UNITED STATES DEPARTMENT OF COMMERCE

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COMMERCE SPECTRUM MANAGEMENT ADVISORY COMMITTEE (CSMAC)

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MEETING

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THURSDAY
OCTOBER 9, 2014

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The Advisory Committee met in Room 4830 of the Herbert Hoover Building, 1401 Constitution Avenue, Northwest, Washington, D.C., at 1:00 p.m., Larry Alder and H. Mark Gibson, Co-Chairs, presiding.

PRESENT:

LARRY ALDER, Chair
H. MARK GIBSON, Chair
MICHAEL A. CALABRESE
MICHAEL S. CHARTIER
MARTIN COOPER
DAVID L. DONOVAN
DALE N. HATFIELD
DR. PAUL KOLODZY
DR. ROBERT KUBIK
DR. GIULIA McHENRY
DR. MARK A. McHENRY
JANICE OBUCHOWSKY
DR. ROBERT PEPPER (via telephone)
KARL POVELITES
CHARLA RATH
RICHARD L. REASER, Jr.
DR. JEFFREY H. REED
DENNIS A. ROBERSON
KURT SCHAUBACH
STEVE SHARKEY
MARIAM SOROND
JENNIFER WARREN

DEPARTMENT STAFF:

PAIGE R. ATKINS
KARL B. NEBBIA
LAWRENCE E. STRICKLING

ALSO PRESENT:

MATTHEW HUSSEY

PETER MONCURE

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1:01 p.m.

Welcome and Opening Remarks

CHAIR GIBSON: Well welcome. I think it's one o'clock, and so welcome to this last CSMAC of 2014. A moment of silence. This is also, Karl's sitting here as you see in the guest chair, and we'll recognize Karl for his great stuff.

(Laughter.)

CHAIR GIBSON: That's the last bit of official business.

Opening Comments and Introductions

CHAIR GIBSON: I think by virtue of the agenda, we start with opening remarks from Larry. So I will turn the table over to Larry for his opening remarks.

MR. STRICKLING: You've already taken away my best remarks. I was going to introduce Karl as an observer, as a visitor. But rather than starting with Karl, let's start with the new. Let's start with Paige

Atkins, who's joined us here at the head table. Paige is our new Deputy Associate Administrator for Spectrum Planning and will be taking over all of this work here, as Karl continues to wind down his long tenure here at NTIA.

I think most people know Paige. She came here from the Virginia Tech Applied Research Corporation, where she was the Vice President of Cyber and Information Technology Research and then prior to that, as many of you know, she was over at DISA as the Director for Strategic Planning and Information.

So she's here. Her current set of responsibilities involves international spectrum policy, all of our strategic planning work, all of our overall spectrum policy work, and we have been very happy to have her here. She's been performing spectacularly well, and it will be a delight for all of you to have her here as the lead on CSMAC.

I haven't yet -- we haven't yet

tested her sense of humor to find out if she's as funny as Karl has tended to be with his dry wit, but I'm sure she'll more than make up for that in other categories. So welcome Paige.

MS. ATKINS: Thank you.

MR. STRICKLING: And as a result, Karl is now here on observer status. But I know last meeting, we had a chance to celebrate Karl's long tenure here with CSMAC and with NTIA, and there will be many, many, many more opportunities to do that before he actually departs the agency before the end of the year.

I also want to introduce Matthew Hussey, who joins us today from the FCC. We had decided, and I think there was some discussion here about the benefits of having a more formal relationship with -- through liaisons between NTIA and the FCC, and Matthew drew the long straw at the FCC to come join us here at our meetings.

And Rangam Subramanian. Is Rangam

here? Stand up Rangam. Rangam is in our shop, and he will be our liaison over to the FCC. So some of you that are working on tag issues over there. We'll be seeing Rangam there in the future.

MALE PARTICIPANT: Already attended his first meeting.

MR. STRICKLING: Okay, very good. Last introduction, Glenn Reynolds, who again many of you know joined -- stand up Glenn. Glenn is our new chief of staff here at NTIA, joined us in August from U.S. Telecom Association, and is in our front office.

He'll be focusing on many areas, but spectrum and our work in Boulder will be high among his responsibilities. So with that, I think that's all of our introductions. Beyond that, I just want to welcome everyone to today's CSMAC meeting.

I'm very interested and excited as we continue to probe and evaluate these issues of industry and government collaboration. I

see that as a major emphasis of our work and discussion going forward, and I'm looking forward to that discussion today, as well as with the other reports we will have from the Subcommittees on Enforcement and Transitional Sharing and the rest of it.

So with that, let me get it back to our chairs, and take it away.

CHAIR GIBSON: Thanks Larry, and actually at Larry's suggestion, we're sending Karl's name tag around so everybody can sign it. You can put a note on there if you want to, but keep it clean.

FEMALE PARTICIPANT: Just not nice.

CHAIR GIBSON: Just not nice, yes. Okay. Now I'm going to go through the agenda. Larry would like -- just so you know, Larry and I are going to tag team running this. I'm going to run it up to probably the middle of the committee outbriefs, and he's going to pick it up, and you'll see why later on that's

going to work.

But now I'm going to get Larry to the table for some comments.

CHAIR ALDER: So yeah. Mark and I talked beforehand, just some opening remarks. I think first again welcome everyone. It's a pleasure to be here. We wanted to talk about the pace and cadence of recommendations. We talked about this in the past a little bit.

But it's important that the NTIA get clear recommendations coming out of the Subcommittees. So the NTIA is looking for things that start with the sentence "The NTIA should," and those recommendations should be boiled out not up here on page 30 of an 100 page document.

So as we work in the subcommittees, we want to really focus on the recommendations for the benefit of the NTIA. That's kind of what we're here to deliver. We're trying to set up a cadence, where we get more input from the main body.

So the preferred method, and it won't always be this way. The preferred method is if the subcommittees could bring forward draft recommendations at meeting-end, this meeting for example, have some full committee input, take that input and then revise them and then we'll vote on them at meeting N+1.

We're trying to avoid the subcommittee came said hey, this is take it or leave it. We want to get broader input. So I think today we have some of the subcommittees coming up with kind of their draft recommendations. I don't think we have anything for voting today, but so that's kind of the cadence we're going for.

In terms of recommendations, we also want to make the point if the Subcommittee couldn't get all their recommendations, it's fine. Bring forward the one or the two that you have on an incremental basis, that we don't have to wait for the

long, full laundry list.

Participation. I think there's been pretty good participation. I think everyone's signed up. We want to encourage everyone to get active. I think we do still have some people participating more than others. Let's try and sort of just have a reminder. Feel free to contact Mark or myself. Let us know if you want to take on a leadership role, if you think there's another role on the subcommittee or something we should consider, just let us know. Then the last couple of things. Paige is working with her team to set up a portal of information.

So we're going and try and move to a place where all the subcommittee work can be in a common area so people can access it. It will have the appropriate controls and so forth. I think that will be a big step forward and I'm looking forward to that, and that will probably occur early next year.

Finally, just the administrative

matters, which we've all heard, is state your name into the microphone and we'll do the old raise your card if you want to speak. But that's all I have for opening remarks.

CHAIR GIBSON: All right, thanks Larry. So Bruce or Paige, do we need to go around the room and get people actually to say their names for the record? Okay. So let's start. This is the roll call part. So let's start with I'm Mark Gibson, and we'll end with Larry.

So I'm Mark Gibson, ComSearch, co-chair of CSMAC.

MS. ATKINS: Paige Atkins, NTIA.

MR. NEBBIA: Karl Nebbia, Visitor.

MEMBER RATH: Charla Rath, Verizon.

MEMBER CALABRESE: Michael Calabrese, New America Foundation.

MEMBER HATFIELD: Dale Hatfield, University of Colorado.

MEMBER SHARKEY: Steve Sharkey,

T-Mobile.

MEMBER GLORIA McHENRY: Giulia McHenry, Brattle.

MEMBER ROBERSON: Dennis Roberson, Illinois Institute of Technology.

MEMBER SOROND: Mariam Sorond, DISH Network.

MEMBER CHARTIER: Mike Chartier, Intel.

MEMBER MARK McHENRY: I'm Mark McHenry with Shared Spectrum.

MEMBER KOLODZY: Paul Kolodzy, Independent.

MEMBER KUBIK: Rob Kubik, Samsung.

MEMBER SCHAUBACH: Kurt Schaubach, NRTC.

MEMBER POVELITES: Carl Povelites, AT&T.

MEMBER REED: Jeff Reed, Virginia Tech.

MEMBER DONOVAN: David Donovan, New York State Broadcasters Association.

MEMBER REASER: Rick Reaser, Raytheon.

MEMBER OBUCHOWSKI: Janice Obuchowsky, FTI and co-chair of the Two Way Sharing Working Group.

MEMBER WARREN: Jennifer Warren, Lockheed Martin.

MR. HUSSEY: Matthew Hussey, FCC.

MR. STRICKLING: Larry Strickling, NTIA.

CHAIR ALDER: And Larry Alder with Google.

CHAIR GIBSON: Okay. Would folks on the phone state who you are and who you're with, just the members. I hear you breathing. Is that Pepper?

MEMBER PEPPER: Yes. Robert Pepper.

CHAIR GIBSON: Okay. Anybody else out there?

(No response.)

CHAIR GIBSON: Okay, and now

visitors right? No? Okay, cool. Okay, that's cool. I'm getting used to this. Now we'd like to recognize Matthew from the FCC. Matthew has a statement.

MR. HUSSEY: Typically, I'll be more in a listening mode, but I guess there were some concerns about the upcoming AWS-3 auction and I'm supposed to read a statement, a disclaimer about prohibited communications. So it's a tad lengthy. It's only half a page, but that's the way OGC does.

So okay. Statement begins, it goes "The Commission's rule on prohibited communications is currently in effect for the upcoming AWS-3 auction. To ensure the competitiveness of the auction process, the Commission's rules prohibiting auction applicants for licenses in any of the same or overlapping geographic license areas from communicating with each other about bids, bidding strategies or settlements, unless such applicants have identified each other on their

short form applications as parties with whom they have entered into agreements.

"Auction applicants are advised to consult with their own counsel with any questions they may have about their participation in this or any other venue during the period in which the Commission's rule on prohibited communications is in effect, i.e., from the deadline for filing short form applications to the down payment deadline after the auction closes.

"In addition, to further help protect the integrity of the auction process, the FCC has advised federal agencies to not reveal non-public information that would have the effect of advantaging one bidder over another." Thank you.

CHAIR GIBSON: Any questions?

(Laughter.)

MR. HUSSEY: Please, no questions, because I can't answer them.

CHAIR GIBSON: Now it's Paige for

the NTIA Spectrum Update.

NTIA Spectrum Update

MS. ATKINS: Thank you. I'm very pleased to be here today, and I look forward to working with the CSMAC to ensure we're really thinking through our most critical spectrum issues, to include understanding our options and understanding the cost versus benefit of those options, so we can make better informed decisions. So I'm looking forward to that.

In previous meetings, a couple of the members have talked about us moving into a whole new world, a whole new spectrum world which we are, and we have to do that aggressively yet deliberately and carefully, so we don't create chaos in the process.

We're looking to the collective wisdom of this group, not only to provide us focused, practical, actionable recommendations, but to also ensure that we're focused on the right topics and the right

questions as we move forward.

So with that, I'll move into the spectrum update. I want to touch on a few things that have occurred since our last meeting, and I can't emphasize enough the significant progress we continue to make. I'm going to start with AWS-3, and everything I say was publicly available information. I'm sure most of you are aware of it already.

AWS-3 continues to move forward, as we all know. Earlier, the NTIA published the transition plans for the agency, as well as the DoD workbook and revisions to that workbook, and I believe that we have provided an unprecedented level of information for the potential bidders. So that's great, good news.

The NTIA and FCC also jointly published a public notice, a PN on the coordination procedures for the bands of the -- the federal bands, the 1695 to 1710 megahertz, and 1755 and 1780 megahertz.

Subsequent to that, the FCC also published the AWS-3 auction procedures. We're moving down that process as we move toward the auction next month.

The progress largely was attributable to the great collaboration that has occurred, to include the trusted agent process led by the DoD, which helped us get or to reduce the coordination requirement that then fed the public notice that I mentioned earlier. So great progress, and again largely attributable to the collaboration that occurred.

Now I'll move to another band of interest, 3.5 gigahertz, and NTIA has implemented an initial pilot, spectrum monitoring pilot in 3.5 gigahertz that's our ITS facility in Boulder. As we move forward with the Measurement and Quantification Subcommittee, we're very interested in recommendations that help us understand how to assess value of spectrum monitoring, how to

optimize the resources that we might use to do that, to include the spectrum monitoring process, with the intent of how do we leverage Measurements and Quantification to make better policy decisions, as well as increased transparency to industry as we move forward with future sharing discussions and arrangements.

In addition, we continue collaboration efforts among FCC, NTIA, DoD and industry, to see how we can reduce the exclusion zones that were originally presented in the fast track report through enhanced technical modeling, and we're making progress in that area, good progress.

We also continue to make progress, though perhaps not as quickly, with the potential for sharing at five gigahertz between federal systems and unlicensed devices, and Karl talked about this at the last CSMAC meeting as well, and as a reminder that two bands currently that we're assessing

are 5350 to 5470 megahertz and 5850 to 5925 megahertz.

We are participating in an FCC-led working group, to look at potential sharing options, particularly now focused on the lower band for potential options that we might be able to implement in the U.S., and actively still working, sharing studies internationally in preparation for a potential world radio conference agenda item for 2019, and working that for international acceptance, dependent upon the results of those sharing studies. So a lot of work in five gigahertz.

All of these activities, and I'll particularly emphasize the AWS-3 as well as the 3.5 gigahertz, all of these activities are providing great lessons learned for us, that we want to leverage and incorporate in future activities, particularly as we move to this new frontier of spectrum sharing.

Now NTIA and FCC also released a joint public notice around the Model City, and

think of this as a forum to demonstrate and evaluate advanced spectrum sharing techniques, very aligned with the PCAST recommendation for an urban test city.

We've gotten good public response supportive of the intent around spectrum innovation, technology development and demonstration, transition, as well as national level collaboration. We are working with the FCC to continue to evaluate those responses, so we can formulate a way ahead. So you'll be hearing more about that as we move forward.

The last specific item I want to mention is the wireless spectrum research and development workshop that's coming up, the WSRD for those familiar with the WSRD. This next workshop later this month that's going to be on the 21st of October will be focused on federal/non-federal data exchange in a broad context.

It's very similar to the questions that we have posed for spectrum management via

databases. Some of the similar questions, the WSRD focused on the research end, and developing and prioritizing a research agenda. However, the discussion and thoughts associated with their activity may be helpful to our own as well.

So the bottom line is the momentum continues, and a key factor to that has been the collaboration that we have had over some period of time, but particularly the last three months have been phenomenal in my opinion.

We see this collaboration, as Larry mentioned earlier, as an essential component to our strategy, and our ability to address some of these challenging issues we're going to face, especially as we focus on spectrum sharing in the future.

