Transcript

FirstNet Board of Directors Webcast, Boulder, Colorado, September 13, 2017

Combined Committee Meeting

COORDINATOR: Welcome, and thank you for standing by. This call is being recorded. If you have any objections you may disconnect at this time. Participants are in a listen-only mode for the duration of today's conference. I'd like to turn it over to your host, Miss Sue Swenson, ma'am you may begin.

SUSAN SWENSON: Thank you very much, operator, and welcome everybody to our board meeting here in lovely Boulder, Colorado. Appreciate the FirstNet team hosting this meeting. Obviously, we have some important business to take care of, but we also are going to have an opportunity to see some things firsthand, so we're all pretty excited about that.

But before we begin the meeting, I'd just like to take a few moments--with everything that's been going on the last couple of weeks--I'd like to take a few moments to thank all of the first responders across the nation and all of the volunteers who've worked so diligently to prepare for the emergencies. Fortunately, in many of those situations we had advance notice so we could do what was right to make sure we got people safe, and I think some of the evidence is that that has paid off.

I know that people were concerned, and you know there were some die-hards who wanted to stay. Fortunately, I think they're okay, but I think the result is that I think fewer lives have been lost as a result of that. So I really want to thank everybody across the nation and in the territories, because as you know, the territories were significantly affected by this.

But it's tireless work, you know, preparing for these emergencies, and frankly, I think the real tough work begins now and that is in the recovery. And I hope that there is as much attention on the recovery as there was on the actual event, because we have a lot of people's lives who have been disrupted, and it's going to take quite a bit of time to get people back to normalcy.

But as you know, in addition to the hurricanes, you know, it's kind of taken away from all of the wildfires that are happening out west. Chief Johnson knows all too well, the wildfires that are happening in Oregon, in the state of Washington, in northern California, Montana, and I think to the point where resources, even mutual aid resources, were depleted to the point that even when asked they couldn't respond because there were so many resources being deployed for that.

So obviously, there are a lot of natural disasters occurring, and then of course on top of that Monday, September 11th was obviously an important day and those of us around the nation took a moment to remember the thousands who died in that obviously horrific event that occurred to us on September the 11th in 2001. So I don't think there's any question about the importance of what we're doing and the significance of what we're doing and how important it is.

As you all know, work has already begun with FirstNet and AT&T to deliver the communications capability envisioned in the 9/11 Commission recommendation, which is very exciting. I mean, I know some people feel like it's taken a long time but it's pretty exciting to know that those capabilities that people envisioned are actually being deployed today.

We also have people within FirstNet who have actually been involved in some of those emergencies. Obviously, you know, we're not the people who are running the EOCs, but we have some people that I'd like to thank. In that we had, let's see, we had Ehrin Ehlert, we had Brian Kassa, and we had Jacqueline Miller-Waring, actually participating in the EOCs and actually overseeing some of that work there, and I'm sure we're going to hear a lot from them about those activities.

We also, as you hear, one of our board members, (Former Houston) Mayor (Annise) Parker, we appreciate you calling in today, Mayor Parker, because we know you've been pretty involved in the actual shelter activity there and recovery efforts and actually were instrumental in standing up an emergency shelter for Harvey. And so obviously right in the heart of it and obviously experiencing that directly.

The chair of our PSAC, Tom Sorley, who some of you may know but don't know what his day job is, but he's a deputy CIO, deputy director of IT public safety in Houston, and he actually was in the emergency operations center doing 12-hour shifts for probably the last, you know, two weeks. So if he looks a little tired when you see him, I think that's to be understood.

So obviously, all of this hasn't been lost on us and I think it just reinforces, you know, what we're doing, and it also, I think, reinforces the need to be urgent about what we're doing. You know, I think we feel pretty good about where we are, but we need to continue to press from an urgency perspective to make sure that this capability gets deployed as quickly as possible.

So we're going to talk about at the board meeting, the committee meetings, we have the budget, hard to believe we're back doing the budget again for FY18, so the Finance Committee will talk about that, we'll discuss it at the board tomorrow, and we'll also have the opportunity firsthand to experience and see some of the capabilities

technologically with the help of FirstNet, AT&T, and PSCR. So we're very excited to be here to actually see these things and experience it hands-on. We appreciate all the work it takes to pull something like this together.

You know, I was just talking to Jeff Bratcher before the meeting and having run several meetings like this, there are a lot of details that you never see to make this go smoothly. So appreciate everybody's work at FirstNet, AT&T, and PSCR so that we can experience what we've been talking about.

Before we begin the meeting we also are fortunate enough to have heard just yesterday that Ron Hewitt has been named the FirstNet Board member for DHS, so Ron is here today and sitting at the table. Instead of in the audience, Ron delighted to have you as a FirstNet Board member. You've obviously been involved in this since the very beginning, and so having your experience and you know historical perspective, I think is going to be quite valuable. So, welcome to being on the FirstNet Board.

RON HEWITT: Thank you.

SUSAN SWENSON: So we're delighted to have you. So with that, I think we need to do roll call. (Karen)? If you would do that.

KAREN MILLER-KUWANA: Sue Swenson.

SUSAN SWENSON: Here.

KAREN MILLER-KUWANA: Jeff Johnson?

JEFF JOHNSON: Yes.

KAREN MILLER-KUWANA: Ed Horowitz?

ED HOROWITZ: Here.

KAREN MILLER-KUWANA: Chris Burbank? James Douglas?

JAMES DOUGLAS: Here.

KAREN MILLER-KUWANA: Kevin McGinnis.

KEVIN MCGINNIS: Here.

KAREN MILLER-KUWANA: Annise Parker?

ANNISE PARKER: Here.

KAREN MILLER-KUWANA: Neil Cox?

NEIL COX: Here.

KAREN MILLER-KUWANA: Ed Reynolds?

ED REYNOLDS: Here.

KAREN MILLER-KUWANA: Richard Stanek?

RICHARD STANEK: Here.

KAREN MILLER-KUWANA: Teri Takai.

TERI TAKAI: Here.

KAREN MILLER-KUWANA: Kathy Kraninger?

KATHLEEN KRANINGER: Here.

KAREN MILLER-KUWANA: Ron Hewitt?

RON HEWITT: Here.

KAREN MILLER-KUWANA: And Christopher Piehota.

CHRISTOPHER PIEHOTA: Here.

KAREN MILLER-KUWANA: Madame Chair, we do have a quorum.

SUSAN SWENSON: Great, we now need to do the customary conflicts of interest statement.

KAREN MILLER-KUWANA: And as we have found in the last meeting, you have been sent, in advance of this meeting we were able to send the committee members and the board members an agenda outlining each of the items that will be discussed and decided in today's meeting. The members were provided a conflict of interest assessment, which was produced jointly by the Department of Commerce Office of General Counsel and our chief counsel of FirstNet.

We've provided these documents in advance to the board members, to allow them to identify potential problems and interests and recuse themselves from participation if required. We will, prior to this meeting, remind all committee and board meetings that their obligations related to the conflicts of interest and ask them to identify whether any recusal from deliberations or voting are necessary.

So, in consideration of the meeting today, each member should consider his or her obligation with respect to the appropriate committee, and for some of you that might mean more than one. Just be clear, we are only doing one conflict notification today for this joint committee meeting. And with that said, any committee or board member who believes that they must now recuse themselves, please so state for the record. Hearing no recusals, Madame Chair, we may proceed.

SUSAN SWENSON: Great. The board has before them the minutes from the combined committee meetings and board meeting in Reston. Open for any comments, suggestions, I think, Karen, you have some of my revisions that I shared with you, just there were some minor changes to the minutes that some of you may have seen, but other than that, are there any other comments? Hearing none, entertain a motion to approve.

TERI TAKAI: So moved.

SUSAN SWENSON: Thank you, Teri. Is there a second?

NEIL COX: Second.

SUSAN SWENSON: Thank you, Neil. All of those favor, please signify by saying aye.

GROUP: Aye.

SUSAN SWENSON: Any opposed, same sign. Any abstentions? The minutes are approved, and Karen, I assume you'll make those available on our site.

KAREN MILLER-KUWANA: Yes.

SUSAN SWENSON: Thank you very much. I'd like to turn the meeting over to Governor Douglas and Kim Farington. As you know, governor, we've been spending quite a bit of time over the last couple of months working on the budget. This is an important event for the organization, so the floor is yours and with Kim.

JAMES DOUGLAS: Well, thanks Madame Chair, I appreciate that. It has been a busy time as we pivot from a sort of preparatory phase of budgeting into an operational one of deployment mode, and Kim and her finance team have been doing a great job in ensuring that we keep an eye on our sustainability, especially as we get into a different part of our financial life.

Very quickly, a quick summary of what we've been doing over the past year. The board maybe will recall that we established some key performance indicators for a five-year strategic plan that allows us to measure performance against our strategic goals and objectives. We set up a SharePoint site for the new investment review board that ensures that we have internal controls to decide appropriate recommendations for investment in accordance with the Act, as we generate resources from deploying the network.

We launched FRED, the FirstNet Repository for Enterprise-Wide Decisionmaking. Everything in government needs an acronym, and that's potentially our cost accounting and data analytics environment that will allow Kim and company to gather all the requirements across the enterprise and ensure that we've analyzed alternatives appropriately and move forward.

We established a gifts and bequest Treasury account so we can begin to receive gifts and bequests, which we hope that, well I mean you know.

SUSAN SWENSON: You don't know what's out there, right?

JAMES DOUGLAS: That's right, maybe naming opportunities, who knows? But the most important thing obviously is to keep an eye on our sustainability, especially in terms of cash flow because we're making disbursements of a significant amount and we have to make sure that we fit the revenue in on a timely basis to continue our operations, and Kim's very conscious of that as she is of our $100 million administrative cap.

So it's been a busy time, and I know Mike and everyone on the management team have been focused on ensuring a good process for preparing the budget, and I'll let Kim share the good news, which was the bottom line of our spending recommendations for fiscal '18. So Kim, take it away.

KIM FARINGTON: Thank you, Governor Douglas. Good morning everyone. Before I actually dive into the fiscal year '18 budget request, I would like to just take a few minutes to give you an update on our fiscal year 2017 execution, this current year's execution.

As you can see on this slide, we actually have four lines going across the slide. The first two, the $118.4 million and the $84.6 million, those were our original budget requests last year about this time for fiscal year '17. The dashed lines that you see actually represent the re-baseline budget that we presented to you after we awarded our major contracts with our partner. What you see as far as the bars are concerned are our cumulative execution status. The blue bar of $51.4 million represents our obligations year-to-date for fiscal year 2017. This $61.4 million represents about 78 percent compared to our re-baselined budget for obligations of $78.2 million.

The orange bar represents our expenses year to date, and that's $73.7 million, or representing 82 percent of our execution against our re-baselined expense budget of $90.1 million. So overall, we are doing very well compared to our re-baselined budget, which is what we were expecting.

What have we completed with this money so far? If you look at this next slide, this actually reflects all of our critical milestones that we presented to you at the beginning of the year, and as you can see, we have done a great job across all workstreams and business units to actually accomplish what we set out to achieve this year.

So just wanted to highlight those good news stories about the great progress we're making using current-year execution dollars.

Now, what I'll do is actually shift to fiscal year 2018. As Governor Douglas mentioned, this has been a process, and we are very proud of this process because we started with a zero-based budget approach and had every business unit actually provide their status of their progress to date, how they're utilizing their dollars, and looking at it as we move forward.

We actually made sure that every requested item in the FY18 budget actually aligns to the strategic goals and objectives that we have set forth. So everything aligns to our budget. And basically our FY18 budget priorities for this year are reflected here. We're going to focus on innovation, customer service, and operations.

Specifically, we would like to initiate the RAN buildout for all of the opt-in states. We're also going to do the testing of current and future network features and capabilities. We also want to evolve and deliver applications that will be perfect for our stakeholders. And of course, complete the FirstNet core. We also are going to update our services and always keep an eye on the security enablers of that core and initiate Band 14 for the FirstNet field operations.

So a lot of big, critical things that are planned for FY18, but we feel that we can do this with the budget request that we're presenting today. And that budget request would be for the fiscal year '18, $73.5 million. And as Jim mentioned this actually represents a decrease from the FY17 budget of 13 percent, so well under budget compared to this year, and we still think we'll be able to meet and achieve all the objectives that we've set forth for fiscal year '18.

We did focus on the reductions, really tried to make sure that every penny was spent properly, so that just gives us more money to reinvest in the future needs for FirstNet and the network. But it was basically, you see the reductions because of the processes that we look to streamline in our post-award environment. We also focused on improving our resource optimization, making sure that every resource was utilized efficiently and effectively.

And we also are going to look to reduce our reliance on contractors and more on full-time staff. So basically the assumption that drove this budget includes funding for our staff, which represents about 63 percent of the total budget. All board expenses, which represent about 1 percent of the budget, and all the other necessary resources to achieve our goals that we set forth in '18, which represent about 36 percent of our budget.

And we this year again broke down our budget into the three workstreams that we were actually utilizing last year, or this current year, in FY17. Those workstreams again are focusing on network operations, on public safety, and corporate services. The network operations activities are basically focused on the implementation and oversight of the NPSBN network. The public safety workstream is going to be focusing on that customer outreach and the product management as well as continue our government affairs outreach.

And our corporate services workstream represents basically the operations of FirstNet-- those program operations and administrative operations. We actually break out the corporate services into program and admin operations, just to provide more transparency to what costs and charges actually hit that administrative expense cap that we have, which is the $100 million cap. So you'll see these workstreams again are very similar, are the same as what we had for FY17.

So breaking down the workstreams by quarter and showing you the obligations budget for '18, you can see on this slide our cumulative amounts by quarter that represents those workstreams, comprising the $73.5 million obligations budget. And for '18, public safety, that workstream represents about 29 percent of our total budget. Network operations represent about 35 percent, and our corporate services represent about 36 percent of our total obligations request of $73.5 million.

On the next page we show you our fiscal year '18 cumulative expenses by workstream. And this again is broken down by the workstream, by quarter. For fiscal year '18, the public safety workstream will be representing about 22 percent of our expenses, 46 percent comprises our network operations workstream, and about 33 percent represents the corporate services. These all comprise a total expense budget request of $101.7 million.

You might ask what we will be achieving with this funding request this fiscal year. And this is shown, this milestone chart that you're seeing now. We plan to do so much. The RAN network implementation and evolution, we're going to start approving of devices. Lab testing is also going to be occurring in fiscal year '18, as well as the management of the state RAN deployment.

