, big professional sporting venues be more important, the same or less than local arenas and stuff? Having the discussions as far as pros, cons, what the differences are and what ought to be included, we've tried to narrow down, or we started the process of narrowing down all of these different, hundreds, literally, of databases, and then actually even applying some filters on these databases as far as, okay, so say we have a set that shows us all the hospitals in the United States. Do we just throw them all in lump sum or should we set some limits as far as X number of beds and that and above should be at that hardening threshold? Then what are those thresholds? And trying to come up with some justification. So what you see on this slide here is just kind of an example of some of those discussions as far as maybe what should be included, why, and whatnot.

PATRICK SCHWINGHAMMER: So, not only do we include that, but in every square mile of the United States -- there is three-million square miles in the United States. How each one of these layers is incorporated with the other? So what we'll have is all the hospitals and areas with more hospitals would need to be hardened more. With that, we're also having to put weighting on each one, and have a priority tiering. That's all in its initial stages right now. But the 21 layers that we are using to our initial objectives for hardening are defined here: communications, education, emergency services, energy, government, levies, public health, public venues, transportation, air and ground, and water.

CHRISTOPHER LOMBARD: And, again, there are discussions within each one of these, too, as far as that all public venues or, again, what are the thresholds in trying to come up with a justifications explanation. The other thing that we'll put on here is that, you know, none of this is set in stone by any means, that if we find, you know, looking through history and after action reports and all of this that, you know what, on the second look, my gosh, some of these things, it turns out that these seem to have more incidents associated with them than others, that will be part of the discussion into the system, into the hardening.

Again, I kind of alluded to this in the opening slides here, the differences between connectivity and coverage, and what that means in the hardening discussion. And, again, because these are all interrelated, this is also pertaining to the priority and preemption talks as well. You want to talk a little about it specifically?

PATRICK SCHWINGHAMMER: Yeah. Specifically, one of the things we've been working with the PSCR on, is modeling networks with severe outages and how we can actually maintain coverage in with -- reducing the amount of capacity on the network, and as long as we have a lot of secondary use capacity that can be preempted we can maintain coverage better than a commercial network or a traditional network. So what you're going to see in the PSCR, and I believe it's either Wednesday or Thursday, is we have several types of outages going all the way up to 75 percent. And how we can actually maintain instead of what we're normally used to in an LTE network, is when a network gets loaded, we've all experienced coverages shrinking. Well we can trade that for maintaining coverage as much as we can. And then, even if the network has a very low data rate, at least coverage is king.

CHRISTOPHER LOMBARD: Kind of what you're looking at on these two slides, the top one may be something like a specific event, say a New Years Eve or something, where you've got a 100,000 users that are all posting selfies of themselves on the network. The bottom one may be more something like Hurricane Sandy where as that came through the Northeast corridor of our country, where some sites survived, some didn't, so it was a much more random outage. And so the discussions and the debate has been, okay, given these two different types of scenarios, these two different types of outages, what are some of the better approaches that we can take on the system, on the network, to maintain connectivity and coverage through those.

PATRICK SCHWINGHAMMER: Are there questions?

HARLIN MCEWEN: Any questions or comments from the PSAC? Very good. So, the purpose of these presentations was to give you a sense of how engaged the PSAC is with the FirstNet staff. You're getting a high-level overview of what we're engaged in. Some of which will be informative to the FirstNet staff and to the Board as they make decisions going forward on the design of the network, the possible configuration of user devices, the hardening of facilities, and so on. And I think the fact that these are really, now, underway, these discussions, is very important to the successful outcome of the network.

Again, if any of you have any comments, we would welcome them. And I'm not quite sure what the format is from the public. We've set up a format for the PSAC. Vicki, how would we do that? So that would be --

VICKI LEE: I think we can just work through the consultation process.

HARLIN MCEWEN: Right.

VICKI LEE: For that, yeah.

HARLIN MCEWEN: Exactly, yeah. Good. So, if there are no other comments, those are the presentations. Let's see here. So, the only thing, I guess, we have is an open discussion, in case anybody from the PSAC has any further comments or discussion that we'd like to engage in before we adjourn. I want to -- anybody got any comments? Somebody? No?

Yeah, I'd like to acknowledge the fact that we have several Board members here. We have the Chair, Sue Swenson. She sat here patiently all day with us, and she's informed me privately that she's learned a lot from this process. We certainly appreciate her engagement. The Vice Chair next to me, Jeff Johnson.

UNIDENTIFIED: [Inaudible].

HARLIN MCEWEN: Yeah. I'm very careful in a more open meeting not to criticize the fire service. I don't know where Kevin -- Kevin must have got called out, but Kevin McGinnis, a Board member, was here with us most of the day. Governor Jim Douglas is in the back. He's been here all day, and we had two other Board members. I don't know if they're here right now, but they've been with us most of the day. Chief Chris Burbank from Salt Lake City Police Department, and Sheriff Rich Stanek from up in Hennepin County, Minneapolis. So we've had good participation. We think that their participation and attention has been very valuable to both us and to themselves, and will be helpful as the FirstNet Board continues. So I'd ask the Chair if you have any final comments?

SUSAN SWENSON: No. I'm just very pleased with the way we're working together. I think we've come a lot way in a couple of years, and, you know, we're getting into the meat of things now. We're getting into the details that are really important for the RFP, and the input from the PSAC is incredibly invaluable, so thanks to you and all the folks who work on these projects, because it will be critical to the success of the nationwide network. So thank you.

HARLIN MCEWEN: Thank you. And, Jeff.

JEFFREY JOHNSON: I just want to -- Chief, I just want to thank you and thank Sue. The two of you heard comments about, you know, there's interested parties that want to hear what the PSAC is working on. And the two of you got together and said, absolutely, you know. Sue has been all about transparency and making sure we open up as much as we can, without jeopardizing the procurement.

And, Chief, you know, you've been in the same boat essentially, saying we'll just get it as open as we can but still get our work done. So, I just want to recognize both of you for your focus on our customers and our clients and the users of this network eventually.

HARLIN MCEWEN: So thank you. These were fairly brief, and I realize that this is our first attempt in sharing some of the work of the PSAC with many of you in the room. I hope that it was helpful to you. We hope to improve the process. This is our first effort at this. We hope to improve the process as we move along and make a lot more of our work available to all of you in the public and public safety community. But I think, overall, I'm very encouraged. I think the members of the PSAC around the table will acknowledge that they feel like we're engaged now, we're being listened to. We're certainly part of the process, and that's something that's very valuable to the whole success of this network. So, without any further ado, we're adjourned. Thank you.