The CSMAC has been and will continue to be an essential element to our collaboration approach, and I look forward to hearing some of the initial feedback from the

members, in terms of how we can better leverage and augment our current collaboration activities to create a more sustainable and holistic method for collaboration in the future.

That's all I wanted to say. I did want to mention also, as we move into the Subcommittee presentations, I would be very interested in understanding the significant changes since the last update. Just that it will help us, I think, all understand the progress of the groups and where we're headed.

As I'm sure the co-chairs will probably reiterate, if you can give us an idea of where you think you're going to be in the February time frame for the next meeting, that would be very helpful as well. Any questions?

CHAIR GIBSON: I've got one. Can you talk about the National Spectrum Consortium and any role you're playing in that?

MS. ATKINS: So the consortium

that DoD is setting up, and it's actually contractually another transaction authority, an OTA vehicle. We have been engaged with DoD to follow their efforts, understand what they're doing, and potentially leverage them down the road.

It is an opportunity perhaps to further certain goals particularly related to spectrum-sharing and other technologies and techniques. But that is our role to date. There's going to be an industry day, I believe, coming up and we'll participate.

CHAIR GIBSON: All right, thanks. Any other questions, before we move on to the committee outbriefs?

(No response.)

CSMAC Subcommittee Reports

CHAIR GIBSON: Okay, great. Thank, Paige. Let's go to the committee outbriefs. The first committee, and we'll go right down the list. So the first one is Enforcement, and Dale, that's you and Mark,

and I don't see Mark, so I think it's you.

MEMBER HATFIELD: How much time do we have?

(Laughter.)

CHAIR GIBSON: Plenty of time. I think about ten minutes, give or take.

MEMBER HATFIELD: Ten minutes, okay. I'll try.

CHAIR ALDER: Well, that doesn't mean we're not going to cut your mic off if you go over ten.

(Simultaneous speaking.)

Enforcement

MEMBER HATFIELD: One of the first times I came to D.C. to give a briefing, and I started with an apology and somebody said "You never start with an apology." But I'm going to break the rule today and start with an apology, that Mark was doing a lot of the heavy lifting on some of this. So I've been focusing almost entirely on the important straw man at the end of the report.

So I'm not going to be able to do as good a job, and moreover, we have some missing people also on the subcommittee here that I can't turn to.

Anyway, we met three times, trying to craft questions or responses to the questions, the five questions that were posed. If you remember, there were five questions and we spent our time looking at those, and what we did was we assigned the drafting responsibility to pairs of individuals, and we have complete draft responses that have been supplied separately, and I would say be careful on the website. I don't think we were quite as clear as we could have been about what I'm presenting here in the summary, and which is contained in the actual report.

So I've had some people say hey, there's not much there, and what they were looking at is the summary slides, not the reports themselves. So I would call that to your attention.

One of the significant activities that we had is on September 23rd, we met with the leadership -- the new leadership of the Enforcement Bureau, and talked to them about frankly some of the things we were trying to do, and to look at what their capabilities were and perhaps would be in the future.

As some of you may know, I've been working fairly closely with the Enforcement Bureau at the FCC, and I can say that they're fully aware of the challenges that we face in this shared spectrum, and hopefully we'll be addressing them sufficiently.

Okay. Turning to Question 1, if you remember, any shared spectrum environment involving both federal and non-federal users, what types of sharing criteria would need to be specified in the FCC's ex ante regulations, and what can be said post-rulemaking, post-auction negotiating coordination agreements or other sharing arrangements.

This is where I'm sort of stuck.

The two people who worked on those are Mark Crosby and Audrey Allison, and neither of them are here unless somebody snuck into the room that I'm not aware of. So let me just -- I'm simply just going to read what they said here.

Assumption: The FCC and the NTIA shall identify and report within the ex ante rules the majority of the operational and technical rules governing the sharing of government, federal government spectrum, including interference mitigation and enforcement processes, requires abundant clarity for incumbent government users and prospective commercial operators in advance of the commencement of any competitive bidding actions.

It's apparent that they are at the stage where they now identify certain critical subject areas which we'll be working on between now and the next meeting. Some of the critical subjects are the incumbent reconfiguration and expansion rights. You can

look at what's out there today, but that may not be what's out there tomorrow for all kinds of reasons.

The importance of the definition of the exclusion and coordination sound, and the dynamic sharing thereof; the spectrum access and occupancy rights is an important issue. Interference limits and tolerances; the powers of the SAS. We were just having some discussions this morning about the power of the SAS systems.

The importance, of course, of equipment standards, because a lot of this is ex ante type stuff that you do, in order to head off ex post interference things. Then dispute resolution processes.

Then a subject dear to my own heart. If we're going to do anything in Enforcement, you've got to have clearly defined definitions here. We can't, we just can't, in my opinion, have some sort of an amorphous discussion of what harmful

interference is.

How do you enforce something that's so amorphous, and that's one, as many of you know, I've been a pretty strong supporter of something like harms claim threshold or something like that is a more clear statement of what the reception limits should be and so forth. Questions? Please don't ask me. I'm insane.

(Laughter.)

MEMBER HATFIELD: Comments?

MS. ATKINS: So we asked the question around. It sounds like most of this is -- this is Paige Atkins, sorry.

It sounds like most of the recommendation is that you really need to define, and I'll embellish a little bit, everything up front, and I'm curious as to the thoughts in terms of what you could do post-rulemaking, post-auction from a coordination standpoint, or other elements.

MEMBER HATFIELD: Yes. I think

we're still in the early stages of trying to figure that. I mean the classic issue here, as all you know, is you know, how much money you spend ex ante. Paige is how much you have to spend ex post. Or you can make the trade off that way. You can say I'm not going to do much up front and rely entirely on ex post stuff.

I think that's to try to balance what we're trying to come up with. It's complicated, because you don't want to over-constrain the private sector. On the other hand, you want to make sure you have the hooks and so forth. You have to be able, if something bad goes wrong, you have the hooks in to be able to fix it, fix it ex post. Sorry about that. Any other?

CHAIR GIBSON: Karl.

MR. NEBBIA: Karl Nebbia, NTIA. So, Dale, I think this is certainly the important idea. I think part of the question I have, sorry, based on my experience over the

last few years is that it generally seems that the inclination of the Commission has been to move away from more specification of what the rules would be.

So they're kind of going in the opposite direction, and I think if this is, you know, the voice of the CSMAC, it's important that it comes out clearly that you're really saying we need to -- we need to change that direction, because more and more we've been moving away from it.

I think the particular application in the context of federal agency concerns is, for instance, when we specify a technology-neutral approach, when all of the preparation for the regulatory decision was based on a particular technology, and then people start asking well, if we're not going to require that, what is our future situation, what will we have to deal with, and are there things you can put in these components that might actually require updating of the rules if

those types of things change.

So you still leave it as technologically neutral, but you put in some mechanism that allows for those rules to flex with the changing of the technology.

MEMBER HATFIELD: Thank you Karl, for your comment, that's - I understand exactly what you're saying. It goes back to this balance that we have to -- try to have to achieve.

CHAIR GIBSON: Okay. Janice had her tent up and then we'll go to - Dennis, okay.

(Simultaneous speaking.)

MEMBER OBUCHOWSKI: So this is Janice Obuchowski. First off Dale, you're excessively modest. In terms of this particular topic, I'm not sure where we would be had you not started thinking as deeply as you have, both in the context here but also at the FCC, you know, two and a half or three years ago, maybe even longer. So thank you

for that.

Not surprisingly, because I am a bit of a defender of government spectrum access in some circumstances, I wanted to highlight a bit of a concern - and this is how old I'm getting.

I changed glasses to follow the meeting and, you know, there's a response to the question on shared spectrum environment saying, as an assumption, it was assumed that once the federal government band has been identified for sharing, that new federal government system sites would be prohibited, or are subject to post-rulemaking, post-auction negotiated coordination agreements.

I can certainly understand a concern about uncertainty. But I also have been concerned about an assumption that government requirements don't shift and technology solutions don't shift, just as commercial ones would.

So an assumption that new sites

would be prohibited, I think is one that might be dependent on the band involved, and then in terms of negotiating coordination agreements, well I'm sure that's the case. I mean any subsequent, you know, change in status is going to require that, but I'm not sure why that even is necessary to state, because the same onus would also depend if commercial guys came into a band and, you know, proposed something new.

But anyway, there is an assumption there as to new government identifications, and I'm not sure where that ends. I think it needs to be pretty carefully circumscribed because a lot of government applications are developing as quickly as the technology is as well.

Then I guess there was one other sort of observation I had, which was there's a lot of good information in this about coordination zones, etcetera, all the data required. I guess one of the things that

you've thought about a lot Dale, but I'm not sure how much -- how far we've gotten is what kind of data needs to be developed, not just for coordination but also for enforcement.

So much of this is dependent on good faith. We've always done that in spectrum management but, you know, I think in the new world of much, much more fulsome sharing, enforcement has got to be ironed out very carefully, which you've advocated for.

MEMBER HATFIELD: Thank you. We're spending an awful lot of time unfortunately.

CHAIR GIBSON: I think Dennis is next. I just wanted -- this is a big one and we're on the first question. We're ahead of schedule, and that's good, but I want to move us along and not get too bogged down. So Dennis and then Janice, put your table tent down. Let's go to Dennis, and I think I'll work with the rest of them.

MEMBER ROBERSON: Okay. Dennis

Roberson from Illinois Tech. I wanted to be responsive to Karl's comment about the direction of the FCC. I think the FCC, having had the experience with the Clipper Chip way back when, is very disinclined to be involved with specific implementations.

But the conceptual side is, I think, something that the FCC is pushing strongly for, things like the interference limits, harm claim threshold is something that I think the FCC is embracing. I think other areas, having actually sat with the Chairman this morning, talking about exactly this topic, he's very strongly in favor of having solutions and requirements, as long as they don't have implementations for those requirements.

So set the requirements, let innovation occur that meets the requirements for functionality or for capability, but not specific implementation. So I think that's kind of the balance point that fits around the

question that you raised, and I think it applies very much to enforcement.

CHAIR GIBSON: Do you want to add anything to that Dale?

MEMBER HATFIELD: No, no. I think --

CHAIR GIBSON: I think Jennifer was next. Is that right? If not, you can shoot me.

MEMBER WARREN: I won't. Jennifer Warren --

CHAIR GIBSON: Then Michael, then Paul -- then Paul, then Michael and then Jeff.

MEMBER WARREN: So I had a question that came up that I wanted to ask Dennis. When you said implementation, did you mean specifying the means of implementing that requirement or I just -- I wasn't sure. When you said the Chairman didn't want implementation.

MEMBER ROBERSON: No, no, no, and I think I used him because I just met with him

this morning. But I think it's generic with the FCC.

MEMBER WARREN: It's relevant.

MEMBER ROBERSON: The specific implementation. I don't think anyone wants to see, and forget the fact that I was with the Chairman this morning. But I don't think anyone wants to see the requirement for a specific fixed implementation, given that technology keeps moving and keeps surprising all of us.

But having requirements for functionality is the key, and then allowing for -- because there's a requirement for functionality, but I mean it's tricky business. Make sure that the requirement doesn't prohibit evolution off the base, but that there is a baseline set of required capabilities that are embodied in support of enforcement and support of other things as well.

MEMBER WARREN: Okay. I just

wanted to make sure I understood implementation is specific methods, as opposed to -- okay.

MEMBER ROBERSON: Right.

MEMBER WARREN: Can I -- that was just a side question that came up after Dennis' intervention. The point I wanted to bring up was in the system reconfiguration and expansion rights. While Janice's comments focused on the expansion of sites, this kind of goes back to the point Karl made, which is flexibility.

The flexibility that commercial carriers enjoy to evolve their systems is also the evolution of government systems to the next state of the art. If they don't have that flexibility and the R&D and innovation that's being done in the United States can't be brought to those systems, that's a loss.

So we have to figure out a way that the innovation that's going on in that sector isn't lost, and that is kind of just

stranded, if you like. So I'd like to bring that into the discussion, absent the next Subcommittee discussion. Thank you.

CHAIR GIBSON: Okay thanks, Jennifer. Let's go to Paul and then Mike and then Jeff.

MEMBER KOLODZY: Okay. My one -- Dale, one of the issues --

CHAIR GIBSON: Paul Kolodzy.

MEMBER KOLODZY: Paul Kolodzy, sorry. Dale, you came up with, you know, were discussing about all the different variables you want to measure or define or whatever. One thing you may want to consider, and I think this goes a little bit to where Karl was going also, is there is a longevity or a temporal aspect to this, and maybe you need to actually put that explicitly, because architectures change.

What I see in a lot of this is -- and I haven't brought this up to the Committee yet, because I'm just trying to get my hands

around it. But architectures and how the government architectures are changing and how the civilian architectures are changing over time actually will impact a lot of these variables.

If you have dense pack, depending upon if you're urban, if you're rural, where they're actually operational, what kind of pace is actually trying to be used, all have an impact to those variables that you're trying to define.

So therefore I think we have to be careful and one thing that I remember many years ago we talked about, or one of us talked about, which is what is the temporal nature of this information, and is it five years, is it seven years, is it ten years?

But there is a limitation, and when you're talking about allocations going on and then assignments, and assignments that actually can be renewed ad infinitum, okay, then that time frame actually becomes an

important aspect.

Maybe that's something that needs to be discussed, as to the time frames associated with renewals and how they impact associated agreements that are made in these kind of systems.

MEMBER HATFIELD: Thank you.

CHAIR GIBSON: Thanks Paul. Mike.

MEMBER CHARTIER: Mike Chartier. Dale, with regards to the equipment standards, these ex ante regulations, are you thinking -- were you thinking about commercial devices and something other than a listen before talk, or are you more thinking about the unlicensed devices, and are you necessarily then assuming they're going to be, you know, connected devices which, you know, mandate connectivity standards and that type of thing, in order to have the kill switch, I guess, that you're envisioning there.

MEMBER HATFIELD: Yes. If I understand your question, the focus -- the

focus is on making sure the device that has to be able to do something really is capable of doing it. So that - or, that it's not easily modifiable. That's the other thing we've had experience with, you know, is where a device will go through the type of further processed, and then be modified in the field or something.

So the idea is that in the -- during that equipment certification, that stage, to make sure that it's hard to change them, that they really do function as they're supposed to do, that if they have a kill switch, that the kill switch works reliably and that sort of thing. Is that -- am I addressing your --

MEMBER CHARTIER: Yes. So are you looking for something more robust than the STR rules that we have now in place?

MEMBER HATFIELD: Boy, we've had a lot of -- I got to be careful here. I keep getting my advisory committee hats mixed up.

Yes, there's been a lot of discussion over that very topic.

CHAIR GIBSON: Keep going Dale.

MEMBER HATFIELD: No. There's been a lot of -- that's, you know, a very good point, and there's a lot of discussion going on and I'm not sure we have a conclusion yet.

CHAIR GIBSON: Okay, thanks Dale, and then Jeff.