In the public safety workstream, we're going to be focusing on reporting and revising our branding and social media strategies to meet the needs of our stakeholders. And we will be doing a lot of federal liaison work with other federal agencies. On the corporate services side, we're going to be doing what we do every day and continue it this year in FY18. We're going to be focusing on all the legal support that is needed throughout the year, making sure that our FirstNet systems and networks are operated and maintained properly.

We'll be executing human capital tasks to focus on retention and making sure that all of our staff members have the tools they need to get the job done most efficiently and effectively in support of the mission and will also be continuing to implement FRED, our FirstNet Repository for Enterprise-Wide Decisionmaking or cost-accounting environment and data analytics environment.

So if there aren't any questions, I will just pause there before I actually talk about the resolutions that we have proposed for this meeting.

SUSAN SWENSON: Governor, I do have a question, but I think just for clarification. Kim, could you talk a little bit about the fact, some people may not be aware of the administrative cap and the fact that, you know, we're five years in and I don't think we have any concerns about the administrative cap at this particular point in time, I don't believe.

KIM FARINGTON: Yes, that is correct, great question. The administrative cap is part of our act that limits us to spend no more than $100 million on administrative items in support of FirstNet. And this $100 million cap is in place for 10 years and expires in 2022. It started in 2012, it's a 10-year cap. We are currently more than half way through the life cycle of that administrative cap and yet we are only at a 44 percent utilization

through the end of FY18. So we are in very good shape as far as not being close to hitting that administrative cap.

SUSAN SWENSON: Great, and then one other question, you know just for clarification. I mean, we're kind of in an unusual situation relative to other budgets within the federal government in that, I think the organization has been very focused on, even though we have a budget, we don't necessarily try to spend every dollar if we don't need to, and we don't lose that dollar. Is that correct? In other words, we don't need to spend a dollar, we can roll that to the future versus just losing it and starting from ground zero. Correct?

KIM FARINGTON: Yes, Sue, that is correct. Most agencies have an annual appropriation, and so they try to utilize every dollar they can to make sure that they receive further appropriations at the same level. With regard to FirstNet, we are in a very different situation, we are a 10-year appropriation right now not the annual appropriation you typically see in federal government. So with our 10-year appropriation, whatever money we do not utilize this year, for example, we can put towards utilization next year, the year after, all the way up through fiscal year 2022.

SUSAN SWENSON: I think that's really important, and I would just like to take an opportunity to commend Mike and the team on being really fiscally responsible, having clear objectives and programs that money is being targeted to, and I think over the last several years I think shown some real fiscal responsibility. So my thanks to you and the team for demonstrating that. I think it's really, you know, culturally very important that that's how the organization operates. So Governor, I just wanted to make those couple of comments.

JAMES DOUGLAS: Great points, and that's why as the board could see we're requesting an obligations budget of $73.5, but the expenditures (unintelligible). That flexibility's particularly important because contract (unintelligible) for example. So it's been good to have that flexibility over the decade. Any other questions for Kim on the '18 budget? Wish you could explain the three elements of the resolution, Kim?

KIM FARINGTON: Yeah, thank you. Basically, this resolution is similar to the Finance Committee resolutions you have seen in the past. We are recommending that the Finance Committee approve the proposed fiscal year '18 budget of $73.5 million on an obligations basis. We're also recommending that the Finance Committee today authorize management to enter into all the necessary agreements to meet the milestones that we have set forth in this fiscal year '18 budget.

And we also recommend, as we've done in the past, that management be allowed to reallocate up to 10 percent of the funds from any of the three major activity categories or those workstreams, and that management may exceed the approved obligation level of the three together by no greater than 10 percent in aggregate or 15 percent in any individual major workstream.

JAMES DOUGLAS: As you know, that's been a provision we've had over the last couple of years and I guess, Mike, it's been sufficient flexibility for you?

MICHAEL POTH: Absolutely, and that's, as you know, we continue to underrun that, so we've never had to concern ourselves with even exceeding the 100 percent let alone the 110.

JAMES DOUGLAS: But if something unusual happens, we'll bring it back …

MICHAEL POTH: Absolutely. And this budget does reflect very vigorous oversight and assistance with our program and with our partnership with AT&T, so we're, I want to assure the board that while we are absolutely hypervigilant that every dollar we can save goes to get reinvested back into the network, that there are sufficient funds for us to provide some robust oversight and assistance working with AT&T to continue to get the remarkable progress that we've had this year and carry that momentum into '18.

SUSAN SWENSON: You know, Governor, one of the questions that came up during the finance committee meetings on this topic was, and to Mike's point about are there sufficient resources, you know we're learning, obviously, and we believe we have existing resources that are adequate and I think there's flexibility in the current budget to top up, so to speak, resources should we need more in the program office. So, but if that needs to be re-evaluated, we have the opportunity to come back and actually have that discussion prior to any kind of annual review.

JAMES DOUGLAS: Well if Kim briefs the Finance Committee monthly? For our expenditures against budget, and if there's anything anomalous we'll certainly let the board know. Well, at this point the Finance Committee is going to consider the resolution and then will present it for the board's consideration tomorrow.

SUSAN SWENSON: Karen, you want to read that?

KAREN MILLER-KUWANA: Sure, I will read just the operative language of the resolution. "Now therefore be it resolved," and I'm sorry, this is the Finance Committee Resolution Number 18, "Now therefore be it resolved that the Finance Committee hereby recommends the First Responder Network Authority forward the approval of senior leadership fiscal year 2018 budget of $73.5 million on an obligations basis as presented by senior leadership for the three major activity categories, which include network operations, public safety, and corporate services.

"Be it further resolved that the Finance Committee recommends that the board authorize senior leadership to enter into necessary agreements to meet the FY 2018 FirstNet workstream opt-in, and be it further resolved that the Finance Committee recommends that the board authorize that senior leadership may re-allocate a percentage of the funds from any of these three major activity categories to another major activity category, for an aggregate of $7.35 million. Senior leadership may exceed the approved obligation level of the three major activity categories by no greater than 10 percent in the aggregate, or by 15 percent in any individual major activity category. This budget amount of $7.35 million may be apportioned commensurate with the $73.5 million base budget for availability at the beginning of fiscal year 2018."

JAMES DOUGLAS: Any of the members of the Finance Committee like to make a motion?

ED REYNOLDS: Yes, Governor, it's Ed Reynolds, I move the motion to recommend to the board the FY18 budget be (unintelligible).

UNKNOWN FEMALE SPEAKER: Second.

JAMES DOUGLAS: Second it. Any discussion among the committee members?

ED REYNOLDS: I guess my comment is that the rigor that's gone into this budget process is, as in the past has been extremely (unintelligible) commend Mike and the team for not only the diligence necessary to control our costs and so that we have actually resources to execute on the mission, but also to understand that the environment we are in this year has a lot of moving parts, specifically the various state decisions in opting in and opting out, and so I think that the contingencies that are in here are terrific and adequate to cover whatever Mike (unintelligible) and again, I'm very proud that we can present this budget.

JAMES DOUGLAS: Thanks, well put and I think even in my short tenure of the board however imprecise, a few years ago, and we've got a great finance team in place now and have some experience under our belts, and I think we feel really good about the process and you know, the recommendations. Thank you.

Other discussion? If not, all in favor of adopting the resolution to recommend the budget set forth say aye.

GROUP: Aye.

JAMES DOUGLAS: Opposed, say nay. The resolution passes. That's the extent of our business, Madame Chair.

SUSAN SWENSON: Great, thank you very much. We're going to move on to the Governance and Personnel Committee update. This is the committee that is not quite as generally active as the Finance Committee or the Outreach Committee or the Technology Committee. However, the Governance Committee has been quite active since last year taking a look at board members. As you know, we have several reappointments to consider, and we have some open positions to fill.

The normal appointments take place normally around the end of August. We were not able to conclude the activity necessary to make those appointments, so current board members have been extended, and we have the opportunity to NTIA and Lynne Bechtel serving in the capacity as that position, has extended those position of existing board members until December the 31st, or until the new board members are appointed. So it's important to know that we will have a continuing board until those appointments are made.

We have, as you know, we went out and solicited board member interest earlier this year. We had a number of submissions showing interest. I would just like to remind everybody that regardless of people's interest, there are certain requirements in the Act that cause us to consider people within certain categories, whether it be state and local,

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whether it be, you know, from a, you know from the private sector, finance and technology, so those considerations had to be reviewed and were considered within that context.

So the Governance Committee has concluded their extensive work and I would like to thank the Governance Committee for all of the work, because we actually started this process last year. And so it's been going on for quite some time, and we completed the process and made our formal recommendations to NTIA, and Lynne Bechtel tells me today that the recommendation is in fact in the hands of Department of Commerce and the Secretary of Commerce.

So at this particular point in time we don't know when those appointments will be made, but we're hoping that that would be maybe in the September/October time frame, but I'm sure Lynne and I will stay in close contact with one another to find out where that is. So again I'd like to thank the Governance Committee for all of their work. I think we have some excellent people to continue to serve. And as you know we go through a pretty rigorous process of the interviews.

I think Ed and Neil can attest to that in terms of, that not only do you meet the requirements of the Act, but we want people who are very committed and willing to invest the time necessary. This is not a quarterly job where you come and show up once a quarter. So people get a pretty rigorous review.

So we're excited about where we are in the process, and we will of course make the announcement when the time comes. Any questions from the board on the board nomination update? Okay, great.

We will go into more detail about this tomorrow, but we have a group of people who are very deserving, winning a Commerce gold medal for it, which I think is pretty significant, and we will recognize, not take the time today to go through all the names, but we'll do that at the board meeting tomorrow. But I think this is a real accomplishment.

As you know, the whole RFP process, the acquisition process was excellent to the point that we were able to manage to succeed in a protest. I think that's a real tribute to this team in particular because of the quality of that work we were able to prevail on that. So we'll spend some more time on that tomorrow, but I'm really pleased to see that this team is getting recognized for that work. It was non-trivial in terms of its accomplishments.

In addition we'll talk tomorrow a little bit about, we have a couple more awards, Chief McGinnis, who is of course on the board, was recognized recently for a NPSTC award, and we'll talk about that a little bit more tomorrow. Additionally Tom Sorley, who heads up our PSAC, was recognized by NPSTC and so those are really nice awards that we'll talk a bit about tomorrow.

But with that, that's the update from the Governance Committee, seems like a short review considering all the work that the Governance Committee has done, but at this point I'll turn it over to our Vice-Chair, Chief Johnson.

JEFF JOHNSON: Thank you Madame Chair. Admiral Hewitt, nice to have you on the board. The Oregon section is growing over here. I don't know if you know Admiral Hewitt is an Oregonian and his house was actually in the path of the gorge fire. That house was a couple miles, no, he did not offer the appropriate incentives.

Well his house was a couple miles from the fire front. That particular fire ran six miles overnight on one night. So it has been as you said Madame Chairman an incredible fire year in the west, virtually unprecedented in terms of resource depletion, and it just reminded me why we're here, and why this is such important work. Add to that as you said, Harvey and all the related disasters in the United States, and we just can't possibly get our work done fast enough.

To that point, our own Rich Reed today will be presenting here shortly on where we are, about to trigger the 90-day governor decision process. Get that rolling, and also talk about FirstNet AT&T's observations and lessons learned on some of those disasters. So Rich, without further ado I'll turn it over to you.

RICH REED: Thank you, Vice-Chair Johnson and members of the board, for the opportunity to speak before you today. I missed the last meeting in June, I was on family vacation, and Mike gave me the emotional out to continue to participate in that vacation, so I appreciate it. But we've been very busy since that June board meeting as you know. We've, during that time, we have released the State Plans to the states, we released that portal. We have been engaged in a dialogue with those states, we kept the promise that Jeff Johnson made in the earliest days of our consultation…

JEFF JOHNSON: Funny you say that without throwing something at me.

RICH REED: We've kept the promise that Chief Johnson made in the earliest days, and we've had a lot of significant dialogue with the states around that state planning content. The information we received from that dialogue, from those engagements, has been invaluable. The interactions we've had, and I think it will be evidenced in the upcoming slides, you'll see that the states really have appreciated the value proposition we've put forth, and you'll see that in terms of early movement on the decision to opt in.

We are on target. We've kept all of our timelines that we've put forth up to this point. We are on target to execute the next evolution, which is to make that State Plan official and start the 90-day window as early as next week.

So we've made good progress, we've received feedback from all states and territories through that engagement, either through the official process or through our meetings. And we are in the process right now of actually finalizing the questions and answers and comments we received through that conversation we've had with the states and to update the portal, and I'll get into the details of what that looks like here in the next few slides.

So where we are today, you can see that many of the states have made the decision to opt in, to allow FirstNet to build their radio access network in their state. We are currently sitting at better than one-third of the states have made that decision even before we made the plan official. I think this is evidence of the quality of the plan, the

value proposition that we put forth and frankly the solution that we brought to the table with our partner, AT&T.

This brings us one step closer to delivering this mission-critical network to public safety and to delivering the tools and services and applications it's going to take to keep first responders communicating over the next 25 years and help promote that life-saving mission that is so important to public safety and executing their jobs.

I want to take the time to really thank the consultation team, the government affairs team, and the AT&T staff. We've really worked well together to go out and deliver this content, to engage with states and to make sure they fully understand and appreciate the depth and breadth of the solution. We're very pleased with the interaction we've had with the states and the collaboration we've had across all of the teams.

In terms of the portal, you can see in the areas that are yellow, we are not taking the comments that we received lightly. We've taken the feedback we've received and we're making significant updates to the portal. We're not actually modifying the structure of the portal, but we are updating the content based on the feedback we receive. We are answering the questions and anything that's not reflected in the portal update we're going to document in an official response to the states.

So the states will actually see their comments, the comments they provided us. They're going to see updates reflected in the content of the portal, and then anything that's not reflected in that content update, we're going to document in a formal memo that goes back to the states. In addition, we're going to provide an overarching memo that shows here's the questions you asked and here's where you can find the responses within the portal. So the states will really be able to see that we took their comments to heart.

We have received a lot of questions, and we've gone through a very exhaustive process to structure those responses. The team has done a great job getting together with both the regional subject matter experts, the state subject matter exerts, and the technical experts from AT&T to make sure that we are providing the right contextual responses. And many of those are through, you know going through the legal review process right now. But we do intend to make those State Plans official, and start the 90-day window next week, just like we planned. We have some hurdles left yet, but we do plan to keep that schedule as we outlined.

UNKNOWN MALE SPEAKER: Can you go into just a little more detail about that?

RICH REED: Sure.

UNKNOWN MALE SPEAKER: When you say 90-day plan, first off, is this public where you know people back in our states can go to and look at it and see this portal and some of the questions that are being asked of the State Plan?

RICH REED: It is, the State Plan Portal is not an open portal, it does require user name and login and those user names and logins were provided to us through a state process, state single point of contact or the SPOC. So it's not a public website, it is a controlled access website through the state single point of contact.

UNKNOWN MALE SPEAKER: And again, I guess what I'm wondering, Mrs. Chair and members, can you just go over the timelines again so you say 90 days beginning next week, so what does that mean at the end of the day?

RICH REED: Sure, sure. So the process looks like this, and I have it up on the screen now. The Act requires that we do a couple of things. One, we're required to go out and consult, which we did. We're then required to develop an RFP, and then we're required to notify the governor that we had completed the RFP and to provide them details of the RFP as well as the funding level determination as prescribed by NTIA. And start a 90-day window for the governor to review our plan.

What we decided very early on is that, and the states have asked us for this and Jeff Johnson was kind enough to say we agree, that the states would have the opportunity, specifically leadership within the states, key leadership, state single points of contact and public safety leadership would have a chance to review the state planning content before we made it available to the governor.

So we've done that, we released the State Plan. We've gone out and done an exhaustive review process, and then we expected and gave the states 90 days to review the plan and provide us feedback and comments. We've completed that. That was due on August 4th.

UNKNOWN MALE SPEAKER: That was a draft.

RICH REED: We no longer use the term draft. It was the State Plan. We just gave them the State Plan. So the review process took place and we allowed ourselves 90 days to take all of the feedback and comments we had received from the states, and we wanted to make sure we properly adjudicated and came up with a thoughtful response.

UNKNOWN MALE SPEAKER: That's from August 4th, 90 days forward. Forty-five and 45.

RICH REED: I'm sorry, 45 and 45. That's correct, it's a 90-day total window. And you can see that that, the comments were due August 4th, and we expect to make the state plan official next week, mid-September. That starts the next 90-day window, that's the official review that's required by the Act. That's where the governor and the governor's key staff are able to review the State Plan, and they have a 90-day window in which to make the opt-in, opt-out decision.

SUSAN SWENSON: And what is being included in the distribution next week that wasn't included in the initial distribution?

RICH REED: So we go forward, everything in yellow was updated based on the feedback that we received from the states--the comments and questions. And what the purpose of that feedback was in the update, (unintelligible) update to the content, what it is, our intent is to provide information to the states so it's more clear. So we think we had everything in the State Plan, but there were areas of questions and details that needed to be put in to clarify some of those data elements.

And that's really what was important to the State Plan update. The plan has not materially changed. What we've done is we've made it more clear in areas where states had questions, we clarified it.

SUSAN SWENSON: But you will be providing some additional information to the states in addition to clarification. In other words, there's a piece of information that has to go out.

MICHAEL POTH: Yeah, and I think the way to think about it for the board, is we've put out the plan with all the data that we had and that AT&T committed, and all the states work through those things. Some of the states had additional questions, what about this and not that. Twenty of the states already have reviewed the data and said "We understand it, we understand what FirstNet and AT&T are going to build, so please start that process already." So that's where you have the 20 opt-in states.

What we have to do by statute, so mid-September's where we're targeting to officially start the 90-day shot clock so that by mid-December we will have all states that have not opted in have, will have made their decision to either opt in and continue to have us build out, or start the process of the opt out.

So if you think about it from a, kind of a remarkable standpoint, in calendar 2017 we will have awarded the contract, started the project, delivered the plan and we will by the end of December or middle of December, just on the heels of the next board meeting, we will have a clear road map of what our build-out plan will be with AT&T for all the states that have opted in, and we will also have a clear understanding of those states that want to then begin the opt-out process.

The next contractual thing is with those plans in mid-December, then we'll be working with AT&T's specific plans, 56 times over if all the states opt in, to build out and then that's when we continue to shift not only, and pivot from building out but keeping then the states informed as to how the progress is over the next few years. So by the end of calendar 2017, we will have a bright line of who is in and who is pursuing the opt-out process, which is another, up to two-year process before they complete that review cycle.

UNKNOWN MALE SPEAKER: So what's the advantage of a state opting in early, like the 20 that have done so before, you know, the 90-day clock starts.

MICHAEL POTH: I'll let Rich offer that up, and what incentivized a lot of the behavior…

RICH REED: There's several things, I mean one, and I think the most sort of important concept that a state has access to quality of service and priority more quickly. So one of the things that we offered is if a state decided to declare their desire to opt in, we immediately gave them access to quality of service and priority. Pre-emptive capability isn't available yet, it won't be available till the end of the year. But they will have access immediately to quality of service and priority, which is good for public safety.

Many of the states just realize they don't want to be in the cellular business, they don't want to go build the network, they don't want the financial responsibility, they don't want the integration responsibility, they don't want the technical responsibility, the staffing responsibility. They don't want to be in the cellular business.

UNKNOWN MALE SPEAKER: Rich, can you say that quality of service and whatever the other word was, could that mean that if they have AT&T network or service provider that kicks in but if they had Verizon or T-Mobile or whomever.

RICH REED: That's correct.

UNKNOWN MALE SPEAKER: They weren't able to convert over because there's no advantage to it at this point, because they're still not a…

RICH REED: Yeah, so each one of those sort of service-specific issues, it really requires a contract change and you have to be an AT&T customer to advantage yourself to that. The point is, agency is public safety within the state that decides to opt in would be able to take advantage of that capability in an opt in. So states that did it early said that we want to give our public safety access to this life-saving technology and we want to get it as soon as possible, because we know ultimately we don't want to be in the deployment of a cellular network system.

UNKNOWN MALE SPEAKER: Rich, I would clarify they can sign up for the service as well. They don't have to be use only an existing…

RICH REED: That's correct, that's why I said it would require a contract change, it would be required to change…

UNKNOWN MALE SPEAKER: Then this 90-day piece, so you know when the governor's office gets this and this 90-day clock starts, can they continue to ask questions?

RICH REED: Absolutely. So we're continuing to consult, and we're going to continue to consult even post-decision to opt in. That's one of the roles of the CCO organization, is to continue to have a dialogue with the state, both at the state level, agency level, federal level, tribal level, to make sure that we're continuing to have that open, honest dialogue with practitioners. So yes, the governor's office will continue to be able to ask questions, and we will continue to consult with them.

UNKNOWN MALE SPEAKER: You can either opt in, opt out, or do nothing, in which case you are opted in after 90 days, so mid-December or so?

RICH REED: That's correct, that's why the 90-day window was put into the legislation. It is critical that we time down that decision, and then do nothing is an opt-in.

UNKNOWN MALE SPEAKER: Generally, I don't know if you can answer this here, but generally what are states saying in terms of opt-out? You have 20 that have opted in, none have opted out, so …

RICH REED: Yeah, so technically states are not allowed to opt out until we've made their plan official. So that the opt-out decision has to be based on a couple of pertinent data elements. One, we have to make the plan official. They have to start the 90-day window. And the things that we're currently missing in order to make that 90-day window start was, one, the comment process that Chief Johnson, you know, made available to the states; two, is the funding level determination by NTIA.

Those two things now have to come together before we officially start that 90-day window. And NTIA is developing that funding level determination to make that available to states. That will be the key data element that the state needs to really make a good decision, an informed decision.

UNKNOWN MALE SPEAKER: And when you say that, that means that NTIA determines if a state opts out, what financial piece they get to do it themselves? To…

RICH REED: So the funding level determination is an overarching number that the NTIA comes up with independently, that will become the basis for a future grant program to build out the Radio Access Network.

So it's essentially the high-level, overarching umbrella number that will be leveraged to develop a grant number for each state, that they can ultimately apply for if they're successful in their opt-out.

UNKNOWN MALE SPEAKER: Just continuing on the opt-out track, I mean, because I get these questions all the time, so I appreciate your diligence.

RICH REED: Sure.

UNKNOWN MALE SPEAKER: If they opt out, who governs or regulates or oversees that they're spending the money the right way and doing what they're supposed to do, so at the end of the day it all merges together?

RICH REED: So there are a few different levers. The opt-out process is complex, and it's pretty long in terms of time.

The FCC has a responsibility around interoperability and making sure that there's technical interoperability with our core infrastructure.

NTIA has a responsibility to determine comparability in solutions -- whether the state solution is comparable to FirstNet's just in general. And then they would also have the responsibility for administering the grant program, which really will dictate how money is spent, and the oversight of that expenditure.

And then FirstNet has some levers around spectrum, and how we're going to engage and allow states to use the spectrum, that we would enter into a spectrum lease agreement with.

JEFF JOHNSON: To append that a little bit, the short speaking point on that is if you opt into the plan as presented to the state, the state will hold us and our partner

accountable to that plan. So they will make sure we are doing what we said we were going to do collectively.

If they opt out, it switches. Now we hold them accountable. We, the government, hold them accountable to the pieces that they're required to do if they choose opt-out. So it really flips the accountability switch.

RICH REED: That's correct. We intend to push that accountability down.

JEFF JOHNSON: That's right.

UNKNOWN MALE SPEAKER: We meaning this FirstNet board?

RICH REED: Correct.

JEFF JOHNSON: And our partners.

UNKNOWN MALE SPEAKER: Yeah, the FCC, NTIA, et cetera, et cetera. So the government.

TJ KENNEDY: And part of the discussion when we're talking about the budget, and maybe some need for other program oversight, would be if we had more opt-outs than we can anticipate. So instead of maybe one or two, it's four.

That would require higher level of staffing to do exactly what Chief Johnson was talking about, in that we would have to have the expertise to make sure that they're delivering, and that that network is lining up to exactly what's happening at the nationwide level, and that it is completely interoperable. And that's why the NTIA review is also so detailed.

If you go back to the Act, it actually requires them to have technical capability. It requires them to have the business capability. And it requires them to, you know, meet or exceed the plan that FirstNet has put forward as the FirstNet State Plan.

So it's a pretty rigorous process, which is why it's also timely. But also there will be a number of oversight resources to ensure that an opt-out state could be successful, if they meet all those elements and follow everything as it's laid out as part of that process.

TERI TAKAI: If you think about it, if you go back to BTOP, it's similar in that we, you know, arranged a spectrum lease agreement with the people who were the BTOP grantees to begin with.

But basically the management of the grant, NTIA was, you know, was intimately involved in that. So I knew you'd have a similar cap, but I think it's really important to emphasize they can apply for the amount, but that gets reviewed as to its reasonableness…

UNKNOWN MALE SPEAKER: Right.

TERI TAKAI: …for what they need and what they plan to do. So it's not a guaranteed amount that they get a blank check for.

JEFF JOHNSON: And it's not a snapshot. It's a movie, you know? This doesn't happen on day one. We hold the state, anyone that opts out, we hold them accountable for conforming to network requirements over time.

UNKNOWN MALE SPEAKER: They're not going to be…

(Crosstalk)

JASON KARP: …just to simplify, you know, specific questions.

JASON KARP: Sure.

JASON KARP: It is, with respect to the grant itself, and how that money's spent, to make sure it's spent on the proper things, that's going to be NTIA's responsibility. They're going to administer the grant to make sure the money is spent correctly.

However, Chief Johnson's point, FirstNet then will have obligation to ensure that they are meeting all of the ongoing Act requirements to ensure interoperability, and remaining consistent with the features and functionality of this whole nationwide system.

So it is definitely a partnership between us and NTIA. Long term, to the chief's point, FirstNet and this board will have an obligation to ensure the state is complying with all the requirements, which we will lay out, even spectrum management lease agreements that we will enter into with the state.

UNKNOWN MALE SPEAKER: And then remind me again what happens with our federal partners. So, I mean, they don't opt in, opt out. They're in. They don't have to make some decisional in the way, the states don't make it for them, but rather DHS or FBI or…

RICH REED: That's correct. The only thing our federal partners will do is make an adoption decision. They're going to decide whether we have the appropriate coverage and the appropriate pricing to determine if we are a viable candidate for their business.

So they're going to make a purchase decision, not an opt-in/opt-out decision, that's based on who takes responsibility for deploying the Radio Access Network. That's the only opt-in/opt-out decision the governor Is making, just like they're not, at this local or county level, making an adoption decision when they make the opt-in/opt-out decision. They're not committing any usage to the network.

UNKNOWN MALE SPEAKER: But what about our, what about like DHS? I mean, you're opted in, but you can choose whether or not you use AT&T or someone else as a provider?

UNKNOWN MALE SPEAKER: That's a purchase decision.

(Crosstalk)

TJ KENNEDY: So DHS (unintelligible) as you know, and so many different agencies within there. And each agency is going to migrate people to the FirstNet network at different times based upon their contract and needs and resources, and making sure that we're obviously meeting the needs that they have covering…

(Crosstalk)

RICH REED: …contract, you know, availability. So they're going to have to wait until their contracts expire and everything else. Just like every purchase decision that's made.

JEFF JOHNSON: Yeah, that's the point. If that doesn't change, even if a state opts in, it doesn't mean we sell a single device in that state. We still have to make the compelling business case that that is good for whatever the public safety entity is. And, Jeff Bratcher, I know you might have had a comment.

JEFF BRATHCER: I was just going to add to Jason's comment. The network policy section of the State Plan really outlines if that state chooses to opt out and build their own cell sites, we have the network policies that we put in place with our partners in that State Plan Portal, so they understand what they have to do technically to meet interoperability, upgrades and things over the next 25 years of this system.

SUSAN SWENSON: And just to add to that, isn't it fair to say that those policies are consistent with what you would expect from AT&T…

UNKNOWN MALE SPEAKER: Absolutely.

SUSAN SWENSON: I mean, so it's not different.

UNKNOWN MALE SPEAKER: No.

(Crosstalk)

TERI TAKAI: So what is the process for deciding that the state has not met their obligations, and therefore cannot continue to utilize the grant money? What happens to them? And does the governor get involved in somehow or another falling on his or her sword and saying, gosh, we thought we could do this, but we couldn't? What is that process? Because I've never actually asked that question.

MICHAEL POTH: Lord, look at the time…

(Crosstalk)

MICHAEL POTH: So that's a great…

(Crosstalk)

TERI TAKAI: The assumption is if I opt out and I get the money, I'm going to be successful?

MICHAEL POTH: Correct.

TERI TAKAI: And that has not…

(Crosstalk)

MICHAEL POTH: So you have to remember. Our focus and - you know, our focus has always and will be to nationwide interoperability.