MEMBER REED: Yes. Jeff Reed. This is Jeff Reed. I just had a quick comment. One of the things that I thought should be included in this is the discussion on privacy issues, because it calls for identification of transmitters as well as classification. I think that will make some people nervous, particularly if we don't address it up front. So that would be my recommendation.

MEMBER HATFIELD: Yes. Everything dropping to the straw man that I put at the end. That was one of the things that's very clear. As soon as I talked about even the

collection of IT information, things like that, immediately say oh, you know. There's obvious privacy issues.

Here again is the other trade-off, because to me, we have a precious resource here that we need to protect. We have precious national interests that we need to protect. Therefore, on the Enforcement side we need some hooks to be able to find the bad guys and get them shut down.

On the other hand, the more information we have about being able to shut down quickly a specific person, that obviously raises -- really, it raises some due process issues too, some other things like that. But it really raises privacy issues. So that is almost above my pay grade at this point.

I think I can point out -- we can point out in our stuff what those trade-offs are. But those go to, I think, what we're about as a country, you know, what kind of trade-off you're going to make there, because

you probably can't have both.

You can't have absolute certainty that I can shut down Janice when I want to and get her the freedom to go where she wants to go without being tracked every step of the way.

MEMBER OBUCHOWSKI: I won't go far at this stage.

(Laughter.)

MEMBER HATFIELD: Since I just had my knee replaced, I had to slow down there for a while too -

CHAIR GIBSON: Okay. That took 25 minutes, and that's just one of five questions. So at this pace, we're going to get out by Christmastime. So I'd like to move us along a little bit. So let me suggest something. Rather than Dale going through every page, has everybody read the document? I see heads nodding, okay.

So let's go by question by question, and see what comments we have on

each question. Then we can move it along. So let's go on Question 2. Dale, do you have -- Mariam, are you going to handle that?

MEMBER SOROND: I had 2 -

CHAIR GIBSON: Okay. So who's Question 2?

MEMBER DONOVAN: I had 2.

CHAIR GIBSON: Okay, go ahead David. So I need feedback on David on Question 2. Anything you want to highlight David, first of all?

MEMBER DONOVAN: Just a couple of things.

CHAIR GIBSON: David Donovan.

MEMBER DONOVAN: David Donovan. In looking at the enforcement question as to who would actually enforce, you run into a, and all of us understand this, a clear jurisdictional and deep perhaps separation of powers issue between the FCC and NTIA.

Government entities don't want the FCC. There are issues about whether they can

enforce and the flip side, if you're getting involved with commercial entities and there are issues, NTIA doesn't have the jurisdiction.

So rather than getting involved in a massive and potentially long-term battle, one way was to shift the concept towards a more contractual model, and what we're looking at is a two-layered model. First would be a revised memorandum of understanding between NTIA and the FCC.

Now we do have one back in 2003 that was drafted. It generalized the spectrum coordination model. It spins off of a statute that was passed in 1993, which requires NTIA and the FCC to get together for spectrum coordination purposes.

But that -- on every day, I know Karl and I know NTIA are talking with the FCC. But I think from an enforcement perspective, transparency and certainty, particularly as we go forward, would be important. So what the

Subcommittee is looking at, we've had several meetings on this, is really a two-step process.

One, for the FCC and NTIA to enter into a far more detailed memorandum of understanding regarding the spectrum expectations and rights and requirements, in general, for all spectrum that's going to be shared between federal and commercial entities.

But more importantly a second level, and that is a spectrum -- a memorandum of understanding or an agreement that would be entered between the end users. Now we see this happening in two areas already, one in the 2025 to the 2010 band. I know the broadcasters are working with the Department of Defense, because they're sharing BAS spectrum. They're sharing that spectrum as well.

And Jennifer, you were aware of what was going in some of the satellite areas

as well.

MEMBER WARREN: And it was an agreement or an approach that's being, I guess, agreed to between NTIA and -- Jennifer Warren -- between the NTIA and FCC on how to implement regulatory parity between federal earth stations and commercial earth stations that are accessing commercial satellite systems.

So they currently both -- they have different status, and to make them equal, one of the things that's been explored and pretty much agreed to, I think, by both agencies is that NTIA would in fact enforce the Part 25 rules on the federal earth stations, that would seek to operate on a parity basis with the commercial earth stations.

That's a new and novel approach, and one that the satellite industry agreed with as an approach, as a general matter. So again, a model to consider, and we're doing

more research on that as we go forward.

MEMBER DONOVAN: I think the key part to this is you can work this at the conceptual level. The tough part is putting meat on the bones. So for example, in an MOU between NTIA and the FCC, what would be the basic provisions?

Well it would seem, just to give you some examples, is that perhaps including in there an arbitration provision, a provision regarding fast track interference resolution, a dispute resolution process, the classic enforcement things that one looks to.

Then when you get down to the specific MOU between the entities that are sharing, those provisions would have to be basically consistent with the overall parameter, the umbrella that's been laid out between the FCC and NTIA, but you may want something very specific.

For example, interference dispute resolution. In some instances, that may need

to be resolved with a shot clock of 24 hours. In other types of sharing entities, perhaps 48 hours or some longer period would suffice. Those are very sharing-specific type things that really are best left to the entities that are actually going to be doing the sharing.

The ultimate goal of this is to get, essentially, parallel enforcement provisions, so that the entity, the federal entity is living by generalized -- living by provisions that NTIA is going to enforce, and that the commercial entity is living by the same provisions that the FCC would enforce.

Now you know, we will admit that the devil really is in the details of laying this out, and obviously, we would like some input from the full committee.

But that's where, at least conceptually, that we're going, rather than trying to figure out jurisdictional issues where the FCC reaches across the table and starts enforcing in the federal area, or vice-

versa, which get politically very difficult, will take an awful lot of time, and frankly, we just don't have the time, I think, to wait. We really need to try to resolve this and get it forward.

MEMBER HATFIELD: This is Dale Hatfield. A comment, of course. I shouldn't play lawyer, but to question the contract. Who enforces the contract? So if an MOU is like a contract, we still have -- this is a real challenge.

How do you resolve a dispute between the government and the private sector, for example, or between agencies and who is the ultimate dispute resolution? Hopefully that wouldn't happen very often.

MEMBER DONOVAN: I think what it does, Dale, you're absolutely right. But I think that there have been, you know, there are obviously government contracting issues that go on all the time, and a private sector cutting an arrangement or a deal with a

federal government agency over spectrum would certainly have an enforceability, that component to it.

Hopefully, if the bad actor were the commercial entity, the FCC would be first able to enforce it. If you have parallel provisions in an MOU, the NTIA would be able to enforce over the federal agency. The key is that both are living under the same sets of rules.

At some point, obviously you have to do appellate processes if it gets that far. But at least your first layer of enforcement should work, with both agencies exercising the jurisdiction that they have under statute.

MEMBER HATFIELD: I didn't mean to sound critical at all.

MEMBER DONOVAN: No, no, no, no. We've wrestled with this question all summer, and I think as we said on our conference call, it is a very difficult question to try to grapple with.

CHAIR GIBSON: Okay. Thanks, David. Any questions? Karl.

MR. NEBBIA: Sorry. Just wondering if that involved federal agencies being subject to fines and so on and part of the process. That was one question. The other thing I just wanted to ask is your notes for Question 2 indicated that you didn't contemplate enforcement in dynamic sharing.

MEMBER DONOVAN: No.

MR. NEBBIA: This is Karl Nebbia, sorry.

MEMBER DONOVAN: No. I think frankly, and that was probably just poor wording in the slide, what it was is that the original 1993 statute -- so I drafted this slide, I can say that -- the original 1993 statute, which I can look at, contemplates sharing.

But the sharing at the time really was in the context of separate allocations, in which I'm auctioning, you know, adjacent

spectrum to the federal government and to the FCC, and the need to coordinate.

That was far different than the dynamic situation that we're in now, and that's all that bullet meant.

MR. NEBBIA: I'm chuckling here, because I sent a desperate email, what does that mean?

MEMBER DONOVAN: Right, right.

CHAIR GIBSON: Okay. Any other questions on this one?

(No response.)

CHAIR GIBSON: Okay. Mariam, can you move it along?

MEMBER SOROND: Yes, sure. Mariam Sorond. I'm just going to highlight something really quickly about Question 3, and that is that the responses are general at this stage, and that is because the question is really asking, what additional tools? Therefore, I've reached out to the NTIA to get an understanding of what existing tools there

are, so we can then properly answer this question and maybe some tools need modifications or maybe there will be a subset of tools. So apologies in advance about the general responses. That's all. Thank you.

CHAIR GIBSON: Thank you. Boy, you get a gold star. Okay Rick. Oh no Karl. Karl had his hand up.

MR. NEBBIA: Karl Nebbia. Yes. I think possibly a little bit of clarification needs to be provided, I think, to the question. The emphasis in our mind, in writing this question, were the -- was the word consumer.

So what we were really asking here is once you inject consumers, as opposed to when Dale and I both first started working in this business, everybody that did radio work was pretty much a professional, except amateurs and so on, of course, who were schooled in this.

But nowadays, you know, everybody

and his brother carries a radio device with them, and we've created a whole new environment, where we've got rules on paper, but the consumer, my mom and dad, wouldn't understand them to begin with.

So we now have a -- we have kind of a politicized environment, where those people either get interference or they're causing interference, and how do we treat that? We certainly don't want the FCC to show up at my mom's door, saying we want to take away your such and such a device that you've bought at the local store, because it's somehow breaking the rules.

So for us, the emphasis to the question was injecting the consumer -- things being in the consumer's hands. How does that change the enforcement issue and in our context, the tools we have right now is you say well, there's - on your Part 15 device.

There's a very, very small, you know, set of words here that Janice has to get

out her special glasses for, and you know, to try to read what that says. Then once they read it, they say well, what does that mean to me? Because we've even had people calling congressmen because of the garage door thing, where there were clear rules written.

CHAIR GIBSON: Thanks, Karl. Rick.

MEMBER REASER: Rick Reaser, and you may be - sort of, answer a little bit of my question.

CHAIR GIBSON: And you might want to borrow the mic - yes.

MEMBER REASER: I guess what I was going to say about tools, the real tool is the process, because we get hit for this all the time. We get calls from people, especially FAA, our favorite agency, all the time at my office, and they call.

So a lot of it is the process. So we have processes at our company where if you have interference, you can fill out a thing.

We have a form you fill out and they come to us and we go resolve it. I think your biggest tool is having a process that everybody understands, and then at that point, then you can go figure out what you do with it.

Because it's not just technical tools. A lot of times, we can resolve stuff with phone calls, and that's our biggest tool, is pretty much the phone and email right now, because people report stuff. That would be my little comment about that.

CHAIR GIBSON: All right, thanks. Mariam.

MEMBER SOROND: Just -- Mariam Sorond. Just a quick question back to Karl. So this consumer would be part of the share of the spectrum that has the government users? So we're still looking from that perspective. So then it would still -- so there's no emphasis on additional.

Should we just ignore the additional and just start from scratch on what

that is, or can we get some guidance back from the NTIA on that?

MR. NEBBIA: Yes. This is Karl Nebbia. Once again, I think the idea of additional tools, as Rick said, the tools can be processes as opposed to analytical methods. So that when we have these cases that come up, how do we, you know, how do we deal with it other than, you know, once again you can point them to a particular set of rules that they don't understand.

But I think providing guidance back for how to deal with the public orientation of the current communication-sharing world, I think, is what we're looking for.

CHAIR GIBSON: Okay. Anything more on this? All right. Move to Question 4 and Dale, since Tom's not here, does he need to brief that or can we -- everybody said they've read this.

MEMBER HATFIELD: Okay. He and I

have actually been working fairly close together. But I'm prepared to try to answer questions --

CHAIR GIBSON: So let's go straight to questions on four, if you don't mind, because I think everybody's read this. Four deals with the question of how do you quickly find interference and shut it down? Did you want to highlight any of that?

MEMBER HATFIELD: Just that we sometimes don't make it clear enough, that there are two situations. If you're getting interference now at DCA, there's sudden interference, you're suddenly getting, you know, the rules are trying to fix that.

They're different than when the interference level is beginning to increase in some military installation, and you've got time to remedy it. We can do all our sort of engineering, and those are two different issues.

So the way Tom and I tried to

write up this question was he would take the what do you do when it's an immediate safety of licensed property situation, versus where it looks like we may have done the propagation model wrong, and we're getting a little bit more interference than what we expected.

Those are sort of different. The time frames for those two are different.

CHAIR GIBSON: Okay. Thank you for that clarification. Jennifer.

MEMBER WARREN: Sorry. I do have a question.

CHAIR GIBSON: Questions are cool.

MEMBER WARREN: Jennifer Warren. So I guess to you, Dale. Defining harmful interference. When I read that section and I read the last line, which is the Subcommittee would suggest, it looks like it's suggesting that there should be a stand-alone definition of harmful interference for federal users.

I'm assuming, or at least that's how I'm reading it, that what we're really

talking about there, it wouldn't be unique to that -- to the federal users. I mean if we're defining harmful interference up front, it's a standard that may have more applicability than just to federal users.

Typically, there may be more than one type of federal use in a band. So there wouldn't be a single definition if it's -- I mean are we talking about something that would be to every specific use in the band and a different definition? I have a couple of questions about that.

MEMBER HATFIELD: That's really a good - it goes to the harms claim threshold reception limit, and the way I envision it, if you're on a military base and there are signals, interfering signals that are impinging on that, what is the level of interference that you have to be able to withstand?

That makes it objective. What the different services are in there, that's what

we have to do in these, working out what the harm claim threshold should be. That's the chance to bring that into effect.

In other words, you've got some very sensitive stuff. You've got some less sensitive stuff. Then we would focus at that point on protecting that most sensitive -- that most sensitive application.

MEMBER WARREN: So just a follow-up. That's helpful. So given that exercises can change significantly at a range, right, different composition, different platforms, different networks, etcetera.

So there would be that claims, that harm threshold for the aggregate, for the individual components of that exercise, because obviously the tolerances could vary significantly depending upon what role each --

I think it's very complicated to have a single for something that's going on in a range and exercise and say there's a single harms threshold, because it might be felt very

differently. I think there's a lot of levels to this concept. I'm not --

MEMBER HATFIELD: Yes.

MEMBER WARREN: I'm not expecting - is that correct, I guess?

MEMBER HATFIELD: The reason I'm hesitating here is the Question 5 then deals with the situation where you have multiple, multiple, multiple interference. So that's the way we sort of divided it up in parts.

CHAIR GIBSON: Then let's go to five.

(Laughter.)

MEMBER WARREN: That's interferers, not the recipient of the interference.

CHAIR GIBSON: I hear you.

MEMBER WARREN: Okay. I just think it's something that we need to have a further dialogue on.

CHAIR GIBSON: Well you know, there's a lot of baked into this

MEMBER WARREN: Absolutely.

CHAIR GIBSON: - set of recommendations. So I want to give it time but there's six others to deal with today, and they're not all as weighty as this.