So if a state goes down that path and they initially pursue the opt-out, and they're into year three or four and they realize it's not working, or we realize, because they're not able to complete their requirements, they're not able to keep the technology fresh, they're not. You know, the adoption and all those types of things, then we do have provisions where we would. You know, it sounds kind of overbearing to come in and help them, and possibly have to take over, but it's a very complicated. You know, we would be working with the state, with NTIA, and with the public safety people in that state to try to unravel where they're at at that point in time, to then get them back into being successful.

We're not going to let them once and done. We're not going to let them just flounder.

TERI TAKAI: My concern would be the fiscal responsibility, right?

MICHAEL POTH: Right.

TERI TAKAI: In terms of - I mean, it's one thing around making sure that they have serviced their state. But it's another to make sure that they haven't utilized what are still fairly scarce funds, right?

MICHAEL POTH: Correct.

TERI TAKAI: And going down the path that isn't going to effectively get them to where they need to be. And the question is not letting it cool.

MICHAEL POTH: Right.

TERI TAKAI: But not letting it go on for too long.

MICHAEL POTH: And NTIA will monitor even right out of the first, so that they don't overextend themselves without the proof points, so that, you know, the funds and the grant funding that they have get overextended, and they have nothing to show for it in the end.

(Crosstalk)

JASON KARP: They'll be multiple phases, the initial financial obligation, to the extent that there's a grant, that's going to be heavily overseen by NTIA. But then there's ongoing fiscal responsibility concerns that - generating revenues from the local network, and having it reinvested to make sure it's being reinvested appropriately.

And to the extent that there are excess revenues - and we had this talk, you know, years ago over the issue of public notices. But to the extent that excess revenues above what the state needs to maintain their RAN, that those get poured back, invested back, to FirstNet and back into the nationwide network, right?

So all those have to be monitored. In the spectrum management lease agreement, we have things like audit provisions, so we'll be able to take regular audits of the state financially and operationally, to ensure that they're doing what they need to do.

And to my point, you know, it's going to be - it needs to be collaborative. Our view, at the end of the day, is to ensure continuity for public safety.

So if the state's floundering, we will retain the right to be able to come in, work with the state. If the state can't continue to do that, and if we need to come in and take over operations with our partner, then that is something that is accounted for in the agreement.

Operationally, let's all just hope and pray that does not happen, and people are making very wise decisions when they opt in or opt out.

SUSAN SWENSON: I think that's a great question, and I think it's something that we could probably pick up and cover in more detail. Like you said, you know, you have some experience with this through the BTOP programs and through the grant programs. I think you ask a great question, Teri, but probably worth a module in and of itself to talk about how we manage those situations on ongoing basis and what the implications are.

I mean, we're having some discussions, you know, sort of future…

TERI TAKAI: Right, because I think that, you know, obviously we don't want the states to, you know, be in a situation where they're not having the service that's required for their location. But I also just want to make sure that we don't get to the end of a spend and then say, oh, gosh, that didn't go well.

(Crosstalk)

JASON KARP: Well the key there, right, also is that is why, I think, Congress has created such a rigorous initial approval process, and why each of the agencies, the FCC and NTIA in particular, need to take that extremely seriously to ensure that they have in place appropriate - one of these…

(Crosstalk)

TERI TAKAI: And I don't want to prolong the conversation, but that is an interesting discussion, so that if in fact the plan comes in and the FCC doesn't approve the plan, is there a lengthy appeal, I don't know. You're the lawyer…

(Crosstalk)

JASON KARP: The good news is Congress has some foresight on this particular issue. And they made a very specific appeal right if there is a denial. And it's only for very severe misrepresentation and fraud are the only things you can appeal on. You can't just appeal because you're unhappy about the decision. Congress made it very clear in that.

TERI TAKAI: Interesting.

JASON KARP: In fact, you know, they gave the FCC a lot of authority here to say yes or no. If they say no, as long as they didn't engage in inappropriate conduct or fraud, then it's done. They're…

TERI TAKAI: And then at that point, they're opted in.

JASON KARP: At that point, then it automatically becomes an opt-in.

TERI TAKAI: Okay, thank you.

SUSAN SWENSON: Chief Johnson, do you have a comment on that?

JEFF JOHNSON: Yeah, Madam Chair, just to kind of wrap that up, we've all, as executives or managers, played that telephone game where you tell someone that tells someone that tells someone. Pretty soon you don't recognize the story.

This is actually one genetic strain that made it all the way from the public safety founders of this legislative initiative. What we didn't want to have have happen, and I'm going to, I tell this story so that anyone listening to the opt-out discussion may feel like this is some bureaucratic overreach and, you know, someone's just waiting to hit them with a hammer.

It's not that at all. Public safety has asked for this from our first days of our legislative request, because we have all, this generation of public safety professionals have lived with this hodgepodge of independent systems. And we wanted no exit ramp that didn't create one ubiquitous, fully operable system nationwide.

And we want to close, we wanted to stitch up every possible hole in the fabric that could create independent and fractured systems again. So the fact that this is a rigorous, and that there's remedies, that comes right out of the genetic strain from public safety saying whatever we do, we're not doing this again.

SUSAN SWENSON: Thank you for sharing that. Okay, Rich, I think it's back to you.

RICH REED: Wow. Sure. I absolutely never know where these conversations are going to…

(Crosstalk)

UNKNOWN MALE SPEAKER: Hopefully a couple quickies. So this is from Georgia. Do the other states' portals look that yellow?

RICH REED: Yeah, so the yellow just indicates where we modified…

(Crosstalk)

UNKNOWN MALE SPEAKER: …common picture for all the states.

RICH REED: Yes, yes. We have updated that information across all the 56 states and territories. As you can see, based on the feedback we received, there was a lot of confusion, and we tried to make each one of those sections have better detail and more clear.

I mean, the only thing we really didn't update is about FirstNet, the State Plan overview, the value prop or the acceptance guide.

UNKNOWN MALE SPEAKER: And as you make these updates, you notified the state of changes that…

RICH REED: Oh, we're going to. That'll be a part of the package that goes out to the state.

UNKNOWN MALE SPEAKER: So one piece that I've gotten hit with repeatedly in visits in the last few months is coverage, and how the coverage is portrayed in the, on the portal map. You know, is this today? Is this five years out? Is this some transition? If this is today - I'll buy it, not today. My God, if we don't have coverage there with that, and so my question is under coverage, have there been substantive changes in that? Or has it been clarifications?

RICH REED: So it's a great question. There are going to be fairly substantial coverage modifications over time. We will update the coverage at the release of the official start date. And there will be continued updates of coverage as we deploy the network over time.

But to your question, it's a little different. In how people experience the network, it's very different than the proposed coverage based on drive testing or in the case of Band 14 modeling.

So oftentimes when people experience a failure of a call or a lack of coverage, it could be based on a lot of things. It could be based on devices. It could be based on the number of users on a given network. It could be based on outages, maintenance numbers. Or it could just be a lack of terrestrial coverage. All of those things are

potential, you know, observations the user may have in terms of am I experiencing coverage in a given location.

I experience as well we all do, right? Where we're driving home on a road we all know, and there's a place where you get down into a hole and you drop a call every time you hit that spot. That's never going to be represented on these coverage maps. It's just, it's too detailed.

What we are going to show is multiple visions of coverage based on your perspective. And it's a fairly detailed tool that allows you to drill in down to street level. It allows you to turn on different layers. It allows you to look at different IOCs. And you have to be very conscientious of where you are, and what you're looking at in terms of the representation you're getting.

It's a great tool, and Brian's here if he wants to add anything to what I've just said. But it's the best tool that we've seen out there in terms of representing usable coverage in a way that meets the commitment we made to public safety during consultation.

UNKNOWN MALE SPEAKER: Can I interject?

UNKNOWN MALE SPEAKER: You're fairly confident then that between what changes you've made as a result of comments, and clarifications you've made to explain what you just said, that people can view the portal a bit differently now than they would a few months ago?

RICH REED: Yeah. So probably by mid-October we will have additional functionality in the portal that will help people experience that coverage in a more realistic fashion. We're trying to bring as much realism as possible into the portal in how they, you know, experience coverage, depending on whether they're in-building, out-of-building. And there's a lot of scenarios we put in there.

But remember, you know, the difference between carrying your phone in your pocket, in your purse, in your bag that's behind you, how many times you've dropped it, there's a lot of factors, depending on the device you have, despite the device you have, how you experience the network.

UNKNOWN MALE SPEAKER: Thank you.

RICH REED: Sure. I'm getting the, I'm getting the hook. Anyway, good job, State Plans team, and the consultation team. Thank you all for your hard work.

JEFF JOHNSON: So, Rich, I think just to kind of wrap it up on my end, impressive to be in over a third of the states. And, I mean, before even, you know, we enter the 90-day clock period. So congratulations to you and your team.

I do appreciate the team keeping the promise I made early on. When we made those initial trips, we made this simple promise: You will not be surprised.

And that was an important discussion to have, because often at the state level and the local level, you feel like you're always getting surprised. And there's always something that you can't see. And we didn't want to take that approach.

The good news is, we kept that promise. The bad news is, it was an exhausting lift. I do believe, though, at the end of the day, the reason that we're seeing such a non-typical response for a federal program is because we took a non-typical federal approach, which was literally to open the kimono and to say, this is everything we know about your state. This is what we're doing. And the transparency has to be complete.

And I think you and your team have kept that promise. And I think that keeping that promise and doing such a credible and transparent job of it, in it, is what's led to us seeing the results we're seeing. So hats off to you and your team. Mike, to you and your staff.

And now to the headliner. We're turning to board member, Neil Cox, and Jeff Bratcher from the technology committee. So thank you.

NEIL COX: Okay, thank you Vice Chairman Johnson. Welcome, everybody, to Boulder. We're happy to have all of the committees here. This is going to be, I think we have you for the rest of the day.

We're really excited to show you the innovations that this network will provide. Now this network, we always have to remind ourselves. We've heard a lot this morning. This was lobbied for by public safety. It was designed by public safety through the hundreds and hundreds of thousands of hours that were put in by the PSAC to get these requirements for the RFP.

Now we have an award, which will have a dedicated core. Then we'll have a Radio Access Network that is second to none--that has all kinds of back-up and diversity built in it, so it'll have survivability. So the innovations that this network will provide going forward is going to be unmatched.

So today we're going to hear from our CTO, Jeff Bratcher, who will talk a little bit about the near-end innovations to this network.

And we're also very fortunate to have the division chief for the PSCR, Dereck Orr, who will talk about some of the future items that will be on this network.

And as the legislation provided, it provided funding to NIST that enabled NIST to hand out grants to enterprises and academia on types of innovations that will go onto this network around location-based services, presence, data analytics, mission-critical voice -- a whole host of applications.

Now a lot of the buzzwords now in the valley of next-generation technologies are around really two things: AI, artificial intelligence, and the Internet of Things, IoT.

All of those have a major impact on this network, because we will see applications through the ecosystem that are developed on this network, which will be de-hardened

and used for commercial use. And we'll see commercial use applications that will be hardened and put on this network.

So you'll see a lot. Being able to have this type of technology for our first responders is really unbelievable.

And another thing, too, and I look to what Rich was saying earlier about when we got the proposal in from AT&T, they're kind of, to start things going first, being able to order priority and pre-emption under existing 4G LTE network by the end of this year, was something we really hadn't expected. It's going to take time to build out this Band 14 network.

But this was really something that came to light to me this weekend or last weekend. I was at a wedding in Columbus, Ohio. And the reception was at the state capital. And there were several state police that were obviously guarding the corridors to make sure that the wedding group didn't run around the capital.

But I always, and when I'm at these functions, I always like to go up and talk to the first responders and ask them what they know about FirstNet. And this was the Ohio state police that were there. And I went and talked to an officer and asked him if he had heard about FirstNet.

And he really hadn't. I explained what it was. And this was last Saturday night. And he told me, he said, 'I had a choice of duties for tonight. I could either come here or I could go to the Ohio State-Oklahoma football game, which was that same night.'

He says, 'I chose this assignment because I know my phone will work here. It won't work there.' He made that comment to me (unintelligible) that he chose that assignment so he could stay in touch. I didn't ask if it was personal or business. But the thought about him not wanting to go to that 80,000, you know, seat stadium and not have any communication, he made the decision to go and guard that, a bunch of wedding-goers.

So with that, we will have this afternoon we will have some demos in the lab, which I'm very pleased that we have some vendors that have come here, along with the PSCR and FirstNet, to have some demos of these innovations on the technology.

So no further ado. Let me turn it over to our chief technical officer, Jeff Bratcher, to go into the presentation.

JEFF BRATCHER: Okay. Thank you, Mr. Chairman. Thank you, board members, for joining us here in Boulder in the office.

I was thinking back about the day I got the keys to this place in March of 2014. It's amazing to see how much it's changed over that time. I like to tell this story, but when I walked in it had been sitting empty for about 18 months and it was a mess. I'll just leave it at that. We had dead pigeons, all kinds of stuff floating around in here.

So it's very, we've cleaned it up quite a bit since then. You'll see the lab and things we've done later.

(Crosstalk)

UNKNOWN FEMALE SPEAKER: …your pigeons.

(Crosstalk)

UNKNOWN MALE SPEAKER: It doesn't seem right.

JEFF BRATCHER: So welcome again. And we've got a fantastic day, especially this afternoon with some of the demonstrations you're going to see on what's happening to date with our partner in AT&T, and some of their partners as well.

I want to go over a few things. I usually lead off by starting with the core and working out to the application side of the network. I'm going to flip that with our innovation and technology thing today. I want to start with what we're really doing with the applications, and the excitement I think we're generating in the community, both developer and public safety as well.

I've shown this strategy before, but for this application ecosystem that we're putting together, are developing and creating and enabling the creators to make these apps for public safety users. Leveraging scale and technologies of that commercial market. Continuing to innovate for public safety, for the apps they need to do their jobs to save lives.

And again, creating this open ecosystem for the development community to be able to create applications that take advantage of our key network features for FirstNet, and drive that for public safety, that we fully feel, as I think someone mentioned earlier, will also drive commercial innovation as well, in some of the technologies

Our ecosystem that I've discussed in the past again, and you'll see some actual updates on what is happening in the next couple of weeks with our initial launch of this with AT&T. But again, focused on that identity, credential and access management capability.

The development environment. The testing and certification of applications. Service delivery platform. That's how the developers actually get their app to work on the network. Some of the cloud services.

That local control component, which was a request from public safety. They really wanted the capability to manage their own users, manage their own subscriptions. AT&T has brought together, as part of their solution, some enhanced capabilities for incident command and response, and uplifting priority levels, and some other key capabilities that we think are going to be fantastic for public safety.

And last but not least, the security of this. How many more instances do we have to see in the press of security vulnerabilities? Making sure that's built in, you know, into not only the applications, but the network as well.

So we've done a lot of work over the last six months, or since contract award as well, working closely with AT&T, focusing on, we've got to think bigger than just voice interoperability. That's been the key touchpoint for public safety for many years. But now we're moving to a broadband data network.

It's going to be more than just voice. We are talking applications. Applications from different agencies, different public safety users. We see that as really the big challenge in moving forward. We're excited about it. We've got some great things that we'll be announcing in the future to help drive this in the standards arena.

We have 3GPP for those network standards. This is an LTE network. 3GPP defines those and focuses on that. What we're talking about are driving standards for the application development, and leveraging best-in-class for public safety in this.

We know technical work is necessary, but that is insufficient just to drive the adoption. We've got to prioritize our focus on the applications and the standards work we want to do. The value of standards is driving that adoption and the value to public safety through the vendors and the economies of scale, that public safety has been wanting for their communication needs for the last decade or more.

We are going to continue to drive the open public processes for accessing and developing these application standards. We want to keep and involve the public safety community with our notices, developer events, plug tests, plug fests, other capabilities that we'll bring to bear for the applications on this network.

Some of our focus areas: We pulled this together in consultation, and also as we've been working with AT&T and the developer community, some of those key areas. So this chart kind of illustrates some of those areas that we've heard direct from public safety that are important to them for their specific discipline regarding data and applications, and where clearly defined standards would benefit them.

So starting with the top left is our law enforcement: e-citations, the court, records management, digital evidence, facial recognition. Under fire, the personnel biometrics, location. Chief Johnson, near and dear to his heart, 3D geolocation. How do we get there?

Bottom right, the EMS community. Electronic health records, en route, telemedicine collaboration, you know, doing that remote diagnostics of injuries in the field.

And then bottom left, not to be left out, the emergency management telecommunicators. The PSAP communities. Those CAD systems. The integration with dispatch. Next generation 911. The server info to the PSAPs, and how we get that on through the first responders on the FirstNet network. That government records and alarm management.

So all of these are areas where we've been told by public safety we need to focus on standards moving forward.

The applications based technologies you see on the left, these are cross-cutting across all the disciplines. The location application capabilities. Situational awareness. Data

analytics. I believe Dereck Orr will be touching on some of this with the grant program and how data analytics is a huge driver for public safety as well.

And then, yes, sir?

TJ KENNEDY: Quick question on this. Do you see, for the role of the lab and the technology team, that by doing this and ensuring that we stick to the open standards that were envisioned in the Act, that we'll be able to drive more competition? Drive down, you know, make sure that things are affordable? And that the innovations that happen, happen in a way that can be utilized anywhere in the country, regardless of…

JEFF BRATCHER: Absolutely. I wouldn't just say in the country, either. Worldwide as well. Canada, we have partners that are looking to this as well. But that is absolutely the goal of this.

And also the other, we've heard from a lot of actual firefighters, police officers, emergency medical technicians. They've created some of their own apps. How did they get into this? How did they make this available? Who better to create an app than someone that's doing the job every day, and what they need to have done?

So it's all of the above, TJ, as well as some of the small ones that don't understand how to get into that ecosystem.

TJ KENNEDY: So if you were to just simplify this, you would say your job is to make it easier for those kinds of innovations to come to bear, and that with the software development kit, with all of the details that you're going to provide and post and put out the standards, it'll make it very easy to drive that open ecosystem that's going to really drive…

JEFF BRATCHER: Correct. Yeah, the application programming interfaces--you'll hear APIs a lot today--that's what drives that openness in development for those software developers to be able to do that, and bring these applications, and take advantage of our unique capabilities that AT&T has brought to bear for public safety on this nationwide network.

SUSAN SWENSON: Could, Jeff, one of the things and it's actually a conversation I had with Dereck a couple of years ago. I think, Dereck, you had a PSCR conference that was really looking to the future. And one of the things that came out of that is we tend to compartmentalize our thinking around fire, you know, law enforcement, EMS.

I think there's a move afoot I think where there's some more horizontal view of these things, so that the public safety works more collaboratively and can through these, versus creating kind of more silos and verticals. Is that kind of part of this as well?

(Crosstalk)

DERECK ORR: Absolutely from my perspective. I can't speak for the CTO but…

JEFF BRATCHER: Yeah, absolutely (unintelligible).

DERECK ORR: That was not simply from creating (unintelligible).

(Crosstalk)

DERECK ORR: …but I think that's true for Jeff.

JEFF BRATCHER: I like to put him on the spot. Absolutely.

(Crosstalk)

JEFF BRATCHER: And that's really that left side, too, the base technology across all the disciplines.

And then looking to the future technologies and I'll get into a little of this in the network standards later, developing that, the core standards in the network, so that those higher level, the applications layer can take advantage of those key hooks in the network…

SUSAN SWENSON: Across.

JEFF BRATCHER: …across…

((Crosstalk))

JEFF BRATCHER: …and reuse that across different applications for different…

SUSAN SWENSON: Exactly.

JEFF BRATCHER: …users.

SUSAN SWENSON: And I think we have to really encourage that.

JEFF BRATCHER: Absolutely. And then some of the emerging applications. PSCR, Dereck will talk on this. You'll see some actual examples of this in our demos later this afternoon as well.

The virtual assistants. The virtual reality. The augmented reality that was mentioned earlier. Those are really big areas of development, not only on the commercial side you hear a lot of this, but we see a huge benefit for public safety as well in training environments and other capabilities that Dereck will talk about a little later. And you'll see some examples of this later in the lab.

Another slide I'll put up here, and this one's resonated well out when we've given this publicly and talking to APCO and NASTD and others that I've given over the last month or two.

So what you see here is one of the phones out in the lab. And this is what FirstNet will look like on your device. And some of you have this off the tag now. I know it's on some of ours that are on AT&T.

So we were doing some marketing and development of how this'll look on the devices. That's not really the key of this, although for those listening and watching, this is what it'll look like as a person that's primary, extended primary user. I believe this is on an iPhone device.

I'll call your attention to the left side. That's the screening. You'll notice there's no applications on that. I did that by design. It's blank right now. We've got the main ones on the bottom that we all have.

But this is really, when I'm talking to public safety, we want to know what app you want showing up on that phone that'll help you do your job. I see Sheriff…

UKNOWN MALE SPEAKER: I have a question. So in what if like, you know, God help him, Jeff develops an app…

(Crosstalk)

UKNOWN MALE SPEAKER: Jeff Johnson, you're saying, correct?

((Crosstalk))

UKNOWN MALE SPEAKER: Would FirstNet or AT&T purchase, how would they leverage that? I mean…

JEFF BRATCHER: Great question. So there, and we've got a lot of past experience now, AT&T does as well, with different app store models, how that's done with both Apple and Google and some of the others. We're developing that FirstNet application store capability as well. All that's part of that that you'll hear about later today when we're discussing that.

But absolutely, that's what we want to spur and drive, that innovation. And we want public safety, if they're not an app developer, and Jeff does this, great. He's like, Bratcher, solve 3D geolocation to sub-1 meter resolution. That's what I need, right?

And that's what we're looking for from public safety. Tell us what you need, and that's what we want to drive into the community. And we're going to have some events to where, that'll be announced later in the year, to help tailor that developer community to those needs that we're hearing from public safety going forward.

TJ KENNEDY: Hey, Rich, to your point, I think what Jeff's team's really trying to do well is make sure that we're publishing and very open about the standards, publishing and very open about the APIs and the software developers can have the details to go forward.

And then taking the input from public safety that goes out to the technology community, so that the technology community knows they will have an open playing field where they can generate money off of creating solutions that firefighters need, that police officers

need, and that it can actually meet the needs and really continue to evolve as quickly as we've seen apps evolve in the commercial sector over the last ten years.

We're hoping to see that exact same kind of fast evolution, fast uptick in capabilities, getting in to the hands of all first responders.

UKNOWN MALE SPEAKER: Yeah, but it's not a free-for-all.

TJ KENNEDY: It's not a free-for-all.

(Crosstalk)

UKNOWN MALE SPEAKER: …have a point here which is critical as, you know, determining what it is the market is saying it needs. It's also assuring that if it is put into place, that it meets the requirements for reserving (unintelligible) and for security...

JEFF BRATCHER: Absolutely.

UKNOWN MALE SPEAKER: And for personalization…

(Crosstalk)

UKNOWN MALE SPEAKER: So that's a process tied to the, that's actually Jeff Bratcher's organization, is that process…

JEFF BRATCHER: Right.

UKNOWN MALE SPEAKER: …you're not going to decide which app works versus not. That's not your…

(Crosstalk)

UKNOWN MALE SPEAKER: If an app is going to appear on a FirstNet, call it, customer's phone screen, with the logo on it, then it will have to have gone through, you know, evaluation and process…

JEFF BRATCHER: Absolutely.

(Crosstalk)

UKNOWN MALE SPEAKER: …resiliency and security.

JEFF BRATCHER: I can now skip my last three bullets on this slide.

(Crosstalk)

JEFF BRATCHER: That's exactly right.

UKNOWN MALE SPEAKER: That's not going to determine the business case. The business case will be determined by the level of the market.

(Crosstalk)

JEFF JOHNSON: I'm a little upset that the sheriff has unveiled my Dunkin Donut app store…

(Crosstalk)

TJ KENNEDY: I mean these questions may seem mundane to some…

(Crosstalk)

TJ KENNEDY: These are the questions we're getting. Because, I mean, FirstNet's job was to develop this network, create it, develop it. But now that that part is done and moving, it's just as important to integrate what we currently have, because we may have had a patchwork out there across the country…

JEFF BRATCHER: Absolutely.

TJ KENNEDY: …but you now have to figure out how you're going to integrate some of the things that we like and do, along with some of the things you're capable of doing.

JEFF BRATCHER: Yeah, that's a great comment. It's definitely not mundane, because there is development needed to take advantage of some of the key features we're building into the network. You're absolutely right.

Public safety tells us, I don't care. If it does FirstNet on there, I'm fine. I know I'm on the network. It's how I'm going to experience the network with my applications and use of the network, is what they're focused on. We are not limiting what they're using today. You know, if they have apps they like today, they'll be able to use them on FirstNet as well.

But we want to drive the industry and the vendor community towards the open standards-based development of applications to take advantage of those network features like quality of service, priority, pre-emption. Because there is some development needed to take advantage of some of those key features.

UKNOWN MALE SPEAKER: So a great example would be like video conferencing. Not like what you have here, but think about all the people who end up in jail or prison and you have to go see mom or dad or brother or sister. You can do so via video. And so we're struggling with how to do that.

There are a lot of vendors out there that have solutions for us. But at the end of the day, it's going to come back on this network.

RICH REED: Right. It's the network. And there were actually a couple slides we blew through in my presentation that deals with this. Jeff and I are working together on it.

There's a lot of work being done both at the public safety agency level, as well as third parties.

And we understand that we don't want to lose that work that's been done. We want to capitalize on it and build off of it. And then we need to figure out how we're going to take that work, if it's desired and appropriate, and call out sort of the best of breed, and then put them through the process to even have them be in the app storethat we're going to make available to public safety.

So we don't want to start from ground zero. We want to build off what's been done, what's been invested in already, what's operational and useful.

KEVIN MCGINNIS: But you've also got to remember that this is not a linear process. We don't just say, okay, today we're going to determine what first responders want. And then we're going to match the need with the developers. And then we're done.This is a constant process. I mean 90% of my colleagues in EMS probably don't know what they want on broadband, because they haven't had broadband this dependable to play with.

(Crosstalk)

KEVIN MCGINNIS: Yeah, but soon that will happen. And we'll be in a totally different environment. And so we're going to have to, you know, invent those things because it is apps that are going to make or break us.

RICH REED: Kevin, and to your point, all right, if we may have 500 agencies all developing that same sort of app for a very specific agency and making, you know, 500 times the investment necessary to achieve the goal.

KEVIN MCGINNIS: You got it right.

(Crosstalk)

RICH REED: There's a lot of deconflicting and correlation work that needs to be done just to make this successful. It's really complex.

TJ KENNEDY: It's an ongoing engagement between Rich's CTO organization…but the CTO organization has to be there to be able to listen and hear from police officers, firefighters, paramedics, and EMTs what they need.

RICH REED: Right.

TJ KENNEDY: And to your point, that's going to change every day for the next 25 years. And it's going to evolve, which is good. But it's going to have to make sure that we bring that in and be cost effective about how to push that forward.

(Crosstalk)

RICH REED: It's not just up to you, it's a lot of people have interests, both commercial and public safety at all levels of government. There's a lot of smart people out there trying to do the right thing.

JEFF BRATCHER: And I'll say, Kevin, to tie it back to Neil's lead-in, with his example of the officer choosing where he has broadband, in the future, the way AT&T and the partnership we've built with them using their commercial network, they're never going to have to worry about that again. They'll have the network. So that will drive that what can I do now that I always have it and it always works, those applications and needs.

UNKNOWN FEMALE VOICE: Jeff, can I share one thing? And I don't want to bring it up necessarily to ask how it's going to be addressed. You know, I think we need another pillar, which is around data management, because the, the apps are going to all ultimately get down to how you do the data-sharing.

JEFF BRATCHER: Right.

UNKNOWN FEMALE VOICE: And the data-sharing, in many cases, is a really a complex legal and sort of, you know, statutory blah, blah, blah issue.

JEFF BRATCHER: We actually refer to it as governance. How those agencies can do that, and want to do that.

UNKNOWN FEMALE VOICE: Right. And we may be in the middle of actually trying to look at state-by-state issues around data-sharing, and then look at, you know, is there something that would be more nationwide in terms of that sharing, because there's FirstNet.

So I don't think we need to like delve into it today, but there is another pillar here.

(Crosstalk)

UNKNOWN FEMALE VOICE: And it's very much a governmental kind of a role to really help, because that's actually one of the inhibitors in the states, is it's actually the existing statutory requirements that have been built up over time, that are…

JEFF BRATCHER: Yeah, no, that's a great point.

UNKNOWN FEMALE VOICE: …a real issue in terms of being able to do real data-sharing.