But I am mindful of just trying to move us along. So let's keep on this one. Jennifer, did you get your question

MEMBER WARREN: No, I'm good.

CHAIR GIBSON: -- you're cool. Thank you. Okay. Any other questions on four? All right five, which has got like ten pages.

MEMBER HATFIELD: Yes. I confess I got a little bit frustrated, because a lot of the conversations were sort of in very general terms. I think we need to do more than just general stuff. We begin to need -- I'm a systems engineer and operations research type guy, and I tend to think well, we've got to look at the overall systems problem and how we're going to do enforcement, interference

resolution and enforcement in this very different environment that we're facing now.

So I actually come up with, here, a straw man, and if you look up the dictionary definition of the straw man, it means, you know, it's exactly that. It has -- it could all be wrong. It's a conversation-starter.

Certain parts of it I may be technically all wet, that you can't do that technically, or you can't do it economically. So there may be all kinds of constraints that prevents it. But I thought it was important to get something on the table. Is this how it might work in a broader context?

I would point you then to the last page, which has this little diagram, and I'll wrap up quickly, I promise you. I see four sort of --

MEMBER ROBERSON: It's not the last page.

MEMBER HATFIELD: Oh, I'm sorry. This is a diagram that sort of shows the

different elements that are going to be involved as we look forward. You've got the FCC existing -- FCC's existing monitoring enforcement capabilities. You've got the commercially operated SAS system or systems, okay, that have a role.

You've got the individual federal agencies that are making their own measurements. In fact, I heard about at Fort Huachuca, for example, the FAA is making its measurements. You've got the NTIA monitoring now, which I understand they've made a couple of installations on so they're collecting information now.

Then of course you've got the wireless service providers, who may be collecting interference information as well. So the notion is how do we get these different systems to talk to each other.

Maybe there's a system here we don't need. I'm not even advocating, and then of course the questions of, you know, who's

going to pay for this and so forth.

But just to give you a quick example, you've got the agency, the incumbent making measurements and sees interference, and okay, you've got to resolve and try to figure out is this my own? Am I interfering with myself? Is this interference that's been pulled by the SAS operator and I know about, or is this some other interference that is -- we don't know.

If it's -- that, it seems to me, called back to the FCC and it's stuff that's in there, okay -- the process is different, and then the question is how these networks talk to each other and the sort of things that you would want.

For example, in that case I'm getting interference, I may want to go to the SAS system as sort of a giant log book and say who was on the air at this particular time when I observed interference? But here again, there has to be communications among these

different elements, and they have to have different degrees of power.

Then the other example we touched on earlier, is okay now I've identified. I'm pretty sure that it's a particular type of device that's causing the interference. Now when I issue the order to shut off those types and under what conditions can I shut them off?

This goes to the -- what the SAS operator, what they put that it's capable of, and also what equipment, of course, what measurements they're making. But anyway, there's a tremendous -- for the wizard. There's a tremendous amount of question about data compatibility here, because I'm seeing interference, you're seeing interference and we want to cooperate.

But you define signal levels different than I do. You make your measurements different than I do, and we end up with a mess. So I think sort of a recommendation on policy is the government has

to be spending more time now and making sure that there's consistency across these different systems that are all very heavily enforced appropriately.

Here again, I'm using the term enforcement too much. Of course, perhaps, preface my remarks, is interference resolution and enforcement, I've have been told, a lot of this is resolved and formulated by people at the --

CHAIR GIBSON: Thanks Dale.

MEMBER HATFIELD: Sorry.

CHAIR GIBSON: No, that's okay. There's a lot in this one.

MEMBER HATFIELD: I'm really anxious to get -- really, really anxious to get comments.

CHAIR GIBSON: Any questions? It's okay. I'm not trying to shut it down.

MS. ATKINS: Paige Atkins with NTIA. A general comment related to this discussion, as well as potentially applicable

to the other areas. I appreciate what you've laid out here, Dale, and particularly identifying the assumptions that you have made going in. I'll go back to my opening remarks, where I use the word practical in terms of as we look at potential recommendations, and as we define underlying assumptions for certain recommendations, it would be helpful, particularly if some are not as practical as others, we have an idea of the sensitivity associated with those assumptions to the recommendations that you're providing, to help us better understand the risk associated with that.

MEMBER HATFIELD: Well, it may not be practical now, but with additional work by DARPA, they might become --

MS. ATKINS: Thank you.

CHAIR GIBSON: Karl.

MR. NEBBIA: Karl Nebbia. Just a couple of notes, Dale. First, at least I see an assumption here that in this context of

aggregate interference issues, there is this assumption that there is an SAS involved in the process, which I'm not sure is certainly going to be the case in many situations.

Also, at least as I see in the writing, maybe not so much here in the briefing material, it appears to me that there's some expectation of an NTIA monitoring capability that almost appears to be anywhere, any time, which at this point we have a system out in Boulder that we can call in when we need it.

But it's not as if the Federal Government is capable of deploying a monitoring system that generally tracks like aggregate issues. I think for us, the critical question here regarding aggregate interference is we're doing a lot of work right now, doing analysis leading to sharing environments, where a key component of the analysis is how many users are going to be out there.

Based on the numbers that industry gives us, and I have to admit there's always a wrestling that goes on between the industry projection of numbers for how many millions of people are going to use their devices. Then when you start talking about interference, it kind of gets scaled back to well, the reality is we're only expecting, you know, this many and so on.

But we go through a calculation, an analytical method to determine how many users we're going to include in our analysis. Therefore, the rules we set work with that assumption in mind. The problem gets to be if in the end, industry's much more successful than with projected and predicted in those analyses.

We have an aggregate problem that, you know, wasn't dealt with. I think part of the question, certainly from federal agencies' standpoint, is how do we deal with that kind of situation, where it's due to the success of

the users and the success of the companies deploying systems create an aggregate environment where we find interference.

We can't find one person, we can't identify one user. How do we deal with that?

MEMBER HATFIELD: Yes, my intention here was to directly address that, because if -- here again, just use a military base sort of thing -- the signals coming across that boundary exceed the interference threshold, then what you would tell the SAS operator, you've got a million devices here, and you're going to have to reduce how much signal by 3 dB or something.

You're going to have to cut down the number of devices to reduce the interference level back. So that's what I was -- that was what I was trying to solve here, is exactly that problem.

That assumes engineering that you can measure the signals, all these independent signals coming in, and then you say is the

aggregate greater than what the agreement was. Then if it is, you say okay, do some down tilt in your antenna, directionalize your antenna, keep the energy away from these base by doing these sorts of things, so hopefully we're addressing it.

Now if there's no SAS in there, if you're doing it by other means, your architecture obviously needs -- would need to be -- We'll talk a little bit more about that. So I've been so focused on where there's -- most of it's under control, as the PCAST report suggested, right?

The PCAST report was really oriented towards the database system, and that's what this request is.

CHAIR GIBSON: Any -- Michael.

MEMBER CALABRESE: Just a quick add-on to what Dale said, which is Karl, you mentioned that it may be unrealistic to assume widespread NTIA monitoring. But it could be that as part of -- as part of the SAS or as

part of the commercial obligation, that there is some spectrum monitoring at least in sensitive areas.

So if the potential problem is primarily near certain military bases, for example, certain facilities, a certain port, that there could be private sector monitoring, whether it feeds into the SAS or somehow operates separately. I think that could be taken into account as a potential enforcement tool.

MEMBER HATFIELD: Precisely, and that was the boxes I had drawn, was because that information needs to get around from all these different players. It gets back, it's back, so I agree

CHAIR GIBSON: Okay, sorry. All right thank you. That was interesting. Okay. What I noticed in this document, it's not done, right? There's more work to be done on it? Well I mean that's an open question.

What we need to do is -- and you

know this is going to sound like Jeopardy. But phrase it in the form of, the NTIA should, and there's a lot of good information here. But I think as I'm going through it, and I was wearing Paige or Karl's hat, I'd be a little struggling with what do we take in terms of action or information out of this. Is that safe to say?

MEMBER HATFIELD: Yes, and

CHAIR GIBSON: So you know, and so for February, if you're going to have this kind of document, it would be good to have the recommendations, and then we'll spend -- we need to spend more time on it. But I think this was a good presentation, but we need actually --

MEMBER HATFIELD: Well, in some cases, the recommendation may be there needs to be more effort in terms of data standardization, so these networks can talk to each other. So it might not be a solution in a sense, but it would be a recommendation

saying hey, you guys have got to talk to each other. Look at the interfaces.

CHAIR GIBSON: Okay, thanks. Dennis.

MEMBER ROBERSON: I think in the refinement process, one of the things that will be helpful too, and taking on Karl's comment and I guess even moreso Paige's comment, things that are reasonable from an NTIA standpoint or unreasonable from the assumption set, because there are a set of assumptions that have been laid out.

If you can flag the assumptions that gee, that doesn't make sense to us as NTIA and this is the NTIA monitoring point that Karl made, or the earlier point that you made Paige, you know, the pluses and minuses. But I think as a feedback loop, so that this isn't a one-way flow, that there's a loop that occurs.

I think that would be enormously helpful, particularly for this activity,

probably for others as well. But certainly for this one, because it's sufficiently complex that kind of an iterative approach for this would be quite helpful.

CHAIR GIBSON: Did you want to comment on that?

MS. ATKINS: No, I agree with that, and what I'd like to do also, for most of you, I think you understand that we've established OSM, NTIA OSM liaisons to each of the subcommittees, and we will try to leverage those liaisons also to provide more pointed feedback to include on the assumptions and other areas you move along.

MEMBER ROBERSON: That's very helpful.

CHAIR GIBSON: All right, okay. So that's Enforcement. Any final comments? No, good. All right. So now we have --

Transitional Sharing

CHAIR GIBSON: I apologize for pushing this along, but I mean this was --

there was a lot to inhale. Thank you, and for the rest of the team, this was -- there's a lot to this. Enforcement's a hot issue so --

Transitional Sharing. Well, the good news is I've got nothing to say. Tom and I kind of put this one to rest, and then we just didn't finish with the final set of recommendations. We have a document that we'll present in February as a set of final recommendations. In many situations, a lot of that's been overtaken by events, for example, at the Industry Collaboration Subcommittee, with stuff that's already going on.

So we will have recommendations in February and then we'll put that one to rest. Any comments on Transitional Sharing?

(No response.)

CHAIR GIBSON: All right. Number three, General Occupancy Measurements. That was Mark and Mark, and Mark -- Mark's not here, so Mark, why don't you take that?

MEMBER MARK McHENRY: So we were

given two questions.

CHAIR GIBSON: Give Mark a mic.

General Occupancy Measurements

MEMBER MARK McHENRY: So we were given two questions. One was how would measurements help relocation or sharing the spectrum. We kind of had a multi-part series of recommendations.

The first recommendation was that the measurements are useful, and the real objective is to determine how much spectrum could be shared. That's really hard to figure out from assignments, because you know, the assignment doesn't mean use, and the measurements mean use. So that's what the value of measurements would be.

Then there's several sentences here. Your measurements don't work everywhere. Janice, she just walked out, she gave us like it doesn't work here and there. So there's some backstepping on the where it doesn't work and so forth.

So the next recommendation was we need to break the measurements into different levels, depending on what your objective is. There's some on initial planning stage, Level 0; Level 1 might be some general occupancy measurements like NTIA already does.

These Level 2 might be more technical measurements, where you're trying to get specific system parameters, and then the Level 3 would be a pervasive, really trying to see, you know, what airplane flies where, in what location, because I'm getting ready to bid on the auction and I want to know exactly what's out there.

So by breaking the measurements into levels like this, you kind of achieve different goals and it saves money too, because the last type of measurements are very expensive. So the next part of the response is well, who do you give the data to?

So we suggest NTIA figure out a multi-tier approach. We'd give this data to

these people, and we didn't really break it, you know, make a set of recommendations. But NTIA needs to figure out well, who do you give the data to and when.

I mean toward the end, when a guy really is going to bid for the auction, you might give him a lot of the data. Then the last part of this is how would you obscure the data? The recommendation is NTIA figure out how to obscure spectrum data to meet the needs of maybe a researcher or the needs of a bidder.

But you can't track every airplane the Army and Navy has and flight trajectories and stuff. So you find a way to obscure spectrum data. Then the last part of the recommendation is if you have a bunch of measurements on a system and it's about ready to be not deployed anymore or killed, you wouldn't want to give these measurements to industries, and you know the system is going to be -- get killed.

So you would go through annotate the measurements and extrapolate that, you know, these -- you know, you would talk to the base or whoever the users were, and say we measured a lot of this or that, but discount that, because that's going away or we plan on deploying the system in this band. Just because it's empty here doesn't mean it's empty in the future.

CHAIR GIBSON: Are you done Mark?

MEMBER MARK McHENRY: That's with Question 1. So you have Question 1 --

CHAIR GIBSON: Let Paige -- Paige wants to comment. So let Paige comment on Question 1.

MS. ATKINS: Paige Atkins, NTIA. Actually, the comment is I was trying to follow your words with what are in the summary slides, and I couldn't actually -- okay.

MEMBER MARK McHENRY: Okay, I'll back up. You want to back up to where?

MS. ATKINS: This is just -- what

you just described I don't see in the slide. So I was just trying to follow.

MEMBER MARK McHENRY: Okay. Slide 7 talks about extrapolation. If you measure a bunch of stuff, you know, it could be a Link 16 or some system you know is going to be phased out soon.

How would -- most people wouldn't know that, but NTIA would have insider knowledge, and they could annotate the data with what you know is coming and going in the band. It would make the data much more useful and reliable. You got that one?

MS. ATKINS: I'll follow up and just make sure I can -- I see the information in print, so I can correlate.

MEMBER MARK McHENRY: Okay. Any questions?

CHAIR GIBSON: All right. Let's hold off there. Karl --

MR. NEBBIA: Just Karl Nebbia. Just one thought here. Once again, I think

our issue is that people are constantly saying if they understood how the government, you know, what the government operations look like better, we would be able to make better spectrum decisions.

In that context, people have recommended, you know, you need to go out and do occupancy measurements. So the question that we had, given that we've seen lots of people's occupancy measurements, a real question is how can they be done in a way that would accurately reflect actual federal use in a way that you could then actually make decisions from that information?

Because most of the general occupancy measurements that I think we've seen in the past, you can't make any decisions from. They don't see a lot of the things that you need to look for and so on. So they're very good at providing an initial picture, but for actually moving the spectrum decisions forward, the concept of general spectrum

occupancy measurements is what we're asking about.

MEMBER MARK McHENRY: Well that's Level 1. The measurements -- you're talking about the past. You go to two or three places in San Diego, and you set up equipment for 24 hours, and you get -- is it feasible to share? I mean the band was full at that point, maybe do a few other places, you would learn something.

Level 2 is you sit right next to the devices and measure the wave forms, get the technical characteristics. That would help people building the actual spectrum-sharing mechanisms. So no one does Level 2 right now.

MR. NEBBIA: Right. So this is -- but this is important. In essence to me what you're saying is that the general Level 1 spectrum occupancy measurements that people often talk about and that many people do do not provide sufficient information on that

basis to make spectrum decisions, and therefore you're recommending that other steps be taken.

MR. NEBBIA: Well, each of these levels lead you further down the decision path. Level 3 is I'm getting ready to bid. I want to know exactly in Santa Barbara what is happening at 3:00 in the morning at two gigahertz. That would be a lot more --

CHAIR GIBSON: In this working group, as I was monitoring some of this, providing a flow diagram, sort of hierarchical, if then, if then, what decisions would you make?

MEMBER MARK McHENRY: That's what -- yes. I was signed up to do that and I didn't do that.

CHAIR GIBSON: Yes, and that would have made it a lot more easy to visualize what Mark's talking about, because each of these measurements builds on each other. Jennifer, did you --

MEMBER WARREN: Well, Jennifer Warren, and I think it's not a guarantee that you go from Level 0, 1, 2, 3.

CHAIR GIBSON: Right.

MEMBER WARREN: I mean - I think you do get to 3 if you're past 2, but you don't necessarily go from 0 to 1. Zero may be the stop point, 1 may be a stop point. So it's not a guarantee, for the reasons that, you know, you were bringing up about it.

CHAIR GIBSON: Yes. Go ahead Karl.

MR. NEBBIA: Can I just add to that? So I mean I think the flow's understandable even without the diagram. I just think the specific recommendation point, that general occupancy measurements by themselves are not sufficient, and therefore NTIA or the federal government, FCC, should employ these additional processes to actually get to that point. I think it's a critical point.

CHAIR GIBSON: Okay. I saw

another thing up.

MEMBER ROBERSON: Yes, I put it up.

CHAIR GIBSON: Dennis Roberson.

MEMBER ROBERSON: Yes, Dennis Roberson. I think that this point, and a flow diagram would illustrate probably better. But the key point is that there are multiple levels, and that's what you've gotten, and we have to have the ability to occupy each of those levels, so that a proper decision can be taken.

And as Jennifer just said, that's why I took it down, you really -- you take the decision and that may be the end, that they're fully occupied, there's no possibility of sharing, we're done. Well, if there is a possibility, then that's a different branch. Then we get to another decision point, where at each point, one of them has maybe --

Okay. There's no further activities. This just doesn't make sense. But I think there is this set of refinements.

But the other side of it, the refinements as you move down that logical tree, the amount of equipment and measurement becomes less, because you've already excluded a large portion of the decisions at the top with the crude measurements, if you will, and the investment level if you're thinking about this from an equipment standpoint, is different at these different levels.

You are able to deal with it at the crude level. It may be inexpensive equipment that you can widely deploy, and at the precise level, it may be very expensive equipment, but you only have one of them for the country or some such thing as that.

CHAIR GIBSON: Okay, thanks Dennis. Paul.

MEMBER KOLODZY: Paul Kolodzy. Mark, one of the things you might want to -- I'm a very big fan, obviously, of spectrum measurements. But one of the things that I think you may want to think about is what

would augment spectrum measurements with respect to what modeling analysis that needs to be done, or what advances in modeling that you might be able to use.

For instance, if we're trying to look at the occupancy of a highway, we wouldn't measure every car. What we would do is actually have models on how traffic flow goes, and we'd actually use measurements to actually confirm or modify those analysis.

CHAIR GIBSON: That's not a question.

MEMBER KOLODZY: Okay. But it was asked what can be done with measurements, and that's what I was trying to figure out is what -- how would you actually do the measurements to allow that to occur in those ways?

I just think that it's not just the quantity of measurements, but it's also the quality of measurements, in the sense of what kind of distributions and things like that.

MEMBER MARK McHENRY: The next question -- go to the next question --

CHAIR GIBSON: We'll do that now.

MEMBER MARK McHENRY: Okay. Well, the next question -- focuses on that - okay.

CHAIR GIBSON: I don't want to jump ahead. All right. Janice, then Larry, then Michael.

MS. ATKINS: Just a couple of observations.

CHAIR GIBSON: Janice Obuchowski.

MS. ATKINS: Oh, Janice Obuchowski. Just a couple of observations. One is I understand the value of occupancy measures. Somewhere in this discussion, though, there seems to be an underestimation of mission impact, and I guess we kind of got a little bit.

But certain missions just don't, you know, the old ICBM detection. I mean hopefully --

MEMBER MARK McHENRY: That's your

Level 0. You could say that this band is so critical even my measure 0 doesn't matter. I'm not going to detect you.

MEMBER OBUCHOWSKI: Right. But I mean that --

MEMBER MARK McHENRY: I mean Level 0. That's the Level 0 test.

MEMBER OBUCHOWSKI: That's important to highlight. I guess you do. But I think it's lost in common discussion.

MEMBER MARK McHENRY: Well, I skipped over that briefing, but there's a whole section on Level 0 where those decisions are made.

MEMBER OBUCHOWSKI: Right, right, and then the sort of, I guess it's a different point but in some way related. Often lost here is the relocation option, right. Okay. Not that much going on here but where does it move to, and I would experience this in the WRC context.

You know, there's a whole cadre, a

limited but very vocal cadre that is looking for life way, way, way out in space, and it's pretty controversial, because it uses a fair amount of spectrum in critical places. All right. Then the discussion is like well, maybe we ought to change that. But how theoretically? Where would it go?

MEMBER MARK McHENRY: You could make measurements for the receiving end and the leaving end.

MEMBER OBUCHOWSKI: Okay. Well, that's all good. But all I'm saying is these are -- this is probably highlighting -- this whole topic of measurement rapidly become politicized, as you know, and it's very nuanced. It ought to be a very nuanced argument. Typically, it's not used in such a nuanced way.

CHAIR GIBSON: Thanks Janice. Larry and then Michael.

CHAIR ALDER: Yes, just a quick comment. I think this is a good set of --

this is a good framework to think about it. I definitely support it. Just in the text, it's hard for me like the Level 2. It doesn't describe what the actual Level 2 measurement is, and maybe you want it that way. But when I read like what is Level 2, and it just says for target advance to determine --

MEMBER MARK McHENRY: I said a lot more words in there in the recommendation. When you --

CHAIR ALDER: Yes. That's my comment.

CHAIR GIBSON: Thanks, Larry, and then Michael.

MEMBER CALABRESE: Yes. Like I said, you know --

CHAIR GIBSON: Michael Calabrese.

MEMBER CALABRESE: Yes, Michael Calabrese. When I heard Karl's suggestion about framing a recommendation, it made me think that I believe, you know, part of the purpose of this -- you know, part of our

purpose on the Subcommittee was that we thought that having these levels winnows the number of bands down, and gives you some sense of whether we're talking about a possible, you know, clearing or are we just talking about sharing.

But in any event, a practical benefit is that it allows NTIA or whoever to focus their resources more, so that this winnowing process, we can get to a type of measurement that may be much more difficult and more expensive. But you're only doing it where it's going to really matter, rather than everyone --

I think some of the reactions to some of the general occupancy measures in the past has been to throw our hands up and say well, we just don't know enough to do anything, and part of this is to winnow it down to almost in a fast-track process, is an enhanced fast-track process, talking about which bands are really worth investing in some

much more comprehensive type measurements.

And then what should go into that, I think, is further work for the Subcommittee.

CHAIR GIBSON: That's a good point, Michael, because I agree with what Larry said. This is Mark Gibson, one of three. Then as I read through this, and I was part of the discussion, what we got stuck on was well, how do you move from one level to the next?

It's not like a video chain obviously. It's just, you know, Level 0 has a certain outcome expected. Does that outcome drive level, to the next level, I mean 1, 2, 3 and 4? And that's why we talked about putting it in the form of a flow diagram.

What are the gating criteria that move you to the next level, and what are you hoping to get out of those levels that you couldn't get out of the previous levels? I know you try to articulate that when you --

MEMBER MARK McHENRY: It's harder

to get consensus when you add emails to this.

CHAIR GIBSON: I hear you. Well, I hear you. And that's - Okay. Jennifer.

MEMBER WARREN: Jennifer Warren. So I just take the floor a second time on this. But I wanted to come back and on Chart 7, there is a statement that the measurement characteristics alone are not sufficient to determine future usage as well, right?

I think one of the things we sought to incorporate is that the occupancy doesn't show things that are already in the pipeline to be deployed, and that that also needs to be factored in, because that is not, you know, just potential, but it's reality.

MEMBER MARK McHENRY: And it should be right on the measurements, because you could get confused. You might forget that there's some of the documents says this and it should be on --

CHAIR GIBSON: All right. Thanks, Jennifer. Mark, can you real briefly go over

number two?

MEMBER MARK McHENRY: Number two is how do you use measurements to quantify federal spectrum use, and the problem with this is there's so many diverse spectrum systems all over the place.

You end up with kind of the Level 3 measurements -- be successful and it's unfeasible. So it's really more of a model-based approach. So what the measurements can do is double check your models.

That NTIA is building models and they could point predict occupancy, and then that would check propagation models, transmitter assumptions and that you could spot-check whatever models. They're already building models that do this, and to do measurements to do this, at least I believe, I thought the group believe it's unfeasible.

You go through all the DoD spectrum or government spectrum and all the systems and using measurements alone to do

this. But you can spot check measurements. That's what the recommendation is saying, just use the measurements.

They can generate spot predictions, and the measurements would do spot checks to validate whatever modeling you guys are doing.

CHAIR GIBSON: Okay. I hear Karl over here rustling in his seat --

MR. NEBBIA: Karl Nebbia, sorry. So one of the things here, part of the question had to do with quantification of spectrum use, regardless of whether it involves measurements, and in fact, NTIA put out a plan in April, that we were going to take an approach under the President's 2013 memo to quantify federal spectrum use, to insert in each of the data records for federal assignments, some estimation of how much they were operating.

Because the idea that we were going to go out and measure everybody, all

240,000 records and so on and try to put that in a database, or even to try to pick out a few bands and do that across the country. It seemed like kind of a bridge too far.

So we're going down this path of asking the users, as part of their frequency assignment requests in the future, and as part of the records for a certain number of the bands to indicate some estimation of the percentage of time they're actually transmitting.

So that's part of what we're going to be looking at, and of course the essence here, the question has to do what do you do with the limited resources? How do you actually quantify and/or measure the spectrum used in a way that's meaningful?

CHAIR GIBSON: Thanks.

MEMBER KOLODZY: Paul Kolodzy. Karl, that's a great idea. Can I ask a question? Are they looking at not just their duty cycle, the percentage of time, but

actually looking at the temporal correlation, so they know that they're --

You know, say somebody uses it one-tenth of one percent because they fly a mission only once a month and this is how often they do it, versus when they actually need it or use it at a certain percentage level at that time?

MR. NEBBIA: Certainly, we are asking them for this quantification, this estimation of the amount of time that they use the system, but asking them are there other factors like you were suggesting, that the significance of the system is such that when they need it, it's going to operate full time.

It has to be on, it has to be interference-free. They'll be able to provide that information. But the basic initial quantification is essentially asking them for how much of the time they actually expect to operate.

I know we've done, for instance,

LAN mobile measurements in federal band during an inauguration, when we were expecting use to be high, and still only saw use levels in maybe the five percent range.

So we're expecting in most cases that time to be, you know, representative of the sporadic or temporal use of federal operations, and that will give us a better understanding of well how can we take advantage of that in sharing arrangements in the future.

CHAIR GIBSON: Mark.

MEMBER MARK McHENRY: So why do you want that data? I mean it seems like it's more useful as much as you block T-Mobile from using it where they want to use it. Who cares what they use and if they use it in the middle of the desert? It seems like it's a very complicated thing you're trying to do, well the real metric is how much do you block other people.

MR. NEBBIA: Well I think, Mark,

first of all, we were required to look into quantification of the federal spectrum use. We are trying to take an approach, I think, that relies on the users, as opposed to us having to go out and generate all the information.

And also by building it assignment by assignment, it's going to become part of the record for the future. So it's not going to be a continual big ask of everybody. It's going to get incorporated in the record.

So we actually have a field in the GMF dealing with time of use, but the categorization of that in the past has not yielded this kind of meaningful information. So we're hoping that percentage of use will in fact be of value to people trying to implement new technologies.

CHAIR GIBSON: All right, Rick.

MEMBER REASER: Okay. This is Rick Reaser. Have you guys flowed this? I -- we do frequencies on request every day in Pub

7. So is that all being flowed down, because we have never filled out a field like that?

MR. NEBBIA: The actual initiation of putting it into the new records is still being resolved, how that's going to be done. But in a specific set of bands included in our report, that we think are the bands that at this point are the most critical to this ongoing sharing discussion, we're asking for the agencies to go out and provide that information over the next year starting from June. So it will be until next June.

CHAIR GIBSON: All right. Dale and Steve, and then I'm going to have to move it along.

MEMBER HATFIELD: Yes. Just real quickly, measurements can be the sort of things we're talking about. There's compliance measurements too, and you don't go out and try to measure everything. But you say, just like the IRS does, right?

They go out to see if people are

really claiming -- it's not -- it's not to sort of enforce something against the person that you're doing it. It's to see what percentage of the American public is paying their fair share of taxes.

So it seems to me here if you can do some selective compliance testing, because the incentives I don't think are -- if I'm an agency, I don't think the incentives here are perfectly aligned. But the way you can do it is by compliance. Just go out and make some selected measurements, to see if what's being reported is consistent with what you actually measure, without any finger-pointing.

Not saying okay, you're bad because you wrote down the wrong number, but just to see if people complied by your rules.

CHAIR GIBSON: Before Karl answers, can people on the phone mute? We're hearing a lot of cool things there, but we're not really forwarding the conversation along. Go ahead, Karl.

MR. NEBBIA: Karl Nebbia. So I think the important thing here though, Dale, is we're not looking for people to go out and verify the existence of specific assignments. The question here dealt with the use of these tools in the broad sense of doing spectrum planning decision-making.

So how do we look at a band? How do we use quantification, spectrum use or measurements, to say yes, this is a band that's worth pursuing or isn't, or this kind of technology might work for that band, whereas this other might not.

For instance, if you're doing airborne radar systems in a band, SAS may not work. So that's -- but having this kind of information about the uses might help make that sort of call. We're not really, at least on this question, looking to nail down is this user there? They have an assignment; are they there or not?

That's, I think, too micro in

terms of too small a piece, I think, for this.

CHAIR GIBSON: Okay, Steve.

MEMBER SHARKEY: I was going to say first, you know, I think it's great that you're doing that. I mean it's the more information, the better and it's always more of the challenge is just gathering information.

But just -- and for clarification, so you're looking for them to provide actual use, because one of the things that we found looking at like AWS was there was a difference between scheduled use versus actual use, where they had to just block out a big chunk of time, because they weren't sure when the mission would go off or not. But the actual use might be much smaller than the scheduled use.

And then are you planning to do any measurements that kind of spot-check against what is being reported? That's what -- yes. That's I mean was --

(Off mic comment.)