JEFF BRATCHER: I'm careful, the engineers on my team won't be solving that. That'd take (unintelligible) umbrella over all of this. But absolutely in working through…

(Crosstalk)

JEFF BRATCHER: …users, and those that are using those apps. And some of them don't want to share. They don't want to share with the fire…

(Crosstalk)

JEFF BRATCHER: …or aren't allowed to, absolutely.

(Crosstalk)

UNKNOWN FEMALE VOICE: Exactly. So I think that's where, you know, I think some of the public safety organizations that are looking at things like CJUS and…

JEFF BRATCHER: Right.

UNKNOWN FEMALE VOICE: …the existing data-sharing organizations are going to have to step it up a level…to really look at, you know, how this is going to be done in the future.

(Crosstalk)

JEFF BRATCHER: And we're also very careful when we're talking to public safety that we aren't the Hoover of all their data. We're not Hoovering it all up and putting it in a big cloud server somewhere. They own their data. They're responsible for what they do and what they will and will not share and all that. But we're trying to enable them to be able to do it should they choose.

UNKNOWN FEMALE VOICE: We can help, well plus we can help facilitate…

JEFF BRATCHER: Absolutely.

UNKNOWN FEMALE VOICE: …a national discussion on sharing. Because we all love this stuff because, man, we can see it and push buttons…touch it...and all that.

(Crosstalk)

JEFF BRATCHER: You're going to love it this afternoon.

UNKNOWN FEMALE VOICE: I know that.

JEFF BRATCHER: You'll love this afternoon.

UNKNOWN FEMALE VOICE: It's like just pump it on there…

(Crosstalk)

SUSAN SWENSON: Hey, Jeff, one other question. And maybe this is good with Ron now being a board member. I think of the PSCR meetings, and I think of all the involvement that DHS has, not only today but in the future. How do we coordinate with DHS? Because they've spent billions of dollars, I think, in this area? I just don't know how that works?

(Crosstalk)

RICH REED: When Ron talks, I'll follow up…

SUSAN SWENSON: Yeah.

(Crosstalk)

UNKNOWN MALE VOICE: Well actually, I mean, they're actually sponsors with $300 million that he's going to speak about today. We, the FCC, ourselves, (S&T), are all on those calls and coordinating…

SUSAN SWENSON: But you have capabilities today that are not future investments…

UNKNOWN MALE VOICE: Right.

SUSAN SWENSON: …that we could probably leverage today. And we talk about the coordination effort, do you think there's room for opportunity there to do more for FirstNet?

RON HEWITT: There's one entity that we can't overlook, and that's SAFECOM.

SUSAN SWENSON: Yeah.

RON HEWITT: And SAFECOM, a lot of what SAFECOM develops became something that FirstNet is. Like our PSAC. So they're borne of the SAFECOM group. And SAFECOM's overall responsibility is for public safety, to promote interoperability in communications. That goes way beyond FirstNet. That's everything.

And I think Rich has worked there, and a number of us have worked there. But it, that is a coordination entity for public safety to discuss a lot of people that should have an awareness.

RICH REED: Kevin, great plan. I agree with you, too. And just to your point, Admiral Hewitt, I think there is a real synergy between what DHS-OC does and what we need to do in the future. There's a play here for both our PSAC as well as SAFECOM.

This is a huge, huge animal. And getting our hands around it is going to be a lifelong endeavor. And how we share information is going to be both a technical issue, how we integrate ICAM and the profile attributes that allow you to identify people and what their roles are, are all going to be important. And then there's a huge governance piece that's going to have to be at play. It's a big job.

Our first, you know, five-year target was getting the network built. Our next challenge is making sure that we can use the network in a way that benefits public safety.

JEFF BRATCHER: And that's exactly why I led with this. I think the sheriff said it at the beginning. You know, network, fine. Now this is the next big area, and that's where there'll be a lot of effort. DHS has done fantastic work in governance bodies and

helping, you know, state, local, federal, all, you know, talk about how to share things and data and operations. Great point.

RICH REED: And I would expect Dereck to have this fixed in three years, right?

UNKNOWN MALE VOICE: Two.

RICH REED: Two? Two.

JEFF BRATCHER: So we talked about applications. I want to move on to devices. And you're going to see a lot of these out in the lab later today as part of our demos.

And I'll reiterate. We don't have to wait on Band 14 devices with the solution we're now providing through FirstNet. We're getting quality service, priority and pre-emption on existing AT&T bands. So the devices they have today can have that capability by the end of the calendar year when they roll it in.

We are focused on some key areas for public safety, and we're influencing that roadmap of devices with AT&T now, based on fire, law enforcement, EMS and other recommendations through the PSAC that we're already getting, and driving those into those vendors that supply these devices to AT&T and FirstNet moving forward.

So again, that'll be a big focus moving forward, not only on the application side, but also some of the devices.

I put these three slides in here and they're really based on the EMS 3.0 framework that I believe Kevin McInnis is very familiar with. To kind of, to really shape our vision and how we're going to drive this, you know, it's the protecting, connecting, situationally aware for the three disciplines.

So, for firefighting, real-time monitoring of that firefighters VOCs that are embedded, chemicals sensors, radiation sensors, locating the firefighters and potentially victims in those fires.

Connecting them, so the ruggedized devices. We've heard from the fire community, look, you've seen it in the hurricane. They're underwater connecting fire hoses to the hydrants, et cetera. Ruggedized devices, the NFPA requirements, reliable accessories, because they work in pretty brutal environments, so, driving that.

And then the situational awareness, surveillance, search-and-rescue, hands-free. You know, they do a lot of work with both hands, they don't have time to mess with a smart phone, giving the presentation of contextual information hazards to them for what they're doing. Some of the augmented realities that you'll see later today. So, again, the fire focus is those ruggedized devices, hands-free operation and presenting that contextual information.

Let's move on to law enforcement.

So, they have clearly identified security as an emphasis as well as together with contextual information. Evidence-based policing, the cameras, the vehicle videos, identification of suspects, secure ease-of-use connection to the network or the data bases of the applications they are using, some ad-hoc connection of these personal sensors, personal area network hubs that they've used and want to use moving forward, bluetooths being put into everything. How do we consolidate all of those streams coming in?

And, again, the situational awareness, internet of things, intelligence-led policing. The gunspotter sensors, CCTV, license plate readers. How do they get all of that information to them over the FirstNet network so that they can do their job and protect lives. And, again, also the push for hands-free and the contextual assistance.

Emergency Medical Services division, not just protect but care and protect, patient tracking, complex incidence, on-patient band identifiers and ID bands for when they are triaging patients in the field, telemedicine capabilities, integration of all of this for the personal health records, protection of those personal health records, connecting, sharing diagnostic and monitoring information from the doctors, the EMTs, or the staff in the field, rugged devices and tablets, dispatching clinics, a lot more tablet-focused with the work that they use in the field and in the ambulances.

And, again, exchanging, under the situational awareness, that real-time audio/video feeds with hospitals. Defibrillator location, readiness information, integrating that to the computer in your dispatch systems.

So that's kind of what we're driving. I think we've had a lot of good feedback from the PSAC and Kevin, if you wanted, I'll let you chime in on this. We've rarely leveraged that EMS 3.0 framework. I think it fits nicely with how we're going to drive these visions of the different disciplines in the future. I have tapped the team with our Emergency Management dispatcher self-Communicator vision, we should have that slide for the next go around.

But, I'll open it for a few questions on this if that resonates and move forward after that. Sound good?

KEVIN MCGINNIS: Yes. I think this is good. I would add into this prevention, I mean, one of the big things about EMS 3.0 is that we are doing preventive and primary care between emergency calls to prevent emergencies from happening, not just with discharge.

JEFF BRATCHER: Great add note.

So, devices. Moving on to one we've gained a lot of traction over the last several months as well and I think Bill Schrier has termed this, we all went around several different terms, but we've heard all internet of things; now we're talking internet of live-saving things. So, we're focusing on this. We've got a team working to move forward.

Most of the IOT solutions today are outside the context of this. We've got, you know, Alexa, Google Home, some of them may have a public safety component, you can call

911 via your Smart Home sensor and record conversations, but we're really focused on those things that will help save lives. So that's why we're terming it Internet of Lifesaving Things.

A lot of the smart communities' IOT capabilities have direct or occasional public safety use. We see the dark green side of the bubble of this Venn diagram of the Internet of Lifesaving Things, and some of those, though, in medical healthcare fall outside the purviews for privacy and personal concerns. This is a considerable part of that but outside that smart community's bubble. And these can include the wearable and embedded health devices, heart monitors, your Fitbit trackers, et cetera.

However, all these devices and the associated software contain much very valuable data, which should be made available, if authorized, to the emergency medical responders when they need it, if allowed.

So, we'll have more on this tomorrow. I believe TJ is talking about this for the full Board tomorrow. But we do have teams focused on this. This will be a big driving area we build as well for the public safety community. Again, we don't want them left behind in the bigger internet of things scheme as we move this network forward.

KEVIN MCGINNIS: I'm not quite getting that distinction. I mean, the health, the privacy of personal health information what have you is just one reason that you segment data and don't let everybody get at it.

JEFF BRATCHER: Right.

KEVIN MCGINNIS: (Unintelligible) and NCIC and all sorts of non-health things. So I don't think I'd make such a big deal out of that distinction.

JEFF BRATCHER: Okay.

KEVIN MCGINNIS: I mean it is a distinction, but it doesn't mean that we shouldn't be planning on it because we should be.

JEFF BRATCHER: Great feedback. Thank you, Kevin.

So, we talked about maps, devices, internet of lifesaving things. I wanted to touch briefly on the radio access network, again, to the sheriff's comment earlier. The user really doesn't care as long as it's there and works. But I always want to pull back to what AT&T is committed to doing with FirstNet and that is really highlighted on the right side of the slide.

When we released the RFP, we were going to build a Band 14 with quality of service, priority, and pre-emption network for public safety use. That's what the public safety alliance and public safety came together to get the spectrum and some funding to get this build going.

AT&T, via what I considered their CEO, made the decision that we're going to give this priority and preemption on all our bands. We want to get this to market quicker than

waiting the two to three years to build Band 14 everywhere, get the devices to have Band 14 for them to be able to take advantage of these capabilities. They stepped up and said, 'We're going to give you access to our entire commercial network.' We're going to add priority as soon as the State ops in. It's already in the network. Preemption will be there by the end of the calendar year. They're doing that development and putting it into their commercial core network now. And then when we have our core in March of next year, all of that will be there as well. So no matter what band they're on, they'll have the quality of service, priority and preemption capabilities for FirstNet subscribers.

And we like the pictures on the web. Back to the highway analogy that we use all the time. We were, again, envisioning a single band RAN, a single-lane highway for public safety users at 20 megahertz a spectrum. We are now bringing, and will have available, a multi-band RAN solution multiple-lane highway so that when they need to use the network, just like today when you see the lights go on the police car, the ambulance or the fire truck, everyone gets off the highway and they use the whole thing. That's what we're doing with the entire AT&T commercial network.

KEVIN MCGINNIS: Another distinction. I think those are great pictures – always did. There's another way to use them instead of Band 14 only. What you have for AT&T in your state today only. But this one you can have from FirstNet in your state down the road.

And you can have those arguments that we don't have anything at (unintelligible).

JEFF BRATCHER: Absolutely, Kevin. Good point.

So, some of the future innovation and technology for the radio access network, we actually have one of these out in the lab; you'll see it later today, focus on the deployable capability and how we can bring the network to where the event is happening and have capabilities for responders to do their jobs, you know, envision wildfires and other use cases where there's no terrestrial network bringing these types of capabilities along with the COLTs and the COWs and the other farm animals that you hear about. You'll see some of those today as well.

So, we're doing a lot of work on this and AT&T and leveraging some, this is a very greatly expanding field right now for aerials, not only for public safety use but, I think, in the commercial sector as well. Seeing a lot of issues with them as, you know, an event. The public safety has seen the unique need in how it can drastically reduce response times and discernment in firefighting situations for them to focus their efforts in battling those fires. So, really excited about this area and we'll have more today in the lab talking about that.

SUSAN SWENSON: Is the aerial LTE solution in use today, I mean, or are they still testing that?

JEFF BRATCHER: Great question. I'll hold to not steal her thunder, but you'll see one out in the lab today. And they've been demoing those and piloting that capability. Capability's there today.

SUSAN SWENSON: Okay. That's great. That's what I thought.

JEFF BRATCHER: Yes. Yes. There's a, I think, they accelerated some of that, because of the recent events, to start doing them and using them now.

SUSAN SWENSON: Good. Speaking of this…

JEFF BRATCHER: …yes. They heard me talking about them. Hi Chris.

So, moving on to the core network. So, we've talked that. We've talked devices, we've talked the radio access network. The core network, I think I reviewed this at the last Board meeting, but just to make sure everyone's up to speed, the core network is, we finalized the critical design review. That's been approved. AT&T is now implementing that today as we speak and it is targeted for March to be online and ready to move forward with that capability.

And that will really be the base platform for everything we're going to drive forward to FirstNet. I think I mentioned last time this was a wireless industry first. They have their commercial core and the backup should anything ever happen on the FirstNet core as well. That's not being done anywhere else in the world today. AT&T took the security and development of this very seriously, and we're really pleased with how that's going to roll out.

Geographically redundant capabilities, thorough over capabilities, inherently built into this. And, again, that core is divided, not only the basic network services, but those standardized mission-critical services that I'll talk about in a minute for the future. The secure access to those PSAP communities and then a public safety enterprise networks as we defined them in the RFP and our proposal in talking with public safety. And again, that full network sharing across the Band 14 and the commercial AT&T LTE bands.

Leveraging what's called MOCN, the Multi-Operator Core Network, that's in the standard, it's a standards-based implementation to be able to do this across not only their commercial bands but our Band 14 as well, but always ensuring that that commercial traffic is tied to a unique identifier, a network identifier, that directs all public safety's traffic securely encrypted to our core network. And then the quality of service, priority, and preemption across those bands.

On the evolution, so, this is touching on the standards technology for LTE and was with the recent report put out. By the end of this year, there will be three billion worldwide connections on LTE. By the end of 2018, we're up to five billion LTE connections.

So, and I was in some of the initial meetings, as was Dereck, when public safety was actually choosing what technology should we push for this network, the future broadband network that we may get may never get. And they were going back and forth between YMAX and LTE. They obviously chose the right core and the drive and what we've done with industry 3GPP is becoming worldwide focus for LTE in solving and providing those critical capabilities for first responders worldwide in the standards in an open-standards development environment.

Yes, sir.