MR. NEBBIA: Well, this is Karl again. Certainly, we're looking for actual use, as opposed to just -- they can still once again provide additional information, where they say, even though this is the level of actual use, we have to kind of lock out this to ensure that we have access or something like that.

The question of whether we're going to then go out and try to verify that is a pretty big question because there's lots. You know, we've talked about there's, I forget, six, seven bands. I forget the exact number. It's a lot of stuff. So whether that would prove useful or not is certainly something I think we can talk about.

CHAIR GIBSON: Okay, and Paige wants to make one comment.

MS. ATKINS: Paige Atkins, just a quick comment. If you haven't read the quantification plan, it's in our Fourth Annual

Update to the Ten Year Plan on our website. It's fairly short, but it will give you an idea of what we have asked the agencies to do.

CHAIR GIBSON: All right, thanks. Okay. The next one is number -- not number four. The Spectrum Management Databases and Larry and I co-chair that, so Larry's going to do the brief.

Spectrum Management Via Databases

CHAIR ALDER: So I know we're short on time. The first comment is we do have what we consider draft recommendations. The language is not polished. We'll probably come back in the February meeting to, you know, formalize these.

So we think we've kind of done the base work on the question, which is how could sensitive government-classified operations be included and protected using a database-driven sharing approach, particularly one that strives toward real-time responses?

The goal of the group was really

to collect, do a collective wisdom approach. We really boiled it down into three areas of the recommendation. The first recommendation really challenges the premise of the question and says first of all, we don't think that you have to have sensitive information in order to facilitate sharing.

There's lots of opportunities to do sharing that don't require the use of or knowledge of or the disclosure of sensitive or classified information. So we just wanted to call that out very clearly.

We also wanted to call out that, you know, by its nature, things are band by band. It's impossible for this subcommittee to come out with one overarching solution that's going to apply everywhere. So that was called out here.

Then we kind of did challenge, I think, the NTIA to say that we think that the 3.5 gigahertz band, let's start now. We put a time frame out there. It was a little bit,

you know, pulling a number out of the air.

But we really do want to see some sharing begin, and the idea is as more information, we get better at dealing with sensitive and classified information, that sharing can improve and be more efficient. But we should start now. So that's the first recommendation.

The second recommendation is really around okay, what are some tools to actually deal with sensitive and classified information. So the tool that is most -- was most discussed is the concept of a black box. Some people call it federal SAS. There's other terms.

But the general idea is that the commercial entities make some kind of request that goes into some kind of black box and an answer comes out. So the commercial entities don't necessarily have to know all the classified information that went into computing that answer.

Now that has pros and cons. There's definitely transparency issues that were flagged by the group as a concern for this. There's also concerns that this will take, you know, a significant amount of time, resource and so forth to implement.

So the Committee's kind of consensus view was this is something that should be investigated and we should be building a path towards doing that. It can be a further optimization. But it shouldn't be a gate to kind of getting started with sharing. We wouldn't want to see that as part of the recommendation.

There's another level that this can be taken to. There was discussions around this idea of implied disclosure by an aggregate of information that's in -- any one piece of information might not disclose sensitive facts. But if you aggregate them, there could be disclosed.

So there was a topic, well what

you can do is you can add some kind of form of obfuscation or dithering of some kind into the data. We didn't get into like a deep technical analysis of that. This is just generally a path that the group thought was worth investigating. There are challenges here that everyone acknowledges.

So really Recommendation 2 is if there is sensitive information that just can't be disclosed, that there be some kind of black box approach. We cited the 7090 gigahertz band as one that did have that kind of approach, although it's not as real time and as automated as folks might like to see.

The third element of the recommendation, the third piece, was really a lot of the discussion in the group centered around the fact that there is a barrier to having these discussions, due to the fact that much of this information cannot be shared. Hence, I think we've done a good job of creating this industry-government

collaboration committee.

But we wanted to at least highlight that it is a barrier, and one of the senses was a lot of information isn't actually formally sensitive. It's not in a class guide. It's not subject to, you know, a designated authority. It just gets declared FOUO, and there seems to be that barrier.

So think that's more work really for the other committees. But that's something we'd encourage the NTIA to kind of study, and see if we can come at a way to make sure there isn't kind of information that really shouldn't be sensitive, being overly restricted and prevented from getting out there.

So those were the three elements of the recommendations that we came back with. There's some more details about principles that we put in the kind of addendum, and these principles are fairly consistent with what's up there, and I don't think we have time to go

through them today. So that's the basics of the recommendation.

CHAIR GIBSON: Thanks, Larry. Any questions, comments? Go ahead, Paige.

MS. ATKINS: - quick comment - Paige Atkins. So I think we all agree that we don't want to hold up sharing in the process, and I believe the genesis of this question is understanding that, and we're doing other things to address that then.

To get to where we want to be, we may need to look at mechanisms where we can share in some sense, and it could be through obfuscation as you mentioned, information that allows us to share in a way that we can't share otherwise. So just a side comment on that.

CHAIR ALDER: And I'll respond to that. I think the challenge that the Subcommittee faced in getting into specifics is some of those specifics are so band by band and system by system. It's hard to come up

with one overarching method of doing it.

That's why we kind of just highlighted some general tools, and then I think the recommendation really is around to get specific, you have to deal with kind of some of the industry collaboration steps. You have to get the experts in the room and come up with the tailored solution for the specific thing.

CHAIR GIBSON: Janice.

MEMBER OBUCHOWSKI: Number one, I'd like to compliment the co-chairs. Very clear -- no. It's a very clear report, a lot of clear thinking.

CHAIR ALDER: Thank you, Janice.

MS. ATKINS: And good approaches, and I tend to agree. There are certain things that need to get off the ground. You don't have to study every last detail. Personal concern about the degree of skepticism around black boxes or whatever.

Yes, you can say some of this is

self-protected, but you only have to read the news to figure out that the private sector and probably the country at large underestimates a lot of the threat out there, and I would not poo-poo the notion that some of this information that you may not think is that interesting could be very interesting to adversaries.

Then I guess the other point I'd make here is there's again a lot of -- sort of an implicit criticism that the government, you know, is overly-protective of its data. I would probably be the first to admit there are those occasions.

But I also wanted to observe with some amusement that the idea of a government spectrum score card was certainly not appreciated when the table was turned and said hey private sector, you've got all the data. You're making a lot of statements about your intensity of use. But you're extremely unwilling to share it, even on a classified

basis.

So you know, I think healthy skepticism, when directed to the government, is important, but also, you know, a certain amount of skepticism about some of the statements made about intensity of use on the other side of the table.

CHAIR GIBSON: I'm going to take my co-chair hat off a minute and put my other co-chair hat on. This is Mark Gibson. You know, your points, Janice, are well-taken, and so, you know, what the Subcommittee is trying to do is walk a fine line between poo-pooing both sides, you know.

That's serving many masters, without really being able to address any one of them. The purpose behind this recommendation is to say yes, we get all of this. The data is classified, and in 99.9 percent of the cases, classification is justified.

But we've all had experiences

where there's some piece of data that we find isn't, and from the commercial side, we sort of fly in the clouds a little bit because many of us have run into the situation where this data is not classified and this data is not classified, but when you put them together they are, and nobody other than the offsite guys know that.

So what we're saying by these recommendations is okay, let's study those situations, so that we're not -- we don't have that happening, and anybody that's dealt with classified data has had that happen and it's just a mess.

So I think what we're trying to do is to say let's get together, and it may be beyond CSMAC. But let's get together, those of us that have to deal with data, and try to figure ways through some of this, because anybody that dealt with this in AWS-1 found out almost unilaterally that data were marked FOUO, when we thought we were going to be

getting it.

And you know, there may have been good reasons to that, but we didn't know that going into it. Now AWS-3 has been different, so what we're trying to say by this is let's try to understand that a priori, and deal with it while we can. Jennifer.

MEMBER WARREN: Yes my -- Jennifer Warren -- my comments again are on, you know, charging NTIA with reviewing data classification procedures. It so not within their mandate, sorry Larry. That -- they do not set any of them for any of this information. They're set by the users. They're set by the PEOs. They're not set by this agency. They're not set.

So -- and they're not set because of a particular element like a particular frequency. It's the system and its components. So this to me -- I mean I did, you know, Janice's earlier comments. But this particular recommendation, I think we need to

be much more -- we need to be very focused on what is within NTIA's purview, as opposed to something that is across the entire federal government, not within the FCC's.

This is not something that is peculiar to NTIA or spectrum-specific at all, as you know.

CHAIR GIBSON: This is Mark Gibson, and totally get that, you know. We struggled with that in the committee. I think you're on the committee.

MEMBER WARREN: No, not this one.

(Simultaneous speaking.)

CHAIR GIBSON: One of the few you're not on. No, we struggled with that, because I think those that are -- you know, Rick had a view, gave us a lot of feedback on that. We understand, you know. But we've got to start some place, and so if the pushback is on Karl's issue of status, that no can do, then okay, you know. We'll have to deal with that. But go ahead.

CHAIR ALDER: So just trying to -- just trying to capture the spirit of the Subcommittee here. So one of the spirits, and Rich was a big advocate on the committee. Unfortunately, he wasn't on the last couple calls, but was that we didn't want to -- we didn't want this committee to invent processes for dealing with sensitive and classified information.

That wasn't the charter of the Subcommittee, and the spirit was use the processes that are in place, and maybe work to automate them and make them more efficient. What we wanted to capture in this recommendation, and I think we still need to tune it, like you said, is that it was a big discussion in the Subcommittee around the challenges of dealing with the FOU and the barriers.

I kind of felt that a lot of this is being picked up with this Industry Government and Collaboration work. But we

needed to fine tune that, that third piece.

CHAIR GIBSON: Go ahead, yes. Jennifer.

MEMBER WARREN: Can I? Thank you. Jennifer Warren. I don't -- I'm not questioning the value of looking at data classification procedures, you know, as a general matter. But I think any recommendation needs to very tailored as to what is it that NTIA, we think NTIA could do with respect to the spectrum aspects of data classification procedures.

Because I'm not sure, and perhaps we should look at this legally, because without, I think, a much broader review, you're going to spend a lot of time and the CSMAC is going to spend a lot of time on something that may not have the effects we all would like to see.

So I get the spirit, but I think if we're, you know, trying to -- it's like telling NTIA to do something that they don't

have legislative authority to do. We choose not to do that most of the time, but here we're telling them to do something that they don't have the administrative authority to do.

So I think we need to figure out what is it that NTIA can do or what is it that we recommend NTIA take to the appropriate parties that do have the authority, which is different, and I just -- that's my nuance here.

CHAIR GIBSON: And this is Mark Gibson. I appreciate that. I think that's where we struggled, you know, not getting NTIA into the weeds where they don't belong and there's no mandate for them to go.

MEMBER WARREN: Right.

CHAIR GIBSON: - versus where can we institute some best practices that NTIA may be able to lead. So you're absolutely right, and we wrote that down. Karl.

MR. NEBBIA: So Karl Nebbia. First of all, my middle name is cando, not no-

can-do. So please keep that in mind. Always positive here and positive here at NTIA, right.

I just wanted to mention that I think on the idea of the black box, there's a couple of points that we always run into. First is people wondering well, what are the analytical methods that are being used inside that black box. The second thing is that there's cost in creating it that DoD, for instance, is unlikely to want to absorb in creating such a mechanism.

So I think one of the things that you may want to consider in that discussion is the fact that on a cooperative basis, the black box can actually be set up and run by a non-government entity in, you know, with a relationship with DoD and the inside workings of that black box can be clarified and understood by everybody, in the same way that I think in the --

Whether everybody agreed in the

particular analysis methods on AWS-3, I think everybody kind of understood better what they were, and then based on that, during the trusted agent discussions, were able to discuss what things they could improve in that analysis, and that's where real progress is made.

So I think if in the end, you're able to open up, make transparent how the capability works, and ultimately somebody else may be able to work with DoD or whoever the agencies are, so that the funding doesn't have to come through another government, you know, budgeting mechanism.

CHAIR ALDER: Yes, and that was actually -- we didn't get into the wording here, but that kind of spirit was discussed a lot in the committee about having it not actually run by the government but on behalf of.

CHAIR GIBSON: And actually I thought we had language in there to add.

(Simultaneous speaking.)

CHAIR GIBSON: Steve. I mean that's -- you get the last word.

MEMBER SHARKEY: Yes. So I just wanted to -- actually Jennifer brought up, I think, an interesting point, and it may -- and you kind of touched on it at the end a little bit more though.

But it may bear some clarification on the role of the committee, because I would have thought that even though classification may not be something that NTIA does directly, that NTIA is an advisor to the President on spectrum matters and the administration in general.

So it would be appropriate for us to make recommendations along those lines, that NTIA would then take to, you know, the administration or make recommendations beyond just the agency, of ways that spectrum management can be improved. I never, I guess I never thought that it was limited to -- the

advice of this committee would be limited to just what NTIA could implement directly, but as more of a policy matter, more broadly.

CHAIR GIBSON: Go ahead.

MEMBER WARREN: No. I think what I -- the way it's currently -- sorry, Jennifer Warren. What I said was that the way it's currently structured, it's reviewing -- it's telling NTIA to do it, as opposed to focusing on what it would need to do externally, beyond its own borders, if you like.

CHAIR GIBSON: And this is Mark Gibson. What Steve said was the intent of the recommendation. So it's interesting to see Jennifer's reaction, because obviously we didn't get there, notwithstanding the accolades we got from Janice.

So we're working to craft it a little bit more along the lines of what Steve said. But that was exactly what we're looking for, is some role NTIA can play, and the advisory role they've got within the cabinet

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CHAIR ALDER: Let's move on to the next group.

CHAIR GIBSON: And now Larry's going to co-chair, just to let you know.

CHAIR ALDER: So now there's a new sheriff in town, and I've been left with 15 minutes.

CHAIR GIBSON: You're welcome.

CHAIR ALDER: So let's turn to Jennifer and Janice for the Bidirectional Sharing.

Bidirectional Sharing

MEMBER OBUCHOWSKI: Okay.

CHAIR ALDER: That's a short, easy one.

MEMBER OBUCHOWSKI: Well, I'm shorter.

CHAIR ALDER: So why don't we do this? Why don't we have you guys present the whole picture, and then we may have comments on the whole picture.

MEMBER OBUCHOWSKI: All right. Well, I will give this a shot here. I have to say that the Bidirectional Sharing Working Group, having had seven meetings, and the last iteration was suffering from its own variation of CSMAC fatigue this time around. So we only had -- we have quite a bit of email dialogue, but we only had one meeting, which was prompted by fear that the chairs would call us on the carpet.

CHAIR GIBSON: Us?

MEMBER OBUCHOWSKI: You. In any event, in any event, it was a good dialogue by email. We haven't made as much progress as I'd like. What we have succeeded in doing, however, is recruiting new members, and they are listed, together with the old members, at the bottom of the working group draft report.

New CSMAC members include Charla Rath, Steve Sharkey, although one would have thought he was a member.

Tom Shugrue's alter ego, Dennis,

now existing in his own right; Dennis Roberson, Giulia McHenry, Curt Schaubach and Harold Feld. Did I overlook anybody? Oh, sorry, Mariam. So -- oh good.

FEMALE PARTICIPANT: No, but you were already a member.

(Off mic comments.)

MEMBER OBUCHOWSKI: You forgot those seven meetings. You blocked them. In any event, turning to the --

(Off mic comment.)

MEMBER OBUCHOWSKI: Turning to the overview -- oh, and one other thing. We are not making recommendations on the final report. Since we had substantial -- it's kind of an awkward thing. We had a very extensive dialogue, and so some of the old guard was anxious to turn this into a final set of recommendations.

But I think some of the new members felt as though these were relatively intense recommendations, and they would want

to sort of review the logic more carefully. So with that said, the report as it's written has made four recommendations, one in the category of exploring methods for federal access.

We considered use of commercial networks, secondary easements, license rights from incumbents, interference protection. A pretty extensive discussion and taxonomy in the report on that.

Costs for federal temporary access to spectrum should vary. Good dialogue on that over the course of the last seven meetings. One would be that there'd be no cost or no impact on incumbents.

This is the STA model, which has been working quite well but in limited circumstances, and that the cost options should vary, depending on impact on incumbents in part, constraints on their build out, secondary market participation, et cetera.

We recommend that both NTIA and FCC should review rules to remove existing barriers to bidirectional sharing, and we also recommended in the draft report that NTIA and FCC should issue a joint statement of bidirectional sharing principles.

That, as you know, was in -- bidirectional sharing was in the President's 2013 Executive Memorandum. There's a lot of commentary at both agencies. Consideration that that be taken to a joint statement was the topic that we made a recommendation on, which is at this point a preliminary recommendation.

We also noted scope of work and new areas of inquiry going forward. These are ones that came out of the report last term. What rules and regulations might impede or discourage broader forms of sharing, and how might they be addressed?

We recommended a review and possible changes as a result of that review to

the NTIA Red Book and FCC rules. We thought that perhaps -- or that the Committee should look at possible incentive sharing going forward in two directions, and we suggested that challenges to this -- to identifying and accessing unused spectrum should be viewed more carefully.

One of the words that came up quite a bit in the seven meetings that we had in the last round was well, even if it's not being used, we want the optionality. What about in five years' time if we want to build out? What about if we really have no interest, but at some point we want to share this market?

If we signed onto to some form of government sharing, does that mean that makes this product or this quasi-market property less marketable? And so those are some of the challenges that were identified.

We then asked how should NTIA seek to implement any recommendations? What are

the regulatory hurdles? What are legislative requirements? So those are some of the areas that we teed up for future study. We also identified a way forward. One would be seeking three things from FCC and NTIA.

Basically, there's a lot of discussion at both agencies, both in advisory committees, the TAC and the CSMAC. But there's also some discussion at the -- by the staff and politicos at both agencies.

We recommend that that be a topic that we take on as a priority, and we're going to work through our liaison and Paige to get those briefings set up at NTIA, but also work through appropriate channels at the FCC.

There's going to be -- there is a lot of interplay, and we'd like to look and assess ways that this might be done further. Since this was written, I think TAC and CSMAC established something of a more formalized, but more of a direct relationship, and the link that we have obviously with the new

Private Sector/Government Committee and its work going forward.

We also suggested continuing working group research and evaluation. What new areas of inquiry, specific regulatory changes are needed? What economic incentives ought to be considered?

So that's kind of where we came out and where we left off in the discussion, the one discussion we had. Jennifer, I open up the floor of course to you, but then to the rest of the Committee, new and old, to make observations based on that.

CHAIR ALDER: We'll do that. Just keep it quick, and we'll do about five minutes of Q and A.

MEMBER WARREN: A one minute line. So we had two areas just to flag. One was Question 4 of this report we chose not to answer of the task questions, because it was overly-broad and we would have had to made a lot of kind of uninformed assumptions, I think

we called it.

So if there's something more specific for future work that NTIA would like to give us, to give us more definition there, we could take that Question 4. But I wanted to remind folks of that. Then something that at least some of us thought was a natural transition but was not within scope and we elected to drop it from discussion, we had no consensus to add it, but the question of permanent.

I mean once you start thinking about temporary, what's permanent? So again, that would need to be direction, perhaps from NTIA. But I just wanted to highlight those two omissions, and again these are just draft.

CHAIR ALDER: All right, thank you. So what we'll do is we'll go to questions what I'm going to do is target finishing the Subcommittee reports by 3:30. So that gives us about four-ish minutes on this topic, and I see we've got a question

from Jeff Reed.

MEMBER REED: Yes, this is Jeff Reed. Do you have a sense for who in the federal government might be most interested in bidirectional sharing?

MEMBER OBUCHOWSKI: I guess in terms of public pronouncements, it would be DoD, and that has been a relatively recent sort of overt phenomenon. In terms of others, I'm not really certain. Certainly NASA is already very engaged with the commercial sector, and has been working closely with the FCC in that respect.

Not really particularly -- I've not heard much of a vocal perhaps some of the classified agencies, maybe they are doing bidirectional sharing. How do we know?

(Laughter.)

CHAIR GIBSON: Michael, Michael Calabrese.

MEMBER OBUCHOWSKI: That's a joke guys. That is a joke.

(Laughter.)

MEMBER WARREN: And they can't tell us.

MEMBER CALABRESE: And with Jeff's question, which I think Janice could have answered more fully, but she was involved in the example that came up in the context of the 1755 band for example.

MEMBER OBUCHOWSKI: But we're not talking about that really.

MEMBER CALABRESE: Right. So there's nothing auction-related, was just that -- is that federal agencies such as DoD might want to make use of off the shelf commercial equipment that operates on a commercial, you know, what are FCC bands, and that might be a real benefit to them.

In which case, you know. So for example at remote military bases, to use cellular systems or such and -- but then of course they would be on the air, and the question is, you know, are they limited to

being a customer of a service, private service provider, or could they potentially operate such equipment on those frequencies if they're not being used at some later time.

So you know, that's where it's already come up once in a practical way.

MEMBER OBUCHOWSKI: Well, I could I just briefly respond. I mean I think that is one of -- that's why I highlighted both NASA and DoD, because increasingly, in the era of constrained budgets, of course NASA and DoD are looking at commercial satellites as one part of their, you know, capacity.

Obviously, the whole broadband revolution is not unique to the commercial sector, and so that comes up in the LTE context. There are certainly other cases, however. I mean it is OMB preference. It's often articulated to be the preference of various agencies, that they turn to commercial capability when at all possible.

But you know, if you don't have

the Spectrum Supportability Roadmap, that's pretty tricky. I guess the other observation I would make on that question of -- you know, this whole area is difficult in that you are looking at federal budgets and the federal budget cycle.

I mean that's why we made the recommendation as to long term. I mean short term isn't too hard for either side, right? You have a short-term requirement, people have been pretty forthcoming in terms of looking at their spectrum supply and whether it's available for sharing in the short term. I think that process has gone forward respectably well.

But the question, though, if you ask a DoD player or a NASA player, you know, we want this kind of satellite or this kind of system, you know, you're automatically getting yourself into a protracted budget cycle if it's a significant investment, and of course that's what these agencies ought to be making

is significant investments in commercial capability.

That's always a multi-leap year process, and if you don't have that Spectrum Supportability Roadmap beyond an STA, which is, you know, short term, it's tough.

CHAIR ALDER: All right. We've got two more questions and we'll see if anyone from the NTIA had any questions. So why don't we do the questions and then we'll kind of take the answers.

CHAIR GIBSON: Well, I am going to make it real quick, just a follow-up to Jeff. I think you posed a question to Janice. But really the question ought to be more from an NTIA standpoint, providing additional input on that one.

The other part of that is with the increased sharing that we're driving, there is going to be at least a strong interest from various government agencies to set up systems, if for nothing else than to test. STA does

give you some capability to do that, but some of these are going to be more permanent.

You're going to want to set up a cellular system that you're going to operate on a military base, for instance, in order to be able to test how various equipment operates with that, and you may or may not want to engage a cellular provider to run that for you. So that would be an example.

CHAIR ALDER: Okay, Charla.

MEMBER RATH: This is Charla Rath.

CHAIR ALDER: Charla.

MEMBER RATH: Yeah, and I -- and I was asking the same question, but I wanted to be more precise about it. What struck me when I sat down and looked at this was that the first question was about access to non-federal bands, particularly for large intermittent exercises and emergency use.

But when I read what the Committee -- the Subcommittee had done, it clearly was more along the lines of what, you know, Janice

was talking about. So I think from my point of view and maybe for some of the other new people on the Committee, it would be helpful to have NTIA either expand or clarify, you know, the question.

MS. ATKINS: And this is Paige Atkins, NTIA. I agree with that. We'll follow up in more detail. I would say in general, there is interest in bidirectional sharing for both temporary and perhaps permanent -- more permanent use I'll say in some of the examples that were given, a remote base that may not have access otherwise, to leverage commercial technology and deploy it locally.

I think that it's -- DoD, as was mentioned, and NASA have interests, as well as other federal agencies for various missions within the U.S., and we're trying to peel that back in more detail, to follow up and provide more concrete discussions in that regard.

CHAIR ALDER: With that, I think

we're going to move forward. Thanks Jennifer and Janice, and I guess we'll look for you guys to come back with the finalized ones maybe in February. So now --

MEMBER OBUCHOWSKI: Well, just on that. We're probably going to work with NTIA and have a conversation within the Committee. I mean, you know, some of this is a little bit of old news at this point. I mean the objective is to get something to NTIA that is useful in this, you know, forward.

I hate to sort of deliver a stale report, and frankly after seven rounds, one of the things we did was kind of throw up our hands, right? I mean we've gotten as far as we're going to get. Now we've got new blood and sort of a new environment and, you know, new demands.

We just think we probably should get guidance from Mark and you, Larry, about how desirous you are of this report being finalized as to what you now have, or should

we bring something forward to you that is updated.

CHAIR ALDER: Well, let's take that offline.

CHAIR GIBSON: But I want you to meet seven more times between now and February.

MEMBER WARREN: Christmas at your house?

(Laughter.)

CHAIR ALDER: With that, Michael Calabrese is going to take us through the Spectrum Sharing Cost Recovery.

Spectrum Sharing Cost Recovery

MEMBER CALABRESE: Right, also known in shorthand as the pay for sharing, Equity Sharing Subcommittee, and this is -- the seating is perfect, because Charla Rath is now the co-chair of this Subcommittee. So I'll start off and then Charla, you can add on anything else that I missed or that would be useful.

So just to remind and this will be fairly short, because we don't have recommendations yet. Kind of just my bottom-line preview. But just to remind everyone that the NTIA question was how should federal agencies be resourced to develop and implement sharing with non-auction licensees or services such as the unlicensed devices? And the problem, of course, is that the Commercial Spectrum Enhancement Act limits reimbursements, agency reimbursements for the cost related to bands that are auctioned.

So as we move to more of a sharing world, federal agencies have no source of reimbursement for costs related to facilitating band-sharing, particularly with things like unlicensed devices, or other improvements in spectrum efficiency unrelated to the agency mission.

So we had two calls, very good participation. I think nine members, including several new members of CSMAC. So

that was great. But we have no recommendation yet. The reason is after kind of jumping around a bit in our discussions, we -- and I here I think I'm channeling Harold Furchtgott-Roth, who made this point, that there's two different -- two basic paths, different paths we could go down.

We could come up with an ideal structure, you know, a kind of a green-fields proposal that would certainly require a change in law. Or we can struggle more up front with what might be possible under current law. So we decided that we will probably need to do both, because we're a bit skeptical about how much of this can be done under current law.

But we want to put an initial emphasis on what can be done under existing law, what kind of tricks can we pull out of the bag, if we go to the breaking point of both FCC and NTIA authority, with hopefully some creativity.

So we did not want to make a

recommendation about a fund or a specific funding mechanism such as particular user fees or who should pay them or how they should be collected, without knowing about much more than we do know about legal authority, and whether legislation really would be necessary.

So we need to know more, you know, from Matthew and his colleagues, for example, about the FCC's view of the limits of their legal authority. And just to give a flavor, just to take another minute, I guess, of the kinds of questions, because I'd invite the entire CSMAC to, you know, let us know what sorts of -- not only what sorts of questions, but who are the hidden experts who can -- who's really smart and can tell us these things.

But for example, what authority do the agencies have to impose fees on unlicensed devices, separate from, you know, let's say an FCC regulatory fee, and/or on device certification? Do agencies have authority to

set up a fund at all? Alternatively, what authority do agencies have to certify private sector intermediaries such as band coordinators or spectrum accesses from administrators, or like the FCC did already with the TV bands database providers, that would have the ability to charge and recycle fees.

And then perhaps the hardest question of all is if there is such a flow of funds or a revolving fund, is there authority to transfer that money to reimburse federal agencies for the sort of costs they have, both up-front costs and perhaps even down the road costs, retrofitting systems to be more interference-tolerant or whatever it might be, and that's another topic we thought we'd talk about at the back end, as well as, you know, what sort of costs would we anticipate.

So we decided to, you know, we need another stage of fact-finding inquiry. So we're setting up meetings with FCC, NTIA,

OMB, DoD, and we're just trying -- and you know, and doing some of our own research, including models.

We already did a couple, because I'm sure some of the first things that may jump to your mind are examples like UTAM, the unlicensed fund that existed for the unlicensed PCS bands. We did a little profile of that and the Telecom Development Fund, which uses interest on auction down payments, and recycled that into the sector to fund innovation.

Those are great. I think they're both more or less statutory. So anyway, that's where we're at. So we're going to be doing those inquiries and come back with recommendations at the next meeting.

CHAIR ALDER: Okay thanks. Yes, we are pressed for time. Thanks Michael. We have a question from Mark.

CHAIR GIBSON: A real quick question. Mark Gibson. So you studied -- so

you said you're studying basically the concept of multi-stakeholder groups, like with UTAM and -- are you looking specifically at that whole notion, because the Commission asks that question a big deal.

So are you looking at like what the Wireless Innovation Forum is trying to do and all that in the same context as that, are --

MEMBER CALABRESE: I am not aware of what they're doing in that context. So that's the sort of thing we need your input on, is if someone knows other folks who are thinking about this, who've already done research or other models that we don't know about.

CHAIR GIBSON: Okay, all right. We can talk.

MEMBER CALABRESE: Yeah.

CHAIR ALDER: All right. In the interest of time, I'm going to hold questions, then, on this group. If you have questions,

you can of course see the co-chairs afterwards. I wanted to make sure we did have time to cover our last and very important Subcommittee on the Industry Government Collaboration. So Steve Sharkey's going to talk about that.

Industry and Government Collaboration

MEMBER SHARKEY: All right, thanks Larry. This is Steve Sharkey, and I'm actually going to start by breaking Dale's rule about not having an apology. But I'll apologize, because I don't have a presentation for this. I think that, you know, the Committee has met once. We so it's a new committee that was created.