KEVIN MCGINNIS: Jeff, am I understanding that ProSe is actually, might be the technology of choice for vehicle manufactures for the vehicles to talk to one another? If that's true, are we involved in those discussions as it relates to us in direct network…

JEFF BRATCHER: Absolutely. We're involved in all this. The team is in Japan this week, actually, on standards for the plenary and 3GPP does these plenaries once a quarter, I believe, where all the committees meet to discuss strategies and focus areas. We've been driving those public safety requirements in all that. ProSe stands for "Proximity Services" so that's how devices know we're in proximity to each other and that's also a critical enabler for some of the mission critical push to talk and other capabilities in the future.

But it does have that soft commercial bent, which drives that economies of scale but we don't want them to forget public safety's unique needs as they move forward as well. And that's even present now in the 5G discussions that are going on. They're standardizing and working through the standards on radio network, interface, and capability. We're ensuring they're not leaving behind all the work we've been doing for public safety to drive this into those standards.

KEVIN MCGINNIS: I think, I'm going to be fascinated by how the technical team manages that. You know, because the B2B component is of ProSe. There's also, as you say, a commercial aspect of that. And, absent a better term, I think that'll be a lot more sloppy than we're interested in, in term of the B to C piece of that. We're looking for far more accuracy. But, I do believe it's likely that they are going to drive the speed to market, the pace of that.

So, I'm really glad to hear you're involved in that, that our team's involved in that.

(Crosstalk)

JEFF BRATCHER: …now as well. AT&T has their standards team fully committed as well as the vendors providing equipment to them and even the public safety vendor communities directly participating to help drive this worldwide.

And, again, we've had how many countries at the international forum that are all looking, we want LTE for our public safety as well, we need to make sure these capabilities are in there when this whole thing goes.

So, before I wrap up, I'll just give you a highlight of what you're going to see later this afternoon. We've got a full day planned. We're going to show you some priority services demonstrations, some of the existing over-the-top and embedded push-to-talk solutions that are available now to public safety, demonstrations of the applications store, the home page, the application developer portal, the NDR SATCOLT capabilities, some trailer and unique capabilities that you'll see that we're very excited about for those public safety agencies that want to own their own devices, the satellite capabilities applications and last, but not least, Dereck Orr's brought his team with some virtual

reality and airborne deployable research that they're going to highlight for the Board members as well.

So, looking forward to it. I hope you all have comfortable shoes. It's going to be a long afternoon, but we'll get you through it and we're very excited to have you here.

With that, Mr. Chairman, that concludes my update. Thank you for the time.

NEIL COX: Thank you, Jeff. It's my pleasure to introduce Dereck Orr who is the Division Chief of the Public Safety Communications Research Division of NIST. He's got a long resume in (unintelligible). He was at SAFECOM at one time, which we talked about here this morning. But in the interest of time, Dereck, we appreciate you having to spend time with us.

DERECK ORR: It's a pleasure to be here. As usual, Jeff leaves me approximately 30 seconds, so…

(Crosstalk)

DERECK ORR: So, I will, in light of where we are on the schedule, I will make sure I am efficient in going through these slides. Really, this is an update of where we stand right now and some of the big accomplishments we've made over the last year.

So we are in full swing now, I would say, in our work. Just to ground everybody in what we are going to be talking about here today is PSCR, the Public Safety Communications Research division, did receive $300 million, through the same legislation that created FirstNet to support research and development that would lead public safety to fully be able to utilize and make use of a nationwide broadband system.

And, in the legislation that was specific to NIST and to PSCR, two things were clearly delineated, which was ensuring that there was a path for mission-critical voice to move from Land Mobile Radio to LTE. And, in addition, ensuring there was a capability of Land Mobile Radio communications to LTE in the period of time that those two technologies coexist. So, that was clearly delineated in the legislation. But then the legislation was fairly broad and other necessary critical features identified that are important to public safety.

So, Sue alluded to this earlier, but back in 2013, we held a meeting knowing that at some point we would get the money and wanted to look beyond those two elements that were in the legislation and look at those really future-looking technologies that would make this a transformative network for public safety. And what we identified in that meeting, in that three-day meeting, was in addition to Land Mobile Radio to LTE and in addition to mission-critical voice in LTE were location-based services, data analytics, and enhanced user interfaces.

So, that is really what we have built our $300 million R&D portfolio around. And that's what I'll be talking about today.

So, in all of those areas, we tried to take a very repeatable and defined approach so that we would have traceability at the end of this program to why we did what we did and how we got to where we are. So, we started road mapping each of those areas with user groups from public safety and industry and academia. We published road maps. We held summits around the road maps with greater populations of people than participated in the road map development. And then we issued reports around that summit and then we started building project plans around the summit reports.

We've done this for all three of those key areas that I just showed you and we've held smaller, I would say, focused roundtables around mission-critical voice because we have such a long history in that. We didn't need to hold a big summit. We just needed to get the key stakeholders together and start talking about when we'd get done.

So, this year, this is just 2017, what we've done in the stakeholder engagement arena this year, we've done our last road map summit. Well, we published our final road map, the user interface road map. We held mission-critical voice roundtable, a second one on that topic. We held our broadband stakeholder meeting, our ninth one, in June in San Antonio. Many of you were there. We have had, or, yeah, we've had our next direction deployable systems roundtable in July. And we have held our final summit around the user interface roadmap in July. So, we've actually wrapped up our road mapping processes.

And then upcoming engagements for this year that are already planned, we are in October having a larger next-generation deployable systems summit with more people than the roundtable that we've had. And we are having a security virtual roundtable, an online roundtable, around security topics that we're focused on.

Just to go over some of the internal initiatives that we're doing within NIST right now, and this would be across NIST. This isn't just in PSCR. This is us funding other NIST laboratories to do work on behalf of public safety.

In the mission-critical voice arena, we are focusing on some of the key performance indicators that will allow us to measure whether or not LTE meets the key performance indicators of Land Mobile Radio. So we have just completed work in mouth to ear latency so we will be able to say how does LTE compare to Land Mobile Radio. And we're also looking to evaluate the performance of Direct Mode or ProSe and that's work being done in other divisions of CTL, our Communications Technology Laboratory. That's not a goal means shop. They've done work for the last 10 years for us in modeling and simulation and mobile. They're probably our heaviest work right now in ProSe.

In security, we have a team in Gaithersburg through the information technology laboratory looking at mobile signal finaling, that's one of probably the most important aspects right now in the security piece.

In the user interface arena, we have continued work going on in seeing if we can leverage virtual reality to recreate a realistic public safety environment that we can then test user interfaces in in a realistic scenario but in a controlled repeatable environment.

We will have a system out here today. If you've never tried virtual reality, I encourage you to do it. It's cool. You'll enjoy it, and you'd be able to put out a fire.

So, what we're really trying to do with what you see out here today is to show people you can be immersed in this situation. In fact in San Antonio we had firefighters put on the system, they actually started to get down on their knees when they were putting out the fire. They were doing what they would normally do. So you can actually be immersed in the scenario and then, if we can overlay on top of that, interfaces like heads up displays and maps or auditory cues or captive feedback, we can start to measure, repeatedly, which of those interfaces are going to have to best outcome for the tasks that we give them.

SUSAN SWENSON: Well, Kevin tells the story about users from the EMS side. It's so real you kind of, I mean, you get nervous…

(Crosstalk)

DERECK ORR: Oh absolutely. You can. You can.

KEVIN MCGINNIS: But, what I want to know, though, is are we going to have to hold him down and we're going to put Jeff in front of that and then the firefighter would (unintelligible) the sheriff.

DERECK ORR: We have (unintelligible) at this conference too. We don't have that out here today. We only have the fire. I'm sorry.

JEFF JOHNSON: I'm doing the sheriff one right now.

DERECK ORR: We did it, though.

And then in the UI field also we have a team in Gaithersburg through the information technology lab collecting, they're doing a number of surveys at public safety agencies to understand the key areas in their daily tasks where new interfaces would make the largest impact. So, that's being built in interviews with the public safety community.

In location-based services, we have work going on in our physical measurement laboratory with the people who also work on the atomic clock for NIST and others that are timing experts on finding ways to make more accurate indoor location, and make that capable and available to public safety. And then we also have a team in ITL creating a location, and indoor location tracking system for testing in the Gaithersburg campus.

So that's all internal research going on at NIST right now. That's not all of it. But that was the things I wanted to highlight for you.

SUSAN SWENSON: Can I ask a question of LBS…that's a big topic.

DERECK ORR: Sure.

SUSAN SWENSON: And Chief Johnson obviously is particularly interested. It doesn't go a day that I don't talk to him and he brings it up which is appropriate. There's a lot of people claiming to have solutions out there in the environment and some of them are in various stages of reaching the end game in terms of meeting expectations.

I'm just wondering how this all kind of comes together for us and AT&T because, you know, we get contacted by a lot of these people, and I'm sure we meet with them and kind of understand. But I'm just trying to understand where it all kind of comes together. I mean, does this information go to FirstNet and AT&T and I can tell you that this is what we know about it. Then they can make the commercial decision.

DERECK ORR: Absolutely.

SUSAN SWENSON: Is that how…

DERECK ORR: Absolutely. We're not trying to find a solution. We're trying to advance the state of the art…

SUSAN SWENSON: Okay.

DERECK ORR: …with innovation so that others can decide what…

(Crosstalk)

DERECK ORR: And LBS is much more complicated than most people, I think, give it credit for. Not simply the XYZ coordinates which, you know, everybody talks about "Z" axis, very, very, you know, important element that is difficult to get and especially if you assume worst case which is, I have no existing, preexisting infrastructure in the building or around the building in which I want that level of detail.

On top of that, do you have a map of the building? Does public safety have access to maps? And if you do have a map, how do you then take those coordinates and put them on top of the map in a way that is accurate and then once you have those coordinates on top of that map that's accurate, how does public safety use some form of navigation indoors to navigate to where they need to be?

So, those are all different elements that have to come together to make a successful indoor location system for public safety, which, of course is what we're looking at, right?

So, in the prize challenge, I know everybody knows that we're working with prize challenges. We did our first one and announced it in June in San Antonio, and that was around this VR idea for testing user interfaces, and we actually provided $50,000 to five winners and we had an honorable mention. It was a nice test of how prize challenges could work for us. It was our first foot out the door.

We actually have a second one in play right now. It was supposed to be our first one but some lawyers got involved and now it's our second one. And it is actually to develop some very professional future-looking videos in each of those five areas that I highlighted that were focused on to show people who don't on a daily basis think about

public safety how the kind of technologies they may be working on in the areas they're working in could apply to safety to get them excited and want to start working in this field so that it will be on location services and analytics and all of the five areas that I talked about. That will, hopefully, we'll have finished videos by Christmas is what we're hoping.

The next prize challenge that we have lined up to do right now is data de-identification prize challenge which is, can we have a challenge in which people can create algorithms that would take a data set that might have identifiable data in it and with that algorithm strip it of the identifiable data but still have the data meaningful within the data set because we need people to get access to data sets to do research on analytics and other things, but we can't give them data sets that could then be used to identify people. So this challenge will be to see can we create algorithms that de-identify data sets to improve the ability to have people do research in this field.

KEVIN MCGINNIS: (Unintelligible)

DERECK ORR: Yes. Absolutely. That's exactly what it is.

And, then, the big one is this LBS Grand Challenge. So, we are actually working with NASA right now to finalize a contract that would go to a contractor to work with us for about a year just to create this LBS Grand Challenge. And we're thinking of this LBS Grand Challenge much like the DARPA Grand Challenge, a multi-year, multi-phase, multi-million dollar grand challenge in which it would culminate at the end with possibly stands of people getting to watch teams of First Responders going in and actually trying to navigate buildings. But it's going to be a multi-phase, multi-year, multi-million dollar prize challenge.

So, we'll probably take the next year just designing it and figuring out how that's going to work because it becomes very, very complicated to be successful.

KEVIN MCGINNIS: Public safety ninja.

DERECK ORR: Yes. Exactly.

UNKNOWN MALE VOICE: One thing as you look to architect it, is to perhaps have as an outcome a public, a private public, outcome here. So, as you're going through this DARPA-like experience, the end result should be something that a private sector company that makes and selected to be part of the DARPA, sorry, the challenge, is then able to take government-furnished stuff, add it to their private firm stuff, and actually have a commercial outcome?

DERECK ORR: Absolutely. You know, in fact, in all of these prize challenges that we're doing, we retain none of the IP, so they maintain all IP and our hope is they create a business out of it. In fact, we've had some early discussions with AT&T and they're early discussions, so I'm not committing them to anything. But they were very interested. Which is, they have some incubator programs, and the idea would be if we could have some of our prize challenge winners actually be able to then, part of the prize is not just the money, it becomes an incubator, if it becomes part of that AT&T

incubator, that would probably be a bigger draw than any pile of money that we could give those winners, which would then lead them to potentially then spur them.

UNKNOWN MALE VOICE: (unintelligible)…destination…

DERECK ORR: Yes. It doesn't have to be AT&T. We talked to others as well. There's a, there's several out here in the Boulder area that we talked to about this as well.

On our grants, if you were at our June conference, that's where we announced our first major grant program. It was significant. It was $36 million of grants to 32 grantees in the areas of mission-critical voice, location-based services, public-safety analytics.

And then you see three areas that I haven't talked about and that's because we see them as cross setting and they affect all of the five areas that we're focused on. One is resiliency. Everything we work on, we have to be concerned about resiliency. So, that was an element we called out in the grant program.

Also, we wanted to look for a public safety demand model. We've been looking for that for ten years. How is public safety going to use this network so that we can model it appropriately? Unfortunately, this is the one area we really didn't get much interest from. People just aren't ready to do that.

But then we also want to develop research and prototyping platforms from this grant program that other people could then use to do research in the areas of these focus areas.

So those were the six areas that we focused on in the grant. Like I said, we had $36 million to 33 grant recipients – I'm sorry. And you can see the breakdown and how many we got in each area.

So, I think the key takeaway from this is we now have more people working around the world focused on public safety's key research areas than we ever have, ever, in the history of public safety and in the communications field.

UNKNOWN MALE VOICE: What are some of the demographics of the types of awardings?

DERECK ORR: I'll show you right now. So, I'll break it down by area and we've got some significant heavy hitters.

In mission-critical voice, we had George Washington University, Harris Corporation, Sonim, the University of Basque in Spain, University of Southern California, and Vencore Labs.

In location-based services, Carnegie-Mellon – they actually got two; we had Oxford University, and MIT. In addition, we have TRX Systems, University of California – Irvine, University of Cincinnati, and University of Michigan.