We did have one meeting, and with good participation. Although again, I apologize, I don't have a list of everybody that participated. But some good discussion.

The Subcommittee started off -- we've received three questions from NTIA, and they go to what type of spectrum issues do you

recommend NTIA prioritized for enhanced collaboration, to include requiring sensitive, classified information exchange? How can we most effectively leverage existing or merging entities to include a number of existing entities, CSMAC, EPSG, et cetera, and how would you modify the draft framework to most efficiently and effectively achieve the desired collaboration?

So along with those questions, we received a draft framework for collaboration and for, you know, for industry government work to continue. So that was the basis for the first meeting, was to really talk through those questions a little bit, and take a look at the proposed framework.

I don't know if the framework was sent to everybody or if it's on the website.

MS. ATKINS: It is not at this time.

MEMBER SHARKEY: It's not, okay. So I'll say it's -- you know, I think one of

the things that we focused on, as part of the discussion, was with the draft framework. It does look at kind of a multi-level process, where you would have committees that would set kind of a higher level agenda, and then work down progressively into more detail.

The Committee really talked about one of the things that we want to avoid is creating a lot of new committees that would have additional meetings, because we all have a lot of meetings. There are a number of bodies that currently talk about spectrum issues and how to improve spectrum issues.

So you know, one of the things that we agreed was the need to not allow this to balloon into something bigger, but to really leverage some of the existing committees that were referenced in the question, like EPSG or even groups like the WSRD group or even ISAR, which sets up I think some very good discussions, that can set a high level direction that -- out of which

recommendations could come for more focused discussions.

And then to -- for this effort to focus more on structure with smaller meetings that are smaller groups of experts, where we've seen good results in the past, that can really focus in on questions and the process to make that happen, respond to questions that come down from some of these larger organizations.

So the to-do for the group right now, actually Tom Dombrowsky, who's the other co-chair and myself, we're going to take a first shot at kind of revising the initial framework that we received, to focus in a little bit on more, you know, I think where the Committee came out of a more streamlined process, and then to take that back to the group to refine that, and then to answer some of the questions that were put forward.

CHAIR ALDER: Paige, want to go ahead.

MS. ATKINS: Paige Atkins, NTIA. To clarify a little bit of the intent. So what we're looking for is a holistic picture of how we move forward with collaboration, and that includes many existing activities like the CSMAC.

And in the framework, we tried to identify where we thought holes were and filling those holes in this holistic picture. The primary hole really was I think what you described, Steve, in terms of a -- I'll call it a framework that we can pull in the right players for focused discussions, and those players would change based on the focused discussion that needs to take place, and it would be an agile and flexible process that allows us to do that, coupled with leveraging the CSMAC for certain issues, and having even more public forums for general discussion and messaging around our direction and our vision and focus in certain key areas.

So I'd like to encourage you not

to just focus on that agile smaller process, but ensure that collectively and holistically we've got the right kinds of forums there that we can leverage, to include forums like the WSRD, ISAR, the TAC in certain cases, but ensure that we've got the big picture, as well as then focus in on what we need to do for where we have the gaps.

MEMBER SHARKEY: I think that's well in line, exactly the direction that we were looking at, to have you kind of feed the funnel and then work down into a smaller group, to really solve the problem and then bring it back out.

CHAIR ALDER: Any other questions or comments on that topic?

All right. Seeing none, then we'll close out the Subcommittee reports. Thanks to all the good work for people on the Subcommittee. The next item, Paige is going to take us through some of the lessons learned. Paige.

CSMAC Lessons Learned

MS. ATKINS: I'll do this very briefly. This is Paige Atkins. There were four slides that were posted that you have, and if you recall or some of you may not recall if you're new members, in the March timeframe -- I'll take a step back.

Last year, we convened a group to talk about lessons learned, CSMAC lessons learned, particularly related to the AWS-3 activities and the working groups. We compiled and summarized those lessons learned, and they were posted for the March CSMAC meeting. So those are available on the website as well.

Now in the slides I provided, the first slide really describes the categories of lessons learned that were summarized, and what we did, we took a look across the lessons learned and identified some key actions we wanted to take, to address some of those concerns, challenges, which in some case were

procedural, information-sharing and other challenges that were experienced during the AWS-3 working groups.

So if you go to the second slide, what we did was multifold in that first and foremost, we are developing a strategic plan and on this slide, it incorrectly states it's an NTIA strategic plan, and I want to correct that. It's a strategic plan for federal spectrum management, and we are in the process of developing that.

One of the things that we are doing are creating some fundamental tenets, that will enable us to address some of the lessons learned that were identified during the CSMAC, and summarized in that March summary. Some of the areas I've highlighted here include collaboration, technologies, data and information exchange.

So we'll use the strategic plan to help institutionalize some activities that will help us get to our next level. Now on

the third slide, what we've done is also identified some specific actions that we are taking.

The first one is around this new or enhanced collaboration framework, and as we work with the CSMAC to get your feedback and we work with the agencies to determine exactly what that looks like, we will be moving forward with that plan, to again enhance our collaborative activities, particularly as we move toward the sharing paradigm.

We have a couple of actions that we're taking, the second and third, that are more administrative in nature, to help us do a better job in facilitation of these discussions for the CSMAC specifically, to include the portal that Larry mentioned earlier, that we're going to establish hopefully by early next year, to improve the visibility and sharing of information across the Subcommittees and the Committee members.

Then the last item is one that I

also mentioned earlier, where we established NTIA liaisons to the Subcommittees, to help identify where there may be needed enhanced cross-flow of information or feedback from NTIA to the Subcommittees, to make sure that we are getting what we need to you get what you need to address the questions at hand.

Now the last slide is -- are a couple of larger areas where NTIA will be working with the co-chairs and the Committee members, to ensure that we have or we're providing the right kind of scope and expectations for the Subcommittees and the Committee at large, because there were some issues associated with definition of scope and changing scope or different opinions of what those activities should be.

Then the last major bullet is really around accepted methods, tools. How can we not only create a mechanism to establish those for the relevant activities within the CSMAC, but then again how can we

leverage the lessons learned across multiple activities to wrap our arms around accepted best practices, methods, tools, for other activities that are occurring in the spectrum community.

So that's a quick summary of where we are, and just wanted to let you know that we have taken the lessons learned that were provided and have created some actions to take against those, to improve as we move forward.

CHAIR ALDER: Thanks, Paige. Any comments or questions from the Committee on that piece? Jennifer Warren.

MEMBER WARREN: Jennifer Warren. I just wanted to say that I appreciate this report, because it, you know, it validates kind of the feedback we gave you, but also the commitment in appointing the OSM liaisons. I think that's a real commitment of NTIA to the CSMAC, because we know that's a lot of resources.

So I just wanted to express

appreciation for that, because it's been valuable already in some of the groups.

MS. ATKINS: Thank you, Jennifer. Public Comment

CHAIR ALDER: Other comments, questions? Seeing none, let's move on to the next item, which is the opportunity for public comment. So again during this phase, it's an opportunity for non-members of the Committee to comment, focused on items that were on the agenda today.

MR. MONCURE: Hi. I'm Peter Moncure. I represent LS Telcom and RadioSoft. I was unaware of the work of this Committee until this week, so I have four comments I'd like to make. First, I'd like to say you folks are really well representative and diverse and congratulations on the specific expertise in your work.

Secondly, although the co-chair said there was to be no business conducted today, I am presumptuous enough to suggest an

item for your immediate consideration, which is in view of Mr. Hatfield's point that data from various services needs to be able to be exchanged, aggregated and analyzed. In view of the time it takes to undertake such an actually complex process, Mr. Gibson will confirm that in the 70, 80, 90 process, 90 percent of the time and effort was spent in defining the data and arranging the exchange.

I therefore ask the Committee to consider the following resolution, that NTIA shall, as soon as practical, put up a straw man for data exchange and implement it.

Thirdly, several speakers commented on how to deal in regulation, with the acceleration of technological advancement. We faced this in Part 90 at the SEC, since I do a lot of frequency coordination there, and our solution to part of that problem was to have essentially an industry committee, which could act much more quickly in response to new technological opportunities.

So you'll see in several places in the SEC rules a consensus of the certified frequency coordinators, and it strikes me that even this Committee or a subcommittee of it could be entrusted with that kind of market response, because it's going to happen. You can't get it all right now.

Lastly, I'd like to say in comments about the levels of spectrum observation, that LS Telcom in particular sits right at the bleeding edge of the software analysis of precisely that, and there's a lot of opportunity there, which may modify some of the Committee's conclusions. Thank you.

CHAIR ALDER: Thank you very much. Is there other comments from the public?

On the phone? All right. Seeing no other comments, I think we're going to move into the final piece of the agenda, which is the closing remarks by the co-chairs, and I'm going to give it to Mark to give those.

Closing Remarks

CHAIR GIBSON: All right. I'll be brief, because I think we all want to go.

(Laughter.)

CHAIR GIBSON: This is great. Let's just hold hands and --

(Simultaneous speaking.)

CHAIR GIBSON: It's different from up here, you know. Anyhow, one thing I wanted to comment on is that it is a great group of people to work with, but there's a lot of work to be done. There are seven Subcommittees, and that's more than I've ever seen, and I think I've been on this group for about four years, and it seems like more work than when we had the five, and that was a lot of work.

So I think the Transitional Sharing is going to come off. That will leave us with six. But Larry and I were just wondering, from an existential perspective, do we think that's too many? You know, if you look at the list of who's doing what, a lot of people have way more than one. One, two,

three, perhaps Subcommittees they're working on.

So -- and I'm not directing this to wrap it up and get done so we can move on to other things. I'm just suggesting that, you know, there's a lot of work going on and we all have day jobs. So we got seven on the list because there was a lot of interest. Some of these things have overlapped.

So this is a rhetorical observation, but maybe we need to wrap some of these up so we can go on to new stuff. Did you want to comment, because I know you guys have some thoughts on that? No.

MS. ATKINS: I think that my observation, as we've gone through the outbriefs of the Subcommittees, is there is -- there are intersections, there are interdependencies in some cases, addressing similar issues, and I think it would be helpful for us to look across the Subcommittees and determine if we can gain

additional efficiency and streamline them appropriately, so we can better focus on the key issues that we have at hand.

CHAIR GIBSON: Thanks.

MS. ATKINS: Did you want to say anything?

MR. NEBBIA: Only -- this Karl Nebbia -- only that I think we suggested when topics first came up, that maybe we didn't want to do all of them right away. But I think it was the preponderance of interest on the Committee that said, no, we really want to do all of these. So I do think there's room for consolidation and reducing the number at any one point.

CHAIR GIBSON: That's a good point, consolidation. Stand by, Dennis. So Larry and I and the team here will look at seeing maybe possibly if we can do that. Dennis, a quick comment?

MEMBER ROBERSON: Well, it could be later, but the comment is really more of a

question, and that's the time line. Usually, we have a sunset for the items, or at least a goal of when we're going to complete them, and this time it has been a lot more fuzzy, at least from my observation, as to when there was an expectation when we would complete it, when new topics would come up.

CHAIR GIBSON: It's a good observation. I think, you know, sort of the team up here will probably take a look at that, and I think what we're driving toward is to have some of these wrapped up by February, so that we have the recommendations and then we can close that stuff down and move on to other things.

I thought that -- actually Larry isn't being glib. I thought we were working to some of that today, and some of that is my fault, because we had a Subcommittee we could have closed down and I just didn't get to it.

So mea culpa, but we will work on a timeframe for some of this to get it wrapped

up, so that we know for each of these Subcommittees we're working toward an end time, so we can talk about what we would move on to. Real quick Dale? I'm sorry.

MEMBER ROBERSON: Well, and historically, we seem to work on a cycle where all of them were initiated and all of them were completed by a time, and with some little --

CHAIR GIBSON: What happened was that when the working group -- the five working groups ended, they all ended full stop, and we were stuck with an open slate. So we threw a lot of spaghetti against the refrigerator and it all stuck.

So now we've got to go back and kind of figure out what staggers, and so that's kind of our job. If you guys have thoughts on that, we'd certainly entertain them. But that's kind of where we got into this, so Dale.

MEMBER HATFIELD: Just quickly.

This is Dale Hatfield. Tom and I thought four and five could be consolidated. So I think we actually suggested and I think it was rejected by, I think it was the co-chairs. We tried, because we were working pretty closely together.

But my concern is not so much with that, is that we give an adequate opportunity in the full Committee to be able -- I mean there's an awful lot of smart people around this table who I would love to hear from, and but these meetings end up so rushed, we can't get the benefit of the full Committee thoughts.

So I would -- I don't know. We don't want to do a full-day meeting, I doubt, or things like that. But it does concern me that we don't always get the benefit of everybody's input.

CHAIR GIBSON: That's a good point. There's lots to be done and little time to do it in. I think you saw, we spent

almost an hour on Enforcement, which is not to say it sucked all the air out of the room.

But that's a very hot topic, and you guys had a very intense presentation, intense meeting. There was a lot of data to it and, you know, all of us have had a chance to read it. But you know, there's a lot going on there.

That's why if we pull this back to a select few Subcommittees and focus on them, we may be able to have the broader discussion that you're talking about, rather than try to, you know, do it all --

MEMBER HATFIELD: You're saying be careful you don't pack a lot of topics into one subcommittee.

(Simultaneous speaking.)

CHAIR GIBSON: Yes, yes, that's a good point. It's a challenge. Thank you.

Jennifer.

MEMBER WARREN: Jennifer Warren. To build on what Dale said, another option

would be maybe just to focus on two or three topics, instead of have seven report outs everything on the same time, because I do feel -- I didn't even realize it was an hour we spent on Enforcement.

We could have spent a lot more time on that, and while we're in the Subcommittee, I mean let's face it. Sometimes those Subcommittee calls are necessarily scheduled for certain timelines and not everybody can make them, whereas most of us are here.

So allowing that kind of discussion at this level, I think, would be beneficial.

CHAIR GIBSON: That's a good point. That's a great point. Thank you, and we are trying to do that. So in light of that, so on one hand I taketh away, and on the other hand I giveth. If there are other things that we should be working on, that you guys think --

(Laughter.)

CHAIR GIBSON: Doesn't that seem somewhat mutually exclusive? But I mean seriously, if there's something -- you make a good point, that maybe we don't need to have outreach from every Subcommittee. We could have 90 subcommittees and only brief two, in which case we'll get done by 2019 or something.

But that's the job of the high paid people at this end of the table, right. But I mean seriously, if there are topics out there that are of interest, that we need to be thinking about, you know, float them up and maybe by 2019 we'll get to them.

That was really all I had. Did I miss anything? Okay. That's it. You're bleeding, so you can adjourn.

CHAIR ALDER: The meeting is adjourned.

CHAIR GIBSON: Thank you.

(Whereupon, the above-entitled matter went off the record at 3:43 p.m.)

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C E R T I F I C A T E

This is to certify that the foregoing transcript

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was duly recorded and accurately transcribed under my direction; further, that said transcript is a true and accurate record of the proceedings.

Neal R. Gross

Court Reporter