Public safety analytics, we have Carnegie-Mellon, New Jersey Office of Homeland Security and Preparedness, Prominent Edge, Southern Methodist University, and University of Cincinnati. Analytics was our largest response. University of Houston, unfortunately, they are going to be delayed. That grantee was actually affected by those, they literally…

UNKNOWN MALE VOICE: With good reason, right?

DERECK ORR: Yes. They're going to be delayed. University of Michigan, University of Virginia, Voxel51, and Western Fire Chiefs Association. I'm really am concerned about that one myself.

And then the researching prototyping platforms: NYU, Software Radio Systems, University of Colorado, and University of Washington.

Resilience systems prototyping: Cornell, Michigan Tech University, Misram LLC, University of California, and Texas A&M.

So, great diversity in recipients and significant heavy players in this with a substantial amount of money. We're not talking about $50,000 grants.

(Crosstalk)

DERECK ORR: Yes, so it's exciting. Most of them were two years, so they will be done in time for us to take their results and then turn them into--work off of those results into the next phase and further grants and prize challenges.

SUSAN SWENSON: So when do you think we'll kind of start to know something? This is all great, but we will we start to know…

DERECK ORR: So, that is a great question.

(Crosstalk)

DERECK ORR: Let me defer that for just a second. I will get to that, I promise.

Upcoming grants for this year, within the next few weeks we intend to release about a $6 million grant program to take the ideas that came out of that VR prize challenge that we awarded in June and actually turn it into prototypes so that we can see different ways people might implement it. And we can then see which way we want to go from a laboratory perspective.

In addition, we want to look at research issues using VR for the purposes we're looking at and either things that we need to know about that might either enhance its ability to be useful in this area or that we need to be cautioned about that the results may not transfer from VR to the real world as well as we think they might, right? So, we want research done in that area to tell us whether or not and how much we can trust it.

Mission-critical voice, we do have a grant from mission-critical voice planned in the next few months that will look at some of the, having additional people look at helping us develop the key performance indicators for mission-critical voice, from Land Mobile Radio to LTE.

And then LBS. This is going to be a really interesting one, which is to provide grants to a model city or multiple model cities that would be interested that they would go out and they would map several buildings that would be interesting to public safety and make those indoor maps available to the research community to start doing research on how to do navigation and taking 3-D maps to make 2-D maps. So, really getting cities involved in making a catalog and library of maps that researchers can use to develop, researchers and companies can use, to develop new tools and capabilities.

SUSAN SWENSON: So, it's interesting. I've been spending a little bit of time in this area. In terms of mapping, I mean, you talk to people about where you get that information and cities may have some but not all. But insurance companies have everything around buildings that they do, right? I mean, they have the maps of the buildings they insure? So, in addition to the cities, maybe we tap into some of the insurance companies.

DERECK ORR: Sure.

SUSAN SWENSON: And maybe that's a collaborative…

DERECK ORR: And that's not limited to a…

SUSAN SWENSON: No. I know.

(Crosstalk)

SUSAN SWENSON: We seem to focus on the government access. But I think we should, you know, expand that.

DERECK ORR: Yes. Absolutely.

UNKNOWN MALE VOICE: So, what you're saying is reach out to the insurance folks because they have an association…

(Crosstalk)

SUSAN SWENSON: Yes, because they have the information.

DERECK ORR: Yes. We could actually put that in the grant.

UNKNOWN MALE VOICE: The only problem is they don't know anything about FirstNet yet.

(Crosstalk)

SUSAN SWENSON: I'm just saying they're an aggregate source that might be more helpful than trying to piecemeal it together.

DERECK ORR: Now, one of the things, though, that's interesting from this side that we're working on here is this would not simply be, "Hey, go see a model city, gather all your 2-D blueprints, and give them to us." That is not what we want. We actually will require that they use a LIDAR point cloud capability and we will get an accurate, true, 3-D render of the buildings that we get. And then people can do research on taking those 3-D renders into detailed 2-D drawings, or detailed 3-D drawings in different formats, and I just hit something I didn't mean to.

(Crosstalk)

RICH REED: Have you talked to the Navy or any of the DoD organizations that do -- they model ships – …ships during catastrophes, donated DoD…

DERECK ORR: We can talk to DoD. I gotta say, those aren't always the most beneficial discussions.

But, you know, we talked to them but we haven't walked away thinking there's anything we could use. But you were at a conference. You sent a LIDAR back then, right?

UNKNOWN MALE VOICE: That was incredible.

(Crosstalk)

DERECK ORR: It was incredible. And that's the kind of technology that's now available for about 100K, you have a technology like that that would allow you to do that.

TJ KENNEDY: Much less expensive.

DERECK ORR: Yes. So, and this is where I get to your questions. So…

JEFF JOHNSON: Dereck?

DERECK ORR: Yes sir.

JEFF JOHNSON: On the LIDAR, is part of that grant to look into the privacy concerns of LIDAR? So, you know, if you walk to a building with LIDAR on, and your intent is to avail that for public safety purposes, you know, I'm going to guess you could dumb that down whatever level you need to. But, is anybody looking at whether you can do that and what the privacy issues are?

DERECK ORR: No. You know, that is not the intent of that grant. That grant is simply to see can we get the building data to make an open database. That kind of thing is almost like in the same vein as the de-identification for data set would be could you create a de-identification using a LIDAR map as incredible detail and could you take that detail away while maintaining the important detail necessary for public safety? That would be a great prize challenge at some point, right? I mean, that's just seeing, like, yes…

JEFF JOHNSON: You can dumb that thing down, which you'd almost have to do. I'm just reflecting on, even though, this is an example, even though fire departments have full authority to go in to any public occupancy and inspect it for public safety purposes, you're not just barging into Wells Fargo's vault, for example, and checking their fire extinguishers.

There is a relationship between what you have the public right to do and what's the reality of how you execute against that. And, like you say, maybe that's a great prize challenge.

DERECK ORR: Yes. Seems like that'd be really interesting to see.

We have just named our contract for the 2018 stakeholder program back in San Diego.

(Crosstalk)

DERECK ORR: So, it will be June 5-8. So, we've actually added a day. And so I wanted to go through why because it gets to your point, Sue, which is it will be a full four days this year. And one of the things we want to do is, we have too many projects now with too many players to go and do some panels where everybody gets ten minutes.

SUSAN SWENSON: Yes.

DERECK ORR: There's just too much to talk about. So we're going to break it into tracks. So, we'll have a room that's an LBS track, perhaps for a day. And the MIT guys working on LBS, they can have an entire hour and do their work, you know, and talk about their work, display their work for an hour. The next grantee can have a full hour. So, we're going to get in depth, not just a ten-minute, you know, slide deck, but an in-depth interface with them in the various tracks that we'll be working on. We'll have some plenary as well, but we'll have some focused tracks.

The other thing that we're going to be doing this year that's different, my staff, I swear every year I give them heart attacks when I walk out of the last meeting because I always push it, we want to do up to three live challenges going on during our meeting this year so that when we walk out of the meeting, we haven't just talked about what we're doing, we've actually accomplished something while we were at the meeting and made a difference.

And so the three, we've had some internal challenges and prizes within PSCR over the last month to figure out which ones we would choose and the ones we're evaluating right now. This would be fun to watch if the lowest level and easiest, is the drone load lifting challenge. So, how heavy a weight and for how long can you keep it up to carry payloads that are going to be necessary to do the work that we're talking about? And that's the kind you can see and watch them fall out of the sky at different times until the last man stands, right? So, I think it'd be really interesting to see on that one. But that's an easy one for us to do as well.

Security hack, so, we're working with AT&T and FirstNet to figure out a Hack-a-Thon that we could do. It doesn't have to be on site, it could be somewhere else in San Diego. But it could be on an important issue and then the results of the Hack-a-Thon would be done before the end of the four-day event.

And, one final one is using the 3-D, or the virtual reality environment, actually have a prize challenge around people developing navigation interfaces, envisioning a heads up display, and what is the best way to create a visual navigation interface for public safety. And people could actually experience it there at the event based on the winners and the people who get the highest evaluations through the challenge at the event.

The idea is that we'd have three days of intense, like, breakouts, and plenary. And, on the fourth day, all of the challenges would be wrapped up and those winners would come in and all the participants in the stakeholder meetings would get to hear from the winners, get to see their solutions, and get to actually use them and see the outcome and experience the outcome.

So, that's what we're planning on this year.

SUSAN SWENSON: It's ambitious.

DERECK ORR: It is very ambitious. But, that's what we're planning on.

UNKNOWN MALE VOICE: Dereck, just another question. Are you also going to break it down by time to market. So there's some academic studies that have a decade (unintelligible)…

DERECK ORR: Right. Yes.

UNKNOWN MALE VOICE: (Unintelligible) There are some that it may be beyond that. But I also think it would be helpful to have something that is in the five year or less.

DERECK ORR: Yes.

UNKNOWN MALE VOICE: So, as you talked about the location based services I didn't see the demonstration, that LIDAR demonstration, but clearly the time to market… (unintelligible)…privacy issue that Chief Johnson just raised (unintelligible)…

DERECK ORR: That's right.

UNKNOWN MALE VOICE: But I think it would be helpful to kind of have a short, middle, and end…

DERECK ORR: I think that's a great.

UNKNOWN MALE VOICE: It's fine, but…

DERECK ORR: No. I think that's great. I think we should have a slide showing where our different areas are looking because there's going to be some even in mission-critical

voice, there's going to be elements of mission-critical voice that we're successful in getting into market soon. There's going to be elements of mission voice that are going to be five years away, right? We need to be able to show that. That's a great suggestion.

To finalize, we have been working over the last month or so with FirstNet and AT&T in finalizing an MOU that will allow us to all do these challenges, prizes, and research collaboratively so that AT&T can get the venue, they could bring in the hackers, they could feed them, give them lots of Mountain Dew, we could have prize challenge money. And FirstNet could bring the scenarios and, you know, that kind of thing.

So, with that, I think we're probably a matter of days, if not a week away, from a signed MOU between all entities that will let us know all this work concurrently.

((Crosstalk))

UNKNOWN MALE VOICE: …does not preclude anyone else?

DERECK ORR: No, it just allows us to work together.

UNKNOWN MALE VOICE: Excellent.

DERECK ORR: So, that would take a different, that would take another MOU.

SUSAN SWENSON: You're saying because of some of the rules are about what AT&T as a public company, not a government entity, what they can do versus what me and you can do with people, trying to figure that out, right?

DERECK ORR: Yes. And they might want to… For example, when I was talking about them creating a potential incubator for prize winners, we might give a prize winner $50 million, or $50,000. But they may give somebody in that same week as part of that contest would also be okay. This is going to give you $50,000. AT&T is going to give you an incubation spot in their incubator program. Yes. And, so, it's how we can create these holistic opportunities across multiple organizations.

UNKNOWN MALE VOICE: I mean, I think this is a terrific conversation. It's very, in a public forum that we're saying on the air. I don't know how many participants we have, but I think that it's really healthy and, you know, being transparent within a community at large and which is kind of why I also wanted to mention that I may be heading down the MOU route you suggested, and I just suggested this other things that you're open to and that FirstNet is open to.

DERECK ORR: Absolutely. We'll always look for other opportunities and partnerships to do something else. Absolutely.

SUSAN SWENSON: You know, just a comment on that. One is I think that, you know, working more openly about this is really important so people are aware of it. I really hope we also can leverage what people are already doing. Sometimes I see groups of people kind of in their space not (unintelligible) DHS because they've done so much

already. But I really want to make sure that we leverage for the near term as well as the longer term because we've got some near-term issues, you know, that I think are important as well so we can make sure we…

DERECK ORR: Absolutely.

SUSAN SWENSON: Okay, well. Very exciting stuff, huh? You know I said it before, you know, public safety is mainstream. But, kind of you're mainstream instead of in the back seat…

DERECK ORR: Exactly.

SUSAN SWENSON: …so it's kind of exciting for them and I think you said it Neil that there's some commercial, you know, commercial aspects that will end up in public safety and vice versa and it's kind of nice to see that leverage versus it being kind of something that's unique to public safety. We're at a real interesting time in public safety.

I appreciate you being here. Thank you, Jeff, for the updates on FirstNet perspective and Dereck always great to see you and, you know, you've had a long relationship with FirstNet and we appreciate the continued…

DERECK ORR: I love it.

SUSAN SWENSON: …conversation.

DERECK ORR: And I also, I forgot to mention, I don't know if anybody saw it, but apparently today it's been announced that there soon will be a nominee for NIST and the Undersecretary of Commerce for that position. I don't even know, some people may know him. He's from Colorado, Dr. Copan. I don't know if anybody, Walter Copan, from Colorado. He actually has a pretty interesting background.

(Crosstalk)

DERECK ORR: Yes…private sector background. But, a lot of work in federal labs from an industry perspective of getting involved in federal labs so that has been announced and that will be forthcoming probably in the near future.

SUSAN SWENSON: So, he's actually been, like…

DERECK ORR: It says, no, no, no. It's going to be announced…so confirmation in the Senate.

(Crosstalk)

SUSAN SWENSON: We've known people get nominated but never make it to the seat.

DERECK ORR: Well, that, he's going to be sent for nomination.

SUSAN SWENSON: Okay, all right. Thanks for clarifying that.

COORDINATOR: If I could just make an announcement. I know we do have others listening in. I will have the slides from today's presentation, including Dereck's slides. They'll be posted on our website at the conclusion of the board meeting tomorrow. I'll have someone in our back in our Reston office be able to post it. So, it will be up either Thursday or Friday morning. So, the published listing and you will have access to these slides.

SUSAN SWENSON: Excellent. Okay. Are there any other comments or questions that the Board has for today, anything to contribute Jeff?

JEFF JOHNSON: Thank you, Madam Chair.

Dereck, I want to thank you. You and the NIST team, you know, you guys are making such a difference for public safety and, you know, we talk about a proof point all the time. You're the truth point. Between you and the FirstNet tech team, I mean, you are going to drive it and prove it before it ends up in the hands of public safety and that is a real change compared to history. So, just thank you for being, you have your boat tied to ours. We greatly appreciate it. And on behalf of public safety, it's nice knowing these two teams have our back. So, thank you to both of you.

SUSAN SWENSON: Great. Thank you.

Anything else? So, if no other questions or comments, I'll entertain a Motion to Adjourn. Okay. I assume there's no objections to that. All in favor say "Aye."

GROUP: Aye

Thank you. And we will adjourn now and the meeting tomorrow starts at 8 a.m. mountain time.

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